ALM036 'TAZM-O' Operation Manual

Operation Manual

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Contents

1 INTRODUCTION

The 'TAZM-0' is an analog triangle core oscillator featuring through-zero frequency modulation and a collection of some of our favourite features from classic oscillator designs. It includes a continuous morphing wave/pulse width shape control inspired by the Serge NTO, dual SH-101 style varied pulse sub octave outputs, a voltage controlled FM Index typically found in larger complex oscillators, a built in output level VCA and voltage controlled octave transposition similar to the multipliers found on Akemie's Castle digital FM VCO.

The primary shape output freely moves between sine (or triangle), saw, pulse and square wave shapes before passing through the built in output VCA for on board level control. Additional common direct shape outputs and dual -1 and -2 octave sub outputs are also available, offering the familiar flexibility of more traditional VCOs.

The through zero FM input includes both direct and voltage control over modulation index for fast and straightforward additive patching when paired with a secondary mod oscillator. Additional features include the unique octave transpose CV input (0, +1, +2 octaves), hard sync input and an LFO mode with bipolar LED indication.

Designed to act as the primary oscillator in your system the 'TAZM-0' offers a wide range of timbrel and patch flexibility within a relatively compact 12HP size, making it the perfect fit for any modular system.

2 FEATURES

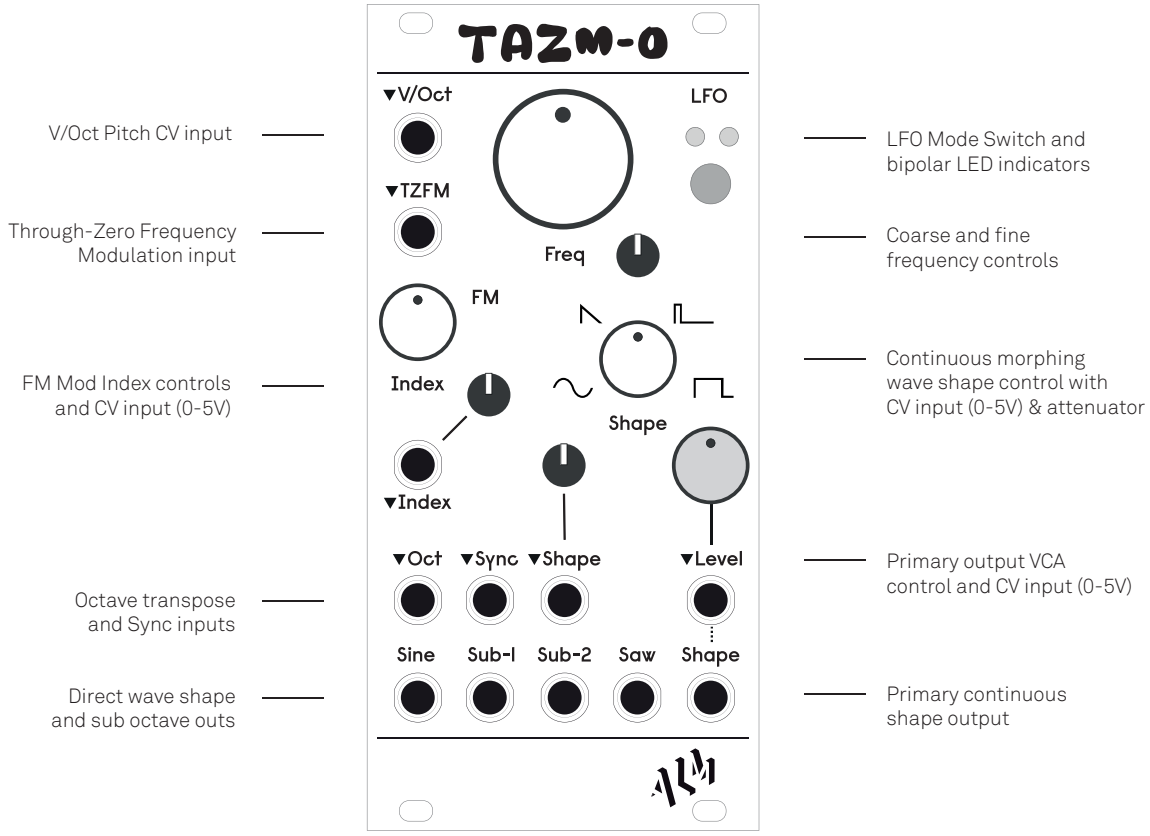
- Continuous crossfading wave shape with direct and voltage control.
- Through-zero FM input with direct and voltage controlled mod index.
- Dedicated outputs for sine (or triangle), saw and square sub-1 & sub-2.
- Primary output with level VCA.
- V/Oct input with an approx 8 octave range.
- Octave transpose CV input ranging 3 octaves.
- Hard Sync input.
- LFO mode with bipoler LED indication.
- Rear switches for selecting Sub-2 pulse width, and sine/triangle wave.
- Skiff friendly with reverse power polarity protection.
- Made in England.

3 TECHNICAL SPECIFICATIONS

- Size: 12HP
- Power: +12v 70ma / -12v 65ma
- Depth: 38mm (approx)

4 CORE OPERATION

4.1 Panel Layout



4.2 Main Frequency Controls

The upper section of the module provides controls the pitch of the ocillator via the volt per octave input, course and fine tune controls and the LFO mode activation switch.

The two frequency controls combine to set the base pitch of the oscillator. The larger coarse frequency knob's range is approx 7 octaves and the smaller fine knob's range is approx 1 octave. The V/oct pitch CV input is added to the frequency set with the controls. Without external patched v/oct signal, the frequency range of the oscillator is between ~20hz - ~5khz.

In LFO mode (activated via the latching push button on the top right of the panel) the frequency range is lowered to approx 0.1hz to 30hz - making the TAZM-0 into a modulation source. The LEDs above the mode switch are activated in LFO mode and indicate the sine wave polarity

(red for positive, green for negative).

4.3 Through-zero Frequency Modulation

The TAZM-0 supports 'Through Zero-Frequency Modulation' (TZFM). Patching an audio rate signal (the modulator) into the TAZM-0's 'TZFM' input will modulate the TAZM-0's base frequency, producing harmonically rich timbres. This works best musically when the output of another osciallor is used as the modulator and its frequency is a related factor of the TAZM-0's set frequency.

The TZFM input is routed through an internal VCA - the level of which is controlled by the FM Index control and the associated CV input with an attenuator. The depth of the TZFM can then be easily controlled directly or using an LFO or envelope into the CV input for dynamic FM sounds.

See the 'Dual Oscillator FM Voice' patch example for a demonstration of the above setup.

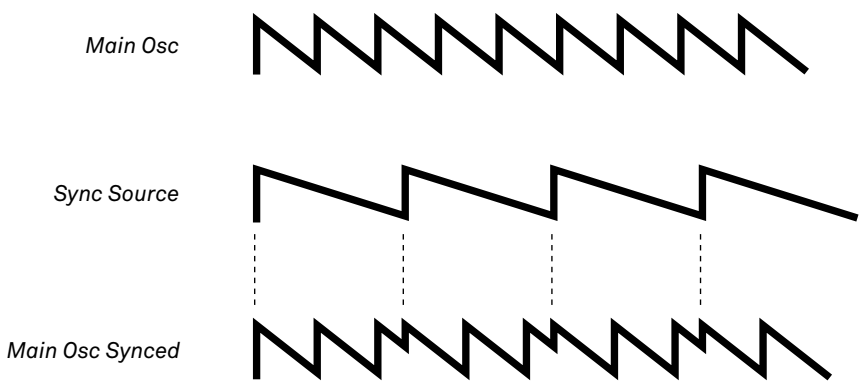
4.4 Octave Input

The TAZM-0 can transpose its frequency up by 1 or 2 octaves in response to a voltage patched into its 'OCT' input.

The frequency is transposed up 1 octave at approx 1V and up 2 octaves at approx 3V. Patching a manual voltage offset provides the TAZM-0 with a typical manual octave swtich. The input is also useful for FM or adding melodic variation to patterns.

4.5 Sync Input

The sync input provides classic timbral sweeping effects when used with a second oscillator patched. Any rising edge detected at this input will hard reset the TAZM-0's oscililator core back to the start of its cycle. Though commonly used as a timbral audio effect, the sync input can also be used with a clock or trigger to reset the cycle in LFO mode.



4.6 Shape Output

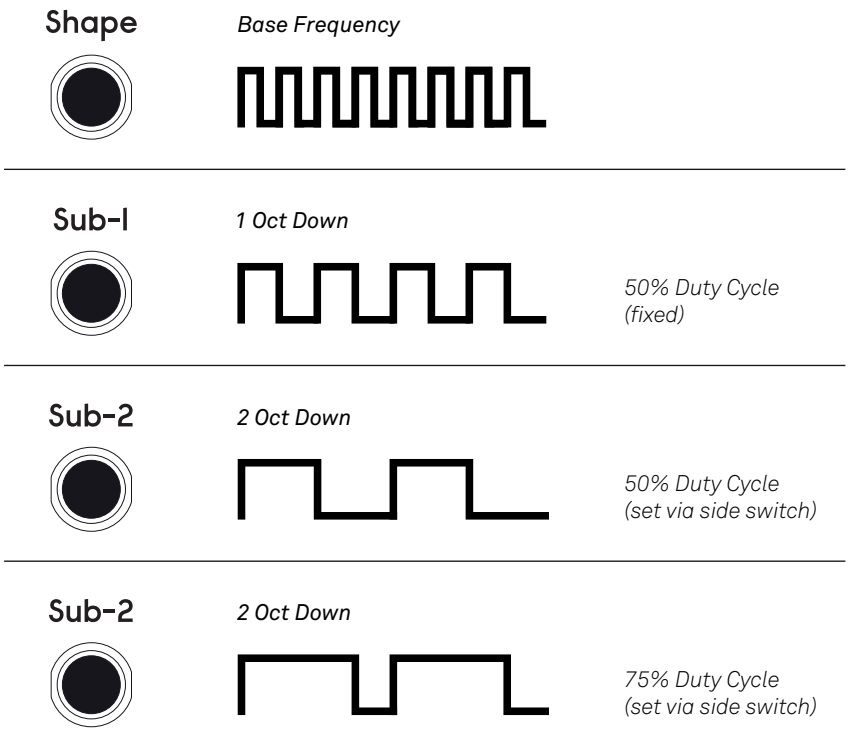
The main 'Shape' output of the TAZM-0 provides a morphing waveform with dedicated VCA to control its level.

The shape control morphs continuosly between waveforms, starting with a sine or triangle (set via a small slide switch below the FM section on the side of the module), to a saw and finally pulse wave which scans from a 10% to a 90% duty cycle. The wave shape control includes a manual offset and CV input with attenuator, great for dialing in more focused modulation such as a familiar pulse width modulation (PWM) sound.

The primary shape output is routed through a linear VCA with manual level control that functions as an attenuator when CV is inserted into the jack. This can be used like a traditional output level VCA or for timbral amplitude modulation effects.

4.7 Dedicated Outputs

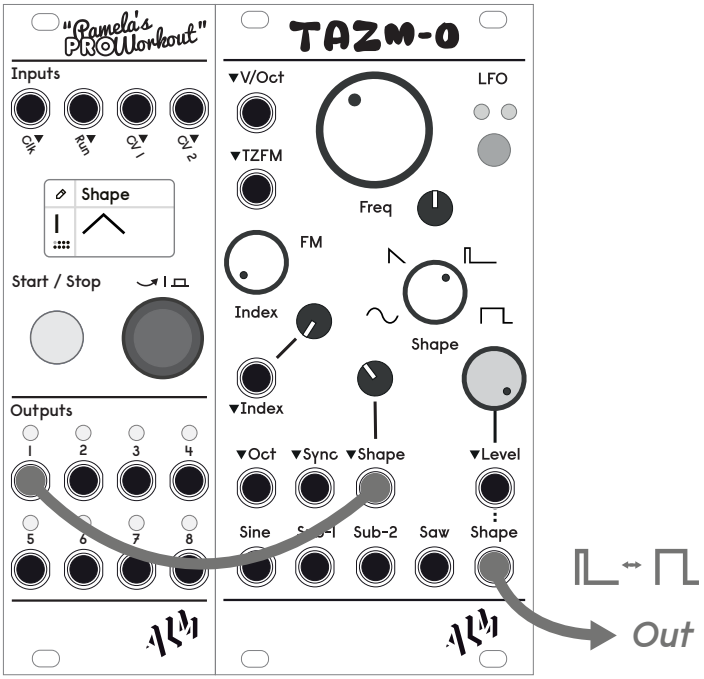
Dedicated outputs for sine, saw and dual -1 and -2 octave sub pulse outputs are included alongside the Shape output. Sub-1 is at a set 50% duty cycle and Sub-2 is selectable between a 50% & 75% duty cycle pulse via a small slide switch below the FM section on the side of the module



5 PATCH EXAMPLES

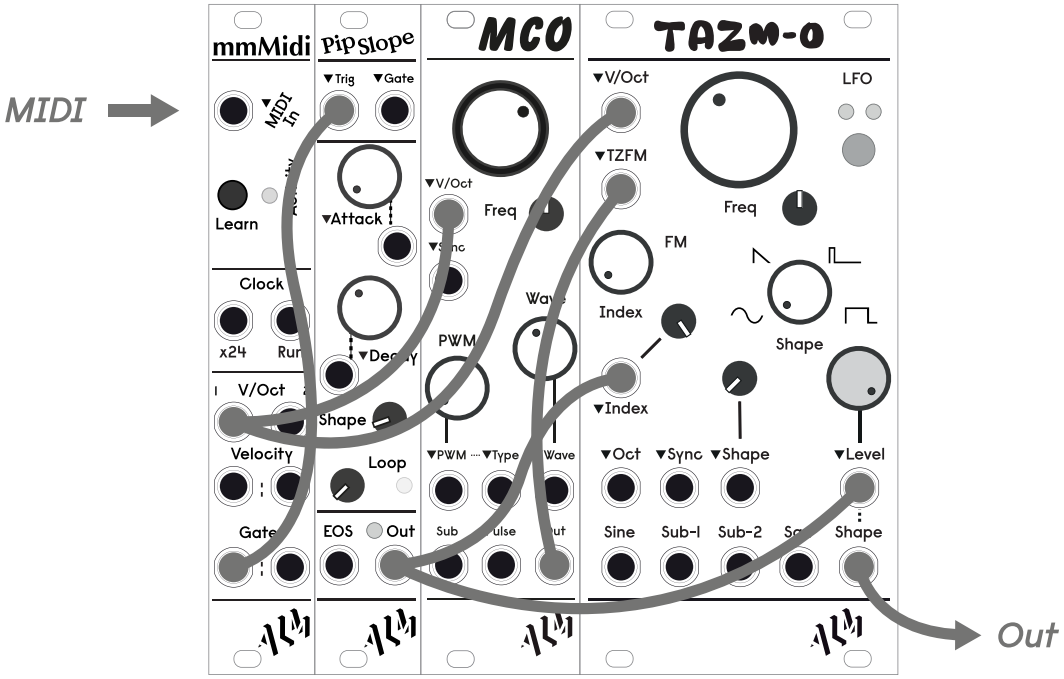
5.1 Basic Pulse Width Modulation (PWM)

1. Set the TAZM-0's 'Shape' control to the narrow 25% pulse wave shape.
2. Set up a Pam output (or other mod source) to produce a medium speed triangle wave LFO.
3. Patch the LFO out to the TAZM-0's 'Shape' CV input and increase the attenuator to around 11 O'clock.
4. Adjust both the attenuator and 'Shape' controls to increase/decrease the span of the PWM.



5.2 Dual Oscillator FM Voice

1. Patch a sine wave from the MCO (or other oscillator) to the TZFM input of the TAZM-O.
2. Increase the 'Index' control and adjust the oscillators' FM frequency ratio to taste.
3. Mult the V/oct out of mmMidi (or any other CV/Gate source) to the V/Oct input of both oscillators.
4. Patch the gate out of mmMidi to the Pip Slope (or other envelope).
5. Mult the envelope out to both the 'Index' and 'Level' CV inputs.
6. Lower the 'Index' control and increase the attenuator for envelope controlled dynamic TZFM.



5.3 Self Patched Modulation

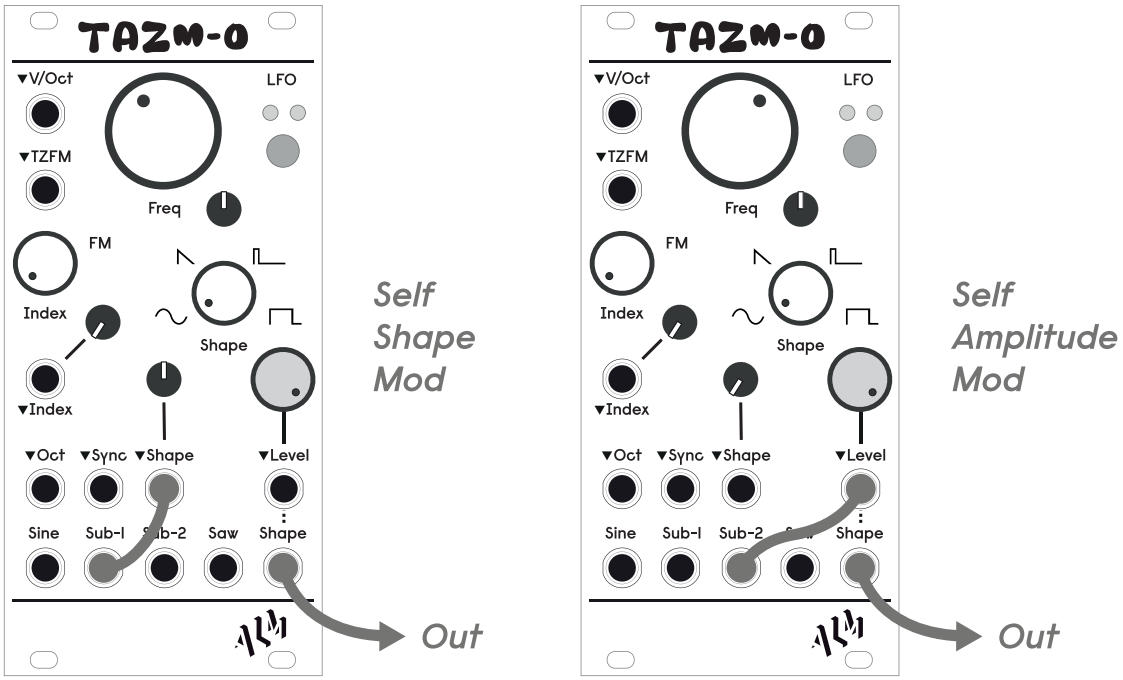
Self patching the TAZM-0 is a great way to 'unlock' new and interesting timbres or spice up a more common oscillator sound. Try patching any of the direct outputs back into the Shape, Level, or Octave transpose inputs for pitch-stable timbrel modulation.

Self Shape Mod

1. Patch the TAZM-0's own Sub-1 output to the 'Shape' CV input.
2. Increase the attenuator and adjust the 'Shape' control to taste for varying buzzy timbres.

Self Amplitude Mod

1. Patch the TAZM-0's own Sub-2 output to the 'Level' CV input.
2. Increase the 'Level' control to introduce unique sub octave amplitude modulation.



6 LIMITED WARRANTY

From the date of manufacture this device is guaranteed for a period of 2 years against any manufacturing or material defects. Any such defects will be repaired or replaced at the discretion of ALM. This does not apply to;

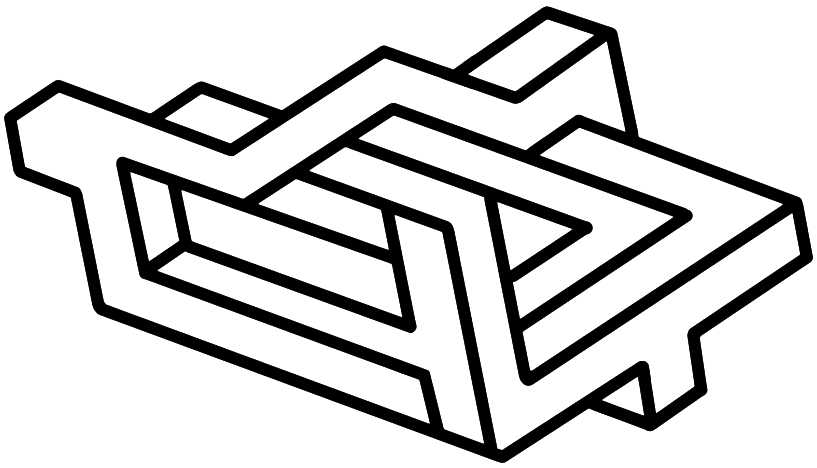
- Physical damage arising for mistreatment (i,e dropping, submerging etc).
- Damage caused by incorrect power connections.
- Overexposure to heat or direct sunlight.
- Damage caused by inappropriate or mis-use including physical 'modding'.
- Use of incorrect or non official firmware

No responsibility is implied or accepted for harm to person or apparatus caused through operation of this product. By using this product you agree to these terms.

7 SUPPORT

For the latest news, additional info, downloads and firmware updates please visit the ALM website at `http://busycircuits.com` and follow @busycircuits on twitter and instagram.

Questions? please visit `http://busycircuits.com/support` .



8 Appendix

8.1 V/OCT Calibration

8.1.1 Trial & Error Method

Calibration can follow a more traditional trial & error method:

- Input 1V into the V/OCT input.
- Tune the oscillator using the Course & Fine knobs to C2 (An MFX or similar tuner can be used)
- Insert 3V into the V/OCT input.
- By carefully turning the 25-turn trimmer on the back of the module, calibrate the module until you get C4.
- Repeat this process to get progressively more accurate tracking.

Note: Use different root notes to get more accurate tracking in the desired octave.

8.1.2 Alternative Math Method

For this method you will need:

- An accurate 1V and 5V source. (A PPW would work with Level set to 20% and 100%)
- An oscilloscope capable of measuring frequency. (An MFX would work)
- A scientific calculator capable of the log function.

Method:

- During this process make sure not to move the course or fine knob. Though the method will work at any position, ideally turn the course knob to 9 'oclock and fine knob fully CCW.
- First insert 1V into the V/OCT input and note the frequency output from ideally the saw output. This is value 'A'.
- Insert the 5V into the V/OCT input and note the frequency output and keep the input connected. This is value 'B'.
- Put 'A' & 'B' in the following equations in a scientific calculator to get 'X' and 'Y' respectively and note the values.

$$X = \log_2 A$$
$$Y = \log_2 B$$

- Next, input the 'X' & 'Y' values into the following equation:

$$Target\ Frequency = 2^{(5+(X-\frac{(Y-X)}{4}))}$$

- The result will be the target frequency with a 5V input
- Turn the multi-turn trimpot marked V/OCT Trim until you match the output frequency on your oscilloscope with the Target Frequency.
- Repeat if more accuracy is desired.

8.2 Transposer Calibration

The two thresholds for transposing are 1V and 3V. The Transposer trimmer at the back of the board allows you to calibrate the intervals to 1 octave at these thresholds. Method:

- Make sure the oscillator V/OCT is calibrated using one of the above methods.
- Pick an offset generator that's capable of easily scanning between the thresholds, such as the O/Ax2.
- Measure the frequency of a waveform output using an oscilloscope such as an MFX and note the frequency. Take care not to move the Fine or Coarse knob after this.
- Apply an offset between 1V & 3V into the transposer input. You should be able to hear the jump on pitch at these thresholds.
- Adjust the reverse trimmer marked 'TRNPS-TRIM' till the frequency read on the oscilloscope is double of the initial frequency
- Apply an offset greater than 3V and the frequency should double again, adjust the trimmer if necessary.

8.3 Waveshaper Calibration

The waveshaper can be adjusted to taste, however there is a recomended setting that it can be calibrated to as follows:

- Connect the waveshaped output to an oscilloscope such as the MFX.
- Turn the shape offset knob fully CW.
- Turn the reverse trimer marked 'FADER-TRIM' fully CCW.

- Slowly turn the trimmer CW till you see a clean square wave.
- Continue turning the trimmer CW until you see the saw wave begin to bleed into the output.
- Back-off the trimmer just before you see the saw wave bleed through.
- The waveshaper should now scan cleanly through the shapes with a short blend at the crossing points of the different waves.