

ARIES AR-317 VOLTAGE-CONTROLLED OSCILLATOR MODULE

The Aries AR-317 Voltage Controlled Oscillator (VCO) is an extremely versatile package which represents a major improvement over other oscillators. It generates all the basic synthesizer waveforms simultaneously: Sawtooth, Triangle, variable width Pulse (Square) and Sine. An engineering breakthrough in sine converters provides a pure, low distortion sine wave, which allows really clean balanced modulation.

Contrary to synthesizer kits which use linear oscillator control, the AR-317 VCO uses accurate full range exponential control. Only this type provides 1 octave per volt (1/12 V per semitone) control of frequency over the entire range of hearing. Only exponential control (with a linear keyboard or control voltage source) allows unlimited flexibility in controlling any number of oscillators from any number of sources.

The AR-317 VCO has 4 control inputs, 1 of which has a level control. Its 1-octave per volt characteristic means that signals may be summed, and each positive volt doubles the frequency, and each negative volt halves it, over an extremely wide range.

A Sync input allows any external square or pulse wave to drive the VCO at exactly the same frequency, or any multiple (harmonic) of the external source. This can generate all sorts of unique speech-like tones. In addition, the width, or duty-cycle of the pulse wave may be voltage controlled (modulated) from an external source.

The AR-317 VCO also has many uses in the electronic lab; i.e., as a function generator, audio sweep oscillator, frequency response tester, transient generator.

The low frequency range, together with the Sync feature, can be used to create unique envelope signals and vibrato type modulation waveforms.

FEATURES:

- Wide Range: Less than 1 Cycle / Minute to over 50,000Hz in 2 Ranges
- Extremely Accurate: Oscillators Track together in tune over entire hearing range
- No Drift: Fully temperature stable
- Very Pure Sine Wave, plus Sawtooth / Triangle / Variable Width Pulse (Square) Waves, simultaneously available
- Phase Synchronizing (Sync) Input
- Pulse Width Modulation Input gives phasing and chorus effects
- 4 Controls Inputs (1 Octave / Volt)
- 1 Control Input Attenuator
- Coarse and Fine Frequency Control
- Pulse Width Control (0 to 100%)

Specifications

- Frequency Range
 - Manual Control (2 ranges): 0.03 Hz to 30Hz / 16Hz to 16kHz
 - May be driven by voltage control from 1 cycle every 10 minutes (0.002 Hz) to 50kHz typically
- Control Inputs 0 to 1V/Octave
- Control Input Level +/- 10 V max
- Sync Input
 - Positive going edge triggers all waveforms to reset
 - Requires at least 2V.
 - Max Level = 10V

- Pulse Width variable 0 to 100% duty cycle (50% = Square Wave)
- Pulse Width Modulation
 - 10% per Volt
 - Maximum Input = +/- 10V
- Sine Wave incorporates a significant advance in waveform converter circuitry which provides a very clean, low distortion, pure sounding sine wave
- All Input Impedances 50K ohms min
- All Output Impedance 1K ohms

Controls

- Coarse Frequency
- Fine Frequency (+/- 1/2 octave)
- Control Input 1
- Pulse Width

Connections

- 4 Control Inputs (1 with Attenuator)
- Sync Input
- Pulse Width Modulation (PWM) Input
- 4 Waveform Outputs (Triangle / Sawtooth / Pulse / Sine)

Power Consumption

- 36mA at +15V
- 36mA at -15V

VCO

FREQUENCY

256

1K

x1

64

4K

16 16K

x0.3 x1.6

COARSE

FINE

4 5 6
3 7
2 8
1 9
0 10

50%
5% 95%

CONTROL 1

PULSE WIDTH

x .0021 x 1

RANGE

1

SYNC

wave

2

PWM

wave

3

wave

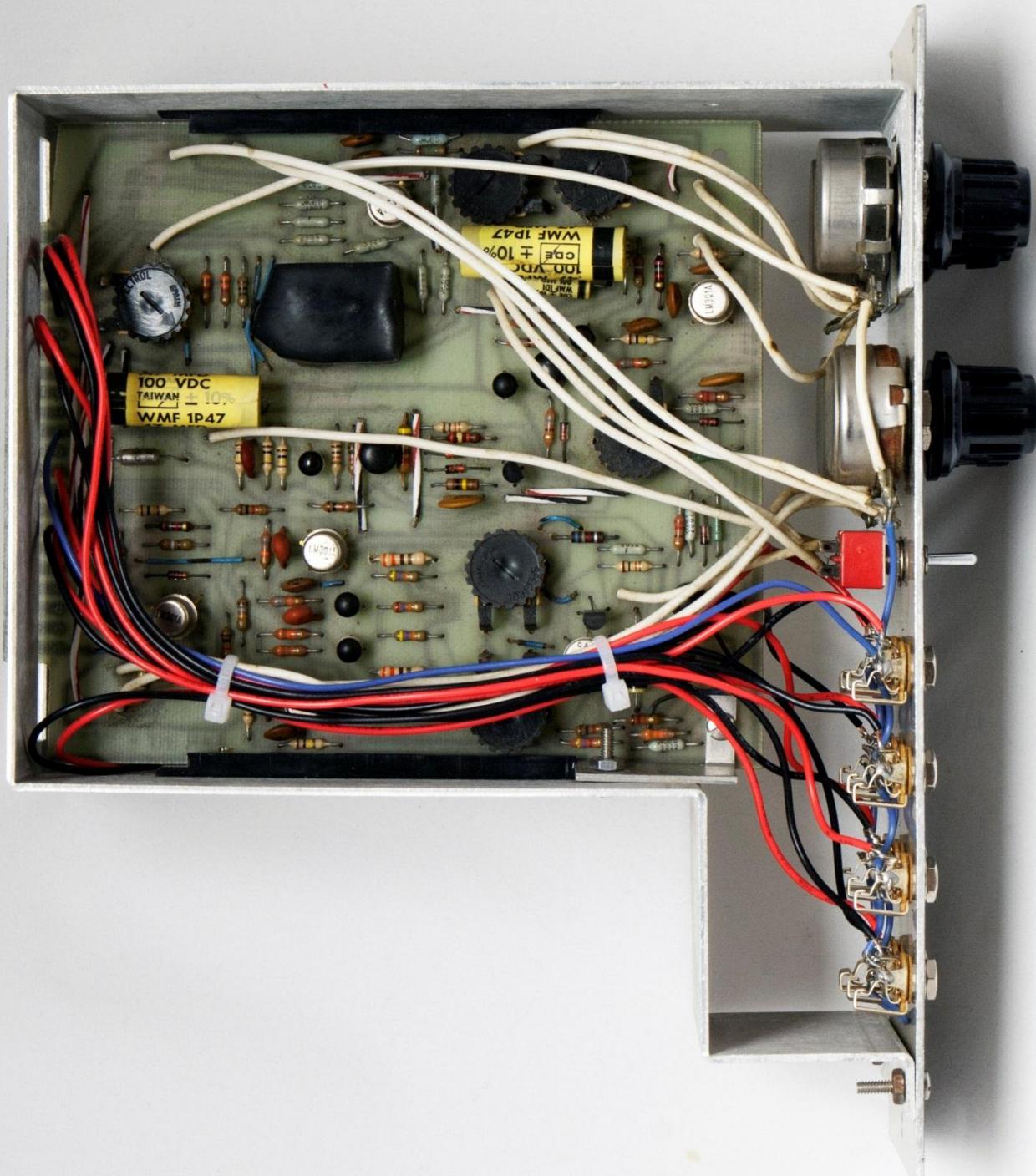
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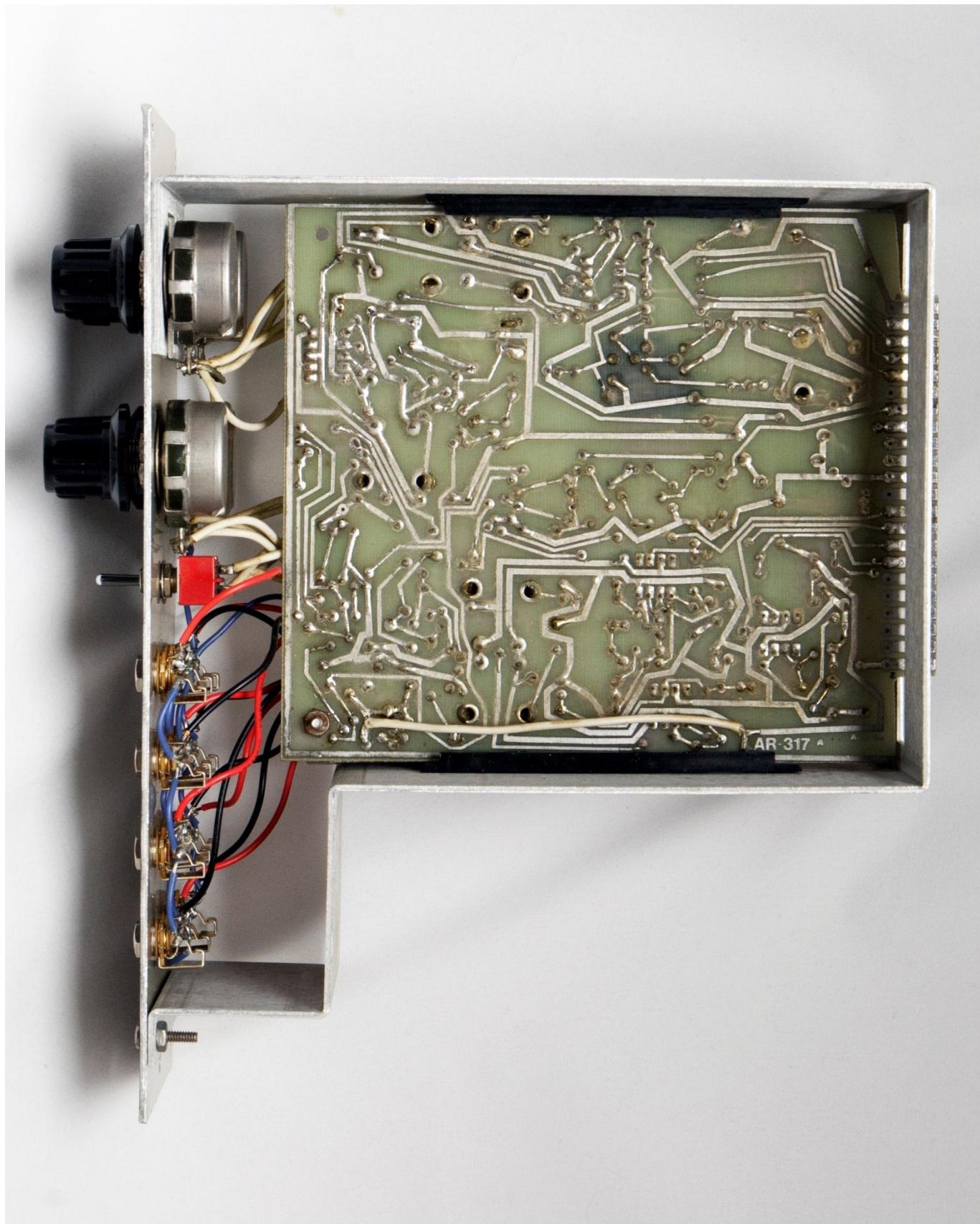
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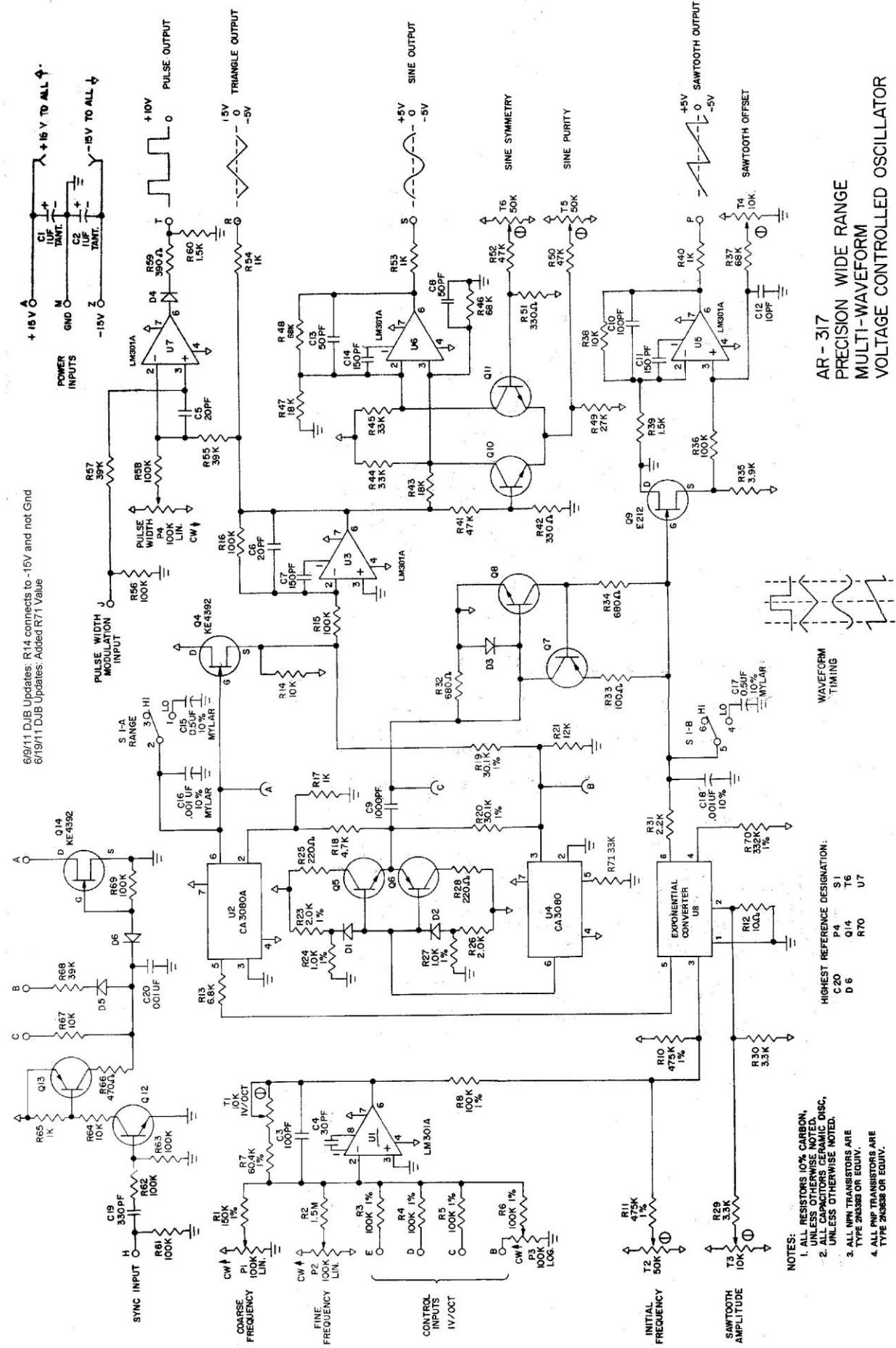
CONTROLS

OUTPUTS

AR-317







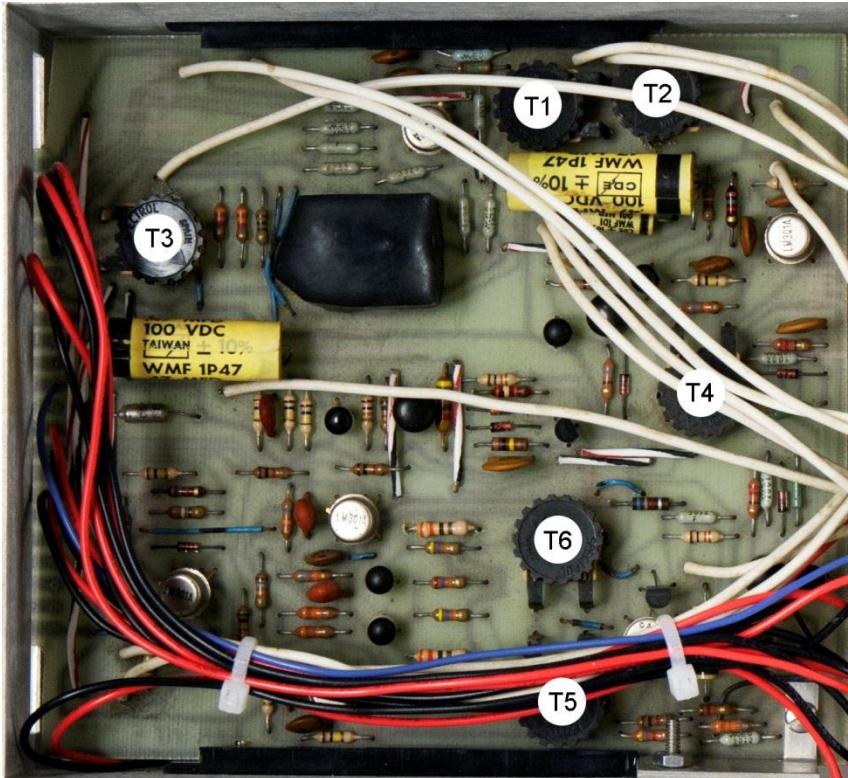
NOTES:

1. ALL RESISTORS 10% CARBON, UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS CERAMIC DISC, UNLESS OTHERWISE NOTED.
3. ALL NPN TRANSISTORS ARE TYPE 2N3868 OR EQUIV.
4. ALL PNP TRANSISTORS ARE TYPE 2N3868 OR EQUIV.

HIGHEST REFERENCE DESIGNATION:

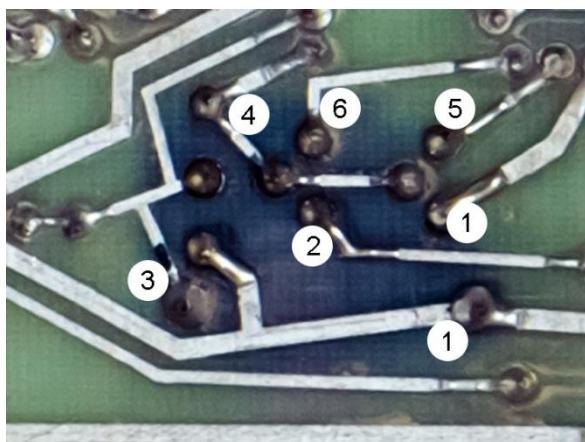
WAVEFORM
TIMING

AR-317 PRECISION WIDE RANGE
MULTI-WAVEFORM
VOLTAGE CONTROLLED OSCILLATOR

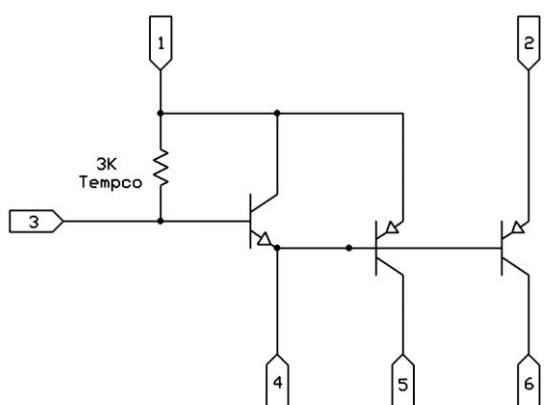


AR-317 Trimmers

- T1: 1V/Oct
- T2: Initial Frequency
- T3: Sawtooth Amplitude
- T4: Sawtooth Offset
- T5: Sine Purity
- T6: Sine Symmetry



The exponential converter potted module U8 contains three transistors and a 3K Tempco resistor. U8 is drawn on the schematics as a 6 pin module but you can see the 11 individual pins on the solder side of the PCB. The numbers correspond to the pin numbers shown on the schematic.



This is the internal schematic of the exponential converter potted module U8.