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# Willtek 4350

## Mobile Fault Finder



getting started manual

version 1.00



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**Ordering information** This guide is issued as part of the 4350 Series Mobile Fault Finder. The ordering number for a published guide is M 295 543. The ordering number for the product can be found in section ["Options" on page 3](#).

**Federal Communications Commission (FCC) Notice** This product was tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this product in a

residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

The authority to operate this product is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by Willtek.

**Industry Canada Requirements** This Class A digital apparatus complies with Canadian ICES-003.  
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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# About This Guide

This section contains the following basic information:

- "Purpose and scope" on page viii
- "Assumptions" on page viii
- "Technical assistance" on page viii
- "Conventions" on page ix

## Purpose and scope

The purpose of this guide is to help you successfully use the 4350 Series Mobile Fault Finder features and capabilities. This guide includes task-based instructions that describe how to install, configure, and use the 4350 Series Mobile Fault Finder. Additionally, this guide provides a description of Willtek's warranty, services, and repair information.

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## Assumptions

This guide is intended for novice users who want to use the 4350 Series Mobile Fault Finder effectively and efficiently. We are assuming that you are familiar with basic telecommunication concepts and terminology.

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## Technical assistance

If you need assistance or have questions related to the use of this product, call or email one of Willtek's technical assistance centers.

Table 1      Technical assistance centers

Region	Phone Number	Fax number, email address
Americas	+1 317 595 2021 +1 866 WILLTEK	+1 317 595 2023 support.us@willtek.com
UK	+44 (0)20 8408 5720	+44 (0)20 8397 6286 support.uk@willtek.com
Europe, Middle East, Asia, Africa	+49 (0)89 99641 386 +49 (0)89 99641 227	+49 (0)89 99641 440 support.eu@willtek.com

## Conventions

This guide uses naming conventions and symbols, as described in the following tables.

Table 2 Typographical conventions

Description	Example
User interface actions appear in this typeface.	On the Status bar, click <b>Start</b> .
Buttons or switches that you press on a unit appear in this TYPEFACE.	Press the <b>ON</b> switch.
Code and output messages appear in this typeface.	All results okay
Text you must type exactly as shown appears in this typeface.	Type: <b>a:\set.exe</b> in the dialog box.
Variables appear in this <typeface>.	Type the new <hostname>.
Book references appear in this typeface.	Refer to <b>Newton's Telecom Dictionary</b>
A vertical bar   means "or": only one option can appear in a single command.	platform [a b e]
Square brackets [ ] indicate an optional argument.	login [platform name]
Slanted brackets < > group required arguments.	<password>

**Table 3** Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press Ctrl+s
A comma indicates consecutive key strokes.	Press Alt+f,s
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click Start > Program Files.

**Table 4** Symbol conventions



This symbol represents a general hazard.



This symbol represents a risk of electrical shock.



**NOTE**

This symbol represents a Note indicating related information or tip.

**Table 5** Safety definitions



**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

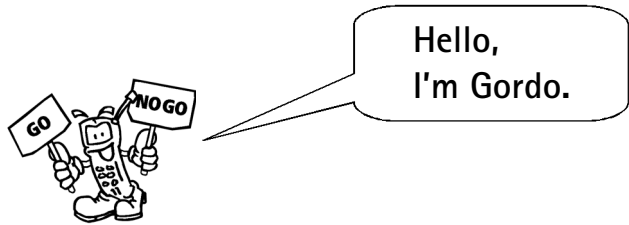
# 4350 Series Mobile Fault Finder Overview

A green square containing the white number 1, indicating the chapter number.

This chapter provides a general description of the 4350 Series Mobile Fault Finder. Topics discussed in this chapter include the following:

- ["About the 4350 Series Mobile Fault Finder" on page 2](#)
- ["Features and capabilities" on page 3](#)
- ["Options" on page 3](#)
- ["Shipping list" on page 5](#)
- ["Specifications" on page 6](#)

## About the 4350 Series Mobile Fault Finder



Congratulations on the purchase of your Willtek 4350 Series Mobile Fault Finder!

Gordo will show you how to set up the mobile fault finder and test mobile phones at the point of return.

The 4350 Series includes models 4351, 4352, 4353, 4354, and 4355.

The 4350 uses an upgradeable test program to simulate various networks and to test multiple mobile phone types.

The 4350 is designed to be easy for you to use.

Test results are easy to read – they are displayed as a pass or fail.

Let's get started!

---

## Features and capabilities

- Checks the capability of the mobile phone to register with the network.
- Tests the transmitter and the receiver.
- Allows to check the speaker and the microphone.
- Performs a frequency check.
- Verifies the channel handoff capability.
- Tests the analog handoff.

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## Options



What more do we need for testing?

The 4350 Series Mobile Fault Finder comes in different variants as listed below. This getting started guide is independent of the chosen model.

4351 Mobile Fault Finder (AMPS) .....	M 104 351
4352 Mobile Fault Finder (AMPS, CDMA) .....	M 104 352
4353 Mobile Fault Finder (AMPS, CDMA, PCS) .....	M 104 353
4354 Mobile Fault Finder (AMPS, TDMA) .....	M 104 354
4355 Mobile Fault Finder (AMPS, TDMA, PCS) .....	M 104 355

4350 Series Mobile Fault Finder Overview  
Options

The following accessories are recommended for use with the 4350 Series Mobile Fault Finder:

Universal Antenna Coupler . . . . .	M 248 330
RF Shield Box (TNC) . . . . .	M 248 340
RF package (TNC) Antenna Coupler + RF Shield Box .	M 248 399
TNC-TNC Bulkhead Adapter for RF Shield Box . . . . .	M 886 235



## Shipping list



Let's see what is shipped with your 4350.

The delivery consists of a 4350 model (see list above) plus the following parts:

- Test Program Installation disk
- System Calibration disk (specific for the 4350 serial number)
- Ship kit which includes one each of the following:
  - This getting started manual
  - RF cable, 36" (90 cm), 50  $\Omega$
  - Mini-UHF adapter
  - TNC-SMA adapter
  - Male-to-female adapter
  - Printer cable

If anything is missing or damaged, contact your supplier or a Willtek technical assistance center immediately (see [page viii](#)).

## Specifications



Here's where you  
get more  
information about  
your 4350.

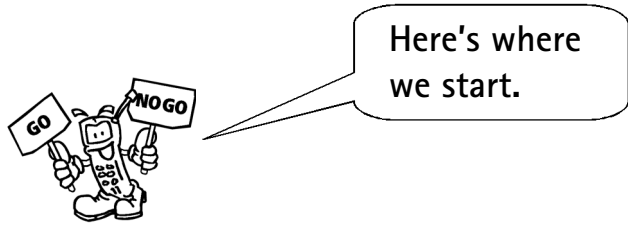
For detailed specifications, refer to the 4350 Series product data sheet.

# Instrument Setup



This chapter describes how to install the 4350 Series Mobile Fault Finder.

## Setting up the 4350



- 1 Unpack the 4350 and verify that the contents match the shipping list. See [page 5](#) for more details.
- 2 Attach the power cord to the rear of the unit and plug it into a suitable AC power source. See [page 13](#) for more details.
- 3 If test results need to be printed out, connect a printer to the rear panel parallel port. See [page 13](#) for more details.
- 4 If your 4350 has just been returned from being serviced, see [page 25](#) for more details.
- 5 If you receive a new test program installation disk, see [page 25](#) for more details.

# Operation

## 3

This chapter describes the functionality of the instrument. Topics discussed in this chapter are as follows:

- ["Using the front panel" on page 10](#)
- ["Using the rear panel" on page 13](#)
- ["Connecting the phone" on page 15](#)
- ["Starting to test" on page 17](#)
- ["Optimizing the 4350" on page 19](#)
- ["Changing the 4350 setup" on page 20](#)

## Using the front panel



Let's take a look at the front panel.

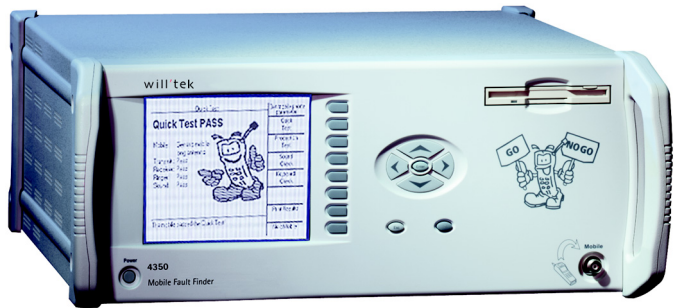


Table 6 User interface elements






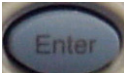





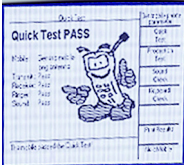
Part	What it looks like	What it does
Power button		Use this button to turn the 4350 power on or off.
Left cursor		Use this button to scroll left or decrease the value.
Right cursor		Use this button to scroll right or increase the value.

Table 6 User interface elements

Part	What it looks like	What it does
Down cursor		Use this button to scroll down.
Up cursor		Use this button to scroll up.
Enter button		Use this button (or the <b>Done</b> soft key) to complete an entry.
? (Help)		Use this button for a description of any soft key function. Press it a second time to exit the Help screen.
ESC		Use this button to access the Instrument Setup screen or to exit Help.
Mobile connector		Use this connector for attaching the mobile phone to the 4350.
Soft keys (S1 – S8)		These keys select the function next to the display.
Floppy disk drive		A device for storing and retrieving data on a floppy disk.

**Table 6** User interface elements

Part	What it looks like	What it does
LCD screen	 <p>The screenshot shows a monochrome LCD screen with a grid background. At the top, it says 'Quick Test PASS'. Below this, there is a list of test items: 'Pulse', 'Impedance', 'Resistance', 'Capacitance', and 'Sound', each followed by a status indicator like 'PASS' or 'FAIL'. In the center, there is a cartoon character of a person with a large head, wearing a hat and holding a tool. At the bottom, there are some numerical values and a small icon.</p>	This displays instructions and test results.






## Using the rear panel




Let's take a look  
at the rear  
panel.



Table 7 Rear panel elements

Part	What it looks like	What it does
AC power		Connect a suitable AC power source here.
Parallel port		Connect a printer to this port for printing out test results.
Serial port (RS-232)		If using a customized test program that requires remote communication, connect a PC to this port.

**Table 7** Rear panel elements

<b>Part</b>	<b>What it looks like</b>	<b>What it does</b>
Ext. 10 MHz Ref. input		If needed, connect an external 10 MHz reference source to this port.

## Connecting the phone

### Direct method 1 (recommended)



Now, let's  
connect the  
phone.

- 1 Attach an RF cable from the outside of the RF shield box to the 4350's front panel mobile connector.
- 2 Attach a pigtail cable from the mobile phone to the cable inside the RF shield box.

**Direct method 2** Attach an RF cable from the mobile phone to the 4350's front panel mobile connector.





Please use an RF shield box for the most accurate test results.

**Coupled method 1 (recommended)**

- 1 Place the Universal Antenna Coupler in the RF shield box.
- 2 Attach the supplied cable from the Universal Antenna Coupler to the inside of the RF shield box.
- 3 Attach an RF cable from the RF shield box to the front panel mobile connector.
- 4 Place the mobile phone to be tested in the holder on the Universal Antenna Coupler and adjust the clamp to secure the mobile phone.

**Coupled method 2**

- 1 Attach an RF cable from the Universal Antenna Coupler to the front panel mobile connector.
- 2 Place the mobile phone to be tested in the holder on the Universal Antenna Coupler and adjust the clamp to secure the mobile phone.

## Starting to test



Let's begin testing.

### Customized test programs

If your 4350 uses customized test programs, the tests and menus may differ from what is described here.

- 1 Ensure that the power cord is plugged into an AC power source.
- 2 Press the power button to turn the 4350 on.

### Optimization prompt

Approximately one hour after power up, an optimization prompt appears. See [page 19](#) for more details.

- 3 At the Main Menu screen, select the network:  
Sel New Network > Up/Down arrows > Done
- 4 At the Main Menu screen, select the type of mobile phone being tested:  
Sel New Phone > Up/Down arrows > Done
- 5 Verify that the correct network and mobile phone type are displayed for the phone being tested.

### More information about network and phone

The Current Config soft key lists a technical description of the selected network and the mobile phone.

- 6 Select the type of test.

**Description of functions**

Press the ? (Help) button for a description of any soft key or test function.

- 7 Follow the prompts as the 4350 tests the phone.

**Results display**

Results are displayed as a pass/fail at the end of the test.

- 8 To get specific test results, press the **Print Results** soft key, and select an output device: screen, printer, or floppy disk.
- 9 To return to the Main Menu and continue testing mobile phones, press the **Done** soft key.

## Optimizing the 4350



Please optimize  
your 4350 every  
24 hours to ensure  
accurate results.

**Daily optimization procedure** The optimization procedure takes up to 15 minutes and ensures that your 4350 provides the most accurate test results. No external equipment is necessary.

- 1 When the optimization prompt appears (one hour after power-up and every 24 hours after that point in time), press the soft key marked **Optimize Now**.
- 2 To start the optimization procedure, press the soft key marked **Yes**.
- 3 To optimize at a later time, press the soft key marked **No**.

**Factory calibration** The 4350 is scheduled for factory calibration once a year to ensure that the test results are accurate.

The calibration due date appears on the Upgrade & Configuration screen.

## Changing the 4350 setup



Here's how to change your 4350 setup.



**Do not change the setup during a test**

Pressing the ESC key while the tests are running ends the test procedure.

- 1 Press the **ESC** key to display the Instrument Setup screen.
- 2 At the Instrument Setup screen, select setup type.

During the setup, press the **ESC** key to return to the Instrument Setup screen.

- 3 After the setup, press the **ESC** key or Run Test soft key to return to the main menu.

Table 8 Setup parameters that can be changed

What to change	How to change it
Volume & contrast	Press the <b>Volume &amp; Contrast</b> soft key to display the volume and contrast screen.
Volume	Use the up/down arrow keys or soft keys to select the volume line. Use the right arrow to increase volume and the left arrow to decrease volume.



**Table 8** Setup parameters that can be changed

What to change	How to change it
Contrast	<p>Use the up/down arrow keys or soft keys to select the contrast line.</p> <p>Use the right arrow to increase contrast and the left arrow to decrease contrast.</p>
Date and date format	<p>At the Instrument Setup screen, press the <b>Date &amp; Time Setup</b> soft key to display the date/time setup screen.</p>
Date	<p>Press the <b>Date</b> soft key.</p> <p>Use the right/left arrow keys to select the day, month or year.</p> <p>Use the up/down arrow keys to set the date.</p>
Date format	<p>Press the <b>Date Format</b> soft key.</p> <p>Use the right/left or up/down arrow keys to select the desired format.</p>
Time and time format	<p>At the Instrument Setup screen, press the <b>Time and Time Format</b> soft keys to display the date/time setup screen.</p>
Time	<p>Use the right/left arrow to select the hours, minutes, seconds or am/pm.</p> <p>Use the up/down arrow keys to set the value.</p>

**Table 8** Setup parameters that can be changed

<b>What to change</b>	<b>How to change it</b>
Time format	Use the right/left arrow keys or soft keys to select the format line. Use the right/left or up/down arrow keys to select the desired format.
Print	At the Instrument Setup screen, press the <b>Print Setup</b> soft key to bring up the print setup screen. Press the <b>Printer Language</b> soft key and choose the printer language. Press the <b>Print Test Page</b> soft key to print a sample page.
Upgrade and Config.	Caution: Use only the customized disks labeled for the specific 4350 model/serial number you are using, otherwise, you may get invalid test results. At the Instrument Setup screen, press the <b>Upgrade &amp; Config.</b> soft key.

**Table 8**     Setup parameters that can be changed

<b>What to change</b>	<b>How to change it</b>
Upgrade System	<p>Use this key to load the system and calibration software.</p> <ol style="list-style-type: none"> <li>1 Press the <b>Upgrade System</b> soft key to access the upgrade system screen.</li> <li>2 Using the System software and the System calibration disks, follow the screen prompts to upgrade the system information.</li> </ol>
Upgrade Composer	<p>Use this key to load a new Composer file (composer.cs1). The Composer file holds the network settings and mobile phone path loss information that is used when you select a network and phone from the list.</p> <ol style="list-style-type: none"> <li>1 Place a floppy disk with the new Composer file in the 4350 disk drive.</li> <li>2 Press the <b>Upgrade Composer</b> soft key and follow the prompts on the screen.</li> </ol>

**Table 8** Setup parameters that can be changed

<b>What to change</b>	<b>How to change it</b>
Upgrade Mfr Codes	<p data-bbox="678 256 975 544">Use this key to load the latest list of manufacturer codes into your 4350. The manufacturer code list allows the 4350 to display the mobile phone manufacturer's name based on the code that it indicates during a registration.</p> <ol data-bbox="678 568 975 935" style="list-style-type: none"><li data-bbox="678 568 975 632">1 Go to the 4300 product page at <a href="http://www.willtek.com">www.willtek.com</a>.</li><li data-bbox="678 647 975 743">2 Download the mfrcodes.log file and place it on a floppy disk.</li><li data-bbox="678 759 975 823">3 Insert the floppy in the 4350 disk drive.</li><li data-bbox="678 839 975 935">4 Press the Upgrade Mfr Codes soft key to load the list.</li></ol>

Table 8 Setup parameters that can be changed

What to change	How to change it
Upgrade Test	<p>Use this key</p> <ul style="list-style-type: none"><li>– to load customized test programs and Composer files when your 4350 returns from being serviced.</li><li>– to load a new test program.</li></ul> <ol style="list-style-type: none"><li>1 Press the <b>Upgrade Test</b> soft key to access the upgrade test screen.</li><li>2 Using the Test Program and Composer disks, follow the screen prompts to upgrade the test screen information.</li></ol>

#### Composer default settings

Composer default settings are located on the test program disk.

Operation  
Changing the 4350 setup

# Troubleshooting



This chapter describes how to identify and correct problems related to the 4350 Series Mobile Fault Finder.

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## Solving problems



Here's what you do if you encounter a problem.

If you experience difficulties using the 4350 Series Mobile Fault Finder, refer to the related topic. Each topic describes problems and solutions that may be pertinent to your task. If you are unable to resolve your problem, please contact ["Technical assistance"](#) on [page viii](#).

**Problem** The phone does get service (does not register) with the 4350.

**Solution** Verify that you have selected the correct network on the 4350 for the mobile phone being tested.

Cycle the phone's power.

Ensure that the cables are securely connected.

Change the cable connecting the 4350 to the phone.

If using an RF shield box, ensure that it is closed.

**Problem** Nothing happens when you press power.

**Solution** Ensure that your 4350 is plugged into a suitable AC power source.



**Problem** Every phone fails/passes.

**Solution** Verify that you have selected the correct mobile phone type for the mobile phone being tested.

**Problem** Every phone fails.

**Solution** Run Optimization.

**Problem** No printout.

**Solution** Ensure that the printer power is on and attached to the 4350 with a cable.



# Warranty and Repair



This chapter describes the customer services available through Willtek. Topics discussed in this chapter include the following:

- ["Warranty information" on page 32](#)
- ["Equipment return instructions" on page 33](#)

## Warranty information

Willtek warrants that all of its products conform to Willtek's published specifications and are free from defects in materials and workmanship for a period of one year from the date of delivery to the original buyer, when used under normal operating conditions and within the service conditions for which they were designed. This warranty is not transferable and does not apply to used or demonstration products.

In case of a warranty claim, Willtek's obligation shall be limited to repairing, or at its option, replacing without charge, any assembly or component (except batteries) which in Willtek's sole opinion proves to be defective within the scope of the warranty. In the event Willtek is not able to modify, repair or replace nonconforming defective parts or components to a condition as warranted within a reasonable time after receipt thereof, the buyer shall receive credit in the amount of the original invoiced price of the product.

It is the buyer's responsibility to notify Willtek in writing of the defect or nonconformity within the warranty period and to return the affected product to Willtek's factory, designated service provider, or authorized service center within thirty (30) days after discovery of such defect or nonconformity. The buyer shall prepay shipping charges and insurance for products returned to Willtek or its designated service provider for warranty service. Willtek or its designated service provider shall pay costs for return of products to the buyer.

Willtek's obligation and the customer's sole remedy under this hardware warranty is limited to the repair or replacement, at Willtek's option, of the defective product. Willtek shall have no obligation to remedy any such defect if it can be shown: (a) that the product was altered, repaired, or reworked by any party other than Willtek without Willtek's written consent; (b) that such defects were the result of customer's improper storage, mishandling, abuse, or misuse of the product; (c) that such defects were the result of customer's use of the product in conjunction with equipment electronically or mechanically incompatible or of an inferior quality; or (d) that the defect was the result of damage by fire, explosion, power failure, or any act of nature.

The warranty described above is the buyer's sole and exclusive remedy and no other warranty, whether written or oral, expressed or implied by statute or course of dealing shall apply. Willtek specifically disclaims the implied warranties of merchantability and fitness for a particular purpose. No statement, representation, agreement, or understanding, oral or written, made by an agent, distributor, or employee of Willtek, which is not contained in the foregoing warranty will be binding upon Willtek, unless made in writing and executed by an authorized representative of Willtek. Under no circumstances shall Willtek be liable for any direct, indirect, special, incidental, or consequential damages, expenses, or losses, including loss of profits, based on contract, tort, or any other legal theory.

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## Equipment return instructions

Please contact your local service center for Willtek products via telephone or web site for return or reference authorization to accompany your equipment. For each piece of equipment returned for repair, attach a tag that includes the following information:

- Owner's name, address, and telephone number.
- Serial number, product type, and model.
- Warranty status. (If you are unsure of the warranty status of your instrument, include a copy of the invoice or delivery note.)
- Detailed description of the problem or service requested.
- Name and telephone number of the person to contact regarding questions about the repair.
- Return authorization (RA) number or reference number.

If possible, return the equipment using the original shipping container and material. Additional Willtek shipping containers are available from Willtek on request. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit. Willtek is not liable for any damage that may occur during shipping. The customer should clearly mark the Willtek-issued RA or reference number on the outside of the package and ship it prepaid and insured to Willtek.

Warranty and Repair  
Equipment return instructions

# Glossary

**4350** — Any of the 4350 Series Mobile Fault Finder models: 4351, 4352, 4353, 4354, 4355.

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## A

**AC power source** — Alternating current. Typically refers to the 120 or 230 volt electricity delivered by your local power utility to the three-pin power output in your wall.

---

## B

**Button** — One of several external key pads.

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## E

**External reference 10 MHz input** — A connector on the 4350 rear panel designed for a frequency reference cable.

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## F

**Factory calibration data** —

Willtek-supplied data to ensure the accuracy of the 4350 (by serial number).

---

## L

**LCD** — Liquid crystal display. Typically refers to the display screen.

---

## M

**Mobile phone** — Any type of cellular or PCS phone.

---

## N

**Network** — Cellular service provider.

**Network Interference** — Occurs when a mobile phone being tested on the 4350 attempts connection to a cellular or PCS network instead of to the 4350.

---

## O

**Optimization** — A process that increases the accuracy of some measurements.

---

## P

**Parallel port** — An output connector on the rear panel of the 4350 used for a printer.

**Pass/fail** — Test indications.

**PC** — Personal computer.

**PCS** — Personal Communications Service. A lower-priced, higher frequency alternative to cellular.

**POR** — Point of return.

**Product Data Sheet** — A detailed list of product specifications.

---

## R

**Registration** — The assignment of identification numbers and testing of equipment.

**RF** — Radio Frequency.

**RF shield box** — A Willtek product that protects mobile phones and networks from interfering with each other.

**RS-232** — A standard for serial communications devices.

---

## S

**Serial port** — An input/output connector on the rear panel of the 4350 that transmits data.

**Soft Key** — One of eight keys to the right of the screen.

**Specifications** — A defined set of product operating parameters.

**System software** — Willtek-supplied software, required for proper operation of the 4350.

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## U

**Universal Antenna Coupler** — A Willtek product onto which any mobile phone can be mounted and tested without a direct antenna connection.



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