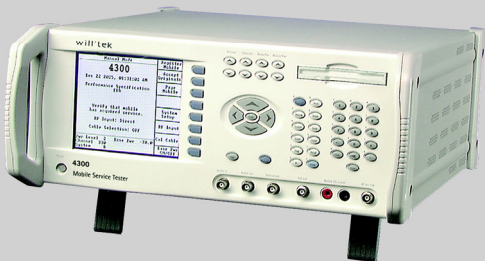


will'tek

# Willtek 4300

## Mobile Service Tester



getting started manual

version 1.00



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**Ordering information** This guide is issued as part of the Willtek 4300 Series Mobile Service Tester. The ordering number for a published guide is M 295 043. The ordering number for the product is detailed in section ["Options" on page 2](#).

**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
- "Related information" on page viii
- "Technical assistance" on page ix
- "Conventions" on page x

## **Purpose and scope**

The purpose of this guide is to help you successfully use the 4300 Mobile Service Tester features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the 4300 Mobile Service Tester. Additionally, this guide provides a description of Willtek's warranty, services, and repair information, including terms and conditions of the licensing agreement.

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## **Assumptions**

This guide is intended for novice users who want to use the 4300 Mobile Service Tester effectively and efficiently. We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication concepts and terminology.

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## **Related information**

Use this guide in conjunction with the following information (these manuals are delivered with the 4300 in PDF format on CD and are available from Willtek in printed format on request):

4300 user's guide, doc. no. M 290 043

4300 SCPI reference guide, doc. no. M 293 043

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## Technical assistance

If you need assistance or have questions related to the use of this product, call or e-mail 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 Start.
Buttons or switches that you press on a unit appear in this TYPEFACE.	Press the ON switch.
Code and output messages appear in this typeface.	All results okay
Text you must type exactly as shown appears in this typeface.	Type: a: \set.exe in the dialog box.
Variables appear in this <typeface>.	Type the new <hostname>.
Book references appear in this typeface.	Refer to Newton's Telecom Dictionary
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.

About This Guide  
*Conventions*

# 4300 Mobile Service Tester Overview



## 1

This chapter provides a general description of the 4300 Mobile Service Tester. Topics discussed in this chapter include the following:

- ["About the 4300 Mobile Service Tester" on page 2](#)
- ["Features and capabilities" on page 2](#)
- ["Options" on page 2](#)
- ["Shipping list" on page 3](#)
- ["Specifications" on page 4](#)
- ["Factory calibration" on page 4](#)
- ["4300 upgrades" on page 4](#)

## About the 4300 Mobile Service Tester

The Willtek 4300 Mobile Service Tester is especially designed to meet the needs of service depots and repair sites that have to repair and align mobile phones. Customers can choose the appropriate model from the Willtek 4300 Series according to their format requirements, AMPS/NAMPS/CDMA2000/TDMA.

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## Features and capabilities

- High accuracy in a powerful test instrument that is easy to use
- Handoff capability from AMPS/NAMPS/TDMA and vice versa
- Models available for CDMA2000 (IS-2000) and CDMAOne (IS-95)
- Data management results can be printed, stored or managed on a PC
- Three powerful test modes: QuickTest, AutoTest and manual mode.

---

## Options

The 4300 Mobile Service Tester comes in different variants as listed below. This getting started guide is independent of the chosen model.

- 4301 Mobile Service Tester (AMPS incl. NAMPS) ..... M 104 301
- 4302 Mobile Service Tester (AMPS, CDMA, 1xRTT) ..... M 104 302
- 4303 Mobile Service Tester (AMPS, CDMA, 1xRTT, PCS) M 104 303
- 4304 Mobile Service Tester (AMPS, TDMA) ..... M 104 304
- 4305 Mobile Service Tester (AMPS, TDMA, PCS)..... M 104 305



The following options and accessories are available for use with the 4300 Series Mobile Service Tester:

IS-136 Custom Software

Korean PCS (1700) Upgrade (for 4303 only)

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## Shipping list

The 4300 Mobile Service Tester includes one of each of the following:

- 4300 Series Mobile Service Tester
- System calibration/test sequence installation disk
- AC power cord
- Mini-UHF adapter
- TNC-SMA adapter
- UHF male-to-female adapter
- TNC-TNC RF cable
- RS-232 cable
- Printer cable
- This getting started manual
- CD with user's guide and SCPI reference manual

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

The 4300 uses pre-selected tests. To customize the tests your 4300 uses, contact Willtek at any of the addresses provided in section ["Technical assistance" on page ix](#).

## Specifications

For detailed specifications, refer to the 4300 Series data sheets.

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## Factory calibration

The 4300 is scheduled for factory calibration once a year to ensure that the test results are accurate.

Press the Diag key to view the calibration date.

---

## 4300 upgrades



### CAUTION

Use only the customized disks labeled for the specific 4300 model/serial number you are using, otherwise, you may get invalid test results.

Refer to the user's guide, chapter "Sequence Setup" for loading customized tests or system upgrades.

# Instrument Setup

## 2

This chapter describes how to install the 4300 Mobile Service Tester. The topics discussed in this chapter are as follows:

- ["Setting up the 4300" on page 6](#)
- ["Calibrating the RF cable" on page 7](#)
- ["Connecting the phone" on page 7](#)

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## Setting up the 4300

- 1 Unpack the 4300 and verify that the contents match the shipping list. See ["Shipping list" on page 3](#) 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 17](#) for more details.

### Connecting the mobile power source

If required, attach the mobile power source to the rear of the 4300, observing the labeled polarities (red = positive and black = negative). The mobile power source should be 3–15 volt, 5A supply. Ensure that the voltage source is adjusted to conform to the maximum voltage rating of the phone. Attach the mobile telephone to the front panel connectors.

- 3 If test results need to be printed out, connect a printer to the rear panel parallel port. See [page 17](#) for more details.
- 4 Using the RF cable and adapter connect the mobile to be tested to the front panel RF in/out connector. See [page 16](#).

### Some phones may require a special test fixture or cable.

- 5 Ensure that the set up parameters correspond with the individual requirements for the mobile being tested. See section ["Setting up the parameters" on page 18](#) for specific test parameters.
- 6 Begin testing. See section ["Automatic Tests" on page 29](#) for more details on automatic testing.

Refer to the 4300 user's guide for manual testing and/or assistance on troubleshooting any test failures.

Refer to the 4300 SCPI reference guide for an explanation of the test parameters.

- 7 If your 4300 is returning from being serviced, reload any custom tests. Refer to the user's guide, section "Sequence Setup".
- 8 If you receive a new custom test disk, refer to the user's guide, section "Upgrade Software".

---

## Calibrating the RF cable

Calibrate the cable between the 4300 and the phone to compensate for the insertion loss introduced by the cable.

■ Insertion loss is calculated into the test parameters.

- 1 At the Manual Mode screen, press the **Cal Cable** soft key.
- 2 Label the cable with a calibration tag indicating the date of the calibration and the insertion loss value.

---

## Connecting the phone

Attach an RF cable and adapter from the mobile phone to the 4300 RF in/out connector (see [page 16](#)).

■ To test the voltage, current and power draw of the phone, attach a mobile power source to the Mobile DC power connectors on the 4300 front panel.

**Chapter 2** Instrument Setup  
*Connecting the phone*

# Operation

## 3

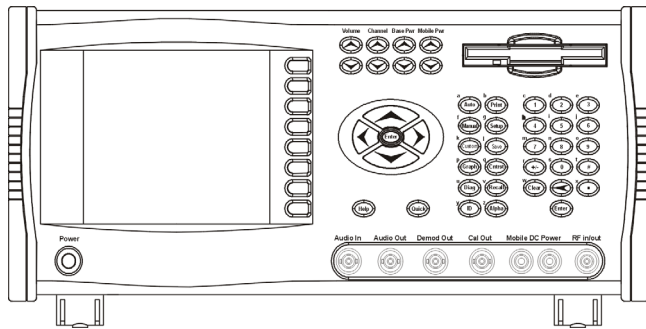
This chapter describes the functionality of the instrument. Topics discussed in this chapter are as follows:

- ["Using the front panel" on page 10](#)
- ["Connecting test leads" on page 16](#)
- ["Setting up the parameters" on page 18](#)
- ["Automatic Tests" on page 29](#)

## Using the front panel

This section discusses the front panel elements which are grouped as follows:

- "Basic user interface elements"
- "Test mode keys"
- "Data entry keys"
- "Base station adjustment keys"



### Basic user interface elements

Table 6 Basic user interface elements


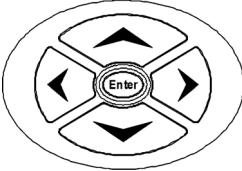
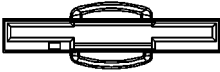




Part	What it looks like	What it does
Power button	<p>Power</p> 	Use this button to turn the 4300 power on or off.
Arrow keys		Use these keys to scroll left or right or to increase or decrease values.









Table 6 Basic user interface elements

Part	What it looks like	What it does																																							
Floppy disk drive		A device for storing and retrieving data on a floppy disk.																																							
LCD screen	<table border="1" data-bbox="524 384 744 576"> <tr> <td colspan="2">AMPS Summary</td> <td>Messages</td> </tr> <tr> <td colspan="2">Mobile Transmitter</td> <td>Audio Setup</td> </tr> <tr> <td>Power</td> <td>6.2 dBW</td> <td>RF Tests</td> </tr> <tr> <td>Freq Error</td> <td>-0.02 kHz</td> <td>SAT</td> </tr> <tr> <td>SAT Deviation</td> <td>1400 Hz</td> <td>ST</td> </tr> <tr> <td>SAT Frequency</td> <td>5970 Hz</td> <td>Wide Band Deviation</td> </tr> <tr> <td>Audio Deviation</td> <td>2650 Hz</td> <td>Audio Deviation</td> </tr> <tr> <td colspan="2">Mobile Receiver</td> <td>Release</td> </tr> <tr> <td>Rx Sinad</td> <td>20.0 dB</td> <td></td> </tr> <tr> <td>DC Power</td> <td>27.3W 12.6V 2.2A</td> <td></td> </tr> <tr> <td>Pwr Lever</td> <td>5</td> <td>Base Pwr -75.0</td> </tr> <tr> <td>Channel</td> <td>333</td> <td>System</td> </tr> <tr> <td>System</td> <td>A</td> <td></td> </tr> </table>	AMPS Summary		Messages	Mobile Transmitter		Audio Setup	Power	6.2 dBW	RF Tests	Freq Error	-0.02 kHz	SAT	SAT Deviation	1400 Hz	ST	SAT Frequency	5970 Hz	Wide Band Deviation	Audio Deviation	2650 Hz	Audio Deviation	Mobile Receiver		Release	Rx Sinad	20.0 dB		DC Power	27.3W 12.6V 2.2A		Pwr Lever	5	Base Pwr -75.0	Channel	333	System	System	A		This displays instructions and test results.
AMPS Summary		Messages																																							
Mobile Transmitter		Audio Setup																																							
Power	6.2 dBW	RF Tests																																							
Freq Error	-0.02 kHz	SAT																																							
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DC Power	27.3W 12.6V 2.2A																																								
Pwr Lever	5	Base Pwr -75.0																																							
Channel	333	System																																							
System	A																																								
Enter button		Use this button to complete an entry.																																							
Help key		Use this button to access context sensitive HELP.																																							
Quick key		Use this button to initiate the Quick test.																																							
Soft keys		These keys select the function next to the display.																																							







**Test mode keys**

Table 7 Test mode keys

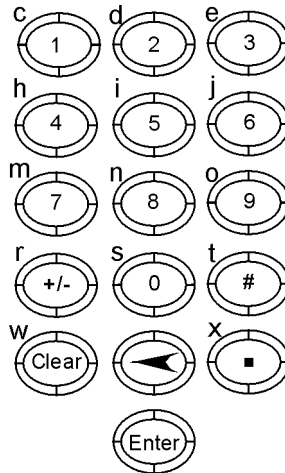
Part	What it looks like	What it does
Auto	a 	This key initiates the Auto test.
Manual	f 	This key initiates manual testing.
Custom	c 	This key initiates custom test sequences.
Graph	p 	This key initiates a graphical display of the mobile's output power (AMPS or TDMA only).
Diag	u 	This key initiates the diagnostic self-test and self-test screen.
ID	y 	This key initiates a mobile ID registration.

Function mode keys

Table 8 Function mode keys

Part	What it looks like	What it does
Print		This key initiates the print/test summary function.
Setup		This key initiates the system mode selection.
Save		This key initiates the saving of data.
Cntrst		This key initiates the adjustment of display contrast.
Recall		This key initiates access to stored parameter settings.
Alpha		This key initiates the entry of alpha characters.

## Data entry keys



These keys are used to enter numeric values in selected fields.

When used in conjunction with Test and Function keys, these keys can be used to enter alpha values.

Use the **BACKSPACE** arrow to delete a character in a field.

Use the **CLEAR** key to delete all characters in a field.

Use the **ENTER** key to execute entered values or to terminate the alpha entry mode.

Use the **+/-** key to change the sign of a numerical value.

**Base station  
adjustment  
keys**

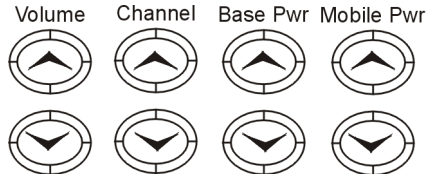


Table 9 Base station adjustment keys

Part	What it does
Volume	This key enables the adjustment of the 4300 audio level.
Channel	This key allows the user to select the mobile voice channel.
Base Pwr	This key allows the user to select the 4300 output power level.
Mobile Pwr	This key allows the user to select the mobile transmit power level.

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## Connecting test leads

Connectors are available both on the front and on the rear panel.

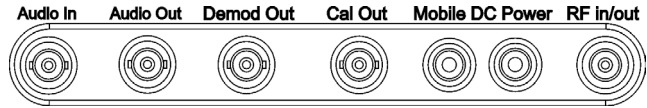


Table 10 Front panel connectors

Part	What it does
Audio In	Use this connector for SINAD testing.
Audio Out	Use this connector for audio synthesizer output or audio out.
Demod Out	Use this connector for a demodulated signal output in the receive mode.
Cal Out	Use this connector to measure cable loss.
Mobile DC Power	Use these connectors for attaching a power supply to the mobile phone.
RF in/out	Use this connector with the provided TNC-TNC cable to attach the mobile phone to the 4300.

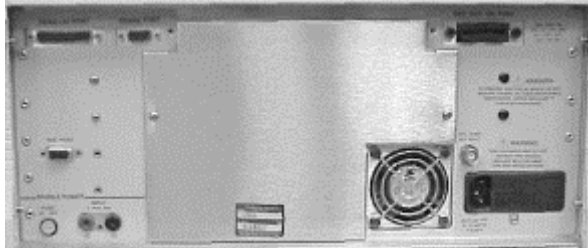







Table 11 Rear panel connectors

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 test results.
Serial port		If using a customized test program that requires remote communication, connect a PC to this port.
Ext. 10 MHz ref. input		If required, connect an external 10 MHz reference source to this port.
IEEE std 488 port		Provides a standard GPIB interface.

---

## Setting up the parameters

- Cellular CDMA**
- 1 Press the **SETUP** key on the right side front panel and then the **System Setup** soft key.
  - 2 Program the Initial System as follows:
    - Select System A (Non-Wireline channels) or System B (Wireline channels) by pressing the **Initial System** key.
    - Press the **System A** or **System B** soft key and set the corresponding parameters.
  - 3 Program the Type parameter as follows:
    - Press the **Type** soft key until the CDMA designator appears in the upper right hand side of the screen.

— If **Type** does not appear after pressing the **System A** or **System B** key, then press the **More** key and then press the **Type** key. Press this key until CDMA appears on the upper right-hand side of the main screen.

- Press **Return**.
- 4 Program the Channel parameters as follows:
    - Press the **Channel** soft key.
    - Using the data entry keys, set the primary or secondary CDMA control channel for the system selected in step 2.

Table 12 Setting the primary and secondary CDMA control channels

	System A	System B
Primary	283	384
Secondary	691	777



- 5 Program the System Identification Code (SID) as follows:
  - Press the **SID** soft key.
  - Using the data entry keys set the system SID to match the mobile SID.

Set the mobile SID to a value different from your operating system SID to keep the mobile unit from locking onto a valid operating channel in your geographical area and not the 4300.

Turn off the roam feature in the mobile telephone.

- 6 Program the Network Identification Code (NID) as follows:
  - Press the **NID** soft key.
  - Using the data entry keys, set the system NID. It is recommended to leave the NID at 0, unless problems arise with registrations. In the latter case, set the system NID to match the mobile NID.
- 7 Program the Pilot PN Sequence Offset Index (PN Offset) as follows:
  - Press the **PN Offset** soft key.
  - Set the PN Offset to 000.

This minimizes interference on your operating channels.

- 8 Program the Initial Type parameters as follows:
  - Press **Return** until the Setup Initial Service screen appears.
  - At the Setup Initial Service screen, press the **Initial Type** key until CDMA appears.
- 9 Press the CDMA key to program the following:
  - Channel: Set this to the channel selected in step 4.
  - Frame Offset: 00
  - Traffic Code: 08
  - Service Option: 2
- 10 Press **Return** until the Manual Mode screen appears.

- 11 At the Manual Mode screen select one of the automatic tests.

## PCS CDMA

The 4300 must be equipped with the FEX option to test PCS phones.

To verify that the FEX option is enabled, press the **DIAG** key to display option information on your 4300. If the FEX option is not listed, contact customer service at any of the addresses provided in ["Technical assistance" on page ix](#).

- 1 Press the **SETUP** key on the right side front panel and then the **System Setup** soft key.
- 2 Program the Initial System as follows:
  - Select System A (Non-Wireline channels) or System B (Wireline channels) by pressing the **Initial System** key.
  - Press the **System A** or **System B** soft key and set the corresponding parameters.
- 3 Program the Band as follows: Press the **Band** soft key until the PCS label appears to the left of the Channel label.
- 4 Program the Channel parameters as follows:
  - Press the **Channel** soft key.
  - Set the channel to the primary RF channel used by the PCS Service Provider.

The Channel/SID combination must be in the roaming list for the mobile being tested.

- 5 Program the System Identification Code (SID) as follows:
  - Press the **SID** soft key.
  - Using the data entry keys set the system SID to match the mobile SID.

- 6 Program the Network identification Code (NID) as follows:
  - Press the **NID** soft key.
  - Using the data entry keys set the system NID to match the mobile NID.
- 7 Program the Pilot PN Sequence Offset Index (PN Offset) parameter as follows:
  - Press the **PN Offset** soft key.
  - Set the PN Offset to 000.

— | This minimizes interference on your operating channels. |

- 8 Program the Type parameter as follows:
  - Press the **More** soft key.
  - Press the **Type** soft key until the CDMA designator appears in the upper right hand side of the screen.
  - Press **Return** twice.
- 9 Program the Initial Type parameters as follows:
  - At the Setup Initial Service screen, press the **Initial Type** key until CDMA appears.
  - Press the **CDMA** key to program the following:
    - Channel: Set this to the channel selected in step 4.
    - Frame Offset: 00
    - Traffic Code: 08
    - Service Option: 2
- 10 Press **Return** until the Manual Mode screen appears.
- 11 At the Manual Mode screen select one of the automatic tests.

- AMPS**
- 1 Press the **SETUP** key on the right side front panel and then the **System Setup** soft key.
  - 2 Program the Initial System as follows:  
Select **System A** (Non-Wireline channels) or **System B** (Wireline channels) by pressing the Initial System key.

## Chapter 3 Operation

### Setting up the parameters

- 3 Program the Channel parameters as follows:
  - Press the **Channel** soft key.
  - Set the Channel to 0313 - 0333 for System A or 0334 - 0354 for System B.
- 4 Program the Initial Type as follows:
  - Press the **Initial Type** soft key until AMPS appears.
  - Press the **AMPS** soft key to program the following:  
Channel: Set this to the channel selected in step 3.  
SAT frequency: 00  
Power Level: 02
  - Press **Return** until the first Setup Initial Service screen appears.
- 5 Press the **System A** or **System B** soft key and set the corresponding parameters.
- 6 Program the Type parameter as follows:
  - Press the **Type** soft key until the CDMA or DIGITAL designator disappears from the upper right hand side of the screen.
  - Press **Return**.
- 7 Program the System Identification Code (SID) as follows:
  - Using the data entry keys set the system SID to match the mobile SID.

Set this to a value different from your operating system SID to keep the mobile unit from locking onto a valid operating channel in your geographical area and not the 4300.

- If the mobile phone being tested has a roam feature, turn it off.
- 8 Program the Digital Color Code (DCC) as follows:
    - Press the **DCC** soft key.
    - Set the DCC to 0.

- 9 Program the Power Level as follows:
  - Press the **Power Level** soft key.
  - Set the Power Level to 2.
- 10 Press **Return** until the Manual Mode screen appears.
- 11 At the Manual Mode screen select one of the automatic tests.

- NAMPS**
- 1 Press the **SETUP** key on the right side front panel and then the **System Setup** soft key.
  - 2 Program the Initial System as follows:
    - Select **System A** (Non-Wireline channels) or **System B** (Wireline channels) by pressing the **Initial System** key.
    - Press the **System A** or **System B** soft key and set the corresponding parameters.
  - 3 Program the Channel as follows:
    - Press the **Channel** soft key.
    - Set the Channel to 0313 - 0333 for System A or 0334 - 0354 for System B.
  - 4 Program the Initial Type as follows:
    - Press the **Initial Type** soft key until NAMPS appears.
    - Press the **NAMPS** soft key to program the following:  
Channel: Set this to the channel selected in step 3.  
Offset: Mid  
DSAT Vector: 2  
Power Level: 2
    - Press **Return** until the first Setup Initial Service screen appears.
  - 5 Press the **System A** or **System B** soft key and set the corresponding parameters.
  - 6 Program the Type as follows:  
Press **More**, then the **Type** soft key until the CDMA or DIGITAL designator disappears from the upper right hand side of the screen.

## Chapter 3 Operation

### Setting up the parameters

- 7 Program the System Identification Code (SID) as follows:
  - Using the data entry keys set the SID to match the mobile SID.

Set this to a value different from your operating system SID to keep the mobile unit from locking onto a valid operating channel in your geographical area and not the 4300.

- Turn off the roam feature in the mobile telephone.
- 8 Program the Power Level as follows:
    - Press the **Power Level** soft key.
    - Set the Power Level to 2.
  - 9 Program the Digital Color Code (DCC) as follows:
    - Press the **DCC** soft key.
    - Set the DCC to 0.
  - 10 Press **Return** until the Manual Mode screen appears.
  - 11 At the Manual Mode screen select one of the automatic tests.

### Cellular TDMA

- 1 Press the **SETUP** key on the right side front panel and then the **System Setup** soft key.
- 2 Program the Initial System as follows:
  - Select System A (Non-Wireline channels) or System B (Wireline channels) by pressing the **Initial System** key.
  - Press the **System A** or **System B** soft key and set the corresponding parameters.

- 3 Program the Type as follows:
  - Press the **More** soft key, then the **Type** soft key.
  - For an IS-136 digital control channel, press the **Type** soft key until Digital appears on the upper right screen.
  - If an IS-136 digital control channel is not desired, press the **Type** soft key until Digital disappears on the upper right screen.
  - Press the **Return** soft key to return to the Setup Initial Service screen.
- 4 Program the Channel as follows:
  - Press the **Channel** soft key.
  - Select the appropriate control channel (1 to 799 or 991 to 1023).
- 5 Program the System Identification Code (SID) as follows:
  - Press the **SID** soft key.
  - Using the data entry keys set the system SID to match the mobile SID.

Set the system SID to a value different from your operating system SID to keep the mobile unit from locking onto a valid operating channel in your geographical area and not the 4300.

- If the mobile phone being tested has a roam feature, turn it off.
  - If the mobile phone being tested has a home only feature, select it.
- 6 Program the Power Level as follows:  
Press the **Power Level** soft key and using either the **Mobile Pwr** soft keys or the arrow keys, set the power level to 2.
  - 7 For System A , program the Digital Verification Color Code (DVCC) as follows:
    - Press the **DVCC** soft key.
    - Set the DVCC to 0.

## Chapter 3 Operation

### Setting up the parameters

- 8 For System B, program the Digital Color Code (DCC) as follows:
  - Press the **DCC** soft key.
  - Set the DCC to 0.
- 9 Set the Analog Pointer as follows:

The analog pointer is a field in the analog control channel overhead messages that tells the phone which channel is the local IS-136 control channel. If the phone is digital control channel capable it can then tune to this channel. This improves channel acquisition time because it allows the phone to scan the 42 analog control channels first rather than having to search through all of the channels looking for a digital control channel.

- Press the **More** soft key twice.
  - Press the **Pointer** soft key to toggle the Analog Pointer to **ON**.
- 10 Press **Return** until the Manual Mode screen appears.
  - 11 At the Manual Mode screen select one of the automatic tests.

## PCS TDMA

The 4300 must be equipped with the FEX option to test PCS phones. To verify that the FEX option is enabled, press the **DIAG** key to display option information on your 4300. If the FEX option is not listed, contact Willtek at any of the numbers provided in section "[Technical assistance](#)" on page ix.

- 1 Press the **SETUP** key on the right side front panel and then the **System Setup** soft key.
- 2 Set the Initial System as follows:
  - Select System A (Non-Wireline channels) or System B (Wireline channels) by pressing the **Initial System** key.
  - Press the **System A** or **System B** soft key and set the corresponding parameters.



- 3 Program the Band as follows:  
Press the **Band** soft key until the letters PCS appear to the left of the channel number on the screen.
- 4 Program the Channel as follows:
  - Press the **Channel** soft key and using the channel up/down soft keys, set the channel range for the following bands:

Table 13 Channel numbers in PCS bands

Band	Channel Range
A	2-498
B	668-1165
C	1502-1998
D	502-665
E	1168-1332
F	1335-1498

Some PCS phones are set to block certain channels or channel bands. If the scan pattern/blocked channels of the phone are unknown, select one channel from each band until the phone is able to lock on.

- 5 Program the System Identification Code (SID) as follows:
  - Press the **SID** soft key.
  - Using the data entry keys set the system SID to match the mobile SID.

Set this to a value different from your operating system SID to keep the mobile unit from locking onto a valid operating channel in your geographical area and not the 4300.

## Chapter 3 Operation

### Setting up the parameters

- If the mobile phone being tested has a roam feature, turn it off.
  - If the mobile phone being tested has a home only feature, select it.
- 6 Program the Power Level as follows:  
Press the **Power Level** soft key and using the **Mobile Pwr** soft keys set the Power Level to 2.
  - 7 Program the Type as follows:
    - Press the **More** soft key then press the **Type** soft key until Digital appears on the upper right of the screen.
    - Press **Return**.
  - 8 For System A, program the Digital Verification Color Code (DVCC) as follows:  
Press the **DVCC** soft key and set the DVCC to 001.
  - 9 For System B, program the Digital Color Code (DCC) as follows:
    - Press the **DCC** soft key and set the DCC to 0.
    - Press the **Return** soft key when done.
  - 10 Program the Initial Type parameter as follows:  
Press the **Initial Type** key until TDMA appears as the Initial Type.
  - 11 Press **Return** until the Manual Mode screen appears.
  - 12 At the Manual Mode screen select one of the automatic tests.

## Automatic Tests

The Automatic Tests (Quick, Auto, and three Custom tests) are memory locations used to store test scripts that allow you to test the functionality of the mobile phone. Pre-written tests scripts have been loaded in these memory locations by the factory and can be found on the system calibration/test sequence disk. Any sequence may be loaded into any one of the test locations.

Refer to the SCPI reference manual for custom test creation, or contact a Willtek technical assistance center.

Refer to section ["Setting up the parameters" on page 18](#) to set the system parameters for the unit under test.

### Quick Test

This test assumes that a Quick test sequence has been loaded into the 4300. If a Quick test sequence has not been loaded, refer to the user's guide, section Sequence Setup.

- 1 Power on the mobile telephone.
- 2 Verify that the Initial Type and Band of the mobile telephone match the test parameters.
- 3 Connect the mobile to the 4300 via the RF in/out connector.
- 4 Press **Return**.
- 5 Press the **QUICK** key.
- 6 Follow the instructions on the 4300 screen.
- 7 Print the results by pressing the **Save To Printer** soft key or the **Save To Disk** soft key.

#### Note

Some of the test scripts have formatted printouts that will automatically dump to the printer upon completion of the test sequence if the printer is turned on.

## Auto Test

This test assumes that an Auto test sequence has been loaded into the 4300. If an Auto test sequence has not been loaded, refer to the user's guide, section Sequence Setup.

- 1 Power on the mobile telephone.
- 2 Verify that the Initial Type and Band of the mobile telephone match the test parameters.
- 3 Connect the mobile to the 4300 via the RF in/out connector.
- 4 Press **Return**.
- 5 Press the **AUTO** key.
- 6 Follow the instructions on the 4300 screen.
- 7 When the tests are complete, the 4300 displays a summary of the tests along with a summary of the failed tests.
- 8 Print the results by pressing the **Save To Printer** soft key or the **Save To Disk** soft key.

### Note

Some of the test scripts have formatted printouts that will automatically dump to the printer upon completion of the test sequence if the printer is turned on.

**Custom Test** This test assumes that a Custom test sequence has been loaded into the 4300. If a Custom test sequence has not been loaded, refer to the user's guide, section Sequence Setup.

- 1 Press the **CUSTOM** key.
- 2 Select which custom test to run, by pressing the **Setup** key and the **Sequence Number** key.
- 3 Press **Return**.
- 4 Press **Start**.
- 5 Follow the prompts on the 4300 screen.

- 6 When the tests are complete, the 4300 displays a summary of the tests along with a summary of the failed tests.
- 7 Print the results by pressing the **Save To Printer** soft key or the **Save To Disk** soft key.

**Note**

Some of the test scripts have formatted printouts that will automatically dump to the printer upon completion of the test sequence if the printer is turned on.

**Chapter 3** Operation  
*Automatic Tests*

# Maintenance and Troubleshooting

## 4

This chapter describes how to identify and correct problems related to the 4300 Mobile Service Tester. Topics discussed in this chapter are as follows:

- ["Troubleshooting" on page 34](#)
- ["Solving problems" on page 34](#)

## Troubleshooting

If you are unable to resolve problems related to the 4300 Mobile Service Tester, refer to ["Technical assistance" on page ix](#).

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## Solving problems

If you experience difficulties using the 4300 Mobile Service Tester, 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 ix](#).

**Problem** Phone won't register.

**Solution** Verify that you have selected the correct control channel, SID and type (CDMA, TDMA, AMPS) for the phone being tested.

Cycle the phone's power.

Ensure that the cables are securely connected.

Change the cable connecting the 4300 to the phone.

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

**Solution** Ensure that your 4300 is plugged into a suitable power source.

**Problem** Every phone fails/passes.

**Solution** Verify that you have selected the correct cable loss for the type of cable (and adapter) being used.



**Problem** Every phone fails.

**Solution** Run Calibration.

**Problem** No printout.

**Solution** Ensure that the printer power is on and attached to the 4300 with a Centronics cable.

**Chapter 4** Maintenance and Troubleshooting  
*Solving problems*

# Warranty and Repair



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

- ["Warranty information" on page 38](#)
- ["Equipment return instructions" on page 39](#)

## 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.

**Appendix A** Warranty and Repair  
*Equipment return instructions*

# Glossary

**4300** — Cellular Test System.

**AC power source** — Alternating current.

**ext. ref. 10 MHz input** — A connector on the 4300 rear panel designed for a frequency reference cable.

**factory calibration data** — Willtek-supplied data to ensure the accuracy of the 4300 (by serial number).

**IEEE std 488 port** — A connector on the 4300 rear panel designed to provide a standard GPIB interface.

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

**mobile phone** — Any type of cellular (800 MHz) or PCS (1900 MHz) phone.

**network** — Service provider.

**initial system** — The initial system sets the control channel band for the 4300 base station emulator.

**network interference** — Occurs when a mobile phone being tested on the 4300 attempts connection to a cellular or PCS network instead of to the 4300.

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

**parallel port** — An output connector on the rear panel of the 4300 used for a printer.

**pass/fail** — Test indications.

**PC** — Personal computer.

**PCS** — Personal Communications Service. A higher frequency (1900 MHz) alternative to cellular (800 MHz).

**POR** — Point of return.

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

**RF** — Radio Frequency.

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

**serial port** — An input/output connector on the rear panel of the 4300 that transmits data.

**soft key** — One of eight keys to the right of the screen.

**system software** — Willtek-supplied software, required for proper operation of the 4300.



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