

# Q116 Ring Modulator

Aug 2014

The Q116 Ring Modulator performs a variation of amplitude modulation in which two input signals are multiplied creating an output that contains the sum and difference of the input signals (called sidebands), but without the original input signals themselves. The result is a very strange clanging, bell-like sound that can only be created with a ring modulator. Useful for producing gong sounds, bell sounds, and many strange sounds having no description. Sometimes referred to as a 'Balanced Modulator'.

## Controls and Connectors

### X Input Connector

First Input signal to be multiplied.

### Y Input Connector

Second Input signal to be multiplied.

### Output Connector

Output signal

## Specifications

**Panel Size:** Single width 2.125"w x 8.75"h.

**Signal Levels:** 10V PP maximum

**Power:** +15V@30ma, -15V@30ma



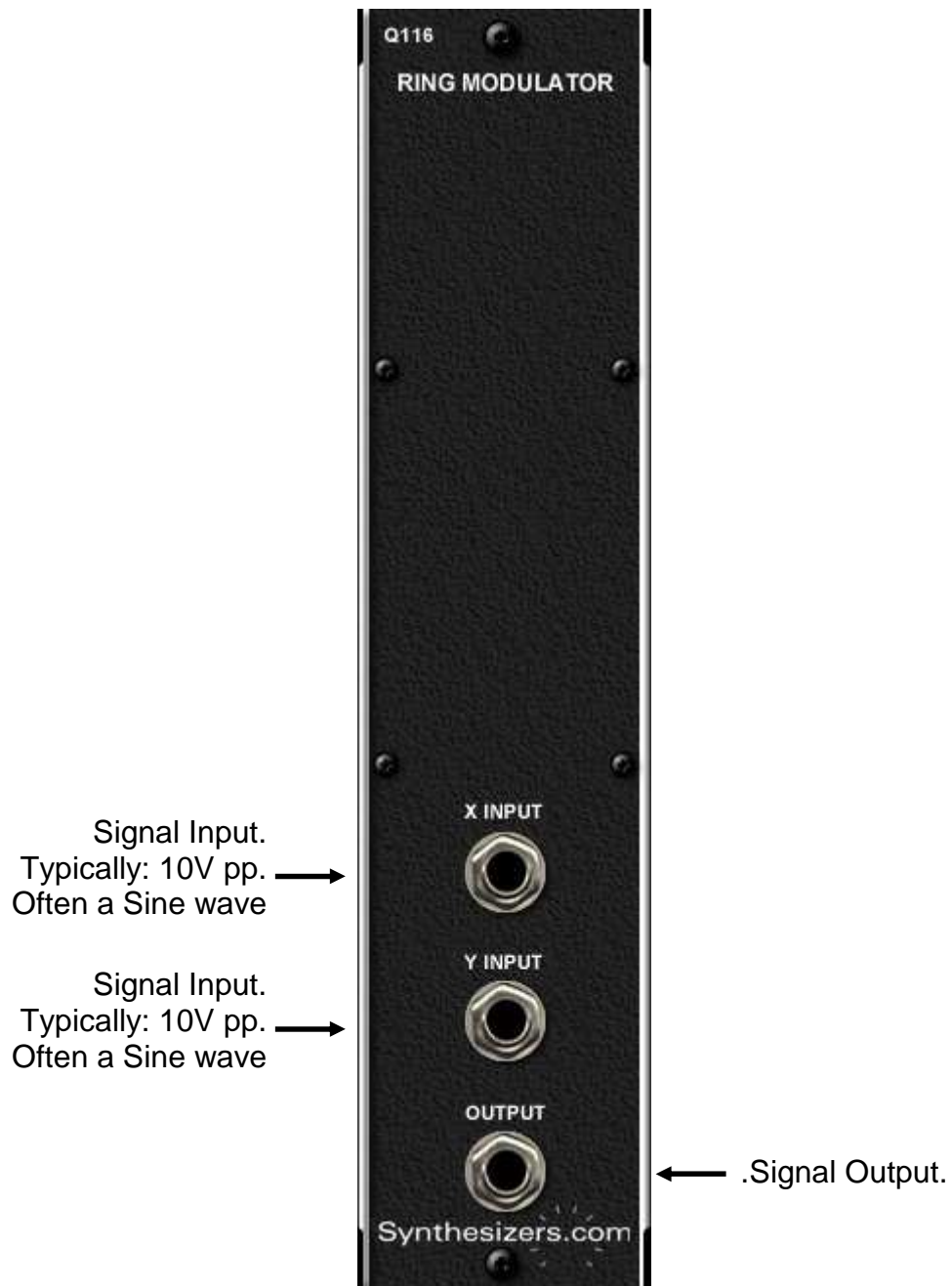
## Usage and Patch Tips

### The Basics

Simply put, the Ring Modulator makes strange sounds by combining two signals. A simple patch would include an oscillator driven by the keyboard into the X input, and another manually controlled oscillator into the Y input, then patch the output to an amplifier which is driven by an envelope generator. The result will be a bell-like sound.

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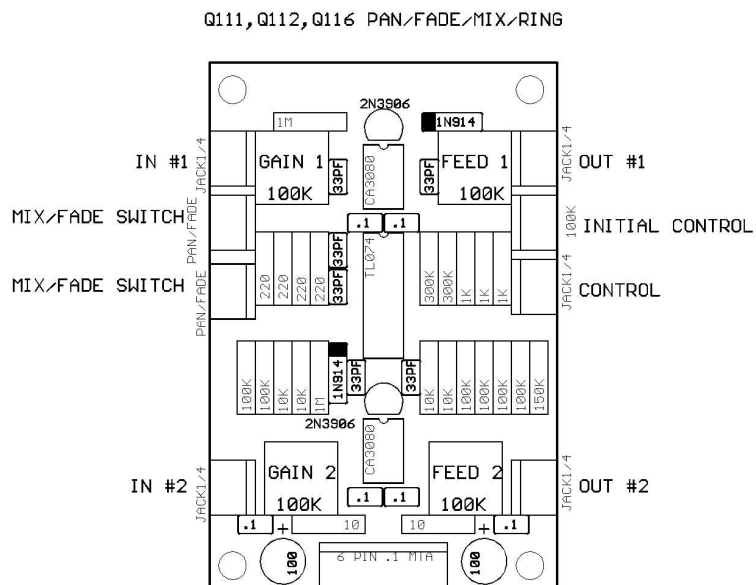
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## Calibration and Testing

Calibration is accomplished with 3 trim pots.

1. Center all 3 trim pots.
2. Apply a +/-5v sine wave to the Y Input, 0v to the X Input, and an Oscilloscope to the Output.
3. Adjust both Feedthrough pots for minimal waveform amplitude (50mv scale).
4. Apply a +/-5v sine wave to the X Input, 5v to the Y Input, and an Oscilloscope to the Output.
5. Adjust Gain #1 pot for a +/-5v output signal.

## PC Board Layout



## Power Connector

6 pin .1" MTA type connector made by AMP. Available from Mouser Electronics or Digi-Key. Modules have a male PCB-mount connector and cable harnesses have a female.

### Part Numbers:

Female cable mount: #6404416

Male PCB mount: #6404566

### Pinout:

- 1 = +15v
- 2 = key (pin removed)
- 3 = +5v
- 4 = gnd
- 5 = -15v

Not all voltages are used on all modules.