
pyDM404

version 2.0.0

Users Guide

Contents

1. **Features**
2. **Introduction and Installation**
3. **Concepts and Terminology**
4. **GUI**
5. **Getting Ready to Record**
6. **Recording and Editing a Sequence**
7. **Song Mode**
8. **Assigning PADS**
9. **Saving and Loading DISKS**
10. **Whats Next?**

Features

- **Audio:** 44100 Hz, 16 bit playback. Edited sounds are also saved in this format
- **Sequences:** 40 nameable sequences. Length of a sequence can be from 1 to 8 bars in 4/4 timing
- **Songs:** 8 nameable songs which playback sequences in specified order
- **Sound Editor:** Truncate, Reverse, or low pass filter sounds (low pass frequency of 250Hz)
- **Sound Chopper:** Chop a loaded sound into slices (up to 8 slices) and auto assign to pads.
- **Pads:** 4 banks of 8 assignable pads for programming up to 32 sounds
- **8 Choke Groups:** Sounds in same group cut one another off when played.
- **8 Sliders:** Sliders control volume of sound playback, or pitch (-/+ 12 semitones) of sequenced sound (tuning algorithm based on the SP-1200's algorithm, adding aliasing on certain turnings)
- **Grid and Real Time Record:** Clickable grid for making sequences or record in real time via the keyboard keys.
- **Swing:** 3 swing settings that delay playback of notes recorded on 16th notes (swings every other 16th note)
- **Sequencer Clock:** 24 PPQN clock that can be set to from 50 to 240 BPM.
- **Auto Correct/Quantize:** Auto Correct (aka quantize) recorded notes to 1/4, 8th, 8th triplets, 16th, 16th triplets, 32nd, 32nd triplets or at HI-REZ (no auto correction, notes fall on pulse)
- **Stock Sounds:** Several stock synth drum sounds are available on load. There is also a "sample pack" of real drums, a few piano/bass notes, and some simple drum loops.

Part 1 – Introduction and Installation

Intro

The pyDM404 is a semi-serious drum sequencer/machine program. The idea is to emulate the look, feel and use (not the sound) of 90's drum machines. Therefore, the interface is meant to be limited and somewhat clunky. There are not a bunch of bells and whistles in terms of sound editing etc., but a user can create nice drum tracks with the pyDM404 or an entire song using samples.

What does pyDM404 mean?

py (python) DM (Drum Machine) 404, which is half of 808 (think TR-808), or a play on “resource not found” server responses.

Why was the pyDM404 made?

It was made to provide a simple drum sequencer with sound editing features, that was cross-platform compatible and free to use. It was also an excuse to explore the Python library Pygame and to learn about building a whole application (and just for fun!)

Installation

The easiest way to “install” the pyDM404 is to download the appropriate binary files provided on the release page (insert here). There are binaries for Windows, and Ubuntu/Debian based Linux distributions. Sorry, there are no binaries available for macOS.

Download the zip file from the release page, and unzip it anywhere. You can double click on the executable to start the pyDM404. Also, will see the executable and 2 directories:

- **DISKS** - used to store “*disks*” that contain saved sounds, sequences, songs and other settings.
- **Assets** - contains the needed resources for the program to run and is required (***do not remove or change its location!***)

You can also run the program from the source code in the repository, which requires:

- Python >= 3.9
- Pygame >= 2.0.1
- Numpy >= 1.15

Once the dependencies are installed, you can run the program from the command line with (Linux):

```
user@pc:~$ python main.py
```

PART 2 – CONCEPTS & TERMINOLOGY

There are a few concept and terms associated with the pyDM404 that you should be familiar with.

Modules/Modes

The pyDM404 functionality of consists of several “modules”/ “modes” which are accessed through the menu keys located below the LCD when in the <MAIN> module

1. <Main> – main performance module for recording and playback (default on load)
 - 1b. <GRID> - Provides alternative view of <MAIN> with clickable grid
2. <PADS> – Assign sounds to pads and to channels/choke groups
3. <SNDS> – load, rename, delete and edit/chop sounds
4. <SEQS> – initialize, copy, rename and delete sequences
5. <SONG> – Create a song which is an ordered list of sequences for playback
6. <DISK>– Load, Save, and Create disks

DISK

pyDM404 “disks” are the digital equivalent of the floppy disks used by 90’s drum machines. A Disk has a unique name and stores sounds, pad and global configurations, as well as recorded sequences and songs. All disks are saved in the **DISKS** directory.

Sound

Each individually loaded file in the pyDM404 is called a sound. A sound is loaded from your hard-drive via the <SNDS> mode. Newly loaded sounds are copied to the current active disk or to a temp directory if no disk has been created (default behavior). Sounds can be assigned to a **Bank & Pad** for recording and playback. Sounds can also be edited to create new sounds.

Banks & Pads

Sounds are played by assigning them to a **Bank** and a **Pad**. There are 4 banks (A, B, C, D) which have 8 pads that can be played with the keyboard keys (A, S, D, F, G, H, J, K), allowing assignment of up to 32 sounds (8 pads x 4 pad banks). To play a sound from a pad, assign a sound to the pad using the <PADS> mode and press its keyboard key. Each Pad will record a **Note**, into a **Track** of a **Sequence**. Additionally, a Pad is assigned to a **channel** (aka a choke group).

Channel/Choke group

Channels/choke groups control pad sound playback. Pads assigned to the same channel/choke group cut, or choke, one another off when played. That is, pads assigned to the same channel can not play their assigned sounds at the same time. There are 8 channels available for pad assignment.

Note

A note is the smallest subdivision of a **track** within a **sequence**. **Notes** are recorded in performance mode by playing **Pads**, and a recorded **note** is triggered during play back (that is, a **note** will trigger/play the sound associated with the Pad/track). **Notes** contain pitch information for sound playback, which ranges from -12 semitones to +12 semitones, and a notes pitch is set with the sliders in **TUNE** mode.

Track

In a **sequence**, each **Pad** is associated with a **Track**. **Tracks** are a linear collection of **Notes** in a sequence's timeline. Since Pads uniquely correspond to tracks in a sequence, there are 32 tracks available for recording **notes** in a **sequence** (8 pads x 4 banks).

Sequence

A sequence is collection of **notes** recorded in one or more **tracks**. The notes in a track play back a **Pad** which in turn has a **sound** assigned to it. A sequence contains the recorded performance of **pads** as notes within the **Pads track**. Each sequence has 32 pads/tracks for recording. It is possible to create up to 40 sequences, with each sequence having a maximum length of 8 bars in 4/4 timing.

Song

A song is an ordered list of sequences. This list contains steps, and a sequence is assigned to each step to create a song. When playing a song, the list of steps is used to automatically change the current sequence. The BPM of a song can be set, and whenever that song is selected, the global BPM is changed to match the song BPM. There are 8 songs slots available in the pyDM404, each having up to 250 steps.

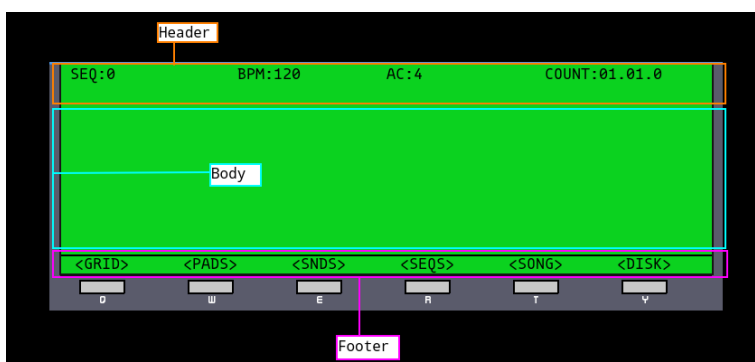
PART 3 – GUI

The GUI is broken into several areas. Almost everything can be clicked or has a shortcut key mapped to the keyboard. In many cases using the keyboard is a better option, especially for playing sounds.



LCD

The LCD is can be broken down into 3 main areas: **Header**, **Body**, and **Footer**.

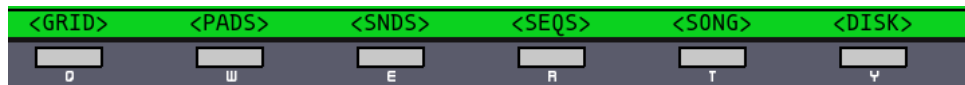


Header: This area display various information depending on the mode.

Body: Shows the grid editor, a waveform, menu options, prompts for typing and confirm operation, or nothing at all.

Footer: Displays menu keys commands.

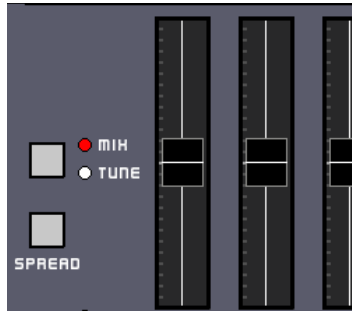
Menu Keys



Menu Keys engage a module or execute the command displayed in the LCD above them. They are clickable or can be used with the keyboard shortcuts.

Sliders

Sliders can be adjusted by clicking on the knobs and dragging with the mouse.



These sliders either set the volume of sound playback or the pitch of recorded notes.

The mode of the sliders can be changed (*MIX* or *TUNE*) with the button to the left of the mode names.

The current setting of the sliders is indicated by the red LED.

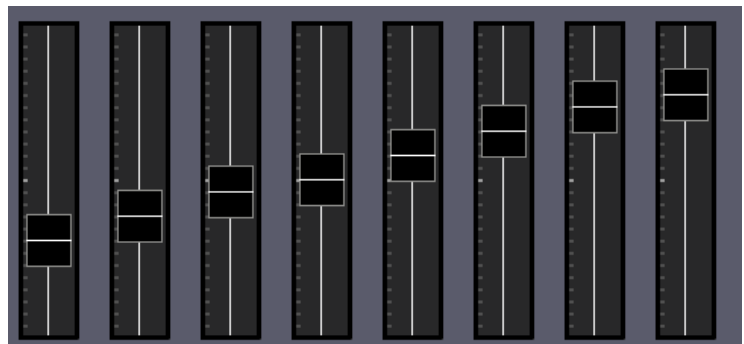
SPREAD

An entire bank of sliders can be “Spread” with the **SPREAD** button.

This ‘spreads’ the slider levels across the pads.

Lower values on the left, increasing as you move to the right.

This works with the sliders in **MIX** or **TUNE**

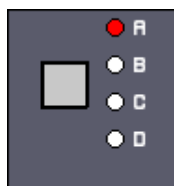


PADS

There are 8 pads in each of the 4 banks. These control sound playback, and can be triggered with the keyboard keys or by clicking the on-screen buttons.



Banks Selector



The bank selector button is located to the left of the pads. Clicking this button (or using the shortcut key TAB) will cycle through the 4 banks (A, B, C, D). The current bank is indicated by the lit red LED. Within each bank, there are 8 Pads which can be assigned sounds.

Main Controls

The main controls are primarily used for interacting with the sequencer, and control what is displayed on the LCD.



LCD: Move hi-lighted elements in the LCD, such as menu items. The small, unlabeled buttons, change 'pages' or move to the beginning or end of a range of selections

SEQ: change the current sequence

BPM: Increase or decrease the BPM. The large buttons change BPM in steps of 0.5, while the small, unlabeled buttons, change the BPM in steps of +/- 10 BPM

AC: Auto-Correct / Quantize Settings

MET: Toggle metronome on and off

VOL: Master volume control. Sets the global playback volume

PLAY: Play the current sequence. Red LED indicates a sequence is playing

REC: Toggle record. When led is lit, notes can be recorded into the sequencer in grid mode, or in real time (adjusted by Auto correct setting) when the sequence is also playing

Keyboard Shortcuts

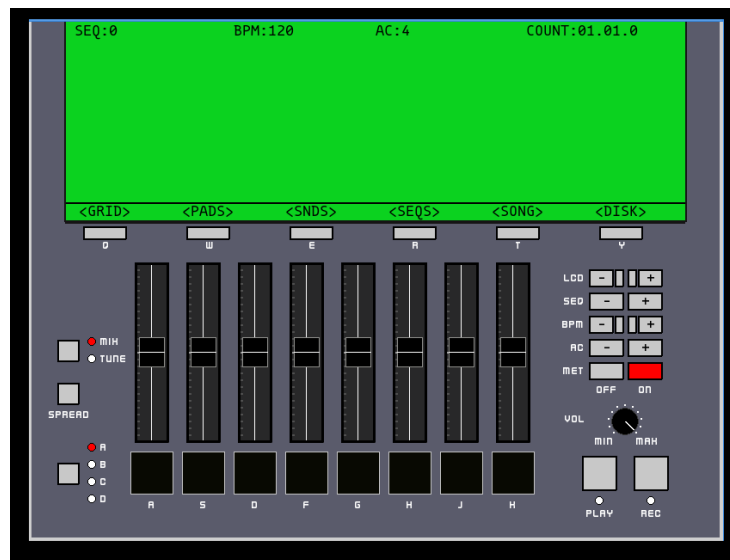
Q, W, E, R, T, Y :	LCD Menu Keys.
A, S, D, F, G, H, J, K :	Play sounds assigned to pads in current bank
TAB:	Toggles between pad banks A, B, C, D
~ :	Changes the mode of the sliders. MIX/TUNE
Main Controls	
Arrow Keys ← ↑ ↓ → :	Control Cursor in LCD menus, or move editor flags
Left/Right bracket [/] :	Change Sequence
- / + :	Change BPM
9 / 0 :	Change Auto Correct (AC) setting
M :	Toggle Metronome on and off
O :	Toggle Record
P or SPACEBAR :	Toggle Play
BACKSPACE :	Delete note key (all notes from a pad or in real time)

PART 4 - Getting Ready to Record

On Load Defaults

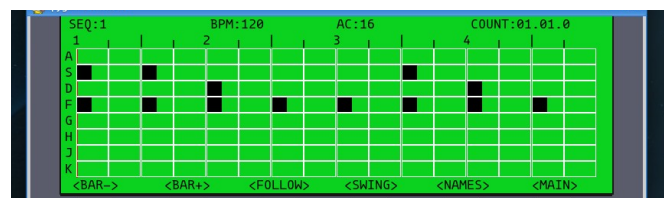
When the program is first started there are several defaults that are set. **SEQ 0** is initialized to 2 bars, **BPM** is set to 120, stock sounds are loaded and preassigned to pads and choke groups, the master volume is set to its maximum value and all the sliders are set to their center values for **MIX** and **TUNE**, with the sliders set to **MIX** mode.

You will be presented with the main performance view. The LCD header shows the current sequence, **BPM**, **AC** setting and **Count** – *Bar.Beat.Pulse*



<MAIN> / <GRID> Mode

The main view is for playback and recording of sequences, provides accesses to other modules via the LCD menu keys, and offers a recording/editing view called **<GRID>**, which can be toggled by clicking the button under the corresponding text in the LCD or by pressing **Q**. The **<GRID>** view is shown in the following screenshot.



The **<GRID>** view provides additional functionality and visualizations to modify sequences by allowing a user to click inside the LCD body to add or remove notes, add swing to the sequence playback via **<SWING>** and several helper functions to facilitate editing a sequence when **<GRID>** is active. Users can toggle **<GRID>** off by clicking the button under **<MAIN>** or by pressing **Y** on the keyboard.

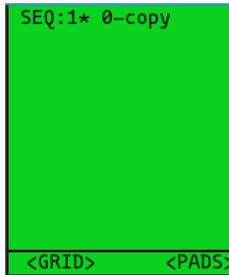
From **<MAIN>/<GRID>** you can change the slider settings, current sequence, BPM, Auto-Correct settings, toggle the metronome, and play/record notes into the tracks of the sequence.

Adjusting the Mix and Tune settings

The sliders levels can only be changed by clicking and dragging. You can adjust the volume of any pad with the sliders in **MIX** mode. This sets the playback volume level of a sound assigned to a pad. In **TUNE** mode, the sliders adjust the pitch of a sound. The pitch will be recorded with a **note**, so once a note is recorded, you can change the slider to another level, and the recorded note will still playback the sound at the notes record pitch.

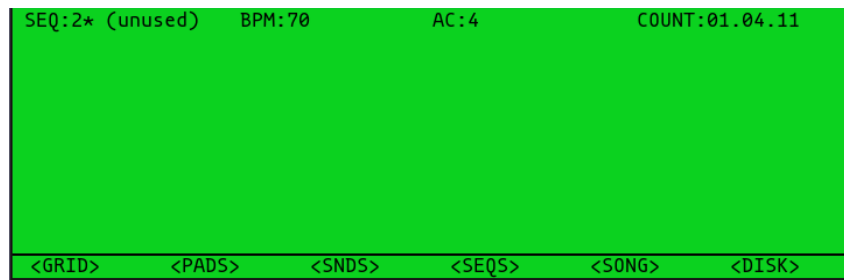
Selecting Sequence

When a sequence is not playing, changing the sequence is immediate.



When a sequence is playing, a * will appear next to the sequence number indicating a queued sequence. Once the currently playing sequence reaches its end, the queued sequence will begin playback and the * will no longer be displayed. If playback is stopped before the queued sequence takes effect, the sequence will not change, but remain on the current sequence.

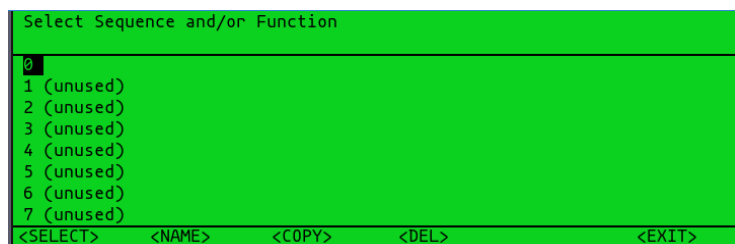
Additionally, the sequencer will not play an uninitialized sequence labeled **(unused)**, and will produce a “Beep Error” if trying to play one. If an **(unused)** sequence is queued, the sequencer will not change to the uninitialized sequence, but stop playback instead.



Initializing, Naming, Deleting, & Copying Sequences

You can initialize, name, copy or delete a sequence from within the **<SEQS>** module. A sequence does not have to be named, though it may be useful to name sequences for use in the **<SONG>** module. Names like “intro”, “bridge”, “verse”, “chorus” etc, can be helpful when creating the steps in a song.

On entering the **<SEQS>** module, you will be presented with a list of sequences. You can navigate this menu with the keyboard arrow keys ← ↑ ↓ →, where up and down move up or down the menu, and left/right move to the next/previous ‘page’. Each page displays 8 items. With 40 sequences, there are 5 pages.



Selecting a sequence labeled **(unused)** will prompt you to initialize the sequence with a length from 1 to 8 bars. You can change the number of bars using the menu keys **<BAR->** and **<BAR+>**. Once you have the length set, you can initialize the sequence by using the **<DO IT>** menu key.

Enter Sequence Length (Max is 8 Bars)
BARS: 2

<BAR-> <BAR+> <DO IT> <EXIT>

If you selected an initialized sequence with **<SELECT>**, you will be returned to the **<MAIN>** performance module view, with the selected sequence set as as the current sequence.

By default, no name is assigned to a sequence when initializing, however, you can name (or rename) an initialized sequence. To name an initialized sequence, selected it in the menu using the arrow keys (it will be hi-lighted), and use the **<NAME>** menu key. You will be prompted to type a name, and confirm or change the typed name.

Enter SEQ Name (Press Return to toggle typing):
intro|

Typing...

Confirm SEQ Name? (Press Return to change):
intro

<EXIT> <CONFIRM>

Select Destination Sequence
Copy To: 1

<SEQ-> <SEQ+> <DO IT>

You can also copy an initialized sequence to another initialized sequence, or to an unused sequence by selecting the menu key **<COPY>**. Use **<SEQ->** and **<SEQ+>** to selection the destination sequence number. Coping to an initialized sequence appends the copy to the end of the sequence.

Select Sequence and/or Function

0 intro
1 0-copy
2 (unused)
3 (unused)

The name of the copied sequence (if copied to an unused sequence) will be the sequence number copied, followed by **“-copy”**

You can delete a sequence by selecting the menu key ****. You will be prompted to confirm the deletion **NOTE: you can not undo a delete!**

Confirm Delete?

<NO> <YES>

0 1 2 3 4 5

SET BPM

The default BPM on load is 120. BPM can be set from 50 to 240, and BPM is a global value effecting all sequences. The current global BPM is saved in the config file of a disk, so that when you load a disk, the last used BPM will be set.

Metronome

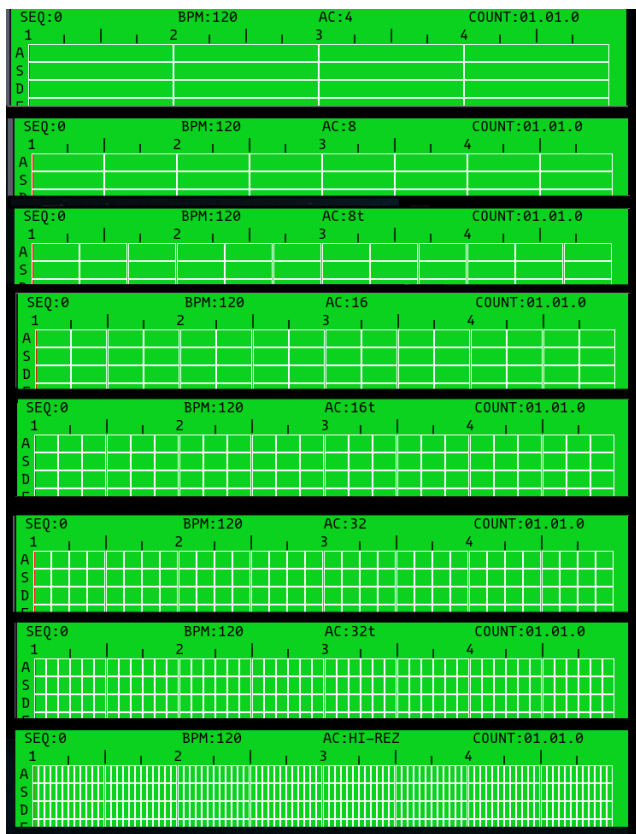
Can Toggle on/off plays with the main controls button. The metronome plays quarter notes, loud for the start of a bar, and soft for each beat within a bar

UNDERSTANDING AUTO CORRECT

Auto-Correct (**AC**), often called “Quantize” in modern DAWS, causes notes to be ‘corrected’ or snapped to the closest beat in a sequence during recording. The AC values are:

- **4** - Correct to closets quarter note
- **8** - Correct to closets eighth note (Default)
- **8t** - Correct to closets eighth note triplet
- **16** - Correct to closets sixteenth note
- **16t** - Correct to closets sixteenth note triplet
- **32** - Correct to closets thirty-second note
- **32t** - Correct to closets thirty-second note triplet
- **HI-REZ** - NO auto correction, notes record into sequence at the highest resolution, 24 Pulses Per Quarter Note

The AC value can be changed from the main controls. In the <**GRID**> view of <**MAIN**>, the AC value changes the size of each box in the grid.



Note about AC and <GRID> view

When editing a sequence in <**GRID**> view, you will only be able to remove notes with a mouse click if the left side of a note perfectly aligns with a vertical white line in the grid.

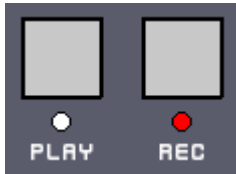
Also, when adding a note with a mouse click, it will ‘snap’ to the left hand side of the clicked ‘box’. In the highest **AC** setting (**HI-REZ**), there is no ‘snapping’, the note will fill the clicked box.

The size of the notes displayed is constant until you set **AC** to **32t** or **HI-REZ**. The note size will shrink so that it fits inside the grid in theses settings. The note will enlarge when you change **AC** to a lower setting. This is for visualization purposes only.

PART 5 - RECORDING AND EDITING A SEQUENCE

Recording a sequence can be done in real time, with or without the grid. After recording a sequence, you can make changes with either real time editing or by using the grid view. Grid view can also be used to record/delete notes in a sequence even when the sequencer is not running.

Real Time Record



Enable Record by clicking the **REC** button on the GUI, or by pressing **O**.

The LED above the **REC** text should now be lit.

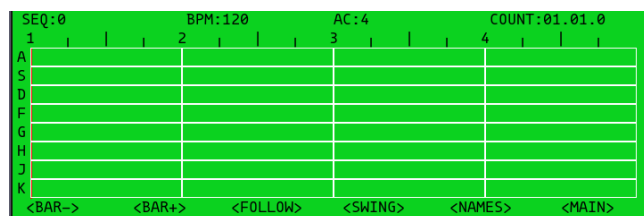
Press **SPACE**, **P** or click the **PLAY** button to begin the sequence. The metronome should be playing and the **COUNT** value in the LCD header should be changing. Play a few pads with the keyboard keys to record some notes and let them playback once the sequence loops to the beginning. If the recorded pattern is too rigid or mechanical sounding, try increasing the AC setting to a higher value.

Delete Notes

To delete a note you can use the **BACKSPACE** keyboard key. If the sequence is not playing, pressing and holding **BACKSPACE**, then pressing a key (**A**, **S**, **D**, **F**, **G**, **H**, **J**, **K**) will remove all corresponding notes from the sequence. If the sequence is playing, holding down **BACKSPACE** will allow you to remove notes in real time. It functions the opposite of recording. i.e. holding down **BACKSPACE** and pressing **D** will not record, but delete a note at that time step.

<GRID> Recording

Hit the grid menu key or press **Q** to activate the **<GRID>** view. Recording and editing real time in this view is the same procedure described above. However, as long as REC is enabled, you can click inside the grid to record or delete a note inside a track of a sequence. The sequencer does not have to be running to do this, so this sort of acts like step edit.

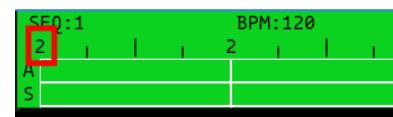


When playing a sequence with grid active, a vertical red line will scroll across the grid showing the current location in the sequence. Also, each bank of pads has a unique color associated, so that at a glance, you can tell which bank is selected.

You'll notice there are also new functions for the menu keys when grid view is active.

<MAIN>: Deactivates the grid view

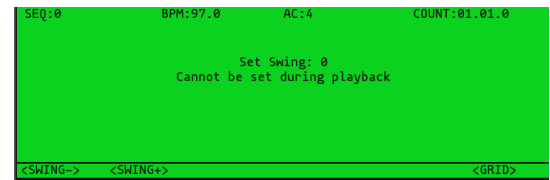
<BAR-> / **<BAR+>**: These change the *visible* bar in sequence. The currently displayed bar is shown in the upper left of the timeline



<FOLLOW>: Toggling **<FOLLOW>** causes the displayed sequence bar to automatically change and follow the current **COUNT**.



<SWING>: This brings up a menu that lets you apply swing to every other 16th note in a sequence. There are 4 swing settings, 0, 1, 2, and 3, that can only be set when the sequencer is stopped using the **<SWING->** / **<SWING+>** menu keys

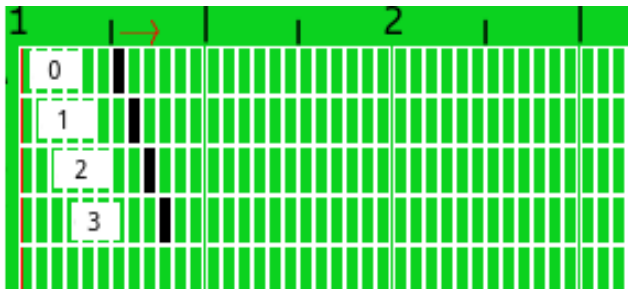


You can start playback while in this sub-menu. The **<GRID>** menu key will return to the grid view. Lets take a moment to explain swing and how it works in the pyDM404.

Understanding Swing

Swing can help add a more human “feel” to the notes recorded into a sequences by ‘shifting’ them forward in time. That is, the notes play slightly later than their recorded position in the track. The swing in the pyDM404 shifts every other 16th note in the entire sequence, across all tracks in the sequence. The amount of shift can be 0 (the default, with no shift), 1, 2 or 3.

With the way swing is implemented, if swing is set to any value other than 0, the 16th notes are ‘copied’ to a later pulse in the sequence for playback. In doing so, if a note already exist at that position, it will be ‘overridden’ and not play. Instead, the swung note(s) will play instead. Lets look at a visualization of this process, using **AC** set to **HI-REZ** and the grid view.



Here you can see the top note is at a swing value of 0, its normal play position. Each note below the top one shows how a given swing value changes a notes play back position by shifting it forward to a later pulse, indicated by the swing value . This process is transparent to the user, and does not change the actual recorded position within the sequence.

If using an **AC** setting higher than **16** (especially **HI-REZ**), you should beware that notes may not actually playback when using swing (see above). This is especially true if there is *NO* note at the actual 16th note in the bar, but there is one at what would be a swing value. The actual note will not play, since any empty value is “copied” into its position.

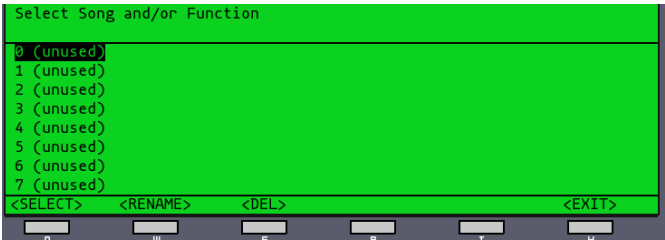
<NAME>:

This is a convenience function that displays the name of sound assigned to a pad inside the grid. Useful to quickly see what is assigned, and helpful when you have chops/slices of a sound.

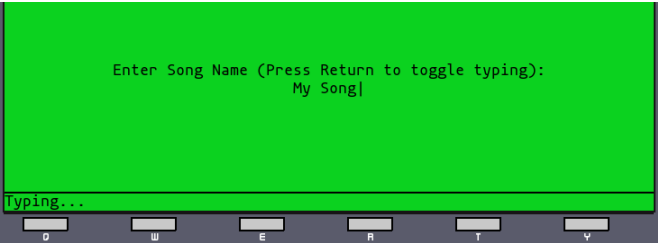
SEQ:0		BPM
1		2
A	Boom-Kic	
S	Kick	
D	Snare	
F	Hat-Clos	
G	Hat-Open	
H	Tom	

PART 6 - Song Mode

Song mode provides 8 nameable “songs” that can be configured to playback sequences in a predefined order. Songs are essentially a list of sequences. To enter song mode, select **<SONG>** from the main mode menu keys. When entering song mode for the first time, you will be presented with the following screen



Notice that all the songs are uninitialized, showing **(unused)** as the song name. To initialize a song, highlight the song number using the arrow keys or LCD GUI buttons. Then press **Q** or click the **<SELECT>** menu key button. You will be prompted to initialize the song with a name as shown below.

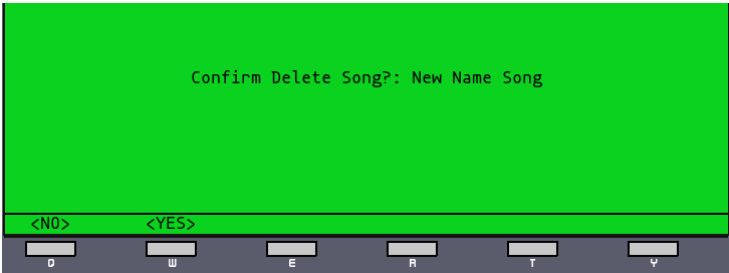


You can optionally rename a song after initializing it by using the Menu option **<RENAME>**.

NOTE: Using **<RENAME>** on an uninitialized song will prompt you to enter the song name and will also initialize it.



or you can delete an existing song using **** menu option. You will be prompted to confirm the deletion



Song Setup

Once a song has been initialized, hi-lite the menu entry and use **<SELECT>**. The following LCD will then be shown.

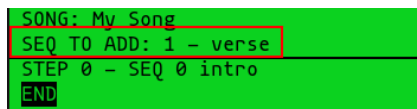


From this screen you can set the song BPM, and insert or remove sequences from the song “list”. When first entering a song, the BPM for the song is set to the current global BPM value. A song can have a BPM that is different than the current global BPM, and once set, whenever the song is selected and

subsequently exited, the global BPM will be set to the song BPM. Use the GUI BPM buttons or keyboard keys to set the song BPM

Editing a Song

The layout is straight forward, with the menu header showing the song name, BPM, length (in bars), and “SEQ TO ADD”.



To the right of “SEQ TO ADD” will be displayed the sequence number and name of the sequence (if assigned). For example **SEQ TO ADD: 1 – verse**, adds sequence 1 to the song list.

To change the sequence to add use the menu options **<SEQ->** and **<SEQ+>**. “SEQ TO ADD” will update to show the currently selected sequence to add to the list. To add the sequence, use the **<INSERT>** menu option with **END** hi-lighted.



By default, the sequence will be added to the end of the list, when **END** is hi-lighted, and the list will update moving **END** further down (it will still be hi-lighted). You can change the sequence to add and repeat the steps outline above to populate the song playback list.



Here is an example of a populated song list. The list shows the STEP # (of the song) followed by the SEQ # and sequence name is applicable



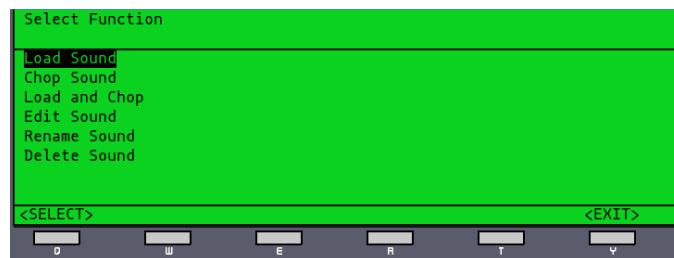
You can also insert a sequence anywhere in the list by hi-lighting the step where you would like to insert the sequence. Deleting a step works in the same manner, hi-lite the step, and use the **** menu option to remove the sequence from the list. The list will update to reflect the changes

To start playback of a song, use **SPACEBAR**, the GUI play button or **P**. The pydm404 will step through the steps and automatically change to the appropriate sequence when in song mode.

PART 7 – Loading and Editing Sounds

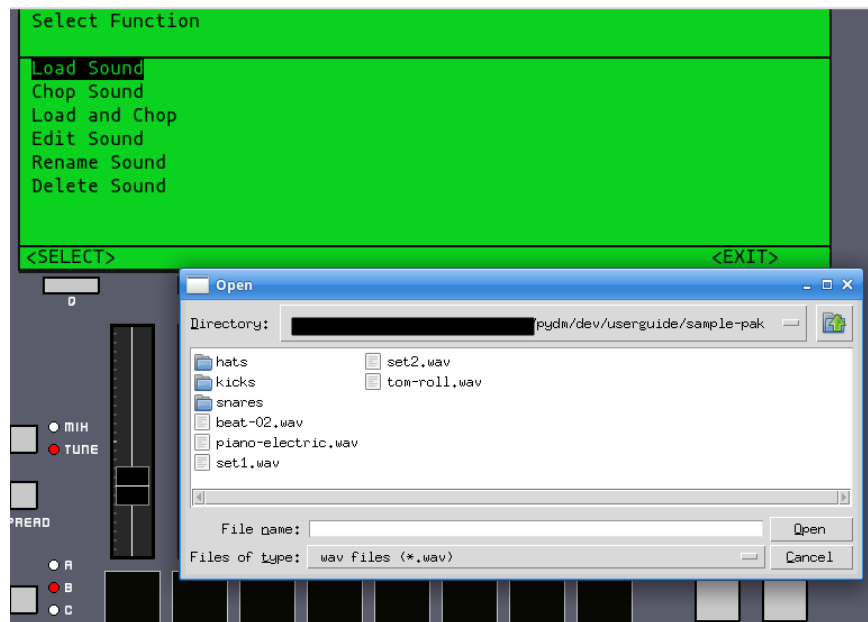
To load additional sounds, and edit sounds in memory, you can use the <SNDS> menu option from the main mode. From here you can:

- Load any **.wav** or **.mp3** file from your hard-drive into the pyDM404.
- Edit the start and/or end of a sound (truncate) and/or
 - Reverse a sound
 - Low-pass filter a sound at a fixed frequency of 250 HZ
- Chop a sound into as many as 8 slices and auto assign to a pad bank
- Rename a sound in memory
- Delete a sound from memory



Load A Sound from Hard-Drive

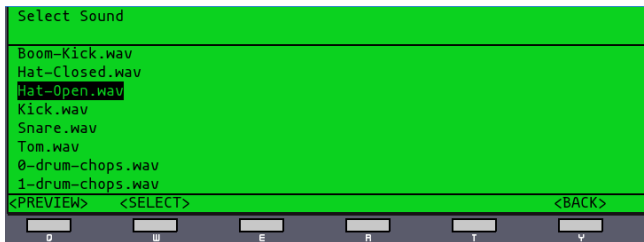
Selecting the “Load Sound” menu option will bring up a file explorer, with the directory set to the pyDM404s current directory. From here you can use the file explore to load a sound from anywhere on your file system into the pyDM. Only .wav and .mp3 files will be shown in the file-explorer. (file-explorer is resize-able)



Once a sound is loaded into memory, you can rename, edit, chop or delete the sound. Additionally you can load a sound directly into the chopper (discussed in following sections)

Select Sound to Edit

When selecting to edit, delete or rename a sound, you will give a menu of currently loaded sounds. If no sounds are in memory (i.e., from loading a new blank disk), the menu will display “No sounds in memory”



Editor

The sound editor will show the start and end of a sound in samples (44100 \approx 1 second) in the header, the number of “**UNDOS**” available, corresponding to one of the actions <**REVERSE**>, <**FILTER**>, or <**TRUNCATE**>. The body will show the left audio channel waveform of the sound being edited.



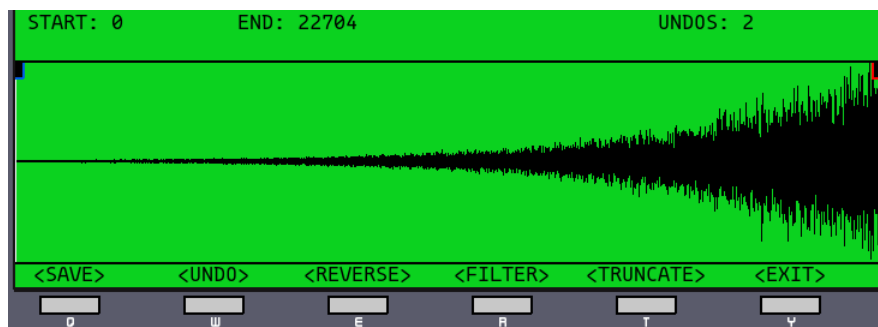
To change the start/end of a sound, select one of the editor “Flags” (it will turn blue) and drag it with your mouse. Or, while a “flag” is selected, use the arrow keys to “fine-tune” the flag position. Areas to be truncated will have be shown with a darkened overlay as shown below. You can use the <**TRUNCATE**> menu option to update the waveform. You can play the current state of the sound using any pad key (A, S, D, F, G, H, J, K).



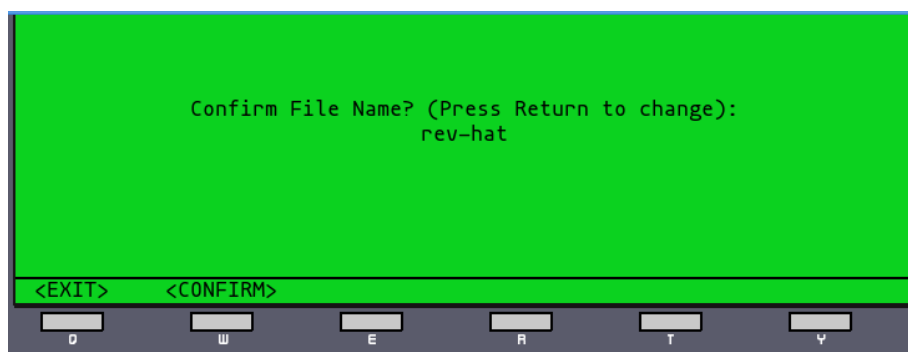
You can also reverse the sound using the <**REVERSE**> menu option. The sound waveform will update to reflect the change.



Below is an example of a hi-hat the has been reversed and truncated. Notice that there are 2 **UNDOS** available. Using the **<UNDO>** menu option, you can revert any changes that have been made during the *current* editing session.



If you are satisfied with the change, select **<SAVE>** from the menu option. You will be prompted to enter a file name for the sound. **NOTE:** editing a sound always creates a **NEW** sound. The original sound remains unchanged. This is why you are prompted to enter a new file name. The new sound will have to be assigned to a pad(s) to utilize it (discussed in the next section of the user guide)

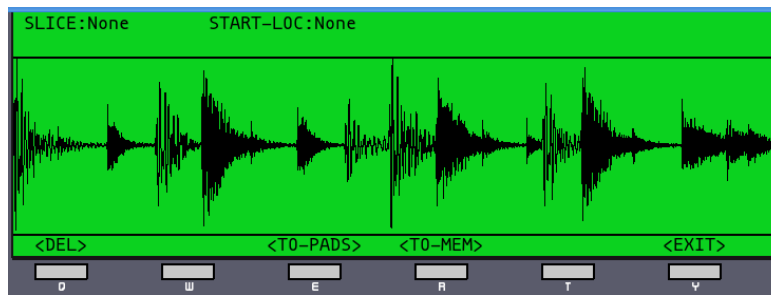


Additionally you can low-pass filter a sound at 250 HZ. This process takes some time to complete, especially for long sounds (more than 1 second). Filtering can also be undone.

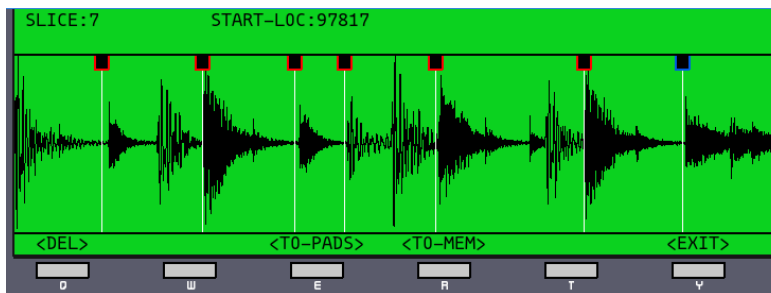
CHOP a Sound

Users can also chop or slice a loaded sound and have the chops/slices be automatically assigned to a bank of pads. The sound to chop can be one already loaded into memory, or you can use “Load and Chop” to load a sound directly into the chop editor for processing. If using “Load and Chop” and the chops are not saved, the sound will not remain in memory.

The header shows the currently selected slice, and its start location (in samples) and the body shows the left channel waveform similar to the editor. Large sounds will take some time to load. It is recommend to chop sound of lengths of less than or equal to 30 seconds. Longer length will take more time to load and the precision of the chopper will be greatly reduced. You can use to chopper to break a long sound into more manageable lengths.



Once the sound is loaded into the chopper, you can add chops/slices by clicking inside the LCD on the waveform where you would like the chop to be place. You change to chop location by selecting the chop flag (will turn blue) and drag with the mouse or use the arrows keys to fine tune. A selected chop/slice can be deleted using the **** menu option. Chops can be played using (**A, S, D, F, G, H, J, K**) where A plays slice 1, and K plays slice 8



There are 2 options for saving chopped sound, **<TO-PADS>** and **<TO-MEM>**.

<TO-PADS>

will allow you to automatically assign the chops to a pad bank. You will be prompted for which bank to assign the chops, after which you will be prompted to enter a file name for the chops. This will override all sounds currently assigned to the selected bank, so make sure the bank is empty if you don't want to reassign.



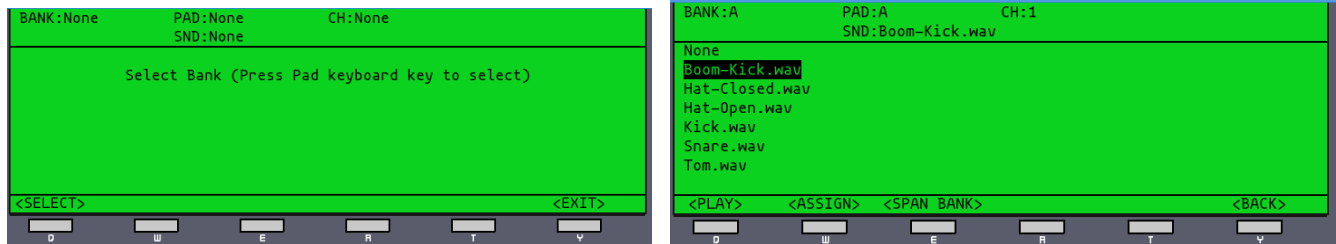
<TO-MEM>

will only prompt for a file name, which will be suffixed with “-1”, “-2”, etc up to the number of chops to distinguish the chops from one another. The chops will be loaded into memory, but *not* assigned to pads

NOTE: If using the default disk, loading, editing or chopping a sound will not cause the sound to be saved if the pyDM404 is shutdown. Create a new disk to save all sounds, edits, sequences and songs.

PART 8 - Assigning PADS

To assign or reassign loaded sounds to pads, use the **<PADS>** menu option from main mode. Use the GUI bank select button or hit TAB to select the bank in which you would like to assign a pad, then press any pad key (**A, S, D, F, G, H, J, K**), then use **<SELECT>** menu option. Once a bank has been selected, you can assign any of the pads with any sound in memory. A list of loaded sounds will be displayed. Upon entering the assignment list, the selected pad sound will be hi-lighted if one is assigned to that pad.



The header shows the current bank, selected pad and assigned sound (if any) and the current Channel/choke group (**CH**). You can optionally preview a hi-lighted sound with the **<PLAY>** menu option.

The way **<PAD>** mode works, is such that it is easy to assign multiple pads in a given bank quickly. This is useful for the assigning the same sound or chops across a bank. While only the first pad selected sound is hi-lighted when entering this list, you can still assign *any* pad in the bank using this menu.

With a pad selected, hi-lite the sound you would like to assign, and select the **<ASSIGN>** menu option. With a pad selected, you can use the number keys (top keyboard row or number pad) to assign the sound to a channel/Choke group, regardless of the hi-lighted sound (sounds are not assigned a channel, only pads)

Note about Choke Groups

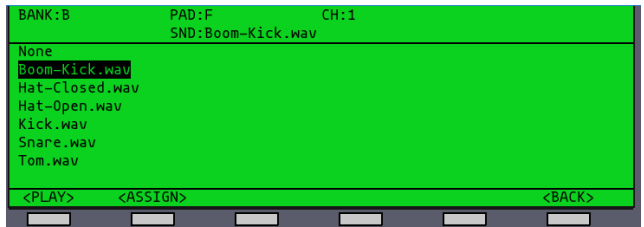
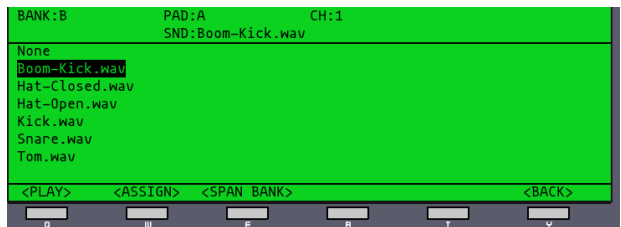
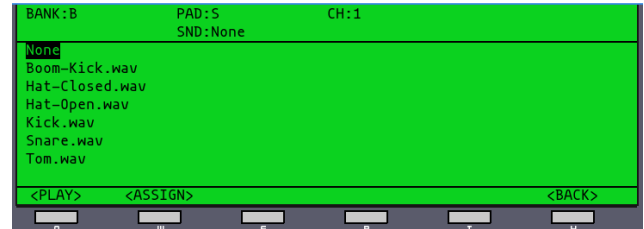
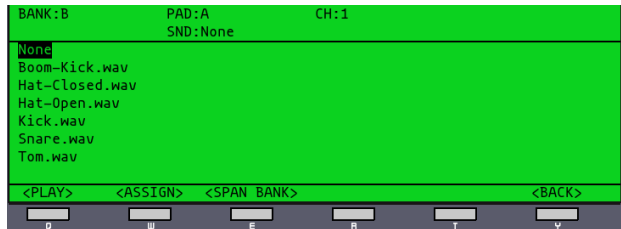
Sounds in the same choke group (that is sounds assigned to the same channel) cannot be played simultaneously. For example, say we have a bass sound assigned to channel 1, and we play it either in a sequence or which a pad key, and we also have a kick drum assigned to channel 1, if the bass sound is currently play and we play the kick drum, the kick drum sound will choke/cutoff the playback of the bass sound to play the kick drum.

Remove Sound assignment

You can remove a pad assignment by hitting the corresponding keyboard key, hi-lighting **None** in the sound options and using **<ASSIGN>**. This will remove a pad assignment. To change the bank, use **<BACK>** menu option, selected the bank with the bank select, hit a keyboard key and use **<SELECT>**

SPAN BANK

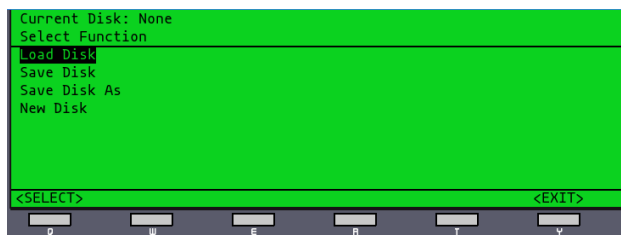
When pad **A** of a bank is selected, you have the additional option ****. This will cause the hi-lighted *sound to be assigned to every pad in the selected bank*. This process overrides any assigned pads. **** is useful when used with the **SPREAD** levels function to quickly get multiple versions of a sound at different pitch or volume levels (useful for adding dynamics to a sequence)



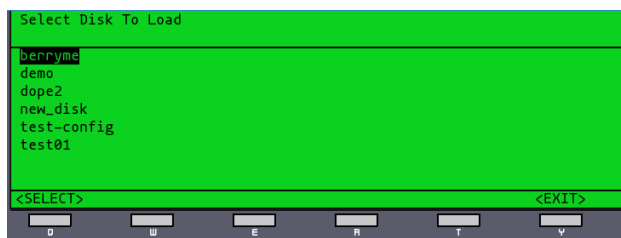
PART 9 - Saving and Loading DISK

On startup, the pyDM404 will load default sounds and initialize the first sequence to 2 bars. There is no disk loaded on startup, so you will need to save the defaults to a disk using “Save As”, or you can load a “New Disk” which will be blank. (i.e., no sounds loaded or initialized sequences)

To access the disk functionality, select the **<DISK>** menu option from the main mode. From here you can load an existing disk, save the currently loaded disk as a new disk, save the current disk or create a new blank disk.



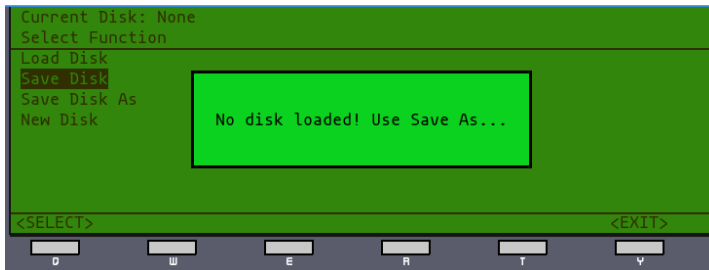
The header area in **<DISK>** mode shows the currently loaded disk (if applicable) and the previously mentioned functions.



To load a saved disk, hi-lite “Load Disk” and use the **<SELECT>** menu option. You will be provided with a list of a disks in the **DISK** directory. Hi-lite the disk you want to load, and use the **<SELECT>** menu option

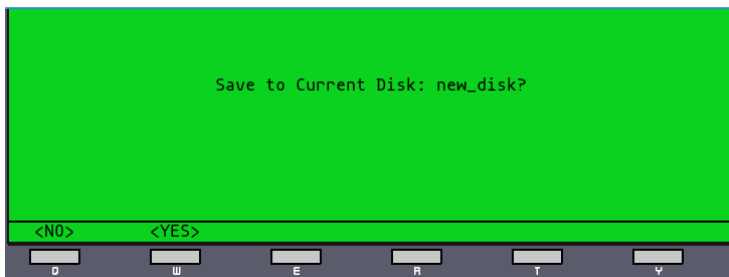


Since loading a disk overwrites all memory, you will be prompted to confirm this operation.



If you try to use the function “*Save Disk*” after startup, you will receive an error message that there is no disk loaded.

To create a disk that contains the default sound, you can simply use “*Save As*” after startup. You will be prompted to enter a name for the new disk which you would like to save. If you do not wish you use any of the default sound you can optionally create a “*New Disk*”, which will be entirely blank.



After setting up a new disk etc, you can save to the current disk at any time using “*Save Disk*”. You will be prompted to confirm this operation, as it will overwrite the target disk.

NOTE: You should always save your work after performing actions such as editing or loading sounds, creating new sequences or songs, as the pyDM memory is “*volatile*”, that is many changes are lost after shutting down the application (or if the application crashes.) Save frequently!

Saving a disk will also save the current global BPM, so on next load, the BPM will be set to the last saved value.

PART 10 - Whats Next?

Recording Songs and Sequences to Disk

There is no built-in functionality to record songs to your hard disk. To create a .wav or .mp3 recording of a song and or sequence, you can use any software that is capable of recording the stereo channel/mix of your computer, For example a DAW, such as Ableton Live, or free cross-platform audio software such as Audacity. Alternatively, you can record the line-out from your computer into an external device such as a tape deck (zomg, so old-skol and lofi!) or a VCR etc.