

M64 MIDI Chromatic Harmonica

User's Guide

Version 1.1.3

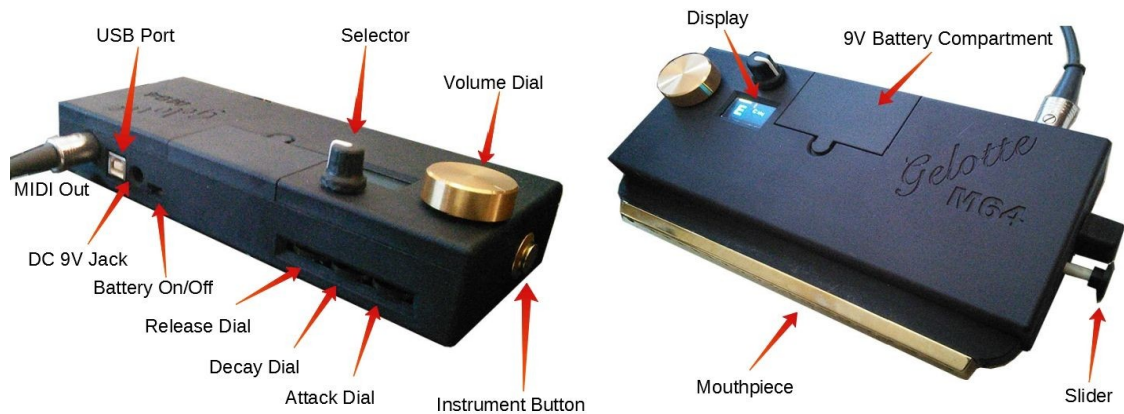
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* items marked with an asterisk are advanced (A) or expert (E) settings.
To change the menu mode .

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1 LAYOUT



The M64 has the following features:

1. A large volume dial to control channel volume during play.
2. A selector dial with a built-in button. Press down to select/deselect and turn to navigate or change values.
3. An instrument button that will allow quick changes of up to 12 different settings during play.
4. Three thumbwheel dials in the back to allow real-time control over attack, decay, and release or assigned to other tone modification effects.
5. A battery on/off switch to preserve battery life.
6. A DC 9v jack to allow using an external power source. The connection to the battery is shut off when you plug into the jack.
7. A USB port which can be used as MIDI out (after selecting from Setup menu) and for software updates.
8. A standard DIN5 MIDI out jack.
9. A slider which acts like the slide on a chromatic harmonica. You can program up to 8 trigger and release points and assign note offsets for each.
10. A metal 16 hole mouthpiece for a total of 64 notes.
11. Easily accessible 9V battery compartment.
12. An internal accelerometer to sense tilt changes. Tilt left or right for pitch bend. Tilt forward for modulation. Tilt back to recalibrate the sensors.
13. An internal 4Gb SD card for saving settings, chords, etc. for fast retrieval.
14. 4k of internal flash memory used to store favorite settings to load on start up.

2 MENU

The menu is accessible by clicking the selector switch. Once the menu is shown you can navigate using the selector dial. The menu functions are listed below. The items with an asterisk are only shown in advanced mode. The items in advanced mode are either experimental or should not be modified under normal circumstances. To access the advanced menu, press the instrument select button during power up and hold while the logo is shown.

2.1 SET UP

2.1.1 General

2.1.1.1 *Init Count**

The init count specifies how many times to read the sensors while calibrating. The more times the sensors are read during calibration, the less likely you will have spurious notes while playing. The downside is that it will take longer to calibrate. The default is 3000 and the range is from 1000-10000.

2.1.1.2 *Auto Adjust**

This is an experimental setting which is currently turned off. The sensors can have drift over time and the auto adjust was an attempt to compensate for the drift without having to force a recalibration. It is not working yet and should not be used.

2.1.1.3 *Show Midi LED**

There is an LED on the microcontroller within the M64. If this setting is turned on it will blink the LED every time a packet of information is sent to the MIDI device. The default is turned off.

2.1.1.4 *Loudness Margin**

This is an experimental setting to make the LEAD mode and GAP mode play more accurate. LEAD and GAP mode play the loudest sounding hole. This is used to keep from switching to a new note if it is within the loudness margin of the currently playing note. The downside of increasing this value is that while transitioning notes up or down, notes will “stick”. The default for this setting is 0 (i.e. off) with a range of 0 to 20.

2.1.1.5 *Afirtouch Timer**

This setting determines the least amount of time that must pass (in milliseconds) before a change in note volume is sent. Setting this too low will flood the external MIDI device with MIDI messages. The default is 10milliseconds with a range of 0ms to 100ms.

2.1.1.6 *Resume Adjust*

This setting tells whether to enable recalibration after tilting backward then forward. This triggers a “suspend play” mode which turns off all notes and keeps the harmonica from triggering any sound. Having resume adjust on will also recalibrate the sensors. The default setting is on.

2.1.1.7 *Tilt Threshold*

The wind sensors are sensitive to orientation changes – specifically tilting back. This setting sets the point where you can add a margin to your current breath settings to keep extraneous notes from sounding. The default is -10 (roughly -5 degrees) with a range of -100 (essentially turned off) to 20.

2.1.1.8 *Threshold Inc.*

When the above tilt threshold is met, this increment value will be added to both blow and draw trigger and release values. A small + sign will appear on the top right of the display indicating the thresholds have increased. The default is 3 with a range of 0 to 100 (basically turning off your harmonica).

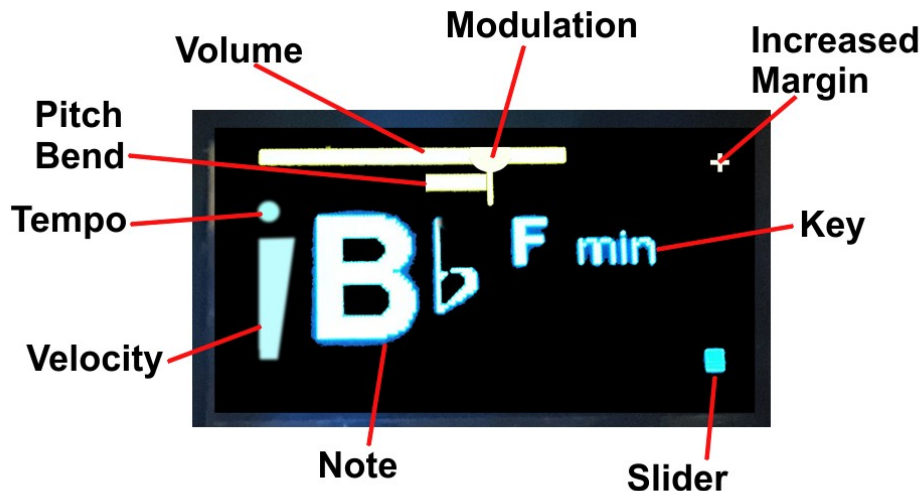
2.1.1.9 *Suspend Play*

This is the tilt amount needed to enter suspend play mode (and possibly recalibration – see Resume Adjust above). The default is -50 (roughly -60°) with a range of -100 (essentially turned off) to 0.

2.1.1.10 *Wind Adjust*

This setting adds a margin to the blow trigger and release settings only. This is handy if playing in an outdoor area without changing your normal settings. It is not saved and will return to 0 when the harmonica is turned off. The default is 0 and the range is 0 to 40 (hurricane).

2.1.2 Display



2.1.2.1 *Mode*

Display mode is an easy way to turn off the display while playing. The menu will still be shown when selected even if the display mode is off. The default is on.

2.1.2.2 *Dim*

The display can be dimmed slightly by setting dim to on. This may be useful when playing in dark venues. It does not have an impact on overall battery life. The default is on.

2.1.2.3 *Refresh Rate*

Refresh rate tells how often to refresh the display in milliseconds. Setting this too high may slow the responsiveness of the harmonica slightly. Setting it too low will result in a sluggish display. The default is 100 milliseconds with a range from 25ms to 500ms. When playing fast the refresh rate will automatically slow so that the play won't suffer.

2.1.2.4 *Tempo*

The tempo is displayed as a small dot at the top of the volume level indicator (left) of the display. It will turn on and off in time to the selected tempo if the tempo value is greater than 0. The default is on. When playing in arpeggio mode you must set a tempo. The tempo along with the arpeggio interval is used to trigger the next note in the sequence.

2.1.2.5 *Pitch Bend*

Pitch bend is shown at the top of the display under the volume level line. For pitch bend down a line will appear growing to the left. from the center line. The length of the line indicates the amount of pitch bend. Pitch bend up will have the line growing toward the right. The default is on.

2.1.2.6 *Modulation*

Modulation is displayed as a growing semicircle coming down from the top center of the display. The more modulation, the bigger the circle. The default is on.

2.1.2.7 *Levels*

The three thumbnail dials at the back are default set to Attack, Decay, and Release. When you adjust one of the dials the levels screen will display showing all three values as a horizontal bar chart. The levels screen will disappear 1 second after the dials stop being adjusted. The default is on.

2.1.2.8 *Volume*

The volume dial's position is shown as a horizontal bar at the top of the display starting at the left going towards the right. The default is on.

2.1.2.9 *Velocity*

The velocity is how hard you are blowing into the M64. This is shown in the left as a bar growing from the bottom. The velocity value is adjusted using the Velocity settings described later. The default is on.

2.1.2.10 *Slider*

The slider can have up to eight trigger/release points. These slider positions are displayed as a series of small dots on the bottom right of the display indicating how many trigger points have been passed. The default is on.

2.1.2.11 *Note*

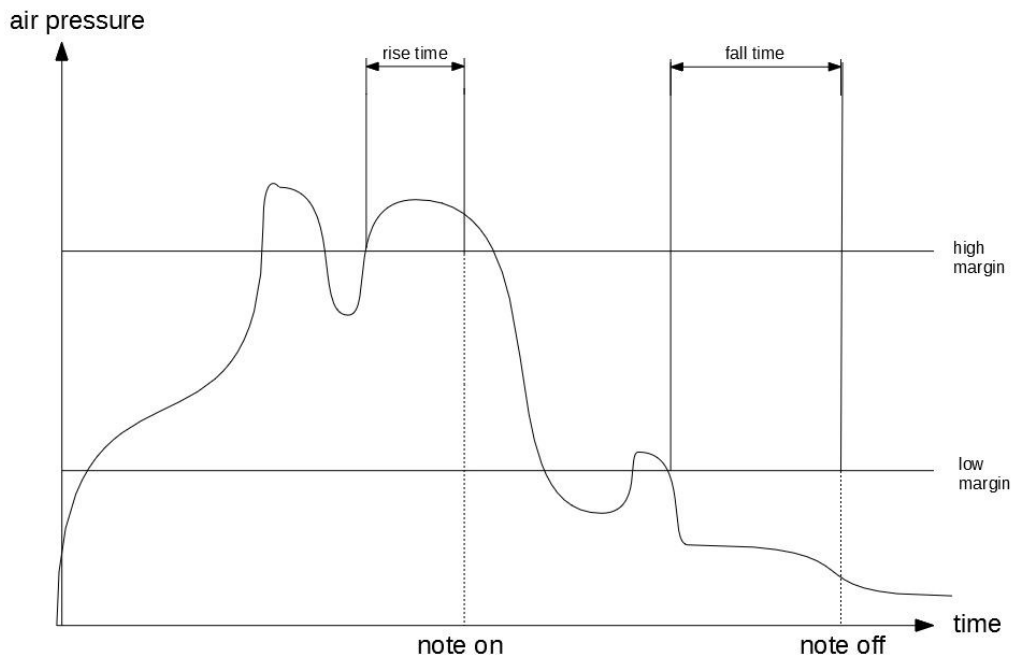
The last played note is shown. In Chord Mode, the last played chord is shown. The default is on.

2.1.2.12 *Key*

The M64 tries to figure out the key you are playing in. It will be displayed at the top right of the display. If you set the key of the instrument explicitly it will show the key you selected. The default is on.

2.1.3

Breath Sensors



2.1.3.1

Blow Max*

This setting is what the highest blow sensor value can be. The response range is distributed from sensor midpoint set during calibration (roughly 500+) to Blow Max. The Blow Sensitivity can be modified instead of changing the Blow Max with similar results. The default is 750 with a range of 550 to 1000.

2.1.3.2

Blow High Margin

This value is the margin (which added to the sensor midpoint) the sensor blow value must be held above for at least Blow Rise Time before a note will be triggered on. The default is 5 with a range of Blow Low Margin to 25.

2.1.3.3

Blow Rise Time*

This is the time in milliseconds that the Blow High Margin + sensor blow zero level must be surpassed in order for a note on event to be triggered. The default is 15 ms with a range of 0 to 500ms.

2.1.3.4

Blow Low Margin

This value is the margin (which added to the sensor midpoint) the sensor blow value must be fall below for at least Blow Fall Time before a note will be triggered off. The default is 3 with a range of 2 to Blow High Margin.

2.1.3.5

Blow Fall Time*

This is the time in milliseconds that the Blow Low Margin + sensor midpoint must be dropped below in order for a note on event to be triggered. The default is 25 ms with a range of 0 to 500ms.

2.1.3.6

Blow Sensitivity

The blow value is calculated using the distribution from sensor midpoint to Blow Max. Blow sensitivity is then multiplied to the blow value to either linearly skew the value higher (> 1.0) or lower (<

1.0). In addition, the velocity default and sensitivity envelope will be applied to determine note velocity/aftertouch. The default value is 1.5 with a range of 0.0 to 10.0

2.1.3.7 *Draw Max**

This setting is what the lowest draw sensor value can be. The response range is distributed from sensor midpoint set during calibration (roughly 500-) to Draw Max. The Draw Sensitivity can be modified instead of changing the Draw Max with similar results. The default is 325 with a range of 24 to 450.

2.1.3.8 *Draw High Margin*

This value is the margin (which subtracted from the sensor midpoint) the sensor draw value must be held below for at least Draw Rise Time before a note will be triggered on. The default is 4 with a range of Draw Low Margin to 25.

2.1.3.9 *Draw Rise Time**

This is the time in milliseconds that the sensor midpoint - Draw High Margin must be drawn below in order for a note on event to be triggered. The default is 15 ms with a range of 0 to 500ms.

2.1.3.10 *Draw Low Margin*

This value is the margin (which subtracted from the sensor midpoint) the sensor draw value must rise above for at least Draw Fall Time before a note will be triggered off. The default is 2 with a range of 2 to Draw High Margin.

2.1.3.11 *Draw Fall Time**

This is the time in milliseconds that the sensor midpoint - Draw Low Margin must rise above in order for a note on event to be triggered. The default is 25 ms with a range of 0 to 500ms.

2.1.3.12 *Draw Sensitivity*

The draw value is calculated using the distribution from sensor draw zero level to Draw Max. Draw sensitivity is then multiplied to the draw value to either linearly skew the value higher (> 1.0) or lower (< 1.0). In addition, the velocity default and sensitivity envelope will be applied to determine note velocity/aftertouch. The default value is 1.5 with a range of 0.0 to 10.0

2.1.4 *Pitch Bend*

The M64 has an internal accelerometer which can detect tilt. If you tilt the harmonica left or right you can apply pitch bend down or pitch bend up respectively.

2.1.4.1 *Enable*

You can turn pitch bend on or off. The default is turned on.

2.1.4.2 *High Margin*

This value is the threshold right tilt you need to apply before pitch bend up occurs. The default is 10 with a range of 0 (no tilt) to 200 (unreachable).

2.1.4.3 *Low Margin*

This value is the threshold left tilt you need to apply before pitch bend down occurs. The default is -10 with a range of 0 (no tilt) to -200 (unreachable).

2.1.4.4 *Factor*

This is a multiplicative factor used to determine the amount of pitch bend to apply. The higher this value the more pitch bend. The default is 1.55 with a range of 0 (turned off) to 5.0

2.1.5 *Modulation*

The M64 has an internal accelerometer which can detect tilt. If you tilt the forward you can apply modulation, similar to the modulation wheel on some synthesizer keyboards.

2.1.5.1 *Enable*

You can turn modulation on or off. The default is turned on.

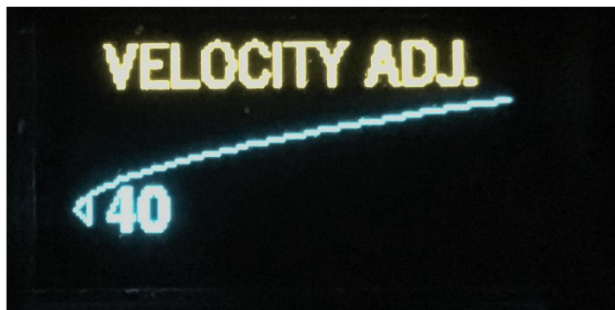
2.1.5.2 *Margin*

This is the forward tilt that must be surpassed before modulation is applied. The default is 20 with a range of 0 (no tilt) to 200 (unreachable).

2.1.5.3 *Factor*

This is a multiplicative factor applied to the value to either increase or lower the amount of modulation. The default is 1.55 with a range of 0 (turned off) to 5.0

2.1.6 *Velocity*



You can affect how the air pressure translates to the actual note velocity and aftertouch using this screen. The first value is the default velocity or the lower bound (values go from 0 to 127). The second value affects the rate at which the velocity increases when you blow or draw harder. Zero is a linear response, positive values gives a quicker rise at lower breath pressures, negative values diminish the response at lower breath pressures.

2.1.7 *Envelope*

The envelope of the synthesizer sound can be modified using the 3 thumbwheel dials at the back of the M64. Normally the dials adjust the Attack, Decay, and Release times. These can be reassigned to any of the 10 Sound Controller MIDI parameters ("Variation", "Timbre", "Release Time", "Attack Time", "Brightness", "Decay Time", "Vibrato Rate", "Vibrato Depth", "Vibrato Delay", "Undefined").

2.1.7.1 *Dial 1 CC#**

This affects which of the above 10 MIDI Control Codes is sent when adjusting the first dial. The default is "Attack Time".

2.1.7.2 *Attack Time*

You can either send the dial value, a specific value, or not send any value at all (Ignore) for this setting. The default is to use "Dial".

2.1.7.3 *Dial 2 CC#**

This affects which of the above 10 MIDI Control Codes is sent when adjusting the second dial. The default is "Decay Time".

2.1.7.4 *Decay Time*

You can either send the dial value, a specific value, or not send any value at all (Ignore) for this setting. The default is to use "Dial".

2.1.7.5 *Dial 3 CC#**

This affects which of the above 10 MIDI Control Codes is sent when adjusting the third dial. The default is "Release Time".

2.1.7.6 *Release Time*

You can either send the dial value, a specific value, or not send any value at all (Ignore) for this setting. The default is to use "Dial".

2.1.8 Slider



The slider is a linear potentiometer with values ranging roughly from 0 (all the way out) to 800 (pressed all the way in). It is meant to have a similar function to the chromatic harmonica's button slide.

2.1.8.1 *# Positions*

The number of trigger/release points on the slider. The default is 1 and the range is 0 to 8.

2.1.8.2 *Positions*

This screen allows you to choose where on the slider the trigger and release points should be. You can set the trigger point for the current position (indicated at the top left) by pressing the selector button once. You can now either dial in the position using the selector or push the slider in to the

desired position and press the selector button once more. Once the trigger point is set you can now set the release point and press the selector button when done. You can have the release point higher than the trigger point. This will create a “dead gap” where the harmonica won’t produce a sound. You may want to try this to get sharper articulation. Most people will like the release about 3 less than the trigger point.

2.1.8.3 *Offsets*

Each trigger point you define on the slider will apply an offset. You define those offsets here. The default offset for the first trigger point is “scale + 1”. This means play the note defined 1 up from the current note (same column with slide in). Any trigger point can be assigned to use it’s “scale + #” to follow the scale mapping up. This is usually not desirable after the first trigger point since there is usually a lot of repeating and out of order notes when climbing the scale. In this case, set an explicit semitone offset. The default depends on the trigger point but can range from -24 semitones to +24 semitones.

2.1.8.4 *Change Delay*

The response of the M64 is very fast. This can cause accidental play of a non-offset note especially when changing from a draw note slide out to blow note slide in (or vice versa). This delay will hold off playing the note when changing blow/draw direction to make sure the slider is in the position you intend. The default delay is 0 milliseconds with a range of 0ms to 100ms.

2.1.9 *Accelerometer**

This screen just gives a continuous readout of the accelerometer x, y, and z values. Press the selector button to leave this screen.

2.1.10 *MIDI Messages*

This section allows you to control which MIDI messages are sent to your synthesizer/computer. You can use the in combination. For example you can have Note Aftertouch and Expression on simultaneously.

2.1.10.1 *Aftertouch*

If Aftertouch is on, the velocity value will be sent as Channel Aftertouch (MIDI 0xD0). The default is off.

2.1.10.2 *Channel Vol.*

If turned on, the velocity value (modified by the Volume Dial) will be sent using Channel Volume (MIDI CC# 0x07). The default is off.

2.1.10.3 *Note Aftertouch*

If Aftertouch is on, the velocity value will be sent as Note Aftertouch (MIDI 0xA0). The default is off.

2.1.10.4 *Expression*

If Aftertouch is on, the velocity value will be sent as Expression (MIDI CC# 0x0B). The default is on.

* items marked with an asterisk are advanced (A) or expert (E) settings.
To change the menu mode .

2.1.10.5 *Breath Controller*

If Aftertouch is on, the velocity value will be sent as Breath Controller (MIDI CC# 0x02). The default is off.

2.1.10.6 *MIDI Note Off**

If MIDI Note Off is on, the note off event will be sent using Note Off (MIDI 0x80). If this setting is off, the event will be sent using Note On with a volume of 0 (MIDI 0x90). If this setting is on, velocity will be sent for note off. The velocity used for note off is the same used for the corresponding note on event. The default is off.

2.1.10.7 *MIDI All Note Off**

If MIDI All Note Off is on, when the harmonica turns off all notes (during recalibration, slider changes, etc) a single All Notes Off (MIDI CC# 0x7B) will be sent. If this setting is off, all notes will be turned off (0-127) individually using the Note Off/Note On (see above) event. It appears this MIDI event is either not implemented or may leave notes on in some synthesizers.. The default is off.

2.1.11 Channel

You can set the MIDI channel the M64 will play on. There are 16 possible MIDI channels. The default is to play on channel 1.

2.1.12 Bank/Patch

The Bank and Patch screen allows you to enter the Bank (MSB and LSB) and Patch values specific for the synthesizer you are connected to. Changing a Bank and or Patch plays a different sound. The manufacturer's guide should be consulted for the numbers that have been used for your synthesizer.

2.1.13 Save Startup

Saves the current Profile settings and Instrument(s) to the internal 4Kb flash memory. Your harmonica will have these settings next time you power up.

2.1.14 Factory Restore

This will overwrite the internal 4Kb flash memory with the values the M64 shipped with. It will not change or remove any file saved on the SD card.

2.2 MEMORY USAGE*

Used to make sure all memory is being handled correctly and there are no memory "leaks". This feature is useful for developers.

2.3 ADJ. CALIBRATION*

This screen will show when the sensors hit the low and high thresholds. You can also adjust any individual sensor on this screen. Use the selector dial to go to the sensor you want to modify, and press the selector button once to edit the blow threshold

2.4 PLAY

2.4.1 Instrument Count

The M64 can have up to 12 separate instrument settings at any time. To switch between settings, press the instrument select button on the side of the M64 until you reach the desired instrument. This allows for fast changes during play. The default is 1 instrument with a range of 1 to 12.

2.4.2 Mode

The M64 can be set to play in different modes. The different modes are:

- Normal – Acts as regular polyphonic chromatic harmonica.
- Lead – Only plays the loudest note (monophonic mode).
- Gap – Using the loudest note as a root note, it adds an additional note based on the gap setting.
- Chord – Using the highest note played as a root note, will play the chord matching the pattern.
- Arpeggio – Similar to chord play but rotates through the chord notes at the tempo setting.

2.4.3 Scale Editor



Here you can modify the note assignments. Note assignments can be made to any hole for draw or blow and with the slider in or out. You can save scales on the SD card by going to SD->Scale->Save. There are also some predefined scales you can load from the SD card by going to SD->Scale->Load. The default scale is the "solo" C major scale. When you select Set Up->Save Settings, the current scale will loaded next time you power up the harmonica whether or not you have saved it on the SD card.

2.4.4 Tempo

You can set tempo in beats per minute. If the value is greater than 0 a small dot will appear at the top of the volume level indicator (left) of the display. It will turn on and off in time to the selected tempo. The tempo will also need to be set if you are playing in Arpeggio Mode. The default is 0 and the range is 0(off) to 500bpm

2.4.5 Gap

When the play mode is Gap, this value will determine the second note played from the root note. The gap can either be positive or negative for a range of +/- two octaves. The default is +4 semitones.

2.4.6 Define Chord

You can define a chord with up to 7 notes (root note + 6 additional offsets). Saving a chord on the SD card allows you to easily load it to a specific instrument setting later.

2.4.7 Assign Chords



Chords are assigned to 3 different blow/draw patterns. The different patterns are

1. 1 or 2 adjacent holes
2. 3 or more adjacent holes
3. 1 or 2 holes and then 1 or more tongue blocked holes followed by 1 or more holes

It may take some practice to play these patterns consistently. The root note of the chord is the highest note being played in a grouping.

2.4.8 Chord Min Time

This is the time in milliseconds you must hold a blow/draw pattern before a chord will be played. This is to avoid fluttering between chords.

2.4.9 Arpeggio Style

You can specify whether to play arpeggios notes rising, falling, or a combination, as well as random order.

2.4.10 Arpeggio Length

This specifies how many notes to play in the arpeggio. You can have the arpeggio play only while you continue to blow/draw, 1 cycle, a specific number of notes, or play continuously.

2.4.11 Transpose

The default key of the M64 is C. The lowest hole will play a middle C. You can shift the key signature by semitone steps using this screen.

2.4.12 Octave

The Octave screen is similar to Transpose except that it shift the key signature up or down an octave at a time.

2.4.13 Key

You can set the key of the harmonica. This does not affect the pitch of any note but will display an inverted note (black on blue instead of blue on black) when you play a note not in the selected key. This can be handy when you are trying to learn a key. You can also set the key to AUTO in which the M64 will try to figure out the key you are playing in and display it at the top right of the display screen.

2.5 SD CARD

In addition to the internal 4Kb of flash memory, the M64 has an internal 4Gb memory card. This storage is used to hold profiles, settings, chords, etc. for easy retrieval without having to change the harmonica's start up state.

2.5.1 Profiles

Profiles are settings that are player specific. The profile settings are all the settings associated with the Display, the Breath Sensors, and Play suspend and recalibrate. All the rest are considered Instrument settings and are saved under Instruments.

2.5.1.1 *Edit Name*

This is the name used to identify the setting on the SD card. The default name is "default".

2.5.1.2 *Load*

Load a previously saved Profile (if any) into memory. This will not change the power up settings unless you select Set Up->Save Startup.

2.5.1.3 *Save*

2.5.1.4 *Erase*

2.5.2 Instruments

2.5.2.1 *Edit Name*

- 2.5.2.2 *Load*
- 2.5.2.3 *Save*
- 2.5.2.4 *Erase*
- 2.5.2.5 *Load Group*
- 2.5.2.6 *Save Group*
- 2.5.2.7 *Erase Group*
- 2.5.3 Chord
- 2.5.3.1 *Erase*
- 2.5.3.2 *Load Assignment*
- 2.5.3.3 *Save Assignment*
- 2.5.3.4 *Erase Assignment*
- 2.5.4 Scale
- 2.5.4.1 *Load*
- 2.5.4.2 *Save*
- 2.5.4.3 *Erase*

3 POWER

You can power the M64 from multiple sources. When switching between power sources (from battery to 9V jack for example) you should turn off the harmonica first. You won't damage the harmonica but the different voltage level will affect the sensor calibration and may trigger a "REPLACE BATTERY" screen. If this happens while switching power sources, just turn off or unplug the M64 and turn it back on so the unit can recalibrate.

3.1 BATTERY

An alkaline 9V battery has typically around 450mAh for a 50mA draw. This means you could at most get 9 hours of usage from a single alkaline battery. My experience is that it is more like 6 hours. You can buy rechargeable 9Volt batteries but be sure that the dimensions are equal or less than a regular 9Volt battery. I use the EBL 840 rechargeable batteries and they work fine:



3.2 DC POWER SUPPLY

The M64 can be powered from a 9Volt power adapter. The harmonica draws less than 100mA (more like 70mA on average) so any power supply that can deliver 200mA or more should work fine. It is important to use a negative tip polarity. Most guitar pedal power supplies should work on the M64.

5.5mm x 2.1mm Barrel Connector



Center Negative



3.3 USB

The harmonica can also be powered from the USB port. You can send the MIDI output through the USB port or the MIDI DIN5 jack when powering from the USB port. When sending the MIDI output to the USB port, the power should come from the USB host you are connecting to.

4 MIDI IMPLEMENTATION CHART

Function	Transmit	Receive	Remarks
1. Basic Information			
MIDI channels	1-16 or repeating groups of channels	X	Can be set to send on a single channel or have successive holes assigned to separate channels (useful if using channel volume to handle note aftertouch).
Note numbers	C0 – G10	X	10 is shown as ^ in the Scale Editor
Program change	Yes	X	Range 0-127
Bank Select response? (Yes/No) If yes, list banks utilized in remarks column	Yes	X	Select the bank # (0-127)
Modes supported : Mode 1: Omni-On, Poly (Yes/No) Mode 2: Omni-On, Mono (Yes/No) Mode 3: Omni-Off, Poly (Yes/No) Mode 4: Omni-Off, Mono (Yes/No) Multi Mode (Yes/No)	Yes No No No No	X	Mono mode can be emulated selecting Play->Mode = LEAD
Note-On Velocity (Yes/No)	Yes	X	
Note-Off Velocity (Yes/No)	Yes?	X	If Advanced Menu MIDI Messages->Note Off is set to ON
Channel Aftertouch (Yes/No)	Yes?	X	If MIDI Messages->Channel Aftertouch is set to ON
Poly (Key) Aftertouch (Yes/No)	Yes?	X	If MIDI Messages->Note Aftertouch is set to ON
Pitch Bend (Yes/No)	Yes	X	If Set up->Pitch Bend is enabled
Active Sensing (Yes/No)	No		
System Reset (Yes/No)	No		
Tune Request (Yes/No)	No		
Universal System Exclusive: Sample Dump Standard (Yes/No) Device Inquiry (Yes/No) File Dump (Yes/No) MIDI Tuning (Yes/No) Master Volume (Yes/No) Master Balance (Yes/No) Notation Information (Yes/No) Turn GM1 System On (Yes/No) Turn GM2 System On (Yes/No)	No No No No No No No No No		

Turn GM System Off (Yes/No)	No		
DLS-1 (Yes/No)	No		
File Reference (Yes/No)	No		
Controller Destination (Yes/No)	No		
Key-based Instrument Ctrl (Yes/No)	No		
Master Fine/Coarse Tune (Yes/No)	No		
Other Universal System Exclusive	No		
Manufacturer or Non-Commercial System Exclusive	No		
NRPNs (Yes/No)	No		
RPN 00 (Pitch Bend Sensitivity) (Yes/No)	No		
RPN 01 (Channel Fine Tune) (Yes/No)	No		
RPN 02 (Channel Coarse Tune) (Yes/No)	No		
RPN 03 (Tuning Program Select) (Yes/No)	No		
RPN 04 (Tuning Bank Select) (Yes/No)	No		
RPN 05 (Modulation Depth Range) (Yes/No)	No		
2. MIDI Timing and Synchronization			
MIDI Clock (Yes/No)	No		
Song Position Pointer (Yes/No)	No		
Song Select (Yes/No)	No		
Start (Yes/No)	No		
Continue (Yes/No)	No		
Stop (Yes/No)	No		
MIDI Time Code (Yes/No)	No		
MIDI Machine Control (Yes/No)	No		
MIDI Show Control (Yes/No) If yes, MSC Level supported	No		
3. Extensions Compatibility			
General MIDI compatible? (Level(s)/No) Is GM default power-up mode? (Level/No)	No		
DLS compatible? (Levels(s)/No) (DLS File Type(s)/No)	No		
Standard MIDI Files (Type(s)/No)	No		
XMF Files (Type(s)/No)	No		
SP-MIDI compatible? (Yes/No)	No		

5 TROUBLESHOOTING
