

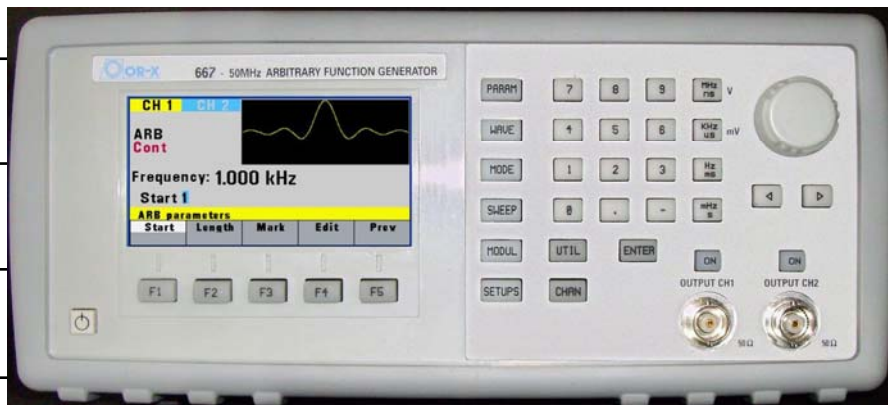


# MODEL 667

## DUAL CHANNEL

### ARBITRARY WAVEFORM GENERATOR

- \* 50 MHz Sine and Square Waveforms
- \* 4M-point Arbitrary Waveforms
- \* 200 MHz Sampling Rate
- \* 14 bit Resolution
- \* USB TMC and GPIB



#### Capabilities

The MODEL 667 can generate standard DDS or Arbitrary waveforms with sampling rates of up to 200 MHz (5 ns), 14 bit vertical resolution and up to 4M points length. The sampling rate can also be controlled by an external clock. All waveforms are internally generated with amplitudes up to 10Vp-p into 50  $\Omega$  and 4 digits resolution. An offset generator allows generation of signals with large offsets. A full range of triggering capabilities is available, including internal-external trigger source, gated and burst modes of operation. Each channel can be operated fully independently or channels can be linked, coupled and phased adjusted. Additional units can be parallel connected to produce multi channels waveforms.

#### Easy Operation

A menu-driven front panel operation with a graphic high resolution color LCD makes the MODEL 667 easy to operate. Parameter changes and data entry can be made using the numerical keys or rotary knob. Waveform editing can be done from scratch or by modifying standard waveforms. A PC software program, **Wave-X** Arbitrary Waveform Editor, allows you to easily create, edit and download complex waveforms. Multiple waveforms can be stored in the instrument flash memory.

#### External Reference

A 10MHz external reference clock lets you synchronize the unit for precise phase adjustment.

#### Standard Waveforms

The wide choice of build-in standard waveforms gives instant access to frequently used test signals. The standard waveforms are: sine, triangle, square, ramps, pulses and DC. The waveforms can be swept over the full unit frequency range. AM, FM and FSK modulation are available with programmable internal or external signals.

#### Programming

The instrument can be remotely controlled by the build-in USB TMC or the optional GPIB IEEE-488.2 interface. All parameters, modes and functions are programmable and SCPI compatible.

# MODEL 667 - SPECIFICATIONS

The **MODEL 667** is a programmable **Dual Channel - Arbitrary Waveform Generator**, generating user defined waveforms or Sine, Square, Pulse, Triangle, Ramp up, Ramp down, etc. Each channel can be operated fully independently with the following characteristics:

## OPERATING MODES

**Continuous:** Output continuous at programmed parameters.

**Triggered:** Output quiescent until triggered by an internal, external, GPIB or manual trigger, then one waveform period is generated at the programmed point rate, amplitude and offset. Up to 20MHz trig rate for ARB waveforms and 10MHz in DDS mode.

**Gated:** Same as triggered mode except waveform is executed for the duration of the gated signal. The last waveform period started is completed.

**Burst:** Same as triggered mode for programmed number of waveform from 2 to 1,000,000.

## ARBITRARY CHARACTERISTICS

**Horizontal Resolution:** 4,194,304 points.

**Vertical Resolution:** 14 bits (- 8191 to + 8191).

**Point Execution Rate:** 5 ns to 100s (200 MHz) with 4 digits resolution (limited to 1ps) and 0.001% accuracy.

## FREQUENCY CHARACTERISTICS

**Sine:** 1uHz to 50 MHz.

**Square:** 1 uHz to 50 MHz.

**Triangle:** 1 uHz to 5 MHz.

**Pulse:** 0.5mHz to 25 MHz with variable width, rise and fall times.

**Accuracy:** 10 ppm.

**Resolution:** 12 digits.

## OUTPUT CHARACTERISTICS

**Amplitude Range:** 10mV-10Vp-p

into 50  $\Omega$ , 20Vp-p into open circuit

**Resolution:** 4 digits (9999 counts)

**Accuracy:**  $\pm 1\%$   $\pm 20\text{mV}$  of the programmed output from 1V- 10V.

**Units:** Vp-p, Vrms, dBm

**Flatness:**  $\pm 0.1\text{dB}$  to 1MHz  
 $\pm 1\text{dB}$  to 50 MHz

**Offset Range:**  $\pm 4.99\text{V}$  into 50  $\Omega$ .

**Offset Resolution:** 4 digits, 10 mV.

**Offset Accuracy:**  $\pm 1\%$   $\pm 10\text{mV}$ .

**Output Impedance:** 50 $\Omega$ .

**Filters:** 9 pole Elliptic and 5 pole Bessel filters.

**Protection:** The instrument is protected against short circuit to ground or to any voltage practically available in electronics laboratories.

## WAVEFORM CHARACTERISTICS

### Harmonic Distortion:

DC -100 KHz -65dBc

100KHz-5MHz -45dBc

5MHz-50MHz -35dBc

**Spurious:** DC-1MHz, < -60dBc

**Square Rise/Fall Time:** < 5 ns (10% to 90%) at full amplitude into 50  $\Omega$ .

### Square Variable Duty Cycle:

20% to 80% to 10MHz

40% to 60% to 30MHz,  $\pm 5\%$ .

**Symmetry** at 50%:  $\pm 0.5\%$  to 1MHz.

**Overshoot:** < 3% of p-p  $\pm 50$  mV.

**Triangle Symmetry:** Variable 0%-100%

## MODULATION CHARACTERISTICS

**Amplitude Modulation:** Internal 0.01Hz-20KHz sine wave, square or triangle, variable depth from 0% to 100%.

External: 5 Vp-p for 100% modulation.

**Frequency Modulation:** Internal : 0.01Hz-20KHz sine wave, square or triangle. External: 5 Vp-p for 100% deviation.

**FSK:** Internal rate 0.01Hz-1MHz. External 1MHz max.

**Phase:** Variable from -360° to +360° with 0.1° resolution.

## SWEEP CHARACTERISTICS

**Sweep Shape:** Linear, Logarithmic, Up and Down or Up/Down.

**Sweep Time:** 10 ms to 500 s.

**Sweep trigger:** Internal, External, continuous or burst

## INPUTS AND OUTPUTS

**Sync Output:** Positive TTL pulse at selected frequency, 50  $\Omega$  impedance.

**Trigger Input:** TTL compatible, 10K $\Omega$  nominal impedance. Max. rate 20MHz, Minimum width is 20ns.

**Modulation Input:** 5 Vp-p for 100% modulation, 10 K $\Omega$  input impedance, DC to >50 KHz bandwidth.

**Ref Input:** 10MHz, TTL compatible.

**Ref Output:** 10MHz, TTL levels

**Marker Output:** TTL levels

## INTERNAL TRIGGER

**Repetition:** 0.01Hz - 1MHz

**Resolution:** 4 digits

**Accuracy:**  $\pm 0.002\%$

## INTERFACE

USB TMC

GPIB - IEEE488.2

SCPI compatible

## GENERAL

**Store memory:** 50 full panel settings at power-off

**Arbitrary memory:** 8 waveforms of up to 4M points, for each channel, in internal flash memory

**Power Requirements:** 90-264V, 50 VA max.

**Dimensions:** Height: 88 mm (3.5 in)

Width: 213 mm (8.4in)

Length: 300 mm (12 in)

Weight: 3 Kg net.

**Operating Temperature:** 0 °C to 50 °C

**Humidity:** to 95% RH, 0 °C to 30 °C

**EMC:** EN61326-1

**Safety:** EN61010-1

**CE Labeled**

## NOTES

Specifications are verified according to the performance check procedures in the technical manual. Specification not verified in the manual are either explanatory notes or general performance characteristics only.

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