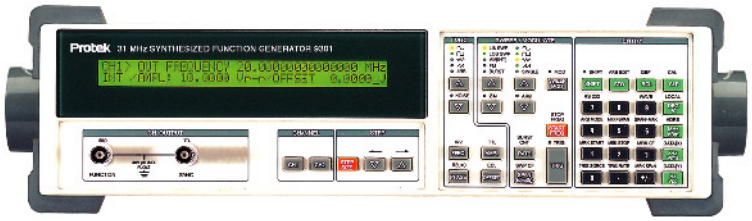
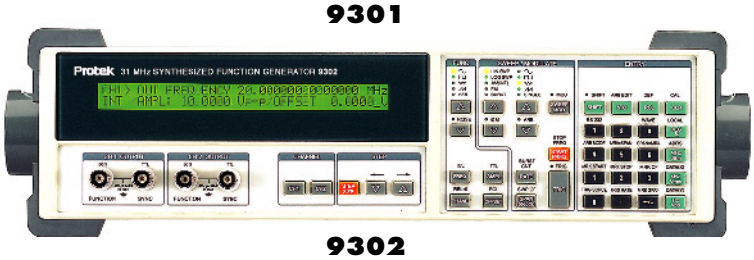
# 1 & 2 Channel Synthesized Function/Arbitrary Waveform Generator

- Log, linear, phase continuous sweeps
- Frequency to 31MHz
- 0.01µHz frequency resolution
- 16 to 16K points arbitrary waveform lengths
- Standard waveforms: Sine, Square, Triangle, Ramp and Noise
- Includes waveform design software
- Waveforms may be designed via front panel or software
- Dual independent channels (9302)
- Sweep times to 1000s
- AM, FM and phase modulation
- RS-232, GPIB and software interface




**9301**




**9302**

## SPECIFICATIONS

**Waveforms**
Sine, Square, Triangle, Ramp Noise, Abitrary

**Frequency**
Sine and Square: 0.01µHz to 31MHz
Ramp and Triangle: 0.01µHz to 2MHz
Noise: 10MHz

**Output**
Output: 9301: 1CH; 9302: 2CH
Output Volts: 20mV to 20V P-P, no load 10mV to 10V P-P, into 50Ω
Resolution: 3 digits
Best Accuracy: Sine wave: ±0.2dB (1µHz to 20MHz)
Square Wave: ±3% (0.01µHz to 100kHz)
Ramp, Triangle and Arbitrary: ±3%

**DC Offset**
0 to ±10V (no load), 0 to ±5V DC (50Ω load)
Resolution: 3 digits
Accuracy: ±1.5% + 0.2mVDC

**Sine Wave**
Sine Wave Spectral Purity Spurious: < -50dBc (non harmonic)
Phase Noise: < -50dBc in a 30kHz band
Subharmonics: < -50dBc
Harmonic Distortion: -45dBc: DC to 1MHz
-32dBc: 1kHz to 31MHz

**Square Wave**
Rise/Fall Time: < 15ns from 10 to 90% of full amplitude
Asymmetry: < 1% of period + 4ns
Overshoot: < 5%

**Ramp, Triangle and Arbitrary**
Rise and Fall Time: <35ns
Settling Time: <1µs
Linearity: ±0.5% FS

**Arbitrary Waveforms**
Standard: Sine, Square, Triangle, Ramp, DC, Exponential Fall, Noise, Freehand, Line, Damped Sine
Sample Rate: 40MS/s (Max)
Waveform Length: 16 to 16,384 points
Amplitude Resolution: 12 Bit

**Phase**
Range: 9999.99°; Resolution: 0.01°; Rate: 0.001Hz to 10kHz

**Frequency Modulation**
Source: Internal
Waveforms: Sine, Square, Ramp, Triangle, Ramp, Arbitrary
Rate: 0.001Hz to 10kHz
Span: 0.01Hz to 31MHz (2MHz for Triangle or Ramp)

**Amplitude Modulation**
Source: Internal or external
Waveforms: Sine, Square, Ramp, Triangle, Arbitrary
Depth: 0 to 100%
Rate: Internal: 0.001Hz to 10kHz; External: 20kHz Max.
Distortion: < -35dB
DSB Carrier: < -35dB typical at 1kHz modulation rate
Ext. Input: 5V for 100% modulation

**Frequency Sweep**
Type: Linear or log, phase continuous
Waveforms: Up, down, Up-down, Single sweep
Sweep Time: 100µs to 1000s (0.001Hz to 10kHz)
Span: 0.01µHz to 31 MHz (2MHz for Ramp and Triangle)
Markers: Two markers may be set between any sweep point
Sweep Output - 0 to 10V linear ramp signal synchronized to sweep

**Burst**
Waveforms: Sine, Square, Triangle, Ramp, Arbitrary
Frequency: 2MHz Max for any waveform
Count: 1 to 65,000 cycles/burst
Phase Shift: ≤100kHz

**Trigger Generator**
Source: CH 1: Single, Int rate, Pos Ext, Neg Ext 1, Line
CH 2: Int CH 1, Int rate, Pos Ext 2, Neg Ext 2 (9302 only)
Rate: 100µs to 999.99s
External: Positive or negative slope, TTL input
Output: TTL Level

**Timebase**
Accuracy: ±3PPM (20 to 30°C)
Aging: ±3PPM/Yr
Input: 10MHz/N ±2PPM where N=1 to 8.1V P-P Min. input level
Output: > 1V P-P 10MHz sine wave into 50Ω

**General Specifications**
Interface: RS-232 (baud rates from 2400 to 19.2k bps, DCE) and GPIB
Size: 14.0" W × 3.5" H × 13.5" D; Weight: 22 lbs.
Power Consumption: 46Ω (9301); 80Ω (9302)
Supplied Accessories: Manual, Line cord, Software, BNC cable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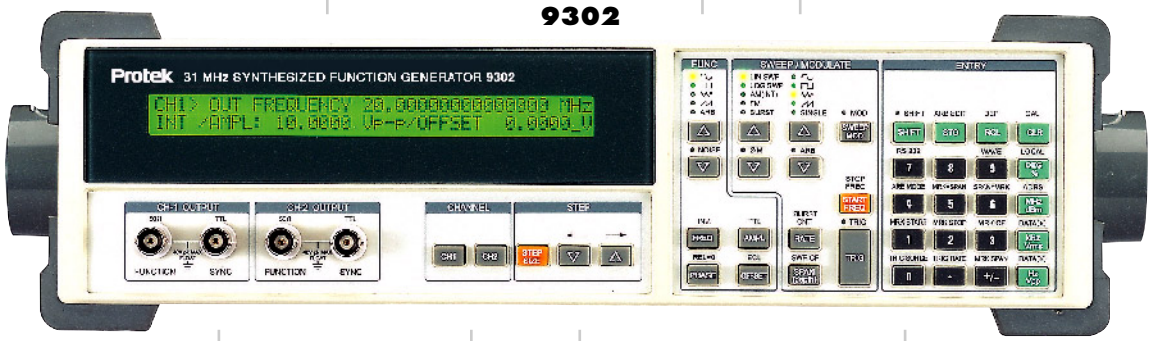
**LCD display** reads out waveform parameters for single or dual channel models

**Function**
Sine, Square, Triangle, Ramp, Arbitrary or Noise may be selected along with their frequency, amplitude and offset values and displayed on the LCD

**Sweep / Modulate**
- Log and Lin sweep
- AM, FM, Phase or burst modulation of Sine, Square, Triangle, Ramp and Arbitrary waves
- Bursts may be from 1 to 65,666 waveforms and internally or externally triggered




**Output**
- Single (9301) or Dual independent outputs (9302) with 10V P-P in to a 50-Ohm load
- TTL compatible Sync output

**Channel**
Displays CH 1 or CH 2 (9302) parameters on the LCD

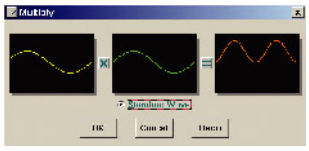
**Step**
All waveform parameters may be changed in any increment or decrement value

**Keyboard entry**
- Amplitude in RMS, P-P or dB units
- Frequency in Hz, kHz or MHz
- Arbitrary waveform data point editing
- Store and Recall waveforms in 16 memory locations
- Setting marker values
- Enabling RS-232 and GPIB Interface

## SOFTWARE

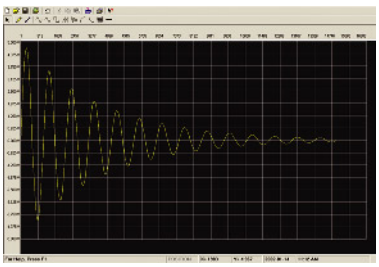
The Protek Waveform composer software allows the user to design a waveform on a computer monitor and then download it to the ARB. The software has 8 standard waveforms: Sine, Square/Pulse, Triangle/Ramp DC, Exponential rise, Exponential fall, Noise and Damped Sine wave, plus Freehand and Line. These standard waveforms, selected from the tool bar are 2K points long and 5 Volts P-P. More complex waveforms of up to 16K points in length may be created using the Waveform and Math menu as shown below.


Waveform creation menu:
Allows you to create a 16 to 16,384 point, multi cycle waveform with Phase Shift, DC Offset and Amplitudes of 0 to ± 5V P-P



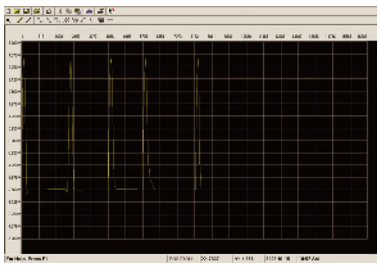

Math menu for creating complex waveforms.

## WAVEFORMS



Waveform tool bar for selecting standard waveforms and drawing custom waveforms

Waveforms from 16 to 16,000 points width and amplitude of up to ± 5 volts may be created and edited.



Example of a custom waveform