



# **406 Beacon Tester Operator's Manual**

**for models:**

**BT100D**

**BT100A**

**BT100S**

Version 2.21

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# CONTENTS

INTRODUCTION .....	1
SUMMARY OF MODELS .....	1
UNPACKING.....	1
BEFORE YOU START.....	2
GETTING STARTED .....	2
Flowcharts .....	2
Setting the desired measurement File Name: .....	8
Setting the Input Mode and REF Mode: .....	8
Selecting the desired 10 MHz Reference source: .....	9
Selecting the desired RF Input Mode: .....	9
Setting the Configuration Settings: .....	10
Saving Options Setting:.....	11
Location Coordinates Setting: .....	11
Receive Mode Settings: .....	11
Non-406 MHz Beacons .....	11
HTML Print Settings: .....	12
Display Options Settings: .....	12
Stability Settings: .....	12
Cable Loss:.....	13
MAKING MEASUREMENTS .....	14
General:.....	14
Conventional Measurement Mode: .....	16
Stability Measurement Mode (BT100S model only): .....	17
Terminating the Stability Test Prior to Completion: .....	19
MEASUREMENTS RESULTS .....	20
Decode Screens: .....	20
Details Screens: .....	21
Graphics screens: .....	21
Options: .....	22
User Comments:.....	22
Files: .....	23
About Beacon Tester:.....	24
121.5 MHz Homing Transmitter in Self-Test Mode: .....	24
PRINTING THE MEASUREMENT TEST REPORT .....	25
Activesync: .....	25
Memory Card:.....	26
Network Card:.....	28
Infrared Link:.....	29
DELIMITED TEXT FILE .....	29
RE-INSTALLING BEACON TESTER SOFTWARE .....	30
SOFTWARE UPDATES.....	30
BEACON TESTER MODEL UPGRADING .....	30
SPECIFICATIONS .....	34
REGULATORY INFORMATION .....	35
CANADA.....	35
USA .....	35
EUROPEAN UNION .....	36
WARRANTY INFORMATION .....	37
CALIBRATION .....	37
RETURNS.....	37

**WARNING!**

**DO NOT ACTIVATE ANY BEACON IN ITS NORMAL ACTIVATE MODE UNLESS THE BEACON IS IN A SCREEN BOX OR A SCREEN ROOM. DOING SO COULD RESULT IN A FALSE DISTRESS ALERT.**

**WARNING!**

**WHEN USING 5 WATT INPUT MODE DO NOT EXCEED A DUTY CYCLE OF ONE BURST (520 MS) EVERY 30 SECONDS. DAMAGE WILL RESULT!**

## INTRODUCTION

Thank you for choosing the BT100 series of 406 Beacon Testers. The BT100 series of Beacon Testers are the most advanced portable Beacon Testers available.

This Operator's Manual explains the operation of three models: BT100D, BT100A, and BT100S. Measurement capabilities differ with each model.

## SUMMARY OF MODELS

**BT100D:** This model decodes the 406 MHz message and measures 406 MHz frequency and power.

**BT100A:** This model decodes the 406 MHz message, measures the details of the 406 MHz transmitter and the details of the 121.5 MHz transmitter.

**BT100S:** This model decodes the 406 MHz message, measures the details of the 406 MHz transmitter, the 406 MHz frequency stability, and the details of the 121.5 MHz transmitter.

## UNPACKING

Please verify the contents of your package. The BT100 should contain:

- Beacon Tester CF Card
- Operator's Manual
- Certificate of Calibration
- 406 Interface cable
- REF Interface cable (optional on the BT100D)
- Screen cleaning cloth
- Zipper Pouch
- Waterproof yellow hard case (optional on the BT100D)
- PDA
- CD containing PDA software
- AC Adapter
- Activesync cable/cradle
- PDA User Manual

## **BEFORE YOU START**

Unpack the PDA and charge the batteries in accordance with PDA manufacturer's instructions.

**NOTE: Activesync must be installed on any computer that you wish to connect the PDA. Install Activesync on your desktop computer using the CD or, for the most up-to-date version, download Activesync from the Microsoft website. Please refer to the PDA documentation for instructions.**

**NOTE: When not in use, charge the batteries in the PDA at least once a month. This will prevent the loss of programs and data. In the event that the Beacon Tester application is lost due to battery discharge, re-installation is very simple. Refer to *Re-Installing the Beacon Tester Software* section for details.**

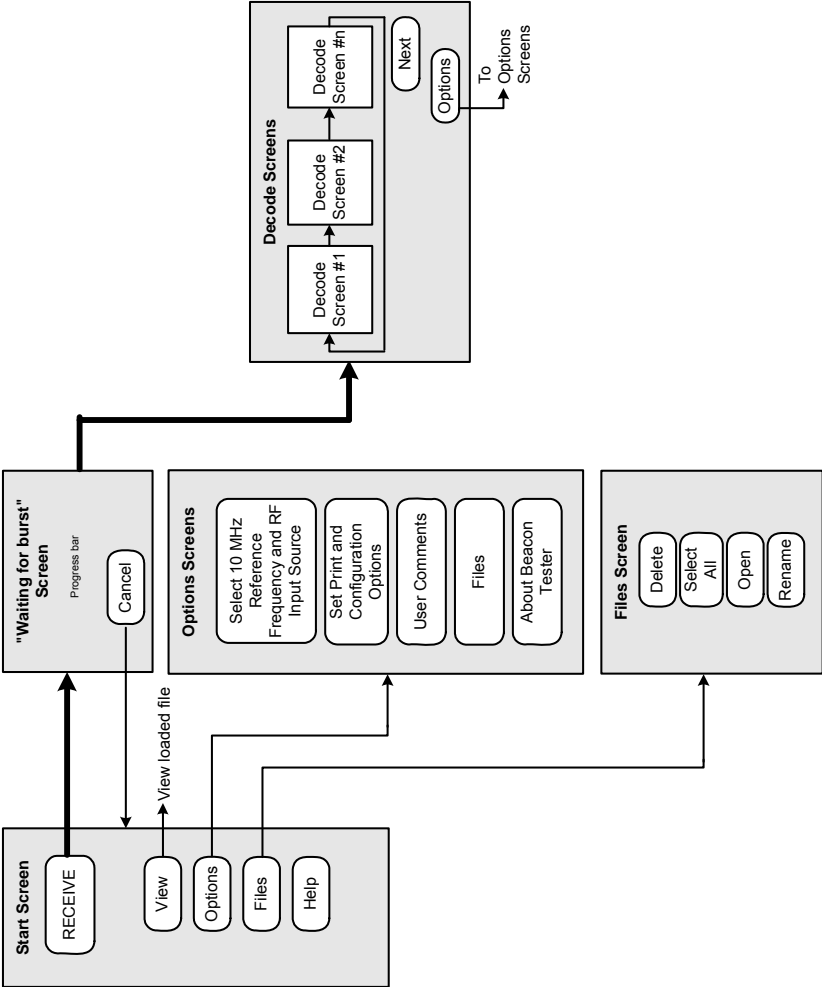
## **GETTING STARTED**

Please read this Operator's Manual to become familiar with the operation of the Beacon Tester.

### **Flowcharts**

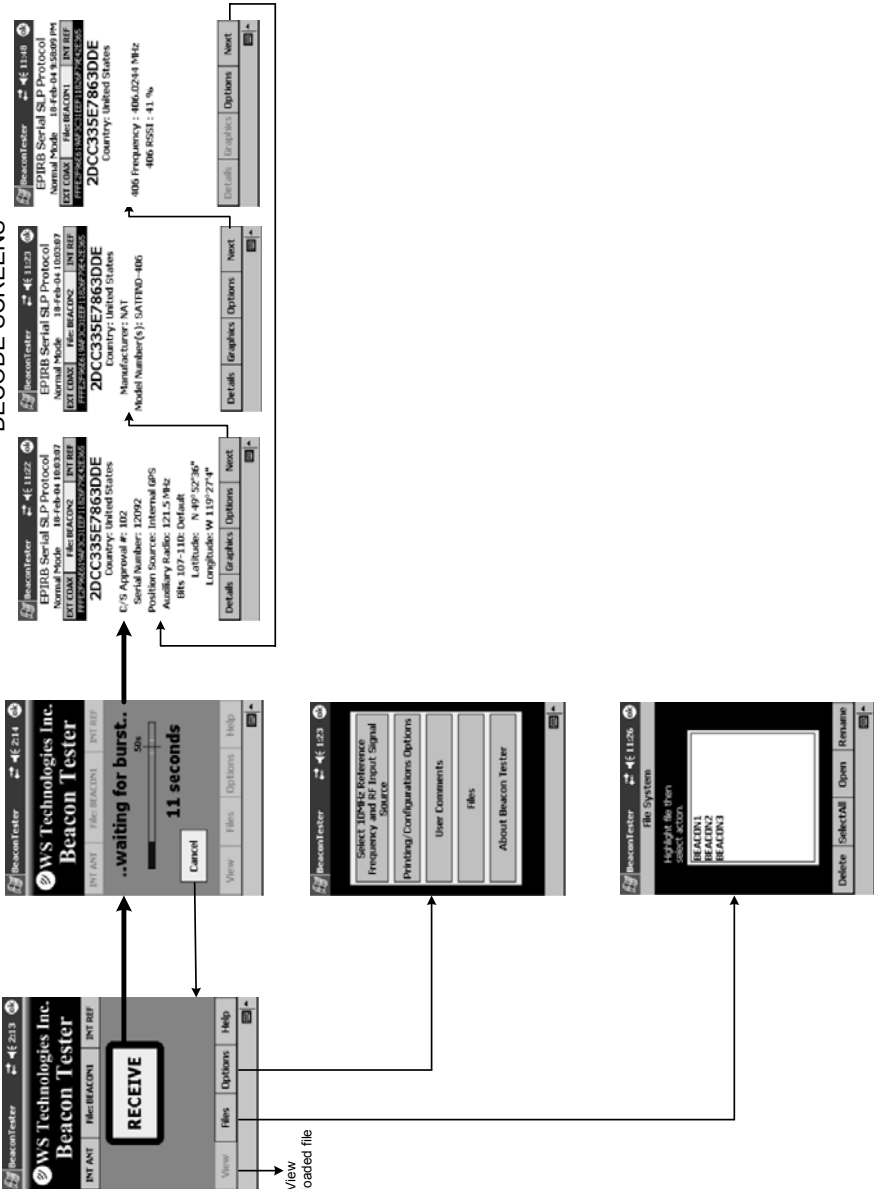
**Examining the Navigation Flowcharts located on the following pages will help you understand the basic operation of the Beacon Tester program.**

# BT100D Flowchart

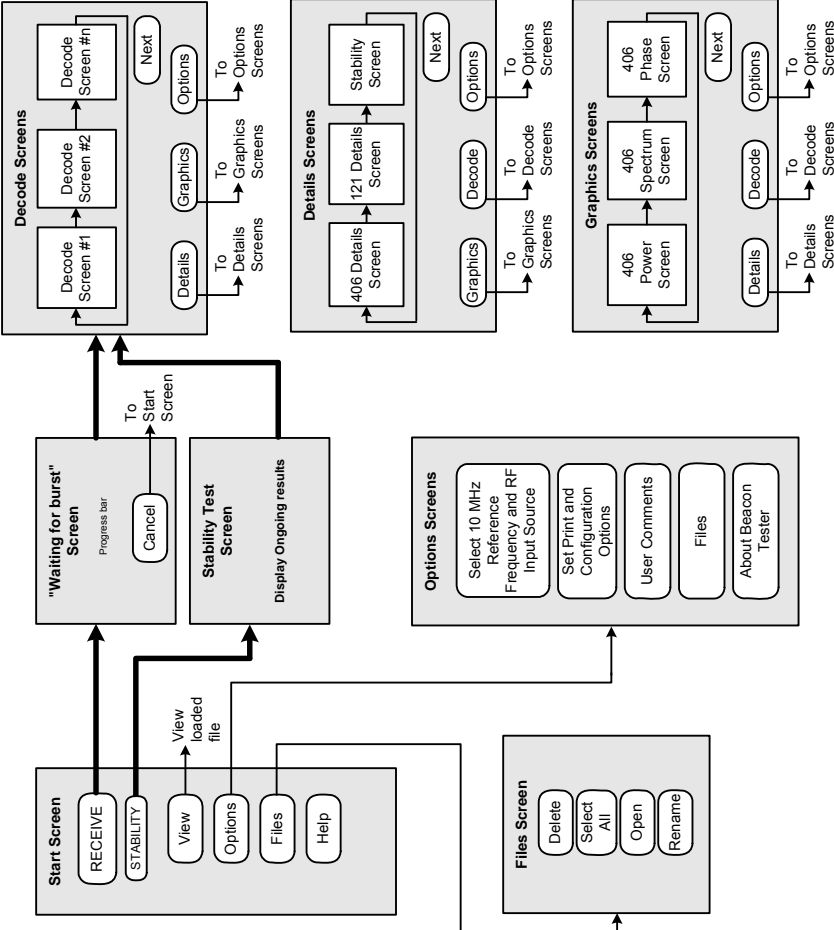


# BT100D Graphic Flowchart

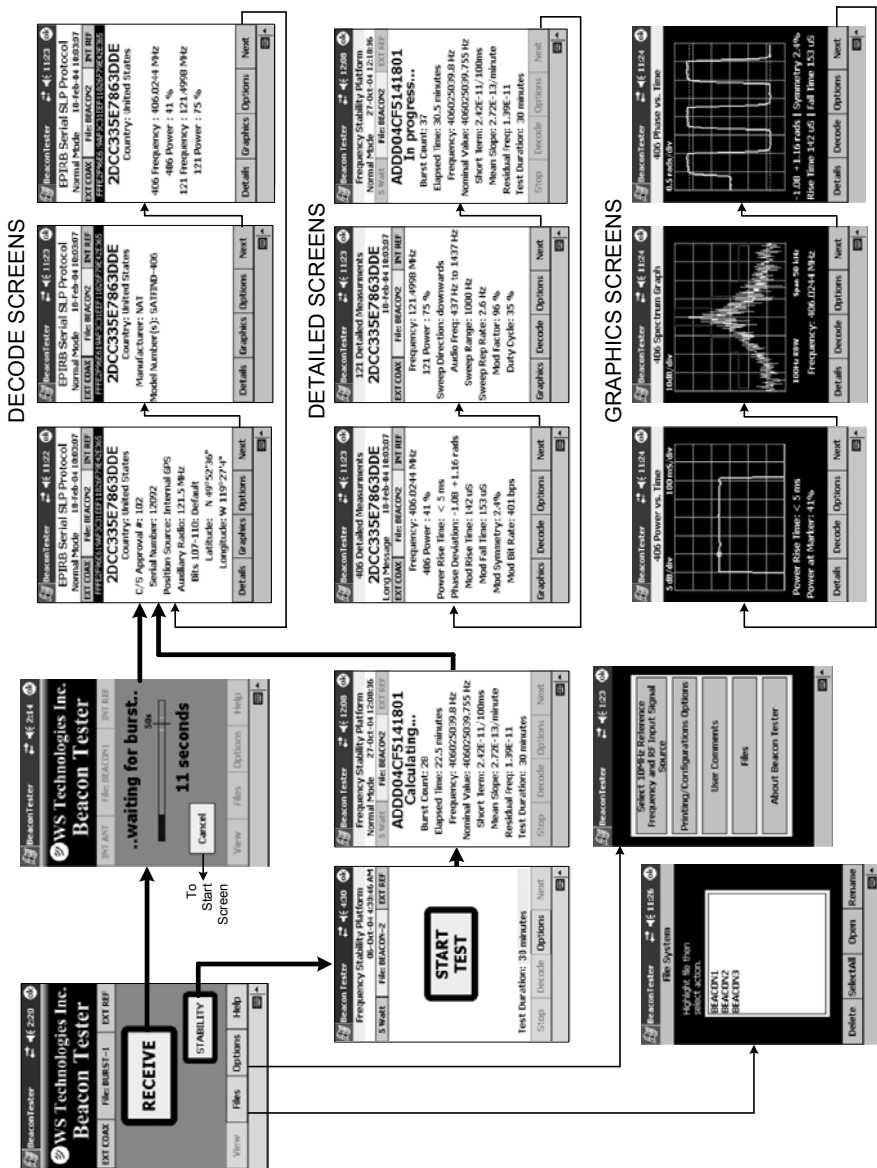
## DECODE SCREENS



# BT100A/BT100S Flowchart



# BT100A/BT100S Graphic Flowchart

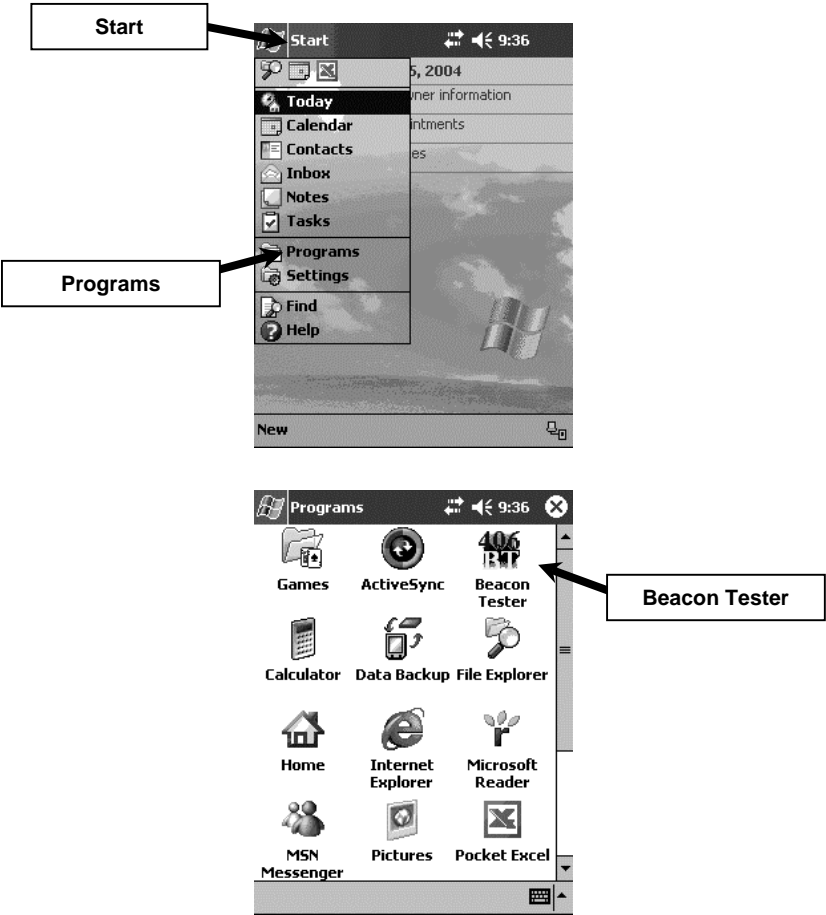


**Running the Beacon Tester Application:**

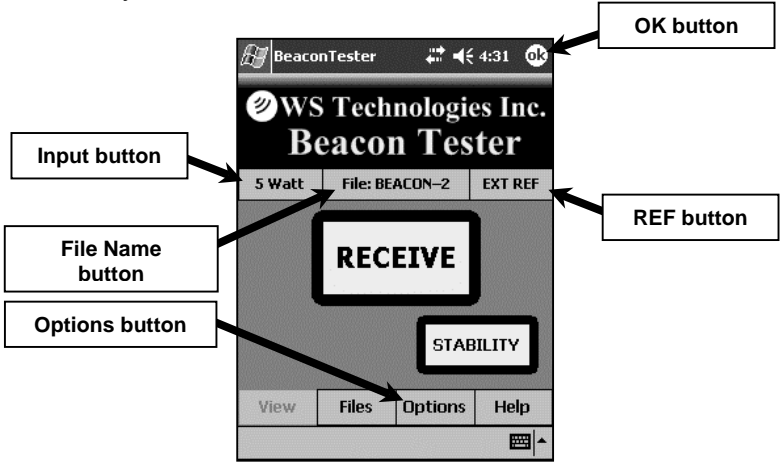
Insert the Beacon Tester CF card into the CompactFlash (CF) slot of the PDA.

Launch the Beacon Tester application by tapping:

***Start > Programs > Beacon Tester***



The 406 Beacon Tester title screen will show for a few seconds followed by the Receive screen:



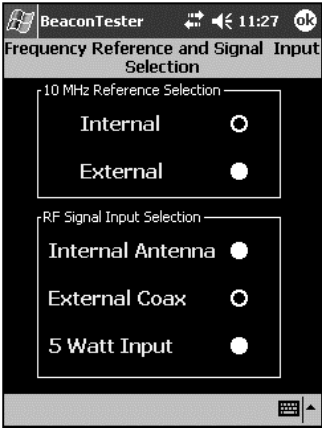
**Setting the desired measurement File Name:**

- tap the **File Name** button as shown above.
- type the desired measurement file name followed by **OK**.
- type the desired number extension followed by **OK**.

**NOTE: Do not use forbidden file name characters: / \ : \* ? " < > |**

**Setting the Input Mode and REF Mode:**

- tap either the **Input** button or **REF** button as shown above. The following screen will appear.



**Selecting the desired 10 MHz Reference source:**

- select **Internal** to use the internal 10 MHz reference frequency.
- select **External** to use an external 10 MHz reference frequency.

**NOTE: For Stability mode measurements, the external 10 MHz reference accuracy must be better than  $1 \times 10^{-10}$  Hz. The internal 10 MHz reference is not suitable for completing Stability measurements. In non-Stability mode measurements, the external 10 MHz reference accuracy must be better than  $1 \times 10^{-9}$  Hz.**

**Selecting the desired RF Input Mode:**

- select **Internal Antenna** when receiving the beacon signal through the air.
- select **External Coax** when receiving the beacon signal using a screen box (the output of the screen box must be connected to the RF Input using the 406 Interface cable and a 50Ω cable).
- select **5 Watt Input** when connecting the output of the beacon directly to the RF Input using the 406 Interface cable.
- tap **OK** (top right corner) when done.

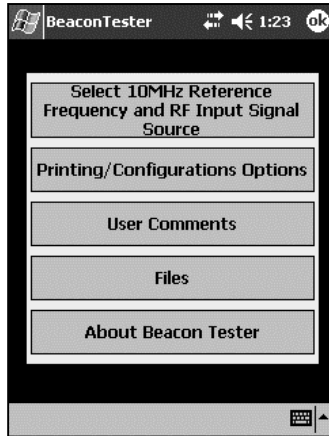
**WARNING!**

**WHEN USING 5 WATT INPUT DO NOT EXCEED A DUTY CYCLE OF ONE BURST (520 MS) EVERY 30 SECONDS FOR A 406 MHz 5 WATT SIGNAL. DAMAGE WILL RESULT!**

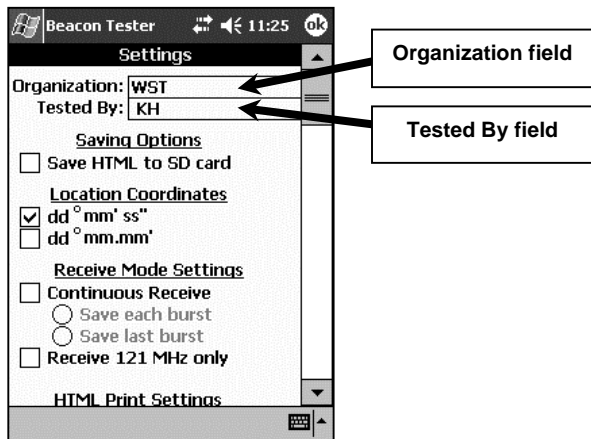
**NOTE: Using the 5 Watt Input will result in absolute power measurement units (dBm). Using the Internal Antenna or External Coax will result in relative power measurement units (%).**

## Setting the Configuration Settings:

- tap the **Options** button as shown above.



- tap the **Printing/Configuration Options** button.



- tap the **Organization** field as shown above.
- enter your organization name or initials.
- tap the **Tested By** field as shown above.
- enter your name or initials as desired.

**NOTE: The entered *Organization* and *Tested By* names will appear on each printed Test Report.**

**Saving Options Setting:**

- select the **Save HTML to SD card** box if you want each measurement saved to an SD memory card in addition to being saved in the standard PDA memory.

**Location Coordinates Setting:**

- select the box relating to your desired location coordinate display.

**NOTE: dd° mm.mm' is degrees/decimal minutes, dd° mm' ss" is degrees/minutes/seconds.**

**Receive Mode Settings:**

- to receive each burst manually (i.e.: you have to press Receive for each measurement), do not select any box.
- if you are measuring a beacon in the activate mode where the beacon is transmitting a burst each 50 seconds, then select the **Continuous Receive** box.
- when using Continuous Receive mode, you have the option of saving each burst or saving only the last burst. Select the desired box.

**NOTE: When saving each burst, the number on the end of the File Name will automatically increment.**

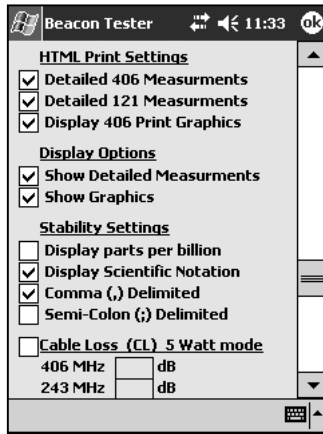
**Non-406 MHz Beacons**

- if you are measuring a beacon without 406 MHz capabilities, then select one of the following:

***Receive 121 MHz only*** box.

## HTML Print Settings:

- scroll down on the Configuration Settings screen.



**NOTE: You can choose the level of detail you wish to print on the Test Report.**

- if you do not wish to print the detailed 406 Measurements then un-select the **Detailed 406 Measurements** box. The frequency and power will still be printed.
- if you do not wish to print the detailed 121 Measurements then un-select the **Detailed 121 Measurements** box. The frequency and power will still be printed.
- if you do not wish to print the 406 MHz Graphics then un-select the **Display 406 Print Graphics** box.

## Display Options Settings:

- if you do not wish to see the detailed measurements or graphics on the PDA display then un-select the **Show Detailed Measurements** box or **Show Graphics** box as appropriate.

**NOTE: The Detailed Measurements and/or Graphics can be displayed later by re-selecting the appropriate box.**

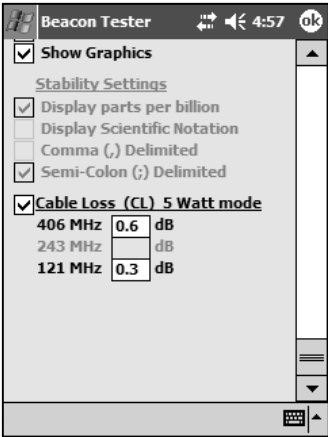
## Stability Settings:

- select the desired setting to display either parts per billion (ppm) or scientific notation.
- select the desired delimiter (comma or semicolon) to use in the delimited text file that is generated during Stability tests.

**Cable Loss:**

You may wish to enter the Cable Loss factor of any additional 50Ω cable used between the ELT Tester 406 Interface cable and the ELT. You must determine the Cable Loss factors for your cable at 406 MHz and 121.5 MHz.

- scroll down on the Configuration Settings screen.

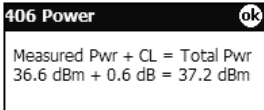


- select the **Cable Loss** box and enter the cable loss value for each frequency.

Once the measurement has been taken, the Cable Loss factor (CL) will be indicated on all power measurements.



Tap on the power measurement to show a pop-up window detailing the power measurement:



# MAKING MEASUREMENTS

**NOTE:** Interpreting the results provided by the Beacon Tester requires some knowledge of beacon requirements. Using the self test mode of the beacon may result in some measurements being outside the required limits due to the lack of a warm-up period.

**WARNING! DO NOT ACTIVATE ANY BEACON IN ITS NORMAL ACTIVATE MODE UNLESS THE BEACON IS IN A SCREEN BOX OR A SCREEN ROOM. DOING SO COULD RESULT IN A FALSE DISTRESS ALERT.**

### General:

All measurements will produce a Test Report. In addition, the BT100S model will create a delimited text file.

Measurement results are stored in the PDA memory. Each measurement will be saved in a folder with the same name as the measurement. For example, a measurement with the name “Burst-1” is made on a beacon. When the measurement is completed, the following is created:

<b>&lt;Burst-1&gt;</b>	folder name
<b>Burst-1.htm</b>	test report
<b>graphics_enabler.class</b>	utility file

The next measurement will be named “Burst-2” unless manually changed.

When the **Receive Mode Settings** are set to **Continuous Receive** and **Save each burst**, then each burst measurement will be saved in the same folder:

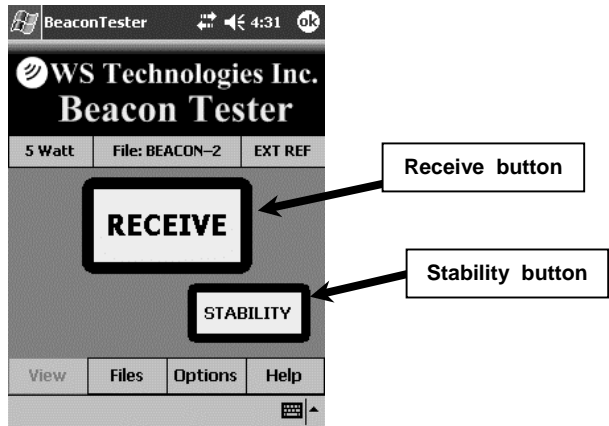
<b>&lt;Burst-1&gt;</b>	folder name
<b>Burst-1.htm</b>	1 <sup>st</sup> burst test report
<b>Burst-2.htm</b>	2 <sup>nd</sup> burst test report
<b>Burst-3.htm</b>	3 <sup>rd</sup> burst test report
<b>Burst-4.htm</b>	4 <sup>th</sup> burst test report
<b>etc.</b>	
<b>graphics_enabler.class</b>	utility file

For the BT100S in the **Stability mode**, the measurement will be saved in a folder with the same name as the measurement. For example, a stability measurement with the name “Burst-5” is made on a beacon. When the measurement is completed, the following is created:

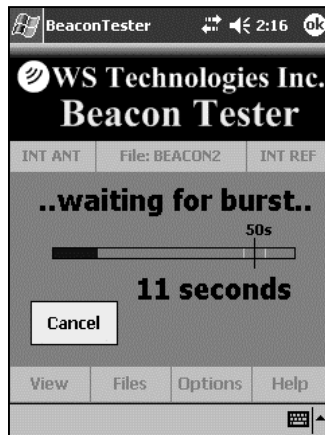
<b>&lt;Burst-5&gt;</b>	folder name
<b>Burst-5.htm</b>	test report
<b>graphics_enabler.class</b>	utility file
<b>Burst-5(S).txt</b>	delimited text file

## Conventional Measurement Mode:

- tap the **Receive** button.



The following screen will appear and the timer will start.

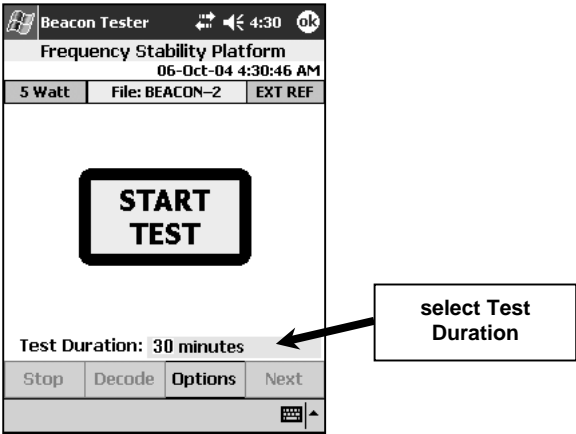


- activate the beacon under test.
- if the beacon is transmitting a 121.5 MHz homing signal the tester will produce the characteristic swept audio tone and display *121 Received*.
- once a 406 MHz burst is received, the first Decode screen automatically appears. See the MEASUREMENT RESULTS section.

**Stability Measurement Mode (BT100S model only):**

- from the Receive screen tap the **Stability** button.

The following screen will appear.

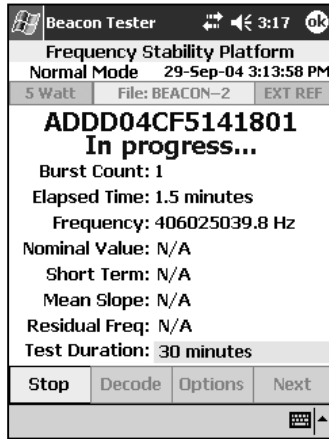


- Select the desired duration of the test by tapping on the area to the right of **Test Duration**. This value can be between 1 minute and 43,200 minutes (30 days).

**NOTE:** Cospas-Sarsat requirements allow a 15 minute warm-up period before starting the stability test. You can turn the beacon ON and allow it to warm-up for 15 minutes before starting the test, in which case the first stability data point (after 18 bursts) must be within specification. Alternatively, you can turn the beacon on and start the test simultaneously, in which case the beacon does not have to be in specification until 15 minutes after the first stability data point.

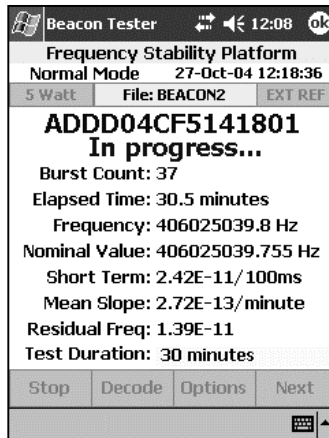
- start the test by tapping the **Start Test** button.

- After the first burst, the following screen will appear:



In the measurement folder on the PDA, a comma delimited text file is created. This text file is updated after each burst during the stability measurement test. This delimited text file can be imported to your favourite spreadsheet or database application.

- On the 18<sup>th</sup> burst the stability values are calculated and displayed in the appropriate fields. After each burst, the screen is updated with new values, along with the delimited text file.



- Once Test Duration has been reached, one final burst is automatically captured to create the Test Report.

**NOTE: The background of the 15 HEX ID field will turn green when a GPS location is reported in the 406 message.**

### **Terminating the Stability Test Prior to Completion:**

If you wish to stop the stability test prior to the **Test Duration**, then tap **Stop**. The **Stop** button will turn into a **Cancel** button. The display will show “**waiting for final burst ...**”. In order to create a Test Report this final burst must be captured. Once the final burst is captured the test is complete and both the Test Report and delimited text file will reside in the measurement folder. If the final burst is not available (i.e.: the beacon battery has failed) then press the **Cancel** button. No Test Report will be created, however, the delimited text file is still available containing all of the measured stability information.

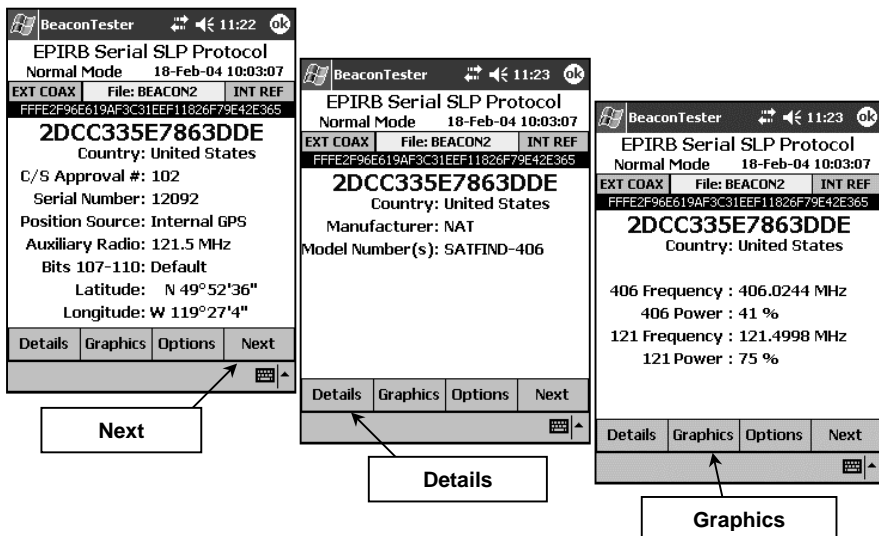
## MEASUREMENTS RESULTS

**NOTE:** The BT100D model will not display the measurement results on the 121 transmitter.

**NOTE:** Only the BT100S model will show the measurement results for the Frequency Stability Platform.

### Decode Screens:

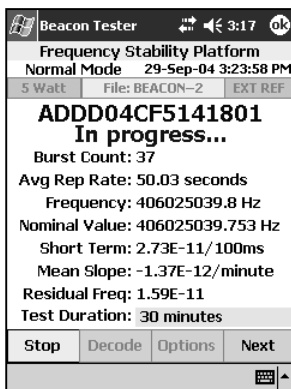
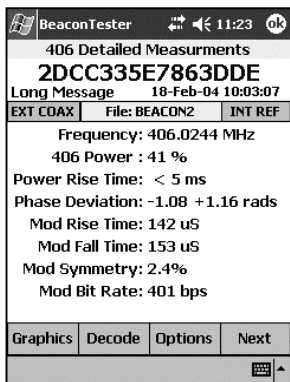
- tap the **Next** button to cycle through the Decode screens.



## Details Screens:

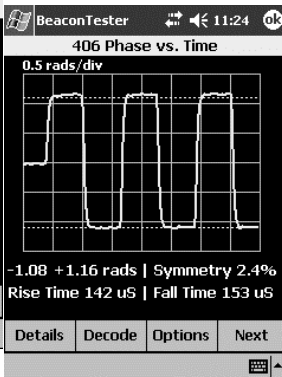
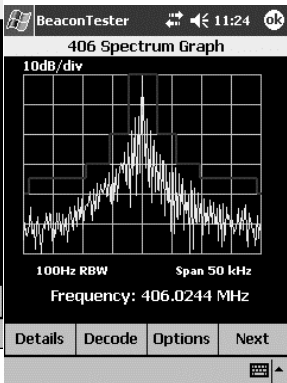
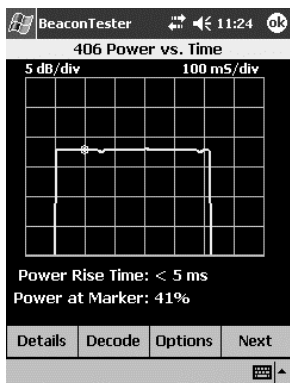
- tap the **Details** button to access the Details section.
- tap the **Next** button to cycle through the Details screens.

**NOTE: the Frequency Stability Platform screen will only appear when the Stability Measurement mode is used in the BT100S model.**



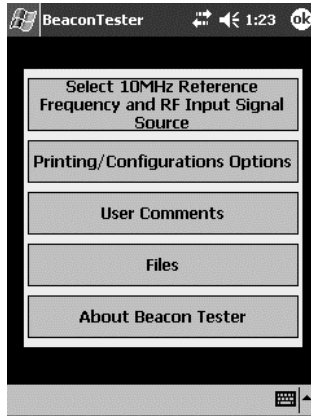
## Graphics screens:

- tap the **Graphics** button to access the Graphics section.
- tap the **Next** button to cycle through the Graphics screens.



### Options:

- pressing the **Options** button from any of the measurement modes will bring you to this screen:



### User Comments:

Once a measurement has been made, you can add user comments. These comments will be saved to the measurement file.

#### Adding Text Comments:

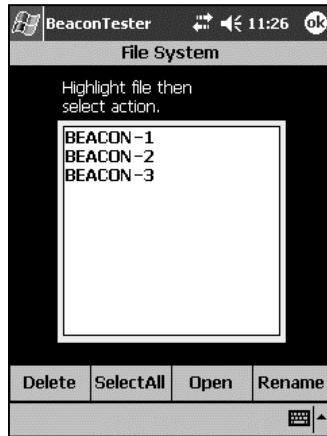
- from the Options screen, tap **User Comments** > **Text Comment**.
- type the desired text comment and tap **OK**. The text comment will appear on the printed Test Report.

#### Adding Audio Comments:

- from the Options screen, tap **User Comments** > **Audio Comment**.
- tap **Record** and speak clearly into the microphone located at the top left of the PDA. When finished, tap **Stop** and tap **OK**. The audio comment will be saved with the measurement file and can be replayed when opening the measurement file at a later time.

## Files:

- tap **Files** from the Options screen.

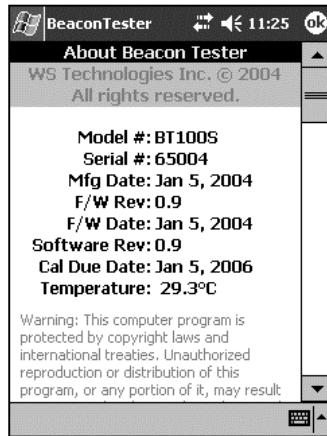


Tapping a file name will select the file name. Tapping the file name again will de-select it. Pressing **Select All** will select all of the files. The **Open** and **Rename** buttons will only work when a single file name has been selected. To delete multiple files, tap **Select All** or select each file individually, then press **Delete**.

**NOTE: The PDA can store many measurements. It is strongly advised to transfer your measurements to a storage card or a PC. The PDA is a Windows device and subject to periodic situations where data may be lost.**

## About Beacon Tester:

- tap **About Beacon Tester** from the Options screen.



This screen displays information about the Beacon Tester card installed in the PDA, along with the Firmware and Software dates and versions. The Calibration Due date is shown. A real-time temperature sensor displays the temperature inside the Beacon Tester.

## 121.5 MHz Homing Transmitter in Self-Test Mode:

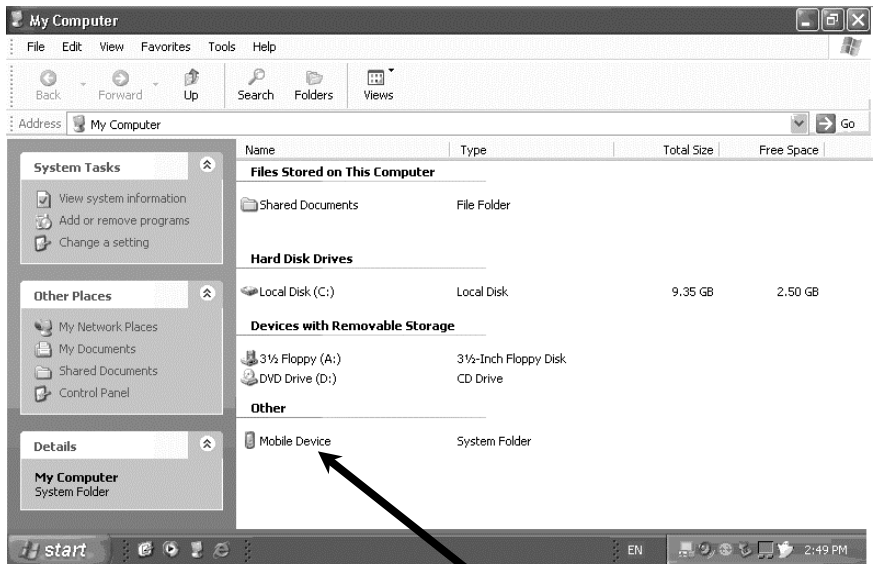
When measuring a beacon using the self-test mode, results for the 121.5 MHz transmitters may vary between different beacon manufacturers. In the self-test mode, some beacons transmit about 1 second of modulated carrier, some beacons transmit a short duration of unmodulated carrier, while some beacons do not transmit 121.5 MHz at all. If the length of modulated carrier is too short for the Beacon Tester to measure, or if a short duration of unmodulated carrier is transmitted, then the Beacon Tester will display the message “unable to measure details” or “unmodulated carrier”.

## PRINTING THE MEASUREMENT TEST REPORT

Each measurement generates a folder containing an HTML file containing the measurement data. To generate a printed Test Report, the measurement folder must be transferred to a directory on the PC that is connected to a printer. The transfer of the folder can be accomplished via Activesync, memory card (Secure Digital or CompactFlash), infrared link, or wireless link. Choose the method that gives you the fewest headaches!

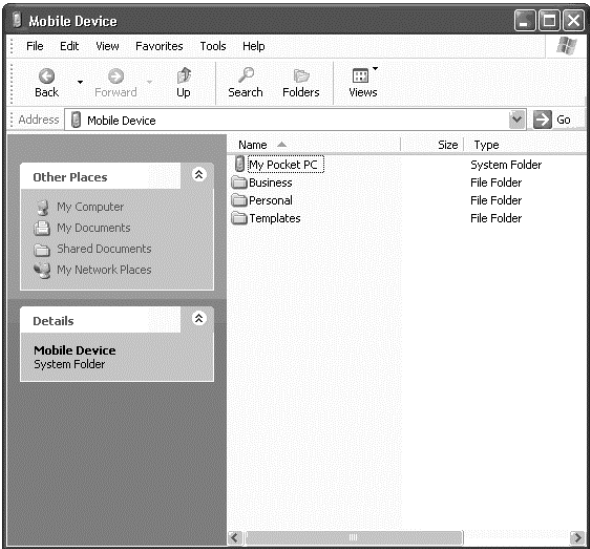
### Activesync:

- connect the PDA to the PC using the Activesync cable in accordance to the PDA manufacturer's instructions.
- depending on your Windows version, go to **My Computer** or **Explorer** on the PC and double-click on: **Mobile Device**.



Mobile Device

The resulting window will display the PDA file system.



- go to the Measurements directory by clicking on:  
***My Pocket PC > Beacon Tester > Measurements***

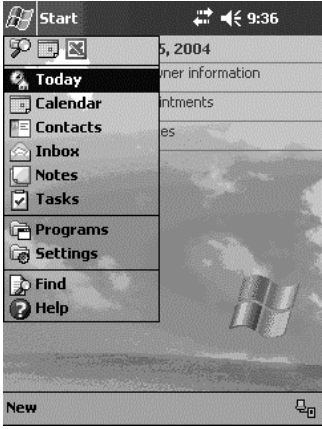
Each stored measurement will have a folder with the measurement name. Using standard Windows techniques, Cut and Paste, or Drag and Drop the desired measurement folder to the Desktop or any desired location on the PC.

From the PC directory where you transferred this measurement folder, open the folder. Double-clicking on the measurement html file will open it in your browser. Once open, select ***File > Print*** and the measurement Test Report will be printed.

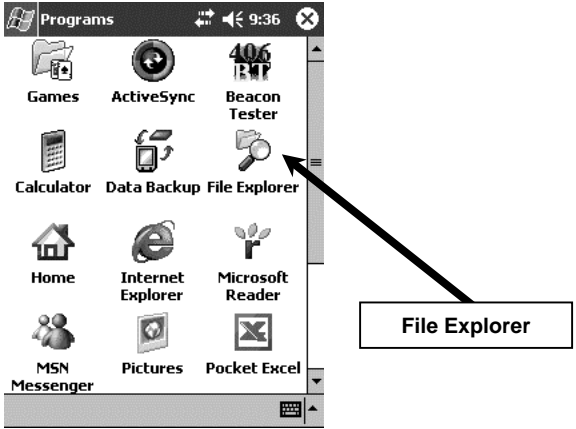
**Memory Card:**

In order to transfer files using a memory card, you will need a memory card reader on your PC. This can be internal or external. The memory card can be either a CompactFlash (CF) card or a Secure Digital (SD) card.

- turn the PDA on and tap **Start > Programs**.



- tap **File Explorer**.



- go to the Measurements directory by tapping **Beacon Tester > Measurements**. Each measurement will have a folder.
- tap and hold on the measurement folder that you want to transfer.
- select *Copy*
- navigate back to the **My Device** directory by tapping the PDA icon (located below the Windows logo in the top left corner) and tapping **My Device**.

- tap on the desired memory card, **SD Card** or **CF Card**.
- tap **Edit** (located in the lower left corner) and tap **Paste**. The measurement folder should now be on the memory card.
- remove the memory card from the PDA slot and insert it into the card reader attached to the PC.
- the card reader will appear as another drive on your PC. Open this drive. Using standard Windows techniques, Cut and Paste, or Drag and Drop the desired measurement folder to the Desktop or any desired location on the PC.
- from the PC directory where you transferred this measurement folder, open the folder. Double-clicking on the measurement html file will open it in your browser. Once open, select **File > Print** and the measurement Test Report will be printed.

#### **Network Card:**

- set up your network card in accordance to the manufacturer's instructions.
- go to File Explorer on the PDA by tapping **Start > Programs > File Explorer**.
- go to the Measurements directory by tapping **Beacon Tester > Measurements**. Each completed measurement will have a folder.
- tap and hold on the measurement folder that you want to transfer.
- select **Copy**
- go to the network connection icon at the bottom centre of the File Explorer page. Type the name of the network PC you wish to transfer the files to.
- navigate to the desired folder on the PC and tap and hold until the selection menu appears. Select **Paste**.
- from the PC directory where you transferred this measurement folder, open the folder. Double-clicking on the measurement html file will open it in your browser. Once open, select **File > Print** and the measurement Test Report will be printed.

### **Infrared Link:**

Unfortunately, the infrared (IR) transfer method only allows the transfer of files not folders. Therefore each file in the measurement folder must be transferred individually.

**NOTE: If you are transferring or storing many measurements into a single directory, only one copy of the graphics\_enabler.class file needs to be present.**

- go to File Explorer on the PDA by tapping **Start > Programs > File Explorer**.
- go to the Measurements directory by tapping **Beacon Tester > Measurements**. Each completed measurement will have a folder.
- open the desired measurement folder.
- tap and hold on the measurement file that you want to transfer.
- select **Beam File ...**
- align the IR port of the PDA with the IR port of the receiving PC
- you should be prompted to accept the transferred file.
- navigate to the PC directory where this measurement file was stored. Double-clicking on the measurement html file will open it in your browser. Once open, select **File > Print** and the measurement Test Report will be printed.

**NOTE: A copy of the graphics\_enabler.class file must be present in the folder in order for the measurement graphics to be printed on the Test Report.**

### **DELIMITED TEXT FILE**

In the BT100S model, the Stability mode produces a (comma or semicolon) delimited text file containing details on the stability measurement. To access this file, connect the PDA to the PC. From the PC navigate to **Mobile Device > Beacon Tester > Measurement > "measurement folder name"**. In this delimited file, each burst creates a record containing the following fields: Date/Time, Burst #, UIN, Full HEX, 406 Power, S1, S2, S3, Elapsed Time, Nominal Frequency, Short Term Stability, Medium Term Stability Mean Slope, and Medium Term Stability Residual Frequency. Each field is terminated with a carriage return linefeed (CRLF). This file can be used in whatever application the user requires to analyze or graph the results.

## RE-INSTALLING BEACON TESTER SOFTWARE

If the batteries are run down in the PDA, or if the user initiates a hard reset (see PDA manual), the Beacon Tester program may be deleted from the program memory. It can easily be re-installed. Recharge the main battery and ensure that the backup battery is OK before re-installing the Beacon Tester application.

On the PDA navigate to Built-In Storage directory.

- tap **Start > Programs > File Explorer**.
- navigate to My Device and tap **Built-In Storage**.
- open the **BTInstaller** folder and tap on the **BTInstaller** program.

Follow the instructions on the screen. **DO NOT interrupt the installation**. Be patient as the installation may take one or two minutes to complete. A green bar at the bottom of the screen will indicate when installation is complete.

**NOTE: If the BTInstaller folder or file are missing then go to [www.wst-inc.ca](http://www.wst-inc.ca) and download the latest Software. Follow the download instructions on the website.**

## SOFTWARE UPDATES

Software updates are available free of charge on the WS Technologies Inc. website: [www.wst-inc.ca](http://www.wst-inc.ca)

You are encouraged to keep your Beacon Tester software up to date by downloading and installing the most current software revision. Follow the installation instructions on the website.

## BEACON TESTER MODEL UPGRADING

All Beacon Tester models can be upgraded as desired to BT100A, BT100S, or the aviation versions BT100AV<sub>triple</sub> or BT100AVS. Models beginning with serial numbers 1xxx need to be returned to the factory for upgrading. Models beginning with serial numbers 2xxx can be remotely upgraded. Please contact your purchasing distributor or WS Technologies Inc. for upgrade costs and procedures.

## FREQUENTLY ASKED QUESTIONS

### **I haven't used my Beacon Tester for a while. Now, I can't find the Beacon Tester icon.**

The Beacon Tester software will need to be re-installed. Tap **Start > Programs > File Explorer > My Device > Built-in Storage > BTInstaller > BTInstaller.exe**. Follow the procedure in the section entitled *RE-INSTALLING BEACON TESTER SOFTWARE*. The procedure is very simple. If the BTInstaller folder is missing then go to the website [www.wst-inc.ca](http://www.wst-inc.ca) and download the latest Software.

### **Why is my PDA not responding?**

Occasionally the PDA will go into a mode where it will not respond to any input. Doing a soft reset by pressing the RESET button on the left side of the PDA usually fixes this problem.

### **Why does nothing happen when I launch the Beacon Tester program?**

Occasionally the Beacon Tester application does not terminate properly. Try tapping **Start > Settings > System > Memory > Running Programs > Stop All**. Then try to re-launch the program.

### **Why can't I see the graphics on my Test Report?**

Each measurement folder contains a copy of the file named `graphics_enabler.class` that is required for the graphics to be displayed on the Test Report. Make sure a copy of this file is present in the same folder as the measurement HTML file.

### **My Beacon Tester won't receive either 406 MHz or 121.5 MHz.**

Ensure that the proper Input mode is selected. If you are receiving a beacon self test transmission through its antenna, then select **Internal Antenna**. If you are testing a beacon in a screen box and connecting via the coax cable, then select **External Coax**.

### **My GPS coordinates are being displayed in degrees/decimal minutes (dd° mm.mm'). I prefer degrees/minutes/seconds (dd° mm' ss"). How do I change this?**

Tap **Options > Printing/Configuration Options**. Selected the desired format under the GPS Coordinates heading.

**The internal temperature sensor appears to be reading high. Is there a problem?**

Due to normal internal heating of the components, it is perfectly normal for the temperature sensor to indicate a reading that is a few degrees higher than the ambient temperature.

**How many measurements will the PDA store?**

The PDA can hold over 1000 measurements. If you have a 5 second comment on each measurement, then the PDA can hold about 200 measurements. It is strongly advised to transfer your measurements to a storage card (CompactFlash or Secure Digital) or to a PC for long term storage.

**How do I change a file name?**

Select **Options > Files**. Select the file that you wish to change. Tap **Rename**. From the pop-up keyboard enter the desired new file name and tap **OK**.

**How do I update the Beacon Tester software?**

Go to the WS Technologies Inc. website at [www.wst-inc.ca](http://www.wst-inc.ca) and follow the instructions on updating the application software.

**When I updated the Beacon Tester software I now have two Beacon Tester icons on the Program screen. How do I remove the second icon?**

The second Beacon Tester icon can be easily removed by tapping **Start > Programs > File Explorer > My Device > Windows > Start Menu > Programs**. Tap and Hold on one of the Beacon Tester icons. When the pop-up menu appears, select delete.

**When I activate the beacon in self test mode, the measurements produce questionable results. Is there a problem with the beacon?**

In order to meet all of the Cospas-Sarsat requirements, a beacon is allowed a 15 minute warm-up period. When testing a beacon in self test, there is no warm-up period, hence some measurements may be somewhat skewed.

Also, in self-test, the 121.5 homing transmission may be different depending on the particular beacon. Some beacons transmit a short modulated signal, some beacons transmit a shorter unmodulated signal and some beacons transmit no signal. The Beacon Tester may indicate "unable to measure details" or unmodulated carrier" depending on the beacon characteristics.

**I am testing an ELT with separate 121.5 and 406 output connectors. What do I do to get the results printed on one Test Report?**

Connect to the 121.5 transmitter first, then start the test. Once the Beacon Tester gives the indication that the 121.5 signal has been received, switch the cable to the 406 transmitter without stopping the test. Once the 406 burst is received on the Beacon Tester, the measurement will be complete.

**I have a BT100S model. How do I import the stability measurement delimited text file into Microsoft Excel?**

From Excel, click **File > Open**. From the pop-up window under **Files of Type** select **Text Files (\*.prn, \*.txt, \*.csv)**. Go to the directory where your measurement file is saved. Click on the desired text file and click **Open**. The Text Import wizard will be displayed. Under the **Original data type** section select **delimited**. Click Next. In the next window under the **Delimiters** section select **Comma or Semicolon** (depending on which delimiter you have selected on the Beacon Tester). Click **Finish**.

To size the columns, select all columns then **Format > Column > AutoFit Selection**.

The data is now available to easily graph or analyze the data as desired.

**Is the characteristic swept tone audio that I hear when the Beacon Tester receives a 121.5 MHz signal the actual demodulated audio from the beacon?**

No, the swept tone audio is just an audio file played when the tester has received a 121 MHz signal.

# SPECIFICATIONS

Parameter		BT100S	BT100A	BT100D	Accuracy
<b>406 MHz Measurements</b>					
Measure all Cospas-Sarsat Frequency Channels		•	•	•	
Decode all Cospas-Sarsat Protocols		•	•	•	
UIN & Full HEX		•	•	•	
Frequency (using INT REF) (resolution = 100 Hz)					
Leaving Factory		•	•	•	± 100 Hz
Long Term					± 0.4 ppm/year
Frequency Stability *	Nominal Frequency	•			± 2.5 x 10 <sup>-11</sup>
	Short Term	•			
	Medium Term – Mean Slope	•			
	Medium Term – Residual Frequency	•			
Frequency (using EXT REF) (resolution = 1 Hz)		•	•	O	± 1 Hz
Power		•	•	•	± 1 dB
Power Rise Time		•	•		± 0.5 ms
Phase Modulation		•	•		± 0.04 rad
Modulation Rise and Fall Times		•	•		± 10 µs
Modulation Symmetry		•	•		± 0.005
Modulation Bit Rate		•	•		± 0.2 bps
* User must supply a stable 10 MHz Reference Signal					O = optional
<b>121.5 MHz Measurements</b>					
Frequency (using INT REF) (resolution = 100 Hz)					
Leaving Factory		•	•		±100Hz
Long Term					± 0.4 ppm/year
Frequency (using EXT REF) (resolution = 1 Hz)		•	•		± 11 Hz
Peak Power		•	•		± 1.5 dB
Sweep Direction		•	•		-
Audio Frequency		•	•		± 30 Hz
Sweep Range		•	•		± 60 Hz
Duty Cycle		•	•		± 2%
Modulation Factor		•	•		± 5%
Sweep Repetition Rate		•	•		± 0.1 Hz

Miscellaneous			
Range (using Internal Antenna): 406 MHz 121.5 MHz		>10 m >3 m	
RF Input VSWR		1.10:1	
RF Input Level: 406 MHz Burst 121.5 MHz		-13 dBm Min -28 dBm Min	+40 dBm Max +31 dBm Max
10 MHz REF Input VSWR		1.15:1	
10 MHz REF Input Level		-10 dBm Min	+10 dBm Max
Operating Temperature Range		0°C to +50°C	
Storage Temperature Range		-20°C to +60°C	
Internal Temperature Sensor Accuracy		± 0.5°C	
RF Input Cable Termination		BNC-female	
10 MHz REF Cable Termination		SMA-female	
Dimensions: BT100 w x l x h mm (inches)		43.5 (1.71) x 58.5 (2.30) x 12.7 (0.50)	
BT100 in PDA w x l x h mm (inches)		73 (2.87) x 140 (5.50) x 16.5 (0.65)	
Hard Case w x l x h mm (inches)		324 (12.75) x 273 (10.75) x 114 (4.50)	

## **REGULATORY INFORMATION**

### **CANADA**

This Class B digital apparatus complies with Canadian ICES-003.

### **USA**

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

## EUROPEAN UNION

### DECLARATION OF CONFORMITY

Supplier Name: WS Technologies Inc.

Supplier Address: 201-1960 Springfield Road  
Kelowna, B.C.  
Canada V1Y 5V7

Declares under our sole responsibility that the following product

Product Name: 406 Beacon Tester  
Model BT100

Conforms to the following normative European and International Standards

Normative Standards: EN 300 220-1 V1.3.1 (2000-09)  
EN 301 489-3 V1.4.1 (2002-04)  
EN 61000-4-2 :1995  
EN 61000-4-3 :1996

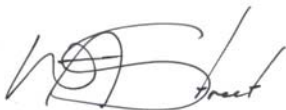
Following the provisions of the normative European Council 1999/5/EC R&TTE Directive.

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Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment at Nemko Canada, Inc. located in Ottawa, Canada. Accepted by EU or FCC Notified and Competent Bodies.

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**Supplementary Information:** This product was tested and complies with all the requirements for the CE Mark.



W.A. Street  
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WS Technologies Inc.  
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Canada V1Y 5V7  
Phone: (250) 860-7277  
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## **WARRANTY INFORMATION**

WS Technologies Inc. (WST) warrants the products manufactured by WST to be free from defects in material and workmanship for one year from the date of shipment. This warranty is NOT inclusive of the PDA nor its accessories. All PDA and PDA accessories are covered under the PDA manufacturer's warranty. The purchaser is required to contact the PDA manufacturer for these warranty issues. Liability of WST under the foregoing warranty is limited to the replacement or repair, at the option of WST, of any products which show defective workmanship or materials within one year from the date of shipment, which replacement shall be made FOB WST's facility in Kelowna, BC, CANADA, upon proof satisfactory to WST of the defect claimed. Except for the foregoing warranty, WST makes no other warranty, express or implied, as to the merchantability or fitness for a particular purpose of products shipped or the performance thereof, and does not make any warranty to the purchaser's customers or agents.

## **CALIBRATION**

The BT100 series have been designed to have a standard two year calibration cycle. The calibration date appears on the Calibration Certificate supplied with the Beacon Tester and the Cal Due date appears on the back of the BT100 module.

Return only the BT100 CF Card – do not return the PDA. Once calibrated a new Cal Due date label will be placed on the back of the CF Card and a new Calibration Certificate will be issued.

## **RETURNS**

All returns must be done through your purchasing distributor. If the unit was purchased directly from WST, a Return Materials Authorization (RMA) number must be obtained by emailing [returns@wst-inc.ca](mailto:returns@wst-inc.ca). If the unit being returned is not covered under warranty, a minimum repair charge will apply. If damage is severe or the products have been tampered with, there may be additional charges.

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