

# 20 MS/s Arbitrary Waveform Generator

# 2714A

## ■ High-Fidelity Waveform Generator

0.06% Waveform Distortion  
128k Waveform Memory

## ■ Systems-Ready

RS-232 and GPIB  
Multi-phase Mode

## ■ Complete Set of Tools

Waveform Creation Software included  
Sequence Generator (optional)

## ■ Value and Outstanding Support

Best Value  
Superb Technical Assistance



## Comprehensive Solutions

Get abundant waveforms using the resident standard set; or import your application waveform file; or create your signals using WaveWorks Jr. creation software included in this package. Then, for instant recall, store all your waveforms in the 128k nonvolatile memory. You are now ready to proceed with your testing, such as I and Q modulation profile for communications, radar or sonar simulations, complex electromagnetic simulation, ultrasound detector emulation and a host of other applications.

## Complete Set of Tools

The 2714A offers 10 resident standard waveforms for function-generator simplicity, and direct-dial access to 100 user-defined waveforms. Additionally, WaveWorks Jr. software provides 21 standard functions, waveform math features and sequence generator programming capability for waveform iteration. At the click of a mouse, you can

perform frequency and time domain synthesis and analysis using tabular and graphical means. All this with excellent waveform fidelity of 12 bits, plus an impressive 131,036 point waveform memory with complete partitioning flexibility.

## Waveform Integrity

You deserve consistent, repeatable waveforms from your arbitrary waveform generator. This performance is assured in the 2714A with its direct sequential addressing of waveform memory. Other generators using phase accumulator based addressing schemes produce precession and inaccuracies in successive memory scans. At higher sample rates the need for longer waveform memory becomes obvious. The 2714A offers the longest memory in its price range and -65 dB total harmonic distortion plus noise. Critical mixed signal applications require the wide dynamic range of this instrument.

## Systems Ready

The RS-232 serial port offers direct, easy programming. GPIB features higher speed and a more sophisticated interface. WaveWorks Jr. functions in both arenas using a graphical presentation. Three multi-phase modes are included to synchronize multiple units for phase generation applications.

## Value and Invaluable Support

Unmatched in price performance and feature set, the 2714A is a natural choice offering outstanding quality with ready access to the best customer support in the industry. Your satisfaction is guaranteed as a Pragmatic customer. Call for immediate attention, fax or e-mail 24 hours, and visit our Web site.

*To bring an effective solution to your application is our highest priority.*

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**2714A**

## Output Waveforms

Up to 100 User-defined Waveforms, Standard Waveforms: Sine, Square, Triangle, Ramp, DC, Exponential, Haversine, Pulse, Gaussian, Sin x/x (Sinc).

## Sequence Generator (Optional)

**Waveform:** Transient-free Loop and Link

**Repetitions:** **Loop:** 1,048,575 times **Link:** 100 waveforms

**Program:** 100 Steps per Sequence

**File:** 10 Sequences

## Waveform

**Storage:** 100 waveforms

### Resolution:

Horizontal Points: 131,036 max.

Vertical Points: 12 bits, 4096 (-2048 to +2047)

### Sample Rate:

Range: 0.1Hz to 20MHz (10s to 50ns)

Resolution: 4 digits

Accuracy:  $\pm 50$ ppm

### Transition Time: <20ns

*(Tested with square wave, filter off, 10Vp-p, 50 $\Omega$  termination.)*

### THD + Noise: -65dB typical (20kHz sinewave)

*(Tested with 80kHz measurement bandwidth, 20MHz clock, sinewave, 1000 points, filter on, full amplitude, 50 $\Omega$  termination.)*

### Amplitude and Offset

<u>Range</u>	<u>Resolution</u>	<u>Accuracy</u>
$\pm 1.00$ to 10V	10mV	1% of setting + 20mV
$\pm 100$ mV to 999mV	1mV	3% of setting + 5mV
$\pm 10$ mV to 99.9mV	100mV	5% of setting + 1mV

*(Tested with 1kHz sinewave plus DC offset, 50 $\Omega$  source impedance, open circuit.)*

### Selectable Analog Filter

Cutoff: 7MHz, 7th order

## Operational Modes

**Continuous:** Output runs continuously between selected memory address locations.

**Triggered:** Output at start point until triggered, then runs once.

**Gated:** As triggered except output is continuous until gate signal ends.

**Burst:** Each trigger outputs a preprogrammed number of waveforms from 1 to 1,048,575.

**Toggled:** Alternate triggers gate the output waveform.

**Master-Slave:** For multi-unit operation.

Cont-Sync: multiple units run continuously in sync with the master unit

Trig-Sync: multiple units run in sync with the master unit for one cycle when the master unit is triggered.

Trig-Sequence: a tail-chasing mode between the master and the slave unit initiated by triggering the master unit.

## Outputs

**Output:** Front-panel main waveform output, 50 $\Omega$  impedance.

**Sync Output:** Front-panel TTL sync output, 50 $\Omega$  impedance.

**Clock Out:** Rear-panel AWG waveform sample clock output (TTL). x2 sample clock.

**Reference Out:** Rear-panel internal 10MHz reference output (TTL).

**Sync Trigger Out:** Triggers additional units

## Inputs

**Trigger Input:** Rear-panel TTL trigger input for triggered, gated, burst, toggled and master-slave modes.

**External TTL Sample Clock Input:**  $\leq 20$ MHz

**Reference In:** Rear-panel 10MHz reference input will phase lock the internal crystal-controlled oscillator.

## Trigger Sources

External Trigger Input

Manual Trigger

## Waveform Creation Tools

**Software:** WaveWorks Jr. for Windows

**Operating System:** Windows 95 or 3.1; MS-DOS 6.2

**PC Requirements:** 486DX or better with 4MB RAM space

**Interface:** COM port or National Instrument AT-GPIB card (or equivalent)

**Standard Function:** 21

### Math Operation:

Operators: 6

Transfer Function: 12

**Sequence Creation** (optional hardware required)

### Waveform Analysis:

Frequency Domain: FFT and IFFT: up to 500th harmonic, graphic display and tabulation

Time Domain: Waveform and Digital Pattern

Edit: Point, Vertex and Harmonics (FFT, IFFT).

## Computer Interface

**RS-232C:** 19.2k Baud. max.

**GPIB:** IEEE Std. 488.2-1987

## General

**Temperature Range:**  $+23^{\circ}\text{C} \pm 3^{\circ}\text{C}$  for specified operation.

Operates  $0^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ . Storage  $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .

**Dimensions:** 11.5cm (4.53 in.) H; 25.8cm (10.14 in.) W; 30cm (11.81 in.) D.

**Weight:** 5.0kg (11 lbs)

**Power:** 55VA; 45W (max) 100/120/220/240 VAC.  $\pm 5\%$ ,  $-10\%$ ; 48 to 63 Hz.

Weight and dimensions are approximate. Errors and omissions excepted. Prices and specifications subject to change without notice. Pragmatic is the registered trademark of Pragmatic Instruments, Inc.

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