BNC Model 630 Function and Arbitrary Waveform Generator

The Model 630 Arbitrary Waveform Function Generator represents the finest single source for signal generation to date. Combining the latest DSP and DSS technologies, the 630 offers a number of operating modes, providing a versatile, cost-effective signal source. You will find the 630 is the best value and most capable instrument for any bench.

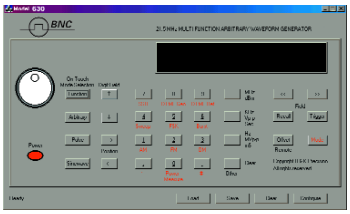
Arbitrary Waveform Function Generator, Sweep Function Generator, Pulse, VCO, AM, FM, Ø Modulation, FSK and Burst Modes are all accessed quickly and easily from the front panel keypad. Being a true 12 bit arbitrary generator, the 630 is stable, accurate and drift free. Unlike competitive models, the 630 generates every data point independently of the repetition rate instead of a simple look-up table. Custom design waveforms on a PC, or download from a number of sources, spread sheet, oscilloscope or application program - the 630 will perform like no other signal source.

- ***Recreate "real-world" signals***
- ***More operating modes***
- ***Simulates normal and aberrant situations***
- ***More standard waveforms***
- ***"The best of both worlds"– EDN***

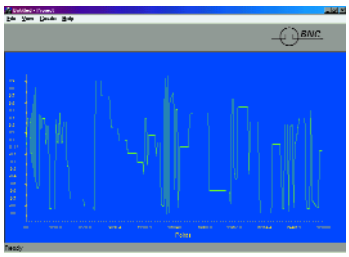
The 630 represents a major breakthrough in signal generation and analysis. This versatile instrument has capabilities that allow the engineer to use it in a broad range of that include communications, radio, telephony, analog / digital circuit design and test.

The 630 is much more than a signal generator. Never before has so much versatility, capability and performance been packed into a single low-cost instrument. Its architecture is based on the latest advances in DSP and DDS technology which not only ensures calibrated and drift-free performance, but also gives the engineer signal analysis functions such as DTMF Detection and Power Level Measurement. The capabilities of the 630 can continually be enhanced and expanded by downloading software upgrades to internal Flash memory.

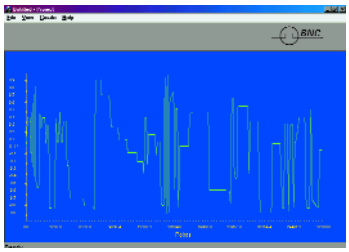
The 630 delivers clean, fully synthesized, DC to 21.5MHz modulated or unmodulated waveforms with 0.01Hz frequency resolution. User-friendly features include a large, easy-to-read illuminated LCD display which allows the user to see all modulation parameters simultaneously and a full numeric keypad and encoder which provide direct editing of each parameter. No confusing submenus!



Control Panel



Freehand Waveform



Amplitude Modulation Waveform

Arbitrary Waveform Function Generator

The Arbitrary Waveform Function Generator allows you to design custom waveforms on your personal computer and download them to the 630 which generates them in real-time. The Arbitrary Waveform Generator system is also used to generate pulse waveforms with an adjustable duty cycle and a suite of pre-stored Function Generator waveforms. Arbitrary waveforms may either be designed with a graphical Windows®-based design tool or be generated point-by-point in a variety of data formats from your own application software. A floppy diskette with a data generator program, example waveforms, and a downloader utility are included with this option.

Arbitrary Waveform Generation

Design custom waveforms on your PC and download for generation 40 MS / s max update rate 12 bit resolution, 32K buffer. Arbitrary waveforms may be designed with a graphical Windows®-based design tool, which is available for free download from www.bkprecision.com.

Function Generator

Generate Triangle, Ramp, Sinewave and others.

Pulse Generator

Digital waveforms with an adjustable duty cycle.

High Stability Timebase

Guarantee ±5 ppm frequency over 32˚ to 104˚F (0 to 40°C) range.

Modes

Basic Sine / Square Wave
Linear / Log Sweep (Free Run or Triggered)
Internal / External AM
Internal / External FM
Internal / External PM
Internal / External BPSK
Internal / External FSK (Ext FSK to 3MHz)
Burst (Int / Ext trigger)
Internal / External SSB
DTMF Detection
Power Measurement
Dualtone Generation
Arbitrary Waveform
Function Generator
Pulse Generator

Specifications subject to change without notice

Berkeley Nucleonics Corporation BNC
3060 Kerner Blvd., #2, San Rafael, California 94901 Tel: 415•453•9955 Fax: 415•453•9956 www.berkeleynucleonics.com

Model 630 Specifications

STANDARD FEATURES

DC offset capability

TTL/CMOS sync output available in all modes

RS232 remote control (Easy to use) Code examples included.

External logic input for gating or output signal and triggering.

Easy software updates via Flash memory.

Configuration save/restore: 10 complete front panel setups.

MAIN OUTPUT

Frequency: DC to 21.5000000 MHz, 0.01 Hz steps

Level: 4 mVp-p to 10.000 Vp-p, 1mV steps (into 50 Ω) or -44 dBm to +24 dBm, 0.1 dBm steps (into 50 Ω)

Level Accuracy: ±1%

Sinewave Distortion: <1%

Flatness: ± 0.2 dB (DC-21.5 MHz) Level 5V @50Ω

DC offset: 0V to ±6 V, 1 mV steps (into 50 Ω)

Output impedance: 50 Ω

Freq. accuracy: ±10 ppm (.001%), ±5 ppm optional (@50Ω)

Phase Noise: < -55 dBc in a 30 kHz band

Spectral Purity: DC to 100 kHz: > -50 dBc

100 KHz to 1 MHz: > -45 dBc

1 MHz to 12 MHz: > -40 dBc

12 MHz to 21.5 MHz: > -35 dBc

SYNC OUTPUT

Amplitude: 0V to +5V (TTL/CMOS comp.)

Fall Time: 3 ns.

Rise Time: < 8 ns. 10% to 90%

Output current: ±24 mA.

RS232 PORT

Asynchronous, no parity, 1 start bit, 1 stop bit.

Baud rate: Adjustable, 300 bps to 115,200 bps.

Remote operation from a terminal or host computer.

EXTERNAL MODULATION INPUT

Maximum full scale input:±5 V (10 Vp-p)

Input Impedance: 30 kΩ

EXT. TRIGGER/GATING/FSK/BPSK INPUT

Input impedance: 80 kΩ

Max. input level: ±10V

Max. gating freq: 3 MHz

EXT. ARB CLOCK INPUT

Input level: TTL/CMOS

Max. clock freq: 40 MHz

OPERATING MODES

The carrier frequency for all modulation modes is 0 Hz to 21.5000000 MHz, 0.01 Hz steps.

All internal modulation frequencies are synthesized and are accurate to 0.01%.

BASIC SINEWAVE (CW) MODE

Output frequency: 0 Hz to 21.500 MHz, 0.01 Hz steps

FREQUENCY MODULATION (FM) MODE

Int. modulation freq: 0 Hz to 10 kHz, 1 Hz steps

Ext. modulation freq: DC to 35 kHz

Peak frequency deviation:0 Hz to ±5.0 MHz, 1 Hz steps

PHASE MODULATION (PM) MODE

Int. modulation freq: 0 Hz to 10 kHz, 1 Hz steps

Ext. modulation freq: DC to 35 kHz

Peak phase deviation: 0 to ±180°, 1° steps

SWEEP MODE

Start/Stop freq: 0 Hz to 21.500 MHz, .01 Hz steps

Linear or Log sweep. Up or Down sweep direction

Continuous or Int/Ext Triggered sweep

Sweep time: 1 ms to 60 sec. 1 ms steps.

VOLTAGE CONTROLLED OSCILLATOR MODE

Endpoint frequencies: 0 Hz to 21.500 MHz, 0.01 Hz steps

Control input range: -5.0V to +5.0V

Control signal bandwidth: DC to 35 kHz

BURST MODE

Continuous or Triggered from Front Panel, RS232, or Ext. TTL

On Time: 1 mS to 99.999 Sec, 1 mS steps

Off Time: 0 mS to 99.999 Sec, 1 mS steps

DUAL TONE MULTI FREQUENCY (DTMF) GENERATE MODE

Dialing digits generated: 0 to 9, #, *, A, B, C, D

Duration: 1 mS to 10.000 Sec, 1 mS steps

Delay: 0 mS to 10.000 Sec, 1 mS steps

CUSTOM DUAL TONE GENERATE MODE

Tone 1, Tone 2 Frequency: DC to 10.000 kHz, 1 Hz steps

Phase Offset: 0 deg. to 359 deg., 1 deg. steps

Output ON time: Cont. or 1 ms to 10.000 sec, 1 ms steps

Output OFF time: 0 ms to 10.000 sec, 1 ms step.

AMPLITUDE MODULATION (AM) MODE

Int. modulation freq: 0 Hz to 10 KHz, 1 Hz steps

Ext. modulation freq: DC to 35 kHz

Percentage modulation: Variable 0% to 100%, 1% steps

SINGLE SIDEBAND (SSB) MODE

Int. modulation freq: 0 Hz to 1.0 MHz, 1 Hz steps

Ext. modulation freq: DC to 8500 Hz

Upper or Lower Sideband selectable

FREQUENCY SHIFT KEYING (FSK) MODE

Int. modulation freq: 0 Hz to 130 kHz, 1 Hz steps

Ext. modulation freq: 0 Hz to 3 MHz

Mark/Space freqs: 0 Hz to 21.5 MHz, 0.01 Hz steps

DATA MODULATION MODE

Baud Rate: 0 Hz to 130 kHz, 1 Hz steps

Message length: 1 to 960 bits. Nonvolatile storage: 10 locations

Mark/Space frequencies: 0 Hz to 21.5 MHz, 0.01 Hz steps

POWER & VOLTAGE MEASUREMENT MODE

Input signal level: ±5 V max. (10Vp-p)

Input signal bandwidth: DC to 50 kHz

Power calc. impedance: Variable from 1 to 999 Ω

BINARY PHASE SHIFT KEYING (BPSK) MODE

Int. modulation freq: 0 Hz to 130 kHz, 1 Hz steps

Ext. modulation freq: 0 Hz to 10 kHz

DUAL TONE MULTI FREQUENCY (DTMF) DETECT MODE

DTMF digits detected: 0 to 9, #, *, A, B, C, D

Detection range: 10 Vp-p max., 20 mVp-p min.

Detection time: 100 ms

ARBITRARY WAVEFORM GENERATOR MODE

Vertical Resolution: 12 bits

Sample Rate: Variable from 0Hz to 40 Msamples/Sec. in .1 Hz steps

Sample Buffer Depth: 32,768 data points

Data Formats Supported: Floating Point, Decimal, Hexadecimal, Integer, Binary, Digital, CSV and PRN formats

Nonvolatile waveform storage: 1 location, 32,768 points

FUNCTION GENERATOR MODE

Waveforms: Pos. Ramp, Neg. Ramp, Triangle, Pos. Exponential, Inverted Pos. Exponential, Neg. Exponential, Inverted Neg. Exponential, Random (noise), Sinewave

Repetition Rate: 0 Hz to 2 MHz in 1 Hz steps, all functions

Run Mode: Continuous or Internal/External Triggered

PULSE GENERATOR MODE

Frequency: 0 Hz to 2 MHz in 1 Hz steps

Duty Cycle: Variable 0% to 100% in 1% steps

Run mode: Continuous or Intl/Ext Triggered

Output: Variable in amplitude and offset, A TTL/CMOS output is simultaneously provided.

GENERAL

Power: 100-240 VAC 47-63 Hz, 30W, 3 prong IEC conn.

Display: 2 line by 40 character, LCD, backlit.

Weight: Approx. 3.5 lbs. (1.6 kg)

Dimensions (H x W x L): 5.5 x 11.75 x 10.375" (140 x 298 x 264mm)

Operating Temperature: 32° to 104°F (0° to 40°C) ambient.

Stored instrument setups: 10, including 1 power-up state

Specifications subject to change without notice

Berkeley Nucleonics Corporation

Tel: 415·453·9955 Fax: 415·453·9956

www.berkeleynucleonics.com