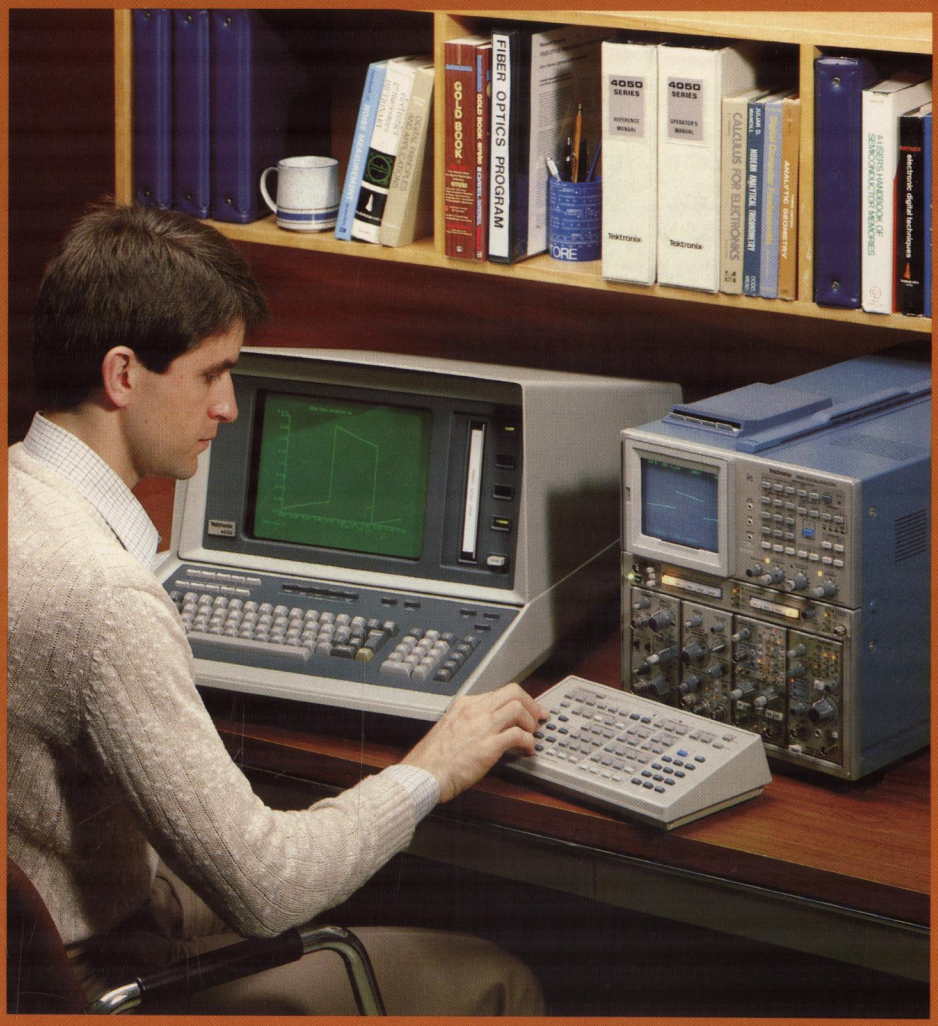
# WP1310

## Signal Processing System

Tektronix



# WP1310 makes waveform test and measurement a hands-off proposition.


**Automatic waveform processing with the 7854 Oscilloscope and 4052 Graphic Computer.**

The WP1310 Signal Processing System is a synergistic combination of the Tektronix 7854 Oscilloscope and 4052 Graphic Computer. Together, these two instruments automate the entire waveform test and measurement process, from acquisition and calculation to storage and display formatting. When combined in the WP1310 system, the 7854 and 4052 offer significant benefits:

- Extended waveform processing: in addition to the computational capabilities of the 7854, the WP1310 system offers extended processing capabilities – including FFT, IFT, Correlation, and Convolution.
- Complex and lengthy measurement routines can be permanently stored for instant recall, along with acquired waveform data.
- Acquired data can be put into a user-defined graphic display format that helps improve comprehension – such as log and log log displays, graphs with associated text and operating instructions.
- With its GPIB format, the WP1310 Signal Processing System can control additional instruments.
- Hard copy units can be interfaced with the WP1310 to provide documentation of graphic displays.

**Automatic digitizing and waveform calculation with the 7854 Oscilloscope.**

The 7854 Oscilloscope is an extremely powerful waveform measurement and analysis tool in its own right. It has the ability to digitize incoming waveforms which allows the storage of repetitive signals up to the scope's full bandwidth (400 MHz) and the storage of single-shot signals up to 50 $\mu$s/div. Built-in firmware permits automatic calculation of most common waveform parameters, and also provides signal averaging to reveal waveforms buried in noise. Also included are vertical and horizontal cursors to extend digital measurement capabilities.

Accompanying the 7854 is a calculator keyboard that uses the same simple programming technique found in handheld calculators. With this keyboard, a user can easily develop extended measurement routines and sophisticated calculations. As part of the WP1310 Signal Processing System, keyboard programs and resulting data can be transferred from the 7854 to the 4052 Graphic Computer for permanent storage on mag tape. These programs can be recalled at any time for execution on the 7854. This transfer is accomplished through the 7854's GPIB interface, which permits intersystem communications through software provided as part of the WP1310 system package.

In addition to its digital capabilities, the 7854 offers exceptional analog measurement flexibility through its ability to accept over thirty 7000-Series plug-ins, which cover the entire spectrum of waveform measurement needs.




**Expanded programming and storage with the 4052 Graphic Computer.**

The Tektronix 4052 Graphic Computer has gained wide acceptance as a powerful data processing tool in both stand-alone and system applications. It allows the programming of high resolution graphics and rapid floating point calculations to assist the user in waveform processing.

As part of the WP1310 system, the 4052 accepts both program and waveform data from the 7854 Oscilloscope via the GPIB bus.

This data can be permanently stored by using the 4052's magnetic tape drive system which provides non-volatile storage of up to 300K bytes per cartridge.

Waveform data and calculation results can also be converted into user-defined graphic formats, such as bode plots, log, log log, data and text, etc. And the 4052 offers a large, high resolution crt.

The 4052 software is an easy-to-learn, enhanced form of BASIC, which allows the user to create special processing programs tailored to individual application requirements, such as comparing acquired data to a stored model. The utility software, which provides 7854/4052 communication over the GPIB, is included as part of the WP1310 system. This software package allows system operation with little or no programming.

**Two ROM packs to supercharge the system.**

The WP1310 Signal Processing System includes two ROM packs installed in the 4052 Graphic Computer that allows the user to apply a number of advanced functions to waveform data sent from the 7854 Oscilloscope to the 4052's system memory. Among the functions included are FFT, IFT, Convolution, Maximum, Minimum and Cross. Each function can be called to use by a single BASIC statement, and requires no other programming effort. Both ROM packs offer a significant increase in execution speed and require no working memory space since they are set in firmware.

**Continued expansion as you need it.**

The WP1310 Signal Processing System uses the General Purpose Interface Bus (GPIB) with the 4052 Graphic Computer acting as the controller, which means that additional GPIB instruments can be added to the system as your needs require. And, the 4052 has an output for a hard copy unit to provide documentation of graphic displays produced by the 4052.


The WP1310 is a complete, integrated Signal Processing System that makes waveform test and measurement a hands-off proposition. For more information on the WP1310 contact your local Tektronix Signal Processing System Specialists.

# WP1310 Specification Highlights

### System Components

1 ea Tektronix 7854 Option 2D (8K word memory) Oscilloscope
1 ea Tektronix 4052 Option 24 (64K byte memory) Graphic Computing System
1 ea 4052 R07 Signal Processing ROM Pack #1
1 ea 4052 R08 Signal Processing ROM Pack #2 (FFT)

### System Accessories

1 ea WP1310 Utility Software
1 ea 2 Meter GPIB Cable
1 ea Blank 4052 Tape Cartridge
1 ea WP1310 System Manual

### WP1310 Options

17 Delete 7854 Oscilloscope (allows customer-owned 7854 to be integrated into WP1310; 7854 must be checked and upgraded by Tektronix Field Service at customer's expense before integration)
26 Add Tektronix 4631 Hard Copy Unit

### WP-System Installation, Warranty, and Service

Tektronix WP-Systems which include a controller are installed and checked out by Tektronix field service personnel — contact your local Tektronix Service Center for assistance. This system is warranted for ninety (90) days on site after installation (but not more than 120 days from date of shipment). Individual system components are warranted at the service center as stated in their respective manuals. On-site service after the warranty expires is available on a service contract through your local Tektronix Service Center.

### Power Requirements

This system is designed for operation from a 115 volt (nominal), 60 hertz line. For operation from other line voltages or frequencies, contact your local Tektronix Field Office or representative.

**Line Voltage Range** — 90 to 132 volts ac.

**Line Frequency** — 48 to 66 hertz.

**Power Consumption** — 470 watts maximum (6 amps at 90 volts ac).

### System Environmental Characteristics

Temperature Operating
+10 to +40 degrees C
+50 to +104 degrees F

Altitude operating
4572M (15,000 ft.)

### System Physical Characteristics

Weight: 52.2 kg (115 lbs.)

Dimensions:

7854:
Length = 62.7 cm (24.7 in)
Width = 30.5 cm (12.0 in)
Height = 34.8 cm (13.7 in)

Calc Keyboard:
Length = 15.2 cm (6.0 in)
Width = 27.7 cm (10.9 in)
Height = 8.1 cm (3.2 in)

4052:
Length = 81.4 cm (32.1 in)
Width = 46.5 cm (18.3 in)
Height = 36.2 cm (14.3 in)

### WP1310 Utility Software

The WP1310 Utility Software provides 4050 BASIC routines to facilitate waveform acquisition, transfer, and processing. These routines allow operation of the WP1310 with limited programming experience. Each routine is called by a single key stroke using the 4052 user-definable keys. Routines provided include:

1. Transfer waveform from 7854 to 4052 memory
2. Read waveform from mag tape to 4052 memory
3. Read program from 4052 mag tape and transfer to 7854
4. Read log tape files into 4052 memory
5. Graph waveform stored in 4052 memory
6. Pulse parameter analysis based on min, max
7. Pulse parameter analysis based on histogram
8. Pulse parameter analysis based on linear curve fit
9. Integration
10. Restart
11. Transfer waveform from 4052 to 7854 memory
12. Record waveform from 4052 to mag tape
13. Record program from 7854 to 4052 mag tape
14. Enter key board commands from 4052 to 7854
15. Transfer message from 4052 to 7854 display
16. Cosine window
17. FFT
18. Correlation/convolution
19. Two or three point derivative
20. Not used

### 4052 R07

The Signal Processing ROM Pack #1 provides seven of the most frequently needed operations on arrays or sets of data. ROM Pack functions locate the maximum, minimum, threshold crossing, determine the derivative (slope), integral (area), or perform fast unlabeled screen graphing of data with just one 4050 BASIC statement per function.

### 4052 R08

The Signal Processing ROM Pack #2 provides eight advanced signal processing functions. ROM Pack functions include convolution, correlation, fast Fourier transform, inverse Fourier transform, rectangular to polar conversion of interleaved data, separation of interleaved data, interleaving of data, and cosine windowing of data. A single 4050 BASIC statement calls each ROM Pack function.

### Ordering Information

WP1310 Signal Processing System

For the address of your nearest Tektronix Field Office, contact:


**U.S.A.**
Tektronix, Inc.
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