Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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HP 54600-Series Oscilloscopes

Analog feel and digital power for precise, accurate troubleshooting at an affordable price

**Enhance your troubleshooting capability at an affordable price**

The HP 54600 family of oscilloscopes provide the familiar, easy-to-use controls and interactive displays you’ve grown accustomed to on analog scopes. Yet, to solve your most difficult test problems, these scopes provide powerful digital features, such as pre-trigger viewing, waveform storage, and measurement automation. The eight models in this family give you the features and performance you need for confidence in your critical measurements, at a fraction of the price you’d expect to pay.

**Displays you can trust**

HP 54600-series oscilloscopes feature real-time vector displays that give you a clear and accurate picture of your waveforms. Like analog oscilloscope displays, these enhanced displays give you waveform slew rate information at a glance, with brighter traces representing more slowly changing waveforms and dimmer traces representing more rapidly changing waveforms. These trace intensity differences give you the visual information you need to quickly assess waveform slew rate, for faster, more effective troubleshooting.

The multi-processor architecture of HP 54600-series oscilloscopes delivers a display update rate of over 500,000 points per second (up to 3 million points per second on the HP 54645A). This fast display update means the oscilloscope screen reflects changes in the waveform instantaneously, giving you the display responsiveness you need to make adjustments quickly and see complex waveforms accurately.

In vector mode, HP 54600-series oscilloscopes, provide a fast screen refresh rate of 60 times/second, regardless of the number of waveforms displayed, and minimal display blind time so you can capture and display infrequent events that other scopes might miss.

**Powerful digital features**

The digital architecture of HP 54600-series oscilloscopes gives you a multitude of features that help you get your job done easier and faster:

- Pre-trigger viewing capability lets you view events that you’d miss with an analog scope. This feature lets you see what happened before the trigger event, so you can troubleshoot more effectively.
- Autoscale frees you from resetting the scope every time you move the probe from test point to test point. You simply hit the autoscale button and it sets voltage, time and trigger parameters for you.
With autostore, the waveform displays at full brightness while all previously acquired waveforms remain on the scope's screen at half brightness. This lets you see a history of waveform activity while simultaneously viewing the live waveform. You can use this tool to analyze worst-case jitter and noise, or to permanently capture infrequent waveform anomalies.

Automatic measurements of voltage, frequency and time, plus user-defined cursor measurements, make waveform characterization fast and easy.

With peak detect, you won't have to worry about missing narrow glitches.

Choose from models designed to meet your needs

The HP 54600 series includes eight models designed to meet your needs and your budget.

**HP 54600B 100 MHz oscilloscope**

With 100 MHz bandwidth, two input channels and sweep speeds from 2ns/div to 5 s/div, the HP 54600B is ideal for production, test, field service and education, or anywhere you need a solid, dependable scope.

**HP 54645A MegaZoom oscilloscope**

The HP 54645A oscilloscope brings the advantages of deep memory with none of the disadvantages usually associated with this class of oscilloscopes. The HP 54645A is a dual-channel 100 MHz oscilloscope with 200 MSA/s and a full 1 MB of memory behind each of its channels. Through the application of MegaZoom technology, this deep memory oscilloscope has a high speed/low dead time display and a highly responsive front panel. Unlike all other deep memory scopes which force the user to choose between fast response and deep memory, the MegaZoom technology gives you a scope that is always fast and deep. Pan and zoom operation is as simple as turning the time/division knob. No special menus or controls are required to take full advantage of the HP 54645A's deep memory.

A powerful glitch trigger extends the power of the MegaZoom technology in solving your toughest troubleshooting problems. Simply set-up the desired pulse width that represents a worse case situation and after the scope finds it, pan and zoom through the deep waveform record to find exactly what was going on in your circuit that caused the problem.

**HP 54602B 4-channel oscilloscope**

When you need more bandwidth than the HP 54600B and HP 54645A provide, take a closer look at the HP 54602B scope. You get the same capabilities as with the HP 54600B but with the added advantage of a 150 MHz bandwidth, 4 (2+2) channels and 1mV/div sensitivity.

**HP 54603B 60 MHz oscilloscope**

For colleges and universities with tight budgets, this scope is a great way to introduce students to the world of professional test equipment. Students can use the 60 MHz, 2-channel HP 54603B to understand circuit operation and learn standard measurement practices on the same type of equipment they are likely to use when they graduate. Sweep speed varies from 5 ns/div to 5s/div.

**HP 54610B 500 MHz oscilloscope**

Even though the HP 54610B is the least expensive 500 MHz oscilloscope on the market, it has analog performance that is similar to higher cost oscilloscopes. The HP 54610B is ideal for many production line test applications. This 2-channel, delayed sweep scope offers a viewable external trigger and horizontal accuracy of +0.001%. Sweep speeds range from 1ns/div to 5s/div.

**HP 54615B 1 GSa/s oscilloscope**

With the HP 54615B you can capture narrow glitches and subtle details of your signal. This 2-channel scope combines 500 MHz bandwidth, 1 GSa/s sample rate and 1 nanosecond peak detection on both channels. The HP 54615B peak detection allows the scope to maintain a 1 GSa/s sample rate at all sweep speeds. A horizontal accuracy of 0.005% means you can make critical timing measurements with confidence.

**HP 54616B 2 GSa/s oscilloscope**

The top-of-the line HP 54616B offers the same benefits as the 54615B but with twice the sample rate—2GSa/s sampling rate, 500 MHz bandwidth and 1 nanosecond peak detection. Whether you need to verify a one time, 1 ns edge or view the envelope of a modulated waveform, the HP 54616B has the power and flexibility to get the job done. And, the intuitive front panel and responsive display makes this the scope of choice for everyday troubleshooting.

**HP 54616C color oscilloscope**

The HP 54616C color display makes viewing more interesting and easier when you are viewing multiple waveforms.

**3-year warranty**

All HP 54600-series oscilloscopes include a full 3-year warranty with optional 5-year warranty coverage. Each scope includes two 1.5 meter 10X voltage probes, a user's guide, and a power cord.
## Technical Specifications

<table>
<thead>
<tr>
<th>HP 54600B, HP 54602B, HP 54603B, HP 54610B, HP 54615B, HP 54645A and HP 54616B/C Oscilloscopes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bandwidth</strong></td>
</tr>
<tr>
<td>CH 1 &amp; 2 &amp; dc coupled</td>
</tr>
<tr>
<td>Single-shot bandwidth</td>
</tr>
<tr>
<td>Number of channels</td>
</tr>
<tr>
<td>Sensitivity</td>
</tr>
<tr>
<td>dc gain accuracy</td>
</tr>
<tr>
<td>Rise time (calculated)</td>
</tr>
<tr>
<td>Input impedance</td>
</tr>
<tr>
<td>Maximum input (dc + peak ac)</td>
</tr>
<tr>
<td>Timebase range (main &amp; delayed)</td>
</tr>
<tr>
<td>Trigger sources</td>
</tr>
<tr>
<td>Horizontal accuracy</td>
</tr>
<tr>
<td>Horizontal resolution</td>
</tr>
<tr>
<td>Trigger sensitivity</td>
</tr>
<tr>
<td>DC to max. bandwidth</td>
</tr>
<tr>
<td>Repetitive</td>
</tr>
<tr>
<td>Record length (maximum)</td>
</tr>
<tr>
<td>Max. display update rate</td>
</tr>
<tr>
<td>Resolution</td>
</tr>
<tr>
<td>Power</td>
</tr>
<tr>
<td>Net weight</td>
</tr>
<tr>
<td>Size (excl. handle)</td>
</tr>
<tr>
<td>Warranty</td>
</tr>
</tbody>
</table>

* Maximum bandwidth on CH 1 & 2 is 100 MHz at 1, 2, and 5 mV/div.
** HP 54602B, for ranges 1, 2, and 5 mV/div: sensitivity between 25 MHz and 100 MHz on CH 1 & 2 is 2 div or 4 mV.
*** Trigger sensitivity from dc to 100 MHz.

1 Trigger sensitivity from 100 MHz to max. bandwidth.
2 Maximum bandwidth on CH 1 & 2 is 75 MHz at 1, 2 and 5 mV/div.
### Vertical System (HP 54600B, 54645A, 54602B, 54603B)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth Limit</td>
<td>≈ 20 MHz</td>
</tr>
<tr>
<td>Inversion</td>
<td>CH 1 &amp; CH 2</td>
</tr>
<tr>
<td>CM RR</td>
<td>≈ 20 dB at 50 MHz</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>±8 div from center screen</td>
</tr>
<tr>
<td>Input R&amp;C</td>
<td>1 MΩ, ≈ 13 pf</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>400 V (dc + peak ac)</td>
</tr>
<tr>
<td>Math Functions</td>
<td>CH 1 + or – CH 2</td>
</tr>
</tbody>
</table>

### Inversion CH 1 & CH 2 CMRR

- CMRR ≈ 20 dB at 50 MHz

### Dynamic Range

- ±8 div from center screen

### Input R&C

- 1 MΩ, ≈ 13 pf

### Maximum Input

- 400 V (dc + peak ac)

### Math Functions

- CH 1 + or – CH 2

### Cursor Accuracy

- Single Cursor: Vert. Acc. ±1.2% of full scale, ±0.5% of position value
- Dual Cursor: Vert. Acc. ±0.4% of full scale

### Horizontal System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth Limit</td>
<td>≈ 20 MHz</td>
</tr>
<tr>
<td>Inversion</td>
<td>CH 1 &amp; CH 2</td>
</tr>
<tr>
<td>CM RR</td>
<td>≈ 20 dB at 50 MHz</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>±8 div from center screen</td>
</tr>
<tr>
<td>Input R&amp;C</td>
<td>1 MΩ, ≈ 13 pf</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>400 V (dc + peak ac)</td>
</tr>
<tr>
<td>Math Functions</td>
<td>CH 1 + or – CH 2</td>
</tr>
</tbody>
</table>

### Inversion CH 1 & CH 2 CMRR

- CMRR ≈ 20 dB at 50 MHz

### Dynamic Range

- ±8 div from center screen

### Input R&C

- 1 MΩ, ≈ 13 pf

### Maximum Input

- 400 V (dc + peak ac)

### Math Functions

- CH 1 + or – CH 2

### Cursor Accuracy

- Single Cursor: Vert. Acc. ±1.2% of full scale, ±0.5% of position value
- Dual Cursor: Vert. Acc. ±0.4% of full scale

### Delayed Sweep

<table>
<thead>
<tr>
<th>Mode</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Sweep</td>
<td>5 s/div to 10 ms/div</td>
</tr>
<tr>
<td>Delayed Sweep</td>
<td>up to 200X main</td>
</tr>
</tbody>
</table>

### Delayed Sweep (HP 54610B only)

- Bandwidth is >350MHz

### External Trigger (54610B, 54615B, 54616B/C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Sensitivity</td>
<td>±18V dc to 100 MHz, &lt;25mV dc to 500 MHz, &lt;150mV</td>
</tr>
<tr>
<td>Coupling</td>
<td>dc and ground</td>
</tr>
<tr>
<td>Input R&amp;C</td>
<td>1MΩ, ≈ 12pf or 50Ω selectable</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>250 V (dc + peak ac) or 5 Vrms in 50Ω mode</td>
</tr>
<tr>
<td>Trigger View</td>
<td>External trigger is viewable. Bandwidth is &gt;350MHz</td>
</tr>
</tbody>
</table>

### Display System

- 7-inch Raster CRT

### Display (54616C)

- 5.8 inch Active Matrix Color LCD Display

### Z-Blanking

- TTL high blanks trace

### Bandwidth

- X & Y same as vertical system

### Phase Difference

- ±3 degrees at 100 kHz
- ±10 degrees at 10 MHz (54615B, 54616B/C)

### Display (54610B)

- X-Y Operation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Y Operation</td>
<td>Z-Blanking</td>
</tr>
<tr>
<td></td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Mode</td>
</tr>
<tr>
<td></td>
<td>TV Triggering</td>
</tr>
<tr>
<td></td>
<td>TV Functions</td>
</tr>
<tr>
<td></td>
<td>Display</td>
</tr>
</tbody>
</table>

### Trigger System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling</td>
<td>ac, dc, LF reject, HF reject, ωR, ωL reject,</td>
</tr>
<tr>
<td></td>
<td>LF &amp; HF, 30Ω at ≈ 50 kHz</td>
</tr>
<tr>
<td>Modes</td>
<td>Auto, Autolevel, Normal, Single, &amp; TV</td>
</tr>
<tr>
<td>HP 54645A</td>
<td>Mimum width 8 ns, Operators: &lt;, &gt;, or range</td>
</tr>
<tr>
<td>TV Triggering</td>
<td>TV line and field, 0.5 div of composite sync for stable display (Ch1 &amp; Ch2)</td>
</tr>
<tr>
<td>TV Functions</td>
<td>Delay time calibrated in NTSC and PAL line numbers</td>
</tr>
<tr>
<td>TV Triggering</td>
<td>Oscilloscope triggers on the vertical sync pulse in both fields, allowing use with noninterlaced video.</td>
</tr>
<tr>
<td>Holdoff</td>
<td>Adjustable from 200 ns to ≈ 13 s</td>
</tr>
<tr>
<td>External Trigger (54600B, 54603B)</td>
<td>1MΩ, ≈ 13pf</td>
</tr>
</tbody>
</table>

### Display (54616C)

- 5.8 inch Active Matrix Color LCD Display

---

1. Temperature ±10°C from calibration
2. Use full scale at 80mV for 2mV/div and 5 mV/div ranges
3. Use full scale of 50 ns for 2 ns/div

[6]
### Acquisition System

#### Simultaneous Channels
- HP 54600B/54610B, 54615B, 54616B: Channels 1 & 2
- HP 54602B: Channels 1 & 2 or 3 & 4
- HP 54602B: 1 million points

#### Record Length
- HP 54600B: 4,000 points
- HP 54602B: Vectors off and/or Vectors on
- HP 54615B, 54616B: 5,000 points
- HP 54645A: 5 million points

#### Max Update Rate
- HP 54600B: 1,500,000 points/sec
- HP 54602B: 60 full screens/sec
- HP 54615B, 54616B/C: 500,000 points/sec
- HP 54645A: 3,000,000 points/sec

#### Usable Single-Shot Bandwidth
- HP 54600B: 2 MHz
- HP 54602B: 1 MHz
- HP 54615B, 54616B/C: 250 MHz
- HP 54645A: 20 MHz

#### Peak Detect
- HP 54600B: 50 ns
- HP 54602B: 1 ns
- HP 54615B, 54616B/C: 1 ns
- HP 54645A: 5 ns

#### Average
- HP 54600B: Number of averages selectable at 8, 64, 256

### General

#### Power Line Requirements
- Line Voltage Range: 100 Vac to 240 Vac
- Line Voltage Selection: Automatic
- Line Frequency: 45 Hz to 440 Hz
- Max Power: 220 VA
- Consumption: 300 VA (54615B, 54616B/C)

#### Environmental Characteristics
- Operating temperature: -10 °C to +55 °C
- Nonoperating temperature: -51 °C to +71 °C
- Humidity (operating): 95% RH at 40°C for 24 Hrs
- Humidity (nonoperating): 90% RH at 60°C for 24 Hrs
- Altitude (operating): to 4,500 m (15,000 ft)
- Altitude (nonoperating): to 15,000 m (50,000 ft)
- EMI (commercial): Meets FTZ 1046 Class B
- EMI (MIL-T-28800D): Meets requirements in accordance with Paragraph 3.8.3, EMI Type III, and MIL-STD-461C as modified by Table XII.
- CE01, CE03: Full limits
- CS01, CS02, CS06: Full limits
- RE01: 15 dB relaxation to 20 kHz; exceptioned from 20 kHz to 50 kHz
- RE02 (With Opt 002): Full limits of class A1c and A1f
- RE02 (Without Opt 002): 10 dB relaxation from 14 kHz to 100 kHz
- RS01: Exceptioned
- RD03 (With Opt 001): Slight trace shift from 80 M Hz to 200 M Hz

### Expandable feature set to meet your changing needs

HP 54600-series oscilloscopes can be easily and inexpensively upgraded with add-on modules and software links to provide advanced analysis capability. Accessories and modules available include:

- Interface modules for remote control and hard-copy output to RS-232, HP-IB and parallel printers and plotters. With the addition of these modules, the scope's two trace memories become nonvolatile.
- Add FFT capability and unattended signal monitoring along with the rest of the basic interface module benefits. Catching intermittent failures is easy with unattended waveform monitoring. The nonvolatile memory can store up to 100 traces.
- HP BenchLink Scope software for transferring screen images and waveform data to Windows applications for further analysis or to create polished reports and presentations. HP BenchLink Scope also lets you store instrument setups.

### Enhanced TV/video trigger

With Option 005, six of the HP 54600-series scopes gain the ability to trigger and perform highly detailed measurements on the video components of your system. You can order this option for HP 54602B, HP 54610B, HP 54615B, HP 54616B/C, and HP 54645A oscilloscopes. For more information about this option, request data sheet 5965-1100 EN.

### Safety
- CSA Certification, IEC 348
- UL 1244 listed

### Warranty
- 3 years

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(1) Tested to Hewlett-Packard Environmental Specification Section 758 for Class B-1 products
### HP 54650A  HP-IB Interface Module

Provides full remote control and hard copy to HP-IB printers and plotters. Programming is in accordance with IEEE 488.2. With the addition of this module, the scope’s two pixel memories become non-volatile. An operating and programming manual and a programming examples disk are supplied.

**Specifications**

| Printer/Plotter Supported | HP ThinkJet, HP QuietJet, HP PaintJet, and HP LaserJet; HP-GL compatible plotters. |

### HP 54652B  RS-232/Parallel Interface Module

Provides full remote control via RS-232 and printing via parallel in one module. The RS-232 can also be configured for printing when not being used for remote control.

**Specifications**

| Connector Type | 9 pin (m) DTE Port, works with HP 34398A RS-232 cable. |
| Protocols | Xon/Xoff, hardware |
| Data Bits | 8 |
| Parity | None |
| Baud Rates | 1200, 2400, 9600, or 19200 |
| Supported Printers | HP ThinkJet, HP QuietJet, HP PaintJet, and HP LaserJet; HP-GL compatible plotters. |

### HP 54657A and 54659B  Measurement/Storage Modules

With the addition of either the HP 54657A module with HP-IB interface or the HP 54659B module with RS-232 and parallel interface, the HP 54600 series oscilloscope will provide all of the following features:

- **19 Automatic Measurements** consisting of:
  - Voltage: Vamp, Vavg, Vrms, Vpp, Vpre, Vover, Vtop, Vbase, Vmin, and Vmax
  - Time: Delay, Duty Cycle, Frequency, Period, Phase Angle, Rise Time, Fall Time, +/width, and -/width
  - Thresholds: User selectable among 10%/90%, 20%/80%, or absolute voltage levels.

### Cursor Readout Modes

| Voltage or percentage | Time or phase angle |

### Waveform Math Functions

- **Function 1**: Addition, subtraction, and multiplication
- **Function 2**: Differentiation, integration, and FFT

### FFT

- **Windows**: Exponential, flat top, Hanning and rectangular
- **Samples**: 1024 points

### Trace Memory

- **Memories 1 - 3**: High speed storage without compression.
- **Memories 4 - 100**: Storage with compression. Storage time is approximately 7 seconds. Number of traces that can be stored is a function of complexity, with the minimum being 4 highly complex traces and the maximum being 96.

### Memory Labeling

An onscreen text editor is provided for creating labels up to 20 characters. Each label contains the date and time it was saved.

### Real Time Clock

- **24-hour format with battery back-up. Can be set from front panel.**

### Unattended Waveform Monitoring

- **Testing Method**: Comparison to waveform mask.
- **Number of M scans**: 2
- **M ask Generation and Operation**: Automask, controlled from the front panel, generates mask from displayed waveform with selectable tolerance. M ask editor function allows pixel-by-pixel editing and line drawing. Smoothing function performs a running average of 3 pixels.

### Action on Failure

- • Save failed trace to memory with date and time of the failure
- • Print failed trace with date and time of the failure
- • Count the failure and maintain pass/fail statistics while continuing the test

### Hard Copy and Programmability Interface

- **HP 54657A**  HP-IB (For HP-IB specifications see HP 54650A)
- **HP 54658A**  RS-232 (For RS-232 specifications see HP 54652B)
### Probe Accessories

**HP 10072A SMT Probe tips for HP 1007X probes**
This accessory adapts this series of rugged probes to HP logic analyzer style grabbers that can be used in SMT probing applications. Supplied with 8 grabbers.

**HP 5081-7705 BNC Adapter for HP 1007X probes**
This accessory clips on the end of the probe and allows the probe to mate with BNC (f) connectors.

**HP 5081-7690 Replacement Accessory Kit for HP 1007X probes**
This kit contains replacement Hook Tip, IC Tip, Ground Bayonet, Ground Lead, Adjustment Tool, and Probe Identification Tags.

### Specifications for HP 54600-Series Scope Probes

<table>
<thead>
<tr>
<th>Probe Model Number</th>
<th>Bandwidth</th>
<th>Division Ratio</th>
<th>Approx. length</th>
<th>Input R</th>
<th>Approx. Input C</th>
<th>Rise-time</th>
<th>Max input dc + peak ac</th>
<th>Scope Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>10070A</td>
<td>20 MHz</td>
<td>1:1</td>
<td>1.5m</td>
<td>1 M Ω</td>
<td>70 pF</td>
<td>&lt;17.5 ns</td>
<td>400 V</td>
<td>HP 54600-series</td>
</tr>
<tr>
<td>10071A</td>
<td>150 MHz</td>
<td>10:1</td>
<td>1.5m</td>
<td>10 M Ω</td>
<td>&lt;2.23 ns</td>
<td>450 V</td>
<td>HP 54600/02/03/45B</td>
<td></td>
</tr>
<tr>
<td>10073A</td>
<td>500 MHz</td>
<td>10:1</td>
<td>1.5m</td>
<td>1 M Ω</td>
<td>12 pF</td>
<td>&lt;0.7 ns</td>
<td>450 V</td>
<td>HP 54610/15/16B</td>
</tr>
<tr>
<td>10074A</td>
<td>150 MHz</td>
<td>10:1</td>
<td>1.5m</td>
<td>10 M Ω</td>
<td>12 pF</td>
<td>&lt;7.33 ns</td>
<td>450 V</td>
<td>HP 54645A</td>
</tr>
<tr>
<td>10442A</td>
<td>1 GHz</td>
<td>10:1</td>
<td>2.0m</td>
<td>500 Ω</td>
<td>1.2 pF</td>
<td>&lt;0.35 ns</td>
<td>10 V scopes with 50 Ω inputs</td>
<td></td>
</tr>
<tr>
<td>10444A</td>
<td>500 MHz</td>
<td>10:1</td>
<td>1.6m</td>
<td>1 M Ω</td>
<td>6-15 pF</td>
<td>&lt;0.7 ns</td>
<td>450 V</td>
<td>HP 54610/15/16B</td>
</tr>
<tr>
<td>1137A</td>
<td>1 MHz</td>
<td>1000:1</td>
<td>1.5m</td>
<td>500 M Ω</td>
<td>3 pF</td>
<td>&lt;35 ns</td>
<td>5 KV scopes with 1m Ω inputs</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Measurement Accessories

**HP 10100C**
50 Ω ± 1% Feedthrough Termination
BNC (f) to BNC (m), Frequency range dc-300 MHz, Max. VSWR 1.1:1

**HP 11094B**
75 Ω ± 0.2% Feedthrough Termination
BNC (f) to BNC (m), maximum power 1 W

**HP 1251-2277**
Dual Banana (m) to BNC (f) Adapter

**HP 10110B**
Dual Banana (m) to BNC (m) Adapter

### Additional Accessories

**HP 10098A**
Front Panel Cover and Pouch Kit
This kit will add the Option 101 front panel cover and pouch to any 54600-series oscilloscope

**HP 1183A**
Testmobile Scope Cart for HP 54600-series scopes
Ordering Information

**HP 54600-Series Oscilloscopes**
- HP 54600B Two-channel, 100 MHz Oscilloscope
- HP 54602B Four-channel, 150 MHz Oscilloscope
- HP 54603B Two-channel, 60 MHz Oscilloscope

Each of the above oscilloscopes comes with two 1.5 meter 10X probes (HP 10073A), a user’s and service guide, and power cord.

**HP 54610B** Two-channel, 500 MHz, 20 MSa/s Oscilloscope
- HP 54615B Two-channel, 500 MHz, 1 GSa/s Oscilloscope
- HP 54616B Two-channel, 500 MHz, 2 GSa/s Oscilloscope
- HP 54616C Color two-channel, 500 MHz, 2 GSa/s Oscilloscope
- HP 54645A Color two-channel, 500 MHz, 2 GSa/s Oscilloscope

Each of the above oscilloscopes comes with two 1.5 meter 10X probes (HP 10073A), a user’s and service guide, and power cord.

Options
- **Opt. 001** RS-03 Magnetic interface shield added to CRT
- **Opt. 002** RE-02 Display shield added to CRT to reduce radiated interface
- **Opt. 005** Enhanced TV/video triggering (not HP 54600B/03B)
- **Opt. 090** Delete probes (for HP 54600/02/03B)
- **Opt. 101** Accessory pouch and front panel cover (HP 10098A)
- **Opt. 102** Two additional HP 10071A probes (HP 54602B only)
- **Opt. 103** Operator training kit (includes training signal board & lab workbook)
- **Opt. 104** Carrying case (protects scope for shipping or baggage checking)
- **Opt. 105** HP BenchLink Scope software for Windows (HP 34810B)
- **Opt. 106** HP-IB test automation module (compatible only with 54600/03/02/10B)
- **Opt. 107** RS-232 test automation module (compatible only with 54600/03/02/10B)
- **Opt. 500** Enhanced TV/video triggering
- **Opt. 501** RS-232 and parallel interface module
- **Opt. 502** Parallel interface module
- **Opt. 503** RS-232 and parallel measurement/storage module
- **Opt. 504** HP-IB measurement/storage module
- **Opt. 505** RS-232 test automation module (compatible only with 54600/03/02/10B)
- **Opt. 506** HP-IB test automation module (compatible only with 54600/03/02/10B)

### HP 54650-series enhancement modules
- **HP 54650A** HP-IB interface module
- **HP 54652A** Parallel interface module
- **HP 54652B** RS-232 and parallel interface module
- **HP 54655A** HP-IB test automation module (compatible only with 54600/03/02/10B)
- **HP 54656A** RS-232 test automation module (compatible only with 54600/03/02/10B)
- **HP 54657A** HP-IB measurement/storage module
- **HP 54659A** RS-232 and parallel measurement/storage module

Each module includes user’s and programmer’s guide; HP 54656A includes HP 59561-61604 RS-232 adapter cable and one 2-meter RJ-45 cable.

### Additional oscilloscope accessories, probes and terminations
- **HP 10070A** 1:1 probe
- **HP 10071A** 10:1 probe
- **HP 10072A** SM T-probing adapters
- **HP 10073A** 10:1 500 MHz probe with readout
- **HP 10074A** 10:1 150 MHz probe with readout
- **HP 10442A** 10:1 GHz probe for 50 Ω inputs.
- **HP 10444A** 10:1 500 MHz mini-probe with readout
- **HP 1137A** 1000:1 high-voltage probe
- **HP 10100C** 50 Ω feedthrough termination
- **HP 5081-7690** HP 1007X probe-to-BNC (m) adapter
- **HP 10098A** Front panel cover and pouch kit
- **HP 34327A** Inverter, 12 Volt dc to 115 V ac

**HP 34810-Series BenchLink Software**
- **HP 34810B** BenchLink Scope Software
  - Includes software on 3.5” disk, user’s guide. (all languages)
  - For RS-232 needs adapter module.

For more information on Hewlett-Packard Test and Measurement products, applications or services please call your local Hewlett-Packard sales offices. A current listing is available via the Web through AccessHP at [http://www.hp.com](http://www.hp.com). If you do not have access to the internet, please contact one of the HP centers below and they will direct you to your nearest HP representative.

**United States:**
Hewlett-Packard Company
Test and Measurement Organization
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1 800 452 4844

**Canada:**
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L4W 5G1
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Victoria 3130, Australia
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