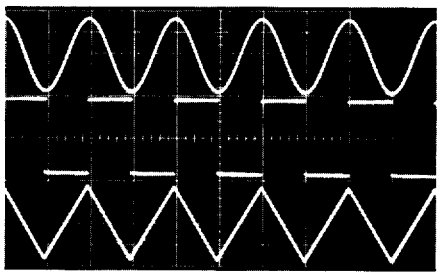
Programmable Signal Source



- **0.0001 Hz to 13 MHz Frequency Range**
- **GPIB Compatiblity**
- **500 Settings Per Second**
- **5½ Digit Synthesizer Option**
- **Waveform Versatility With Phase Lock**

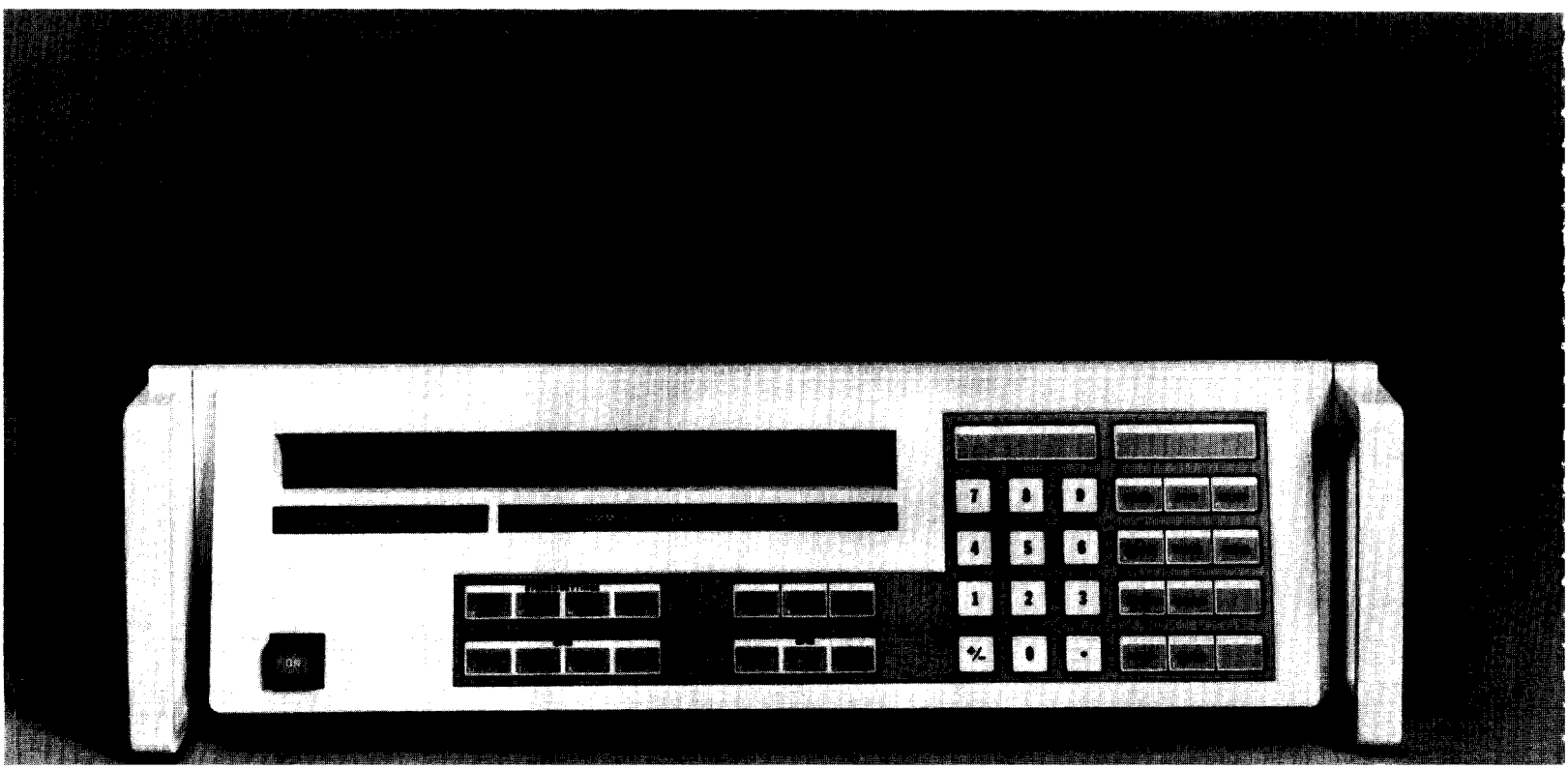
Versatile Performance
Versatile Model 172B generates many different waveforms over a wide frequency range. The instrument is actually an oscillator, waveform generator, pulse generator and synthesizer, all of which are manually or remotely programmable.

The 172B generates sine, triangle, square, haversine and havertriangle waveforms. A no-waveform or dc mode can also be programmed which expands the versatility of the unit to a dc supply with a 50Ω source impedance.

Sweep and FM
With the Wavetek-pioneered VCG (Voltage Controlled Generator) circuit, the Model 172B can be used as an FM generator for frequencies up to 13 MHz. For frequency bandpass testing of components or complete systems, the instrument can be swept three decades, a 1000:1 ratio, by simply applying an external ramp.

Trigger and Tone Burst
All waveforms can be triggered and gated, meaning single cycle or tone burst output be enabled from an external source. In the single cycle, triggered mode, the unit can be operated with the square wave function to provide one pulse output. In this application, the variable symmetry, or duty cycle, control adjusts the pulse width ratio while the frequency control adjusts the time duration of the complete pulse. In the gated mode, the unit can provide a sine wave tone burst for typical sonar applications, while the square waveform burst can give a controlled pulse train for logic testing.

Precision Output Amplitude
The output has high resolution 3 digit programming for precision amplitude offset control throughout the voltage range of 1 millivolt to 15 volts peak-to-peak. This provides the accuracy, repeatability and voltage range needed for most system testing applications. The output also features selectable internal 50Ω termination which eliminates system problems related to signal terminations.



VERSATILITY

Waveforms
Sine ∿, square ⊓, triangle △, pulses ⎍, ⊔, ramps ◿, ◺, haversine ∧, havertriangle ⩚ and dc.

Operational Modes
Continuous, triggered and gated.
Synthesizer: (Option 002.)
Phase Lock: Generator locks to an external 10 Hz to 13 MHz signal when programmed within 2% of the external frequency.

Frequency Range
0.0001 Hz to 12.99 MHz.

Resolution
3 digit standard. Also ref Option 002.

Main Output
∿, ⊓, △, ◿, ◺, ∧, ⩚ and dc variable to 30 Vp-p (15 Vp-p into 50Ω load) with 3 digit resolution. Composite waveform/offset to ±7.5V peak into 50Ω load. 50Ω source impedance with selectable internal 50Ω load.

DC Offset and DC Voltage Output
0 to ±7.5 Vdc into 50Ω. 3 digit resolution.

Auxiliary Output
TTL pulse at generator frequency.

Phase Lock Input
Input: TTL level.
Range: 10 Hz to 13 MHz.

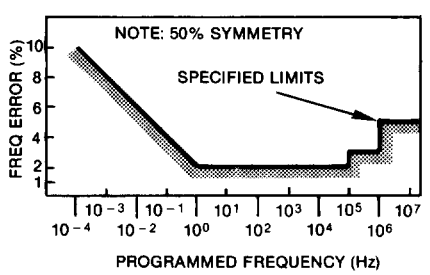
VCG—Voltage Controlled Generator
Up to 1000:1 frequency change for sweep on FM.
Input Signal Bandwidth: 50 kHz for small signal (ΔV = 0.5V).
Input Impedance: 5 kΩ.

Symmetry Control
Waveform symmetry from 10 to 90% in 10% steps for frequencies to 999,990 Hz.

Data Entry
GPIB remote programming and optional front panel keyboard/ display (Option 001).

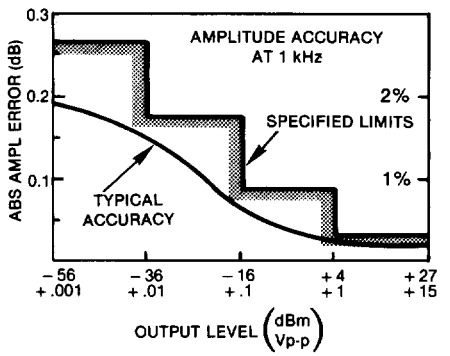
FREQUENCY PRECISION

Open Loop Accuracy

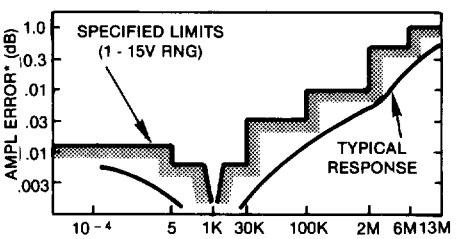


AMPLITUDE PRECISION

Accuracy
Specified for 1 kHz sine wave or dc voltage output with internal 50Ω load and greater than 1 MΩ external impedance.



Frequency Response



**Relative to 1 kHz.*

NOTE: For sine wave relative to 1 kHz signal. External load required above 100 kHz.
∿ and ∿ accuracy are within 0.2 dB of sine wave accuracy.

Amplitude Resolution
3 digits to 9.99 volts.
4 digits ≥10.00 volts.

Amplitude Output Conversion
Vp-p, Vrms, and dBm.

WAVEFORM CHARACTERISTICS

Sine Distortion
Total harmonics referenced to carrier are −46 dB to 30 kHz. Each harmonic reference to carrier is less than:
−40 dB to 1 MHz
−30 dB to 13 MHz
Continuous mode, 2.82 Vp-p test level.

Square Wave Rise and Fall Time
Less than 20 ns (typically 15 ns).

GENERAL

GPIB Programming
GPIB programming fully compatible with the IEEE Standard 488-1978 and with optical couplers. Interface provides AH1 and L4, SH1 and T6, SR1, RL1, DC1 and DT1 capabilities.

Stored Settings and Sweep
Up to 240 complete instrument settings can be stored and recalled by number from volatile (RAM) memory. Settings may be modified or deleted. The setting number recalled may also be incremented or decremented and executed by the GET command, when in a special GET mode. This sweep stepping time requires 2 ms per setting.

Stability (measured at 25 ±1°C)
Amplitude and DC Offset
Short term: 0.025 dB for 15 min
Long term: 0.05 dB for 6 months

Frequency
Short term: 0.3% for 15 min.
Long term: 1.0% for 8 hrs (to 1 MHz).
See Option 002 for synthesizer.

Environmental
Specifications apply for 25 ±10°C after 1 hr unless otherwise noted. Operates from 0 to 45°C, to 10,000 ft altitude, and to 95% rel humidity.

Dimensions
Fits standard 48.3 cm (19 in.) rack. 43.2 cm (17 in.) wide; 13.3 cm (5¼ in.) high; 58.4 cm (23 in.) deep. Has rack mount adapters.

Weight
26.3 kg (58 lb) net; 30.8 kg (68 lb) shipping.

Power
90 to 110V, 105 to 125V, 180 to 220V or 210 to 250V; 48 to 67 Hz; less than 200 watts.

OPTIONS

001: Display and Control Front Panel
Keyboard entry front panel and 40 character alphanumeric display.

002: 5½ Digit Synthesizer
Provides synthesizer accuracy for any waveform selected. The following specifications apply.

Frequency
10 Hz to 12.9999 MHz.

Freq Resolution
5 digits <10 MHz.
6 digits >10 MHz.

Accuracy
Better than 0.0005% of setting.

Frequency Stability
Short term: ±1 × 10^{-7} of frequency per day.
Long term: ±1 × 10^{-6} of frequency per month.
Temperature: 1.2 × 10^{-7} per °C.

Signal To Phase-Noise
>40 dB in a 30 kHz band centered on carrier excluding ±1 Hz band at carrier.

Spurious

172B Frequency Range	Max spurious Signals (greater of)
10 Hz to 999.99 kHz	−60 dB or 40 μV
1 MHz to 4.9999 MHz	−55 dB or 40 μV
5 to 12.9999 MHz	−50 dB or 40 μV

For spurious of 400 Hz to 110 MHz.

Internal Reference Output
10 MHz TTL compatible signal.

External Reference Input
10.0 MHz, 1 to 10 Vrms.

PRICE (FOB San Diego)

Model 172B	**$5995**
Option 001	**$1195**
Option 002	**$1195**