More Details

OK, so the editor is configured and you've played around a bit and now want to know some more. This document is designed to give you additional detail on what's happening, briefly discuss known limitations, and a partial list of upcoming features.

Let's go back to the beginning. The opening/main screen was designed to present the maximum amount of information without cluttering it up with lots of sliders and buttons and knobs for everything. This is accomplished by hiding the controls behind the data. In addition, I wanted to make it easy to get to the commonly used parameters for Voice and Performance editing.

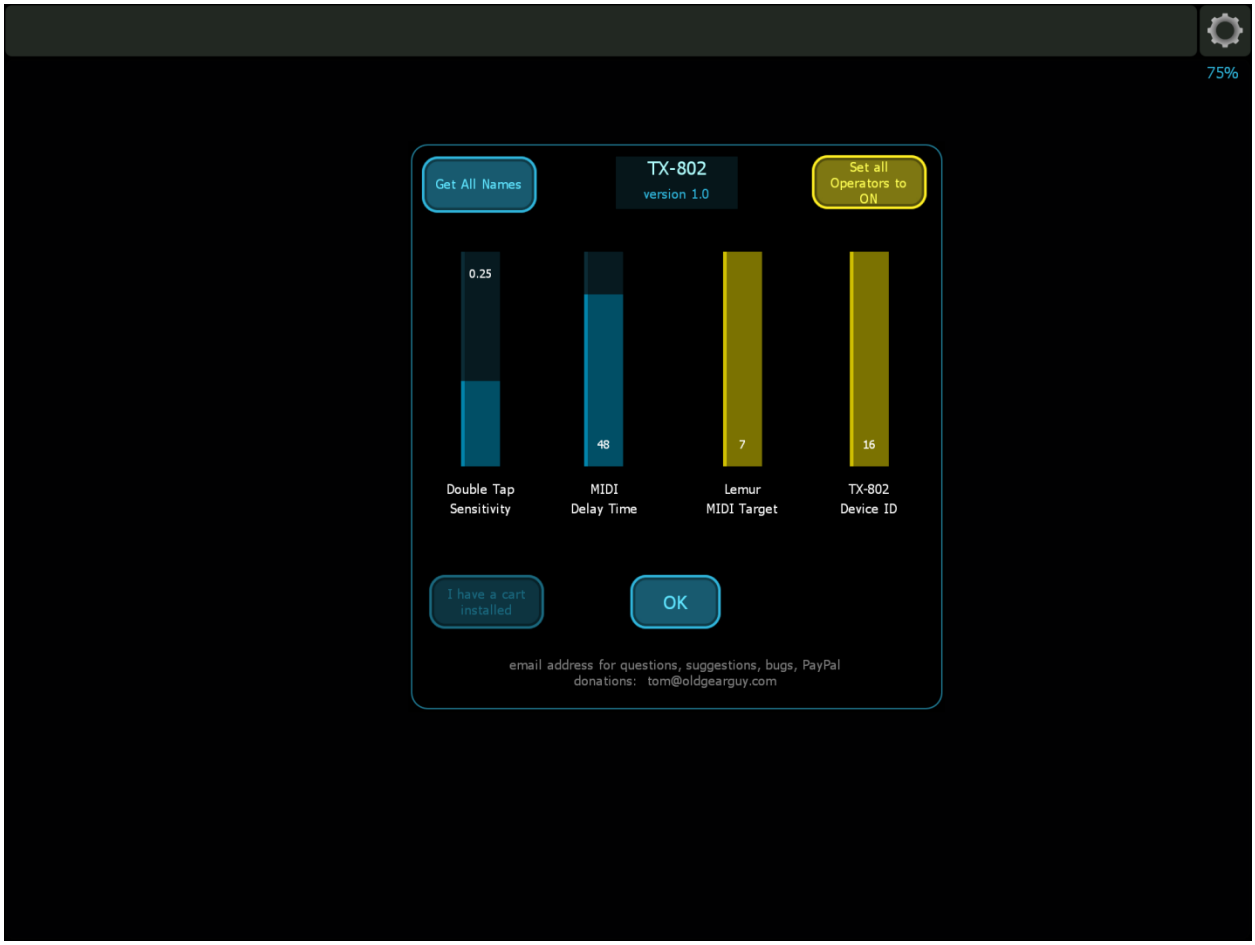
Before diving into the actual TX-802 editing capabilities, there's a couple boring but key things to cover. First, in the upper right area of the screen are three important things – a Play Note bar, a Battery Monitor with hidden Configuration Menu button, and a Lemur Options control.

First is the Play Note bar. Pressing anywhere on that bar will send a single note at maximum velocity to the TX-802 on the MIDI channel of the currently selected Voice. If multiple Voices are set up for Alternate Assignment, repeated presses and releases will move through all of the Alternate Assignments. The bar is not velocity sensitive and it covers 6 octaves centered on middle C. It is not meant to be a precision tool; rather it allows you to get a quick feel of what your changes are doing to a sound.

Next is the Battery Monitor. It reports the approximate percentage of battery life left on the iPad. The Lemur OS rounds this value off to the nearest 5%, so you will see it change by 5 each time. When the percentage drops below 15%, the number starts blinking in red.

Finally, the Lemur Options control is important because that is how your initial changes made in the Configuration menu are saved. If you don't save the state of the TX-802 editor, you'll have to reselect the MIDI target and Sysex ID for the TX-802 each time you start it up. The Lemur menu is also where you go to configure the MIDI target.

The Configuration menu is not something you need to frequently use, so the access is hidden to minimize distractions. Holding your finger on the Battery Percentage will bring up the Configuration menu. It takes a couple seconds to prevent accidental invocation. The Configuration menu is pictured below.



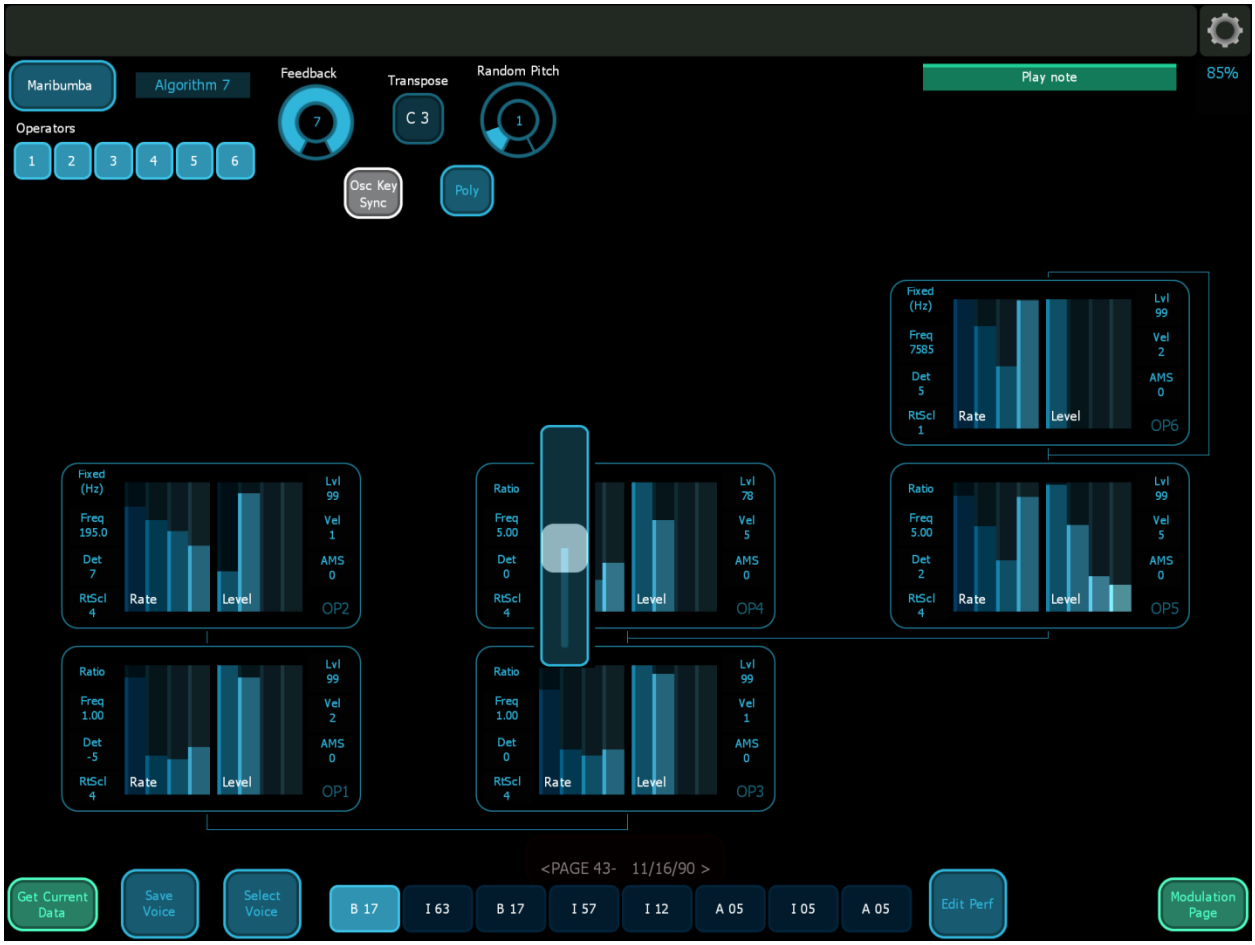
In addition to the Lemur MIDI Target and TX-802 Device ID that you have already used, there are a couple more controls that might be of interest. The 'I have a cart installed' button is used to tell me that you have a properly formatted RAM cart in your TX-802. This option changes where Voices and Performances can be selected and stored. A few TX-802 controls are centered on 0 or 50. These controls have a center line in the middle of the slider and can be reset to 0/50 by double tapping anywhere on the control. The Double tap sensitivity control determines the time between successive taps on a control. The default of 0.25 works well on the iPad 4. If you find the editor not responding well to your double tapping, try adjusting the value higher (allows a slower double tap) or lower (you need to tap more quickly).

The last control is the MIDI Delay Time slider. This controls the time the editor waits between MIDI transmissions when sending a lot of information to the TX-802. Higher numbers translate into longer waits betweens transmission blocks. The reality is that the TX-802 is an older unit and it is possible to overflow its MIDI input buffer. This usually results in a difference in where the editor thinks it is and where the TX-802 thinks it is. As a result, you could accidentally overwrite a parameter or a Voice due to the mismatch. The default value works well for an iPad 4 talking through an Apple Camera Connector kit through an Emu 1x1 USB-MIDI cable. You may need to increase the delay slightly for other configurations.

For details on ways to test decreasing the delay time and for explanations as to what the actual values are controlling for double tap and delay, see the end of the Some Notes section. The 'Get All Names' is currently unimplemented. Try it.

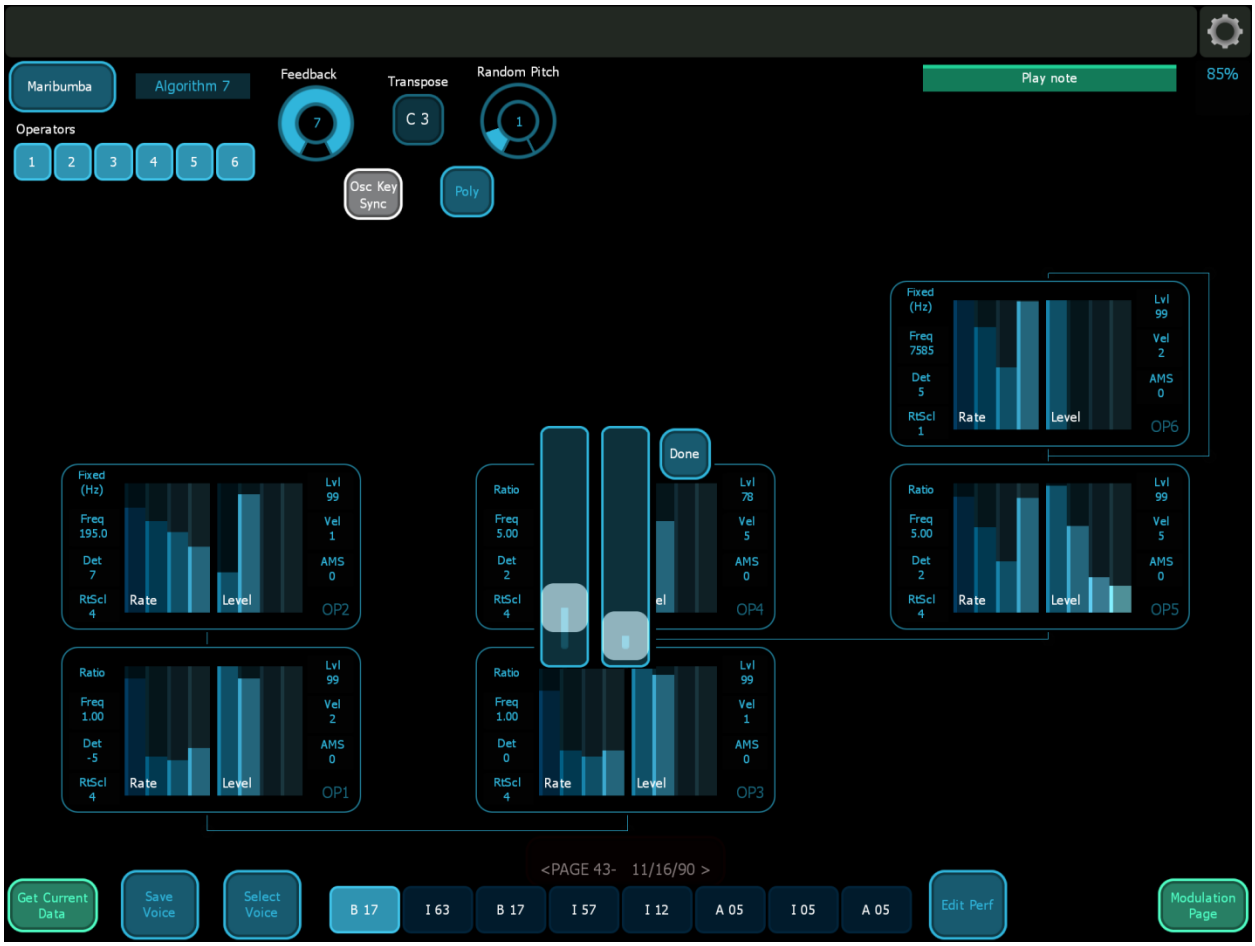
That covers the setup/configuration pieces. Now we can discuss the actual TX-802 editing controls.

There's a basic, consistent idea behind what you see. If there's a value that can be changed, you change it by touching it and the appropriate control will come up. Direct options (buttons, knobs, dedicated sliders) immediately change when touched. For example, in this screenshot, I pressed on OP4's Detune value and the slider appeared next to it.



The operation of the single slider is simple – drag the tab to the value you want (the display updates as you move it) and when you release it the slider goes away. The editor sends the new value down to the TX-802 so you can play and hear the change. Note that the TX-802 does not necessarily update sustaining notes for all parameter changes, so you may have to retrigger the note to hear the effect.

The next screen shows a variation – the Frequency control. Frequency has a coarse and a fine component, so you can adjust both controls separately and then touch 'Done' when satisfied.



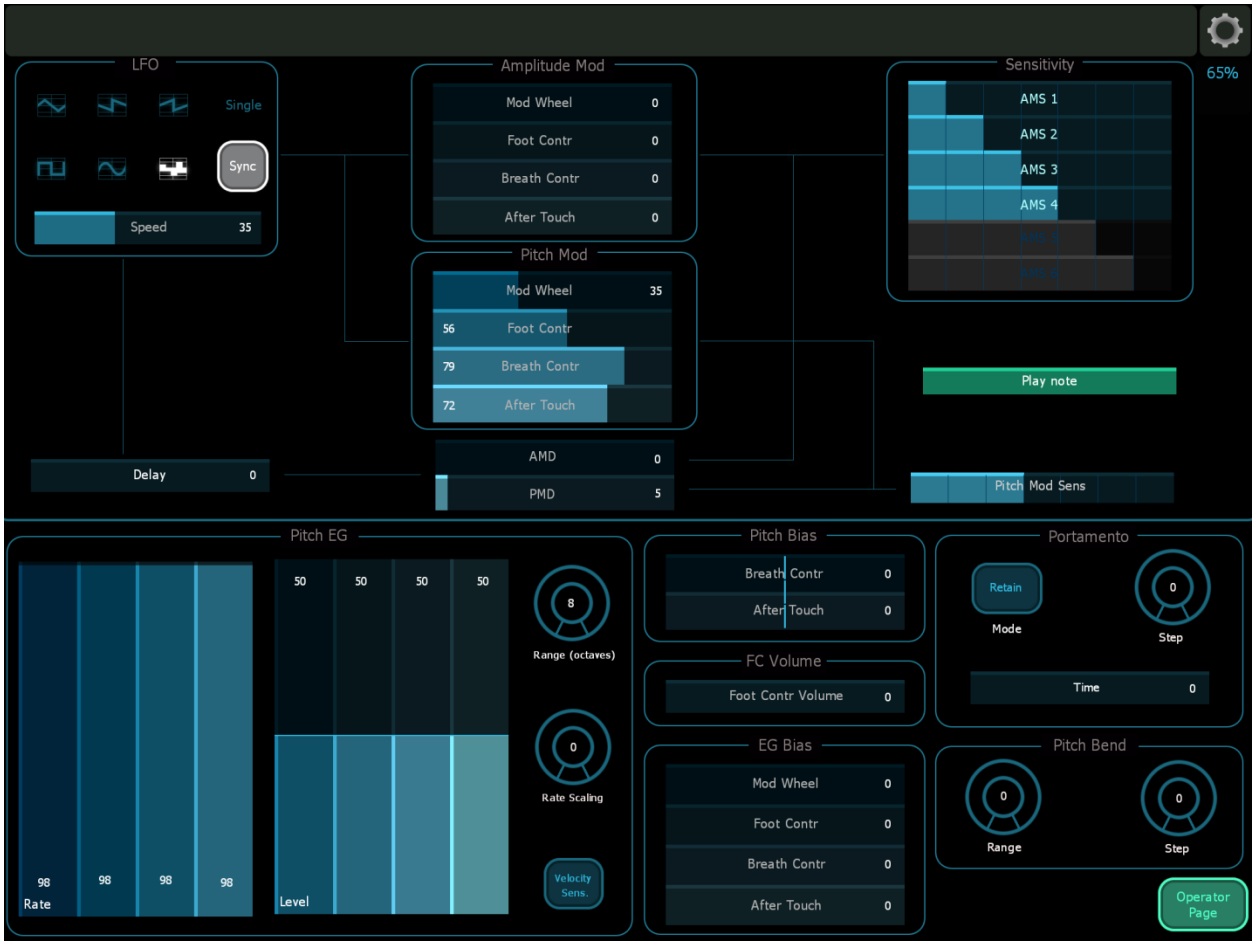
The Fixed/Ratio control is a toggle button. Press it to change from Fixed to Ratio and back again. The Operator label in the lower right corner identifies the operator and also serves to bring up a larger view of that operator to give you finer control over the envelope and to adjust the scaling. This expanded view is pictured below.

Output Level Scaling can be adjusted using the preset curves and breakpoint. I do not plan on implementing Fractional scaling at this time. When you are finished, press the Operator name again to close this display.

The rest of the main display should be fairly clear. Feedback and random pitch amounts are adjusted by touching and dragging on the knobs. Poly/Mono is a toggle and does not change color since each value is equally valid. Transpose brings up a horizontal slider to set the new value. Oscillator Key Sync is an on/off button that is dim when off and bright when on. Similarly, the 6 Operator on/off buttons toggle the state of the operators. Pressing a button will toggle that operator. Off is indicated by a dimmer color for the button and operator. You are still allowed to edit the Operator, but the dim color indicates it is not contributing to the sound. The Algorithm button is actually a drop-down menu to let you select one of the 32 available algorithms. Currently, I cannot display graphical thumbnails of the algorithm, but that may change in a future Lemur release. The drop-down menu is pictured below.

You are able to edit the Voice Name and the Performance Name. To get to the edit screens, touch on the name (Voice is in the upper left and Performance is centered above the 8 Voice slots). The Voice Name edit is pictured below. The Performance Name edit is the same (except it is 20 characters long). Each letter is changed by touching and moving the slider. Across the sliders are convenient reference lines for upper and lower case letters, numbers, and allowed symbols. The lowest and highest slider positions are the space character to make life a bit easier.

Across the bottom of the main screen are a set of additional buttons. The Get Current Data button will always query the TX-802 and pull back the current Performance and Voice data. The button on the far right – Modulation Page, brings up the various modulations available. That screen is shown below.



Most controls are self-explanatory. Sliders with a value embedded in them will automatically move the value to the other side as you change the slider position. This allows you to always see the current value.

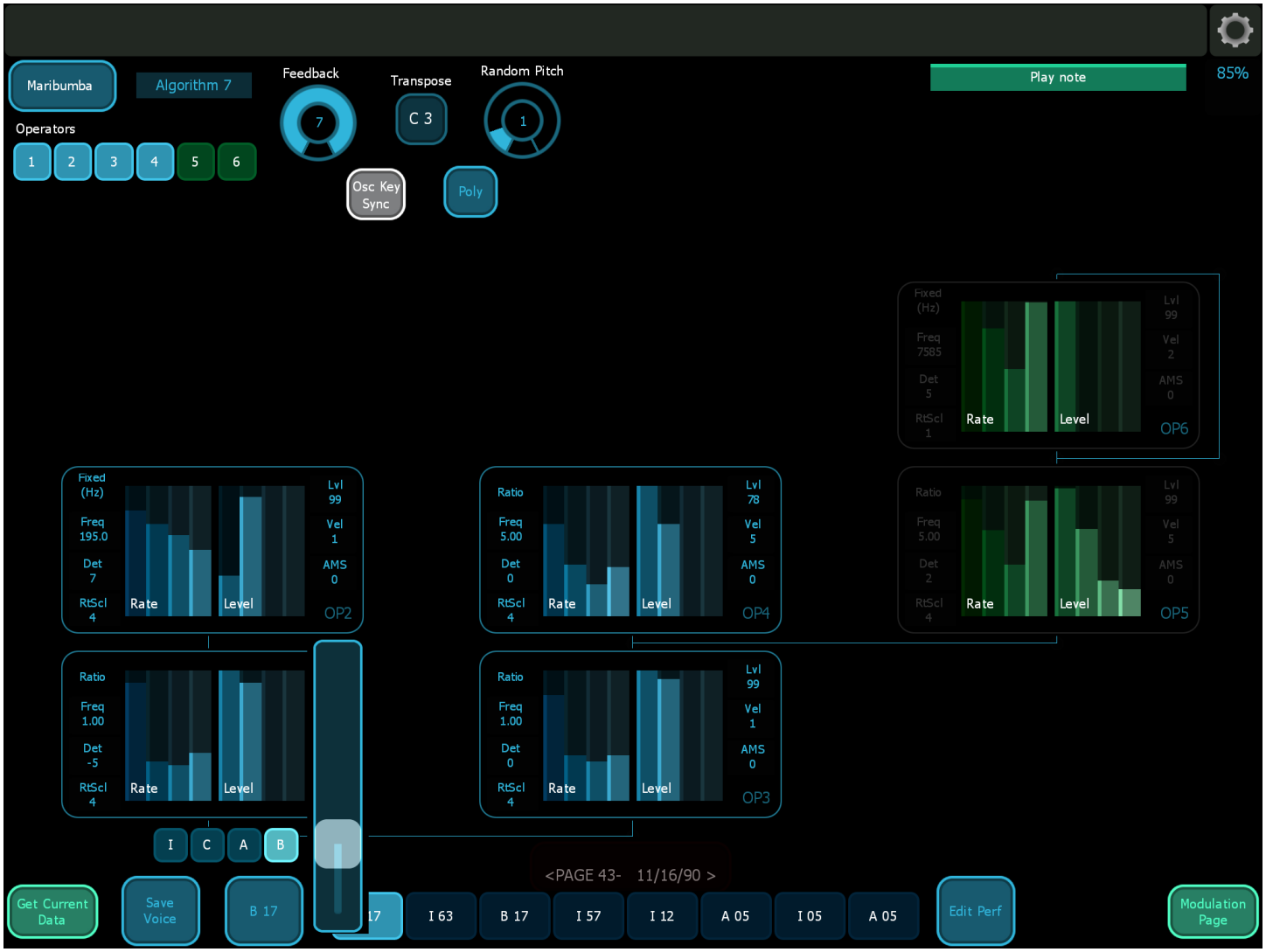
The LFO waveforms are mutually exclusive – only one can be selected at a time. In the Sensitivity section you can see operators 5 and 6 are dimmer than the rest. This indicates they have been turned off on the main screen. Again – you can still edit the dimmed values, but they will not affect the sound.

Note that the Pitch EG Level sliders and the Pitch Bias sliders have a center line. This is the default value and the slider can be quickly set to the default value by double-tapping anywhere on the slider.

The final thing to note is the Pitch Bend controls. They work as described in the TX-802 manual. If you set the Step value greater than 0, the range control is set to 12. I chose to remove it from the screen to make it clear it is not editable. As soon as the Step control is reduced back to 0, Range reappears and is set to its previous value.

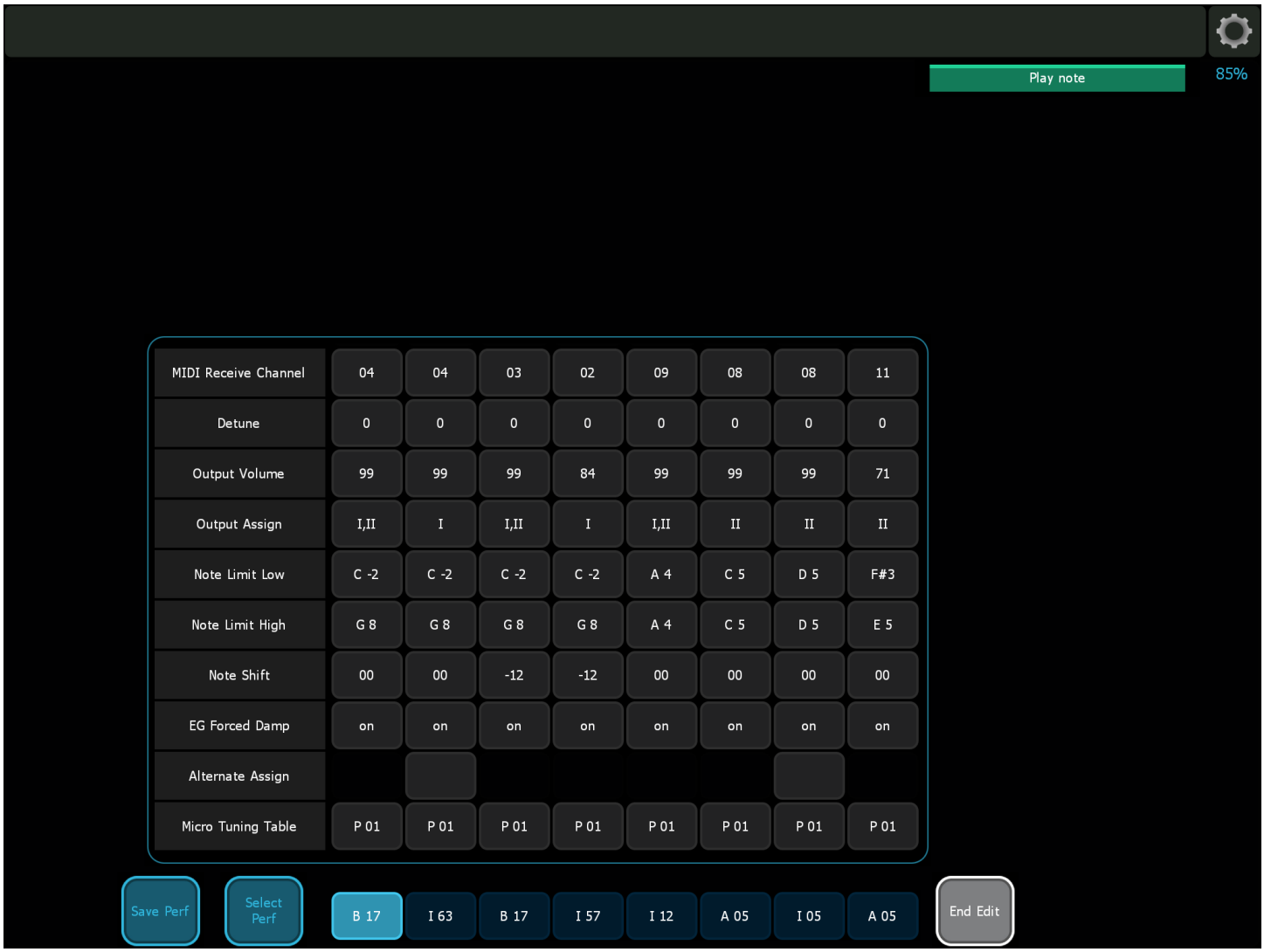
Return to the main screen by touching the Operator Page button.

Back on the main screen, Save Voice and Select Voice operate in a similar manner. Touching the Select Voice button will bring up a slider and 4 buttons. The position of the buttons and slider reflects the current Voice number and the same information is shown in the Select button to the left. By touching the I/C/A/B buttons and moving the slider, you can select a new Voice to edit. Note that once you release the slider, the Voice will be selected, so I recommend using the four bank buttons first. The Save Voice button works the same way with the exception that only Banks I and C are available (you cannot overwrite the Voices in ROM Banks A and B). Select Voice is pictured below.



Eight buttons under the algorithm graphic display the Voices loaded in each of the slots. The same TX-802 conventions are used to indicate Chained Voices (long arrow pointing to the left) and Alternate Assign (short arrow with Voice number). Touching a Voice slot will download and display the current values for the Voice. Be aware that the Voice slots will flash blue during the MIDI transfer and you should wait until it finishes before editing any values.

The final button is the Edit Perf button used to edit the Performance details. The Performance screen is pictured below.



Across the bottom are the Save and Select buttons which work exactly like the Voice Save and Select buttons. On the far right is the End Edit button which takes you back to the main screen. In the center are all the parameters associated with the Performance.

Each value will either bring up a slider or directly toggles through allowed values. If one or more Voices are chained, you will only be allowed to edit the first Voice values. As you can see from above, the Alternate Assign option is only present when adjacent Voices share a common MIDI channel. Changing the MIDI channel will show/hide Alternate Assign buttons as appropriate.

A final note on this screen – move between Voices by touching the buttons in the Performance section. You can move by touching the Voice slot buttons across the bottom, but that will also cause a MIDI transfer of that selected slot and you will have to wait for that to complete before continuing to edit the Performance. It doesn't hurt anything, but it does add unnecessary delays to your Performance editing session.

Some notes

The TX-802 is an older MIDI unit and as such offers limited opportunities for querying and mutual understanding of state. Currently, there is no easy way to determine if there is a properly formatted cartridge in the slot. That is why there is a user-selectable button in the Configuration menu. There is also no way to get back error messages or other status from the TX-802, so the editor is mostly operating blind. There is at least one bug in the MIDI implementation of the TX-802 and it exists in all firmware revisions. Using MIDI, you cannot move the current Voice cursor past chained locations (long arrow in the Voice name). In addition, there is no option to send a MIDI command that is the equivalent of 'Hold Enter and press a cursor key'.

I do some tricks to try and determine if the MIDI connection is available, but even then you may see the "Warning – No MIDI connection" dialog even after correctly setting the Lemur MIDI Target and TX-802 sysex device ID. If that happens, try pressing the 'Get Current Data' button again to see if the connection is in fact correct. I have spent considerable time and will continue to spend time trying to make the communication as robust and hands-off as possible. The current implementation is stable, but it can always be made better.

The Lemur platform does not currently support MIDI system exclusive messages larger than 256 bytes (yes, you read that right). As a consequence, the TX-802 editor cannot simply pull back all the Voices and Performances in the TX-802 at once. The editor needs to be selective and retrieve data only when needed while still updating both the TX-802 and the Lemur screen as a user edits a Voice/Performance. The consequence is that it is possible to get out of sync. If you feel the editor and TX-802 are out of sync, the best course of action is to use the Get Current Data button to pull back everything in the TX-802 edit buffer. If you still don't like what you see, the next action should be to go to the TX-802, press the Select Performance button, then press the +1 button and then the -1 button to reload the current Performance from the last saved state. Go back to the editor and get the current data again. At that point, everything should be back in sync.

A secondary consequence is that you can currently only select Voices and Performances by bank and number. Additionally, I have no idea what the current Performance number is when the editor starts up. I can in fact get names, but that would involve pulling back every Voice and Performance one at a time and storing the name. If you feel strongly about seeing the names, it would involve an additional step after configuring the connection. You would have to wait while the editor queried the TX-802 for all that data. Once it was retrieved and (hopefully) stored (see below for more details about storing the state of the system on an iPad), it could be maintained in memory, so subsequent displays and accesses by name would be quick. However, that initial retrieval could take a few minutes. Initial tests are showing that it takes about a minute and a half per bank of 64, so 4 Voice banks and 2 Performance banks would be about 9 minutes of sitting and waiting. If I hardcode the ROM Voice names, that would save 3 minutes. That's why the 'Get Voice Names' button in the Configuration menu is currently unimplemented.

Along those lines, the current Select Voice/Performance functionality requires you to select a bank (I/C/A/B or I/C), then scroll through the numbers in the bank and automatically selects that number when you release the control. I did this for a couple reasons – one was to maintain user interface consistency, and two, to minimize the number of extra buttons you see and have to press. If the option to select a bank, scroll through the list, maybe jump to another bank and scroll through that list before selecting a Voice/Performance is desired, give me that feedback and I can make the Select work similarly to the coarse/fine frequency control with the extra 'Done' button. It would also prevent you from selecting the wrong Voice if your finger tends to drift while releasing a slider control. It may be more of an issue if/when I store and display names. I did some testing with a Done button and personally didn't like it, but that's just me and I'm open to input from other users.

Currently, the Save Voice and Save Performance buttons do not prompt for confirmation. Presenting dialogs and interacting with the user in that way is not one of Lemur's strong points, so I made the decision to answer 'Yes' for you when the TX-802 asks if you are sure. If you feel strongly about that choice let me know and I'll look into adding a user-selectable "Prompt me during Save" option.

I added the PlayNote bar purely as a convenience for myself so I could quickly audition changes I was making without having to hook up a keyboard and MIDI merger. I felt that a full set of 2 or 3 octaves of keys on screen was too cluttered and too distracting to use. The focus of the editor is to edit. On screen keyboards for Lemur are available, but to get the full nuance of playing a patch, you'll probably want a larger keyboard with pitch bend, mod wheel, aftertouch, etc. However, the TX-802 actually does allow you to hear a number of parameter changes while holding a note. I am debating whether allowing you to tap once to select and hold the note and then tapping again to release it is worthwhile. It's kind of awkward holding the note with one finger while trying to edit values with the other hand.

Saving the state of the editor is currently an issue to some extent. Since Lemur (and generally any iOS app) does not expose a file system, there's no traditional notion of saving a configuration file. In theory, if you save the editor using the Lemur control in the upper right corner, the entire state will be preserved. In practice, that doesn't seem to be the case. Either due to internal design decisions or outstanding bugs, a variable and its value may or may not be saved depending on how and where it was declared, initialized, and changed. In addition, I have found that during testing, Lemur will drop the MIDI connection to the TX-802 if the iPad is doing a lot of other network activity and the MIDI connection is idle for a period of time. The editor relies on a successful (and complete) save to maintain things like the sysex ID, MIDI Target, and the Operator on/off status for every Voice. As the platform continues to mature, this aspect should improve. You should only need to visit the editor's Configuration menu once, save those choices, and after that your settings should be saved and recalled automatically. Realistically, you may have to go back into the Configuration screen and reselect the various options.

The MIDI Delay Time setting is actually adjusting the BPM of an internal clock. Lemur provides a few internal controls to manage time. One is simply a time counter that reports the number of seconds and milliseconds the Lemur has been running. This value is reset every hour and is good if you need to check elapsed time between two events (like a double tap). It is not good to use for general delays (you can email me and I'll explain what I know about Lemur frames, triggering scripts, and how scripts are processed). The second control is an internal BPM clock. In fact, there are 8 available and they can be started, stopped, and used to trigger execution of scripts. I use BPM clocks to manage the transmission delays when talking to the TX-802. The Delay Time setting is actually changing one of the clock's BPM settings between 100 and 160 BPM. So, a delay setting of 0 will equal 160 BPM and a setting of 60 equals 100 BPM. The default setting of 40 is a BPM of 120 which seems to provide a stable communication path without being unduly slow (for my configuration). Slower is never a problem – the TX-802 doesn't time out. Faster transmission can result in multiple problems ranging from the wrong data to a missed command to overflowing the TX-802 MIDI buffer. The end result is the editor and the TX-802 are out of sync and subsequent edits are probably doing the wrong thing.

If you want to try decreasing the delay time, I suggest the following approach:

Drop the delay time by 5, press the Get Current Data button and compare what the editor shows for the Performance versus what you see on the TX-802 screen. Verify the Voices are correct for each position. If that works, drop the time more and try again. At some point the two will get out of sync.

Once you have that lowest good time, try selecting a Voice this way – start on a Voice in the Performance that is an Internal (I xx) Voice. Then jump to a B Voice and select something in the higher end (B 58 or so). Verify that the Performance slot is updated correctly on the TX-802 and the editor.

Finally, make a trivial change to the Voice (Level change from 99 to 98 or something similar) and then save it back. Verify that it saved correctly to the correct location.

Future Plans/Known bugs

- Position current Voice cursor properly after loading a new Performance
- Pulling back and displaying Voice and Performance names
- Changing the Voice display to show lower case letters for edited voices
- Copy and Paste of Operators, envelopes, other values
- Group edit (for example - change attack time of all envelopes at once)
- Allow selecting a new Voice for a chained location
- Save All Edits option
- Move algorithms around on the screen to better center some of them
- Sometimes button titles don’t get put back or patch # not displayed (save/select voice/perf)