ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

**Artisan Technology Group**
(217) 352-9330 | sales@artisantg.com | artisantg.com

**Full-service, independent repair center**
with experienced engineers and technicians on staff.

**We buy your excess, underutilized, and idle equipment**
along with credit for buybacks and trade-ins.

**Custom engineering**
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

**Expert team | Trust guarantee | 100% satisfaction**

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Keysight / Agilent 8160A* at our website: ***Click HERE***

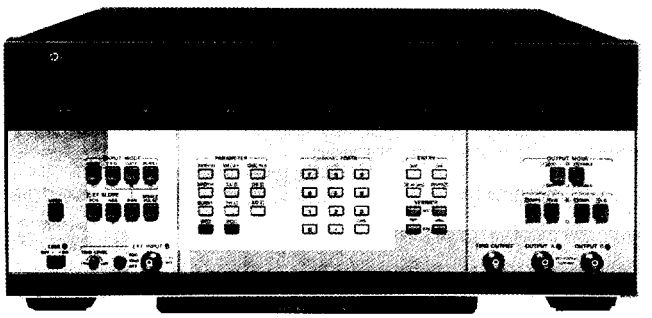
- HP 8160A: 6 ns variable edges/20 V pp
- Hp 8161A: 1.3 ns variable edges/5 V pp
- One-to-three percent basic accuracy
- Variable transitions
- Dual channel (Option 020)

The HP 8160A and 8161A are fully programmable pulse generators designed for high-performance applications on the bench and in automatic test systems. Operation is easy because the pulse parameters are controlled independently and do not inter-react. Dual channel options permit synchronous or complex waveforms to be generated. With its 50 MHz repetition rate, 20 V output, and 6 ns variable transition times, the HP 8160A is a general-purpose pulse generator. The HP 8161A covers the high end of technology with its 100 MHz, 5 V, and 1.3 ns variable transition times. Measured between the 20 percent to 80 percent amplitude points, these transitions are faster than 1 ns and meet ECL requirements.



HP 8161A output

ECL memory output



HP 8160 with Options 020, 700

DESIGNED FOR MATE SYSTEMS

DESIGNED FOR HP-IB SYSTEMS

Combining high programming accuracy with microprocessor-based control capabilities, pulses can be set up without a measuring instrument. Pulse parameters are entered and displayed numerically, and generated with a basic timing accuracy of one-to-three percent, depending upon parameter.

An easy-to-use HP-IB interface brings high-accuracy pulses to automatic test. All parameters and operating modes are remotely programmable using straightforward command sequences. Faster, easier program generation and reduced software costs are direct benefits.

### Precision Pulse Generation

Both models provide precision control over all parameters of their output pulses. The HP 8160A's leading and trailing edge transition times may be independently programmed down to 6 ns. The HP 8161A's transitions have a common control from 1.3 ns to 5 ns, and are independent above 5 ns. Variable transition times are indispensable when digital ICs need to be characterized: either the ICs data sheeted input transition time is required, or the ICs functioning range with various transitions needs to be evaluated.

Direct entry of the high and low levels of the output pulse enables easy adjustment to the logic levels concerned. Pulse width is variable from 4 ns (HP 8161A) or 10 ns (HP 8160A) to 1 s, giving a wide range of duty cycle programmability. Delay shifts the output pulse in relation to the trigger output or, in double pulse mode, defines the pulse spacing.

In the dual-channel versions, double pulse can be selected in either or both channels. This means, for example, that simultaneous clock and data signals can be generated.

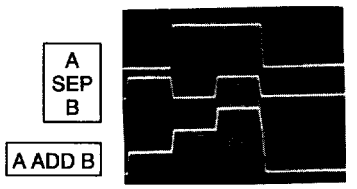
### Counted Burst

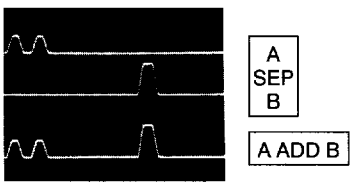
Using Burst Mode, a predetermined number of pulses is generated independent of frequency. Bursts from 0 to 9999 pulses in length may be produced, and can be triggered via an external signal manually or with an HP-IB command.

### Complex Signals

Independent pulse parameters plus individual programmability of the Option 020's dual outputs are augmented by the A ADD B mode. Summation allows complex signals to be precisely and easily set up. Here are some examples:

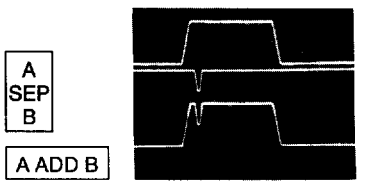
Applications such as radar coincidence circuits and special codes in communications require 3- and 4-level signals. These are conveniently generated by combining channel A and channel B pulses.




Transponder circuits need accurate delays, often with respect to a double-pulse interrogation signal. This is arranged by operating one channel in double pulse mode and setting up the transponder delay in the other.

A critical test for digital circuits and ICs is its glitch and noise sensitivity, which can be easily performed with the A ADD B mode.



# PULSE GENERATORS & DATA GENERATORS

## MATE-Approved Stimuli

### HP 8160A, 8161A

## User Features

### Fast, Reliable Setup

Microprocessor control promotes highly accurate pulses. Parameters are directly entered via the instrument's keyboard, and are then displayed on numeric LEDs with three-digit resolution.

In bench applications, the vernier controls give a fine adjust capability to "tweak-in" any pulse parameter. You can increment or decrement the selected parameter either in single steps or at speed.

Error detection by the microprocessor further simplifies pulse set-up by solving the old problem of incompatible settings. Should pulse width exceed pulse period, for example, the microprocessor indicates a TIMING error. All possible mis-settings are detected and the type of error is indicated to aid rapid correction.

### HP-IB Programming

Microprocessor control over all interface functions makes remote programming as easy and straightforward as manual control. The instruments employ keystroke programming so that data entry via the HP-IB is an exact simulation of manual entry. Bus commands for each front panel key simply replace manual keystrokes.

### Specifications

Specifications apply over the temperature range 20° C to 40° C, with an output load of 50 ohms. More detailed specifications are available in the product data sheets.

**Period**
**Range:** 20 ns to 999 ms (HP8161A: 10 ns to 980 ms)
**Basic accuracy:** ± 3%
**Basic jitter:** 0.1% pp

**Delay/double pulse, width**
**Range:** 0.0 ns to 999 ms (HP8161A: 0 ns to 990 ms)
**Basic accuracy:** ± 1%.

**Transition times** (10 to 90% of amplitude)
**Range:** 6.0 ns to 9.99 ms (HP8161A: 1.3 ns to 900 us)
**Basic accuracy:** ± 3% (HP8161A: ± 10%)

**Output** (50 ohms into 50 ohms)
**Amplitude:** 0.10 to 9.99 V (HP8161A: 0.06 to 5.00 V)
**Window:** ± 9.99 V (HP8161A: ± 5.00 V)
**Basic accuracy:** ± 1%
**Source resistance:** 50 Ω (HP8160A: 50 ohm /1 k Ω selectable)
Output voltages double when 1 k Ω is selected)
**Normal/complement:** Selectable (HP8161A without Option 020 has normal and complement outputs)
**Channel addition:** Selectable with Option 020,3- and 4-level signals feasible. Maximum output: 20 V pp (HP8161A, 5 Vpp)

**Operating modes:** Normal, trigger, gate, ext burst (0 to 9999 pulses), double pulse.
**HP-IB capability:** All modes and parameters can be programmed
Talk mode for status, error messages, stored parameters
**Memory:** 9 programmable locations*
1 location for active operating state*
1 location with fixed parameter set
**Capacity:** 1 complete operating state per location

*Battery back-up for power-off storage

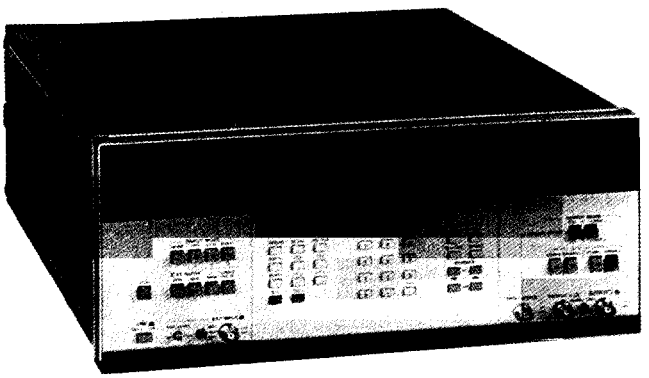
### Parameter Storage

Complete parameter and mode information for nine independent instrument setups can be stored. Waveforms may be stored and recalled either manually or via the HP-IB.

By utilizing a single command to recall an entire instrument setup, controller time is saved. In simple repetitive testing applications, storage of test waveforms gives a high degree of convenience without an external controller.

### Learn Mode

When interrogated by the system controller, the instruments output a character string to the interface bus. This string completely describes the pulser's current setup or any one of its stored parameter sets. Using Learn Mode, you can enter and try out waveforms manually and then automatically transfer them via the HP-IB to the controller for storage in a program.



HP 8161A

### General

**Recalibration period:** 1 year
**Repeatability:** Factor 2 better than specified accuracy
**Operating temperature:** 0° C to 50° C (Specifications apply from 20° C to 40° C. Accuracy derating factors for 0° C to 20° C and 40° C to 50° C)
**Power:** 115/230 V ac + 10%, −22%, 48-66 Hz; 675 VA max
**Weight:** Net 20.8 kg (46 lbs), shipping 25 kg (55 lbs)
**Size:** 178 mm H × 426 mm W × 530 mm D (7 in × 16.8 in × 20.9 in)

| Ordering Information | Price HP 8160A | HP 8161A |
|---|---|---|
| **HP 8160A/8161A** Programmable Pulse generator* | $17,900 | $20,400 |
| **Opt 001** Rear-panel inputs and outputs | $0 | $0 |
| **Opt 020** Second channel (Rate common) | $8,350 | $8,750 |
| **Opt 700** Built-in MATE/CIIL compatibility | $3,060 | $3,060 |
| **Opt 907** Front handle kit (HP 5062-3990) | $66☎ | $66 ☎ |
| **Opt 908** Rack flange kit (HP 5062-3978) | $36☎ | $36 ☎ |
| **Opt 909** Opt 907, 908, combined (HP 5062-3984) | $92☎ | $92 ☎ |
| **Opt 910** Set of operating/programming and service manuals | $122 | $153 |
| **Opt W30** Extended repair service. See page 671. | $380 | $310 |

* HP-IB cables not supplied, see page 615.

☎ For off-the-shelf shipment, call 800-452-4844.

**Artisan Technology Group** is an independent supplier of quality pre-owned equipment

## Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

## We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

## Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP