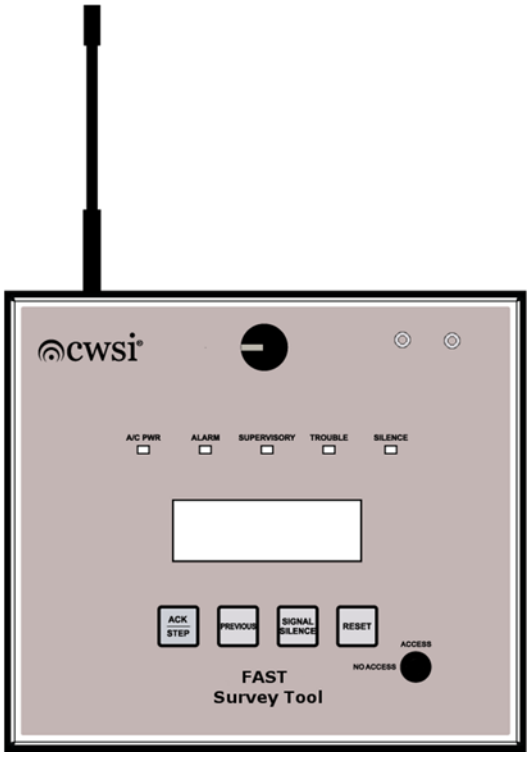
commercial wireless systems international

Field Analysis Survey Tool

OPERATING MANUAL



CWSI by Tyco Fire & Security GmbH

P/N: CWSI-IM-FST-1 Rev C

Disclaimer

The information contained in this document is believed to be accurate and reliable at the time of printing. Known corrections or omissions may be found on errata sheets included in the various product manuals. However, CWSI a Tyco Fire & Security GmbH Company (CWSI), may not be held accountable for errors or omissions in this or other CWSI publications. No license is granted by implication or otherwise under any patent rights of CWSI. Applicable terms and conditions can be found at http://tycofsbp.com/TFPPTerms_of_Sale/TFPPTerms_of_Sale.pdf

DISCLAIMER 2

INTRODUCTION 4

SECTION 1 - DESCRIPTION AND FEATURES 5

1.1 Product Description 5
1.2 Features 5
1.3 Specifications 5

SECTION 2 - COMPATIBILITY 6

2.1 Compatible Equipment and Accessories 6

Section 3 – Receiving and Unpacking 7

3.1 Receiving and Unpacking the equipment 7
3.2 The Fast battery 7

SECTION 4 – USER INTERFACES 8

4.1 LEDS 8
4.2 LCD 9
4.3 Sounder 9
4.4 Buttons 9
4.5 Screens 9

SECTION 5 – OPERATION 10

5.1 Overview 10
5.2 Survey – New Survey 10
5.3 Survey – Existing Survey 13
5.4 Alarm, Supervisory and Trouble annunciation in Test Mode 13
5.5 Trouble signals 14

SECTION 6 – PROGRAMMING 14

6.1 General 14
6.2 FAST Software programming tool 15
6.3 Programming the FAST 15

SECTION 7 – INFO AND MAINTENANCE 17

7.1 Menus 17

INDEX 19

Introduction

This manual is intended for persons involved with the maintenance and operation of the Field Analysis Survey Tool herein known as the FAST. It is a comprehensive guide that provides details on product operation and should be kept for future reference. This manual consists of separate sections. Each section contains information in a manner as to be clear as possible. It is designed to provide all the information necessary to program and operate the equipment. Read and understand this manual prior to operating the equipment.

The model FAST is a wireless signal survey tool manufactured by CWSI.

Section 1 - Description and Features

1.1 Product Description

The CWSI FAST is wireless signal survey tool intended to perform repeater to repeater signal surveys. It has a 4 x 20 character backlit LCD which will display alarm, supervisory and trouble signals from the control panel and devices in the compatibility section of this manual. Additionally there are 5 front panel leds for visual indication of A/C power, Alarm, Supervisory, Trouble. The FAST provides signal survey functions via a membrane keypad.

1.2 Features

- Bi-Directional RF communication
- 900 MHz Frequency Hopping Spread Spectrum format
- CRC data validation
- Rechargeable Lithium battery supplies 24 hour backup time
- 4 line 20 character backlit LCD display
- Power, Alarm, Supervisory, Trouble and Silence LED's
- Acknowledge, Previous, Signal Silence
- Hinged locked enclosure
- Easy site programming with SD card

1.3 Specifications

Power Source: 120 VAC Primary 12VAC 20VA Secondary Transformer

Battery: 3.7VDC 3Ah lithium ion battery CWSI P/N BA-3.7V-3AH

Transceiver Operating Frequency: 900 MHz band

Signal to Noise Ratio: Minimum Signal -100.2dBM Maximum Noise -115.3dBM

Antenna Type: Omni

Transmission Format: Frequency Hopping – Spread Spectrum.

Dimensions: 7" high, 8" wide, 2 ¼" deep

Enclosure: Powder coated steel

Weight: 1 Lbs.

Section 2 - Compatibility

2.1 Compatible Equipment and Accessories

The following UL Listed RF products are compatible with the Field Analysis Survey Tool:

CWSI Models:

CP-3000A(DA)/CP-3000 (D)/CP-3500/CP-3600(B)(+) – And newer CWSI Control Panel(s)

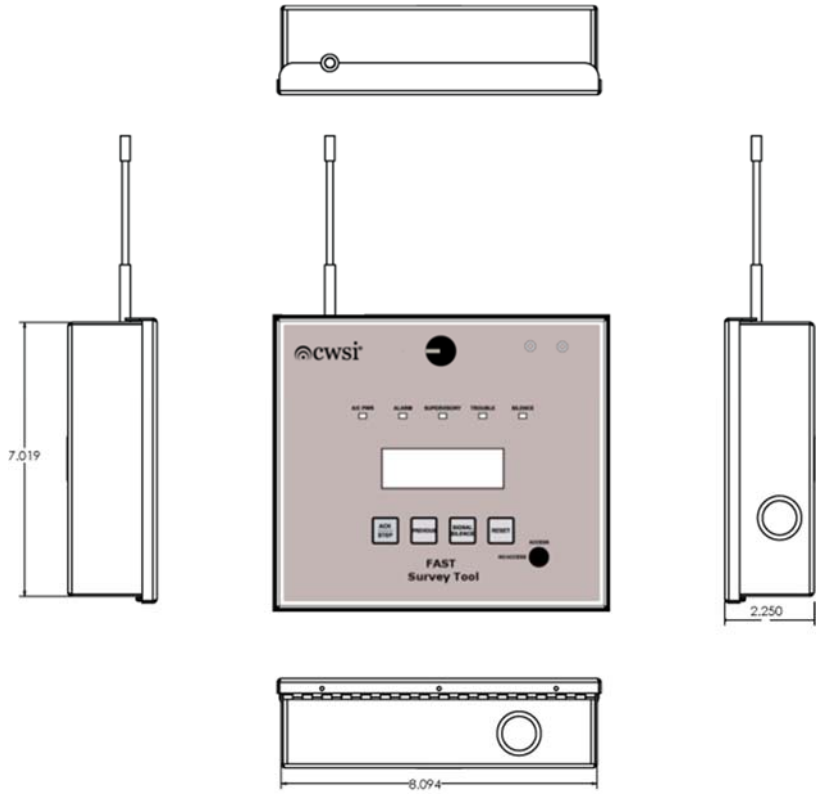
AR-3A/ AR-3 / AR-5(B) and newer Repeater(s)

The following antennas are for use with the Field Analysis Survey Tool:

CWSI Models:

Model OM-1 Omni – Isotropic gain 2.5 dB

Model YA-1 Yagi - Isotropic gain 15 dB



Section 3 – Receiving and Unpacking

3.1 Receiving and Unpacking the Equipment

Upon receiving the equipment, the carton should be inspected for damage, which may have occurred during shipment. Each package should be checked against the packing slip for completeness. Differences should be reported to CWSI immediately. If any product is suspected of damage it should be checked for proper operation or returned to CWSI.

Always attach an OM-1 antenna to the sma connector prior to applying power, enrolling or conducting a signal survey with the Field Analysis Survey Tool.

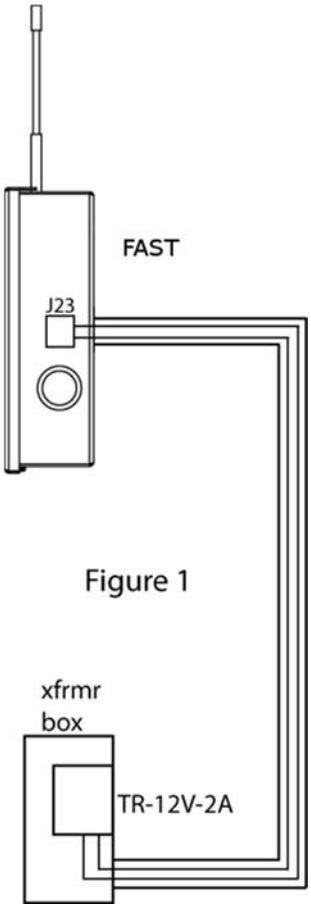


Figure 1

Unlock the FAST cover and open the unit. Carefully verify that the unit is not damaged and the printed circuit board is secured in the enclosure.

3.2 The FAST Battery

The FAST uses a 3.7VDC 3Ah (CWSI p/n BA-3.7V-3AH) lithium ion battery for power. The battery will supply a minimum of 24 hours of standby and approximately 8 hours of Survey operation. The battery plugs into the BT1 connector (figure 3). The battery is periodically tested under load. A low battery trouble will be indicated on the unit's battery voltage screen. If the battery is low or bad the low battery will be indicated by an exclamation point in parenthesis on the battery voltage screen until it is charged or replaced with a charged battery.

To replace the battery:

1. Disconnect the battery from connector BT1
2. Cut the tie wraps securing the battery.
3. Replace the battery with a CWSI p/n BA-3.7V-3AH battery only. **Warning: Use of any other battery may cause damage/harm to the unit, battery or user.**
4. Secure the new battery with new tie wraps supplied with the replacement battery and cut the excess length of the tie wrap.
5. Connect the battery to the BT1 connector.
   The battery and charger voltage can be viewed in the voltage information screen. These voltages are readings under load. Refer to the Info and Maintenance section of this manual.
6. To recharge the battery, the unit must be powered on and the A/C jack must be plugged into the A/C port. The A/C LED will light when A/C is present.

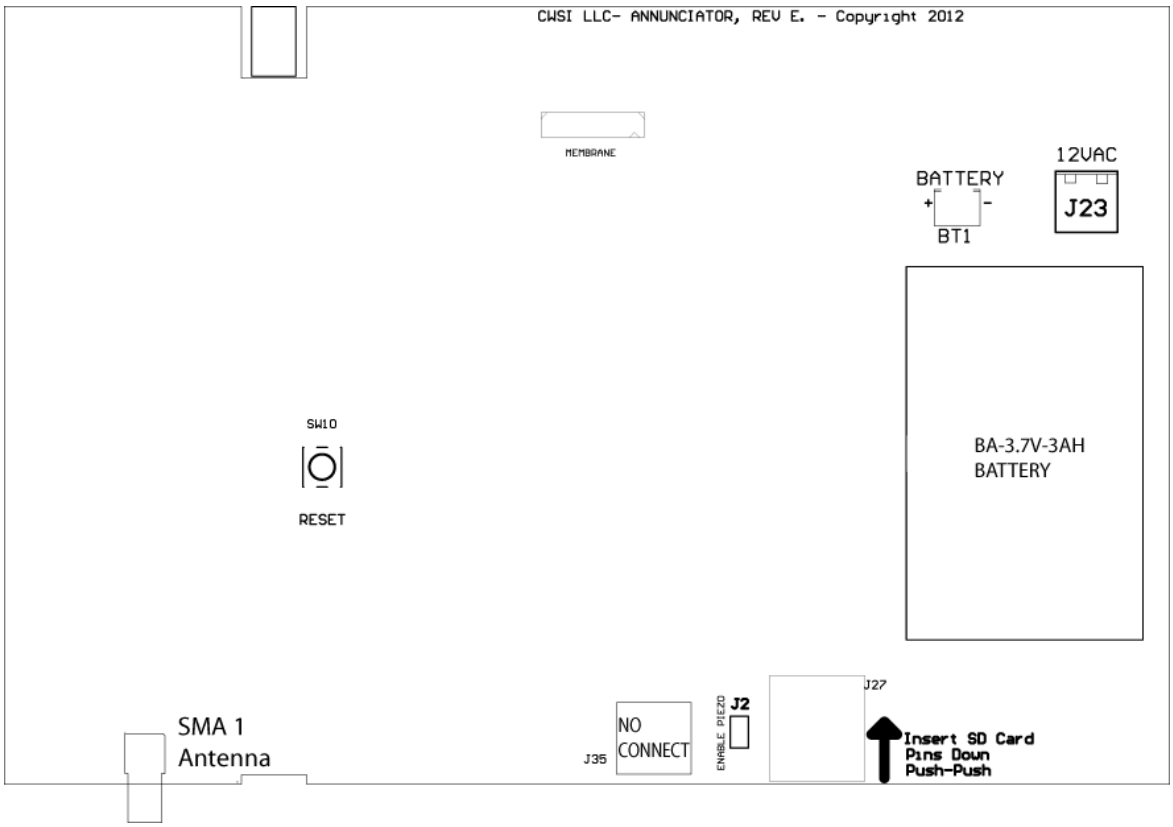


Figure 2

Section 4 – User Interfaces

This section will explain LED, LCD, Sounder and Switch functions.

4.1 LEDS

The FAST has 5 LED indicators as follows:

A/C PWR – This green LED indicates the status of the incoming A/C voltage. On steady indicates proper A/C voltage is present. This LED will remain off when no A/C voltage present.

ALARM – This red LED indicates an alarm condition exists, it will flash when an alarm is present on the FAST. It will remain solid when Alarm conditions are acknowledged on the Panel. It will not activate if the panel is in Panel Test Mode.

SUPERVISORY - This yellow LED indicates a supervisory condition exists, it will flash when a supervisory condition is present on the FAST. It will remain solid when Supervisory conditions are acknowledged on the Panel. It will not activate if the panel is in Panel Test Mode.

TROUBLE – This yellow LED indicates a trouble condition exists. This LED will flash when a trouble condition is present on the FAST. It will remain solid if the panel is in Panel Test Mode.

SILENCE – This LED will light when the signal silence button is pressed on the panel to deactivate NACs.

4.2 LCD

The 4 line 20 character backlit LCD displays all the alpha numeric information such as alarm, supervisory, trouble, menus etc. needed for the operator to properly respond and interface with the FAST. The backlight will be on continuously during any off normal condition or the unit is being operated.

4.3 Sounder

The sounder is used as an audible indicator for alarm, supervisory, trouble and signal survey. The sounder can be disabled by removing J2.

4.4 Buttons

The buttons and their functions are as follows:

ACK/STEP – this button will step or scroll forward through various screens and any active events if the unit is enrolled and the panel is in Test Mode.

PREVIOUS – Steps backwards through events while the unit is in Test Mode.

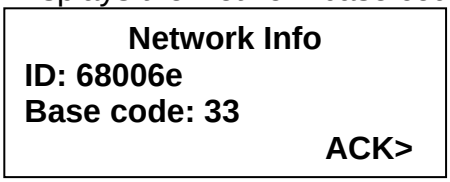
SIGNAL SILENCE – Will allow unit to perform a SIGNAL SURVEY in survey mode and wipe the unit's base code.

RESET – Not Used.

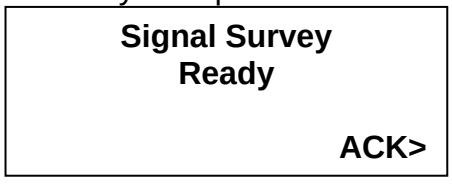
4.5 Screens

1. **Main screen** – The main screen after the unit completes initialization.

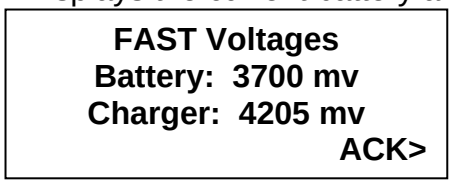
2. **Network Code screen** – Displays the Network base code the FAST is enrolled to.



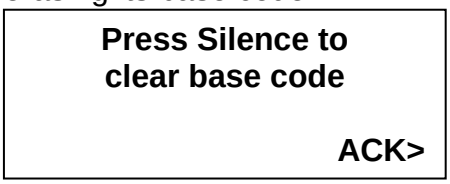
3. **Signal Survey screen** – Allows you to perform and view signal survey results.



4. **Battery Voltage screen-** Displays the current battery and charger voltage of the FAST.



5. **Erase Base code screen**- Allows you to erase the network base code of your FAST. The unit will reinitialize after erasing its base code.



Section 5 – Operation

5.1 Overview

The FAST is designed to be a survey and signal strength analysis tool with the capability to be used as a site testing tool. Control functions include scrolling, and signal silence. The LCD display will show signal strength, network base code, battery voltage, alarm, supervisory and trouble signals with the highest priority signal displayed when unit is in test mode.

A complete list of trouble signals is included in this section. The FAST is programmed by inserting a standard SD card which has been programmed with the panel information via the WRA-3 software.

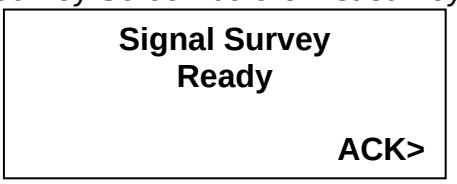
5.2 Survey Mode- New Survey

To perform a new site survey you will need the FAST and one AR-3(A). Place the repeater in survey mode by changing the appropriate dip switch. Power up the FAST, it will display “Initializing” indicating it is looking to enroll to the repeater. This can take up to a minute.

Using the ACK> button advance to the Signal Survey screen.

The survey screen will look as shown below when first viewing it.

Survey Screen before first survey



The word “Ready” indicates the FAST has communication with the network. If “Not Ready” is displayed the FAST will not perform a survey as it is not in communication with the repeater.

Press the SIGNAL SILENCE button and the FAST will beep initiate a survey procedure in which the FAST will perform a set of five (5) surveys back to back, the survey results will then display. The

result will be displayed as a percentage based on the average of the 5 survey set. The following screen will be displayed.

Signal Survey after first survey

Signal Survey
Linked to I.D. xx
Good survey: xx%
ACK>

The Linked to I.D. shows the last two characters of the repeater the FAST is linked to. The next line shows if the survey is good or bad based on a percentage of signal strength read during the survey signal communication. A number of 68% or higher will display a “Good Survey” message and the sounder will beep twice. Anything less than 68% will display a “Bad Survey” message and the sounder will emit a 2 second continuous tone. Press the SIGNAL SILENCE button to perform additional survey sets. The user should wait 2 seconds after the survey result prior to conducting the next survey set.

Should the signal link be lost during a survey set procedure the unit will emit a 2 second continuous tone and will display Not Ready pressing SIGNAL SILENCE again while the unit is still Not Ready will cause the unit to display Bad Survey. Please wait until unit has regained link and displays Ready before attempting to perform another survey set.

It is strongly recommended that a minimum of 3-5 survey sets are performed at a good location.

If a bad survey is received try moving the FAST until at least 3 good survey sets in a row are received.

5.3 Survey Mode – Existing Network Survey

The FAST will allow you to perform a signal survey in order to determine Repeater to Repeater signal link strength on an existing network. To perform your signal survey you will need to perform the following steps:

5.3.1 CWSI FACP Network System (Excluding CP-3000(D))

1. Enroll the FAST to your CWSI FACP excluding CP-3000(D) panels. This may take up to a minute. You will see the FAST will be in Initialization until it completes the process. When completed you will see the FAST main screen.

2. You will see a Pwr Up Reset trouble from the FAST on your Panel accompanied by a Checksum Bad trouble. This indicates your FAST has enrolled but does not have your network information programmed into it. If you only intend to perform signal surveys you can leave this trouble acknowledged. The FAST will not need the Network programming to perform surveys.

3. On the FAST, ACK-STEP to the Signal Survey screen. You can press the Signal Silence button to perform a signal survey.

4. Travel to the repeater location for which you want to perform a signal link strength check.

5. To determine the signal strength of the repeater in question, power the repeater down and place the FAST as close to the repeater as possible. Allow for the FAST to acquire a signal, you will see Ready displayed on the Signal Survey screen. Perform 5-10 signal surveys to determine your signal strength from that location out to the next available repeater/panel.

6. When you have completed your surveys and are ready to leave, delete the FAST from the panel's device list. This will clear your Checksum Bad troubles on your network.

5.3.2 CP-3000(D) Network System

1. Enroll the Fast to your CP-3000(D). This may take up to a minute. You will see the FAST will be in Initialization until it completes the process. When completed you will see the FAST main screen.

2. You will see the FAST enroll in the device enrollment list but will not receive a Pwr Up Reset trouble on the panel. The FAST will enroll with a default device type of "Pullstation".

3. On the FAST ACK-STEP to the Signal Survey screen. You can press the Signal Silence button to perform a signal survey.

4. Travel to the repeater location for which you want to perform a signal link strength check.

5. To determine the signal strength of the repeater in question, power the repeater down and place the FAST as close to the repeater as possible. Perform 5-10 signal surveys to determine your signal strength from that location out to the next available repeater/panel.

6. When you have completed your surveys and are ready to leave, delete the FAST from the panel's device list.

5.4 Test Mode

The FAST tool will allow you to perform functional walk-tests on CWSI FACP systems. CP-3000(D) systems will not support this feature. After enrolling the FAST to the network you will need to update the FAST's programming as well as any WRA-3 Annunciators on the system to clear your Checksum Bad Trouble conditions. Refer to the programming section of the manual for that procedure.

To perform the tests you will need to first place the Panel in Panel Test Mode.

5.4.1 Alarm, Supervisory and Trouble annunciation in Test Mode

When the CWSI FACP is in test mode the FAST:

1. Display “PANEL IN TEST MODE” in the first line of the LCD.
2. Turn on the TROUBLE LED steady.
3. With the panel in Panel Test Mode Alarm and Supervisory conditions will not activate the LEDs or sounder on the FAST.
4. Display Alarm and Supervisory events. **Troubles will not be displayed except troubles originating from the affected FAST.**

When an alarm is received:

1. The LCD shows the alarm level, device type, description, serial number and number of events in process.
2. Press ACK/STEP to acknowledge active events.

Typical alarm screen

PANEL IN TEST MODE	
Alarm A	**1/8**
Pull Station	**4003cb**
West Stairwell	

When a supervisory is received:

1. The LCD shows Supervisory, device type, description, serial number and number of events in process.
2. Press ACK/STEP to scroll through events.

Typical supervisory screen

PANEL IN TEST MODE	
Supervisory	**2/8**
PIV	**30518f**
South Building	

Pressing ACK/STEP or PREVIOUS when events are present will scroll through those events one at a time. The LCD will display the oldest event first with a new event received not automatically showing on the display. The user will need to manually scroll to the new event using the ACK-STEP or PREVIOUS buttons.

The x/x numbers on first line of the display indicate “event being viewed/total events”. The event being viewed number will change as the user scrolls.

5.4.2 Alarm, Supervisory and Trouble annunciation while NOT in Test Mode

When the FAST is enrolled to a CWSI FACP and programmed but NOT in Test Mode:

1. Trouble conditions on the panel will activate only a flashing Trouble LED, no Trouble conditions will display, the sounder will not activate. Resetting the panel will clear this from the FAST.
2. Supervisory conditions on the panel will activate only a flashing Supervisory LED, no Supervisory conditions will display, the sounder will not activate. Resetting the panel will clear this from the FAST.
3. Alarm conditions on the panel will activate only a flashing Alarm LED, no Alarm conditions will display, the sounder will not activate. Resetting the panel will clear this from the FAST.
4. Activating Signal Silence on the Panel will light a solid Signal Silence LED and change the flashing alarm LED from flashing to solid on the Fast. Resetting the panel will clear this from the FAST.

5.5 Trouble signals

This section contains a list of trouble signals that can be transmitted by the FAST. Possible causes are given to help the technician quickly solve the issue. The FAST is continuously monitored for proper operation. If a problem arises then a trouble signal will be sent to the control panel within 200 seconds indicating the trouble condition. The trouble will be retransmitted every 200 seconds until the problem is resolved. All other troubles will have to be reset at the CWSI FACP and will not self-restore.

1. **Checksum Bad -** Caused by a mismatch of programming information between the CWSI FACP and the FAST. Will also be displayed while an SD card remains in the Field Analysis Survey Tool SD card slot. Program the FAST. Refer to the programming section of this manual. **This will display only on the panel when the FAST is enrolled to the system.**
2. **Test Failure** – Displayed by the CWSI FACP when a FAST polling transmission is not received within 200 seconds. Possible causes are a missing antenna, break in FAST network communications or component failure in the FAST. Check the FAST for proper communication with the network. Will display on the FAST only on initial power up of the FAST if it is unable to connect to a Panel or Survey Repeater. To move past this Test Failure on the display, press and hold ACK-STEP and Signal Silence for 5 seconds.
3. **Hardware Fault –** Caused by a fault with the internal circuitry of the FAST. The FAST will require factory service.
4. **Charger Failure** – Caused by problem in battery charging circuit. Factory service is required.
5. **Low Battery** – Caused by battery voltage being too low or battery failing to pass load test. Charge or change the battery.

Section 6 – Programming

6.1 General

The FAST must be programmed with information about the installation in order to display Alarms and Supervisory conditions correctly when the panel is in Test Mode. A Checksum trouble indicates the FAST does not have the same information as the CWSI FACP it's enrolled into. The FAST must be programmed to clear this trouble condition. Programming is accomplished by downloading installation information from the CWSI FACP using the WRA-3 Programmer pc application and uploading it to the FAST as explained in this section.

When the FAST is first enrolled into the CWSI FACP it will display a Checksum bad trouble message because its device and programming information does not match the CWSI FACP. After the FAST is programmed the Checksum can be cleared. There are however several installation changes which will initiate a Checksum bad trouble and require the FAST and any annunciator(s) to be reprogrammed.

The following changes will cause a Checksum trouble and require reprogramming of the FAST and any on-site annunciator(s):

1. A change to any of the editable parameters of any device or repeater on the device edit screen of the CWSI FACP. The Checksum will occur after saving the change(s).
2. Enrolling or deleting a device, annunciator or repeater on the CWSI FACP.
3. Changing the supervisory on/off setting for alarm C on the CWSI FACP.
4. Changing the point I.D. of a device. Deleting and enrolling the same device would cause this.

Changing any other programming options on the CWSI FACP will not cause a Checksum trouble.

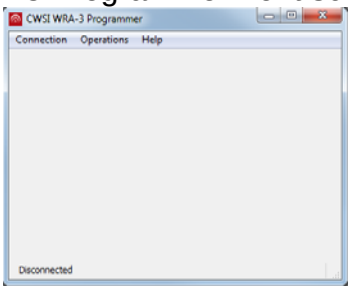
6.2 FAST Software programming

The WRA-3 Programmer is a Windows PC application (WRA3Programmer-1.0.0.exe) used to program the FAST with the current installation information. The WRA-3 Programmer tool is included in the WRA3-PK programming kit sold separately. The kit includes the software, micro SD card and USB adapter. The WRA-3 Programmer tool is compatible with Windows XP 32 bit, Windows 7 32/64 bit and Windows 8 32/64 bit. Double click the installation program and follow the prompts. A desktop icon will be created.

6.3 Programming the FAST

When the programming tool installation is complete double click the WRA-3 Programmer desktop icon. The first step is to download the installation information from the CWSI FACP. Connect a USB cable from the computer to the CWSI FACP. Refer to the CWSI FACP for the connector location.

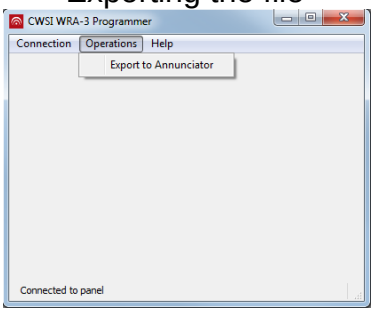
WRA-3 Programmer front screen



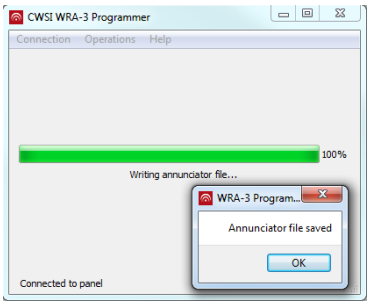
Click on the connection top menu item and then click connect. The word connected will appear in the bottom left corner of the programmer screen when the control panel connects to the computer. If the panel cannot connect check that a USB connection shows up in Windows device manager when the panel is connected. Also check the USB connection between the computer and panel.

Once connected choose the Operations top menu item and click on Export to Annunciator. Save the file to a formatted micro SD card. Alternatively save the file on the computer then copy the file to a formatted SD card. The file will automatically be named as annunciator.bin.

Exporting the file



Successful file save



Insert the SD card with the annunciator.bin file on it into the J27 SD card slot marked “Insert SD Card” on the FAST(s) to be programmed (Figure 2). The contact pins should be facing down. Push the card all the way into the connector until it locks into the SD card holder. A Checksum bad trouble will be transmitted to the CWSI FACP. The FAST trouble LED will flash and the sounder will beep a trouble condition until the SD card is removed.

Flip the front cover of the Field Analysis Survey Tool up so the LCD can be viewed. The LCD should be displaying a “Program Device Table” message. Press the SIGNAL SILENCE button to start the programming.

Program device table screen

Program Device Table?
Press Sil to Program
Remove SD to reset

When programming is complete the LCD should display success as shown below. Remove the SD card by pushing it in then release. The Field Analysis Survey Tool will initialize and send a power up reset trouble when it connects to the network. Any WRA-3 Annunciators in the installation site must be programmed as well to remove Checksum Bad troubles.

Program successful screen

Success
Remove SD to Reset

In the event the programming is not successful there will be a Failed Program message displayed with a reason. The reasons are listed below with suggestions for correction. Follow the corrective action and try programming again.

1. SD Card Invalid – Remove and replace SD card. Reformat the SD card. Try a new SD card.
2. Prog File Not Found – Verify the annunciator.bin file is on the SD card. Format the SD card then rewrite the file again with the FAST programmer.
3. Error Reading file - Verify the annunciator.bin file is on the SD card. Format the SD card then rewrite the file again with the FAST programmer. Try a new SD card.

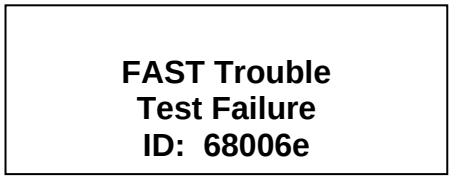
Section 7 – Info and Maintenance

7.1 Network Info, Test Failure, Voltage and Base Code

1. Network Info – This screen shows the ID (serial number) of the FAST as well as the base code of the CWSI FACP it is reporting to.

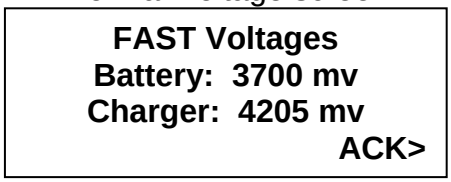
2. Test Failure – The Trouble LED will flash and Test Failure will display on the FAST only on initial power up of the FAST if it is unable to connect to a Panel or Survey Repeater. To move past this Test Failure on the display, press and hold ACK-STEP and Signal Silence for 5 seconds. This will take you to the FAST main screen.

Test Failure screen

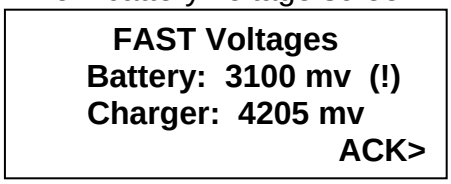


3. FAST Voltage– This screen shows the latest voltage reading on the battery and battery charger. The voltages are as read under load and displayed in millivolts. The readings are updated every 180 seconds or when the Signal Silence button is pressed. A battery is considered low when this reading is less than 3200mv and a charger fault trouble will be transmitted if the charger is less than 3700mv. If a charger fault is present the mv reading will be 0 since the charger will be shut off in the event of a charger fault. A (!) will be displayed to the right of a voltage reading if that voltage reading is not in range. Sample screens are shown below. **Note: The numbers shown below are examples and may differ from your display.**

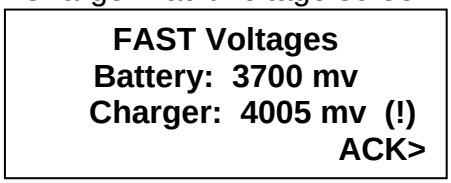
Normal Voltage screen



Low battery voltage screen



Charger Fault voltage screen



To recharge the battery connect the A/C jack into the charging port on the face of the FAST, to recharge the battery the FAST must be powered on.

4. Clear Base Code - This screen allows the user to clear the base code (network code) assigned to the FAST when it is enrolled to a CWSI FACP/Survey Repeater. This will allow the FAST to be enrolled and used with another CWSI FACP. Press the SIGNAL SILENCE when on this screen to erase the base code. **Warning: Do not press the SIGNAL SILENCE button unless you are sure you want to erase the base code as no additional confirmation will be asked.**

INDEX

A

A/C power 8
Antenna 6
Antenna sma connector 6

B

Base code 10
Battery 7
Buttons 9

C

Charger Failure 14,18
Checksum 12-17
Compatibility 6
Compatible devices 6

D

Description and Features 5
Dimensions 5
Disclaimer 2

E

Enclosure 5
Enrollment 12

F

Features 5

H

Hardware Fault 14

I

Introduction 4

L

LED 8
Low Battery 14,18

O

Omni 5,6
Operating Frequency 5

P

Power Source 5
Power Up Reset 12, 17
Programming 15

R

Repeater 10
Recharging Battery 18

S

Signal Survey 11
Sounder 9

T

Test Failure 17
Test Mode 13
Trouble signals 14

V

Voltage 18

W

Weight 5