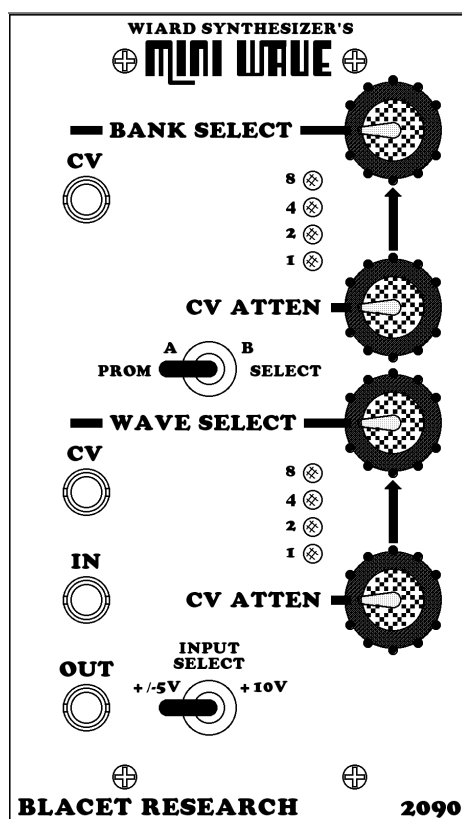


Wiard Synthesizer's

# Mini Wave

## BLACET RESEARCH MODEL MW2090 Voltage Controlled Wavetable Module

### Users Manual



Blacet Research 15210 Orchard Rd Guerneville CA 95446  
blacet@blacet.com <http://www.blacet.com> 707-869-9164

Contents Copyright.

Reproduction by any means including the Internet prohibited without permission.  
This document contains proprietary and trade secret information of Blacet Research and is provided as a service to the module owner. Any unauthorized duplication or transferal may violate trade secret laws.  
Contents subject to change without notice.

# Introduction

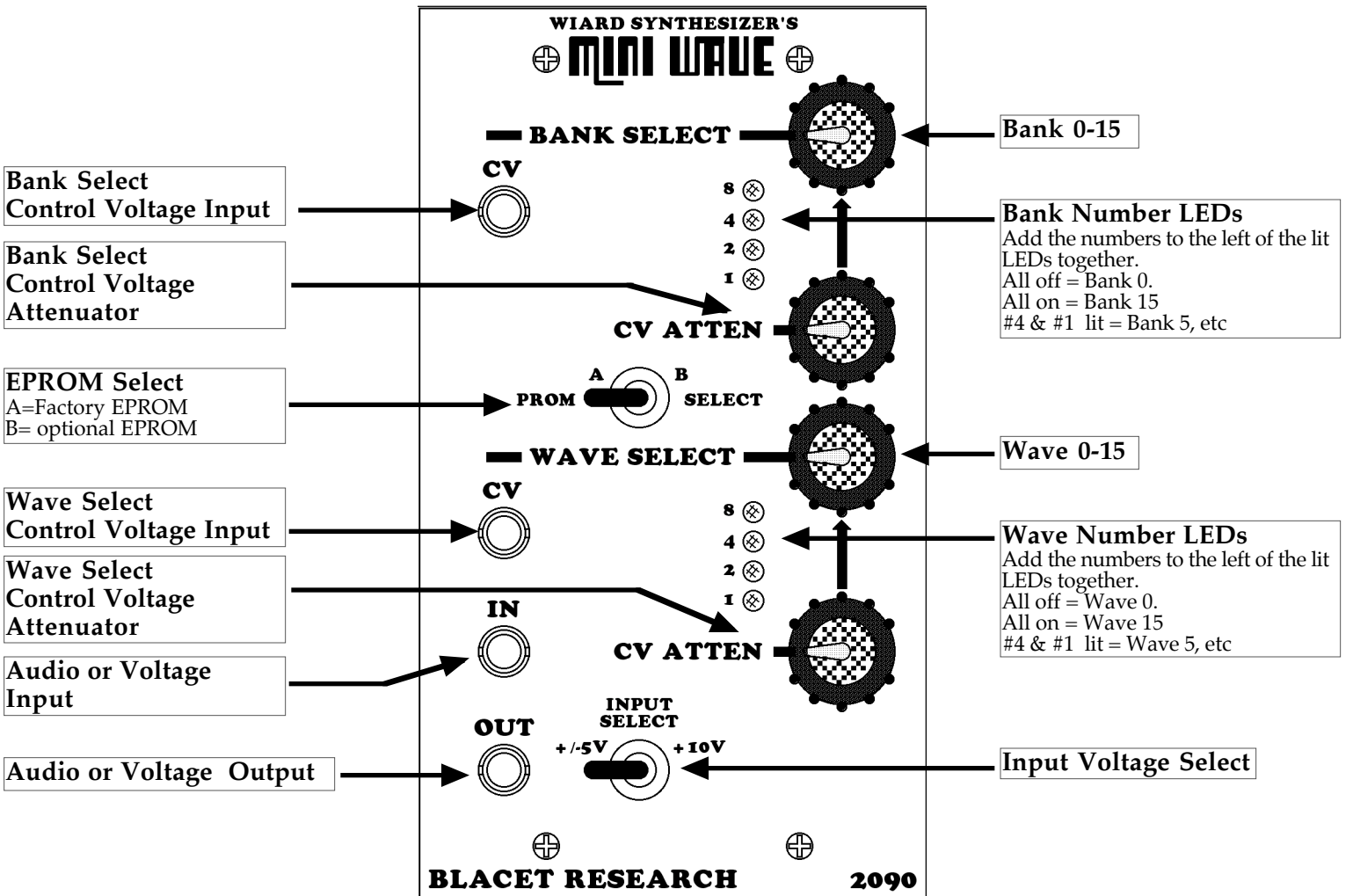
The Mini Wave is a wavetable lookup type module that features 256 different waveforms stored in a digital memory arranged as sixteen "Banks" with sixteen "Waves" for each Bank. The selection of Wave and Bank is voltage controlled.

Each waveform consists of 256 samples or steps that are output by decoding an input voltage or waveform. Using a sawtooth input wave, the samples are output in sequential order, with the frequency tracking the input signal.

Using a more complex input waveform allows for non sequential sample output with a more "distortion box" feel.

A slow speed input waveform allows complex envelope or LFO type signals to be output.

The Mini Wave can also be used as a quantizer, processing control voltage inputs to only output specific steps of control voltage.



## Controls and Operation

**Bank and Wave Select Pots, CV ins and Attenuators, LEDs:** The 256 waveforms available are arranged as 16 Banks of 16 Waves each. The Bank or Wave select pots can be used alone or in combination with the CV inputs to select the waveform. When CVs are used, the CV Attenuator Pot reduces the CV level.

The CV ins can be connected to LFOs, ADSRs, analog sequencers, MIDI to CV converters or any other source of DC in the range of 0-10V. Negative CVs can be used providing the pots are turned CW to some extent. This would be useful for sweeping the Bank and Wave selection in a reverse or downward direction.

Bank or Wave locations are indicated in binary on the 8 LEDs. To read the location, **add** the numbers along side the lit LEDs. For example, if #1, #2 and #4 are lit, the location is bank or wave 7.

See the "Waveforms" manual for more information.

**EPROM Select:** There are two EPROM locations on the PCB. "A" is the factory supplied memory. "B" is an optional EPROM, not supplied.

**Audio or Voltage Input, Input Voltage Select Switch:** To use the MW as a **tracking oscillator**, input a +/-5V sawtooth wave from a standard VCO. Place the Input Select switch in the "+/-5V" position. Trim pots RT1 and RT2 may have to be adjusted for lowest distortion. See the "Calibration" section. VCOs with swings as low as +/-2.5V can be used.

Sawtooth VCOs that output a 0-10V signal may be used by placing the Input Select switch in the "+10V" position.

The waveforms pictured in the Waveforms Manual are generated by a positive going sawtooth. Some VCOs may have a negative going sawtooth (such as the MOTM) and the waveforms will be reversed. This will not change the waveform sound but may effect use as a LFO, etc.

For use as a **distortion unit**, amplify external audio signals to +/-5V.

For use as a **complex wave LFO**, input a triangle or sawtooth LFO with a +/-5V or 0-10V swing, setting the Input Voltage Select switch accordingly.

For **quantizer** functions, select Bank 15. A 0-10V input will result in the following scales when the output is connected to a standard 1V/oct VCO. Trimpot RT4 adjusts the tracking. See the "Calibration" section.

- **Wave 0:** 0 Chromatic 12 notes per octave (4 steps per note)
- **Wave 1:** Diatonic Major (C-D-E-F-G-A-B) Eight per octave (6 steps per note)
- **Wave 2:** Diatonic Harmonic Minor (C-D-D#-F-G-G#-B) Eight per octave (6 steps per note)
- **Wave 3:** Diatonic Natural Minor (C-D-D#-F-G-G#-A#) Eight per octave (6 steps per note)
- **Wave 4:** Diatonic Dorian Mode (C-D-D#-F-G-A-A#) Eight per octave (6 steps per note)
- **Wave 5:** Diatonic Phygian Mode (C-C#-D#-F-G-G#-A#) Eight per octave (6 steps per note)
- **Wave 6:** Diatonic Lydian Mode (C-D-E-F#-G-A-B) Eight per octave (6 steps per note)
- **Wave 7:** Diatonic Aolian Mode (C-D-E-F-G-G#-A#) Eight per octave (6 steps per note)
- **Wave 8:** Whole Tone (C-D-E-F#-G#-A#) 6 notes per octave (8 steps per note)
- **Wave 9:** Pentatonic (C#-D#-F#-G#-A#) 5 notes per octave (10 steps per note)
- **Wave 10:** C Major (C-E-G) 3 notes per octave (17 steps per note)
- **Wave 11:** A minor (C-E-A)
- **Wave 12:** G Major (D-G-B)
- **Wave 13:** F major (C-F-A)
- **Wave 14:** D major (D - F# - A)
- **Wave 15:** 5 Octaves, one note per octave (46 steps per note)

**Output Jack:** The Voltage Select switch also determines the output swing of the MW. Since the memory used in the MW is only 8 bit, you can expect the sound to be a bit low fi, with some odd noises present on occasion.

**Power Input Jack J4:** A source of regulated +/-15Vdc power must be supplied to this PCB jack to run the module. Note the current requirements in the "Specifications" section.

**Connections to this jack should be made only when the power supply is OFF and the connector must be positioned correctly on the pins.**

As using the wrong supply can cause damage to the unit, please contact us if you have any questions!

# Calibration

**RT1:** Input Span

**RT2:** Input Offset. Both RT1 and RT2 are adjusted for minimum output distortion with Bank 0 and Wave 0 selected, with a sawtooth wave input. Use the "+/-5V" switch position. An oscilloscope is the optimal device for this adjustment. These adjustments are designed to match the MW to the specific VCO used for the input. Changing models of VCO may require recalibration.

**RT3:** Output Offset. Set Bank 0 and Wave 0. Input a 1Khz (nominal) sawtooth. Use the "+/-5V" switch position . Adjust the Output voltage for 0V.

**RT4:** V/Oct. Set Bank 15 and Wave 15. Use the "+10V" switch position. Input 10.0V and adjust the trimmer for an output voltage of 5.0V. This adjustment ensures that the quantizer functions of the MW are set for best accuracy.

# Options

To insert an EPROM into the "B" location, power down the module and pull it from the rack so that the PCB can be accessed. Use an antistatic wrist strap during this procedure.

Locate the blank 28 pin LIF socket and insert a programmed 27C512. Note the orientation of the IC is the same as all other ICs on the board, notch to the left or toward the front panel. To remove the IC, press down on the "flippers" on each end of the socket with equal pressure.

For information on programming waveform EPROMs for the Mini Wave, please visit our web site at [blacet.com](http://blacet.com).

# Specifications

Front Panel Size: 5.25 x 3" W

Module Depth: 6"

Input/Output Jacks: 3.5 mm (1/8")

Waveforms: 256 (16 Banks X 16 Waves)

Samples per Waveform: 256 (8 bit)

CV Range: 0-10V

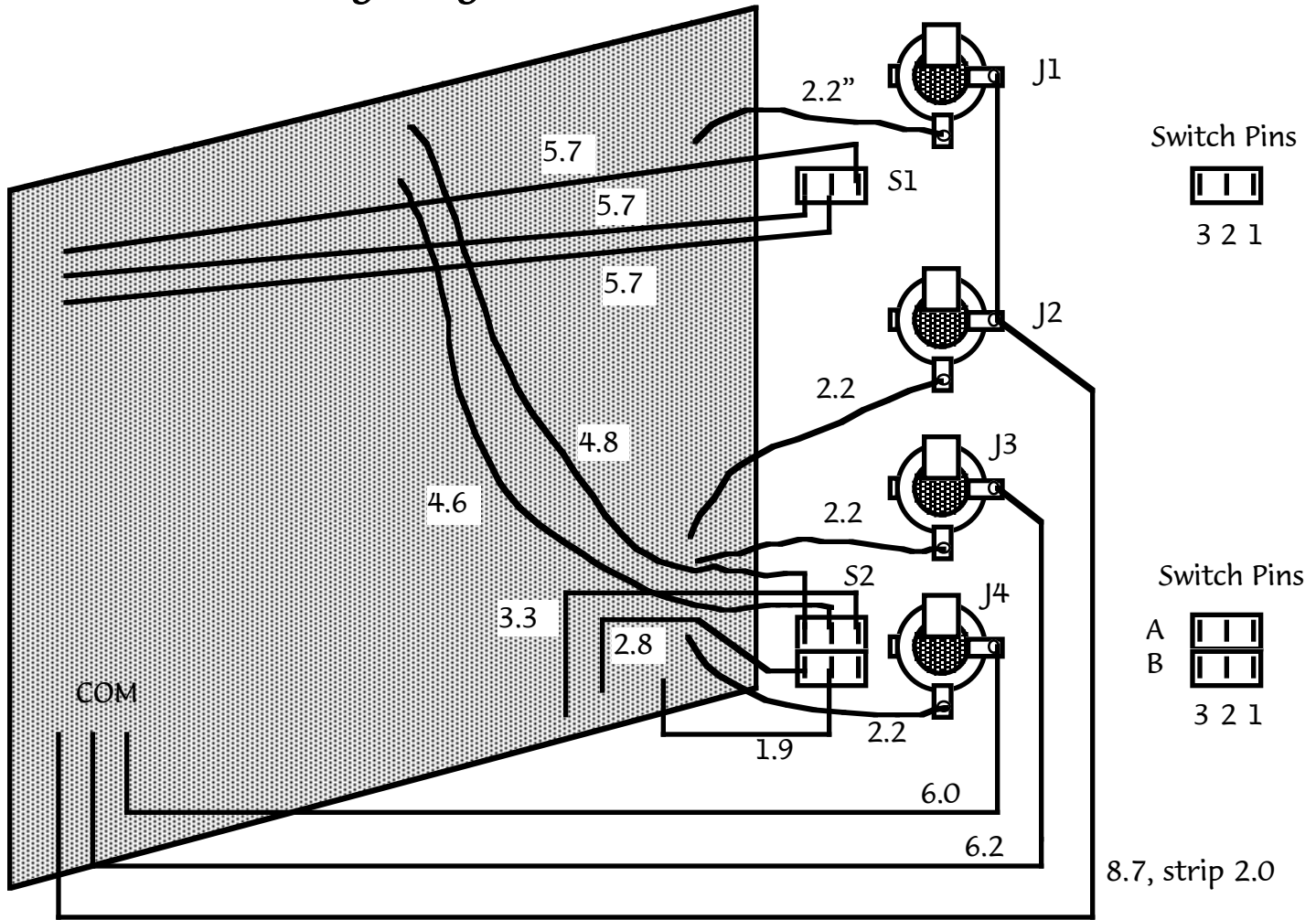
Input Level: +/-5V or 0-10V audio or DC

Output Level: +/-5V or 0-10V audio or DC

DA converter accuracy: typical 0.19%

Power: +/-15 Vdc @+65/-18 mA

# Front Panel Wiring Diagram



## Troubleshooting, Repair, Warranty

If you encounter problems that you can't solve, contact us, preferably via e-mail with a description of the problem. We can then help you get your module working.

The parts contained in this unit have been carefully selected and tested. They are guaranteed for 90 days from the date of purchase. If you believe that you have a defective part (or if you have a part missing), contact us so we can provide you with a replacement or repair.