

# E520 Release V1.3

07-30-2023

This is a summary of all the changes incorporated into the V1.3 release of firmware for the Synthesis Technology E520 Hyperion processor. Thanks to all the customers and testers who submitted bug reports, feature requests and algorithm suggestions.

## Installation

This update includes major changes to the on board patch storage so it will erase and reset the EEPROM. In order to avoid losing any valued patches you may have created you will need to back up and restore your system settings manually. Please follow these steps to install the firmware update:

1. Copy the firmware file "e520\_fm.w.bin" onto a FAT32 formatted SD card of 32GB or less.
2. Turn on the E520 and insert the SD card into your E520's Micro SD card slot.
3. Navigate to the TOP → FILE → SYS SAVE menu page and save your current settings.
4. While holding in the encoder button, cycle power on the E520. When you see the blue bootloader screen. If your firmware file was properly copied to the SD card then you will be given the choice to install it.
5. Select "Yes" to begin installation. This will take some time but you will see progress information.
6. After flashing completes push the encoder button to restart the system. There may be a wait of up to a minute with a black screen while the E520 resets its EEPROM, but it should eventually start up normally with a splash screen that then proceeds to the main screen.
7. Navigate to the TOP → FILE → SYS LOAD menu page and select the file you saved in step 2 above. Answer "Y" to confirm you want to load the saved settings.
8. The E520 will provide a progress bar and status text telling you that it's converting. When it finishes you can navigate back to the Main menu and use it normally.

## New Algorithms

- **Sampler.** This is a basic sample recorder / player with variable sample rate, variable start/loop/end positions and a number of filtering and distortion options. Samples can be loaded & saved via SD card.

- Reflexions. This is a highly controllable reverb with variable early reflections, decay rate, room size and modulation. There are controls for diffusion, signal routing, lowpass and highpass filters and Tap/Sync enables infinite mode.
- Seqwah. This is a 3-channel synced delay with 4-pole multimode filters on each channel that are driven by sequence patterns.
- Spectral Sweep. A spectral effect with bandpass or notch filters sweeping across the audio spectrum. Inspired by the Michael Norris “Gliding Filters” plugin.

## New Features

- Added more ratios to pitch quantize selectors on most algos with pitch
- L&R Mix combined on Lchl pot, Rchl disabled option on main prefs (3rd option on CV Patch item).
- Add one-shot LFOs triggered by Sync.
- Phase offset for LFO waves.
- Patch names and CV lock state persists across power cycles.
- L/R Input envelope followers available as waves on LFOs.
- New Prefs item to select Software (default) or Hardware Bypass (reduced latency but more noticeable changeover).

## Algorithm changes

- Add large display modes to Spectroscope
- Add P2 pitch quantize ratio option to Mini-Delay, Resample Delay, and Multitap Delay.
- L/R alternate bins option for Vocoder on button 3
- 1V/Oct mode for Granular Pitch Shifter, Spectral Pitch + Delay, Spectral Crusher, Spectral Drones (l and s), Spectral Time Machine, Resampling Relays (Stereo & Mini), Looper, Multitap, Resampling Reverb.
- P2 Lag option for resample rate on Mini-Delay, Resampling Delay, Resampling Reverb, and Looper.
- P2 Lag for pitch on Resonators algo.
- P2 Tap Tempo option with BPM readout for Prime Delay algo.
- Add Midiverb II programs 40-49 (Reverse reverbs + Bloom) to Resampled Reverb algo.
- Add “Eigenverb” program to Resampled Reverb – a highly controllable bloom reverb with controllable attack, decay, filtering and modulation.

- Looper algorithm now disables BYPASS mode on entry.

## Bug Fixes

- Fixed LFO wave name overflow on main LFO pg.
- Fixed resample ratio quantization for Maj3rd
- Fix rounding bug in pitch quantization
- Fix overflow bug in global input high-pass filter.
- Fix overflow bug in Resampled Reverb Midiverb emulator.
- Fix lower range of pitch quantization in some algorithms.
- Fix quantization wrap in Time Machine.
- Fix clicks in Sampler bitcrush filtering.
- Fix dry delay phasing and possible initialization error in Dirt.
- Fix waveform inversion in Scope.
- Fix various UI bugs in Sampler, Time Machine and Resampled Reverb.
- Update Docs with Feedback info.