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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Web: www.TestEquipmentHQ.com
LeCroy
Digital Oscilloscopes
Get the Complete Picture
CATCH THE FRESH WAVE OF THINKING IN OSCILLOSCOPE DESIGN – THE NEW LECROY WAVERUNNER, UNLIKE ANY OTHER SCOPE IN ITS CLASS, IT PUTS COMPLETE FUNCTIONALITY WITH MAXIMUM POWER ON YOUR DESK OR WORKBENCH. AND ALL OF THIS CAPABILITY IS AVAILABLE IN ONE REMARKABLY EASY-TO-USE PACKAGE. FROM TROUBLESHOOTING TO TIMING ANALYSIS TO PRODUCTION TESTING, THE LECROY WAVERUNNER SERIES IS UNIQUELY QUALIFIED TO MEET YOUR REQUIREMENTS.

Why Walk When You Can Run?

CATCH THE FRESH WAVE OF THINKING IN OSCILLOSCOPE DESIGN – THE NEW LECROY WAVERUNNER, UNLIKE ANY OTHER SCOPE IN ITS CLASS, IT PUTS COMPLETE FUNCTIONALITY WITH MAXIMUM POWER ON YOUR DESK OR WORKBENCH. AND ALL OF THIS CAPABILITY IS AVAILABLE IN ONE REMARKABLY EASY-TO-USE PACKAGE. FROM TROUBLESHOOTING TO TIMING ANALYSIS TO PRODUCTION TESTING, THE LECROY WAVERUNNER SERIES IS UNIQUELY QUALIFIED TO MEET YOUR REQUIREMENTS.

Because There's No Such Thing as a Perfect Wave.

NO MATTER WHAT YOUR CHALLENGE, THE WAVERUNNER SCOPE WILL HELP YOU SOLVE IT FASTER. THIS NEW SCOPE IS DESIGNED FOR TECHNICIANS AND ENGINEERS WORKING IN TEST, DESIGN, AND SERVICE, INCLUDING:

- POWER CONVERSION
- GENERAL ELECTRONICS
- AUTOMOTIVE
- ELECTRO-MECHANICAL
- ...AND MANY MORE

FOR SIGNAL CAPTURE AND VIEWING, THE WAVERUNNER SCOPE IS SIMPLY BRILLIANT: ITS EXCEPTIONALLY STRONG FEATURE SET AND COMPLETE RANGE OF ADD-ONS, INCLUDING MATH TOOLS AND PROBES, BRING YOU TO SOLUTIONS FASTER AND EASIER.
Document your work using Strip Chart mode on the graphics printer (optional) or print to the standard Centronics™ interface.

The color, 8.4" TFT display is large, bright, and crisp, so it’s easy to recognize signal features. Connect an external VGA monitor for remote viewing.

Intelligent ProBus® interface automatically configures the scope for compatible current, voltage, and differential probes.

Compact footprint provides more space on your bench to do your work.

The Waverunner Series

**Autosetup** adjusts the scope to automatically display the signal.

**SMART Trigger®** lets you see hard-to-catch glitches, dropouts, and timing errors.

**Easy to navigate** with an optimized set of knobs, buttons, and simple menus.

**Math Tools** include FFTs, averaging high resolution, and more... so you:
- see the signal
- see the spectrum
- measure the result with the most complete set of waveform analysis tools available.

**Analog Persistence™** lets you see your signal using the best of both analog and digital scope methods.

Measure Tools – one press of the button gives you control of automatic measurements and cursors.

**ALSO AVAILABLE ON THE REAR PANEL**
- GPIB, RS232-C
- Logic signal output, so you can trigger another test instrument or use Pass/Fail for test system control.
- PC Card Slot option

Icons show trigger conditions.
CATCH THESE SPECS
The Waverunner oscilloscopes provide all you need to quickly view, measure, and evaluate your signals—accurately and reliably:
- 500 MHz bandwidth
- 500 MS/s single-shot sample rate and 25 GS/s for repetitive signals
- Up to one million data points to view signals with high resolution over longer time intervals
Its powerful, integrated processors provide rapid response. Turn a knob or press a button—Waverunner scopes respond instantly.

ANALOG PERSISTENCE FOR A FRESH VIEW
This affordable new class of scopes brings you the power of LeCroy Analog Persistence. All it takes is one touch of the green button to get an analog-like view of your waveforms and explore the full depth of signal information. Then the 8.4" color display lets you clearly see the information you might have missed.

EASY TO USE
The Waverunner series is designed to quickly get you up and running. Its color-coded front panel and simple menu system are quick to understand, so your focus is on the work not the tool. Common tasks are automatic. Navigation is logical and intuitive. You'll quickly master its powerful operations.

THE RIGHT PRICE
The Waverunner scope raises the bar when it comes to value—you get more for your money than with any other scope in this class. And because Waverunner can be upgraded, you can extend its life to meet future needs.

INCREASE YOUR PRODUCTIVITY
Expand the vertical resolution, view the spectrum of a signal with an FFT, average to reduce noise, and more. Two optional measurement packages give you additional capabilities to datalog, integrate, and more. LeCroy’s signal diagnostic and troubleshooting tools provide a complete solution for jitter and timing analysis and power measurement.

GETTING STARTED
Waverunner scopes give you three quick ways to find the information you need:
- Quick Reference Guide
- In-depth Operator’s Manual organized both for first-time and experienced users
- HTML Manual on CD-ROM

<table>
<thead>
<tr>
<th>Model</th>
<th>Bandwidth</th>
<th>Channels</th>
<th>Sample Rate</th>
<th>Acquisition Memory</th>
<th>Analog Persistence</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT342</td>
<td>500 MHz</td>
<td>Two</td>
<td>500 MS/s</td>
<td>250 kpts/Ch</td>
<td>Yes</td>
</tr>
<tr>
<td>LT342L</td>
<td>500 MHz</td>
<td>Two</td>
<td>500 MS/s</td>
<td>1 Mpts/Ch</td>
<td>Yes</td>
</tr>
<tr>
<td>LT344</td>
<td>500 MHz</td>
<td>Four</td>
<td>500 MS/s</td>
<td>250 kpts/Ch</td>
<td>Yes</td>
</tr>
<tr>
<td>LT344L</td>
<td>500 MHz</td>
<td>Four</td>
<td>500 MS/s</td>
<td>1 Mpts/Ch</td>
<td>Yes</td>
</tr>
</tbody>
</table>
See the Third Dimension

Scopes are great tools that help technicians and engineers understand the operation of electrical and electronic systems. With Analog Persistence, you see a third dimension. Are you concerned with intermittent runts or timing problems? Just press the green button and see infrequent signal anomalies such as slow edges, pulse width variations, runts, and glitches. The intensity and color variation indicate the relative rate, such as a clock’s period varying once every 100 cycles. Analog Persistence gives you insight into what is happening in your system.

SMART TRIGGER
Another touch of a button expands your ability to lock onto a problem signal. The SMART Trigger function uses an icon display and menu control, so you can set trigger conditions like timing intervals, edges, and TV formats. Waverunner oscilloscopes can trigger on hard-to-find glitches down to 2 ns, catch signal dropouts, or trigger when the signal falls within a window. You can even set up an exclusion trigger to find events that differ from the nominal signal.

MEASURE ON THE SCREEN
Cursor measurements let you dial into a specific section of your waveform to measure the peak voltage or the time between signal features, such as glitches on two different channels. The user interface and large display let you quickly perform basic measurements. Cursors work in XY display mode so you can read the angle in degrees and the radius in volts for CDMA signals.

EASY STEPS

Using your Waverunner scope is as easy as 1-2-3!

Waverunner has a powerful interface. Simply connect your signal, press AUTO SETUP, and view. LeCroy SMART memory ensures the highest time resolution for the time window displayed.

Press the green button and you have the power of Analog Persistence. This three-dimensional view shows variations in pulse width.
The Scope with Solutions

The Waverunner series provides the best set of troubleshooting and analysis tools available. It gives you maximum power to measure and analyze in the time domain and in the frequency domain with FFTs.

**MEASURE & MATH TOOLS**

Choose from 25 automatic measurements that update with your waveform – live, on-screen. Turn on statistics for the parameters average and standard deviation to fully characterize or troubleshoot your circuit. Math Tools let you average (1000 sweeps) to reduce random noise or increase vertical resolution (to 11 bits). Select an optional analysis package for even more power using the same, easy-to-navigate menu system.

**SPECTRUM ANALYSIS WITH FFTS**

View the FFT of a 50 kpoint waveform while the signal trace updates on the screen. Simultaneously see both the time and frequency domains, even on transient signals. Use cursors to measure the frequency of peaks in the FFT. Perform Pass/Fail testing of the spectrum to a tolerance mask. See transient signals with the time waveform and the frequency spectrum in different colors.

**EXTENDED MATH & MEASUREMENTS**

This option gives you over 40 measurement parameters and additional math tools to increase your productivity (integrate, differentiate, square, log). You can even datalog measurements with the trend function.

**THE COMPREHENSIVE WAVE ANALYZER**

The WaveAnalyzer™ option is the ultimate tool for characterization and troubleshooting in time, frequency, and statistical domains for design and research applications. Waveform averaging increases to one million sweeps and FFT spectrum analysis to one million points. Histogram analysis lets you view and measure statistical variations.
The Waverunner oscilloscope acquires signals with high fidelity and integrity. A variety of measurement and analysis tools, as well as probes and accessories, are available. And it's easy to upgrade.

Whether you are troubleshooting, debugging, characterizing circuits and system testing in production, Waverunner scopes get the job done. Standard features include Analog Persistence, SMART Trigger, FFTs, automatic measurements, waveform math, and Pass/Fail test.

Use the standard passive probes for 500 MHz bandwidth at the probe tip. Choose an active FET probe to minimize loading on your circuit, or for differential measurements, select the active 500 MHz differential probe. ProBus automatically controls and configures your LeCroy probes.

WORLD-CLASS POWER MEASUREMENT TOOLS
Waverunner and PowerMeasure™ tools provide a complete solution for easily and accurately performing difficult power-related measurements. You can measure instantaneous power, characterize devices and circuits, and perform loop stability measurements. As well as harmonic analysis (FFT). Or deskew timing of current and voltage waveforms, integrate, rescale, and assign electrical units such as watts, amperes, and coulombs.

PowerMeasure and precision differential voltage and current measurement probes give the power conversion engineer unprecedented measurement capability.

Powerful Applications
A TIME ANALYZER IN A SCOPE

Jitter and Timing Analysis (JTA) with second-generation persistence technology (patent pending) enables precise measurements with enhanced timing resolution.

JTA lets you display the jitter function as well as its source signal. Both are perfectly time-correlated, so anomalies can be directly observed on the source trace. Use the Jitter-Track™ feature to plot cycle-to-cycle jitter, interval error, period, pulse width, or duty cycle versus time. Use persistence trace histograms to measure jitter and noise on eye diagrams.

SOFTWARE TO ENHANCE PRODUCTIVITY

ScopeExplorer™ and ActiveDSO™ are Microsoft Windows (95, 98, or NT) PC-based connectivity tools that make it easy to interface your Waverunner scope with a PC via RS-232-C or GPIB. It’s easy to integrate scope data with Windows applications as well as to control the scope from your PC. Both tools and the interfaces are standard.

All it takes is a PC with Windows 95, 98, or NT and a GPIB or RS-232-C connection.

The JTA persistence histogram shows the variation of the waveform within amplitude or time slices.

So small, but it’s a standout!
Acquisition System

**Bandwidth (-3dB):** 500 MHz @ 50 Ω and at probe tip with PP006; select bandwidth limit (25 or 200 MHz) independently by channel.

**Input Impedance:** 50 Ω ± 0.0% ± 1 Ω // 12 pF typical (using PP006 probe)

**Input Coupling:**
- 1 MΩ: AC, DC, GND
- 50 Ω: DC, GND

**Max Input:**
- 50 Ω: 5 Volts
- 1 MΩ: 400 Volts (peak AC <5kHz + DC)

**Single-Shot Sampling Rate:** 500 MS/s max

**Acquisition Memory:**
- 250 kpts/Ch
- 1 Mpoint/Ch on L models

**Vertical Resolution:** 8 bits

**Sensitivity:**
- 2 mV–5 V/div fully variable; 10 V/div

**DC Accuracy:** ±1.5% (0.5% of full scale)

**Offset Range:**
- 2 mV–50 mV/div: ±1 V
- 100 mV–500 mV/div: ±10 V
- 1 V–10 V/div: ±100 V

Timebase System

**Timebases:** Main and up to four zoom traces simultaneously

**Time/Div Range:**
- 1 ns/div to 1000 s/div

**Clock Accuracy:** ≤ 10 ppm

**Interpolator Resolution:** 5 ps

**External Clock:** ≤500 MHz, 50 Ω or 1 Ω impedance

Triggering System

**Modes:** Normal, Auto, Single, and Stop

**Sources:** Any input channel, external, Ext/10 or line; slope, level, and coupling are unique to each source (except line trigger).

**Coupling Modes:**
- DC, AC, HF, HFREJ, LFREJ (reject frequency 50 kHz typ)

**Pre-Trigger Recording:** 0–100% of horizontal time scale

**Post-Trigger Delay:** 0–10,000 divisions

**Holdoff to Time or Events:** Up to 20 s or to 99,999,999 events

**Internal Trigger Range:** ≤50 MHz

**Maximum Trigger Frequency:** Up to 500 MHz with HF coupling

**External Trigger Input:** ±.5 V, ±5 V with Ext/10; max input same as input channels

AutoSetup

Automatically sets timebase, trigger, and sensitivity to display a wide range of repetitive signals; vertical find automatically sets sensitivity for the selected input signal.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Edge or SMART Trigger®</th>
</tr>
</thead>
<tbody>
<tr>
<td>WaveRunner Triggers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>Time Base Setting</td>
<td>Maximum Rate</td>
</tr>
<tr>
<td>Single Shot</td>
<td>10 m/div to 1000 m/div</td>
<td>500 MS/s</td>
</tr>
<tr>
<td>Repetitive</td>
<td>1 m/div to 500 m/div</td>
<td>25 GS/s</td>
</tr>
<tr>
<td>Roll Mode</td>
<td>≤500 kpts; 500 m/s–1000 m/s</td>
<td>100 k/s</td>
</tr>
<tr>
<td></td>
<td>5000 kpts; 1 s–1000 m/s</td>
<td>10 k/s</td>
</tr>
<tr>
<td>Sequence Mode:</td>
<td>2–1000 segments (4000 with L models)</td>
<td>300 MS/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Edge or SMART Trigger®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge/ Slope/ Window/ Line</td>
<td>Triggers when signal meets slope and level condition.</td>
<td>Edge</td>
</tr>
<tr>
<td>Signal pulse width</td>
<td>Triggers on glitches down to 2 ns. Width selectable from &lt;2.5 ns to 20 s or on intermittent faults.</td>
<td>SMART</td>
</tr>
<tr>
<td>Signal interval</td>
<td>Triggers on intervals selectable between 10 ns and 20 s.</td>
<td>SMART</td>
</tr>
<tr>
<td>State or edge qualified</td>
<td>Triggers on input only after a defined state or edge occurred on another channel. Delay between sources is selectable by time or events.</td>
<td>SMART</td>
</tr>
<tr>
<td>DropOut</td>
<td>Triggers if the input signal drops out for longer than selected time between 25 ns and 20 s.</td>
<td>SMART</td>
</tr>
<tr>
<td>IV</td>
<td>Triggers on line (up to 1500) in odd or even fields for PAL, NTSC, or nonstandard video.</td>
<td>SMART</td>
</tr>
</tbody>
</table>
Technical Specifications

Probes

MODEL PP006: 10:1, 10 MΩ with autodetect (one per channel)

PROBE SYSTEM: ProBus Intelligent Probe System supports differential amplifiers and active, high-voltage, current, and differential probes.

Color Waveform Display

TYPE: Color 8.4” flat panel TFT-LCD with VGA

SCREEN SAVER: Display blanks after 10 minutes.

REAL TIME CLOCK: Date, hours, minutes, and seconds displayed with waveform

NUMBER OF TRACES: Maximum eight on LT344, six on LT342; simultaneously display channel, zoom, memory, and math traces.

GRID STYLES: Single, Dual, Quad, Octal, XY; Full Screen gives enlarged view of each style.

WAVEFORM STYLES: Sample dots joined or dots only — regular or bold

Analog Persistence Display

ANALOG AND COLOR-GRADED PERSISTENCE: Variable saturation levels up to 100% for each trace’s persistence data in memory

TRACE DISPLAY: Opaque or transparent overlap

Zoom Expansion Traces

STYLE: Display up to four zoom trac

VERTICAL ZOOM: Up to 5x expansion, 50x with averaging

HORIZONTAL ZOOM: Expand to 2 pts/div, magnify to 50,000x

AUTO SCROLL: Automatically scan and display a captured signal

Rapid Signal Processing

PROCESSOR: 96 MHz PowerPC

<table>
<thead>
<tr>
<th>LT342</th>
<th>LT344</th>
<th>LT342L</th>
<th>LT344L</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Mbytes</td>
<td>16 Mbytes</td>
<td>32 Mbytes</td>
<td>32 Mbytes</td>
</tr>
</tbody>
</table>
| 64 Mbyte system memory optional for all models.

Internal Waveform Memory

WAVEFORM: M1, M2, M3, M4*

ZOOM AND MATH: A, B, C, D*

*Store full-length waveforms with 16 bits/data point.

Setup Storage

FOR FRONT PANEL AND INSTRUMENT STATUS: Four non-volatile memories and floppy drive are standard. Hard drive and memory card are optional.

Math Tools

Simultaneously perform up to four math processing. All processing, traces can be chained together to perform math on math.

STANDARD MATH TOOLS: (1000 samples)

SAMPLE: select, function, parameter example (desktops), scale (with units), sin x/x

HORIZONTAL ZOOM: Expand to 2 pts/div, magnify to 50,000x

AUTO SCROLL: Automatically scan and display a captured signal

Rapid Signal Processing

PROCESSOR: 96 MHz PowerPC

<table>
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<tr>
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<th>LT344</th>
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<tr>
<td>16 Mbytes</td>
<td>16 Mbytes</td>
<td>32 Mbytes</td>
<td>32 Mbytes</td>
</tr>
</tbody>
</table>
| 64 Mbyte system memory optional for all models.

Measure Tools

AUTOMATED MEASUREMENTS: Display any five parameters together with their average, high, low, and standard deviations.

STANDARD MEASURE TOOLS:

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative time</td>
<td></td>
<td>first point on waveform</td>
<td>any other point on waveform</td>
</tr>
<tr>
<td>Relative voltage</td>
<td></td>
<td>select voltage level</td>
<td>any other voltage level</td>
</tr>
<tr>
<td>Absolute time</td>
<td></td>
<td>time and voltage relative to ground and trigger</td>
<td></td>
</tr>
<tr>
<td>Absolute voltage</td>
<td></td>
<td>voltage</td>
<td>ground</td>
</tr>
</tbody>
</table>

CURSOR MEASUREMENTS

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>peak-to-peak period</td>
<td>peak-to-peak</td>
<td>period</td>
<td></td>
</tr>
<tr>
<td>phase</td>
<td></td>
<td>phase</td>
<td></td>
</tr>
<tr>
<td>rise</td>
<td></td>
<td>rise</td>
<td></td>
</tr>
<tr>
<td>top</td>
<td></td>
<td>top</td>
<td></td>
</tr>
<tr>
<td>width</td>
<td></td>
<td>width</td>
<td></td>
</tr>
</tbody>
</table>

PASS/FAIL: Test any five parameters against selectable thresholds. Limit testing is performed using masks created on the scope or on a PC. Setup a pass or fail condition to initiate actions such as hardcopy output, save waveform to...
Technical Specifications

memory, GPIB SRQ, or pulse out.

## Extended Math and Measurements Option

Adds math and advanced measurements for general purpose applications. Includes all standard math and measurement tools, plus:

### EXTENDED MATH TOOLS:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>absolute value</td>
<td></td>
</tr>
<tr>
<td>exp (base e)</td>
<td></td>
</tr>
<tr>
<td>exp (base 10)</td>
<td></td>
</tr>
<tr>
<td>log (base e)</td>
<td></td>
</tr>
<tr>
<td>log (base 10)</td>
<td></td>
</tr>
</tbody>
</table>

### EXTENDED MEASURE TOOLS:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cycles median</td>
<td></td>
</tr>
<tr>
<td>cycles std. deviation</td>
<td></td>
</tr>
<tr>
<td>A time (at level)</td>
<td></td>
</tr>
<tr>
<td>% and volts</td>
<td></td>
</tr>
<tr>
<td>A time @ level from trigger</td>
<td></td>
</tr>
<tr>
<td>A time from clock to data + and duration</td>
<td></td>
</tr>
</tbody>
</table>

## WaveAnalyzer

Includes the Extended Math and Measure Tools as well as expanded capabilities for performing FFTs, averaging, histograms, and histogram parameters.

### WAVE ANALYZER TOOLS:

- Histograms with 16 Histogram Parameters
- Summed Averaging to 1 Million Samples
- Continuous Weighted Averaging
- FFT up to 1 Million Waveforms
- FFT Power Averaging
- FFT Power Density, Real, and Imaginary

## Other Application Solutions

### JITTER AND TIMING ANALYSIS (JTA)

### POWERMEASURE TOOLS

## Interface

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REMOTE CONTROL</td>
<td>Full control via GPIB and RS232C</td>
</tr>
<tr>
<td>FLOPPY DRIVE</td>
<td>Internal, DOS format, 3.5&quot; high-density</td>
</tr>
<tr>
<td>PCMCIA TYPE III SLOT</td>
<td>Optional: Supports memory and hard drive cards</td>
</tr>
<tr>
<td>EXTERNAL MONITOR PORT</td>
<td>15-pin D Type VGA-compatible</td>
</tr>
<tr>
<td>CENTRONICS PORT</td>
<td>Optional: Parallel printer interface</td>
</tr>
<tr>
<td>INTERNAL GRAPHICS PRINTER</td>
<td>Optional: Provides hardcopy output in &lt;10 seconds</td>
</tr>
</tbody>
</table>

## Outputs

### CALIBRATOR SIGNAL

- 500 Hz – 1 MHz square wave, ±1 V, +1.0 to -1.0, test point and ground lug on front panel

### CONTROL SIGNALS

- Choice of trigger ready, trigger out, or pass/fail status; TTL levels into 1 MΩ at rear panel BNC (output resistance 300 Ω ±10%)

## General

### OPERATING CONDITIONS

- Temperature: 5–40°C
- Humidity: 80% non-condensing at 40°C
- Altitude: ≤2,000 meters

### SHOCK AND VIBRATION

- Conforms to MIL-PRF-28800P, Class C

### POWER REQUIREMENTS

- 90–132 V AC and 180–250 V AC: 45–66 Hz, maximum power dissipation: 150 VA – 230 VA, depending on model

### CERTIFICATIONS

- CE, UL and cUL

### DIMENSIONS (HWD)

- 210mm x 350mm x 300mm; 8.3" x 13.8" x 11.8" (height excludes feet)

### WEIGHT

- 8 kg; 18 lbs

### WARRANTY AND CALIBRATION

- Three years; calibration recommended yearly
## Ordering Information

### WaveRunner Digital Oscilloscopes  

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT342</td>
<td>Two-Channel Color, 500 MHz, 500 Msps, 250 kpts/ch</td>
</tr>
<tr>
<td>LT342L</td>
<td>Two-Channel Color, 500 MHz, 500 Msps, 1 Mpts/ch</td>
</tr>
<tr>
<td>LT344</td>
<td>Four-Channel Color, 500 MHz, 500 Msps, 250 kpts/ch</td>
</tr>
<tr>
<td>LT344L</td>
<td>Four-Channel Color, 500 MHz, 500 Msps, 1 Mpts/ch</td>
</tr>
</tbody>
</table>

### Included in Standard Configuration

- 10:1 10 MΩ Passive Probe (1 per channel): PP006
- Remote Control Manual: LTXXX-RCM
- Quick Reference Guide: LTXXX-QRG
- Math Analysis with FFT
- Floppy Disk Drive
- GPIB, RS232C, Centronics Interfaces and VGA Output Port
- Performance Certificate
- Three-Year Warranty

### Selected Probes & Accessories

- 50 MHz 30 amp (50 amp peak) Current Probe: AP015
- 100 MHz 150 amp Current Probe: AP011
- 100 MHz Differential Amplifiers: DA1820/DA1822
- 200 MHz, 1 GΩ Passives, Passive Differential Probe Pair: DA1850/DA1855
- 1 GHz 10:1 FET Probe with SMD Kit: AP020
- DC-500 MHz Active Differential Probe: AP033
- Probes: 75 to 50Ω Adapter: PP000
- Graphics Printer Paper/10 rolls: GPR10

### Software Options

- Extended Math and Measurement Package: LTXXX-EMM
- WaveAnalyzer Package including Histograms: LTXXX-WAVA
- Jitter and Timing Analysis Package: LTXXX-JTA
- Power Measurement Tools: LTXXX-PMT1

### Printers

- Internal Graphics Printer: LTXXX-GP02
- PC Card Slot: LTXXX-PCSL0T
- PC Card Hard Disk: 320 Mbytes: LTXXX-HD02
- PC Card Slot with HD02 and MC04: LTXXX-PAC04MXA
- 64 Mbytes System Memory: MC04
- 512 Mbytes Serial Memory: LTXXX-SE512M

### Manuals

- Service Manual for LT34X Series: LT34X-SM

### Warranty & Calibration

- US Military Standard: CCUSM
- US NIST Standard: CCUSN
- CCUSF
- CCMFT

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