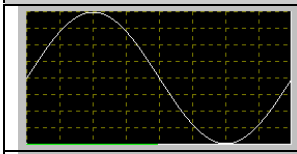
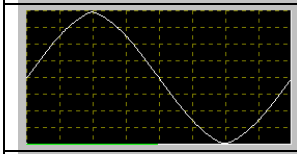
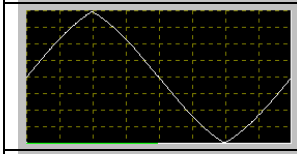
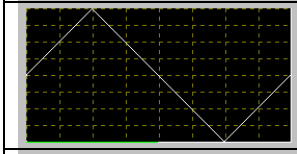
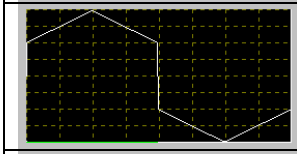
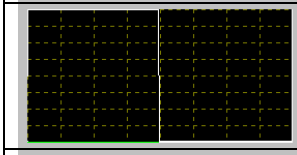
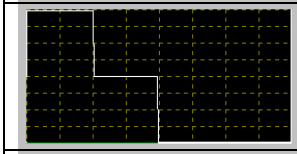
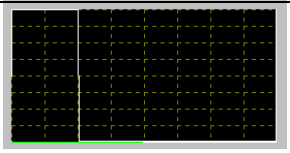
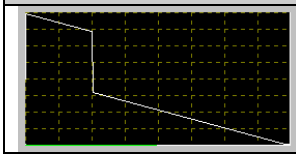
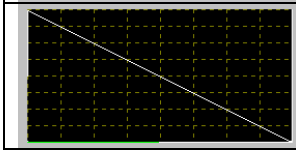
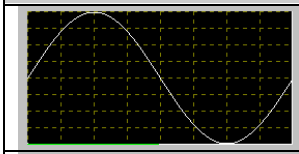
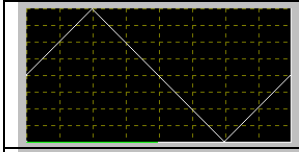
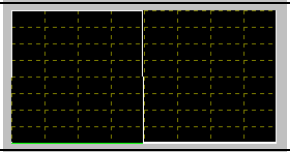
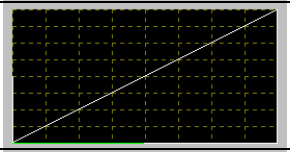
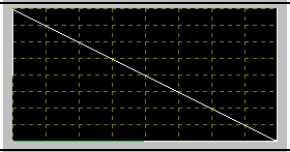
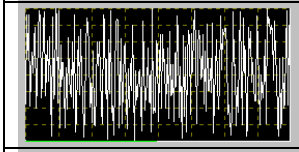
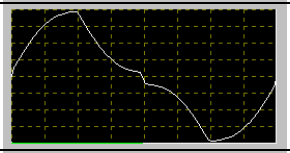
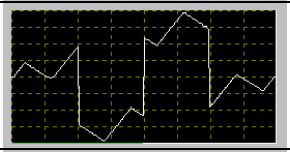
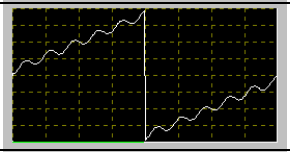
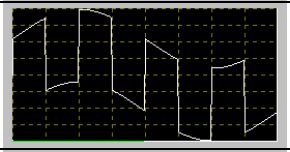
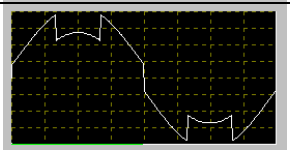
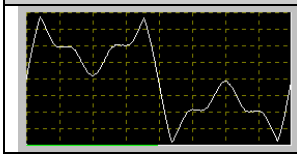
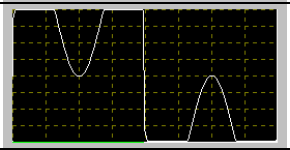
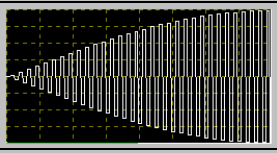
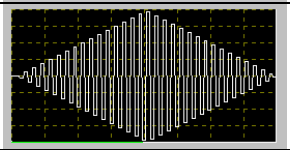
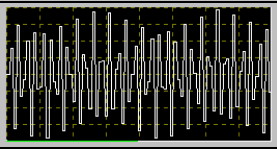
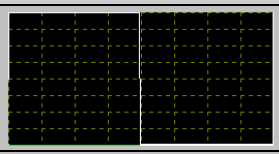
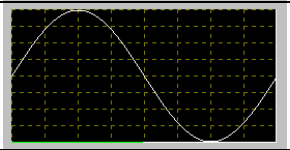
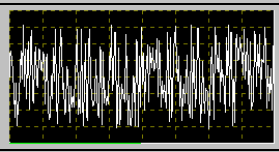
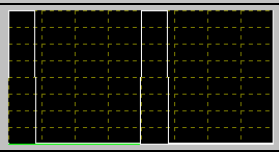
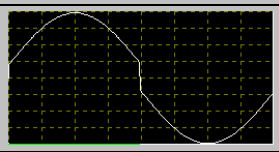
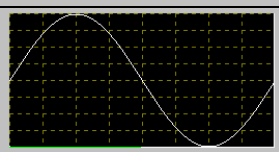
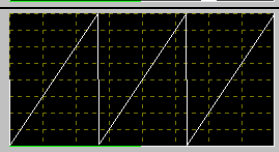
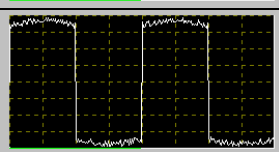
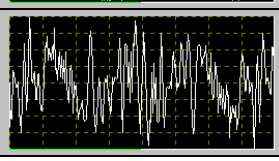
Frac-Rac Waveform Display and Listing:

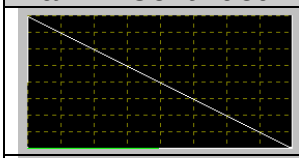
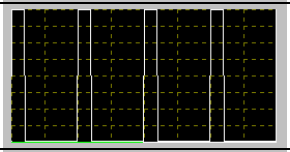
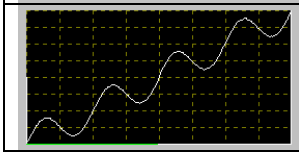
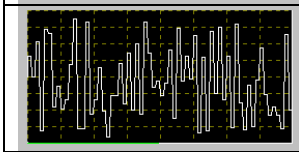
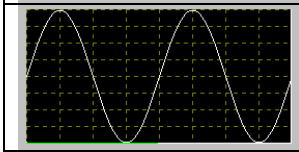
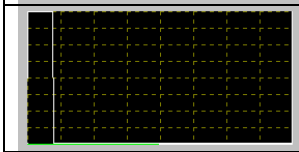
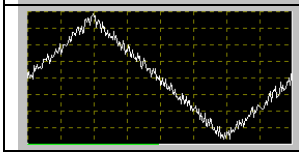
Bank 0	This bank does a coarse morph (a morph with few transitional steps) through a number of primary waveforms. It is useful as both a static waveform source as well as a modulated bank. Scanning the waveform bank provides an increase in harmonic content as you select higher numbered waveforms.
	Waveform 0: A single-cycle sine wave.
	Waveform 1: First intermediate morph to a triangle wave.
	Waveform 2: Second intermediate morph to a triangle.
	Waveform 3: Fully morphed to a triangle.
	Waveforms 4-6: Three intermediate morphs to Waveform 7. (Example shown is Waveform 5)
	Waveform 7: Fully morphed to a single-cycle square wave.
	Waveforms 8-10: Three intermediate morphs to Waveform 11. (Example shown is Waveform 9)
	Waveform 11: Fully morphed to a 25% pulse wave.

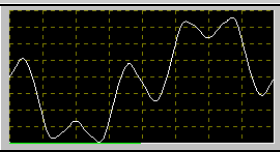
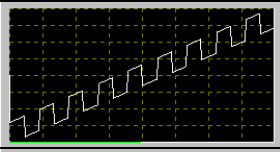
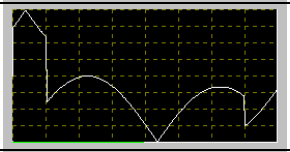
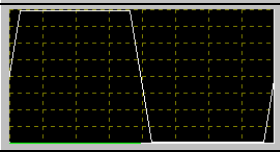
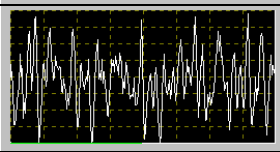
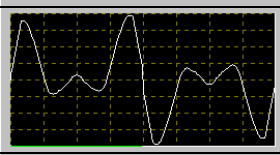
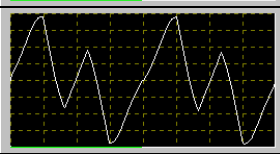
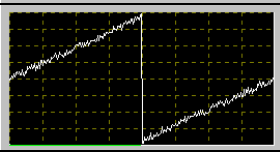
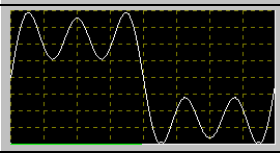
Bank 0 Continued	
	Waveforms 12-14: Three intermediate morphs to Waveform 15. (Example shown is Waveform 13)
	Waveform 15: Fully morphed to a single-cycle descending sawtooth.

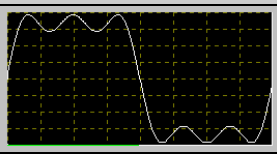
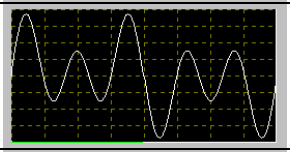
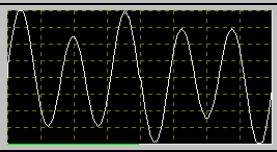
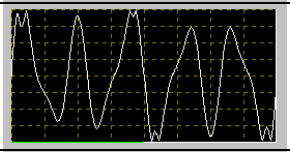
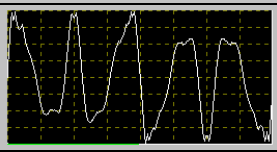
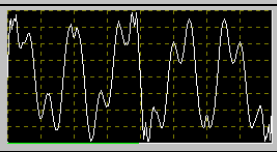
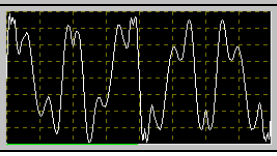
Bank 1	A variety of standard, and some not-so-standard waveforms created by Darwin Grosse.
	Waveform 0: A single-cycle sine wave.
	Waveform 1: A single-cycle triangle wave.
	Waveform 2: A single-cycle square wave.
	Waveform 3: A single-cycle ascending sawtooth wave.
	Waveform 4: A single-cycle descending sawtooth wave.
	Waveform 5: A noisy pseudo-random wave.
	Waveform 6: Darwin's SharkFin wave.
	Waveform 7: Darwin's GrandTeton wave.
	Waveform 8: Darwin's RippleZip wave.
	Waveform 9: Darwin's SkyScraper wave.
	Waveform 10: Darwin's Batman wave.

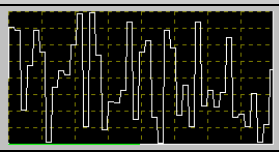
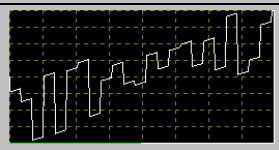
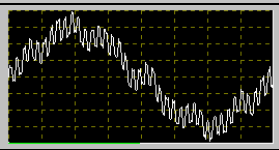
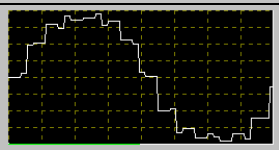
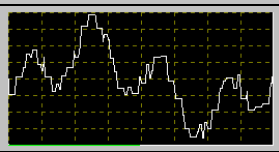
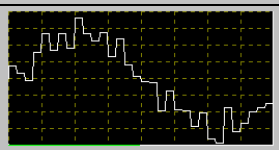
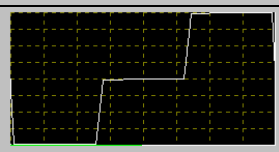
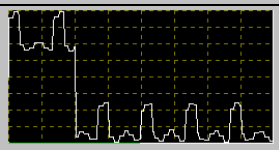
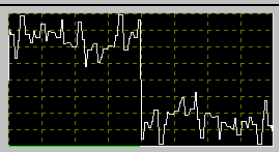
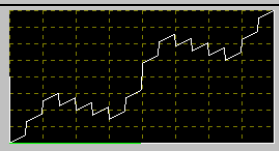
Bank 1 continued	
	Waveform 11: Darwin's FoxBat wave.
	Waveform 12: Darwin's NeckBrace wave.
	Waveform 13: Darwin's Transmission wave.
	Waveform 14: Darwin's Diamond wave.
	Waveform 15: Darwin's AlternatingCurrents wave.

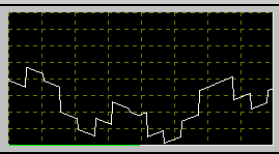
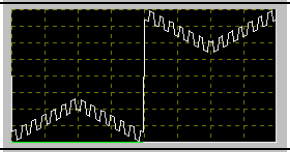
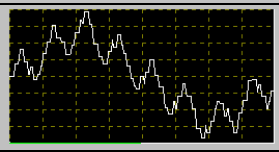
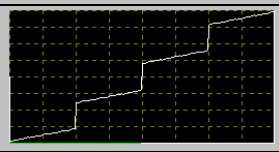
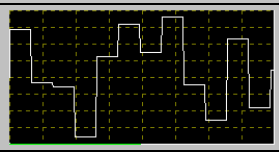
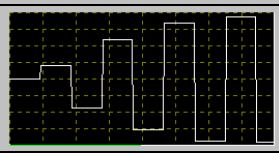
Bank 2	A variety of waveforms - this bank was meant to be "stepped through" with an analog sequencer (usually with a drone pitch) to give a "wave-sequence" effect. A combination of jarring and subtle changes provides a natural rhythm when used in this manner.
	Waveform 0: A single-cycle square wave.
	Waveform 1: A single-cycle sine wave.
	Waveform 2: A "nasty" random waveform.
	Waveform 3: A two-cycle 20% pulse wave.
	Waveform 4: A modified sine wave with vertical offset (which adds a bit of an overdriven sound).
	Waveform 5: A single-cycle sine wave.
	Waveform 6: A three-cycle ascending sawtooth wave.
	Waveform 7: A two-cycle square wave with a slight bit of noise and tube-like overdrive.
	Waveform 8: Another jarring random waveform.

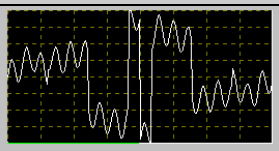
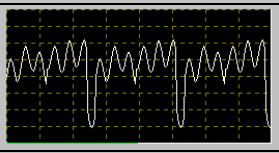
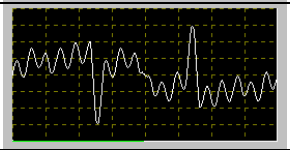
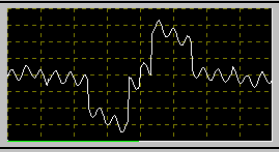
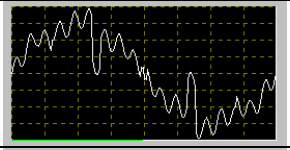
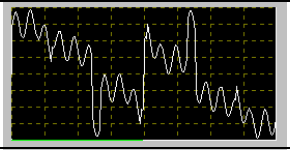
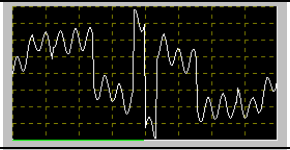
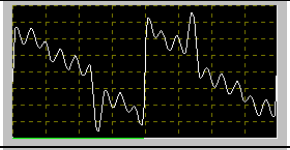
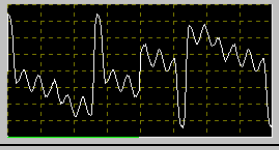
Bank 2 Continued	
	Waveform 9: A single-cycle descending sawtooth wave.
	Waveform 10: A four-cycle 15% pulse wave.
	Waveform 11: A single-cycle ascending sawtooth with a significant amount of added third harmonic.
	Waveform 12: A sample-and-hold styled random waveform.
	Waveform 13: A two-cycle sine wave.
	Waveform 14: A single-cycle 12% pulse wave.
	Waveform 15: A single-cycle triangle wave with a slight bit of added noise.

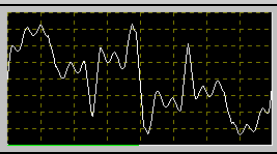
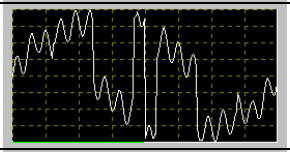
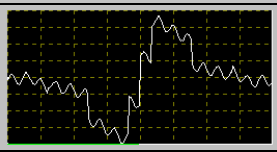
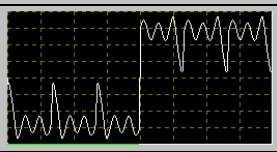
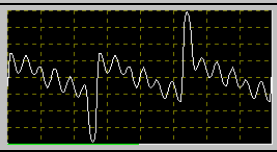
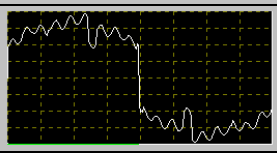
Bank 3	A number of oddball waveforms (some by Darwin Grosse), as well as a morph series (waves 9-15).
	Waveform 0: Darwin's Lumpy wave.
	Waveform 1: Darwin's NineSteps wave.
	Waveform 2: Darwin's Steeplechase wave.
	Waveform 3: A sloped square wave.
	Waveform 4: A pseudo-random waveform
	Waveform 5: A long-eared version of the FoxBat.
	Waveform 6: A spiky dual-saw wave.
	Waveform 7: A slightly noisy sawtooth wave.
	Waveform 8: Darwin's DoubleDip wave.

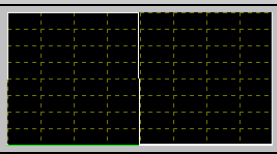
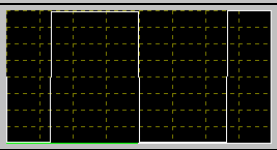
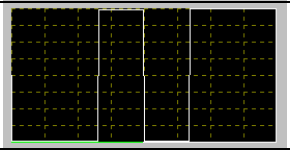
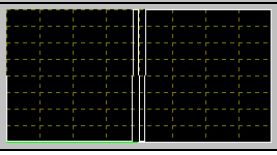
Bank 3 Continued	
	Waveform 9: A modified version of the DoubleDip wave, used as the beginning of a morph pattern.
	Waveform 10: The first morph step to Waveform 15.
	Waveform 11: The second morph step to Waveform 15.
	Waveform 12: The third morph step to Waveform 15.
	Waveform 13: The fourth morph step to Waveform 15.
	Waveform 14: The fifth morph step to Waveform 15.
	Waveform 15: The final step of the morph series - a moderately active, "rounded random" waveform.

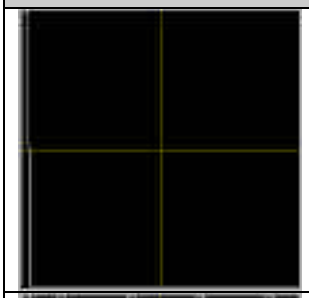
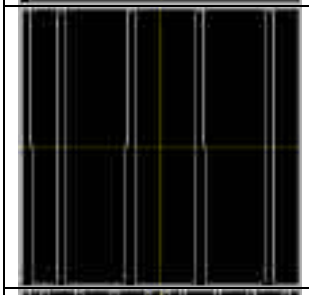
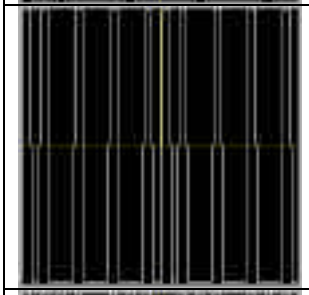
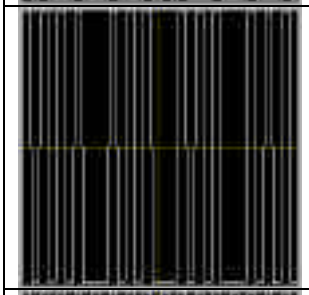
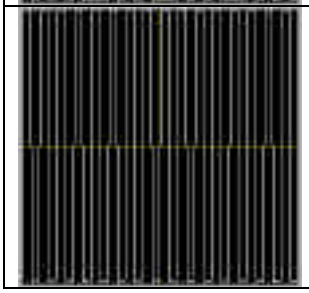
Bank 4	The waveforms in this bank are made for use as cyclical sequences. If you drive the Mini-Wave module at extremely low rates, the output of the waveshaper will be an excellent source for interesting pitch and filter modulations.
	Waveform 0
	Waveform 1
	Waveform 2
	Waveform 3
	Waveform 4
	Waveform 5
	Waveform 6
	Waveform 7
	Waveform 8
	Waveform 9

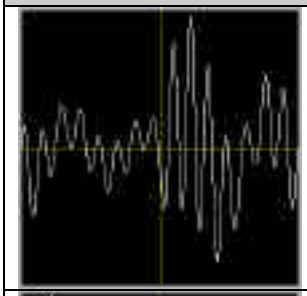
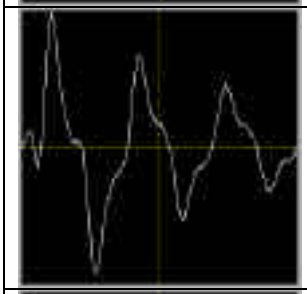
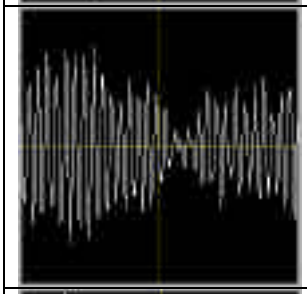
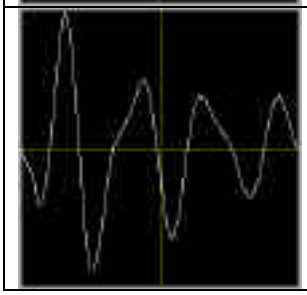
Bank 4 Continued	
	Waveform 10
	Waveform 11
	Waveform 12
	Waveform 13
	Waveform 14
	Waveform 15

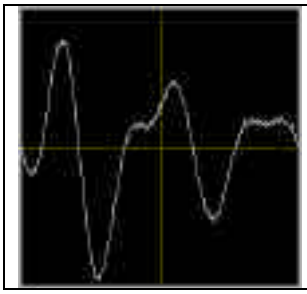
Bank 5	The waveforms in Bank 5, like Bank 4 are made for use as cyclical sequences. These sequence generally have 'rounded edges', so are more useful as controller sequences for filters or VCA's.
	Waveform 0
	Waveform 1
	Waveform 2
	Waveform 3
	Waveform 4
	Waveform 5
	Waveform 6
	Waveform 7
	Waveform 8
	Waveform 9

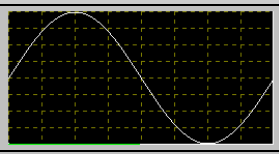
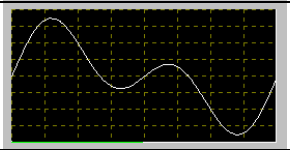
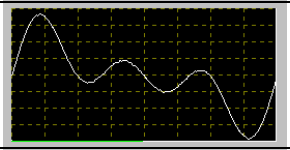
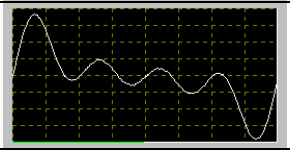
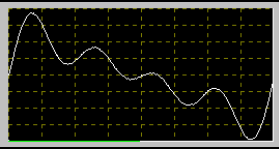
Bank 5 Continued	
	Waveform 10
	Waveform 11
	Waveform 12
	Waveform 13
	Waveform 14
	Waveform 15

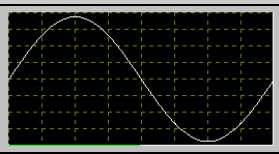
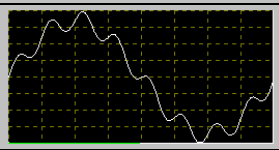
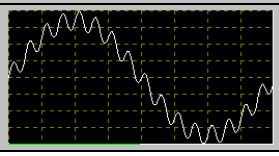
Bank 6	Bank 6 features a funky modulation called 'square wave compression'. Basically, this morphs from a standard square wave into a narrow pulse set, with a high concentration of DC offset. This can either be used as an audio source, or as a pulse source for other modular sub-systems.
	Waveform 0: The modulation series starts with a single-cycle square wave.
	Waveform 5: The modulation series becomes a more compressed square.
	Waveform 10: The square wave is getting seriously compressed…
	Waveform 15: …until it is a tiny portion of the entire waveform.

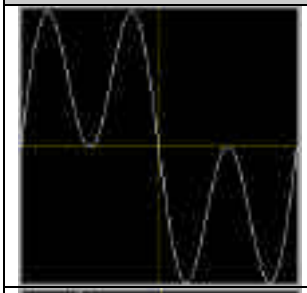
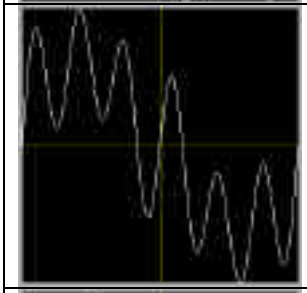
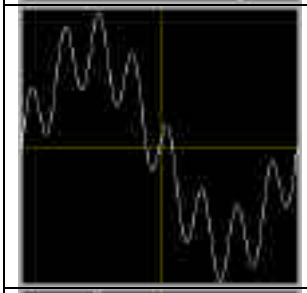
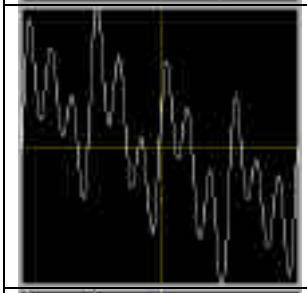
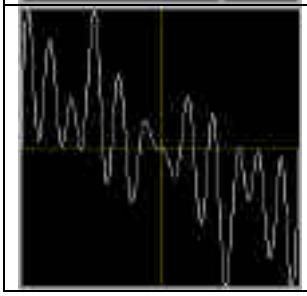
Bank 7	A binary rate multiplier (CD 4089) - this bank provides harsh harmonic sweeps (at audio rates) and drum trigger patterns (at low frequency rates).
	Waveform 0
	Waveform 4
	Waveform 9
	Waveform 12
	Waveform 15

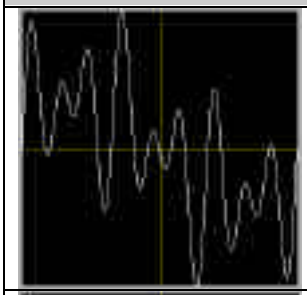
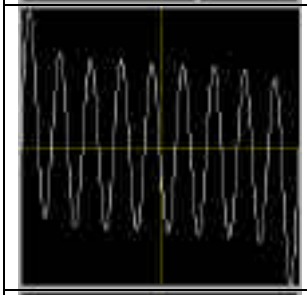
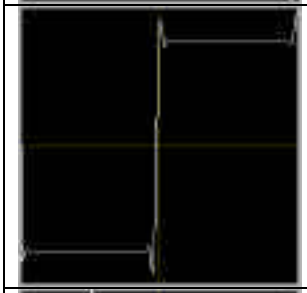
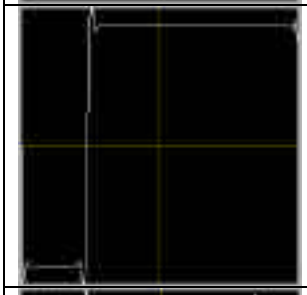
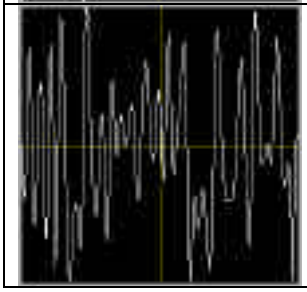
Bank 8	Sixteen samples from a Votrax SC-01 Voder chip - this bank provides vocalizations and vowel sound using voltage control. Sequencer selection of the waveforms can provide a "talking" synth, while using these waveforms as transform functions can add vocal tones to the primary waveform (sort of a pseudo-vocoding). The waveforms shown are an example of the waveforms provided.
	Waveform 0: (probably an "E" sound)
	Waveform 4: (probably an "eh" sound)
	Waveform 10: (probably an "oh" sound)
	Waveform 11: (probably an "er" sound)

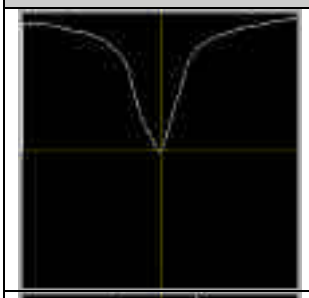
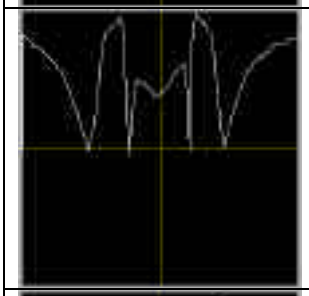
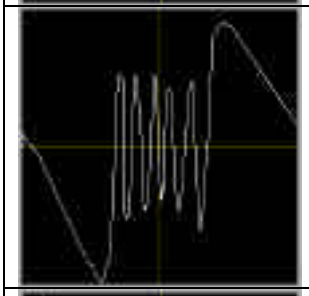
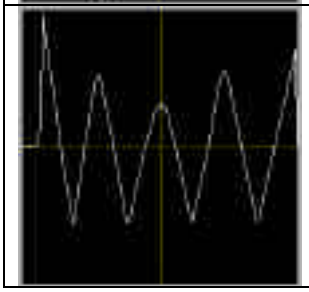
	Waveform 15: (probably an "oo" sound)

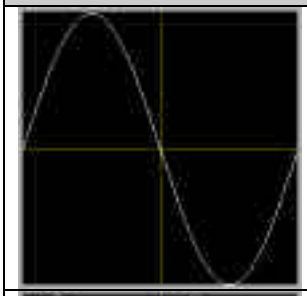
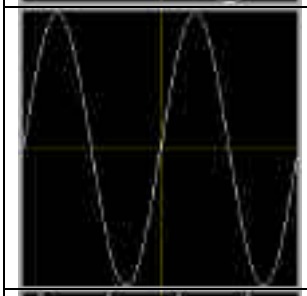
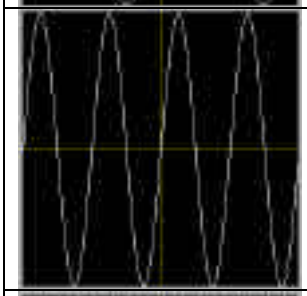
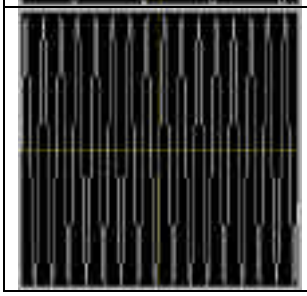
Bank 9	Bank 9 contains a 'morph' from a single cycle sine wave to a rounded saw wave with a fourth harmonic emphasis. This is a useful bank for waveform modulation, since scanning the waveform bank gives the illusion of bandpass filtering.
	Waveform 0: This morph series begins with a single-cycle sine wave.
	Waveform 3: The morph runs through the addition of a octave sine.
	Waveform 7: The morph continues though the addition of the third harmonic.
	Waveform 11: The morph continues through the addition of a fourth harmonic.
	Waveform 15: Finally, the morph series ends with this rounded sawtooth with a fourth harmonic emphesis.

Bank 10	Bank 10 begins with a sine wave (at 80% amplitude), and adds the next 15 harmonics at a 20% amplitude. This adds the harmonic tone while still maintaining a strong fundamental. This bank has a variety of uses, since sweeping the wavetable can add a sub-harmony (or filter-like function) to any tonal line.
	Waveform 0: The series begins with a single cycle sine wave.
	Waveform 7: The sine wave with a 20% mix of the 8th harmonic.
	Waveform 15: The series ends with a sine wave with 20% mix of the 16th harmonic.

Bank 11	This bank contains the first sixteen waveforms from the legendary Digisound VCDO. (Only example waves are shown.)
	Waveform 2
	Waveform 4
	Waveform 8
	Waveform 12
	Waveform 15

Bank 12	The second set of sixteen waveforms from the Digisound VCDO. (Only example waves are shown.)
	Waveform 0
	Waveform 7
	Waveform 9
	Waveform 12
	Waveform 15

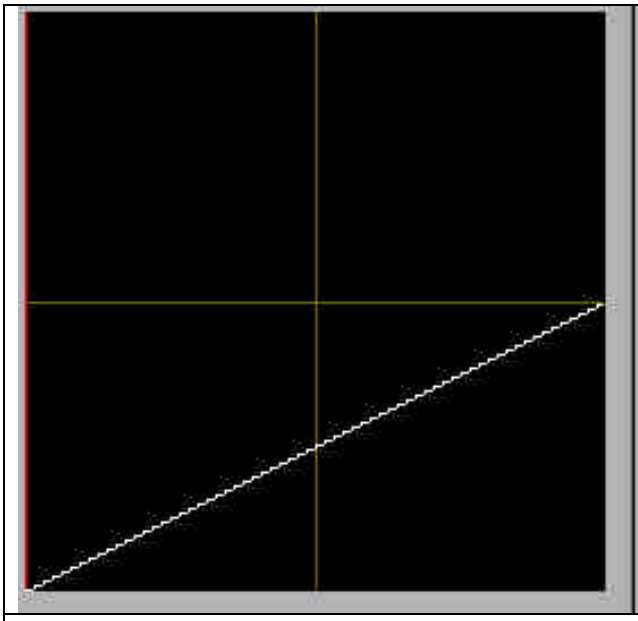
Bank 13	A bank of "Historical" Non-Linear Transforms, this series includes the four "original" shapes (shown) as well as intermediate waveforms using linear interpolation. If you don't know what this means - don't worry. Use these as transform functions for making waveforms "more interesting".
	Waveform 0: "Historical" NLT #1
	Waveform 3: "Historical" NLT #2
	Waveform 9: "Historical" NLT #3
	Waveform 15: "Historical" NLT #4

Bank 14	This bank steps through the harmonic series of a sine wave. This can be used in two ways: first, if you maintain a steady pitch, you can play "games" with harmonic stepping using a sequencer; second, if you have several Mini-Waves, you could use this bank for additive synthesis.
	Waveform 0: A single-cycle sine wave (the fundamental).
	Waveform 1: A two-cycle sine wave (the second harmonic).
	Waveform 3: A three-cycle sine wave (the third harmonic)
	Waveform 15: A fifteen-cycle sine wave (the fifteenth harmonic)

Bank 15 is a special bank - it is used to provide quantization functions for control voltages. If you feed a control voltage into the Wave Shaper Input jack, you will get a quantized output with the following scales:

0. Chromatic 12 notes per octave (4 steps per note).
1. Diatonic Major (C-D-E-F-G-A-B), eight notes/octave (6 steps per note).
2. Diatonic Harmonic Minor (C-D-D#-F-G-G#-B), eight notes/octave (6 steps per note).
3. Diatonic Natural Minor (C-D-D#-F-G-G#-A-A#), eight notes/octave (6 steps per note).
4. Diatonic Dorian Mode (C-D-D#-F-G-A-A#), eight notes/octave (6 steps per note).
5. Diatonic Phrygian Mode (C-C#-D#-F-G-G#-A#), eight notes/octave (6 steps per note).
6. Diatonic Lydian Mode (C-D-E-F#-G-A-B), eight notes/octave (6 steps per note).
7. Diatonic Aolian Mode (C-D-E-F-G-G#-A#), eight notes/octave (6 steps per note).
8. Whole Tone Scale (C-D-E-F#-G#-A#), seven notes/octave (8 steps per note).
9. Pentatonic Scale (C#-D#-F#-G#-A#), six notes/octave (10 steps per note).
10. C Major Chord (C-E-G), three notes/octave (17 steps per note).
11. A Minor Chord (C-E-A), three notes/octave (17 steps per note).
12. G Major Chord (D-G-B), three notes/octave (17 steps per note).
13. F Major Chord (C-F-A), three notes/octave (17 steps per note).
14. D Major Chord (D-F#-A), three notes/octave (17 steps per note).
15. Octaves, one note/octave (46 steps per note).

Note: For proper operation, the range switch should be set to 0-10V setting - this will provide a 5-octave range.



Sample # 0	C0	-128
Sample # 1	C0	-128
Sample # 2	C0	-128
Sample # 3	C0	-128
Sample # 4	C#0	-126
Sample # 5	C#0	-126
Sample # 6	C#0	-126
Sample # 7	C#0	-126
Sample # 8	D0	-124
Sample # 9	D0	-124
Sample # 10	D0	-124
Sample # 11	D0	-124
Sample # 12	D#0	-122

Waveform 0: The Chromatic scale.