

# FREQUENCY, FUNCTION & WAVEFORM SYNTHESIZERS

## 1 Hz–20 MHz Pulse/Function Generator

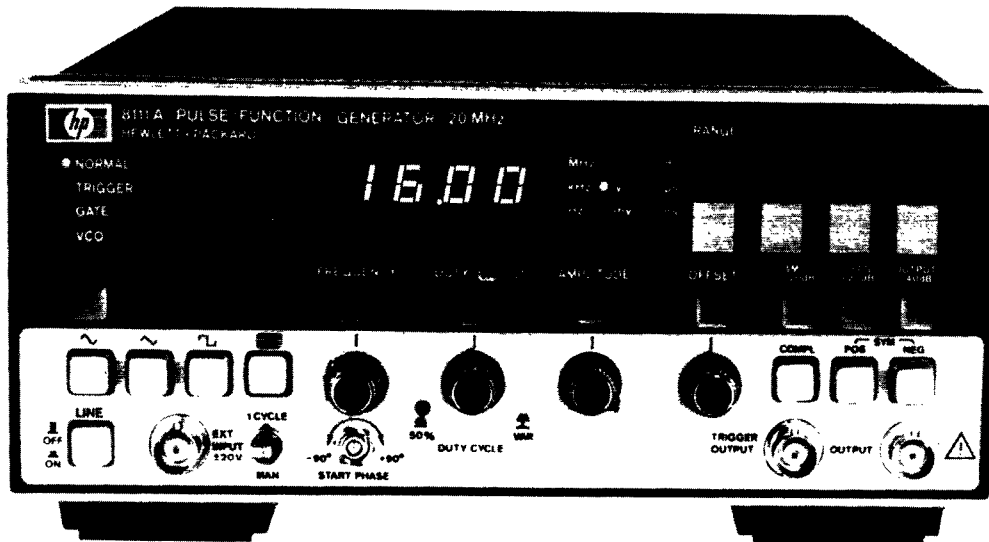
### Model 8111A

411

- Sine, triangle, square, haversine functions
- 20 MHz, 32 Vpp for all waveforms
- Variable duty cycle or pulse width

- Trigger, gate, VCO and optional burst
- Digital display for all parameters
- Error recognition

Picture shows 8111A with Option 001, Counted Burst.



The HP 8111A combines pulse generator and function generator capabilities in a single, compact unit. Triggered operation for all waveforms, and the ability to define rectangular waveforms in terms of pulse width or duty cycle, are examples of the HP 8111A's versatility.

### Saves Space and Equipment

Small size and manifold capability make the HP 8111A an ideal source for service and bench. Digital display, error detector and good repeatability assure high operating confidence. This reduces the need for output monitoring and consequently saves equipment.

### Flexible

Operating modes include VCO which permits frequency-shift keying and dc-to-frequency conversion as well as sweep and FM applications. Option 001's Burst mode simplifies tone burst generation and digital preconditioning by generating a precise number of waveform cycles. An "extra cycle" feature activated after a burst allows critical events to be examined.

Pulse mode's variable width down to 25 ns and clean 10 ns transitions provide useful digital test capability. High analog flexibility is assured because all waveforms can be generated in trigger, gate and burst modes. Adjustable duty cycle up to 999 kHz means that CRT sawtooth waveforms and rectangular signals for dc motor control can be simulated.

### Specifications (50-ohm load resistance)

#### Waveforms

sine, triangle, ramp, square, pulse, haversine functions.

#### Timing

##### Frequency

**Range:** 1.00 Hz to 20.0 MHz (3-digit resolution).

**Accuracy (50% duty cycle):** 5% ( $\pm 10\%$  below 10 Hz).

**Jitter:**  $< 0.1\% + 50$  ps.

**Stability:**  $\pm 0.2\%$  (1 hour),  $\pm 0.5\%$  (24 hours).

**Duty Cycle** (sine, triangle, square, haversine functions):

	Calibrated	Variable (below 1 MHz)
Range:	50% nominal	10% to 90%.
Resolution:	2 digits	2 digits.
Accuracy:	$\pm 1$ digit	$\pm 6$ digits ( $\pm 3$ in range 20 to 80%).

#### Pulse Width

**Range:** 25.0 ns to 100 ms (3-digit resolution).

**Accuracy:**  $\pm 5\% \pm 2$  ns.

### Output Characteristics

(voltages double into high impedance)

#### Amplitude

**Range:** 1.60 mVpp to 16.00 Vpp (3½ digit resolution).

**Accuracy:**  $\pm 5\%$  (at 1 kHz for sine and triangle).

**Flatness (sine, triangle):**  $\pm 3\%$  ( $+10\%$ ,  $-15\%$  above 1 MHz).

#### Offset

**Range:** 0.00 mV to  $\pm 8.00$  V (3-digit resolution).

**Accuracy:**  $\pm 5\%$  setting  $\pm 2\%$  amplitude  $\pm 20$  mV

(ampl  $\geq 160$  mVpp),

$\pm 5\%$  setting  $\pm 2\%$  amplitude  $\pm 1$  mV

(ampl  $< 160$  mVpp).

**Distortion:** THD (1 Hz–1 MHz)  $< 3\%$  ( $-30$  dB); harmonics (1 MHz–20 MHz)  $< -26$  dB. Distortion may increase by 3 dB below  $10^\circ\text{C}$  and above  $45^\circ\text{C}$ .

**Linearity (triangle):**  $< \pm 3\%$  ( $< \pm 1\%$  below 1 MHz)

#### Pulse and Squarewave Performance

**Transitions:**  $< 10$  ns.

**Perturbations:**  $< \pm 5\%$  ( $< \pm 10\%$  below 0.16 Vpp).

**Output impedance:**  $\pm 50$  ohm  $\pm 5\%$ .

#### Modes

normal, trigger\*, gate\*, VCO and (Option 001) burst\*.

\*Adjustable start-phase for haversine, haversinetrangle

**VCO range:** 2 decades, ext. signal 0.1 V to 10 V (dc to 1 kHz).

**Burst length:** 1 to 1999 periods for all waveforms.

#### General

**Repeatability:** factor 2.5 better than accuracy.

#### Environmental

**Storage temperature:**  $-40^\circ\text{C}$  to  $+75^\circ\text{C}$ .

**Operating temperature:**  $0^\circ\text{C}$  to  $55^\circ\text{C}$ .

**Humidity:** 95% RH,  $0^\circ\text{C}$  to  $40^\circ\text{C}$ .

**Power:** 100/120/220/240 V rms;  $+5\% - 10\%$ ; 48 to 440 Hz; 70 VA max.

**Weight:** net, 4.6 kg (10 lb). Shipping, 6.6 kg (15 lb).

**Size:** 89 H x 212.3 W x 345 mm D (3.5" x 8.36" x 13.6").

#### Ordering Information

HP 8111A Pulse/Function Generator

Opt 001: Burst

Opt 910: Extra Operating and Service Manual

HP 5061-9701: Bail Handle Kit

HP 5061-9672 Rack Mount Kit (single HP 8111A)

HP 5061-9674 Rack Mount Kit (two instruments)

HP 5061-9694 Lock Link Kit (for use with HP

5061-9674)

☎ Fast-Ship product—see page 758

#### Price

\$2400 ☎

add \$480

add \$39

\$38 ☎

\$49 ☎

\$30 ☎

\$25 ☎