Mastermind PBC™

User's Manual

RJM Music Technology, Inc.

Mastermind PBC™

User's Manual

Version 3.1
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Table of Contents

Introduction

Thank you for purchasing the Mastermind PBC audio loop switcher! The Mastermind PBC is designed to be an all-in-one switching system for the pedalboard. With the Mastermind PBC, you can switch effects, control your amp's channel switching, and send MIDI commands all with the press of a button. You can now get the power and flexibility of a rack-based rig on a pedalboard!

The Mastermind PBC includes a large feature list:

- 10 audio loops, arranged in a group of 4 loops, a group of 2 loops and another group of 4 loops, with insert points in between
- True-bypass audio switching for the best guitar tone
- The last four loops are stereo capable using TRS jacks
- Each of the last four loops can be switched between series and parallel routing, using an internal line mixer
- The two outputs can be used as left and right outputs for a stereo signal, or as A and B outputs to A/B/Y switch a mono signal between two amps
- The B output has a switchable isolation transformer and a programmable phase switch
- Three audio buffers, each of which can be enabled or disabled by IA button or as part of a preset (before loop 1, before loop 7 and after loop 10)
- Click Stopper noise reduction circuit, which can be switched between two positions (before loop 7 or after loop 10)
- Tap tempo support for both MIDI-compatible pedals and analog pedals that have external tap input jacks
- 11 buttons, each with a multi-color LED indicator
- Buttons are user configurable - any button can be set to any function and LED color
- Easy to read LCD display that can display preset and song names, plus other status
- Built in tuner
- MIDI input & output connections, powered by the MIDI "brain" of our Mastermind GT controller
- USB device port for connection to a PC or Mac. This allows the Mastermind PBC to send MIDI commands to a computer, and to communicate with the Mastermind PBC editor software
- USB host port for use with a USB thumb drive. Back up and restore settings to a flash drive, and also use a flash drive to perform firmware upgrades
- Two 1/4-inch TRS jacks that provide four function switches. These can be used to control the channel switching and other features on an amplifier
- Expression pedal input that can be programmed to generate MIDI messages
- External switch input allows two more switches to be added
- Mac and PC editor software allows for faster and more comprehensive editing

Front Panel
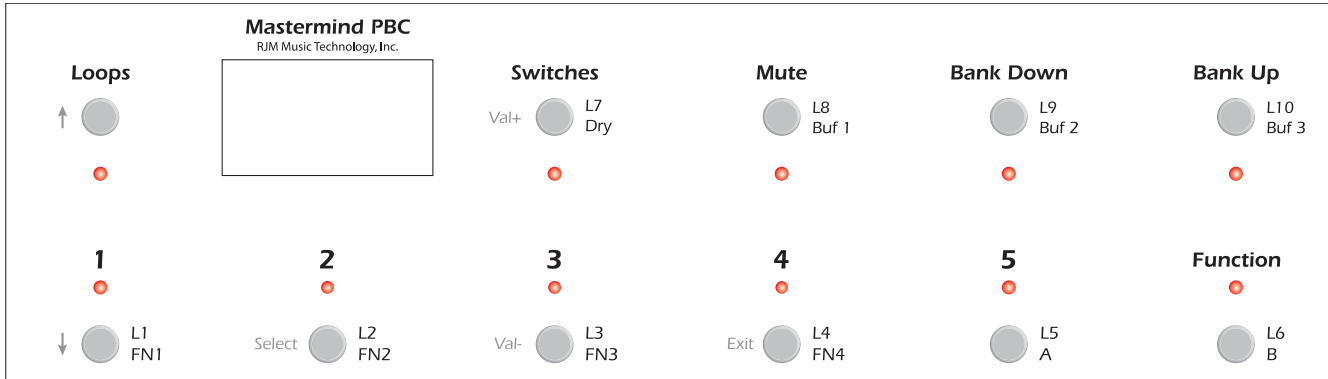
Front Panel Controls

Each button on the front panel can have different functions depending on the current operating mode. In this section, we will only describe the button's main function. The other button functions will be described in subsequent sections of the manual.

1 through 5 – These buttons select one of the five presets in the current bank. Each preset can turn on any combination of audio loops, function switches and send MIDI commands. Holding buttons **1** and **3** enters Setup Mode.

Bank Up / Bank Down –The 768 presets in the Mastermind PBC are arranged in banks of 5, and these buttons allow you to select which bank of 5 you'd like to access. When selecting banks, the preset buttons (**1-5**) flash, indicating that you need to select a preset within the desired bank. The PBC will remain on the previously selected preset throughout the bank selection process until a preset button is pressed.

Loops – Pressing this button puts the Mastermind PBC into loop selection mode, where you can turn individual loops on and off, and store their settings to presets. See the Loop Selection Mode section for information on this mode.

Switches – Pressing this button puts the Mastermind PBC into switch selection mode, where you can turn on function switches, buffers, outputs, and the mixer dry send, and store the settings of these switches to presets. See the Switch Selection Mode section for information on this mode.

Mute – Pressing this button mutes the audio signal and activates the built-in tuner.

Function – This button can have multiple functions based upon your needs. By default, this button is set up to access the global preset, a preset that's available no matter what preset or bank you're on. You can also program this button to other functions, such as tap tempo or controlling the loops on a connected Mini Effect Gizmo.

Main Display

The main display shows the current preset or song name as well as status of the PBC's loops, switches, buffers and outputs. Each indicator changes to white text on a black background to indicate that it's active.
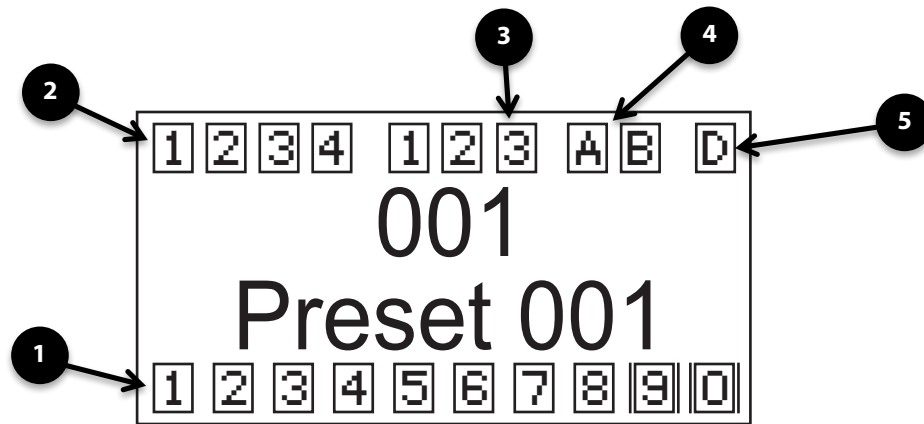
1. Audio Loop Indicators – indicates which of the 10 audio loops are currently active. Loops with two vertical bars next to them (like loops 9 and 10 above) are set to parallel routing instead of the default series routing.

2. Function Switch Indicators – indicates which of the four function switches are currently active

3. Buffer Indicators – indicates which of the three internal audio buffers are currently active

4. Output Indicators – indicates which of the two audio outputs are active. If the B output has two vertical bars next to it, the output is inverted.

5. Dry Signal Indicator – indicates when the dry audio signal is being sent to the internal line mixer.

Rear Panel
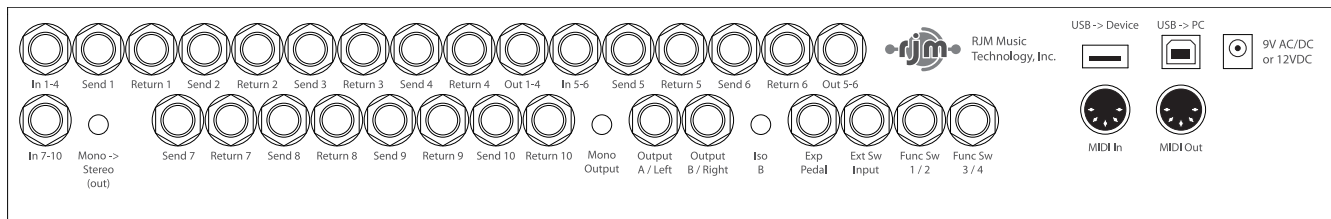
Rear Panel Connections and Switches

In 1-4 – This is the main input where your guitar plugs in.

Send 1-4 and Return 1-4 – Connect your first four effects here. The send jack connects to the input on your effect, the return jack connects to the output on your effect.

Out 1-4 and Input 5-6 – This is an insert point that allows you to connect something between loops 4 and 5. This allows you split out loops 5 and 6 and use them in a different location. If you don't plug anything into **Out 1-4** and **Input 5-6**, the signal from loop 4 will continue on to loop 5, placing loops 1-6 in series with each other.

Send 5-6 and Return 5-6 – Connect your next two effects here. The send jack connects to the input on your effect, the return jack connects to the output on your effect.

Out 5-6 – This is the output from loop 6. If you're using loops 7-10 in your amp's effects loop, this jack should connect to your amp's input. If you're using all 10 loops in front of your amp, don't connect anything to this jack.

In 7-10 – This is the input to loop 7. If you're using loops 7-10 in your amp's effects loop, connect this jack to your amp's effects loop send. If you're using all 10 loops in front of your amp, don't connect anything to this jack. If nothing is plugged into this jack, the signal from loop 6 will be sent to the input of loop 7.

Mono->Stereo button – If this button is pressed in, the signal coming from **In 7-10** is passed unchanged to loop 7. If the button is in the out position, the signal is converted to stereo before going to loop 7. This is done by connecting the tip of the **In 7-10** jack to the tip and ring of loop 7. Keep this button pressed in if you're using a mono output, or the signal coming into **In 7-10** is stereo and you're using stereo outputs.

Send 7-10 and Return 7-10 – Connect your last four effects here. The send jack connects to the input on your effect, the return jack connects to the output on your effect. These loops are stereo capable using TRS connectors.

Mono Output button – If this button is pressed in, the left (mono) side of the signal coming from Loop 10 is passed to both the A and B outputs. This allows you to use the outputs as an A/B/Y switch. If this button is not pressed in, the output jacks are wired in stereo (left and right).

Iso B – Pressing this button activates an isolation transformer on the B output. This is useful when using more than one amp – the isolation transformer may help reduce hum due to ground loops between the amps. It's important to have one or more of the audio buffers turned on when using the isolation transformer to prevent tone loss.

Exp Pedal – An expression pedals can be connected to this port using a ¼" TRS cable. Refer to the Expression Pedal section for more details.

Ext Sw Input – An external footswitch can be connected to this port to add two more switches to the system. The port can take a single or double footswitch connected with a ¼" TRS (tip-ring-sleeve) cable. These switches are fully configurable using the Mastermind PBC editor software and can perform all of the operations the on-board switches can. Refer to the External Switch section for more details.

Func Sw 1/2 and **Func Sw 3/4** – The function switches allow you to control the channel switching and other footswitchable functions on amplifiers. They will work with most amplifiers and other devices that have ¼-inch switching inputs. Because the two jacks are electrically isolated, each of the two jacks can safely connect to a different device.

USB -> Device – This is a USB port designed for use with a USB flash drive. A flash drive can be used to back up or transfer settings, and is also used for firmware upgrades.

USB -> PC – This USB port is designed to connect to a PC or Mac. When connected, the Mastermind PBC will appear as a MIDI interface connected to the computer.

MIDI In – This is a MIDI input port. It can be used for receiving MIDI patch data, program changes or can be used to link multiple Mastermind PBCs together into a multi-unit system.

MIDI Out – This is the main MIDI output. Connect this port to the MIDI device(s) you wish to control.

Power – This is the main power input for the Mastermind PBC. The Mastermind PBC requires a 9VDC or 12VDC supply. The current draw at 9 volts is approximately 500mA, but at 12VDC it is approximately 400mA. The Mastermind PBC will work with Voodoo Lab power supplies that have 12VDC / 400mA outputs.

Audio and Switching Features

Audio Buffers

Using long cables or many effects may degrade the guitar signal, causing it to lose clarity and definition. The audio buffer is used to "strengthen" the guitar signal and preserve sound quality. The effect may vary from subtle to significant, depending on the length and quality of cables and type of effects used in your rig.

There are three audio buffers in the Mastermind PBC: one in front of loop 1, one before loop 7, and one after loop 10. These can be programmed using the Switch Selection mode to turn on or off in each preset. By default, all buffers are enabled for each preset. In most cases, it's ok to leave all of them on. However, certain pedals such as wah pedals or germanium fuzz pedals work better without a buffer in front of them. In presets where you're using one of these pedals, it's best to turn off the first buffer to let the pedal operate normally.

The later two buffers generally can be left on. They tend to improve the audio signal at least a little, and don't usually cause any problems. These later buffers are especially important when using the built-in line mixer or the isolation transformer on the **B** output. These features need the buffers to prevent them from affecting your tone.

Click Stopper

The Mastermind PBC uses relays to perform its switching. Relays are the cleanest, most transparent switching method available. The disadvantage of relays is that they can produce a slight click in your audio signal when they switch. This is more noticeable when using a high gain amplifier or overdrive and distortion pedals. The Click Stopper circuit found in the Mastermind PBC is designed to greatly reduce this click noise by muting the audio output briefly when the relays switch.

The Click Stopper is part of the second and third buffer circuits (before loop 7 and after loop 10). For them to work, the buffers need to be enabled. There are also settings in the Audio section of the setup menu that allow you to disable each Click Stopper if desired. Generally, you can leave both Click Stoppers on, but if you're running loops 7-10 through your amp's effects loop, you can try turning off the Click Stopper after loop 10. Loops 7-10 probably won't produce any noticeable click because they're located after all of the gain in your system.

Stereo Loops

Loops 7 through 10 on the Mastermind PBC are stereo capable. If you plug a stereo or TRS (tip-ring-sleeve) cable into these loops, you can switch stereo signals. Although they are stereo capable, these loops can always be used for standard mono signals – just be sure to use mono cables.

If you need to connect to equipment that has separate left and right inputs and outputs, you will need to use insert cables to connect it to the Effect Gizmo. These cables have a TRS/stereo connector on one end and split the stereo signal to separate left and right connectors.

There are two switches on the rear panel that assist with stereo setups. The **Mono -> Stereo** switch, in the "out" position, takes the signal coming into loop 7 and sends it to both the left and right sides of the stereo signal, creating a false stereo signal. In the "in" position, the signal from loop 7 input is left unchanged (allowing you to send a stereo signal into **Input 7-10**). The **Mono Output** switch, in the "in" position, takes the left side signal and feeds it to both the **A** and **B** outputs, allowing you to use the outputs as a mono A/B/Y switch. In the "out" position, the **A** and **B** outputs are fed from the left and right sides of the signal, respectively.

How these switches should be set depend on your setup:

	Mono -> Stereo switch	Mono Output switch
All mono effects, mono output	In	In
Stereo effects in loops 7-10, mono input to loop 7, stereo out	Out	Out
Stereo effects in loops 7-10, stereo input to loop 7, stereo out	In	Out

<u>Internal Line Mixer</u>

Loops 7-10 also can be routed in parallel using the internal line mixer. Running effects in parallel became popular years ago among L.A. studio musicians because it allows you to use a lot of effects without making your sound excessively muddy. Effects like chorus, reverb and delay can be applied to your guitar signal individually, without having the effects affect each other. For example, in a parallel system, reverb would be applied to the notes you're playing, but not to the echoes coming from your delay processor.

Another benefit of parallel routing is that you can have a separate dry signal path that doesn't travel through your effect processors at all, avoiding the signal degradation that happens when your signal is converted from analog to digital and back again. This dry signal is routed around your effects and mixed back into your signal by the line mixer.

The third benefit is the ability to preserve delay and reverb trails. When most loop switchers deactivate a loop, the effect is cut off abruptly. For most effects, this is exactly what you want. However, for delay and reverb effects, this isn't always desirable. It sounds more natural to allow the echoes to continue to trail off, but not echo any new notes played. Using the line mixer permits this – in the Audio section of the setup menu, you can activate trails for any of the parallel-capable loops. Trails will only work when the loop is set to parallel routing.

The internal line mixer is a basic mixer with unity gain inputs and outputs. Because of this, it works best with pedals that have programmable output levels, and also have a "kill dry" option that allows you to output only the wet (effect) signal from the pedal. The pedals from Eventide and Strymon are good examples. To use them in parallel, set them to "kill dry", then use the output level controls on the pedals to set the amount of effect you'd like to blend into your dry signal for each preset.

The Mastermind PBC allows you to choose which loops are in series and which are in parallel for each preset. This is done by entering loop selection mode (press the **Loops** button), then holding the desired loop (7 through 10). This will switch the loop from series to parallel (or from parallel to series). The indicator light will be blue if the loop is series, and purple if it's parallel. Also, the loop indicator in the main display will show two vertical lines next to the indicator, indicating the loop is parallel.

The dry signal sent to the mixer can be activated or deactivated in the switch selection mode (press the **Switches/Dry** button). The "D" indicator on the main display will also highlight when the dry signal is active.

Setting any loop to parallel enables the internal line mixer. The way the signal is routed can be summarized in a couple of rules:

1). Each loop receives its input signal from the output of the last series loop before it.
2). The dry signal is taken from the output of the last series loop.
3). The output of each parallel loop is sent to the line mixer, not to any other loops.
4). The line mixer output is connected directly to the main outputs of the PBC.

Here are a few examples of how different series/parallel combinations would be routed. Generally, you will want to keep the parallel loops at the end of the signal path, but you can experiment with other routings as well:
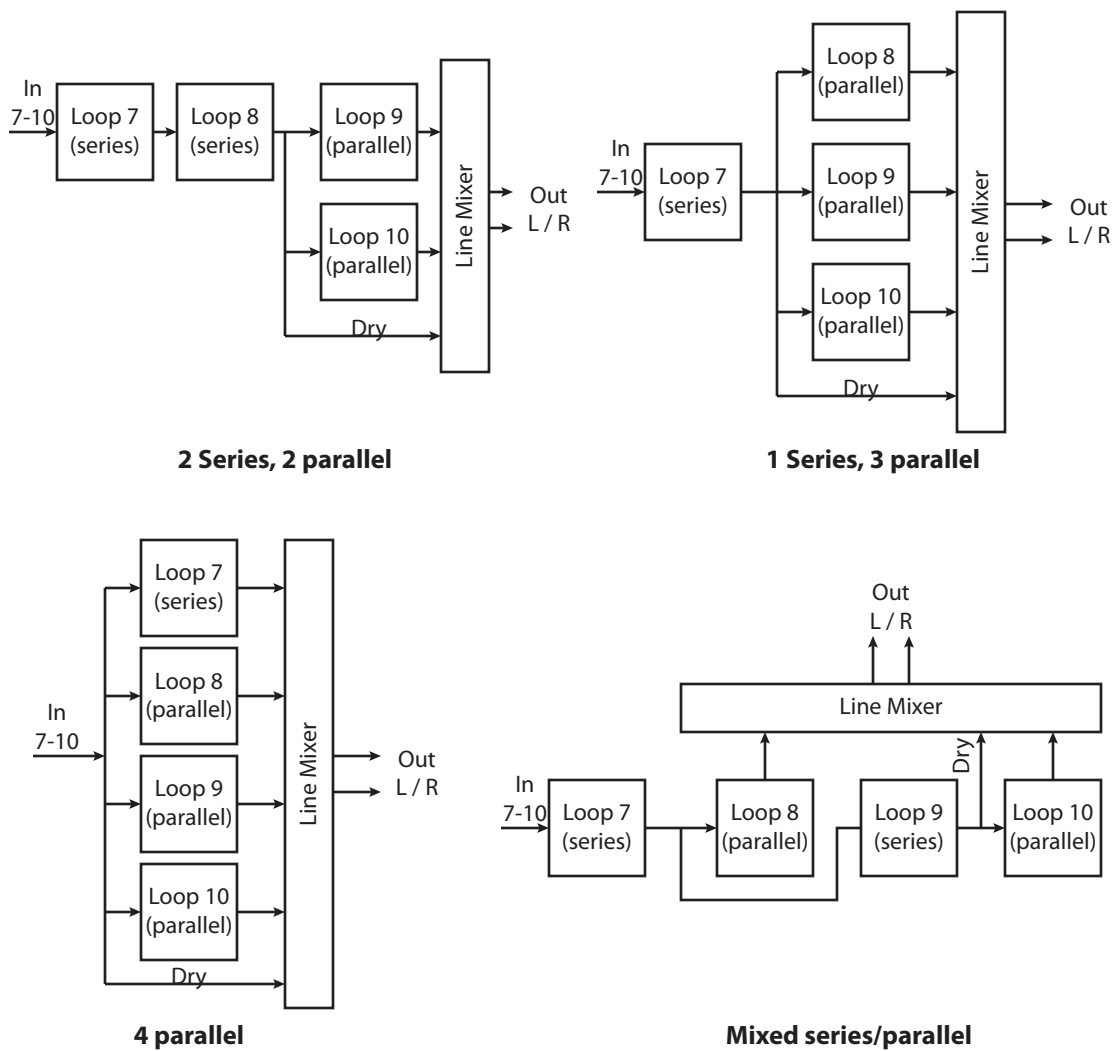
2 Series, 2 parallel

1 Series, 3 parallel

4 parallel

Mixed series/parallel

Outputs A and B

The two outputs, **Out A** and **Out B**, can be used as stereo outputs, or as an A/B/Y switch for a mono guitar signal. The **Mono Output** button on the rear controls the function of these outputs. Press the button in for dual mono outputs, leave it out for stereo outputs.

The outputs are programmable – they can be turned on or off for each preset in switch selection mode. The B output also has an isolation transformer, which can be activated by pressing the **Iso B** button on the rear panel. The isolation transformer can help with ground loop hum that can occur when connecting to two amps. If the isolation transformer is activated, you can also invert the phase of **Out B**. This is useful if you find that your amps don't sound right when played together. Inverting the phase may fix it. To do this, enter switch selection mode, and hold the **Function/B** button for three seconds. The indicator light will switch from yellow to red, indicating the output is inverted. The "B" indicator in the main display will also show two vertical lines next to it when the output is inverted. The phase inverting switch can be programmed to turn on or off for each preset.

Function Switching a.k.a. Controlling Your Amp

The Mastermind PBC has the ability to control footswitchable features on many amps. This could be channel switching, reverb, tremolo, etc. – anything that is controlled by a 1⁄4-inch footswitch jack. The **Func Sw 1/2** and **Func Sw 3/4** jacks are be used for function switching purposes. You can use a standard mono 1⁄4-inch cable, a TRS 1⁄4-inch cable or an insert cable to connect to these jacks:

Mono 1⁄4-inch cable – this allows you to control one function on an amp with each switching jack. This connection will let you use one switch from the function switching jack. (switch 1 on **Func Sw 1/2** or switch 3 on **Function Sw 3/4**). This connection is typically used with amps that have single button footswitches.

TRS 1⁄4-inch cable – this allows you to control two functions on an amp with each switching jack, providing access to all four function switches. This connection is typically used with amps that have two button footswitches.

Insert cable – an insert cable is a 1⁄4-inch cable that has a TRS (aka stereo) connector on one side and two 1/4-inch mono connectors on the other end. Insert cables allow you to access both function switches on a jack, but split them to two different switching jacks on the amp. This connection is typically used with amps that have a non-standard footswitch jack and more than one 1/4-inch external switching jacks. (Mesa Boogies are good examples of this). ***Please note!*** Don't connect the two mono plugs of an insert cable to two different amps or other devices – this can cause a ground loop or worse electrical problems.

The two function switch jacks are electrically isolated from each other, so it is safe to connect each jack to a different amp. Just don't try splitting one jack to two different amps!

The default settings for each switch are latching and normal (non-inverted). These settings will work with the majority of amps. If your amp has different requirements, you can use the Fn Switch Settings section of the setup menu to change the settings for each switch.

These Function Switch jacks can also be used to control tap tempo on pedals that have an analog tap input jack. Please refer to the Auto Tap section for details.

Wiring Diagrams

The following pages show a few examples of ways you can wire the Mastermind PBC to control your guitar rig. These are only a few suggestions – there are many other possible ways to do it.

Mastermind PBC Wiring Diagram

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Guitar In

In 1-4   Send 1   Return 1   Send 2   Return 2   Send 3   Return 3   Send 4   Return 4   Out 1-4   In 5-6   Send 5   Return 5   Send 6   Return 6   Out 5-6

In 7-10   Mono -> Stereo (out)

Send 7   Return 7   Send 8   Return 8   Send 9   Return 9   Send 10   Return 10

Mono Output

Output A / Left   Output B / Right   Iso B   Exp Pedal   Ext Sw Input   Func Sw 1, 2   Func Sw 3, 4

RJM Music Technology, Inc.

USB -> Device   USB -> PC   9V AC/DC or 12VDC

MIDI In   MIDI Out

Amp

Input

Footswitch Input(s)
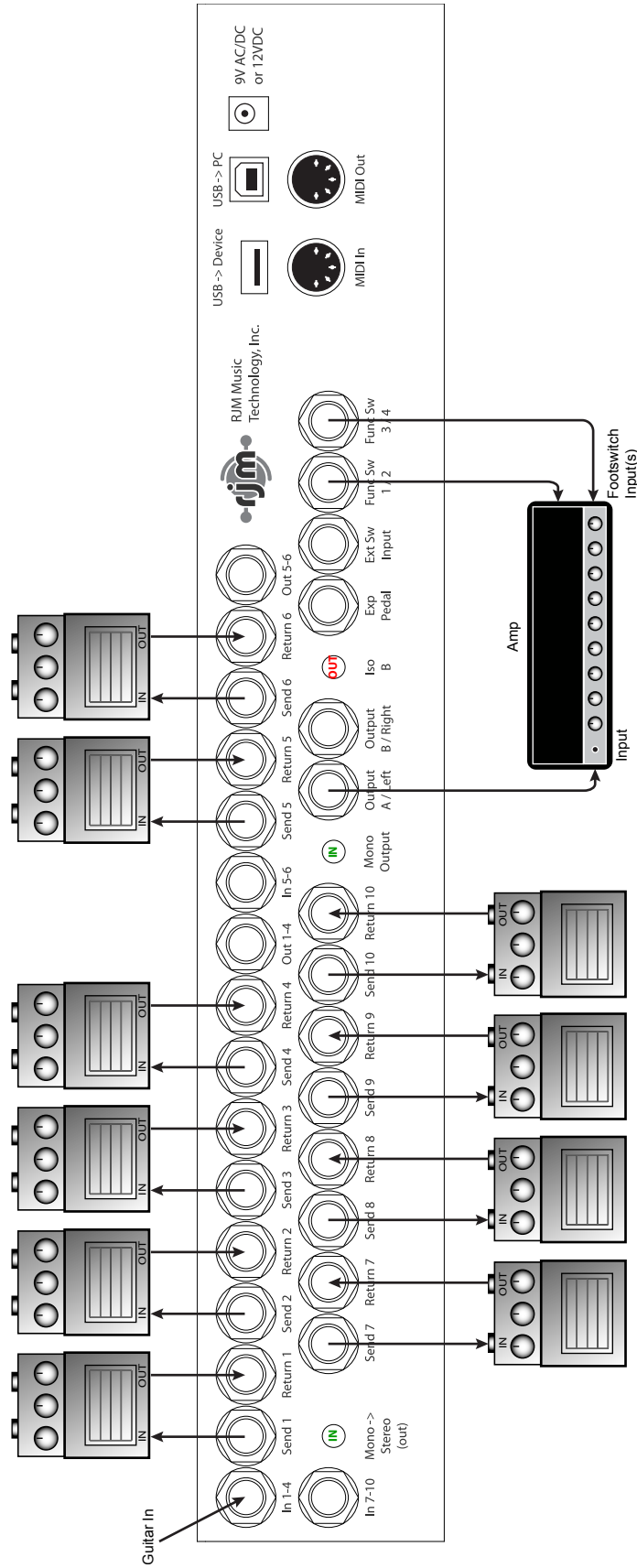
Mastermind PBC Wiring Diagram
10 pedals in front of an amp

This is the most basic configuration - 10 pedals in front of an amp's input. If the amp has more than one channel, you can use the optional function switch connection(s) to control the amp.

17

Mastermind PBC Wiring Diagram

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Guitar In

In 1-4 | In 7-10 | Send 1 | Return 1 | Send 2 | Return 2 | Send 3 | Return 3 | Send 4 | Return 4 | Out 1-4 | In 5-6 | Send 5 | Return 5 | Send 6 | Return 6 | Out 5-6

Mono -> Stereo (out)

Send 7 | Return 7 | Send 8 | Return 8 | Send 9 | Return 9 | Send 10 | Return 10

Mono Output

Output A / Left | Output B / Right | Iso B | Exp Pedal | Ext Sw Input | Func Sw 1 2 | Func Sw 3 4

IN

Amp #1

Amp #2

Input

Footswitch Input

RJM Music Technology, Inc.

USB -> Device | USB -> PC | 9V AC/DC or 12VDC

MIDI In | MIDI Out
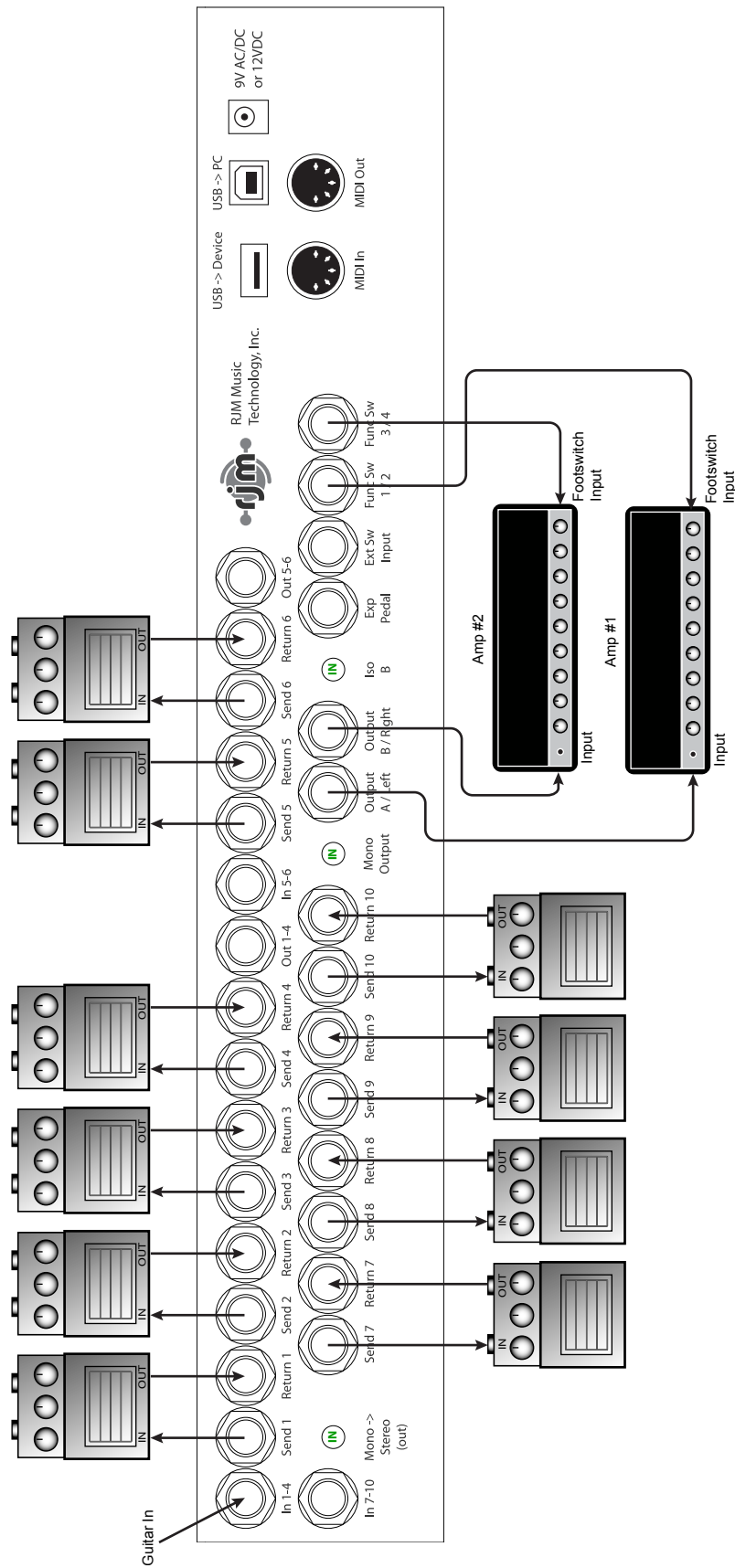
Mastermind PBC Wiring Diagram

10 pedals in front of 2 amps

This configuration shows 10 pedals running into the inputs of 2 amps, in an A/B/Y switch configuration.

If the amp(s) have more than one channel, you can use the optional function switch connection(s) to control the amp.

18

Mastermind PBC Wiring Diagram

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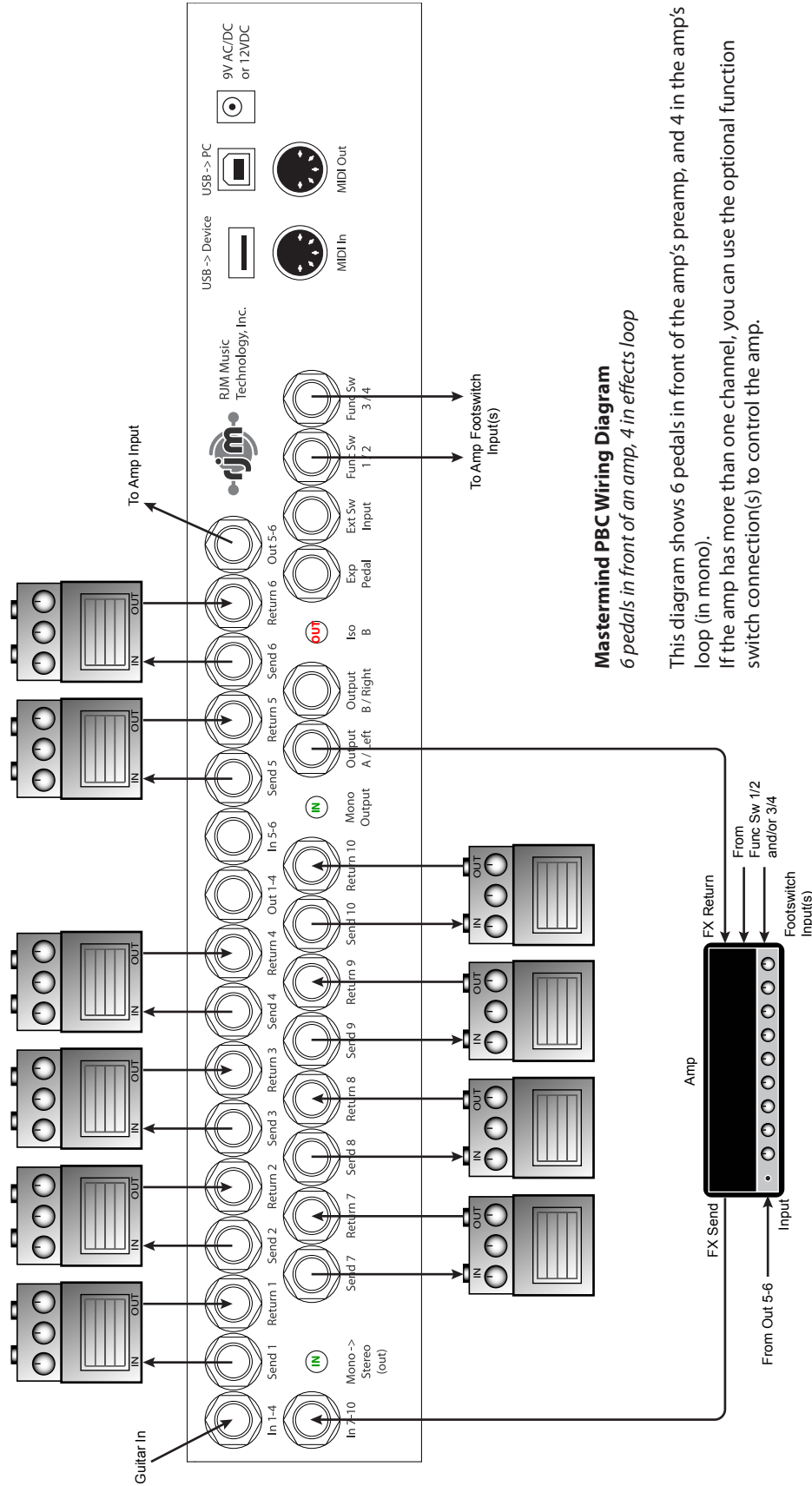
Mastermind PBC Wiring Diagram
6 pedals in front of an amp, 4 in effects loop

This diagram shows 6 pedals in front of the amp's preamp, and 4 in the amp's effects loop (in mono).
If the amp has more than one channel, you can use the optional function switch connection(s) to control the amp.

Guitar In

To Amp Input

To Amp Footswitch Input(s)

9V AC/DC or 12VDC

USB -> PC

USB -> Device

MIDI Out

MIDI In

Func Sw 3/4

Func Sw 1 2

Ext Sw Input

Exp Pedal

Iso B

Output B / Right

Output A / Left

Mono Output

In 5-6

Out 1-4

Out 5-6

Return 6

Send 6

Return 5

Send 5

Return 4

Send 4

Return 3

Send 3

Return 2

Send 2

Return 1

Send 1

In 1-4

Mono -> Stereo (out)

In 7-10

Return 10

Send 10

Return 9

Send 9

Return 8

Send 8

Return 7

Send 7

Amp

FX Return

FX Send

Input

From Out 5-6

From Func Sw 1/2 and/or 3/4

Footswitch Input(s)

IN OUT

Mastermind PBC Wiring Diagram

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Guitar In

To Amp Input

To Amp Footswitch Input(s)

Fun Sw 3/4
Fun Sw 1/2
Ext Sw Input
Exp Pedal
Iso B   IN
Output B / Right
Output A / Left
Mono Output   OUT

In 1-4
In 5-6
Out 5-6
Out 1-4
In 7-10
Mono -> Stereo (out)   OUT

Send 1   Return 1
Send 2   Return 2
Send 3   Return 3
Send 4   Return 4
Send 5   Return 5
Send 6   Return 6
Send 7   Return 7
Send 8   Return 8
Send 9   Return 9
Send 10 Return 10

9V AC/DC or 12VDC
USB -> Device   USB -> PC
MIDI In   MIDI Out

FX Return
FX Send
From Out 5-6
Input
Amp #1

From Func Sw 1/2 and/or 3/4
Footswitch Input(s)

FX Return or power amp input
Amp #2 (or power amp)

Mastermind PBC Wiring Diagram
6 pedals in front of an amp, 4 in effects loop (stereo w/ power amp)

This diagram shows 6 pedals in front of the amp's preamp, and 4 in the amp's loop. A power amp or second amplifier with an effects loop is used for the right side of the stereo signal.
The red dashed lines indicate where you should use insert cables (TRS/stereo on one side, individual left and right 1/4" mono plugs on the other).
If the amp has more than one channel, you can use the optional function switch connection(s) to control the amp.

Mastermind PBC Wiring Diagram

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Guitar In

In 1-4 Send 1 Return 1 Send 2 Return 2 Send 3 Return 3 Send 4 Return 4 Out 1-4 In 5-6 Send 5 Return 5 Send 6 Return 6 Out 5-6

In 7-10 Mono -> Stereo (out) Send 7 Return 7 Send 8 Return 8 Send 9 Return 9 Send 10 Return 10 Mono Output Output A / Left Output B / Right Iso B Ext Sw Input Exp Pedal Func Sw 1 / 2 Func Sw 3 / 4

OUT

From Amp Line Out

Dry Amp

Line Out

To In 7-10

Input

RJM Music Technology, Inc.

USB -> Device USB -> PC MIDI In MIDI Out 9V AC/DC or 12VDC

Power Amp

Inputs

IN OUT
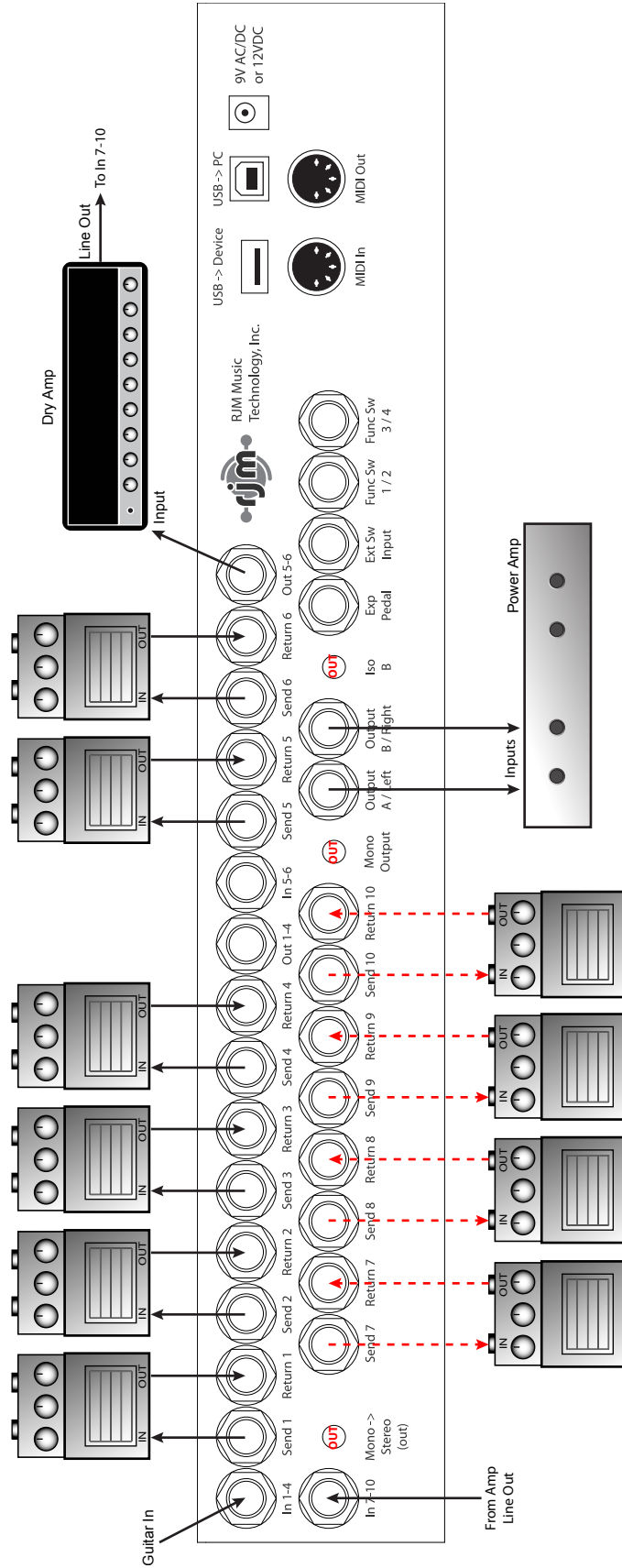
Mastermind PBC Wiring Diagram
Wet/Dry/Wet system

This diagram shows a wet/dry/wet system, where there is a mono amplifier for the dry signal and a stereo power amplifier for the wet signal. The wet signal is taken from a line output on the amplifier and has time-based effects applied to it using loops 7-10

The red dashed lines indicate where you should use insert cables (TRS/stereo on one side, individual left and right 1/4" mono plugs on the other).

Basic Operation

Preset Mode

When you power up the Mastermind PBC, you start off in the preset and bank selection mode. The Mastermind PBC has 768 presets that you can choose from, and they're arranged in banks of five. Pressing one of the five preset buttons (**1** – **5**) selects a preset in the current bank. When the PBC powers up, it starts in the first bank (presets 1-5). Pressing **Bank Up** shifts up one bank to presets 6-10. When doing bank selection, the main display inverts and scrolls through each preset in the new bank, displaying the name of the preset and illuminating the button that selects that preset. At this point, you can keep pressing the **Bank Up** or **Bank Down** buttons to get to a different bank, or you can press one of the preset buttons to finalize your selection.

The other buttons do the following:

Loops – Puts you in the loop selection mode, described later in this chapter.

Switches – Puts you in the switch selection mode, described later in this chapter.

Mute – Mutes the audio signal and activates the built-in tuner.

Function – This multi-function button can be configured to do many things including: selecting the global preset, tap tempo, or controlling a Mini Effect Gizmo. By default, this button will access the global preset, which is described in the Other Special Features section.

Loop Selection Mode

Pressing the **Loops** button brings you to the loop selection mode. This allows you to turn each of the audio loops on or off individually, adjust series/parallel settings on some loops, and store the current loop configuration to the current preset.

To the right of each button (except the **Loops** button), there is a label reading **L1** through **L10**. This indicates which loop the button controls in the loop selection mode. When the button's indicator is lit up in blue, the loop is on, when the button's indicator is not lit, the loop is off.

The stereo loops (loops 7-10) can also be switched between series and parallel. When one of these loops is on, holding the button for 3 seconds will switch the loop to parallel. If the loop was already parallel, it would switch back to series. The switch's indicator will light up in blue if the loop is in series, and purple if the loop is parallel.

In this mode, holding the **Loops** button for 3 seconds will store the current loop configuration to the currently selected preset. The next time the preset is selected, the stored loop configuration will automatically be recalled.

Pressing the **Loops** button will return you to preset mode.

Switch Selection Mode

Pressing the **Switches** button brings you to the switch selection mode. This works like the Loop Selection Mode above, but allows you to control the PBC's function switches, buffers and outputs. Each button (except the **Loops** button) has a label in the lower right corner indicating what the button does in switch selection mode:

FN1–**FN4** – These buttons control the four function switches. Please refer to the Function Switches section for more information

Out A and **Out B** – These buttons control the two outputs (**A / Left** and **B / Right**). When these are lit, the corresponding output is active. When not lit, the output is muted. Holding the **Out B** button for 3 seconds inverts the **B** output. The indicator is red when the **B** output is inverted and yellow when not inverted. ***Please note:*** the inverting function of the **B** output only works when the **Iso B** button is activated on the rear panel.

Dry – This button controls the dry signal that is sent to the line mixer. Please refer to the Function Switches section for more information.

Buf 1 – Buf 3 – These buttons control the three internal audio buffers. Please refer to the Audio and Switching features section for more details.

In this mode, holding the **Loops** button for 3 seconds will store the current switch configuration to the currently selected preset. The next time the preset is selected, the stored configuration for each of the above switches will automatically be recalled.

Pressing the **Loops** button will return you to preset mode.

Programming a Preset

To summarize the previous sections, this is how you program a preset:

1. First, select the desired preset using the bank and preset buttons.
2. Press the **Loops** button to enter loop selection mode.
3. Use the **L1** through **L10** buttons to turn on the desired loops for this preset.
4. Hold the **Loops** button for 3 seconds to store.
5. Press the **Loops** button to return to preset mode.
6. If you don't need to adjust function switches, buffers, dry send or outputs, you're done with this preset! Otherwise, continue with the next steps:
7. Press the **Switches** button enter switch selection mode.
8. Use the buttons to turn on the desired switches as described in the section above.
9. Hold the **Loops** button for 3 seconds to store.
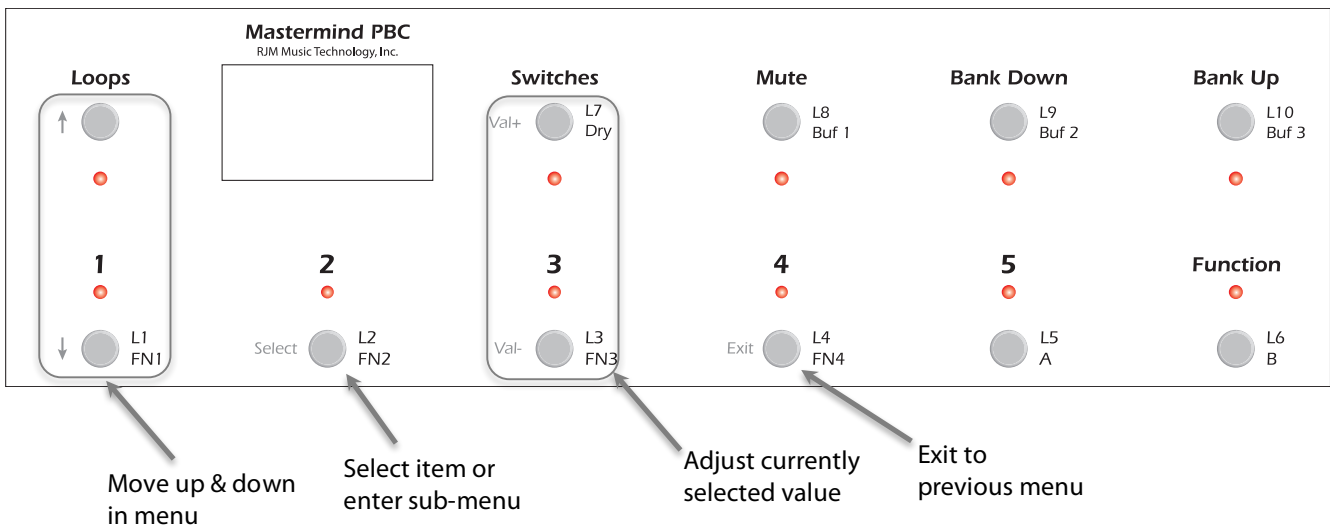10. Press the **Loops** button to return to preset mode.

You can repeat this for each of the Mastermind PBC's 768 presets.

MIDI & Preset Setup

The Mastermind PBC is also a MIDI controller. Each preset can send program changes to up to 16 connected MIDI devices.
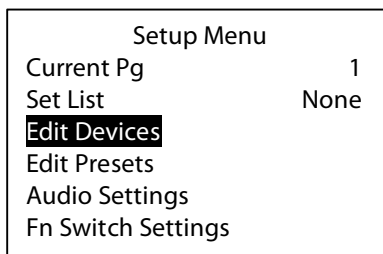
Entering Setup Mode

To edit MIDI settings, you first need to enter Setup Mode. Do this by holding the **1** and **3** buttons for 3 seconds. The main display changes to the setup menu, and the buttons operate according to the labels printed on the left side of the buttons:

Move up & down in menu

Select item or enter sub-menu

Adjust currently selected value

Exit to previous menu

Adding a Device

The first thing that needs to be done is to add a device entry to the Mastermind PBC for each device you wish to control. Once in the setup menu, select the **Edit Devices** option by using the **down arrow** button to highlight the option, and the **Select** button to select the item.

```
            Setup Menu
Current Pg                    1
Set List              None
Edit Devices
Edit Presets
Audio Settings
Fn Switch Settings
```

You will see a list of devices defined in your system. By default, a single Mini Effect Gizmo is defined. You can select the Mini Effect Gizmo if you want to replace that device with another, or you can select another empty device slot to add a second device of another kind. Use the **Up and Down Arrow** buttons to move to the desired slot, and press **Select** to select it.

```
         Select a Device
1: Mini Effect Gizmo
2: Empty Slot
3: Empty Slot
4: Empty Slot
5: Empty Slot
6: Empty Slot
```
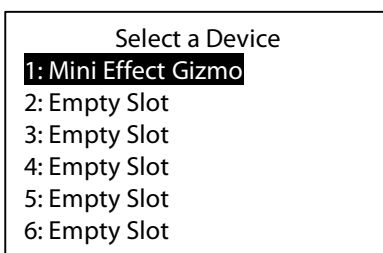
Once a device slot is selected, you are taken to the Device Edit screen. Select the **Type** option to set the type of this device.

```
           Edit Device 2
Type                      ???




```
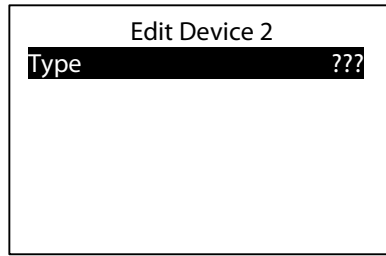
You will be presented with a list of device manufacturers. Select your manufacturer from the list, then select the model of the device in the next list that is presented.

If your device (or device manufacturer) is not listed, you can select **Generic** for the manufacturer and **PC/CC Device** for the device model. This will allow you to control most effect processors and loop switchers. You will need to manually type in the device name and other parameters.

If your device is listed, the Mastermind PBC can set up many of the device parameters for you. What it can do varies from device to device. At the minimum, it can set up the device name and the number of presets and banks the device has. Some devices have additional support including the ability to select effect parameters by name when assigning the expression pedal. The Mastermind PBC editor software will allow you to access even more special support.
The Device Edit screen shows you the options available for your device:

```
           Edit Device 2
Type            Mini Effect Giz
Name            Mini Effect Giz
MIDI Ch                       1
Port                   MIDI Out
Preset Offst                  0
Max PC #                    127
```

One important parameter that needs to be set for every device is the MIDI channel (**MIDI Ch**). The MIDI channel is very important because it insures that each device receives the messages it's supposed to – and doesn't receive the messages that are intended for other devices.

Typically, each MIDI device needs to be set to its own MIDI channel. This number needs to be set here on the Mastermind PBC and also on the device itself. (Most MIDI devices have a MIDI Channel or MIDI Receive Channel parameter). To set the channel on the Mastermind PBC use the **Up and Down arrow** buttons to move to the **MIDI Ch** parameter and use the **Val +** and **Val –** buttons to adjust the channel number.

You can also change the name of the device if desired. Move to the **Name** parameter, and press **Select**. Follow the instructions in the **Setup Mode Reference** section of the manual.

The other parameters are also described in the **Setup Mode Reference** section of the manual.

Once you're done editing the device, press **Exit** to go back to the device selection menu. You can either add another device here, or press **Exit** two more times to get out of setup mode completely.

Assigning Program Changes

Once you've defined the devices you're going to control, you can edit each preset to assign which MIDI program change message is sent to each device. This allows you to select presets on effect processors or other devices.

To do this, enter setup mode by holding the **1** and **3** buttons for 3 seconds. After entering Setup Mode, select the **Edit Presets** option:

```
            Setup Menu
Current Pg                    1
Set List                   None
Edit Devices
Edit Presets
Audio Settings
Fn Switch Settings
```

You'll be presented with a list of presets:

```
           Select a Preset
Global Preset
1: Preset 1
2: Preset 2
3: Preset 3
4: Preset 4
5: Preset 5
```

Choose the preset you'd like to edit, and you'll be presented with some options:

```
            Edit Preset 1
Name                   Preset 1
Page                          1
Tempo                         0
Copy Preset
Mini Effect Giz               0
- None -
```

At the end of the list, you will see the devices you set up in the previous section (starting with "Mini Effect Giz" in this example.) Select the device you'd like to edit.

```
           Edit PC Message
PC                            0
Bank                          0
```

You can use the PC and (optionally) Bank options to select the desired preset on the device. If the device is connected, you should see the device change programs as you adjust the values. Pressing the **Mute** button in this menu sets the PC and Bank values to **None**, which means that no MIDI messages will be sent to this device for this PBC preset.

You can repeat this process for each preset and device within each preset.

Audio Defaults, Overrides and Locks

Default State

Each loop, output, buffer, etc. has a default setting. For example loops, by default, are always off and buffers and outputs are always on. You can change the default using the setup menu. Hold the **1** and **3** buttons to enter setup. In the menu, select **Audio Settings**:

```
            Setup Menu
Current Pg                   1
Set List                  None
Edit Devices
Edit Presets
Audio Settings
Fn Switch Settings
```

In the audio menu, select the loop or other switch you wish to control:

```
            Audio Menu
Tuner Ref                  440
Loop 1 Settings
Loop 2 Settings
Loop 3 Settings
Loop 4 Settings
Loop 5 Settings
```

You can then select the new default state (on or off) using the **Val - / Val +** buttons.

```
          Loop 2 Settings
Default State              Off
Lock State                 Off
Clear State Overrides
```

All loops and switches have a default on/off state. Loops that can be switched between series and parallel also have a **Default Parallel** setting. Output B also has a **Default Invert** setting.

EXAMPLE: You are using two amps, and the second amp is out of phase with the first. To fix this, you want Output B to always be inverted. In the Audio Menu, select **Output B Settings**, and you will see this menu

```
         Output B Settings
Default State              Off
Lock State                 Off
Default Invert             Off
Lock Invert                Off
Clear State Overrides
Clear Invert Overrides
```

Set **Default Invert** to on. Now, Output B will be inverted in each preset.

Overrides

As shown in previous sections, it's very easy to select which loops and other switches turn on or off in each preset. When you use the Loops or Switches page to turn loops or switches on and off, then store them to a preset, you are creating *overrides*. That is, you're changing the loop's state from the default for the current preset. Once you've saved a new setting for a loop or switch, the PBC remembers that the loop or switch is overridden for this preset, and the default state no longer applies to this preset. Even if you change the default state, the override will still be in effect.

EXAMPLE: By default, buffer 1 is always on, but in one preset, you are using a fuzz pedal that doesn't operate well with a buffer in front of it. In that preset, press **Switches**, then turn off Buffer 1. Hold the **Loops** button for 3 seconds to store this override.

If you ever need to remove your overrides and let the loop or switch follow the default state, you can select the **Clear State Overrides** option – it will go through all of your presets and remove all overrides on the currently selected loop or switch. There are also **Clear Parallel Overrides** and **Clear Invert Overrides** where appropriate.

EXAMPLE: You swapped out your fuzz pedal for something more buffer-friendly. You can go to **Buffer 1 Settings**, then select **Clear State Overrides**. Now, any overrides you created will be cleared out, leaving the default "on" state for the buffer in each preset.

Locks

Sometimes, you may need to temporarily override a loop or switch in all presets, but want to keep your overrides for later. You can turn on **Lock State** for a loop or switch, then set **Default State** to the desired state. The loop or switch will become locked to that state, and no override, button press or anything else will change that. The only way to remove a lock is to change the **Lock State** setting to *Off*.

EXAMPLE: You're using a different amp than you normally do. It's less gainy that you're accustomed to, and you feel it needs a boost pedal to get it sounding the way you want. You need that pedal on all the time. This pedal is in loop 1. Go to **Loop 1 Settings**, set **Lock State** to *On*, and **Default State** to *On*. Now, loop 1 will be locked on for all presets. When you go back to your original amp, you can turn **Lock State** and **Default State** to *Off*. Your previous settings for loop 1 will be restored – it will remember which presets had been programmed to turn the loop on, and which presets had been programmed to turn the loop off.

Song and Setlist Mode

For live performances, your Mastermind PBC presets can be arranged into **Songs** and **Setlists**. Using this feature allows you to group presets by song and makes it easy to rearrange those songs for each performance.

A **Song** is a group of presets – up to 16 of them – that are selected for use in a particular song. Each preset is typically chosen for the sounds needed in different parts of a song: intro, verse, chorus, bridge, solo, etc. Each preset in a song can be chosen from any of the 768 presets defined in the system, and presets can be used in more than one song.

A **Setlist** is an ordered list that represents the songs you're going to play in a particular performance. You press a button to move to the next song in your setlist as you finish each song.

When Song and Setlist mode is active, the Bank Up and Bank Down buttons move from song to song instead of moving from bank to bank. When a song is selected, the preset buttons on the current button page display the presets assigned to the song. If there are more presets in the song than there are visible preset buttons, the remaining presets will not be displayed.

Please note! Even though you can specify up to 16 presets per song, you can only access as many presets as you have preset buttons on your Mastermind PBC. By default that means you can use 5 presets per song. If you use the Mastermind PBC editor, you can convert more of the buttons to preset buttons if needed, and you can use two Mastermind PBCs together in Expander mode, which would allow you to use preset buttons on both units.

Editing Songs

The first step in setting up for Song and Setlist mode is to edit your songs. Hold the **1** and **3** buttons to enter Setup Mode. Select **Edit Songs** to get to the Song Edit menu. You will first be shown a list of songs that are defined in the system. Select the song you wish to edit from this list.

Select a song from the list. There are over 1000 songs available for you to edit. The default name for each song is "Song x", where x is the song number, but you can change this name to anything you like in the next menu.

Selecting a song brings up the Song Edit menu. From this menu, you can edit the song's name and assign up to 16 presets to the song.

If you're using MIDI Clock, you can also assign a tempo to each song. This tempo is used for each preset in the song unless overridden by a preset.

Selecting any of the preset slots located below the **Name** item will bring up a menu of all of your presets, allowing you to select which preset goes in each slot. When in performance mode, the presets will be assigned to the preset buttons in the order they appear in the song's preset list.

Editing Setlists

Once all of your songs have been created, you can use a setlist to put them in the order you're going to play them in a performance. You can define up to 64 setlists for different performances, and you can have up to 100 songs in a setlist.

In the Setup Menu, select Edit Setlist. You are presented with a list of all 64 setlists. Select one of the lists and the Setlist Edit menu will be displayed.

Just like you add presets to a song, you also add songs to a setlist by selecting one of the song slots, then selecting the song that should go in that slot. As with a song, you can edit the setlist name using the **Name** button.

Using a Setlist

Once your songs and setlists are defined, you're ready to use one of your setlists in a performance. Enter Setup Mode, then use the Set List option to select which setlist is active.

In the menu that pops up, you can either choose your desired set list, choose "All Songs" which puts all 1008 songs in one large setlist, or choose "None" to select no setlist and return to normal preset and bank mode.
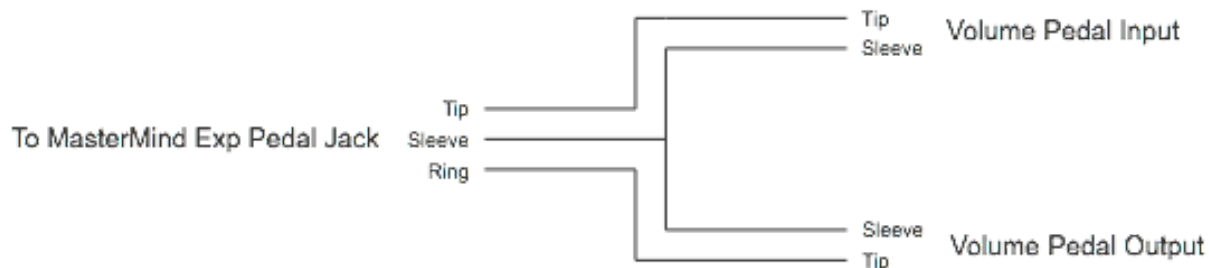
Expression Pedals

The Mastermind PBC has an expression pedal port that allows you to connect an external expression pedal. An expression pedal can be used with MIDI-capable effects processors to provide real time control of different parameters: volume level, echo rate, etc. The Mastermind PBC translates the position of the pedal to MIDI Continuous Controller messages and sends them out the MIDI Out port. The effects processor receives these messages and alters the effects accordingly.

Using Setup Mode, you can set each expression pedal to set the controller number, minimum and maximum values and which device should receive the controller messages. By default, the pedal sends CC#7 to the first MIDI device.

Many expression pedals on the market will work. Pedals that have a stereo (TRS) 1/4" output jack and have the potentiometer wiper connected to the ring conductor of the output jack will definitely work. The Rocktron Hex and Korg XVP-10 are examples of pedals that work well, and the Boss FV-500 and Roland EV-5 are examples of pedals that don't work well.

Note! Even if an expression pedal does not have the correct polarity, you can still fix it with a specially made cable. Connecting it to the Mastermind PBC with a ¼-inch TRS cable that swaps the tip and ring conductors will allow you to use any Roland/Boss type pedal.

You can also use a standard volume pedal as an expression pedal. For this you need a 1/4" Y-cable, also known as an insert cable. The stereo end of the Y cable plugs into the Mastermind PBC and the two mono ends plug into the input and output of the volume pedal:

The Mission Engineering SP1-RJM

Mission Engineering makes a model of its SP1 expression pedal that's designed specifically to work with the Mastermind PBC. This pedal has a built in toe switch and LED which works as an external switch. The toe switch can perform any function that one of the Mastermind PBC's built-in buttons can, and is edited using the Edit Buttons menu.

To connect the SP1-RJM to the Mastermind PBC, you will need two ¼-inch TRS cables. The first one connects from the pedal's Output 1 jack to one of the Expression Pedal inputs on the Mastermind PBC. The second cable connects from the pedal's Output 2 jack to one of the External Switch inputs on the Mastermind PBC.

Expression Pedal Setup

You can set up your expression pedal by selecting the **Exp Pedal** option from the main Setup Menu.

The first time you connect a particular expression pedal to the Mastermind PBC, you will first want to calibrate it. Expression pedals vary from model to model, and calibrating the pedal insures that the Mastermind PBC will always be able to send the correct values for the pedal's position. Simply press the **Calibrate** button, then move the pedal all the way up and all the way down. Press the **Done** button once this is complete.

Basic setup of the expression pedal works like this:

1). Use the **Device** button to select the device you wish to control with the expression pedal.

2). If the option is available for your device, press the **Assign Pedal CC** button. You will be presented with a list of parameters that can be controlled by the expression pedal. Select one of these functions, and the rest of the parameters will be set for you.
3). If the **Assign Pedal CC** option is not available, you can manually set the CC number and minimum/maximum values for the pedal. You can find these numbers in your effect device's manual.
4). Some devices, such as the Eventide pedals and the TC Electronic G-Major, support a "learning" function. This means the effect device configures itself based on the messages it's receiving from the Mastermind PBC. If you have one of these effect processors, turn on the learning function and move the expression pedal you wish to have control the parameter. The device will automatically adapt itself to the CC number being sent by the Mastermind PBC.

The second set of parameters (all labeled with a number **2**) can be used to send a second set of CC messages. This allows you to control multiple devices at the same time and/or cross-fade between two sounds. If the **Device 2** parameter is set to **None**, then the second CC is not sent by this pedal.

Setting Up The Expression Pedal Position Switch

Each expression pedal can be set to turn a parameter on and off based on the position of the pedal. This is especially useful for turning an effect off when the pedal is raised all the way.

Currently, this function is only programmable using the Mastermind PBC editor software. You will, however, need to use the Mastermind PBC to choose at what point in the pedal's travel the switch happens. Move the pedal to that spot (typically not quite all the way down or not quite all the way up), then press **Set Switch Position**. The pedal position will be remembered and the selected function will switch on and off as you move the pedal up and down. When the pedal goes below the saved switch position, the switch is considered to be on, when the pedal moves up above the switch position, the switch is considered to be off. There is an **Invert Switch** setting that reverses this. If you want the switch to be on when the pedal moves up above the switch position, turn the **Invert Switch** setting on.

External Switches

The Mastermind PBC supports up to two external switches. These can be used to add switches to remote locations, to add different types of switches for specialized functions like tap tempo, or simply to increase the number of available switches.

There is an external switch jack on the rear of the Mastermind PBC labeled "Ext Switch". This jack can take a single switch or a double switch with a TRS (tip-ring-sleeve) plug. A single switch should use a TRS plug with the switch connected to the tip and ground, and the ring conductor unconnected to anything. If an LED is wired in parallel with the switch with the cathode connected to the shield of the TRS connector, the Mastermind PBC will light the LED when the switch is on.
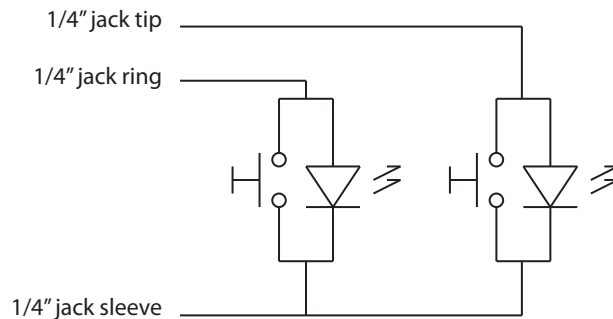
Mastermind PBC External Switch Wiring Diagram

(Note: if you're building your own external switch, please note that the switch must be momentary and normally open, and the LED should be a type with a low forward voltage. Typically, this means red, yellow or green LEDs. Blue or white LEDs will not work.)

RJM Music sells single and dual external switches made to work correctly with the Mastermind PBC, and Mission Engineering's SP1-RJM expression pedal includes a toe switch (similar to the on/off switch on a wah pedal) with an LED that can work as an external switch for the Mastermind PBC.

Please note: To edit the functions of the external switches, you will need to use the Mastermind PBC editor software.

Remote Mode and Expander Mode

You can connect two (or more) Mastermind PBCs together in two ways:

Remote Mode

In Remote Mode, one Mastermind PBC can act as a remote control for another. Simply connect the Remote In port of your Mastermind PBC to the MIDI Out of the unit that should act as a remote control. If needed, you can even chain more PBCs in this way, connecting the Remote In of one unit to the MIDI Out of the next.

When connecting PBCs in this way, make sure you use MIDI cables that are "5-pin active". That is, cables that have all five pins wired through. Not all MIDI cables are wired this way, so it's best to check.

Make sure both PBCs have the **Remote** setting turned on. This setting can be found in the **MIDI Settings** page. Also, make sure that both PBCs have the same exact settings. You can transfer settings using a USB flash drive or a computer.

Once the setup is completed, pressing a button on one PBC will result in the other PBC(s) doing the same action. The PBCs will remain in sync with each other.

When the Mastermind PBCs are turned on, you'll notice one or two arrows in the right side of the main display on each unit. The first unit in the chain will have an arrow pointing to the right, the last unit in the chain will have an arrow pointing left and any units in the middle of the chain will have arrows pointing left and right. These arrows indicate that remote mode communication is active.

Expander Mode

You can also connect multiple Mastermind PBCs together and have them operate together as one unit. Selecting a preset on one unit updates the other units to the same preset. Switching into loop selection mode on one unit puts all units into loop selection mode, giving direct access to 20 loops!

To enable Expander Mode, you need to use the MIDI settings menu to turn on the **Remote** parameter and the **Expander** parameter on both Mastermind PBCs. Next, connect the **Remote In** jack of the first PBC to the **MIDI Out** of the second PBC. The first Mastermind PBC (the one that doesn't have its **MIDI Out** jack occupied) should have its **MIDI Out** jack connected to the rest of your rig.
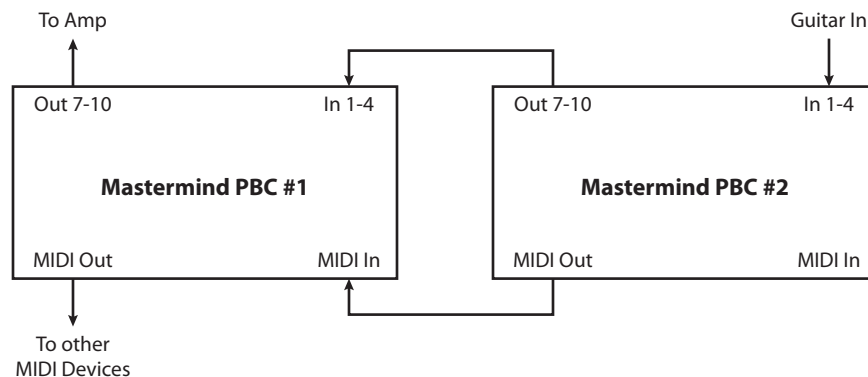
**Connecting two Mastermind PBCs
into a 20 loop (all series) system**

As in Remote Mode above, it's important that your MIDI connection between the two is made with a 5-pin active MIDI cable.

You can have different button configurations on both PBCs, but the presets, songs and setlists should be the same. The Export feature of the Mastermind PBC editor can be used to copy selected settings from one device to another without overwriting all of the settings.

When using Expander mode, your presets will be spread across the preset buttons on both units, starting on PBC #1 in the diagram above, and then continuing to PBC #2. You can put the bank and page selection buttons on either unit or both.

External MIDI Control

The Mastermind PBC can also be controlled by an external MIDI device such as a computer, sequencer or other type of MIDI controller. To enable this feature, set the **MIDI Rx Ch** parameter in the MIDI Settings menu to the desired MIDI channel. Any bank or Program Change messages received through the **Remote In** or **USB -> PC** ports on this channel will cause a preset change on the Mastermind PBC.

The bank and program numbers are interpreted differently based on some settings:

Setlist=None

In normal bank and preset mode (no setlist active), the bank MSB, LSB and program numbers are combined to create the desired preset number. The formula is:

(Bank MSB x 16384) + (Bank LSB x 128) + PC number = preset number

There are only 384 presets within the Mastermind PBC, so only bank numbers 0 through 2 are valid. The Bank MSB should always be set to 0 (or not sent at all), and Bank LSB should be 0, 1 or 2.

Setlist active, Bank=Song On

If you are using a setlist, and the **Bank=Song** parameter (found in the MIDI Settings Menu) is turned **on**, the Bank MSB and Bank LSB are combined to select a song out of the current setlist. (0 = first song in setlist, 1 = second song in setlist, etc.) The number is calculated as follows:

(Bank MSB x 128) + Bank LSB = song number

The PC number selects which preset within the song is selected (0 = first preset in song, 1 = second preset in song, etc.)

Setlist active, Bank=Song Off

If you are using a setlist, and the **Bank=Song** parameter (found in the MIDI Settings Menu) is turned **off**, the bank MSB, LSB and program numbers are combined to create the desired preset number. The formula used is the same as in the **Setlist=None** section above.

Upon receiving bank and program change messages, the Mastermind PBC will find the first song that contains the resulting preset and will load that song and preset.

Individual Loop and Switch Control using CC Messages

When the **MIDI Rx Ch** parameter is set, you can also send Continuous Controller (CC) messages to the Mastermind PBC to remotely control the loops, function switches, outputs and buffers. The default CC numbers are as follows:

Function	CC Number	Values
Loop 1 off/on	48	0-63 off, 64-127 on
Loop 2 off/on	49	0-63 off, 64-127 on
Loop 3 off/on	50	0-63 off, 64-127 on
Loop 4 off/on	51	0-63 off, 64-127 on
Loop 5 off/on	52	0-63 off, 64-127 on
Loop 6 off/on	53	0-63 off, 64-127 on
Loop 7 off/on	54	0-63 off, 64-127 on
Loop 8 off/on	55	0-63 off, 64-127 on
Loop 9 off/on	56	0-63 off, 64-127 on
Loop 10 off/on	57	0-63 off, 64-127 on
Loop 7 series/parallel	58	0-63 series, 64-127 parallel
Loop 8 series/parallel	59	0-63 series, 64-127 parallel
Loop 9 series/parallel	60	0-63 series, 64-127 parallel

|		
Loop 10 series/parallel	61	0-63 series, 64-127 parallel
Buffer 1 disable/enable	62	0-63 off, 64-127 on
Buffer 2 disable/enable	63	0-63 off, 64-127 on
Buffer 3 disable/enable	64	0-63 off, 64-127 on
Function Switch 1 off/on	65	0-63 off, 64-127 on
Function Switch 2 off/on	66	0-63 off, 64-127 on
Function Switch 3 off/on	67	0-63 off, 64-127 on
Function Switch 4 off/on	68	0-63 off, 64-127 on
Output A/Left off/on	69	0-63 off, 64-127 on
Output B/Right off/on	70	0-63 off, 64-127 on
Output B Invert	71	0-63 normal, 64-127 invert
Mute	72	0-63 muted, 64-127 not muted
Dry Send to Mixer	73	0-63 muted, 64-127 not muted
Tuner	74	0-63 off, 64-127 on
Page Select	75	0-15 (page number-1)

These CC numbers can be customized using the setup menu. Please refer to the Setup Mode Reference section for more details.

Other Special Features

Built-in Tuner

The Mastermind PBC features a built-in digital chromatic tuner. To use it, simply press the **Mute** button while in the normal preset mode. The screen will change to show the tuner status. The closest note name is displayed in the center, and arrows can appear on the left side (indicating the note is flat) or the right side (indicating the note is sharp). When the note is close to the target note, both arrows will appear.

There is also a bar graph at the bottom of the screen. It's not visible when perfectly tuned, but moves to the left as your note gets more flat, and moves to the right as your note gets more sharp. This example shows a note that's close to E, but a bit flat.
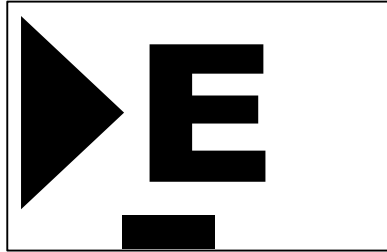
Press the **Mute** button again to exit the tuner.

As of the 2.0 firmware release, you can configure the reference frequency for the tuner, and it will be displayed on the tuner display.

Function Button

The **Function** button is a multi-purpose button that has several things it can do in the preset mode. By default, it recalls the global preset (see below).

Using the setup menu, you can also set it to be a tap tempo button that sends MIDI clock (see below).

A third option is to have the **Function** button control a Mini Effect Gizmo that's connected to the Mastermind PBC. This allows you to add five more loops to your pedalboard. Simply connect the MIDI output jack of the Mastermind PBC to the MIDI input of the Mini Effect Gizmo. Now make the audio connections from the Mini Effect Gizmo to the Mastermind PBC. Typical connections are:

In between loops 4 and 5 – Connect **Out 1-4** on the PBC to **Buf In** on the Mini Effect Gizmo. Connect **In 5-6** on the PBC to **CS Out** on the Mini Effect Gizmo.

After loop 6 – Connect **Out 5-6** on the PBC to **Buf In** on the Mini Effect Gizmo. Connect **CS Out** on the Mini Effect Gizmo to your amp's input (if you're using loops 7-10 in the amps effects loop), or connect **CS Out** on the Mini Effect Gizmo to **Input 7-10** on the PBC if you're using all of your effects in front of the amp's input.

Now, enter the setup menu, select **Function Button**, then select **Mini Effect Gizmo**. Press Exit to leave setup mode. When you press the **Function** button, you enter a mode where buttons 1-5 will control the loops on the Mini Effect Gizmo, similar to how they control the loops on the PBC in loop selection mode. You can hold the Function button to store the Mini Effect Gizmo loop settings to the current preset.

This mode assumes that the Mini Effect Gizmo is in its factory default state. To factory reset the Mini Effect Gizmo, power It up while holding the **1** and **4** buttons (on the Mini Effect Gizmo). The lights will all turn on briefly, then turn off. That's the only indication you'll receive. The Mini Effect Gizmo is now reset and ready to go.

Global Preset

The global preset, if enabled, is an additional preset that can be accessed from any other preset simply by pressing the currently selected preset button again. This is typically used to set up a preset that is your "standard" or "go-to" guitar sound that's always accessible, no matter what bank of presets you're currently using.

There are two ways to access the global preset. By default, the **Function** button is set up to recall the global preset. If you'd like to use the **Function** button for some other purpose, you can also set up the preset buttons so that a 2nd press on a preset button calls up the global preset. To do this, enter Setup Mode and set the **Preset 2nd** (Preset 2nd Press) option to "Global". Setting it back to "Preset" disables the global preset feature. There is also an additional setting, "Previous", which moves you back to the previously selected preset when you press the currently selected preset button a second time.

Tap Tempo and MIDI Clock

The Mastermind PBC supports MIDI clock as a master or slave. With MIDI clock, you can synchronize multiple devices to the same tempo. To enable MIDI clock support, go to the **MIDI Settings** menu. The **MIDI Clock** parameter can be set to "None" (the default), "Master" or "Slave".

When set to "Master", the Mastermind PBC will send a MIDI clock signal out of all MIDI outputs, including the USB port. The tempo will be adjusted any time a tap tempo button is used. Tempo can also be set on a per-song and per-preset basis. Each song and preset has a **Tempo** parameter. Setting it to a non-zero value will cause the tempo to be set to the new BPM value when the preset is selected. A preset's tempo value will override any tempo set by a song. In Song and Setlist mode, you can set a preset's tempo to 0 to use the song's tempo instead. If both the preset's tempo and the song's tempo are set to 0, no MIDI clock output will be generated until a preset or song is selected that has a non-zero tempo defined.

The **Function** button can be set to a tap tempo function using the **Function Button** parameter in the setup menu. When this is set and **MIDI Clock** is set to "Master", tapping the **Function** button will change the MIDI clock rate to the tempo of your taps.

When set to "Slave", the Mastermind PBC will flash any tempo buttons in time with the incoming MIDI clock signal. It will also forward the MIDI clock signal to its other MIDI outputs. This allows the Mastermind PBC to receive a MIDI clock signal from a computer via USB and forward it over standard MIDI connections to your other MIDI devices.

Auto Tap

The Mastermind PBC also has support for devices that only have an analog tap tempo input, or accept tap tempo over MIDI, but not using MIDI clock. The PBC can automatically send taps to the device when you select each preset, adjusting the tempo on the device. To enable this feature, you need to set up a Macro. This is described in the Mastermind PBC Editor Manual. The Macro contains instructions telling the PBC what to do – it can activate a Function Switch output (in the case of analog tap tempo), or can send the appropriate MIDI commands to a device or devices.

Once the Macro has been defined in the editor, you set the **Auto Taps** parameter in the main setup menu. Set it to the number of taps the device should receive (setting it to 0 disables the feature). Then, set the **Tap Macro** number to the number of the macro you wish to use. Once these parameters have been set, the Mastermind will execute the macro the specified number of times at the requested tempo. This will happen every time the tempo changes due to a song or preset change.

Loading and Saving Settings to a USB Flash Drive

The Mastermind PBC allows you to load and save settings to a USB flash drive. You can use this feature to back up settings, transfer settings from one Mastermind PBC to another PBC, or to transfer settings to or from a computer.

The drive is plugged into the **USB -> Device** port on the rear panel. Loading and saving are done from the System Menu. To get there, hold the **1** and **3** buttons. When the setup menu appears, select **System Functions**.

At the top of the menu, you will see the **Load Settings** and **Save Settings** options.

```
              System Menu
Load Settings
Save Settings
Init Preset Names
System Info
Debug Log
Factory Reset
```
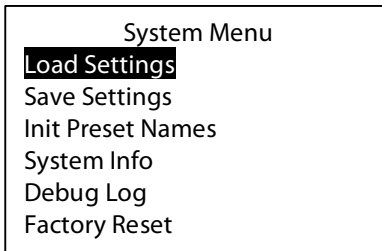
Load Settings

When **Load Settings** is selected, you are shown a list of the files that are on your flash drive. Only RJM settings files (ending in .rjs) and directories are visible. The **Up Arrow** and **Down Arrow** buttons move the selection bar up and down.

Selecting a directory with the **Select** button views the contents of that directory, and selecting a file loads the settings in that file. You can press the **Exit** button at any time to cancel out of the load process and leave your settings unchanged.

```
              Load Settings
Some Directory/
pbc.rjs
blabblah.rjs
```
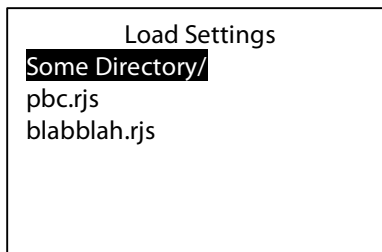
If the file loads without errors, your Mastermind PBC will now be running with the new settings from the file.

Save Settings

Selecting **Save Settings** will bring up a menu that allows you to edit the filename you wish to give the settings. Edit the filename, then press **Select**. Please refer to the Setup Mode Reference section for information on how text is edited on the Mastermind PBC. If a file of that same name exists, you will be asked if it's okay to overwrite the file. If you answer Yes (or if there is no pre-existing file to overwrite), the settings file will be saved to the top level directory of the flash drive.

Please note that all settings files need to end with ".rjs". You don't need to type this in, however. The system will add the extension for you if you don't type it in yourself.

Connecting to a Computer

In addition to the USB flash drive support, the Mastermind PBC's **USB -> PC** port allows you to connect your controller to a PC or Mac with a USB port. The Mastermind PBC is a class-compliant USB MIDI device, which means it doesn't need additional driver software. The Mastermind PBC will appear as another MIDI device in your system, and will work with any MIDI-enabled programs you're using.

To get the Mastermind PBC to send commands over the USB port, use the Edit Devices menu to set the **MIDI Port** parameter of one device to "USB". Any messages that are sent to that device will be sent over the USB port instead of the standard MIDI ports. Since you're communicating with a computer instead of an effect processor, you will most likely want to create a Generic MIDI device and set it's **MIDI Port** parameter to "USB". That will allow you to send commands to a computer without affecting the settings you have for your other MIDI devices.

The Mastermind PBC has been tested successfully on PC systems running Windows 7 through Windows 10. Windows XP systems are not supported. Mac OS 10.7 through 10.11 systems are also known to be compatible with the Mastermind PBC. Older Mac OS versions will likely work, but are not tested at this time.

Mastermind PBC Editor

The Mastermind PBC Editor software is available for free on our website. This software makes it even easier to edit your PBC's parameters and back up settings to your computer. It also allows you to do more extensive customization of your PBC's button pages and MIDI configuration. Settings can be transferred from the PBC to the computer and vice versa using a USB flash drive or a direct USB connection from PBC to computer.

Updating Firmware

The Mastermind PBC is designed to be easily updated by the user. Firmware updates will be periodically made available on the RJM Music website. These updates will add support for more devices and add other new features.

The firmware update process is simple: first, download the firmware file from the RJM Music website using your PC or Mac. Copy the downloaded file to a USB flash drive. All RJM firmware files end in the extension ".rjf", so it will be easy to tell which files are the ones you want.

Once the file is loaded to the flash drive, use the "Eject" option on the computer to safely remove the drive. On the Mac, this is done by pressing the eject arrow next to the drive's name in the left column of the Finder. On the PC, go to "Computer" or "My Computer", right click on the flash drive's icon and select "Eject". You can now remove the flash drive from the computer.

At this point, there are two ways to start the firmware update:

1). Enter Setup Mode, select **System Functions**, then select **Update Firmware**. Plug your flash drive into the Mastermind PBC. A list of firmware update files will be shown. Select the desired firmware file, and the update process will begin.

-OR-

2). If there are any other .rjf files on the flash drive, delete them now. Using this method, the Mastermind PBC will load the first .rjf file it finds, so keeping only one firmware file on the drive at a time will make sure that the correct firmware is loaded. Start with the Mastermind PBC powered down. Hold the **1** and **3** buttons, and while still holding them, power up the Mastermind PBC. Once you see text on the screen, you can release the buttons. Now plug the flash drive into the PBC. The upgrade process will take a minute or two, then the Mastermind PBC will start up. Once it's in the normal operating mode (all the displays lit up and a song or preset name displayed), you can unplug the flash drive and begin using your updated PBC.

Setup Mode Reference

Setup mode allows you to perform basic configuration of the Mastermind PBC. This on-board editing is designed to allow configuration of the most common functionality and features. Complete editing is available using the Mastermind PBC editor software available for Mac and PC.

To enter setup mode, press and hold the **1** and **3**. After about 3 seconds, the display will change, indicating you're in setup mode.

In Setup Mode, the footswitch buttons switch from their normal functions to become a menu for selecting setup options. The text labels to the left of the buttons indicate their function when in Setup Mode.
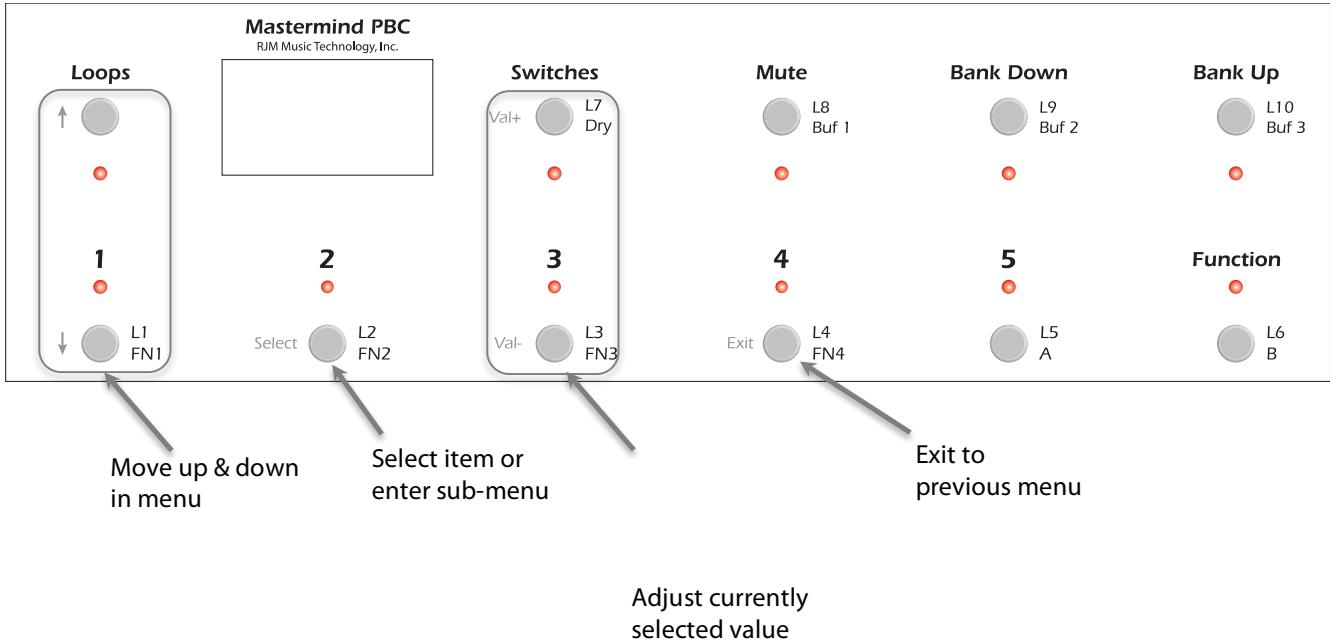
Text Entry

When editing names and other text, the Mastermind PBC uses a special button configuration:

Text is edited by moving the cursor back and forth using the **Up Arrow** and **Down Arrow** buttons, then using the **Val +** and **Val -** buttons to change the value of the character under the cursor.

The **Bank Down** button deletes the character to the left of the cursor.

The **Bank Up** button inserts a space character at the current cursor location.

The **Mute** button deletes all text.

The **Function** button switches between upper case and lower case. When set to upper case, the **Function** button's LED lights up in white.

Press **Exit** when you've finished editing the text. The text will be saved and you'll be returned to the previous menu.

Main Menu

The first menu you see upon entering Setup Mode allows you to configure some system options as well as access submenus to edit devices, buttons and presets.

Set List – Pressing this button allows you to select which setlist is active, and enables Audio Defaults, Overrides and Locks

<u>Default State</u>

Each loop, output, buffer, etc. has a default setting. For example loops, by default, are always off and buffers and outputs are always on. You can change the default using the setup menu. Hold the **1** and **3** buttons to enter setup. In the menu, select **Audio Settings**:

In the audio menu, select the loop or other switch you wish to control:

You can then select the new default state (on or off) using the **Val - / Val +** buttons.

All loops and switches have a default on/off state. Loops that can be switched between series and parallel also have a **Default Parallel** setting. Output B also has a **Default Invert** setting.

EXAMPLE: You are using two amps, and the second amp is out of phase with the first. To fix this, you want Output B to always be inverted. In the Audio Menu, select **Output B Settings**, and you will see this menu

Set **Default Invert** to on. Now, Output B will be inverted in each preset.

Overrides

As shown in previous sections, it's very easy to select which loops and other switches turn on or off in each preset. When you use the Loops or Switches page to turn loops or switches on and off, then store them to a preset, you are creating *overrides*. That is, you're changing the loop's state from the default for the current preset. Once you've saved a new setting for a loop or switch, the PBC remembers that the loop or switch is overridden for this preset, and the default state no longer applies to this preset. Even if you change the default state, the override will still be in effect.

EXAMPLE: By default, buffer 1 is always on, but in one preset, you are using a fuzz pedal that doesn't operate well with a buffer in front of it. In that preset, press **Switches**, then turn off Buffer 1. Hold the **Loops** button for 3 seconds to store this override.

If you ever need to remove your overrides and let the loop or switch follow the default state, you can select the **Clear State Overrides** option – it will go through all of your presets and remove all overrides on the currently selected loop or switch. There are also **Clear Parallel Overrides** and **Clear Invert Overrides** where appropriate.

EXAMPLE: You swapped out your fuzz pedal for something more buffer-friendly. You can go to **Buffer 1 Settings**, then select **Clear State Overrides**. Now, any overrides you created will be cleared out, leaving the default "on" state for the buffer in each preset.

Locks

Sometimes, you may need to temporarily override a loop or switch in all presets, but want to keep your overrides for later. You can turn on **Lock State** for a loop or switch, then set **Default State** to the desired state. The loop or switch will become locked to that state, and no override, button press or anything else will change that. The only way to remove a lock is to change the **Lock State** setting to *Off*.

EXAMPLE: You're using a different amp than you normally do. It's less gainy that you're accustomed to, and you feel it needs a boost pedal to get it sounding the way you want. You need that pedal on all the time. This pedal is in loop 1. Go to **Loop 1 Settings**, set **Lock State** to *On*, and **Default State** to *On*. Now, loop 1 will be locked on for all presets. When you go back to your original amp, you can turn **Lock State** and **Default State** to *Off*. Your previous settings for loop 1 will be restored – it will remember which presets had been programmed to turn the loop on, and which presets had been programmed to turn the loop off.

Song and Setlist Mode. When set to "All Songs", all 1008 songs will be used as your setlist. When set to "None", the controller displays your presets normally: by preset number and bank.

Edit Devices – Brings up the Edit Devices menu.

Edit Presets – Brings up the Edit Presets menu.

Audio Settings – Brings you to the Audio Settings menu.

Fn Switch Settings – Brings you to the Function Switch Settings menu.

MIDI Settings – Brings you to the MIDI Settings menu.

System Functions – Brings you to the System Functions menu.

Edit Songs – Brings up the Edit Songs menu. This menu is described the Song and Setlist Mode section.

Edit Setlists – Brings up the Edit Setlists menu. This menu is described in the Song and Setlist Mode section.

Exp Pedal – Brings up the Expression Pedal menu.

Copy Button – This button allows you to copy one button to another location. You will first be asked to select which button you wish to copy, then where you wish to put the button. The new button will be an exact copy of the first button, performing exactly the same functions.

Swap Buttons - This button allows you to swap the position of one button with another. You will be asked to select two buttons. After the second button is selected, the two buttons' positions will be swapped.

Function Button – Allows you to select what the **Function** button does in preset mode. By default, this is set to access the global preset, but you can also program it to be a tap tempo button or to control a connected Mini Effect Gizmo.

Current Pg. – Sets the currently visible button page. This is useful if you accidentally find yourself on a page that doesn't have a Page Select button defined.

Max Page – Sets the maximum page button page that will be visible. There can be up to 16 button pages, but it's best to limit the number of pages to those you actually need so that finding your page will be easier. When using a local preset button page, this page will always be visible, regardless of the Max Page setting.

Preset 2nd – Selects which action is taken when a preset button is pressed a second time. Setting this to "Same" (the default) just stays on the same preset. "Previous" causes the PBC to switch back to the previously selected preset upon the second press of a preset button. "Global" causes the PBC to switch to the global preset. (See the Global Preset section for details). "Reload" stays on the same preset, but reloads the preset, resetting IA states and device PC numbers back to what was stored in the preset.

Start Last Prst – When this is turned on, the Mastemind PBC will start up on the last preset you selected before turning the PBC off. When this is turned off, the Mastermind PBC will always start up on preset 1.

1st Prst is 0 – Determines the number of the first preset in the system, either 1 (the default) or 0. This can be used to adjust the Mastermind PBC's numbering scheme to match your effects processor. Please note that this parameter only changes the preset numbers, not the name, so the default names (Preset 001, Preset 002, …) will not change. You can use the **Init Prst Names** option in the System Functions Menu to reset the preset names using the current preset offset.

Hold mSec - Sets the number of milliseconds needed to activate a button's secondary hold function. The default value is 1200 msec (1.2 seconds)

1st Rpt mSec – Sets the number of milliseconds needed before a button repeats the first time. This is used on buttons like Bank Up and Bank Down that repeat if you hold them down. The default value is 1500 msec (1.5 seconds).

Repeat mSec – Sets the number of milliseconds needed before a button repeats the second and subsequent times. The default value is 300 msec (0.3 seconds).

Bank Scroll mSec – When you enter bank selection by pressing a bank up or bank down button, the Mastermind PBC will scroll through all of the presets in the currently selected bank, displaying the preset's name and lighting up the button that selects the preset. The parameters sets the number of milliseconds that each preset name is displayed before switching to the next preset.

Auto Page – When this setting is turned on, selecting a new preset will cause the button page to change to the page number stored within the preset. When turned off (the default), the current button page will not change unless you press a Page button or execute a Page action.

Instant Bank – Instant Bank mode, when turned on, will automatically switch presets when you press the Bank Up or Bank Down buttons. Instead of flashing the preset buttons, asking you to select a preset in the new bank, the PBC will switch banks and load the preset that appears on the currently selected preset button. For example, if you are on preset 3, and there are 5 presets per bank, pressing bank up will automatically switch to preset 8.

Auto Taps – Indicates how many times the Tap Macro should be run when the system tempo changes. Set this to 0 to disable Auto Tap. See the Other Special Features section for more details.

Tap Macro – Which Macro should be run for each Auto Tap. See the Other Special Features section for more details.

Show Button Name – When selected, the name of each button you press will be displayed briefly on the screen. Certain buttons such as preset and bank buttons already affect the main display, and because of that, their names are not displayed.

Show Exp Pedal Pos – When selected, the current expression pedal position is shown as a bar graph on the right side of the main display.

Show Tempo – When selected, the tempo is shown briefly in the main display when the tempo changes. Small tempo changes (< 1bpm) are not shown.

Contrast – Adjusts the main display contrast.

Edit Devices

The Edit Devices menu allows you to define which devices are connected to the Mastermind PBC. The Mastermind PBC contains a database of information about popular MIDI devices and can do a lot of the setup for you once you tell it what kind of devices are connected.

The first thing that is presented is a list of the available device slots. Each slot will either show a device name or "None". You can select any of these slots, which will take you to the device edit screen for that slot.

Once you have selected the device you wish to edit, you are taken to the Edit Device Menu.

Edit Device Menu

Type – Sets the type of device that is in this slot. The menu first prompts you for the device manufacturer, then the device model. If your device is not listed here, you can use the Generic setting, which will allow you to manually configure parameters.

Name – Allows you to edit the name shown for this device.

MIDI Ch – Sets the MIDI channel for this device. This number needs to be the same as the channel that is set on the device itself. Most MIDI devices have a setting titled "MIDI Channel" or "MIDI Receive Channel", and this is the parameter you need to change to match the setting here.

Set Default Pedals – Sets the expression pedal to control the a commonly used function on the device.

Get Preset Names – Brings up a dialog that allows you to select which presets' names to download to the Mastermind. This function is only supported on a few devices like the Axe-Fx and Kemper Profiling Amp.

Auto Names – Only available on the Kemper Profiling Amp. Allows the PBC to work with the KPA's Performance Mode, displaying preset and rig names in real time. This option does not change the stored preset or song names in the Mastermind PBC, it only displays the information from the KPA.

Sync Names –As presets are selected on the Mastermind PBC, the stored preset name is replaced by the name of the current preset in the connected MIDI device. This allows preset names to always be in sync. This function is only supported on a few devices like the Axe-Fx and Kemper Profiling Amp.

Direct Send – When turned off, PC and CC messages will be sorted by number and duplicate messages will be deleted. This reduces the amount of MIDI traffic, but may cause problems if you need your messages to be sent in a certain order. Turning Direct Send on will turn off this sorting and duplicate checking. Messages will be sent in the order shown in each action list.

Port – Press to select the MIDI port this device is connected to – either MIDI Out, Remote In or USB. Normal connections will use the "MIDI Out" selection. Use "USB" to communicate with a connected computer.

Preset Offset - Sets the starting preset number for a device. Effect processors typically start numbering their presets with number 0 or 1. Setting this number correctly will insure that the preset numbers on the Mastermind PBC agree with those on the effect processor.

Max PC # - Sets the maximum program change number accepted by a device. MIDI specifies a maximum number of 127, but not all effect processors have that many presets. Setting this correctly insures that the Mastermind PBC doesn't send a program change number that's too large. On devices that support MIDI banks, this determines how many presets are in each bank. Again, this is typically set to 127, but some devices use a smaller bank size.

# of Presets - Sets the total number of presets the device has.

Bank Type – Sets the type of MIDI bank message accepted by a device. MIDI bank messages are used to access more than 127 presets on a device. There are several ways this can be done, and the type of banks used will vary from device to device. The possible settings are: None (no bank support), LSB, MSB and MSB:LSB.

Flat Numbering – This setting controls how you specify presets and banks to devices that support MIDI banks. When checked, you can specify preset numbers for this device as a single preset number. When not checked, you select presets using a PC number and bank number.

Init PCs -None- – Initializes all presets for this device. Selecting this option will initialize all presets on the Mastermind PBC to send no program change messages to this device. This is different than turning the **Send PC** setting off in that it can be overridden on any preset using the Edit Presets menu and assigning a PC number to this device for one or more presets.

Init PCs All 0 – Initializes all presets for this device. Selecting this option will initialize all presets on the Mastermind PBC to send program change number 0 to this device.

Init PCs Sequential – Initializes all presets for this device. Selecting this option will initialize all presets on the Mastermind PBC to send a sequential program change number to the device. Preset #0 will send program change #0, preset #1 will send program change #1, etc. This is the default setting for a new device.

CC On Preset (Send CC on Preset Change) – When set to "On", this device will receive CC messages every time the preset changes, and when an IA button is pressed. When set to "Off", this device will only receive its CC messages when an IA button is pressed.

Send PC– When set to "On", the Mastermind PBC will be allowed to send PC messages to the device. When set to "Off", PC messages will not be allowed. Setting this to "Off" will disable some of the PC and Bank related items in the Edit Device menu.

SndRdunPC (Send Redundant PC) – When set to "Off", the same PC message will never be sent to a device more than once in a row. Some effects processors will cause a gap or hiccup in the audio when receiving a PC message, so turning this parameter off will help prevent that from happening. Turning this parameter to "On" will cause the Mastermind PBC to send a PC message when requested, whether it's a duplicate or not.

IgnorePCIn (Ignore Incoming PC) – When set to "On", any incoming program changes generated by this device will be ignored. Otherwise, these incoming PC messages will cause the PBC to change presets when received.

IgnoreCCIn (Ignore Incoming CC) – When set to "On", any incoming continuous controller messages generated by this device will be ignored. Otherwise, these incoming CC messages (and other status messages) will cause the PBC to change IA button states.

Delete Device – Deletes this device from the system, leaving an empty slot.

Edit Presets

The Edit Presets menu lets you define which program change messages are sent to each device for the preset, as well as the preset name, expression pedal settings and the current button page.

Name – Sets the name of this preset.

Page – Sets the number of the button page that will be displayed when this preset is selected. Setting the page to "Same" will keep the current button page when the preset is selected.

Tempo – Sets the tempo (in BPM) for this preset. A tempo setting of **0** (zero) indicates that this preset has no tempo defined. See the Tap Tempo and MIDI Clock section for details.

Exp Pedal – Brings you to the Expression Pedal menu to allow you to override the global expression pedal settings for this preset.

Copy Preset – Allows you to copy the current preset to a new location.

The remaining items show any devices that are defined, and the bank and preset number that will be sent to those devices when the preset is selected. Pressing one of these buttons allows you to change the bank and PC number for the associated device.

Audio Settings

The Audio Settings menu controls how the audio loops, the Click Stopper circuits, and the internal line mixer work.

Tuner Ref – Sets the reference frequency for the internal tuner. The allowable range is 432 to 445 Hz.

Loop 1 Settings – Brings up the settings menu for Loop 1.
…
Loop 10 Settings – Brings up the settings menu for Loop 10.

Buffer 1 Settings – Brings up the settings menu for Buffer 1.
…
Buffer 3 Settings – Brings up the settings menu for Buffer 3.

Dry Signal Settings – Brings up the settings menu for the dry signal send to the internal line mixer.

Input Settings – Brings up the settings menu for the main input (mute).

Output A Settings – Brings up the settings menu for Output A.

Output B Settings – Brings up the settings menu for Output B.

ClickStop L7 – Controls whether the Click Stopper circuit located in front of loop 7 is active. See the Audio and Switching Features section for more details.

ClickStop L10 – Controls whether the Click Stopper circuit located after loop 10 is active. See the Audio and Switching Features section for more details.

CS Pre Time – Sets the time (in milliseconds) that the Click Stopper turns on before the relays are allowed to switch. By default, this is set to 4 milliseconds, but you can fine-tune the Click Stopper's performance with different values.

CS Post Time – Sets the time (in milliseconds) that the Click Stopper remains on after the relays switch. By default, this is set to 8 milliseconds, but you can fine-tune the Click Stopper's performance with different values.

Audio Menus (Loop, Buffer, etc.)

The menus for each audio loop and switch have similar settings which control the default state of the loop or switch. Please refer to the Audio Defaults, Overrides and Locks section for more details.

Default State – Sets the default state (on or off) for this audio feature.

Lock State – Locks the default state for this audio feature.

Clear State Overrides – Clears all preset overrides for this audio feature.

The following three parameters are only available for loops 7-10:

Default Parallel – Sets the default parallel state (on or off) for this audio feature. "On" means that this loop is parallel, "Off' means that this loop is series.

Lock Parallel – Locks the default parallel state for this audio feature.

Clear Parallel Overrides – Clears all preset overrides for this loop's series/parallel setting.

The following three parameters are only available for Output B:

Default Invert – Sets the default invert state (on or off) for this audio feature. "On" means that this output is inverted, "Off' means that this output is normal (non-inverted).

Lock Invert – Locks the default invert state for this output.

Clear Invert Overrides – Clears all preset overrides for this output's invert setting.

Fn Switch Settings

The Function Switch Settings menu allows you to control the behavior of the function switches. Each switch can be assigned to be latching or momentary, normal or inverted.

FN1 Invert – FN4 Invert – When this parameter is set to "On", the function switch is inverted (electrically shorted when "off", and electrically open when "on"). When set to "Off", the function is normal (electrically open when "off", and electrically shorted when "on").

FN1 Momentary – FN4 Momentary - When this parameter is set to "On", the function switch is set to momentary. When the switch's state changes, the relay will turn on for a short period of time, then turn off. When set to "Off", the function switch is latching – when switching state, it turns on or off and stays that way until the state changes again.

FN1 On Only – FN4 On Only – This parameter is designed to be used in conjunction with the **Momentary** setting. When this setting is turned on, the function switch output will only pulse when the switch is turned on, not when the switch is turned off. This setting is used when controlling channel switching on certain amps, but should be left turned off in most cases.

Momentary mSec – Controls how long momentary function switches will remain on. The default is 100mSec.

MIDI Settings

MIDI Rx Ch – Sets the MIDI channel that the Mastermind PBC will listen to. Any program and/or bank changes received on this channel will cause the Mastermind PBC to jump to the selected preset and send all of the MIDI messages corresponding to that preset. This parameter defaults to "None", which means that the Mastermind PBC will not respond to incoming bank or program change messages.

Bank=Song – This setting affects what MIDI bank and Program Change messages do in Song and Setlist mode. Please refer to the External MIDI Control section for more details.

MIDI Bidir – Turns bidirectional MIDI support on or off. Certain devices support bidirectional communication between the device and MIDI controller. This allows you to have two way communication with a single 5 pin MIDI cable. Don't turn this parameter on unless you know your device does support bidirectional MIDI. Bidirectional MIDI only works with the first device in your MIDI chain.

Remote – Turning this on enables remote mode. This allows more than one Mastermind PBC to be connected together and have them all synchronized together. Refer to the Remote and Expander Mode section for more information.

Expander – Turning this on enables Expander Mode. This allows you to link two PBCs together and use them as one 20 loop switcher. Refer to the Remote and Expander Mode section for more information. This parameter is only visible if the **Remote** parameter is turned on.

MIDI Merge – When set to "On", all MIDI messages that are received through the **Remote In** or **USB -> PC** ports are retransmitted through the **MIDI Out** port.

MIDI Clock – Determines whether the Mastermind PBC acts as a MIDI clock "Master" or "Slave". Setting this parameter to "None" (the default) disables MIDI clock support. See the Tap Tempo and MIDI Clock section for more details.

The remaining options allow you to set the Continuous Controller (CC) numbers that control individual functions like loops, function switches, buffers and outputs. Please refer to the External MIDI Control section for more details.

System Functions Menu

The System Functions Menu allows you to configure low level parameters and do system maintenance.

Load Settings – Allows you to select a settings file from the currently attached USB flash drive and load it into the system.

Save Settings – Allows you to save the current settings to an attached USB flash drive.

Init Preset Names – Initializes all of the preset names in the system to their default names: "Preset 001", "Preset 002", etc. The numbering of these names starts with the global preset offset, which can be set in the main setup menu.

System Info – Displays the versions of the firmware currently installed on the system as well as the electronic serial number of the Mastermind PBC.

Debug Log - Displays detailed error messages used to debug the system.

System Test - Used at the factory to verify that the Mastermind PBC is working properly.

Factory Reset – Erases the memory of the Mastermind PBC and restores all settings to the factory defaults.

Update Firmware – Begins the firmware update process. Please refer to the Updating Firmware section for more information.

Expression Pedal Menu

The Expression Pedal menu allows you to edit the behavior of the expression pedal. This menu can be accessed from the Main Menu, which is where you set the global expression pedal settings. You can also enter this menu from Edit Presets, which allows you to override the global settings for a preset.

Override – This parameter is only visible when editing the expression pedal settings for a particular preset (not from the Main Menu). When editing a preset, turn this parameter **On** to override the global settings for the expression pedal. The remainder of the settings below will be displayed so you can edit the expression pedal settings for the current preset.

Name - Allows you to name the expression pedal.

SndOnPrst – Turning this on makes the expression pedal send its current CC value(s) every time you change to a new preset. This parameter is only available in the global expression pedal menu.

Calibrate – Enters pedal calibration. You are asked to move the pedal all the way up and all the way down. This insures that the pedal will work optimally with the Mastermind PBC. Press the **Done** soft button when you are finished. This parameter is only available when editing the global pedal parameters from the Main Menu.

Device – Selects the device this pedal will control. Uses the Device Select Menu to allow you to choose from the defined devices.

CC Number – Allows you to edit the continuous controller number sent by the pedal.

Min Val – Sets the value sent by the expression pedal when the pedal is raised up all the way.

Max Val – Sets the value sent by the expression pedal when the pedal is pushed all the way down.

Assign CC – This button allows you to choose a continuous controller from the list of functions defined for each device. When this button is selected, you are prompted for one of the functions available on the device. The continuous controller number associated with that function is to the CC Number parameter, and default values are filled in for Min Val and Max Val.

Device 2, CC Number 2, Min Val 2, Max Val 2 and Assign CC 2 – These parameters allow you to set up the expression pedal to control a second CC parameter at the same time as it controls the first CC. This is particularly useful for cross-fading, where one parameter decreases while the another parameter increases (and vice-versa).

Set Switch – Sets the expression pedal's switch point to the current pedal position. Please refer to the Expression Pedal section for more details.

Switch Invert – Inverts the sense of the expression pedal position switch. Please refer to the Expression Pedal section for more details.

Specifications

Dimensions	17.5" (w) x 5.5" (d) x 3.33" (h) / 44.5 cm (w) x 14.0 cm (d) x 8.38 (h)
Weight	4 lbs / 1.8kg
Power	9VDC 500mA **or** 12VDC 400mA 5.5mm OD, 2.1mm ID x 9.5mm barrel connector (*BOSS-style*) **Note:** use the 12VDC 400mA output on Voodoo Lab Pedal Power products.

Mastermind PBC MIDI Implementation Chart

MIDI Implementation Chart v 2.0 (Page 1 of 3) Manufacturer: RJM Music Technology, Inc. Model: Mastermind PBC Version: 1 Date: October 10, 2016			
	Transmit/Export	Recognize/Import	Remarks
1. Basic Information			
MIDI Channels	1-16	1-16	Channel 1 is set by default
Note Numbers	Yes	No	
Program change	Yes	Yes	
Bank Select Response? (Yes/No) If yes, list banks utilized in remarks column	Yes	Yes	Sends any bank number Uses bank MSB and LSB, banks 0-2
Modes supported : Mode 1: Omni-On, Poly (Yes/No)	No	No	
Mode 2: Omni-On, Mono (Yes/No)	No	No	
Mode 3: Omni-Off, Poly (Yes/No)	Yes	Yes	
Mode 4: Omni-Off, Mono (Yes/No)	Yes	Yes	
Multi Mode (Yes/No)	No	No	
Note-On Velocity (Yes/No)	Yes	No	
Note-Off Velocity (Yes/No)	Yes	No	
Channel Aftertouch (Yes/No)	No	No	
Poly (Key) Aftertouch (Yes/No)	No	No	
Pitch Bend (Yes/No)	No	No	
Active Sensing (Yes/No)	No	No	
System Reset (Yes/No)	No	No	
Tune Request (Yes/No)	No	No	
Universal System Exclusive: Sample Dump Standard (Yes/No)	No	No	
Device Inquiry (Yes/No)	No	No	
File Dump (Yes/No)	No	No	
MIDI Tuning (Yes/No)	No	No	
Master Volume (Yes/No)	No	No	
Master Balance (Yes/No)	No	No	
Notation Information (Yes/No)	No	No	
Turn GM1 System On (Yes/No)	No	No	
Turn GM2 System On (Yes/No)	No	No	
Turn GM System Off (Yes/No)	No	No	
DLS-1 (Yes/No)	No	No	
File Reference (Yes/No)	No	No	
Controller Destination (Yes/No)	No	No	
Key-based Instrument Ctrl (Yes/No)	No	No	
Master Fine/Coarse Tune (Yes/No)	No	No	
Other Universal System Exclusive	No	No	
Manufacturer or Non-Commercial System Exclusive	Yes	Yes	RJM Music Technology, Inc. Manuf. ID: 00 01 5B
NRPNs (Yes/No)	No	No	
RPN 00 (Pitch Bend Sensitivity) (Yes/No) RPN 01 (Channel Fine Tune) (Yes/No) RPN 02 (Channel Coarse Tune) (Yes/No) RPN 03 (Tuning Program Select) (Yes/No) RPN 04 (Tuning Bank Select) (Yes/No) RPN 05 (Modulation Depth Range) (Yes/No)	No No No No No No	No No No No No No	
2. MIDI Timing and Synchronization			
MIDI Clock (Yes/No)	No	No	
Song Position Pointer (Yes/No)	No	No	
Song Select (Yes/No)		No	
Start (Yes/No) Continue (Yes/No) Stop (Yes/No)	No No No	No No No	
MIDI Time Code (Yes/No)	No	No	
MIDI Machine Control (Yes/No)	No	No	
MIDI Show Control (Yes/No) If yes, MSC Level supported	No	No	
3. Extensions Compatibility			
General MIDI compatible? (Level(s)/No) Is GM default power-up mode? (Level/No)	No No	No No	
DLS compatible? (Levels(s)/No) (DLS File Type(s)/No)	No No	No No	
Standard MIDI Files (Type(s)/No)	No	No	
XMF Files (Type(s)/No)	No	No	
SP-MIDI compatible? (Yes/No)	No	No	

Manufacturer: RJM Music Technology, Inc.   Model: Mastermind PBC   Version: 1   Date: October 10, 2016

Control #	Function	Transmitted (Y/N)	Recognized (Y/N)	Remarks
0	Bank Select (MSB)	Y	Y	
1	Modulation Wheel (MSB)	Y	N	
2	Breath Controller (MSB)	Y	N	
3		Y	N	
4	Foot Controller (MSB)	Y	N	
5	Portamento Time (MSB)	Y	N	
6	Data Entry (MSB)	Y	N	
7	Channel Volume (MSB)	Y	N	Exp pedal default
8	Balance (MSB)	Y	N	
9		Y	N	
10	Pan (MSB)	Y	N	
11	Expression (MSB)	Y	N	
12	Effect Control 1 (MSB)	Y	N	
13	Effect Control 2 (MSB)	Y	N	
14		Y	N	
15		Y	N	
16	General Purpose Controller 1 (MSB)	Y	N	
17	General Purpose Controller 2 (MSB)	Y	N	
18	General Purpose Controller 3 (MSB)	Y	N	
19	General Purpose Controller 4 (MSB)	Y	N	
20		Y	N	
21		Y	N	
22		Y	N	
23		Y	N	
24		Y	N	
25		Y	N	
26		Y	N	
27		Y	N	
28		Y	N	
29		Y	N	
30		Y	N	
31		Y	N	
32	Bank Select (LSB)	Y	Y	
33	Modulation Wheel (LSB)	Y	N	
34	Breath Controller (LSB)	Y	N	
35		Y	N	
36	Foot Controller (LSB)	Y	N	
37	Portamento Time (LSB)	Y	N	
38	Data Entry (LSB)	Y	N	
39	Channel Volume (LSB)	Y	N	
40	Balance (LSB)	Y	N	
41		Y	N	
42	Pan (LSB)	Y	N	
43	Expression (LSB)	Y	N	
44	Effect Control 1 (LSB)	Y	N	
45	Effect Control 2 (LSB)	Y	N	
46		Y	N	
47		Y	N	
48	General Purpose Controller 1 (LSB)	Y	Y	Loop 1 on/off (default)
49	General Purpose Controller 2 (LSB)	Y	Y	Loop 2 on/off (default)
50	General Purpose Controller 3 (LSB)	Y	Y	Loop 3 on/off (default)
51	General Purpose Controller 4 (LSB)	Y	Y	Loop 4 on/off (default)
52		Y	Y	Loop 5 on/off (default)
53		Y	Y	Loop 6 on/off (default)
54		Y	Y	Loop 7 on/off (default)
55		Y	Y	Loop 8 on/off (default)
56		Y	Y	Loop 9 on/off (default)
57		Y	Y	Loop 10 on/off (default)
58		Y	Y	Loop 7 ser/par (default)
59		Y	Y	Loop 8 ser/par (default)
60		Y	Y	Loop 9 ser/par (default)
61		Y	Y	Loop 10 ser/par (default)
62		Y	Y	Buffer 1 on/off (default)
63		Y	Y	Buffer 2 on/off (default)

Manufacturer: RJM Music Technology, Inc.   Model: Mastermind PBC   Version: 1   Date: October 10, 2016

Control #	Function	Transmitted (Y/N)	Recognized (Y/N)	Remarks
64	Sustain Pedal	Y	Y	Buffer 3 on/off (default)
65	Portamento On/Off	Y	Y	Fn Switch 1 on/off (dflt)
66	Sostenuto	Y	Y	Fn Switch 2 on/off (dflt)
67	Soft Pedal	Y	Y	Fn Switch 3 on/off (dflt)
68	Legato Footswitch	Y	Y	Fn Switch 4 on/off (dflt)
69	Hold 2	Y	Y	Output A on/off (default)
70	Sound Controller 1 (default: Sound Variation)	Y	Y	Output B on/off (default)
71	Sound Controller 2 (default: Timbre / Harmonic Quality)	Y	Y	Output B invert (default)
72	Sound Controller 3 (default: Release Time)	Y	Y	Mute on/off (default)
73	Sound Controller 4 (default: Attack Time)	Y	Y	Dry send on/off (default)
74	Sound Controller 5 (default: Brightness)	Y	Y	Tuner on/off (default)
75	Sound Controller 6 (GM2 default: Decay Time)	Y	Y	Page select (default)
76	Sound Controller 7 (GM2 default: Vibrato Rate)	Y	N	
77	Sound Controller 8 (GM2 default: Vibrato Depth)	Y	N	
78	Sound Controller 9 (GM2 default: Vibrato Delay)	Y	N	
79	Sound Controller 10 (GM2 default: Undefined)	Y	N	
80	General Purpose Controller 5	Y	N	
81	General Purpose Controller 6	Y	N	
82	General Purpose Controller 7	Y	N	
83	General Purpose Controller 8	Y	N	
84	Portamento Control	Y	N	
85		Y	N	
86		Y	N	
87		Y	N	
88		Y	N	
89		Y	N	
90		Y	N	
91	Effects 1 Depth (default: Reverb Send)	Y	N	
92	Effects 2 Depth (default: Tremolo Depth)	Y	N	
93	Effects 3 Depth (default: Chorus Send)	Y	N	
94	Effects 4 Depth (default: Celeste [Detune] Depth)	Y	N	
95	Effects 5 Depth (default: Phaser Depth)	Y	N	
96	Data Increment	Y	N	
97	Data Decrement	Y	N	
98	Non-Registered Parameter Number (LSB)	Y	N	
99	Non-Registered Parameter Number(MSB)	Y	N	
100	Registered Parameter Number (LSB)	Y	N	
101	Registered Parameter Number(MSB)	Y	N	
102		Y	N	
103		Y	N	
104		Y	N	
105		Y	N	
106		Y	N	
107		Y	N	
108		Y	N	
109		Y	N	
110		Y	N	
111		Y	N	
112		Y	N	
113		Y	N	
114		Y	N	
115		Y	N	
116		Y	N	
117		Y	N	
118		Y	N	
119		Y	N	
120	All Sound Off	Y	N	
121	Reset All Controllers	Y	N	
122	Local Control On/Off	Y	N	
123	All Notes Off	Y	N	
124	Omni Mode Off	Y	N	
125	Omni Mode On	Y	N	
126	Poly Mode Off	Y	N	
127	Poly Mode On	Y	N	