

# 2MS/s Arbitrary Waveform Generator

# 2711A

- **Very High-Fidelity Waveform Generator**  
0.005% Waveform Distortion
- **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 and Superb Technical Assistance



## Comprehensive Solutions

Three ways to get your waveforms. Use any of the resident standard waveforms. Or, create your signals using the waveform creation software included in this package, WaveWorks Jr. Or, import your application waveform file. Then, for instant recall, store all your waveforms in non-volatile memory. You are now ready to proceed with your testing, whether of power line harmonics, audio signals including phase-coherent multi-tones, automotive air bags or ABS brakes, medical devices with cardiac or respiratory waveforms, and a host of other applications.

## Complete Set of Tools

The 2711A 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 16 bits, plus an impressive 65,536 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 2711A with its direct sequential addressing of waveform memory. Other generators using phase accumulator based addressing schemes produce precession and inaccuracies in successive memory scans. Also the 2711A's total harmonic distortion plus noise of -86 dB is a must in multi-tone studies or harmonic synthesis which require wide dynamic range signals.

## Systems Ready

Standard RS-232 and GPIB IEEE-488.2 remote control interfaces. The RS-232 serial port offers a direct, easy programming capability. GPIB features higher speed and a more sophisticated interface. For convenience and simplicity, 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

The 2711A is unmatched in performance and value. Equally important, as a Pragmatic customer, you have access to the best customer support in the industry. You will speak to a real person when you call. If you prefer, you can fax or e-mail 24 hours or visit our website.

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

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# 2 MS/s Arbitrary Waveform Generator

**2711A**

## Output Waveforms

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

## Waveform

**Storage:** 100 waveforms

### Resolution:

Horizontal Points: 65,500 max.

Vertical Points: 16 bits, 65,536 (-32768 to +32767)

### Sample Rate:

Range: 0.1Hz to 2MHz (10s to 500ns)

Resolution: 4 digits

Accuracy:  $\pm 50$ ppm

### Transition Time: <150ns

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

### THD + Noise: -86dB typical (2kHz sinewave)

*(Tested with 80kHz measurement bandwidth, 2MHz 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	100 $\mu$ V	5% of setting + 1mV

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

## Selectable Analog Filter

Cutoff: 700kHz, 7th order; 40kHz, 3rd order

## 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

## 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:**  $\leq 4$ 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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