MIDI Pan

https://peacockmedia.software/drum

Introduction

Thank you for your interest in MIDIPan. As its name suggests, it's a polyphonic MIDI controller modelled on a tongue drum or hand pan. It can output:

- MIDI over USB
- MIDI over TRS (a lead with the right pinout gives MIDI over 5-pin DIN, see Appendix B)

From February 25, an alternative version has been available, also offering

- Audio out (3.5mm jack)

It has velocity-sensitivity for expressive playing if enabled via the setup menu (see **Menus > The setup menu**)

If you don't find the information you're looking for in this manual, I'll be very glad to discuss any aspect.

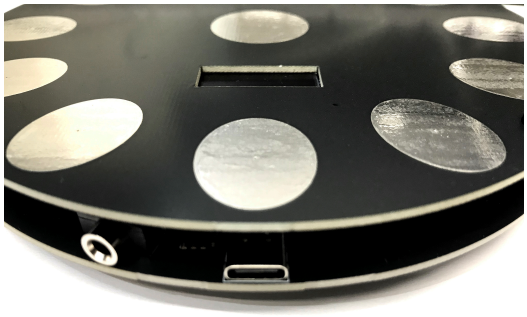
shiela@peacockmedia.co.uk
https://peacockmedia.software/drum

~ Shiela

Powering MIDIPan

Power the unit via its USB-C port. Using MIDI over USB is the most convenient way to use it as you only need to plug in a single lead.

Inputs, outputs and controls



USB-C

This is the most convenient way to use the device as you only need to connect one lead. MIDIPan can take power from here as well as send MIDI. When plugged into a computer or other MIDI host with a USB-C cable, it should power up and appear as 'ekalim'. This socket is also used for updating the firmware. (see **Updating the firmware**.)

MIDI output socket

A 3.5mm jack socket for 'MIDI over TRS', using the 'Korg' or 'type A' configuration. For connecting to a device with 5-pin DIN, you can buy or make a lead following this standard (pinout in Appendix B).
Note that other pin configurations are available. If you have a lead with a 5-pin DIN and 3.5mm TRS, it may not necessarily be the correct pinout.

Note that MIDI messages are sent by default on **channel 2** but this can be changed to any of the 16 channels using the menu.

Audio output socket

If you have the version with audio, you'll have an additional 3.5mm jack at the 9 o'clock position. For more information see **Audio out**

Rotary control

The rotary control at the side steps through the menu items. Note that this control has a push action which has a special meaning in some contexts (eg Looper > Tap tempo). If you push the button in before trying to nudge it up or down, it may not go. Nudging up and down requires a light touch.

Push buttons

These two buttons step the active menu item up or down.

For certain items that may require many presses, such as velocity, program number or the list of scales, which is now quite long, you can hold the push buttons for fast scrolling.

Reset button

This is on the underside of the device. The main reason for including a reset button is so that you can update the firmware. It's easier to access than the 'boot' or 'bootsel' button. (See **Updating the firmware**.)

If MIDIPan doesn't appear as a MIDI device over USB after a few seconds from power-up, try pressing the reset button once.

Playing MIDIPan

Pad order

The notes are arranged in an alternating pattern.

Important: If you bought your MIDIPan before 7 Aug 2024, then the top plate will be 'hard wired' to a different arrangement, with the middle pad and the 12 o'clock pad both being the root. In that case, you should use this version of the manual as it will have the correct chart:
https://peacockmedia.software/drum/manualV1.pdf

The middle pad and the smaller one at 6 o'clock plays the lowest note, your root note. Unless you're playing one of the pentatonics, pad 8 is your octave, or 1', pad 9 the ninth or 2' and so on.

If you're 'playing the changes' then this arrangement makes it easy to find the triads for chords 1 (1,3,5) chord 2 (2,4,6) 3 (3,5,7) 4 (4,6,8) 5 (5,7,9) 6 (6,8,10) and so on.

You can choose to flip this layout left-right, using the **advanced configuration menu** as described in the next section.

Menus

The menu items are divided into three areas, designed to show you all of the relevant information at once. These are the 'playing menu', the 'setup menu' and the 'advanced configuration' menu.

Nudge the rotary control up or down to choose a menu item. A small arrow marks the currently active item.

The playing menu

This menu displays the current scale or mode, the root note or key, and the octave.

Root: Changing this value will change the key of your MIDIPan in semitones, looping around without changing the octave.

Octave: Self-explanatory. Note that software instruments may sound better or only respond to notes within a certain range. It's always worth stepping through the octaves when you change instruments.

Scale / mode: All of the modes from Lydian to Locrian are available, as well as major and minor pentatonics. (obviously you'll get a wider range because the octave will be on the sixth pad rather than the eighth.)

The setup menu

This menu displays the current velocity, MIDI channel and program number.

Velocity: If it shows a number then every note will be sent with the same fixed velocity, and you can step through in tens. If you step down to zero, you'll find 'Auto'. When Auto is chosen, the device will be 'velocity sensitive'. You'll be able to make light taps or heavy taps to control the velocity sent with the note. This does of course rely on the software instrument you're using. Some may not respond to velocity. Some may simply adjust the volume, some may use different samples according to velocity.

Channel: This is the MIDI channel number that MIDIpan is currently using. Note that it will show a '1-based' value, ie 1-16. This option is not visible if the interface is set to 'Simple'. *

Program:
(MIDI output:) Some MIDI modules may respond to a 'program change' message to change the instrument. MIDIpan will send the displayed program number when it is powered up, and when you change the value. This allows you to easily switch instruments where the program change message is supported.
(Audio output:) this changes the instrument. Limited to 1-40 if interface is set to 'Simple'. *

Bank: (from firmware v2.3.6) Some MIDI modules may respond to a 'bank change' message. This option is not visible if the interface is set to 'Simple'. *

* to switch between Simple and Advanced interface, see **The advanced configuration menu** on the next page

The advanced configuration menu

There's a special way to enter this menu, so that you can't accidentally enter it in a live playing situation. It allows you to flip the pad layout (mirror left-right) and to make an adjustments to the velocity sensitivity.

To enter this menu, scroll all the way down to the 'Looper' screen (or the Program change Pr: on earlier versions of the firmware) and then pull down and hold the rotary control for a count of three seconds and then release. You should then see this menu with Flip selected. You will be able to scroll down to the sensitivity setting and back up in the normal way.

Flip: If this is enabled, then the pads will be the left-right mirror of the layout shown in the next section. This may suit you if you're left-handed or if you simply prefer the pad layout to alternate to the left first.

Sens: If properly calibrated (see **Calibration** below) you should be able to get a very low velocity value with the lightest of taps and a maximum value of 127 (7F hex) with the heaviest tap.

There are many factors that will influence the velocity reading. Your playing technique is a factor of course but since the pads read capacitance, factors such as how dry your hands are, and your connection to the ground (ie what you're wearing and the surface your standing / sitting on) will make a difference.

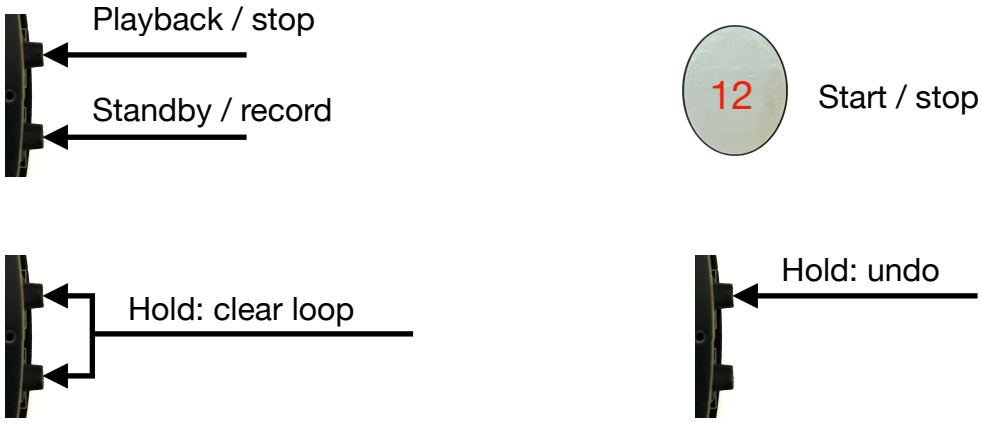
The Sensitivity setting will allow you to make temporary adjustments to the sensitivity. To temporarily compensate for the environmental factors above, or if you simply want to play more lightly or more heavily for a particular song. This setting is reset to zero after a power cycle or after calibration.

If you need to make more permanent adjustment to the sensitivity, see **Calibration** below

Interface: Simple/Advanced (shown as Simp / Adv)**:** The 'simple' option hides and limits some of the menu options to improve the initial experience with the audio MIDIPan. Switch to Advanced in order to see the MIDI channel number, sound bank number and extend the program change menu to 1-128 (The card currently supplied with the MIDIPan has 40 intsruments, so numbers above 40 only make sense if you install your own soundfont or use the MIDI functionality.) MIDI-only devices will be set to Advanced by default and there's no need to switch them to Simple.

The Looper

tl;dr



That should get you started. If you need it, then here's more detail. If you don't see the looper in the menu system then you are probably using firmware earlier than 2.3. Contact me about updating.

Recording a loop

With no loop in memory, your only option is the second button (standby / record).

If you wish to play a note at the very start of the loop, then any note will trigger recording. Otherwise you can use pad 12 (start/stop) to begin recording without playing a note immediately.

Play your heart out. To end the loop, hit pad 12 or the first button. This will end the loop and begin playback.

Now that a loop is in memory, you'll see the length of the loop in seconds, and when playing or recording, the animated circle will indicate your position in the loop.

Adding to the loop

You can now jam over the top of what you've recorded without recording any more notes. Pad 12 will start / stop playback. To add more notes, the second button will re-enter record mode. If playback is stopped, it'll start immediately from the start of the loop without standby.

Using different instruments

If you want to use different instruments within the same loop, then it's necessary to change the MIDI channel before switching the instrument (program) number, otherwise the sound will change for all of the notes you've already played.

Tempo / count-in

You may have noticed that the word 'Standby' and the recording icon flash. You can use this as a count-in and to help you keep time while recording the first pass of your loop.

When there's a loop in memory (indicated on the display by the length in seconds) then you won't get standby mode and the dot will remain steady when recording.

To set the tempo, the looper must be 'Off' and there must be no loop already in memory. (Clear by holding both buttons if you need to.) Then you can press the button within the rotary control.

The display will read "Tap Tempo" and the recording indicator dot will flash at the current tempo (but nothing is being recorded). Tap pad 12 at your desired tempo. When happy, you can push the button again to exit, or just wait for three seconds when it'll exit automatically.

Changing octave while playing

You may want to change octave while recording or playing along with your loop. You would usually have to stop the loop, navigate to the playing menu and switch the octave there, which interrupts your flow somewhat.

So while the loop is "Playing" or "Recording", you will find that you can nudge the rotary control up or down to change octave. When the looper is "Off", that control will navigate as usual.

Audio out

The MIDIPan with audio out is an option available from February 2025.

If you have the version with audio, you'll have a second 3.5mm jack socket at the 9 o'clock position.

This is a stereo output. Plug in earphones or headphones with a 3.5mm jack, or a powered speaker (line level) or anything else that accepts line-level audio using a stereo audio lead.

Note that the power requirements of this version of MIDIPan are higher. On one hand it'll be more likely to keep a small powerbank switched on (a problem with the very low draw of the midi-only version) but on the other hand it'll use up the power faster from such a powerbank.

Changing the instrument

Change the instrument using Pr: (program number) in the menu (from v2.3.6 this will also show Bk: for bank)

The first few audio MIDIPans were loaded with a General MIDI soundfont, so these numbers correspond with the General MIDI Instrument list, see Appendix C.

If you have a General MIDI soundfont installed, the instruments that may sound more appropriate are the percussive instruments 113-115, the tuned percussion instruments 9-16, some of the ethnic instruments, particularly kalimba 109, and the synth effects 97-104. However, for looping or multitracking, you may enjoy having access to all kinds of instruments, plucked, bowed, blown or synth.

From 1 March 2025, MIDIPans are loaded with a soundfont compiled especially for MIDIPan and contains some different tongue drum and handpan sounds along with the General MIDI tuned percussion, fantasy and ethnic sounds that suit the instrument. Plus kit drums.

The soundfont is on an SD within the instrument, installing another soundfont is possible (and there are many options) although not quick or simple. Contact me for help if you'd like to do this.

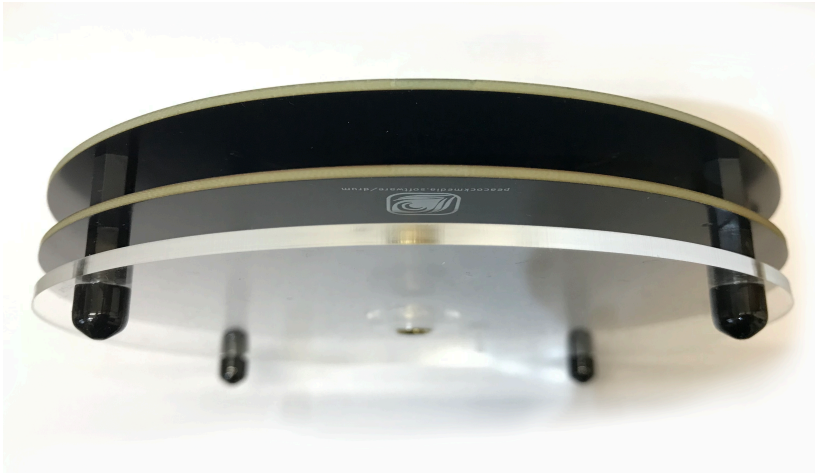
Percussion (kit)

As when using MIDI output, the kit 'scale' will map some useful drum kit sounds to the pads. You have access to **all** of the General MIDI percussion sounds by instead choosing the chromatic scale and choosing channel 10 (or instrument 0, bank 128) You'll find that the drums start at C3 and go into octave 7.

The tripod mount

MIDIPans sold after 1 Jan 2025 will come fitted with a clear tripod mount. This adds heft, making the pan feel more stable when standing on a surface. It shields the reset button* and some of the metal connections on the underside of the main logic board and of course it provides a standard tripod thread (1/4 x 20) for a tabletop or regular tripod.

It's easy to remove if you don't need the tripod screw and would prefer a thinner, lighter device. Simply unscrew the four feet with your fingers, the clear mount will come off. Then put the rubber caps from the old feet onto the remaining stand-offs which become the new feet.



* the button is still accessible with a cocktail stick or straightened paperclip.

The calibration tool

MIDIPans sold after 28 August 20204 should be supplied calibrated, and you don't need to do this unless you want to. MIDIPans sold before that date can be upgraded to the latest firmware and will then have this tool which will lead to much improved velocity results if the calibration is done well. After upgrading the firmware, the device will ask you to calibrate when you first power up. (There are some default values; you can exit the calibration tool if you like and just get on and play it but it will be better if you do go through the calibration procedure.)

If you accidentally leave the calibration tool and move up out of the Advanced menu, or if you simply want to use the calibration tool at any time, then there is a trick for accessing the Advanced menu (see also **The advanced configuration menu** above). Nudge down as far as you can (which is 'Pr:' for Program Change) and then pull down and hold the rotary control for a slow count of three seconds and then release. You should then be in the Advanced menu and have Flip: selected. You will be able to scroll down further to the Calibration Low and Calibration High tools and then back up when you need to.

Calibration procedure (video demo)

Nudge up or down when you want to switch between 'Calibration High' and 'Calibration Low'. It doesn't matter whether you do Low first and then High, or vice versa.

But you **must** make make much heavier taps when in the Calibration High menu than you do when in the Calibration Low menu. If, for any of the pads, your average 'low' tap is heavier than your average 'high' tap, then that pad may appear to no longer work. (If this happens, simply follow the calibration procedure again, taking care that 'low' = light taps and 'high' = heavy taps.)

Calibration Low (Displayed as Calibration Lo)

- If it says 'Calibration Lo' then it's expecting light taps on each pad.
- Tap each pad lightly a number of times, in a way that you consider should barely register as a note. The animation isn't an indication of any value, but of consistency.
- Half a dozen to a dozen taps on each pad should do it.
- The order doesn't matter, the device knows which pad you're tapping.

Calibration High (Displayed as Calibration Hi)

- If it says 'Calibration Hi' then it's expecting the heaviest taps that you can make.
- Tap each pad heavily a number of times in a way that you consider should give the highest velocity value.
- The animation isn't an indication of any value, but of consistency.
- Half a dozen to a dozen taps on each pad should do it.
- The order doesn't matter, the device knows which pad you're tapping.

Once you've done both, navigate back up into the Setup or Playing menu. This step is important. If you power down before nudging back up into the regular menus, your new information may not be saved.

Updating the firmware

When updates are available, it's easy to update the firmware.

With MIDIPan powered via the USB, give a double-click on the reset button. This should put the device into boot mode.

Alternatively, with MIDIPan dismantled (take out the 4 screws and move the top plate) keep the BOOTSEL or BOOT button pressed while plugging in the USB cable.

Then you should see the device on your computer as a drive with a name like "RPI-RP2". Simply drag the new firmware (.uf2 file) onto the new drive's icon. If successful, it should then unmount itself from your computer and the new firmware should start.

I don't yet know why but sometimes after doing this, the device may lock up. If this happens, Simply remove and replace the power.

Troubleshooting

No MIDI output over USB / MIDIPan doesn't appear as a MIDI device or instrument

With recent software, the pan will display on power up (very briefly) "USB mounted" or "USB not mounted".

If USB mounted:
Scroll to the setup menu and check which channel the device is sending on. Make sure your receiving device is responding to messages on that channel or 'all'.

Some software instruments may only work within a certain range, so step through all of the octaves. You should be fine in the 3 / 4 / 5 range.

If this doesn't solve the problem, then do you have any software or device that can display the MIDI? (eg MIDI Monitor on a Mac, MIDI Ox on Windows).

If USB not mounted
Try a tap the reset button once (on the underside). Tapping it twice has a different purpose. Make sure to tap it once only and wait. then try again

A further check: if using a Mac, open the utility Audio MIDI Setup which will already be on your Mac. Go to Window>MIDI Studio (cmd-2) and see whether 'ekalim' has an icon there. If it does, then the computer has connected with it at some point. If it's greyed out, then it's not currently connected and when it does connect, the icon will light up.

The answer to this problem is almost always a bad or wrong USB lead. Note that some USB leads are for charging-only, not data. It's not unknown for USB leads to go bad or not to make good connections. Please try other leads.

If your issue still isn't answered, please contact me, shiela@peacockmedia.co.uk

Appendices

Appendix A

Version control

This document

Version 2.0 : June 2024 first public version
Version 2.1 : July 2024 updates the firmware version list and adds info about the additional settings; sensitivity and flipped pad layout. The name 'MIDITongueDrum' replaced with 'MIDIPan' throughout.
Version 2.2 : August 2024 updates for a new hardware version
Version 2.3 : September 2024 adds section about the new calibration tool and reorganises some of the sections.
Version 2.4 : November 2024 New photos showing the new-shaped pads and all mentions of micro-USB should be changed to USB-C.
Version 2.5 : November 2024 Adds section about using the new looper
Version 2.6 : February 2025 Adds information about using the audio out
Version 2.6.1 : March 2025 Updates to information about using the audio out
Version 2.6.1 : March 2025 Some improvements to the troubleshooting section
Version 2.6.2 : April 2025 Adds information about the Simple/Advanced Interface option

Hardware

Version 1.0 (black) : First public version. (earlier versions were red)
Version 2.0 (black) : (sold from 7 Aug 2024) New top plate has revised pad connections, centre is wired to 6 o'clock rather than 12 o'clock.
Version 3.0 (black) : (sold from 5 Nov 2024) Revised pads are larger and eliptical rather than oval. Main board now has USB-C socket rather than micro.
Version 3.1 (black) : (sold from Feb 2025) As per the v3 USB-C but with the addition of a DAC on the main board and headers for the audio synth module. This is an option, sold alongside the MIDI-only version, 3.0

Firmware ('MIDIPan OS')

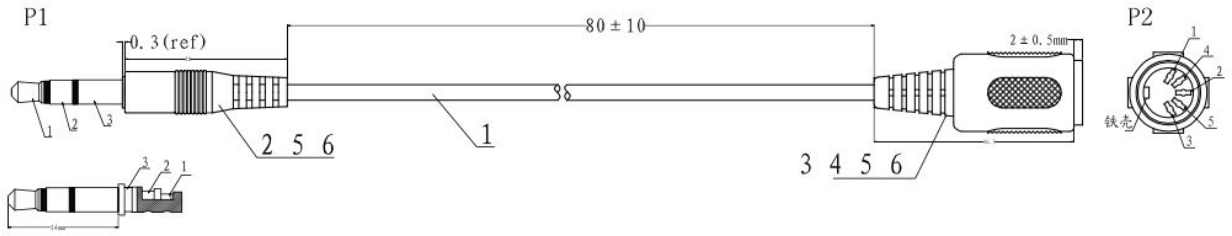
[details for firmware versions before 2.0 are not given here, see the v1 manual]
Version 2.0 : From here, v1 will continue to increment when there are updates for owners of the original hardware version. Firmware v2.x will be for MIDIPans with the altered pad layout.
Version 2.1 : September 2024 Adds calibration tool to improve velocity data. Improves debounce on the rotary switch.
Version 2.2 : September 2024 Adds more handpan/arabic scales
Version 2.3 : (beta) Adds built-in looper
Version 2.3.3 : (release) During beta period, 'hold for fast scrolling' and new looper features such as 'tap tempo' were added.
Version 2.3.4 : minor bug fixes, including a potential 'stuck note' problem.
Version 2.3.5 : minor enhancement for audio version.
Version 2.3.6 : adds 'Bk:' (bank) besider 'Pr:' (program number).
Version 2.4.0 : adds hexatonic minor, hexatonic blues. Changes 'Flip:' for 'Arr: with altern, alt lh, clkwise, anticl
Version 2.4.1 : adds Interface:Simple/Advanced (shown as Simp / Adv) to the advanced menu. The 'simple' option hides and limits some of the menu options to improve the initial experience with the audio MIDIPan. MIDI-only devices will be set to Advanced by default and there's no need to switch them to Simple.
Version 2.4.2 : changes concerning the settings for the capacitive touch chip re the pads at 6 o'clock and centre

Important: If you bought your MIDIPan before 7 Aug 2024, then the top plate will be 'hard wired' to a different arrangement, with the middle pad and the 12 o'clock pad both being the root. Firmware will be built separately for your version of the pan and will be numbered 1.x.x You should refer to this version of the manual as it will have the relevant version information: https://peacockmedia.software/drum/manualV1.pdf

Appendix B

MIDI over TRS

The 3.5mm jack used for MIDI out follows the most official standard for MIDI over TRS. If buying a lead, it may also known as 'Type A' and used by Akai Pro, IK Multimedia, Korg, Line 6, littleBits, Make Noise. (diagram from midi.org)



PIN OUT:

P1	P2
1	5
2	4
3	2

Note that it's very easy to mix up pins 4 and 5. The diagram above is looking at the user end of a *socket*. If looking at the pins of a *plug*, or when looking at the inside/solder side of a socket, the pins will be mirrored. If you're making a lead and it doesn't work right away, then it's likely that you've reversed 4 and 5. (This shouldn't cause any harm.)

https://www.midi.org/midi-articles/updated-how-to-make-your-own-3-5mm-mini-stereo-trs-to-midi-5-pin-din-cables

Appendix C

The list of General MIDI instruments

Piano

1 Acoustic Grand Piano
2 Bright Acoustic Piano
3 Electric Grand Piano
4 Honky-tonk Piano
5 Electric Piano 1 (usually a Rhodes Piano)
6 Electric Piano 2 (usually an FM piano patch)
7 Harpsichord
8 Clavinet

Chromatic Percussion

9 Celesta
10 Glockenspiel
11 Music Box
12 Vibraphone
13 Marimba
14 Xylophone
15 Tubular Bells
16 Dulcimer

Organ

17 Drawbar Organ
18 Percussive Organ
19 Rock Organ
20 Church Organ
21 Reed Organ
22 Accordion
23 Harmonica
24 Tango Accordion

Guitar

25 Acoustic Guitar (nylon)
26 Acoustic Guitar (steel)
27 Electric Guitar (jazz)
28 Electric Guitar (clean)
29 Electric Guitar (muted)
30 Electric Guitar (overdriven)
31 Electric Guitar (distortion)
32 Electric Guitar (harmonics)

Bass

33 Acoustic Bass
34 Electric Bass (finger)
35 Electric Bass (picked)
36 Fretless Bass
37 Slap Bass 1
38 Slap Bass 2
39 Synth Bass 1
40 Synth Bass 2

Strings

41 Violin
42 Viola
43 Cello
44 Contrabass
45 Tremolo Strings
46 Pizzicato Strings
47 Orchestral Harp
48 Timpani

Ensemble

49 String Ensemble 1
50 String Ensemble 2
51 Synth Strings 1
52 Synth Strings 2
53 Choir Aahs
54 Voice Oohs (or Doos)
55 Synth Voice or Solo Vox
56 Orchestra Hit

Brass

57 Trumpet
58 Trombone
59 Tuba
60 Muted Trumpet
61 French Horn
62 Brass Section
63 Synth Brass 1
64 Synth Brass 2

Reed

65 Soprano Sax
66 Alto Sax
67 Tenor Sax
68 Baritone Sax
69 Oboe
70 English Horn
71 Bassoon
72 Clarinet

Pipe

73 Piccolo
74 Flute
75 Recorder
76 Pan Flute
77 Blown bottle
78 Shakuhachi
79 Whistle
80 Ocarina

Synth Lead

81 Lead 1 (square)
82 Lead 2 (sawtooth)
83 Lead 3 (calliope)
84 Lead 4 (chiff)
85 Lead 5 (charang, a guitar-like lead)
86 Lead 6 (space voice)
87 Lead 7 (fifths)
88 Lead 8 (bass and lead)

Synth Pad

89 Pad 1 (new age or fantasia, a warm pad stacked with a bell)
90 Pad 2 (warm)
91 Pad 3 (polysynth or poly)
92 Pad 4 (choir)
93 Pad 5 (bowed glass or bowed)
94 Pad 6 (metallic)
95 Pad 7 (halo)
96 Pad 8 (sweep)

Synth Effects

97 FX 1 (rain)
98 FX 2 (soundtrack, a bright perfect fifth pad)
99 FX 3 (crystal)
100 FX 4 (atmosphere, usually a nylon-like sound)
101 FX 5 (brightness)
102 FX 6 (goblins)
103 FX 7 (echoes or echo drops)
104 FX 8 (sci-fi or star theme)

Ethnic

105 Sitar
106 Banjo
107 Shamisen
108 Koto
109 Kalimba
110 Bag pipe
111 Fiddle
112 Shanai

Percussive

113 Tinkle Bell
114 Agogô
115 Steel Drums
116 Woodblock
117 Taiko Drum
118 Melodic Tom or 808 Toms
119 Synth Drum
120 Reverse Cymbal

Sound Effects

121 Guitar Fret Noise
122 Breath Noise
123 Seashore
124 Bird Tweet
125 Telephone Ring
126 Helicopter
127 Applause
128 Gunshot

Appendix Z

Planned features

- A frequently-requested feature is aftertouch with assignable CC. This is a possibility.

I welcome feature requests: shiela@peacockmedia.co.uk

Acknowledgements

For MIDIPans with audio output, the audio is made possible thanks to the MT32-Pi project which in turn makes use of fluidsynth. To the best of my knowledge all of the software used in that part of MIDIPan is made freely available under the GPL licence:
https://github.com/dwhinham/mt32-pi/blob/main/LICENSE
https://github.com/FluidSynth/fluidsynth/blob/master/LICENSE

I supply it with a General MIDI soundfont installed, GeneralUser GS. This is made and published by S. Christian Collins
https://github.com/mrbumpy409/GeneralUser-GS/blob/main/documentation/LICENSE.txt