VIAVI

3550/3550R

Communications Test Set

Operation Manual

OPERATION MANUAL

COMMUNICATIONS TEST SET

3550 / 3550R

Original Printing   Sep 2012

Re-issued   Feb 2020

Electromagnetic Compatibility:

For continued EMC compliance, all external cables must be shielded and three meters or less in length.

Nomenclature Statement:

In this manual, 3550 / 3550R, Test Set or Unit refers to the 3550 / 3550R Communications Test Set.

Product Warranty

Refer to https://www.viavisolutions.com/en-us/support/warranty-quality-compliance-policies for product warranty information.

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SAFETY FIRST: TO ALL OPERATIONS PERSONNEL

REFER ALL SERVICING OF UNIT TO QUALIFIED TECHNICAL PERSONNEL. THIS UNIT CONTAINS NO OPERATOR SERVICEABLE PARTS.

WARNING: USING THIS EQUIPMENT IN A MANNER NOT SPECIFIED BY THE ACCOMPANYING DOCUMENTATION MAY IMPAIR THE SAFETY PROTECTION PROVIDED BY THE EQUIPMENT.

CASE, COVER OR PANEL REMOVAL

Opening the Case Assembly exposes the operator to electrical hazards that can result in electrical shock or equipment damage. Do not operate this Test Set with the Case Assembly open.

SAFETY IDENTIFICATION IN TECHNICAL MANUAL

This manual uses the following terms to draw attention to possible safety hazards, that may exist when operating or servicing this equipment.

CAUTION: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN EQUIPMENT OR PROPERTY DAMAGE (E.G., FIRE).

WARNING: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN PERSONAL INJURY OR DEATH.

SAFETY SYMBOLS IN MANUALS AND ON UNITS

CAUTION: Refer to accompanying documents. (This symbol refers to specific CAUTIONS represented on the unit and clarified in the text.)

AC OR DC TERMINAL: Terminal that may supply or be supplied with AC or DC voltage.

DC TERMINAL: Terminal that may supply or be supplied with DC voltage.

AC TERMINAL: Terminal that may supply or be supplied with AC or alternating voltage.

EQUIPMENT GROUNDING PRECAUTION

Improper grounding of equipment can result in electrical shock.

USE OF PROBES

Check the specifications for the maximum voltage, current and power ratings of any connector on the Test Set before connecting it with a probe from a terminal device. Be sure the terminal device performs within these specifications before using it for measurement, to prevent electrical shock or damage to the equipment.

POWER CORDS

Power cords must not be frayed, broken nor expose bare wiring when operating this equipment.

USE RECOMMENDED FUSES ONLY

Use only fuses specifically recommended for the equipment at the specified current and voltage ratings.

INTENDED USE

The 3550 is intended for indoor use only and should not be subjected to conditions which cause water or other liquids to collect on the Touch Screen Display.

The 3550R is intended for use in both indoor and outdoor environments and remains functional in typical rain conditions.

INTERNAL BATTERY

This Unit contains a Lithium Ion Battery, serviceable only by a qualified technician.

CAUTION: SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICES OUT TO A DISTANCE OF SEVERAL MILES. USERS OF THIS EQUIPMENT SHOULD SCRUTINIZE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND SHOULD TAKE NECESSARY PRECAUTIONS TO AVOID POTENTIAL COMMUNICATION INTERFERENCE PROBLEMS.

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DECLARATION OF CONFORMITY

The Declaration of Conformity Certificate included with the Unit should remain with the Unit.

VIAVI recommends the operator reproduce a copy of the Declaration of Conformity Certificate to be stored with the Operation Manual for future reference.

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RoHs Product Information for People's Republic of China

Toxic or Hazardous Substance Content Table

The table provided below lists information as required by People's Republic of China Electronic Industry Standard SJ/T11364-2006, Marking for Control of Pollution Caused by Electronic Information Products. The table lists toxic or hazardous substances contained in VIAVI products that exceed limits in SJ/T11363-2006

Table 1. Toxic or Hazardous Substances in Product

部件名称 Parts	Toxic or Hazardous Substances 有毒有害物质或元素					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr6+)	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
印刷板组件 Printed Board Assemblies	X	O	O	O	O	O
机箱子组件 Chassis subassembly	X	O	O	O	O	O
电源 Power Supply	X	O	O	O	O	O
电缆及电缆组件 Cables & Cable Assemblies	X	O	O	O	O	O

O: Indicates that the toxic or hazardous substance contained in all of the homogenous materials for this component is below the limit requirement in SJ/T11363-2006

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006
标准规定的限量要求以下

X: Indicates that the toxic or hazardous substance contained in at least one of the homogeneous materials for this component is above the limit requirement in SJ/T11363-2006.

X : 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006
标准规定的限量要求

RoHs Product Information for People's Republic of China (cont)

Pollution Control Marking

The following marking is located on all VIAVI products sold in China. The number in the center indicates the Environmental Protection Use Period. This indicates the period in years during which the hazardous substances described in Table 1 will not leak or mutate under normal operating conditions so that the use of the product will not result in any severe environmental problem, any bodily injury, or damage to assets. The Environmental Protection Use period is valid only when the product is operated under the conditions defined in the product manual.

PREFACE

SCOPE

This Manual contains Instructions for operating the 3550 / 3550R. It is strongly recommended that the Operator be thoroughly familiar with this manual before attempting to operate the equipment.

ORGANIZATION

The Manual is composed of the following Chapters:

CHAPTER 1 - INTRODUCTION

Provides an Introduction and a Brief Overview of Functions and Features. Principles of Operation are also included.

CHAPTER 2 - OPERATING INSTRUCTIONS

Identifies and functionally describes all Controls, Indicators and Connectors.

Provides UI interaction.

Provides a Turn-On Procedure and Initial Adjustments.

Provides Operation Procedures.

Provides Applications.

CHAPTER 3 - OPERATOR MAINTENANCE

Identifies and explains Routine Service, Troubleshooting, Maintenance and Storage Procedures.

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CHAPTER 3 - MAINTENANCE

APPENDICES

LIST OF ILLUSTRATIONS / TABLES

LIST OF TABLES

SERVICE UPON RECEIPT OF MATERIAL

Unpacking

Use the following steps for unpacking the 3550 / 3550R.

- Cut and remove the sealing tape on top of the shipping container.

- Open the shipping container and remove the Transit Case.

- Place the Transit Case on a clean and dry surface.

- Open the Transit Case to inspect contents.

- Store the shipping carton for future use should the 3550 / 3550R need to be returned.

Checking Unpacked Equipment

Check the equipment for damage incurred during shipment. If the equipment has been damaged or if items seem to be absent from the shipment, report the damage and/or discrepancies to VIAVI Customer Service.

CONTACT: VIAVI

        Telephone: (800) 835-2350 (U.S. only)
                             (316) 522-4981
        FAX: (316) 524-2623
        E-Mail: *AvComm.Service@viavisolutions.com*
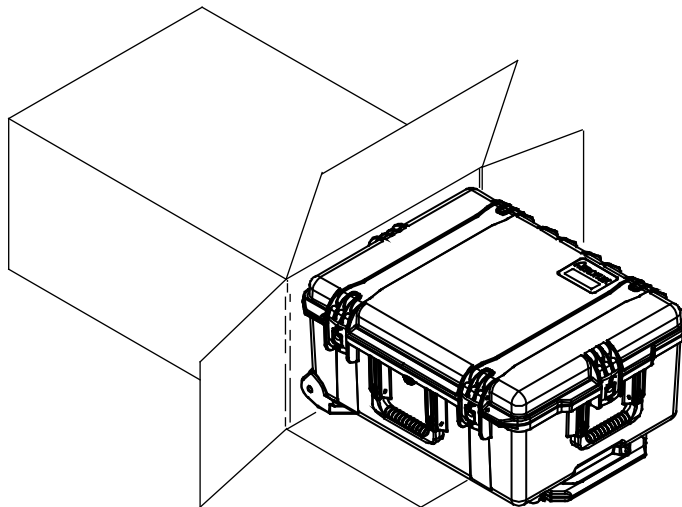
Checking Unpacked Equipment (cont)

STANDARD ITEMS

DESCRIPTION	PART NUMBER	QTY
3550 / 3550R Communications Test Set		1
Adapter (BNC-F to TNC-M)*	23758	5
Antenna (BNC) (50 MHz) (HF)*	9149	1
Antenna (BNC) (150 MHz) (VHF)*	9145	1
Antenna (BNC) (450 MHz) (UHF)*	9147	1
Antenna (BNC) (800 MHz)*	9143	1
Cable (BNC) (M-M) (48 in)*	62368	2
Cable (TNC) (M-M) (48 in)*	62398	1
Case, Accessory*	5762	1
Case, Transit*	91706	1
Cover / Stand*	91679	1
External DC Power Supply	67374	1
Fuse, Spare (5 A, 32 Vdc, Type F)*	56080	2
Handset*	64606	1
Manual, Getting Started (Paper) (English)	90521	1
Manual, Operation (CD) (English)	90520	1
Power Cable (AC) (3-wire leads)*	27516	1
Power Cable (AC) (Continental Europe)*	27480	1
Power Cable (AC) (North America)*	27478	1
Power Cable (AC) (UK)*	27477	1
Power Cable (AC) (China)*	91803	1
Power Cable (DC Cigarette Lighter)*	62404	1
Short-Open-Load VSWR Calibrator (TNC)*	38245	1

*   Included with Regional Accessory Kit (U.S., International or China)

Checking Unpacked Equipment (cont)

Adapter (BNC-F to TNC-M)
23758

Antenna (BNC) (50 MHz) (HF)
9149

Antenna (BNC) (150 MHz) (VHF)
9145

Antenna (BNC) (450 MHz) (UHF)
9147

Antenna (BNC) (800 MHz)
9143

Cable (BNC) (M-M) (48 in)
62368

Cable (TNC) (M-M) (48 in)
62398

Case, Accessory
5762

Checking Unpacked Equipment (cont)

Case, Transit
91706

Cover / Stand
91679

External DC Power Supply
67374

Fuse, Spare (5 A, 32 Vdc, Type F)
56080

Handset
64606

Manual, Getting Started (Paper) (English)
90521

Manual, Operation/ICW (CD) (English)
90520

Power Cable (AC) (3-wire leads)
27516

Checking Unpacked Equipment (cont)

Power Cable (AC) (Continental Europe)
27480

Power Cable (AC) (North America)
27478

Power Cable (AC) (UK)
27477

Power Cable (AC) (China)
91803

Power Cable (DC Cigarette Lighter)
62404

(or)

Short-Open-Load VSWR Calibrator (TNC)
38245

Checking Unpacked Equipment (cont)

OPTIONAL ITEMS
(These optional items may be included if ordered)

DESCRIPTION	PART NUMBER

Attenuator (20 dB / 50 W)
    Attenuator (20 dB / 50 W)
    Adapter (N-F to BNC-F)
    Adapter (N-M to TNC-M)
	82559 (Kit No.)
	38240
	23770
	23766

Attenuator (20 dB / 150 W)
    Attenuator (20 dB / 150 W)
    Adapter (N-F to BNC-F)
    Adapter (N-M to BNC-F)
	82560 (Kit No.)
	38242
	23770
	20327

Battery, Spare	67076
Case, Soft-Sided Carrying	10192

Manual, Getting Started (Paper)
 	
    Arabic
    Chinese - Simplified
    Chinese - Traditional
    French
    German
    Italian
    Japanese
    Korean
    Malay
    Polish
    Portuguese
    Russian
    Spanish
	
	91859
	91860
	91862
	91952
	91863
	139828
	91864
	91865
	91866
	91867
	91868
	91869
	91870

Manual, Maintenance (CD) (English)	90523

Manual, Operation (CD)
 	
    Arabic
    Chinese - Simplified
    Chinese - Traditional
    French
    German
    Italian
    Japanese
    Korean
    Malay
    Polish
    Portuguese
    Russian
    Spanish
	
	91848
	91849
	91850
	91947
	91851
	139827
	91852
	91853
	91854
	91855
	91856
	91857
	91858

Tripod	67474
Tripod Stand	6361
Tripod Dolly	63659

Checking Unpacked Equipment (cont)

Adapter (N-M to TNC-M)
23766

Adapter (N-M to BNC-F)
20327

Adapter (N-F to BNC-F)
23770

Attenuator (20 dB / 50 W)
38240

Attenuator (20 dB / 150 W)
38242

Battery, Spare
67076

Case, Soft-Sided Carrying
10192

Tripod   Tripod Stand   Tripod Dolly
67474   6361   63659

Checking Unpacked Equipment (cont)

Manual, Getting Started (Paper)

(Arabic)	91859
(Chinese - Simplified)	91860
(Chinese - Traditional)	91862
(French)	91952
(German)	91863
(Italian)	139828
(Japanese)	91864
(Korean)	91865
(Malay)	91866
(Polish)	91867
(Portuguese)	91868
(Russian)	91869
(Spanish)	91870

Manual, Maintenance (CD) (English)
90523

Manual, Operation (CD)

(Arabic)	91848
(Chinese - Simplified)	91849
(Chinese - Traditional)	91850
(French)	91947
(German)	91851
(Italian)	139827
(Japanese)	91852
(Korean)	91853
(Malay)	91854
(Polish)	91855
(Portuguese)	91856
(Russian)	91857
(Spanish)	91858

CHAPTER 1 - INTRODUCTION

1-1. GENERAL INFORMATION

A. Scope

Type of Manual:	Operation Manual
Equipment Name and Model Number:	3550 / 3550R Communications Test Set
Purpose of Equipment:	The 3550 / 3550R Communications Test Set is used for testing radios and related equipment.

B. Nomenclature Cross-Reference List

COMMON NAME	OFFICIAL NOMENCLATURE
3550 / 3550R	3550 / 3550R Communications Test Set
Test Set or Unit	3550 / 3550R Communications Test Set

1-2. EQUIPMENT CAPABILITIES AND FEATURES

The 3550 / 3550R is a Touch Screen Handheld Communications Test Set for Radio installation testing. The 3550 / 3550R is capable of measuring high power, up to 200 W, as well as fault finding for antennas, power amplifiers and interconnects. The 3550 / 3550R meets the needs of a variety of vehicular radios, as well as commercial radio applications.

The 3550 / 3550R is designed for ease of use, portability, reliability and long service life. The 3550 / 3550R may also be used for bench testing in the General Communications environment.

Power is derived from an internal battery. For DC input, the DC IN Connector is provided for battery charging, bench operation or servicing.

The 3550 / 3550R and supplied accessories are stored in a Soft Carrying Case or a Transit Case.

A. Capabilities

Capabilities

- RF Receiver Testing - Up to 1 GHz bandwidth; AM, FM, frequency and level measurements.
- RF Transmitter Testing - Up to 1 GHz bandwidth; AM, FM, 1 kHz / 150 Hz and external modulation sources.
- RF Power Meter - 20 W intermittent duty cycle; 200 W with an external attenuator.
- VSWR measurements.
- Simple operation with few key strokes and textual displays.
- Large Touch Screen Display with user adjustable Backlight and Contrast.
- Self Test and Diagnostics for internal validation and testing.
- Internal Battery allows 4.5 hours continuous use before recharge.
- Automatic power shutdown after approximately 5 to 20 minutes (selectable) of non-use when AC power is not connected.
- Compact and lightweight enough to allow for one person operation.

B. Features

Functions and Tiles - LMR

| Generators | Receivers | Instruments |
| Meters | System | Utilities |

Generators	Receivers	Instruments
Generator	Receiver	Ch Analyzer
AF Gen	DCS Decode	Wide Analyzer
Modulation	DTMF Decode	Oscilloscope
	Digital Demod	Tracking Gen
	Digital Config	Digital Plots
	Digital Decode	Power Profile
	Analog Demod	Ant-Cable Test
	Analog Config	
	Tone Decode	
	Freq Select	

Meters	System	Utilities
RSSI	Language ▸	Store/Recall
Modulation	Presets ▸	Freq-Flex
Distortion	Options	
SINAD	Audio Config	Scripting
AF Counter	Cal ▸	File Manager
Audio Level	System Config	Touch Util
RF Error	Freq Find	
RF Power	System Update	
Ext RF Power	Channel Plan	
Ext RF Config	Tone Config	
	Freq List	

(Optional Functions are shown for display purposes only.)

B. Features (cont)

Functions and Tiles - Extended - LMR

System	Utilities
Language ▸	English
	العربية
Presets ▸	中文 (简体)
	中文 (繁體)
Options	Français
	Deutsch
Audio Config	日本語
Cal ▸	한국인
System Config	Melayu
	polski
Freq Find	Português
System Update	русский
Channel Plan	Español
Tone Config	Italiano
Freq List	

System	Utilities
Language ▸	Manager
Presets	Digital
	Analog
Options	Clear Display
Audio Config	Preset 4
Cal ▸	Preset 5
System Config	Preset 6
	Preset 7
Freq Find	Preset 8
System Update	Preset 9
Channel Plan	Preset 10
Tone Config	
Freq List	

System	Utilities
Language ▸	
Presets ▸	
Options	
Audio Config	
Cal	Cal Database
System Config	Calibrations
Freq Find	
System Update	
Channel Plan	
Tone Config	
Freq List	

(Optional Functions are shown for display purposes only.)

B. Features (cont)

Functions and Tiles - PTC

(Optional Functions are shown for display purposes only.)

Functions and Tiles - Extended - PTC
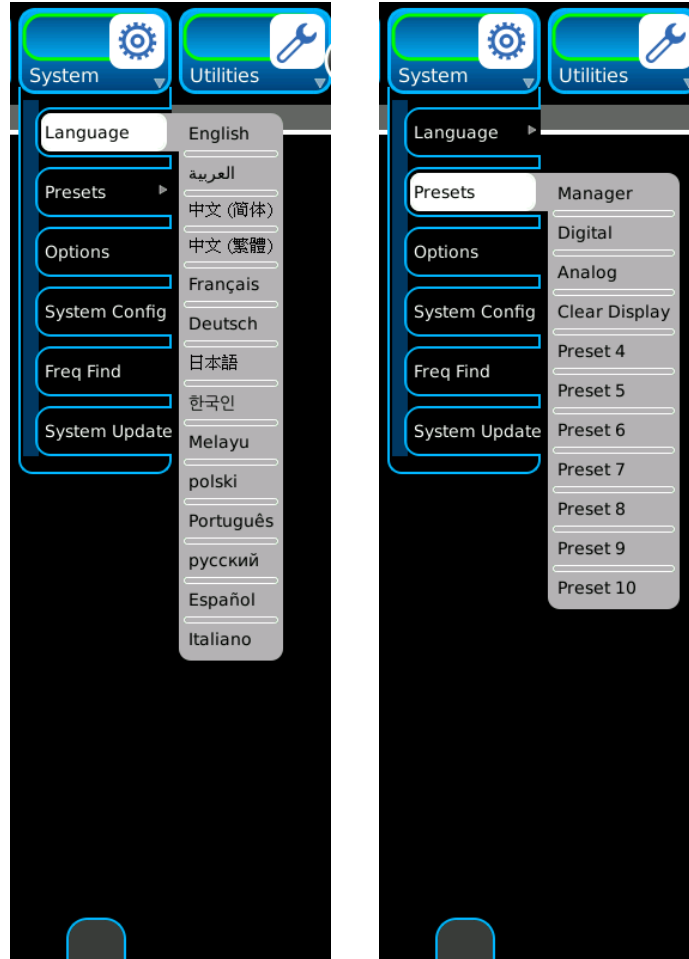
(Optional Functions are shown for display purposes only.)

1-3. EQUIPMENT DATA

NOTE

- Where specified resolution exceeds specified accuracy, the specified resolution takes precedence.

- Accuracy and resolution stated in percentages are referenced to the measured or selected value.

- All RF characteristics are referenced to 50 Ω.

- Allow warm-up period of at least 10 minutes.

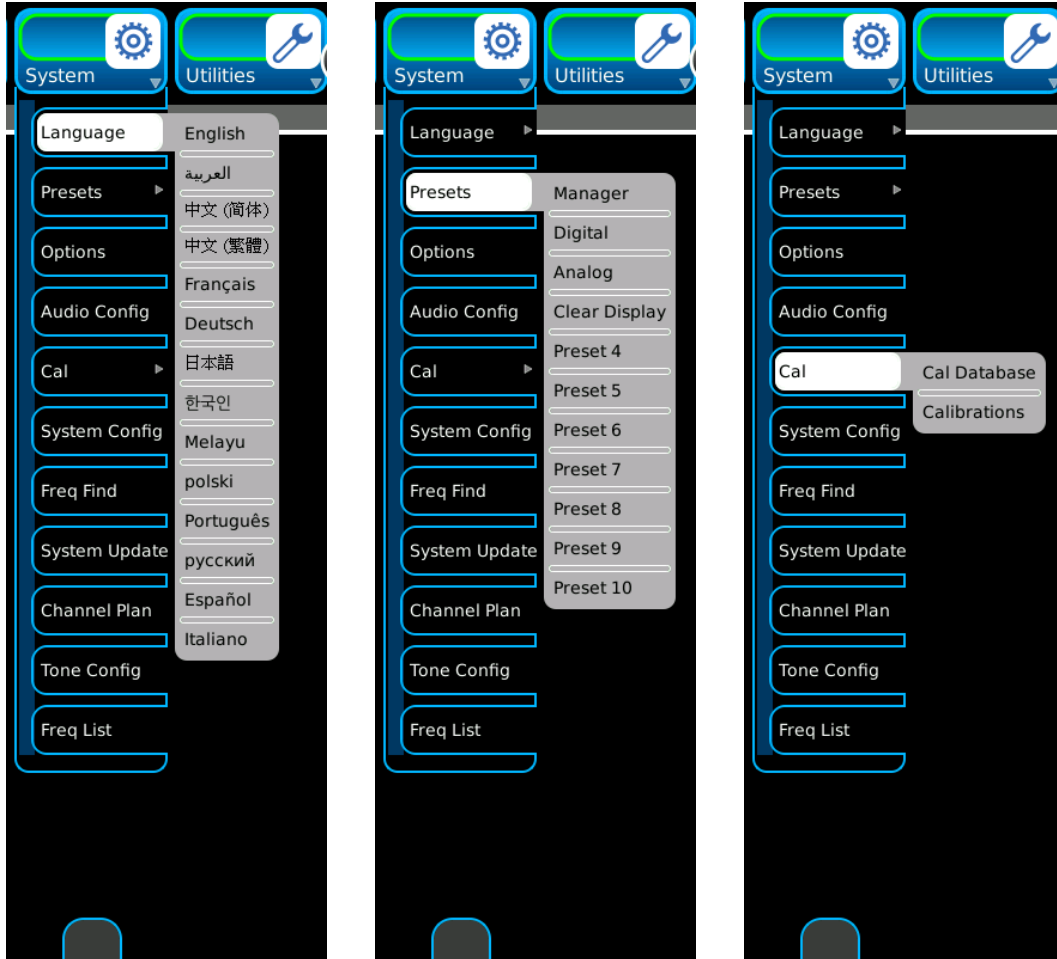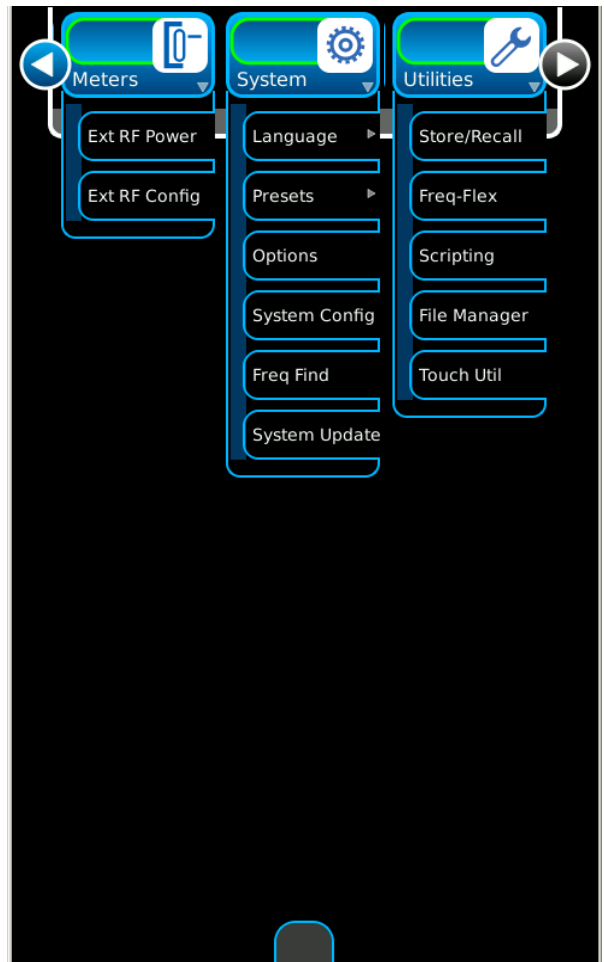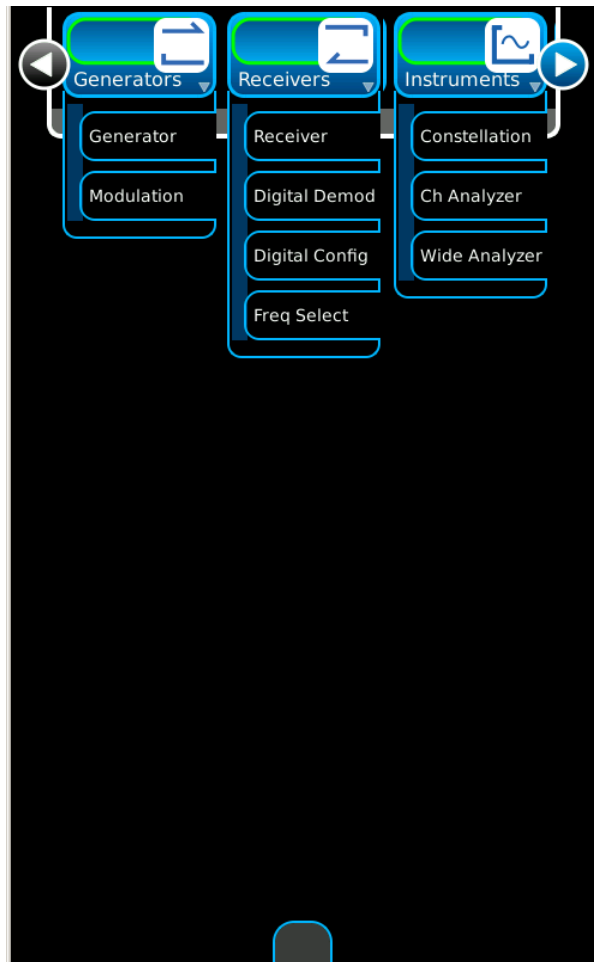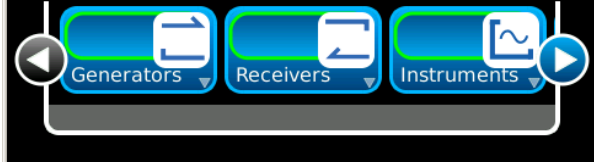- Received (input) signal modulation bandwidth does not exceed selected receiver IF bandwidth.

- Specifications are subject to change without notice.

RF GENERATOR

PORT INPUT PROTECTION

    ANT Port: .... +20 dBm

    SWR Port: .... +20 dBm

    T/R Port: ....+44 dBm (Thermal alarm)

FREQUENCY

    Range: .... 2 to 1000 MHz

    Accuracy: .... Same as Timebase

    Resolution: .... 1 Hz

OUTPUT LEVEL RANGE (TNC FEMALE)

    T/R Connector (dBm / μV): ....-50 to -125 dBm / 707.1 to 0.126 μV

    ANT Connector (dBm / μV): .... -30 to -90 dBm / 7071.1 to 7.1 μV

    SWR Connector (dBm / μV): ....-5 to -65 dBm / 125743.3 to 125.7 μV

    Level Accuracy: ....±2 dB
                                   ±3 dB (<-100 dBm)
                    ±3 dB (<-110 dBm Hold Atten Mode)

    Level Resolution: .... 1 dB / 0.001 μV (1 dB Step Size)

    Level Resolution (Hold Atten Mode): ....0.1 dB / 0.001 μV (0.1 dB [0 to -6 dB] Step Size)

NOTE

Level Accuracy is not specified over Temperature changes while in "Hold Atten Mode."

CONNECTOR VSWR

    ANT Connector: ....<1.5:1 Typical

    T/R Connector: .... <1.25:1

    SWR Connector: ....<1.5:1 Typical

1-3. EQUIPMENT DATA (cont)

SSB PHASE NOISE: ....<-80 dBc/Hz at 20 kHz offset

SPURIOUS

    Harmonics:..-30 dBc

    Non-Harmonics: ....-40 dBc (>±20 kHz Offset from Carrier) in Band (2 MHz to 1 GHz)

RESIDUAL FM: .... <60 Hz in 300 Hz to 3 kHz BW; 16 Hz typical

RESIDUAL AM: ....<5% in 300 Hz to 3 kHz BW

FM MODULATION

    FM Modulation Frequency (Rate):

        Range:...0 Hz to 20 kHz

        Resolution:..0.1 Hz

        Accuracy:..Timebase ±2 Hz

    Modulation Waveforms - AM and FM ....Sine, DCS, DTMF

    FM Deviation Range: ....Off, 0 Hz to 100 kHz (AFGEN1 and AFGEN2 selectable)

    Total Harmonic Distortion: .... 3% (1000 Hz Rate, >2 kHz Deviation, 300 Hz to 3 kHz BPF)

    FM Deviation Resolution: .... 1 Hz

    FM Deviation Accuracy: .... ±10% (2 to 50 kHz deviation, 150 Hz to 3 kHz rate)

    MIC IN:

        Microphone Input: .... 2 to 15 mVrms (8 mVrms nominal) (Range 1)
                                    35 to 350 mVrms (100 mVrms nominal) (Range 2)
                                    2 to 32 mVrms (20 mVrms nominal) (Range 3)

        FM Input Frequency Range: .... 300 Hz to 3 kHz

        FM Deviation: .... Off, 0 Hz to 80 kHz

        FM Modulation Accuracy: .... ±20% (300 Hz to 1.2 kHz)
                                          ±30% (>1.2 kHz)

        FM Input Slope: ....Positive voltage yields positive deviation

    Ext AUDIN Input:

        Switchable Loads:... 150 Ω, 600 Ω, 1 KΩ, Div10, High Z

        Input Levels: ....0.05 to 3 Vrms

        FM Input Frequency Range: .... 300 Hz to 5 kHz

        FM Input Level Sensitivity:.................................. 1 kHz / 35 mVrms nominal (High Z Load)

        FM Input Slope: ....Positive voltage yields positive deviation

1-3.   EQUIPMENT DATA (cont)

AM MODULATION

AM Modulation Frequency (Rate):

Range:...0 Hz to 20 kHz

Resolution:...0.1 Hz

Accuracy:...Timebase ±2 Hz

AM Modulation:

Range:..OFF, 0% to 100% (AFGEN1 and AFGEN2 selectable)

Resolution:..0.1%

Accuracy:...............................10% of setting, 150 Hz to 5 kHz rate, 10% to 90% Modulation

Total Harmonic Distortion: ....3% (20% to 90% mod, 1000 Hz rate, 300 Hz to 3 kHz BPF)

Ext AUDIN Input:

Switchable Loads:... 150 Ω, 600 Ω, 1 KΩ, Div10, High Z

Input Levels: ....0.05 to 3 Vrms

AM Input Frequency Range: ....300 Hz to 5 kHz

AM Input Level Sensitivity:..1% / 35 mVrms nominal (High Z Load)

MIC IN:

Microphone Input: .... 2 to 15 mVrms (8 mVrms nominal) (Range 1)
35 to 350 mVrms (100 mVrms nominal) (Range 2)
2 to 32 mVrms (20 mVrms nominal) (Range 3)

AM Input Frequency Range: ....300 Hz to 3 kHz

AM Modulation:..0% to 80%

AM Modulation Accuracy:... ±20% (300 Hz to 1.2 kHz)
±30% (>1.2 kHz)

1-3. EQUIPMENT DATA (cont)

AUDIO GENERATORS (AFGEN1 AND AFGEN2)

NOTE

If two sources are selected, they are summed together. AFGEN1 and AFGEN2 may be routed to the external AUD Out connection on the handset. Specifications are for each FGEN individually.

Frequency Range: ....30 Hz to 5 kHz
0 to 20 kHz (operational)

Frequency Resolution: ....0.1 Hz

Frequency Accuracy: ....Timebase ±2 Hz

Output Level:

    Load Impedance: .... 600 Ω

    Audio Level Out: ....0 to 1.57 Vrms

    Resolution:.. 0.01 Vrms

    Accuracy:..±10%

Distortion: .... <3% (1 kHz rate, sine 300 Hz to 3 kHz)

PTT OPERATION

NOTE

PTT ON / OFF changes between TRANSMITTER TEST and RECEIVER TEST.

PTT ON:...Low, GND

PTT OFF: .... High, Open with Pullup

1-3. EQUIPMENT DATA (cont)

RF RECEIVER

FREQUENCY RANGE:.. 2 to 1000 MHz

ACCURACY: .... Timebase

RESOLUTION: .... 1 Hz

INPUT AMPLITUDE

    Minimum Input Level (Audio Sensitivity):

        ANT Connector: ....-80 dBm typical, 10 dB SINAD / 22.4 µV (-110 dBm with Preamp)

        T/R Connector: .... -40 dBm typical, 10 dB SINAD, 2236 µV

    Useable Input Level Range (Receiver Measurements):

        ANT Connector: ....-60 to -10 dBm (RF Error, Distortion, Modulation, AF Counter)
                                                    -80 to -10 dBm with Preamp ON
                                                         -90 to -10 dBm (RSSI)
                                            -110 to -10 dBm with Preamp ON

    Minimum Input Level (Receiver Measurements)

        T/R Connector: ....-20 dBm (RF Error, Distortion, Modulation, AF Counter)
                                                      -50 dBm (RSSI)

    Maximum Input Level:

        ANT Connector: .... +20 dBm for 10 seconds, Alarm sounds

        T/R Connector: ....+37 dBm (AM)
                                                        +43 dBm (FM)

NOTE

    Overtemp Alarm trips if the power is left on too long and the temperature of the
    Power Termination gets too hot.

    FM Demod Output (AUD OUT):

        IF BW: ....5, 6.25, 8.33, 10, 12.5, 25, 30, 100 and 300 kHz IF BW

        Audio Filters BW:..................................C-Wt BP, CCITT BP, NONE, 15 kHz LP, 300 Hz LP,
                                  300 Hz HP, 5 kHz LP, 300 Hz to 5 kHz BP, 300 Hz to 3 kHz BP,
                                            300 Hz to 20 kHz BP and 3 kHz LP

        Level Sensitivity: ....(3 Vrms/kHz Dev) / IF BW (kHz) ±15%

    AM Demod Output (AUD OUT):

        IF BW: ....5, 6.25, 8.33, 10, 12.5, 25 and 30 kHz

        Audio Filters BW:..................................C-Wt BP, CCITT BP, NONE, 15 kHz LP, 300 Hz LP,
                                  300 Hz HP, 5 kHz LP, 300 Hz to 5 kHz BP, 300 Hz to 3 kHz BP,
                                            300 Hz to 20 kHz BP and 3 kHz LP

        Level Sensitivity: ....7 mVrms / %AM ±15%

    Speaker Output:..........................75 dBa minimum at 0.5 m, 600 to 1800 Hz, maximum volume

    Volume Control:..Level Range, Scale 0 to 100

    LO Emissions: .... >-50 dBc

1-3. EQUIPMENT DATA (cont)

DUPLEX

NOTE

Duplex Test is Receiver and Transmitter Tests simultaneously. Performance parameters are the same as the independent Receiver and Transmitter Test Screens.

RF TRANSMITTER TEST METERS

RF ERROR METER

Meter Operating Range:...±200 kHz

Resolution:.. 1 Hz

Accuracy:..Timebase ±2 Hz

RSSI METER (RF Power within Receiver IF BW)

Display Range / Units:.. -120 to +43 dBm (10 pW to 20 W)
-120 to +53 dBm (10 pW to 200 W) (Ext Atten set to 20 dB)

Useable Meter Reading - RF Level Range:

ANT Connector: ....-90 to -10 dBm
-110 to -10 dBm (Preamp ON)

T/R Connector: ....-50 to +43 dBm

Resolution:.. 0.01 dBm

Accuracy:..±3 dB

RF POWER METER (Broadband RF Power into T/R Connector)

Display Range / Units:...0 to +43 dBm (0 to 20 W)
0 to +53 dBm (0 to 200 W) (Ext Atten set to 20 dB)

Minimum Input Level (w/ dBm):.. 0.10 W / +20 dBm

Maximum Input Level:... +43 dBm / 20 W for 10 minutes at +25°C
or until Thermal Alarm sounds (whichever occurs first)

Alarms:...+44 dBm for 5 seconds ON, 5 minutes OFF
or until Thermal Alarm sounds (whichever occurs first)

Meter Modes:... Average Power

Display Units:... W or dBm (selectable)

Resolution:...0.01 (W), 0.1 (dBm)

Accuracy

No External Attenuator: .... ±1 dB for internal attenuator

With External Attenuator:.. ±1 dB ± external attenuator accuracy

NOTE

When External Attenuator is selected, 20 dB is added to the measurements of 50 or 200 W.

1-3.   EQUIPMENT DATA (cont)

RF POWER METER (Broadband RF Power into T/R Connector) (cont)

   External 20 dB Attenuator Accuracy

      50 W Attenuator:...±0.75 dB

      150 W Attenuator:..±0.50 dB

   External 20 dB Attenuator Power Rating:

      50 W Attenuator - 20 dB: ....50 W average at 25°C

      150 W Attenuator - 20 dB:.............................150 W average for temperatures up to 25°C,
                                                 linearly de-rated to 125 W at 55°C, horizontal
                                 200 W peak for 30 seconds ON/ 5 minutes OFF at 25°C

FM DEVIATION METER

   Meter Deviation Range: ....500 Hz to ±100 kHz

   Meter Modes:... Peak+, Peak-, (Peak-Peak)/2

   Resolution:..0.1 Hz

   Accuracy:.. ±10% (500 Hz to 100 kHz Deviation)
                                                 ±5% (1 to 10 kHz Deviation)
                                                 150 Hz and 1 kHz Rate

AM MODULATION METER

   Meter Range:...5% to 100%

   Meter Modes:... Peak+, Peak-, (Peak-Peak)/2

   Resolution:... 1%

   Accuracy:................................±5% of reading, 1 kHz rate, 30% to 90% modulation, 3 kHz LPF

SWR MEASUREMENT

FREQUENCY

   Range:.. 2 to 1000 MHz

   Calibration and Sweep Bandwidth: .... 2 to 1000 MHz, 0.1 MHz Resolution

SWR READING

   Display Range: ....1.00 to 20.00

   Resolution:..0.01

   Accuracy:...±20% of SWR readings (calibrated) <300 MHz
                                                 ±30% of SWR readings (calibrated) >300 MHz

DTF READING

   Test Range:...3 to 328 ft (1 to 100 m)

   Display Range: .... 40 to 400 ft
             (Range is function of Frequency Span and Cable Velocity Factor and Cable Loss)

   Accuracy:... ±3 ft

1-3.   EQUIPMENT DATA (cont)

AUDIO METERS

AUDIO INPUT (EXT AUD IN) (BNC Input on Handset)

    EXT AUD IN Input :

        Frequency Range:...................... 300 Hz to 10 kHz (1 kHz for SINAD and Distortion Meters)

        Input Level: .... 0.2 to 5 Vp-p

SINAD METER

    Measurement Sources: .... EXT AUD IN, DEMOD

    Audio Frequency Notch:..1 kHz

    Reading Range: .... 0 to 40 dB

    Resolution:...0.1 dB

    Accuracy:... ±1.5 dB, reading >8 dB, <40 dB, ±1 Count

DISTORTION METER

    Measurement Sources: .... EXT AUD IN, DEMOD

    Audio Frequency Notch:..1 kHz

    Reading Range: ....0% to 100%

    Resolution:..0.1%

    Accuracy:..±10%, reading >1%, <20%, ±1 Count

AF COUNTER

    Input Demodulation Range:

        FM: .... 15 Hz to 20 kHz (IF BW set appropriately for received modulation BW)

        AM: .... 100 Hz to 10 kHz (IF BW set appropriately for received modulation BW)

        Baseband Audio In:... 10 mVp-p to 5 Vp-p

    Audio Input Level: .... 15 Hz to 20 kHz

    Ext Audio Input: .... 10 mVrms to 1.5 Vrms

    Resolution:..0.1 Hz

    Accuracy: ....±1 Hz

AUDIO FREQUENCY LEVEL METER

    Measurement Sources: ....EXT AUD IN, DVM

    Frequency Range: .... 200 Hz to <5 kHz

    Input Level:

        EXT AUD IN: ....10 mVrms to 3 Vrms (x1), 1 Vrms to 30 Vrms (÷10)

        DVM: ....10 mVrms to 3 Vrms (x1), 1 Vrms to 30 Vrms (÷20)

    Display Unit Resolution: .... 0.001 V, 0.001 mV, 0.001 dBμV, 0.001 dBm, 0.001 W

    Accuracy: ....±5% (EXT AUD IN)

1-3.   EQUIPMENT DATA (cont)

OSCILLOSCOPE (OPTIONAL)

Single Input Channels: ....DVM, Audio In, Internal Demod

Input Impedance:

DVM Input: .... 1 MΩ

Audio I/O Input: ....150 Ω, 600 Ω, 1 KΩ, Divide-by-10, High Z

Coupling:

DVM Input: ....AC, DC and GND

Audio I/O Input: ....AC

FM Internal Demod: .... DC

AC Internal Demod: ....AC

Range:

DVM and Audio I/O Output: .... 10 mV/Div to 10 V/Div in a 1,2,5 sequence

FM Internal Demodulation: .... 0.1 kHz/Div to 50 kHz/Div in a 1,2,5 sequence

AM Internal Demodulation: 5%, 10%, 20%, 50%/Div

Vertical Accuracy: .... 10% of Full Scale (DC to 5 kHz)

Bandwidth: ....5 kHz

Horizontal Sweep:

Range: .... 0.5 ms/Div to 0.1 sec/Div

Accuracy: ....3% of Full Scale

Trigger Source: .... Auto or Normal (Internal)

Trigger Adjustment: ....Variable on Vertical Scale

Markers: ....Two Markers
Displays Vertical Measurement (Voltage, kHz, % Modulation)
Displays Delta in Time between Markers

SPECTRUM ANALYZER (OPTIONAL)

Frequency:

Range: .... 2 MHz to 1 GHz

Span: .... 10 kHz to 5 MHz in a 1,2,5 sequence

Windows: .... Hanning, Flat Top, Rectangle

Vertical Scale: ....2, 5, 10, 15, 20 dB/Div

Marker Range: .... 1 kHz to 5 MHz in a 1,2,5 sequence

Marker Offset: ....±1 kHz to 0.5 Span in a 1,2,5 sequence

Power Bandwidth Accuracy: .... ±3 dB Typical (30 dB Signal to Noise)

Noise Floor: .... ±3 dB Typical (30 dB Signal to Noise)

1-3. EQUIPMENT DATA (cont)

TIMEBASE

STANDARD OSCILLATOR

    Temperature Stability: .... 0.15 ppm at -20°C to 70°C

    Aging: .... 0.5 ppm / First Year
                                   0.3 ppm/ After First Year

    Warmup Time: .... 3 minutes

    Frequency Stability: .... 0.15 ppm at -20°C to 70°C

    Aging: .... 0.02 ppm / day
                                     1.0 ppm/ year

EXTERNALLY REFERENCED TIMEBASE CALIBRATION

    Input Frequency Range: .... 2 to 1000 MHz

    Reference Input Connector: .... T/R, >-20 dBm

    External Referenced Timebase Accuracy: .... <0.2 Hz from external source applied +
                                    aging specification of internal timebase

EXAMPLE

10 MHz ($\pm$0.2 Hz) = $\pm$0.02 ppm of the external timebase reference + aging
specification of internal timebase.

1-3. EQUIPMENT DATA (cont)

ENVIRONMENTAL / PHYSICAL

OVERALL DIMENSIONS:................... 231 mm (9.1 in) (W), 285 mm (11.2 in) (L), 70 mm (2.8 in) (D)

WEIGHT:... 8.3 lbs. (3.75 kg); 12 lbs. (5.4 kg) with accessories

TEMPERATURE

    Storage:... -51°C to +71°C

NOTE

Battery must not be subjected to temperatures below -20°C, nor above +60°C.

    Operation:

        DC Only (battery removed, contingent upon applied RF power over time):

            3550:... 0°C to +50°C

            3550R: .... -20°C to +55°C

        Battery (typical based on internal temperature rise and usage of the instrument):

            3550:... 0°C to +40°C

            3550R: .... -20°C to +40°C

NOTE

Battery is to be charged at temperatures between 0°C and +45°C only.

NOTE

Use reason when working with RF test instruments. All thermal ratings are dependent upon applied RF power. The 3550 alarms once the internal temperature of the 3550 exceeds predetermined limits. Applying power continuously in high ambient temperature conditions result in a heat build-up within the instrument. The 3550 is rated for 20 W (43 dBm) for 10 minutes at +25°C or until thermal alarm sounds. Exceeding these conditions results in thermal shutdown.

HUMIDITY: ....95% maximum (non-condensing)

ALTITUDE: .... 4600 M

SHOCK: .... 30 G

BENCH HANDLING

    Operation:.. MIL-PRF-28800F, Class 2

VIBRATION:

    3550:.. MIL-PRF-28800F, Class 3

    3550R:.. MIL-PRF-28800F, Class 2

1-3.   EQUIPMENT DATA (cont)

COMPLIANCE/SAFETY

Use: .... MIL-PRF-28800F, Class 2
Salt Exposure, Enclosure (3550R)
Acoustic Noise
Explosive Atmosphere
Dust Resistance
Drip Proof (3550R)
Blowing Rain (3550R)
Solar Radiation (3550R)

EMC: .... MIL-PRF-28800F, Class 2

Emissions: .... EN61326: 1998 Class A
EN61000-3-2
EN61000-3-3

Immunity: MIL-PRF-28800F
EN61326: 1998

Safety: .... UL 61010-1
UL 6101-1
CSA

AC INPUT POWER

AC Input Voltage Range: .... 100 to 240 VAC, 1.5 A maximum, 47 Hz to 63 Hz

AC Input Voltage Fluctuation: .... <10% of the nominal input voltage

Transient Overvoltage: .... According to Installation Category II

AC-DC CONVERTER

Usage Environment: .... Indoor use, Pollution Degree 2

Operating Temperature: .... 0°C to +40°C

Storage Temperature: .... -20°C to +85°C

NOTE

Consider the use of the Unit for thermal operating temperature. All thermal ratings
are dependent upon applied RF power. The Unit alarms once the internal
temperature exceeds safety limits. Applying power continuously in a high ambient
temperature environment results in a heat build-up within the Unit. The Unit is
rated for 20 W (43 dBm) for 10 minutes at +25°C or until the thermal alarm sounds.
Exceeding these conditions results in thermal shutdown.

EMI: .... EN55022 Class B, EN61000-3-2 Class D

Safety: .... UL 1950, CSA 22.2 No. 234 and No.950, IEC 950/EN 60950

1-3. EQUIPMENT DATA (cont)

DC INPUT CONNECTOR (DC IN)

DC Input Voltage Range: ....11 to 32 Vdc

DC Power Input:

Maximum: ....55 W

Nominal: ....25 W

DC Fuse Requirement:... 5 A, 32 Vdc, Type F

BATTERY

Battery Type:...Lithium Ion (Li Ion) Battery pack

NOTE

Battery must not be subjected to temperatures below -20°C, nor above +60°C.

Operation Time (Typical) (Duty Cycle: 80% Transmitter and 20% Receiver tests):

Minimum Backlight (Still Viewable): ....4.5 hours continuous use

40% Backlight:..4 hours continuous use

100% Backlight:..3.5 hours continuous use

Charge Time:.. 4 hours (Unit OFF) typical / 8 hours (Unit ON) typical

NOTE

Battery is to be charged at 0°C to +45°C. Dead Battery (<10% capacity) is to
be charged for 20 minutes before operation on AC Power.

STATIC THERMAL CHARACTERISTICS

Ambient, Power ON, RF Power OFF: ....<15°C rise after 30 minutes

Ambient, Power ON, RF Power ON:...<25°C rise after 30 minutes

1-4.   PRINCIPLES OF OPERATION

The 3550 / 3550R contains the following assemblies:
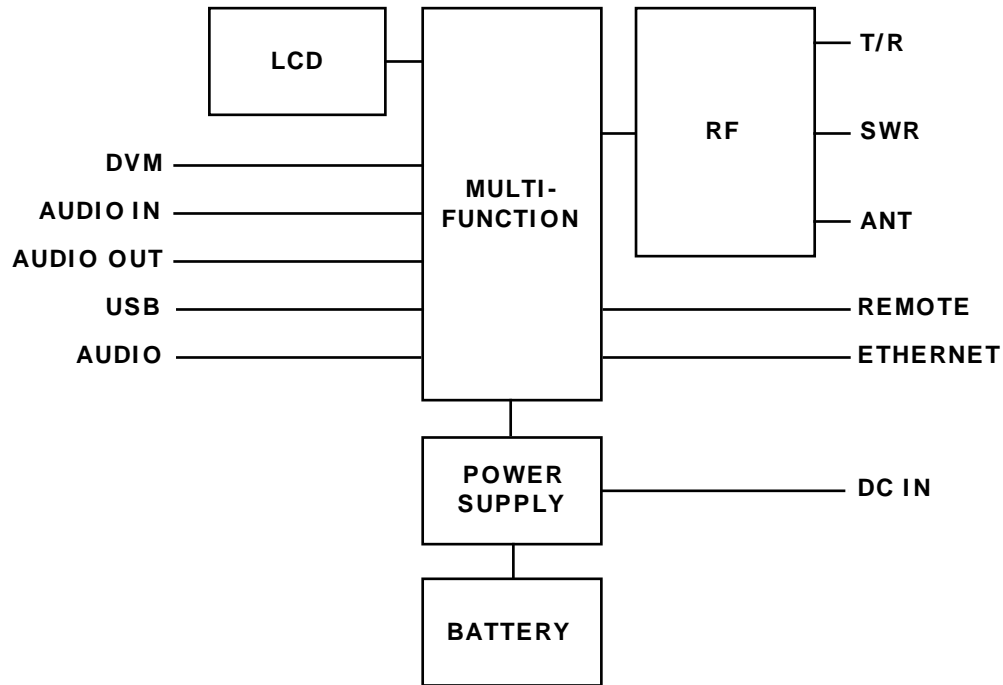
The **Power Supply PCB Assy** is responsible for supplying power to the internal modules for operation and for charging the internal batteries.

The **Multi-Function PCB Assy** includes the processors, FPGA and memory to send data through the Power PC to the ColdFire for display on the LCD Display and to the external connectors.

The **RF Assy** consists of the RF Controller PCB Assy and the RF Converter PCB Assy. The RF Converter PCB Assy converts the 10.5 MHz TX IF to the 2 MHz to 1 GHz RF and from the 2 MHz to 1 GHz receiver input to the 13 MHz RX IF. The RF Converter PCB Assy also contains the VSWR coupler and associated circuitry and the Power Termination. The RF Controller PCB Assy provides the TCXO, LOs and digital circuitry necessary for software control and for tuning and level control.

CHAPTER 2 - OPERATING INSTRUCTIONS

2-1.   OPERATOR'S CONTROLS, INDICATORS AND CONNECTORS
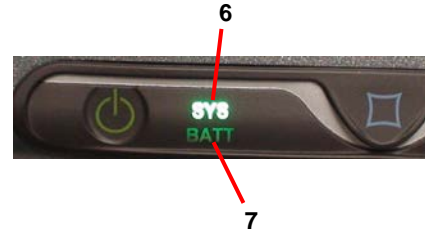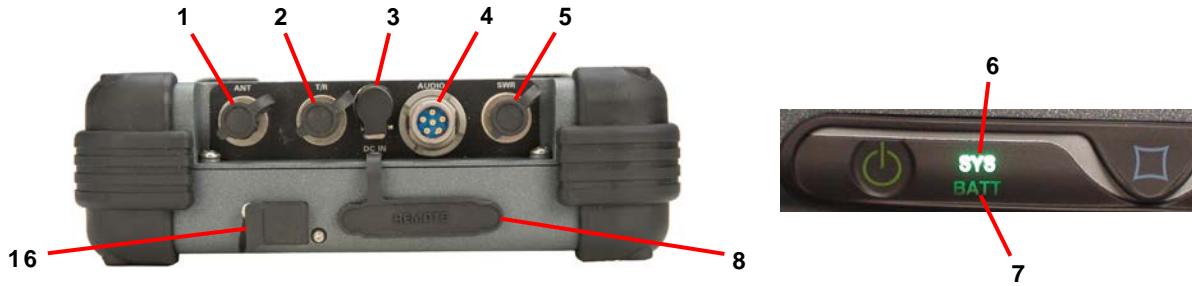
2-1. OPERATOR'S CONTROLS, INDICATORS AND CONNECTORS (cont)

1	ANT Connector	Used for over-the-air tests.
2	T/R Connector	Used for high power direct connection to radio equipment.
3	DC IN Connector	Used for External DC operation of the 3550 / 3550R or battery charging.
4	AUDIO Connector	Used for connection to the Handset (Microphone and Speaker).
5	SWR Connector	Used for measuring the VSWR of Antenna systems. Also used as a transmit signal output.
6	SYS Indicator	Illuminates when external DC power is applied. WHITE 3550 / 3550R is in "awake" mode. BLUE 3550 / 3550R is in "sleep" mode. RED 3550 / 3550R is shutting down.
7	BATT Indicator	Illuminates when external DC power is applied: GREEN Battery at Full Charge YELLOW Battery is Charging
8	REMOTE Connector	Used for communicating with external equipment.
9	Touch Screen Display	Used for viewing menus and screens and for providing manual input for data and settings.
10	DVM Connector	Provides DC coupled input for the Audio Level Meter and the Oscilloscope (Option) functions.
11	AUDIO IN Connector	Used to receive external modulation input, and as input for the SINAD and Distortion Meters and AF Counter.
12	AUDIO OUT Connector	Used as output for Demod and Function Generators and for Audio In signal output.
13	USB Connector	Allows allows connection of USB 1.1 devices (e.g. USB memory stick).
14	HOME Key	Provides access to a screen for the selection of optional system controls and settings.
15	POWER Key	Used for powering the 3550 / 3550R ON and OFF.
16	ETHERNET Connector	Used for software upgrades and/or Remote Operation.

2-2. FUNCTION TABS AND FUNCTION WINDOWS

Functions and Tiles - LMR

Generators	Receivers	Instruments
Generator	Receiver	Ch Analyzer
AF Gen	DCS Decode	Wide Analyzer
Modulation	DTMF Decode	Oscilloscope
	Digital Demod	Tracking Gen
	Digital Config	Digital Plots
	Digital Decode	Power Profile
	Analog Demod	Ant-Cable Test
	Analog Config	
	Tone Decode	
	Freq Select	

Meters	System	Utilities
RSSI	Language	Store/Recall
Modulation	Presets	Freq-Flex
Distortion	Options	
SINAD	Audio Config	Scripting
AF Counter	Cal	File Manager
Audio Level	System Config	Touch Util
RF Error	Freq Find	
RF Power	System Update	
Ext RF Power	Channel Plan	
Ext RF Config	Tone Config	
	Freq List	

(Optional Functions are shown for display purposes only.)

Functions and Tiles - PTC

| Generators | Receivers | Instruments |

| Meters | System | Utilities |

Generators	Receivers	Instruments
Generator	Receiver	Constellation
Modulation	Digital Demod	Ch Analyzer
	Digital Config	Wide Analyzer
	Freq Select	

Meters	System	Utilities
Ext RF Power	Language ▸	Store/Recall
Ext RF Config	Presets ▸	Freq-Flex
	Options	Scripting
	System Config	File Manager
	Freq Find	Touch Util
	System Update	

(Optional Functions are shown for display purposes only.)

2-2-1.   SCREEN ICONS

The System icons are displayed in three modes at the bottom of the screen.
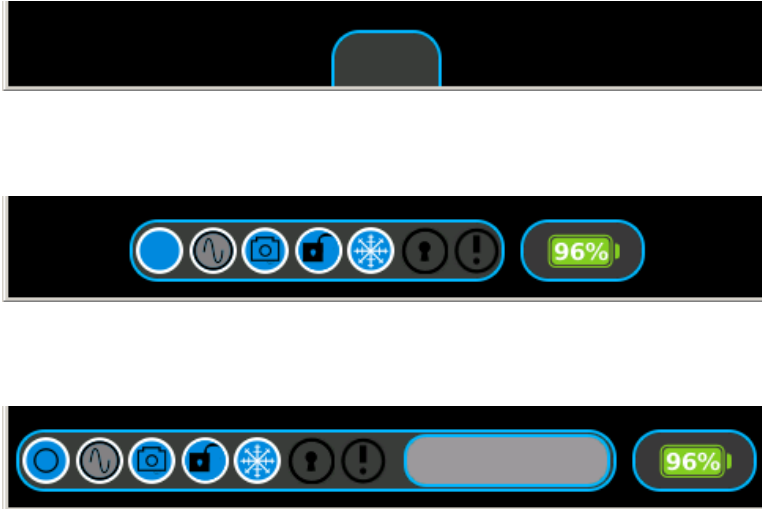
When the System icons are set to minimize mode (default setting), select the System icon tab to display the System icons.
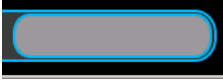
Press the Open/Close icon to display the System icons with input window.

Press the Open/Close icon again to display the System icons in minimize mode.

2-2-1.   SCREEN ICONS (cont)

ICON	FUNCTION
	Opens and closes the Status Bar.
	Applies the external reference (Freq-Flex) Calibration value (if calibrated).
	Opens the Snapshot Function Window.
	Indicates touch screen functions are locked or unlocked.
	Captures (freezes) the readings/traces on the screen.
	Indicates the Unit is controlled remotely.
	Indicates Warnings and Error Messages.
	Displays the level of charge remaining in the Battery.
	Status window.

2-2-1.   SCREEN ICONS (cont)

The Function Window icons are displayed at the bottom right of the Function Windows.

ICON	FUNCTION
	Switches between notepad and slider bar.
	Switches between active function windows on the screen.
	Closes the Function Window.
	Alternates between the different views (if applicable) of the Function Window.
	Alternates between the different views (if applicable) of the Function Window.

2-2-1. SCREEN ICONS (cont)

The Marker icons are displayed on the Function Windows.

ICON	FUNCTION
	Enables marker delta measurements for the first two enabled markers.
	Adds a Marker to the graph.
	Deletes an active marker from the Markers Window.
	Moves the selected marker to the highest point on signal.
	Moves the selected marker to the lowest point on signal.
	Moves the selected marker left to the next peak. Supports press and hold functionality.
	Moves the selected marker right to the next peak. Supports press and hold functionality.
	Moves the selected marker left to the next data point. Supports press and hold functionality.
	Moves the selected marker right to the next data point. Supports press and hold functionality.
	Moves the selected marker to the left side of the plot field.
	Moves the selected marker to the right side of the plot field.

2-2-2.   TOUCH SCREEN

A.   Touch Screen Use

(3550)

The 3550 contains a capacitive Touch Screen that is responsive to the touch of a human finger. The "touch" on the Touch Screen relies on the natural capacitance of the human body so no barriers to the skin (e.g. gloves) should be used.

If the 3550 is running on battery power only, the 3550 must be electrically grounded in order to allow the capacitance Touch Screen to function. Operators should keep both feet on the floor and one hand on the 3550 Case when using the Touch Screen.

(3550R)

The 3550R contains a resistive Touch Screen that is responsive to the touch of a human finger. Gloves can be worn when utilizing the Touch Screen or a writing instrument (e.g. stylus) can be used on the Touch Screen.

B.   User Interface (UI) Components

The Test Set UI is a touch screen control panel that provides a flexible working environment for all users. The UI is designed to allow users to open and close, drag and drop, and maximize/minimize screen components to create custom display configurations.

The Test Set UI is navigated locally using the Front Panel Touch Screen.

Launch Bar

The Launch Bar is a horizontal scrolling menu located at the top of the UI. The Launch Bar provides access to the Function Tabs.

The Launch Bar is opened and closed by touching or clicking on the light gray bar at the bottom of the menu.

The Launch Bar is moved from left to right by "dragging" the Launch Bar or by pressing the left or right arrows.

2-2-2.   TOUCH SCREEN (cont)

B.   User Interface (UI) Components (cont)

Function Tabs

The Launch Bar consists of Function Tabs that identify functions installed in the Test Set.

Pressing a Function Tab opens the Function Window on the UI or brings an opened Function Window to the forefront of the UI.

The Function Window displayed depends on the Options installed in the Test Set.

Function Windows

Function Windows provide visual access to the Test Set's operating parameters and measurement data.

Function Windows are opened by selecting the Function Tab on the Launch Bar. Function Windows are closed by selecting the Minimize icon at the bottom of the Function Window.
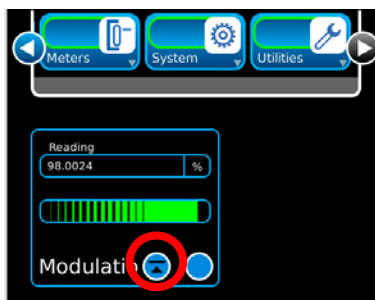
2-2-2. TOUCH SCREEN (cont)

B. User Interface (UI) Components (cont)

Function Windows (cont)

Function Windows can be displayed in multiple shapes (when applicable). Press the View icon to change the Function Window shape.
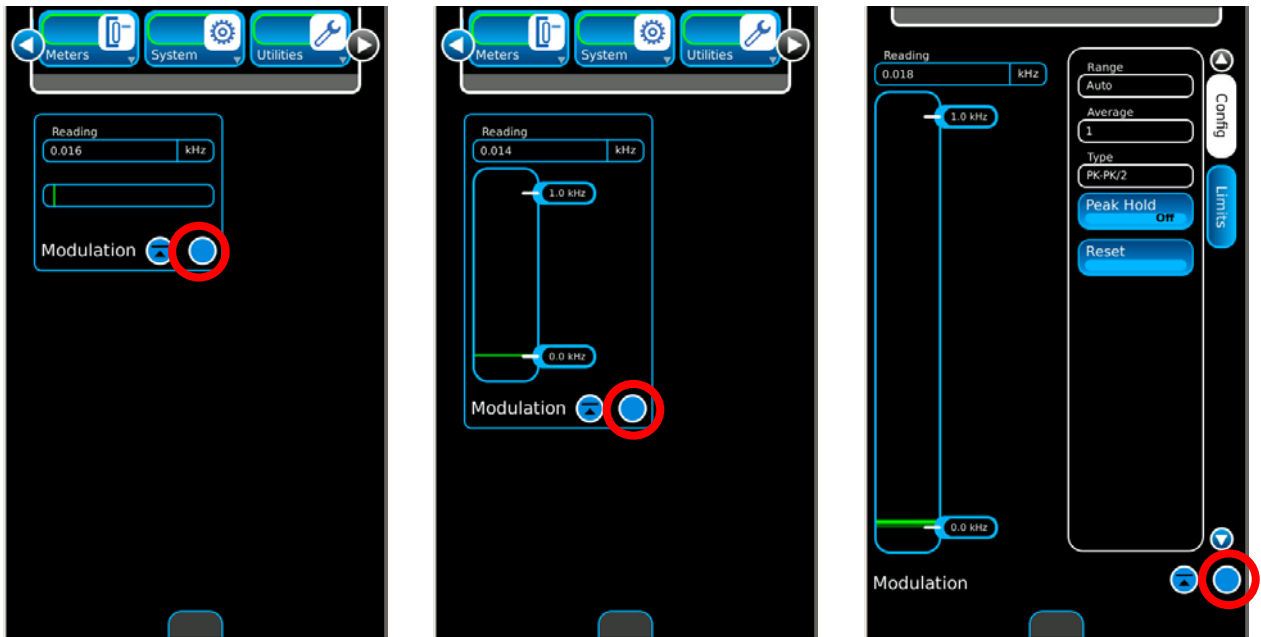
When a Function Window is maximized, the Function Window occupies the full display area and provides access to function parameters which may not be visible in other views.

Function Windows can be moved anywhere on the display area (except Full Screen view). To move a Function Window, touch or click on the Function Window's title block or background and drag the window to a new location on the display area.

Function Windows can be minimized to the Launch Bar where the function remains active but is not visible in the display area.

2-2-2.   TOUCH SCREEN (cont)

B.   User Interface (UI) Components (cont)

Function Windows (cont)

Multiple Function Windows can be displayed on the display area at any one time.

When an active Function Window is closed and reopened, the Test Set positions the Function Window in the last active state and position on the display area.

When multiple Function windows are active on the screen, the Function windows can be switched back and forth.
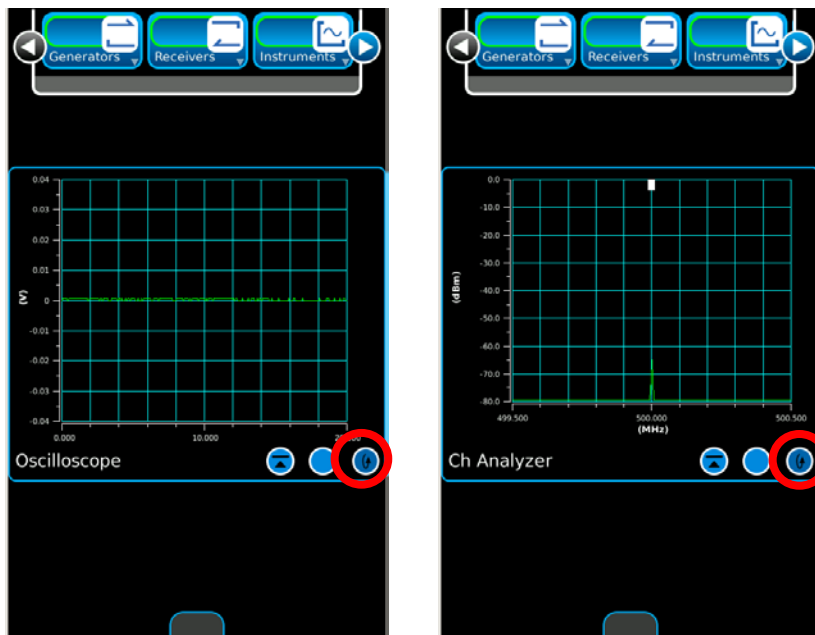
2-2-2. TOUCH SCREEN (cont)

B. User Interface (UI) Components (cont)

Numeric Keypad

When Numeric Data Fields are edited, the Numeric Keypad is displayed. The Numeric Keypad allows the user to enter a specific numeric value. A value is entered by pressing the numbers on the keypad. The value is then enabled by pressing the unit of measurement or the Enter Button on the Numeric Keypad. Press Cancel to void any un-entered changes and close the Numeric Entry Window. Pressing Cancel does not restore a changed value that has already been enabled (entered). Press Clear to reset a numeric value to zero. To reset an un-entered value to the previously defined value press Cancel. Press Backspace to delete the last number (to the right) in the numeric value.
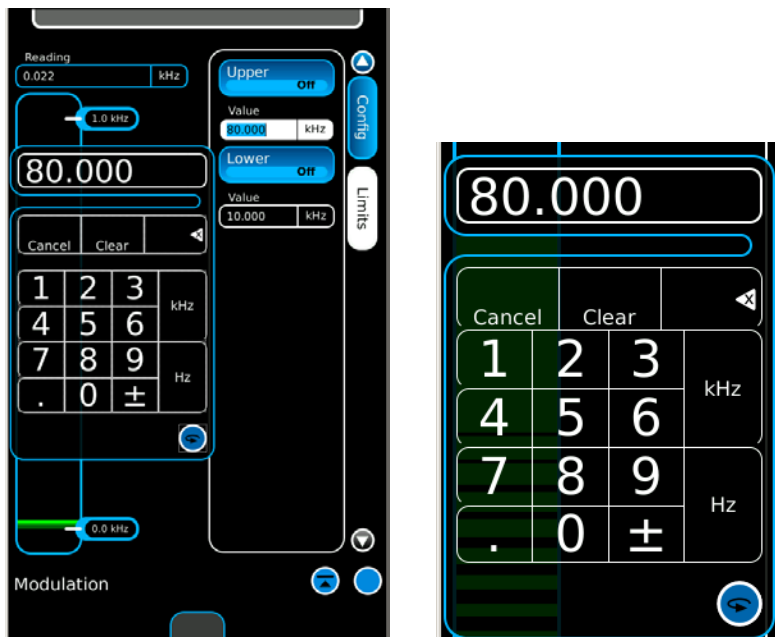
2-2-2.   TOUCH SCREEN (cont)

B.   User Interface (UI) Components (cont)

Slider Bar

The Slider Bar allows the user to select and change a defined range of values. The values to be changed are indicated by a bounding box (box with a white background). The position of the bounding box is controlled using the /10 and x10 keys to adjust the precision setting. Once the digit range is selected the value is increased or decreased using the Slider Bar or the Up and Down arrows. The Up (increase) and Down (decrease) arrows are used to adjust the last value selected in the bounding box. Values are active at the time the values are edited ("live" edits). Press Cancel to void any un-entered changes and close the Slider Bar. Pressing Cancel does not restore a changed value that is already enabled (entered). Press the Enter or Cancel Button to close the Slider Bar.
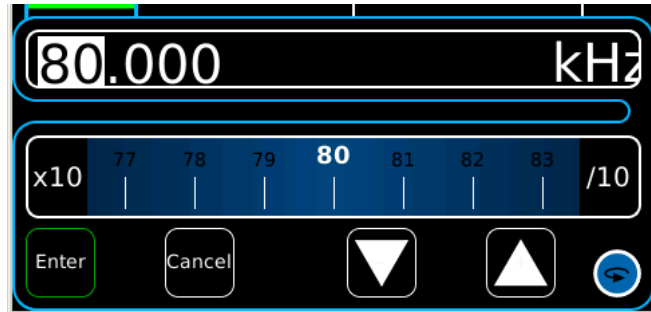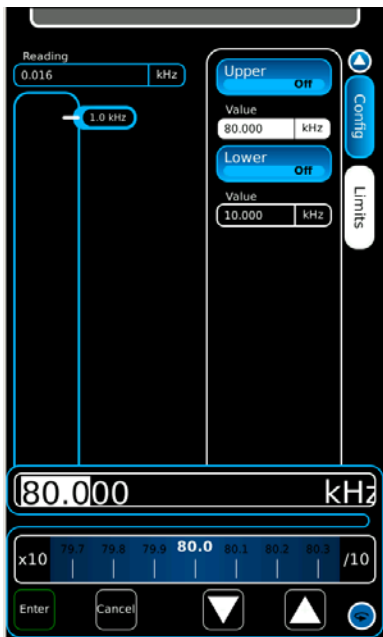
2-2-2.   TOUCH SCREEN (cont)

B.   User Interface (UI) Components (cont)

Keyboard

The Keyboard is displayed when a Text Data Field is selected for editing. The Keyboard functions similar to an external keyboard.
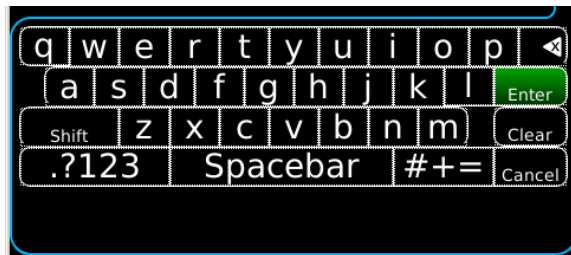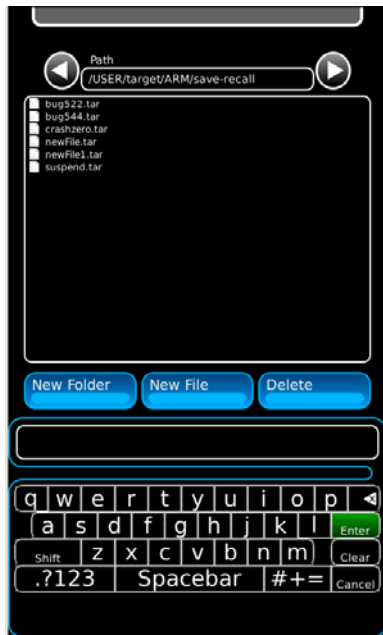
2-2-2.   TOUCH SCREEN (cont)

B.   User Interface (UI) Components (cont)

Message Windows

Message windows are displayed with information or to request user interaction.

WARNING: You are about to remove
your license which is required to
operate optional systems. Are you
sure you want to remove the
license?

No   Yes
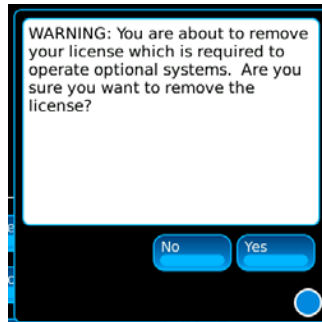
Locked Fields

An editable field updates to the Locked state when the Test Set experiences a condition which makes the field un-editable.

A locked field cannot be edited until the lock-out condition is resolved.

Frequency
500.000000   MHz

Level   Unit
-5   dBm

Ext Attenuation
0.00   dB

Port   PTT
SWR

Enable   Hold Atten
cked-On   Off

Generator
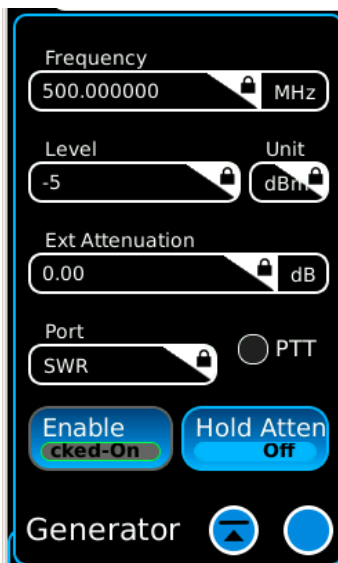
2-2-3.   SUSPEND (SLEEP) MODE

The 3550 / 3550R can be placed in "suspend (sleep)" mode which decreases battery usage and increases the amount of time the 3550 / 3550R can operate on battery power.

Follow these instructions to place the 3550 / 3550R into "suspend (sleep)" mode:

1.   With the 3550 / 3550R running in "active (awake)" mode (SYS Indicator is White), press the HOME Key to display the System Menu.

SYS Indicator   **HOME Key**
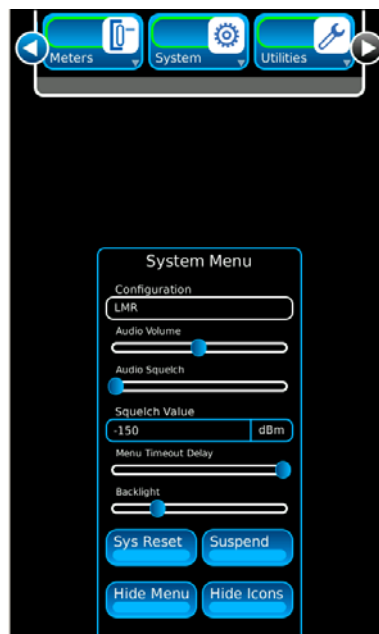
2-2-3.   SUSPEND (SLEEP) MODE (cont)

2.   Press the Suspend Button on the System Menu to place the 3550 / 3550R into "suspend (sleep)" mode (SYS Indicator is Blue).

The Touch Screen Display is blank and the internal RF hardware systems are shut OFF.

NOTE: The Digital Hardware systems retain active status and no information or screen settings are lost in "suspend (sleep)" mode.
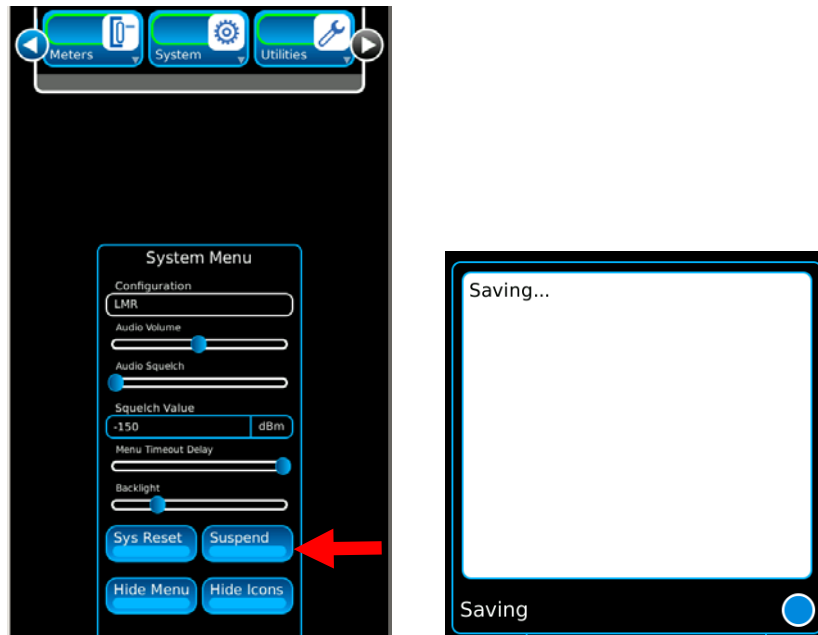
SYS Indicator

2-2-3.   SUSPEND (SLEEP) MODE (cont)

3.   When the 3550 / 3550R is in "suspend (sleep)" mode, press the HOME Key once to display the current time and battery life remaining. Press the HOME Key a second time to restore the system to "active (awake)" mode.
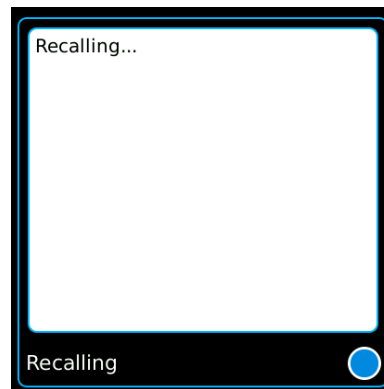
2-2-4. MULTI-LANGUAGE SUPPORT

The 3550 / 3550R can be configured to display the function tiles, tabs and windows in several different languages.

To change the 3550 / 3550R to a different language, select the System function tab. Select the Language drop down item and choose the desired language.
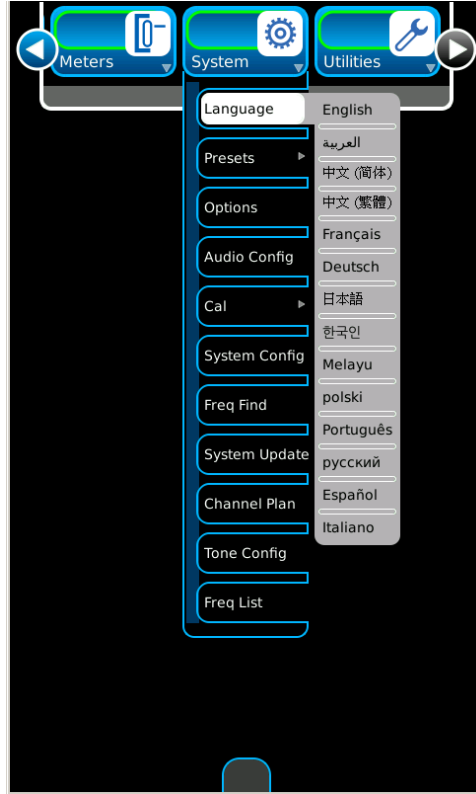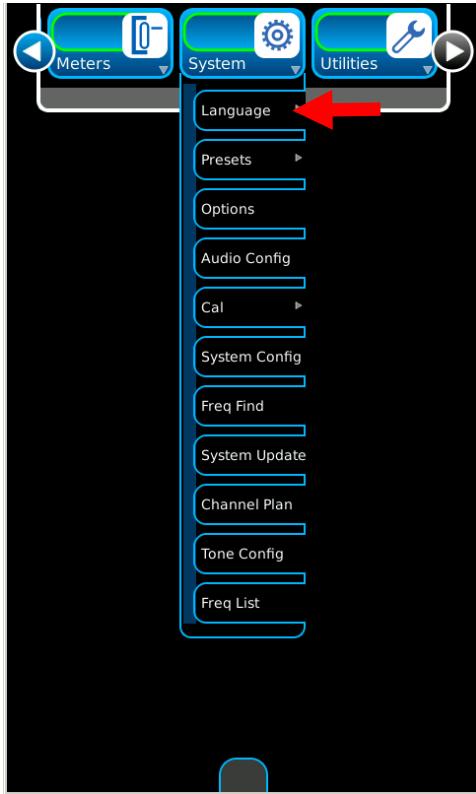
(Optional Languages are shown for display purposes only.)

2-2-4.   MULTI-LANGUAGE SUPPORT (cont)

EXAMPLE

English Language

Chinese (Simplified) Language
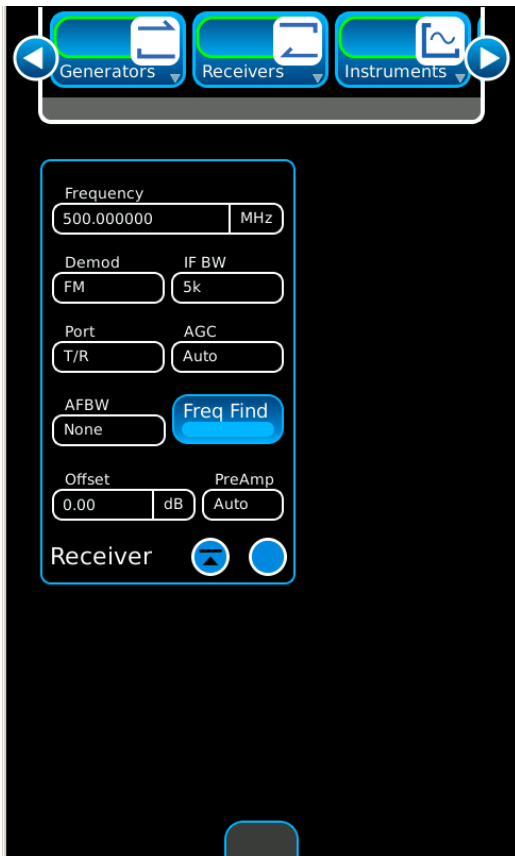
English Language

Chinese (Simplified) Language

2-3.   PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-3-1.   GENERAL

When doing any Preventive Maintenance or routine checks, keep in mind the WARNINGS and CAUTIONS about electrical shock and bodily harm.

2-3-2.   PREVENTIVE MAINTENANCE PROCEDURES

A.   Tools, Materials and Equipment Required

No tools or equipment are required for operator preventive maintenance. Cleaning materials required are a lint free cloth and mild liquid detergent.

B.   Routine Checks

Preventive Maintenance is limited to routine checks such as shown below:

- Cleaning
- Dusting
- Wiping
- Checking for frayed cables
- Storing items not in use
- Covering unused receptacles
- Checking for loose nuts, bolts or screws

C.   Schedule of Checks

Perform routine checks whenever required.

2-4. OPERATION UNDER USUAL CONDITIONS

2-4-1. TURN-ON PROCEDURE

Follow these instructions to initialize the 3550 / 3550R:

1. Press the POWER Key to initialize the 3550 / 3550R.
2. Verify the SYS Indicator illuminates.
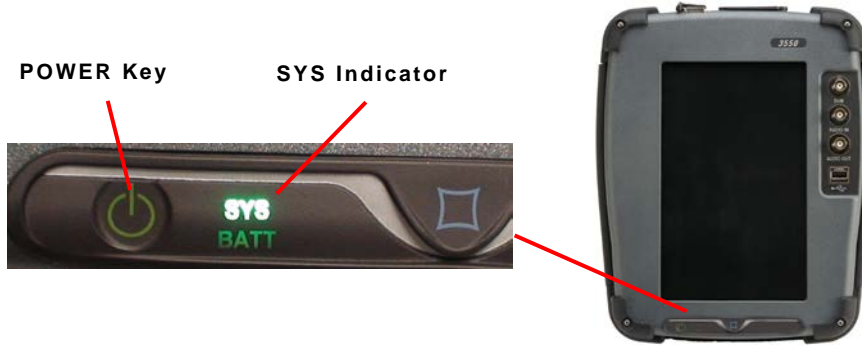
3. The Opening Screen is displayed. The operator can now choose the desired screen.

    NOTE: The 3550 / 3550R displays the last screen(s) accessed when the Unit was powered down.
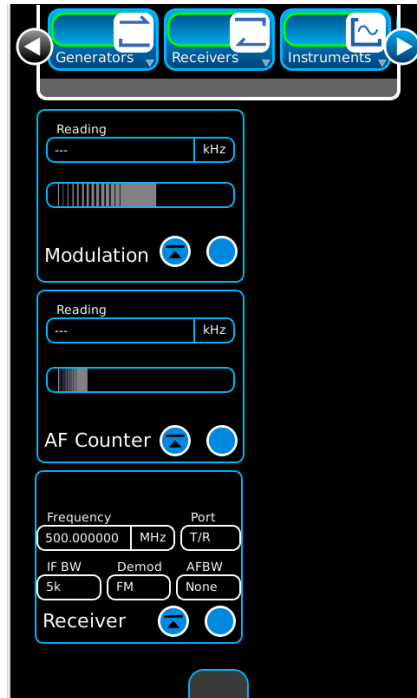
2-4-2.   INSTALL/REMOVE LICENSE

A License can be installed or removed from the 3550 / 3550R. The Options Function Window displays the Options installed in the Unit associated with the License.

Install License

Follow these instructions to install a License in the Unit:

1.   Select the System Function Tab to display the System Dropdown selections. Select "Options" to display the Options Function Window.
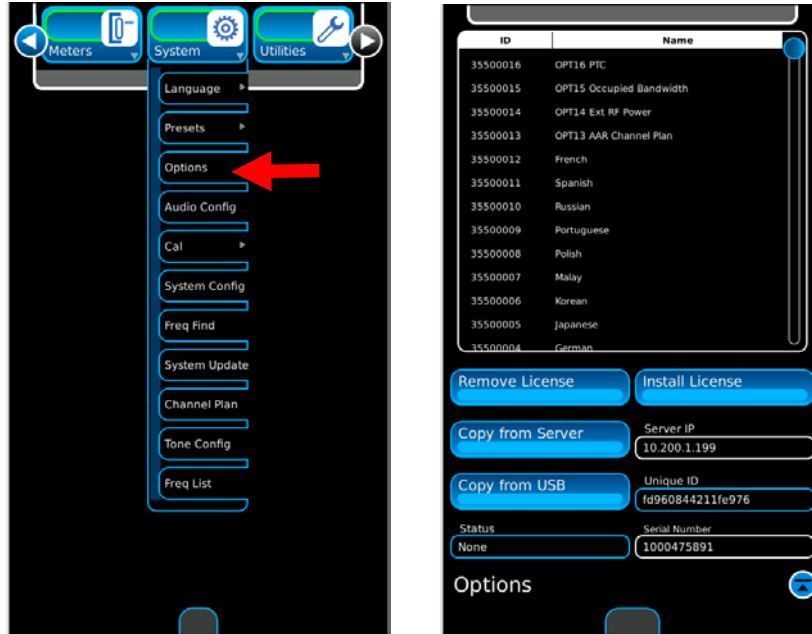
(Options are shown for display purposes only.)

2.   Verify the Unit displays a Serial Number. If the Serial Number field is blank, contact VIAVI Customer Service. This procedure can only be completed with a Serial Number installed in the Unit.
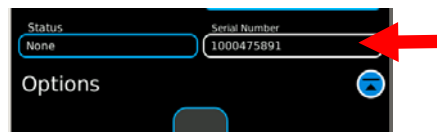
3.   Unzip the License file to the PC then copy the License file (options.new) to the following directory on a USB Flash Drive: Instrument\License.

4.   Install the USB Flash Drive in the USB Connector and wait for the Unit to recognize the USB Flash Drive (approximately 15 seconds).

5.   Select Copy from USB Button and verify the Status Field displays "Copying from USB Drive." When the copy process is completed, the Status Field displays "Copying from USB Done."

6.   Select Install License Button. When License file installation is complete, the Status File displays "Installing License Done."

7.   The Unit prompts to cycle power.

2-4-2.   INSTALL/REMOVE LICENSE (cont)

Remove License

Follow these instructions to remove the License from the Unit:

1.   Select the System Function Tab to display the System Dropdown selections. Select "Options" to display the Options Function Window.
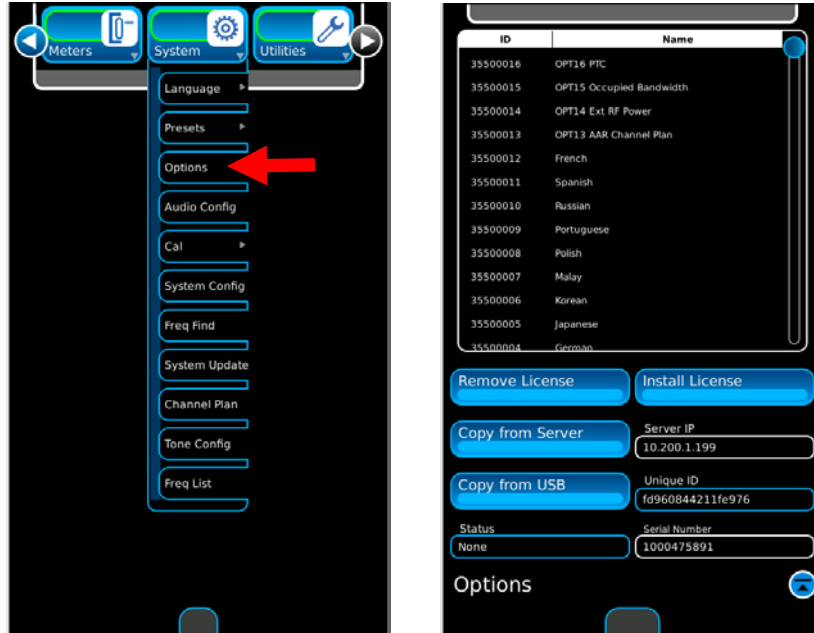
(Options are shown for display purposes only.)

2.   Select the Remove License button. The following prompt is displayed:
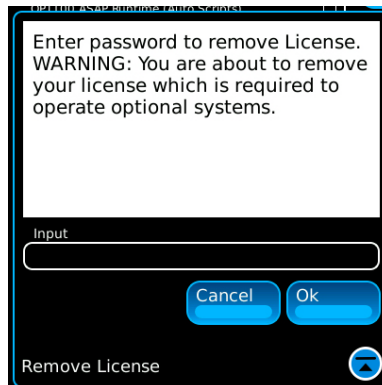
3.   Enter the password and select the OK Button to remove the License. Select the Cancel Button to cancel the License removal.

2-4-3.   INSTALL SOFTWARE

System Software can be installed in 3550 / 3550R. The System Update Function Window displays the System Software version installed in the Unit.

NOTE: When loading Software into the 3550 / 3550R, the Calibration Values are not affected.

Follow these instructions to install System Software in the Unit:

1.   Select the System Function Tab to display the System Dropdown selections. Select "System Update" to display the System Update Function Window.

2.   Using a PC, navigate to the VIAVI product website and download the zip file containing the System Software to the PC.

https://www.viavisolutions.com/en-us/products/3550r-touch-screen-radio-test-system#resources_software_downloads

3.   After removing all files from a USB Flash Drive, unzip the System Software files to the root directory of the USB Flash Drive.

4.   Confirm the "Instrument" folder is created in the root directory of the USB Flash Drive and the system rpm files are located under the "Instument/Common" directory on the USB Flash Drive.

5.   Plug in the USB Flash Drive in the USB Connector and wait for the Unit to recognize the USB Flash Drive (approximately 15 seconds).

2-4-3.   INSTALL SOFTWARE (cont)

6.   Select Copy from USB Button and verify Status Field displays "Copying Software" then "Refreshing List." Items are displayed on the RPM List.

7.   When the Status Field displays "Files are ready to install" select the Install Software Button. Select the OK Button to continue. Press the Cancel Button to abort the Software Load.

8.   When the Software load is completed, the Unit prompts to cycle power.

NOTE: Progress Bars are displayed showing the software installation progress
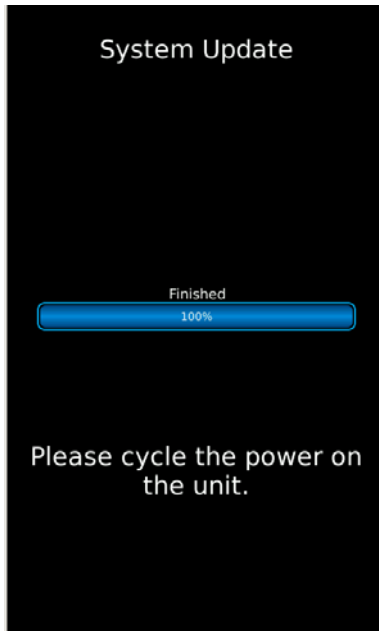
9.   Cycle power and repeat Steps 6 to 8 until all displayed items have been installed in the Unit.

2-4-4.   SAVE/RECALL FUNCTION WINDOWS

Save Function Window

Follow these instructions to save a Function Window in the Unit:

1.   Select the Utilities Function Tab to display the Utilities Dropdown selections. Select "Store/Recall" to display the Store/Recall Function Window.
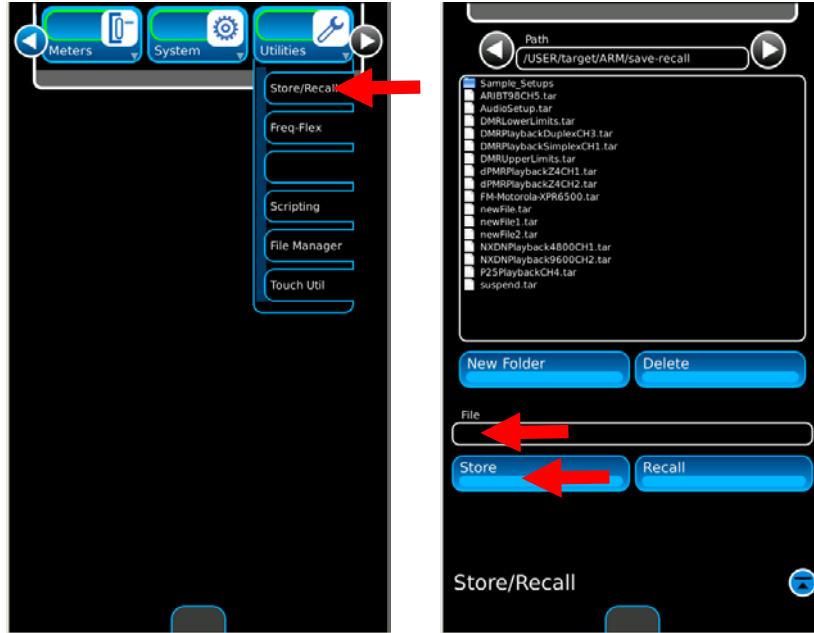
2.   Select the File Name field, use the Keyboard to select the file name and press Enter.

3.   Select the Store button.

NOTE: Up to 100 setups can be saved.

2-4-4. SAVE/RECALL FUNCTION WINDOWS (cont)

Recall Function Window

Follow these instructions to save a Function Window in the Unit:

1. Select the Utilities Function Tab to display the Utilities Dropdown selections. Select "Store/Recall" to display the Store/Recall Function Window.
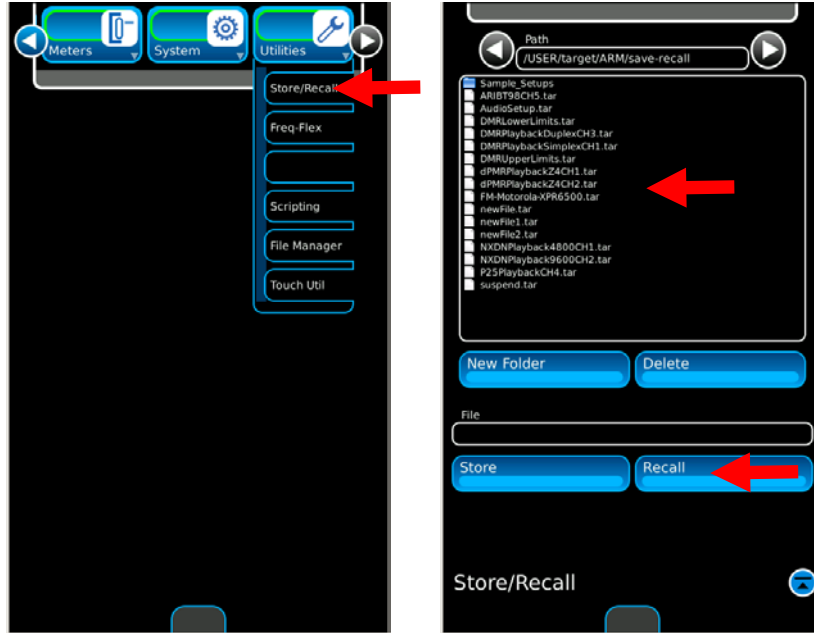
2. Highlight the file name in the displayed list and select the Recall Button.

2-4-5.   SNAPSHOT

Select the Snapshot Icon to display the Snapshot Function Window.

(File Names are shown for display purposes only.)

Save Snapshot

Select the Save button to save the Snapshot with the file name shown in the File field.
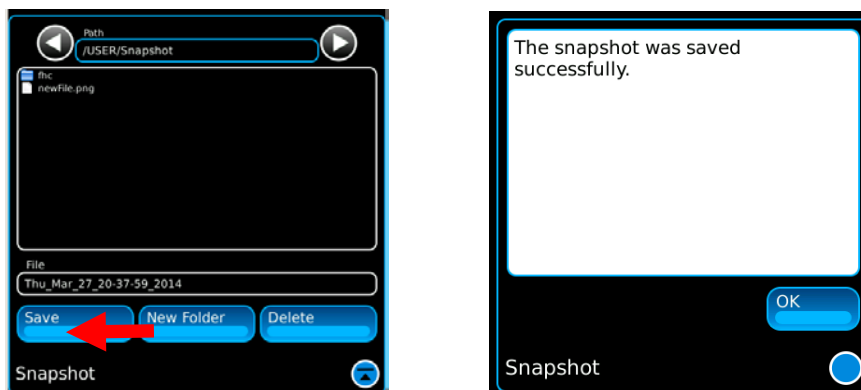
(File Names are shown for display purposes only.)

Press the OK button to save the file name.

2-4-5.   SNAPSHOT (cont)

Create New Folder

To create a new folder, select the New Folder button.
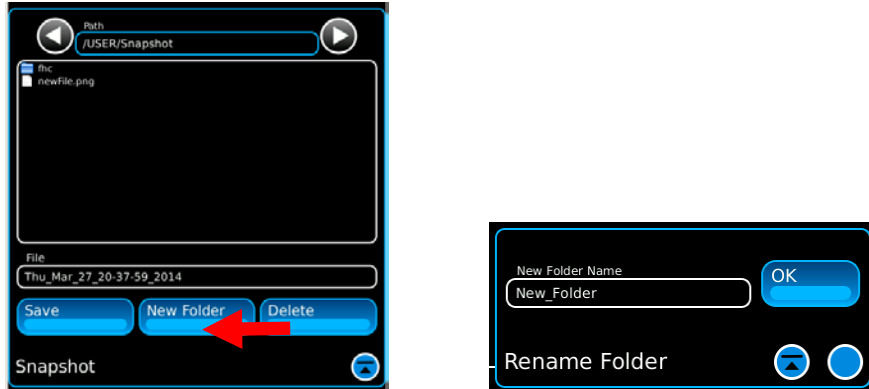
(File Names are shown for display purposes only.)

Select the New Folder Name field and use the Keyboard to select the folder name. Press the OK button to save the folder name.

Create New File

To create a new file name, select the File Name field, use the Keyboard to select the file name and press Enter.
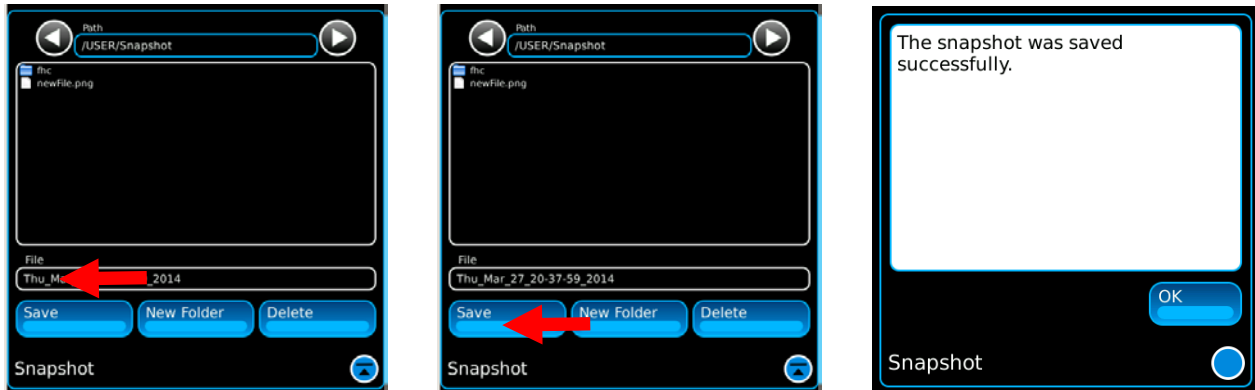
(File Names are shown for display purposes only.)

Select the Save button and press the OK button to save the file name.

2-4-5. SNAPSHOT (cont)

Delete File

To delete a file, use the Delete button.
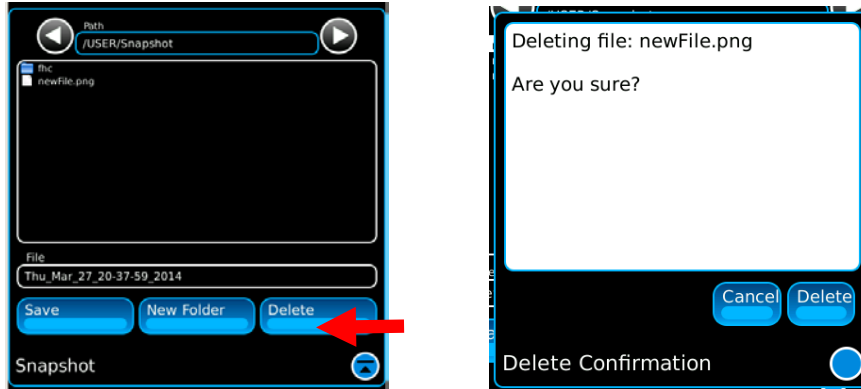
(File Names are shown for display purposes only.)

Select the file to be deleted (file name shown in the File field). Press the Delete button to display the Delete Confirmation Window. Press the Delete button to delete the file or the Cancel button to escape from the Delete action.

2-4-6.   CLONE UNIT

Follow these instructions to clone a Unit:

1. Connect Units to Network.

2. Select the System Function Tab to display the System Dropdown selections. Select "System Config" to display the System Config Function Window. Select the Clone Me Tab.

3. Enter the IP Address of the Base Unit into the Unit IP Field.

4. Enter the IP Address of the Target Unit into the Target IP Field.

5. Select the Screen Settings Clear and Copy Button to clear all saved screens in the Target Unit and copy the saved screens from the Base Unit to the Target Unit.

6. Select the Screen Settings Copy Button to copy the saved screens from the Base Unit to the Target Unit.

7. Select the Scripts Clear and Copy Button to clear all Scripts in the Target Unit and copy the Scripts from the Base Unit to the Target Unit.

8. Select the Scripts Copy Button to copy the Scripts from the Base Unit to the Target Unit.

2-4-7.   SYSTEM MENU

The System Menu contains field selections for the overall operation of the Test Set.
Press the HOME Key to display the System Menu.

HOME Key
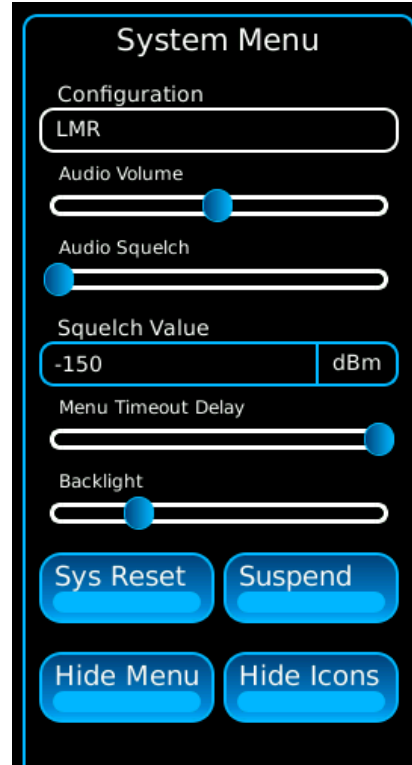
FIELD	DESCRIPTION
Configuration	Selects different systems.
Audio Volume	Volume control for speaker and headphones.
Audio Squelch	Adjusts Audio Squelch level.
Squelch Value	Selects Audio Squelch level display.
Menu Timeout Delay	Adjust for timeout on Launch Bar for Menu to remain displayed.
Backlight	Adjust for Backlight brightness.
System Reset	Resets Test Set to factory settings.
Suspend	Select to place Test Set in Suspend (Sleep) Mode.
Hide Menu	Launch Bar is not displayed on top of Touch Screen.
Hide Icons	Icons are not displayed on bottom of Touch Screen.

2-4-8   CONFIGURATION MODES

The Digital Radio Test System offers two configuration modes depending on the options purchased with the system. These modes include:

 LMR
 Advanced Digital
 PTC

LMR Configuration

The LMR configuration is the standard mode and offers access to analog, digital, Auto-Test and cable/antenna sweep testing. Analog tests include CW, AM, FM, DTMF, DCS, Two Tone Sequential, Tone Remote and Tone Sequential. Digital tests include P25 Phase 1, DMR, NXDN, dPMR, ARIB-T98 and PDR-C.

Advanced Digital Configuration

The Advanced Digital configuration provides access to advanced digital test modes. These modes include: P25 Phase 2 (HCPM and HDQPSK) and DMR Repeater (Sync). For simplicity, the Advanced Digital configuration also contains P25 Phase 1 and DMR test parameters, which allows users to provide complete P25 (Phase 1 and Phase 2) tests and DMR (mobile and repeater) tests from a single location.

PTC Configuration

PTC (Positive Train Control) testing is located under the PTC configuration.

Verifying Configuration

Press the Home Key to display the System Menu. The Configuration field displays the current configuration mode of the Unit.
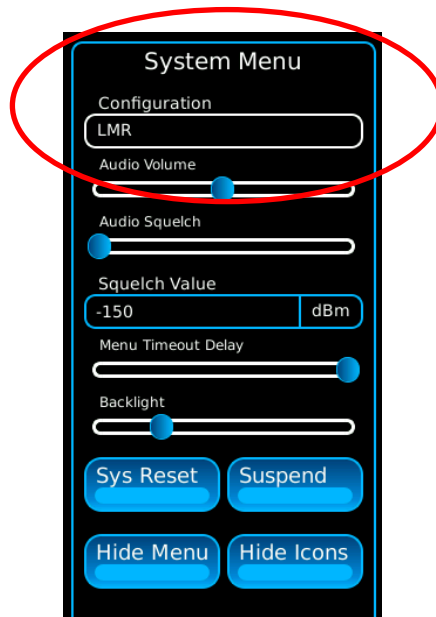
2-4-8   CONFIGURATION MODES (cont)

Selecting Configuration Modes

Press the Home Key to display the System Menu. Select the Configuration field to display a selection menu of configuration modes (LMR, PTC or Advanced Digital). Select the desired configuration mode to change the configuration mode of the Unit.
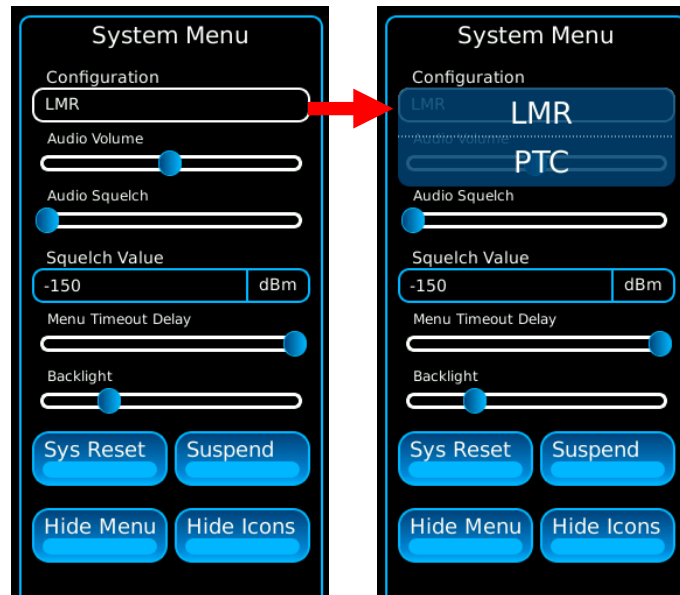
2-5.   OPERATING PROCEDURES

2-5-1.   INTRODUCTION

The 3550 / 3550R is intended to be used to determine that all external connections are in place on the vehicle radio installation and that the antenna is connected and matched to the transmitter.

When the 3550 / 3550R is used in conjunction with the BIT built into the UUT, the user is able to establish, with a 95% probability rate, that the installation is operational. If the UUT is not operational, the user can determine where the fault lies to such a level as to recommend corrective action (i.e., replace the antenna, return the radio for repair etc.).

2-5-2.   TYPICAL VEHICLE INSTALLATION TEST

1.   Connect the appropriate supplied Antenna to the 3550 / 3550R ANT Connector.

ANT Connector

2.   Connect the Handset to the 3550 / 3550R AUDIO Connector.

AUDIO Connector

3.   Select the Generators Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Screen.
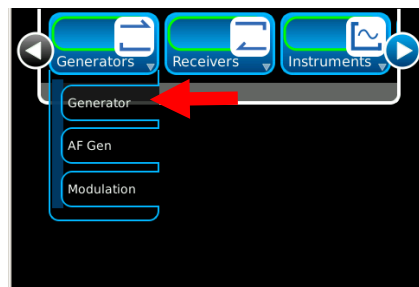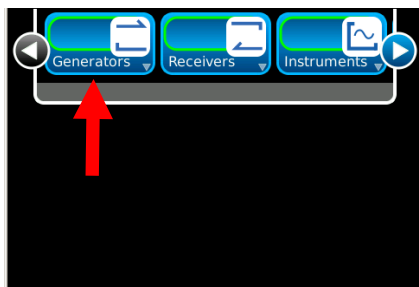
2-5-2. TYPICAL VEHICLE INSTALLATION TEST (cont)

4. Select the following settings:

Port	ANT
Frequency	Desired Frequency
Level	Desired Frequency Level
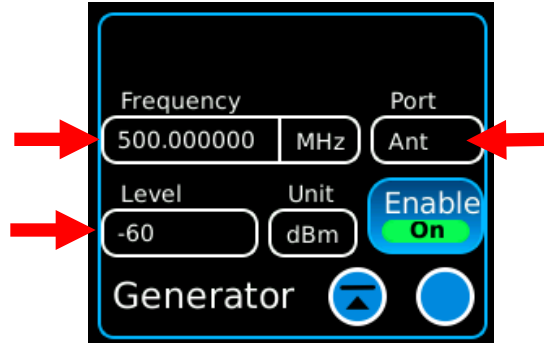
5. Select the Meters Tab to display the Meters Dropdown selections. Select "Modulation" to display the Modulation Meter Screen.
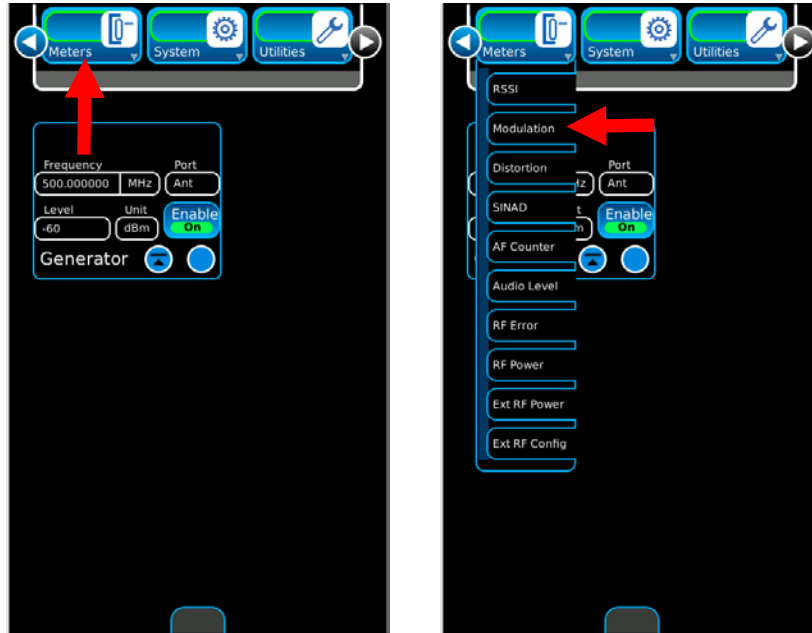
2-5-2.   TYPICAL VEHICLE INSTALLATION TEST (cont)

6.   Select the Meters Tab to display the Meters Dropdown selections. Select "RSSI" to display the RSSI Meter Screen.
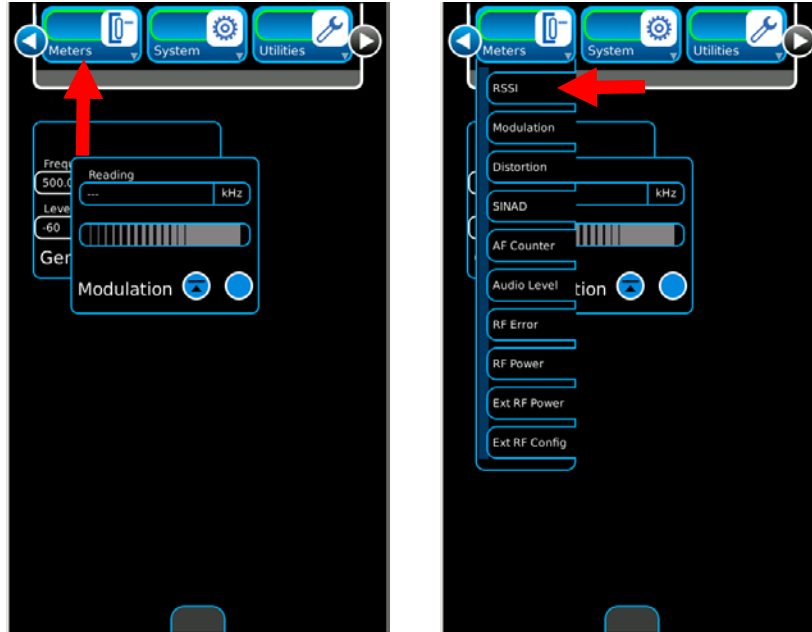
7.   Select the Meters Tab to display the Meters Dropdown selections. Select "RF Error" to display the RF Error Meter Screen.
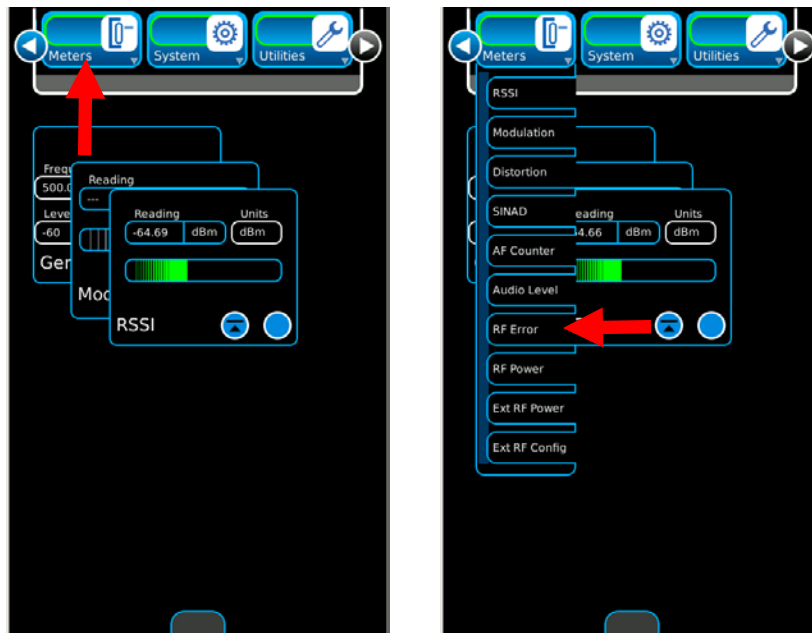
2-5-2.   TYPICAL VEHICLE INSTALLATION TEST (cont)

8.   Adjust the screen functions so all screen functions are visible.
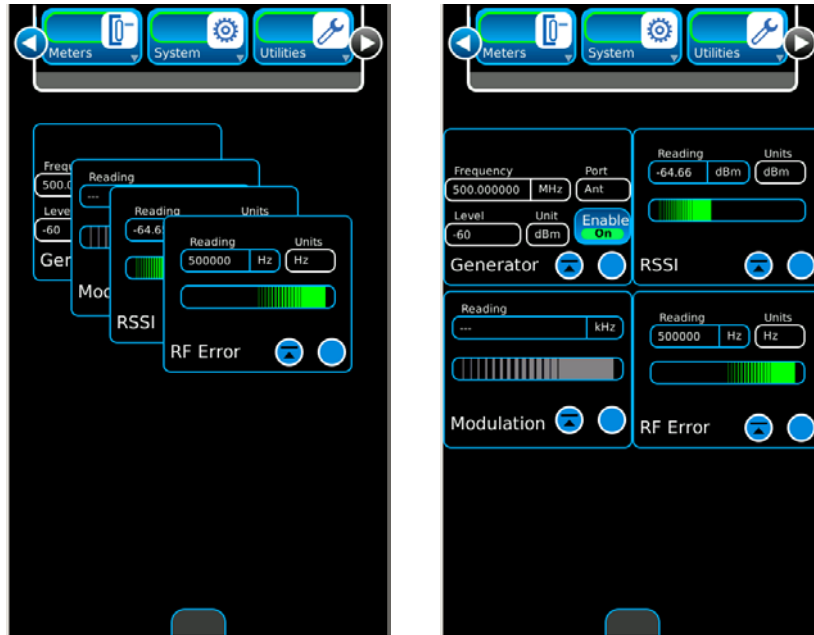
9.   Stand within 5 ft of the vehicle antenna.

10.   With a second operator in the vehicle, talk back and forth on several frequencies to determine that the radio is transmitting and receiving messages over the entire system.

Monitor field strength indicator for proper signal level.

Repeat this test at different locations around the antenna.

11.   If malfunction(s) occur in the testing process, check the Antenna under test first using SWR.

12.   If Antenna test is positive, troubleshoot malfunction(s) in Radio.

2-5-3.   ADVANCED VEHICLE INSTALLATION TESTING

1.   Connect the 3550 / 3550R T/R Connector to the Radio Antenna Port. If the Radio rated output power is >20 W, insert attenuator between the T/R Connector and the Radio Antenna port. Key the Radio and measure the Radio's forward output power, frequency and modulation.

2.   Unkey the Radio, select Receiver Test and set up the RF level so a 1 kHz tone can be heard in the Radio (add 150 Hz squelch tone if required). Select frequency and modulation.

3.   Measure sensitivity by reducing the RF level of the 3550 / 3550R until the audio signal can no longer be heard in the Radio. If a RF Power Amplifier is installed between the Radio and antenna, take a measurement between the RF Power Amplifier and the antenna (install the optional attenuator), then measure between the Radio and the RF Power Amplifier to determine if the Radio or the RF Power Amplifier is faulty.

4.   Connect the antenna to the 3550 / 3550R SWR Connector and measure VSWR. For installations with multiple bulkhead connections, repeat this test at each bulkhead to determine if a bad connection exists between the antenna and the Radio. The 3550 / 3550R SWR Connector needs to be calibrated the first time.

5.   Perform BIT (SELF TEST) on the Radio to detect radio faults not related to the RF output.

2-5-4. MEASURING SWR

1. Select the Instruments Tab to display the Instruments Dropdown selections. Select the Ant-Cable Test Dropdown selection to display the Ant-Cable Test Screen.
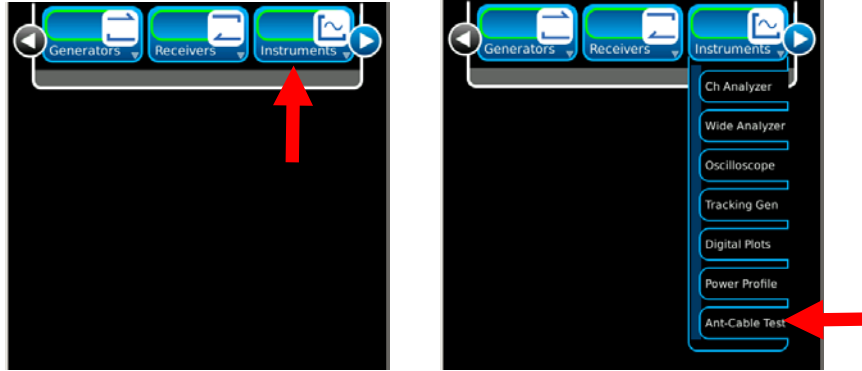
2. Select the following settings on the Control 1 Configuration Screen:

Type	SWR
Center Frequency	Desired Frequency
Span	Desired Frequency Span
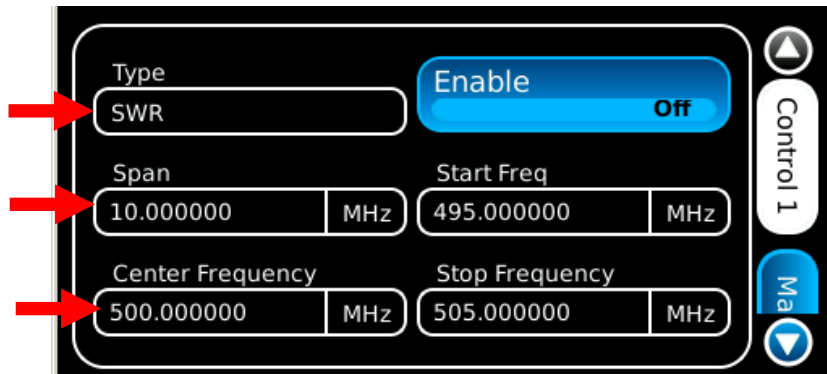
2-5-4. MEASURING SWR (cont)

3. Select the Calibration Button on the Control 2 Configuration Screen. Follow the instructions on the screen to complete the SWR Calibration. When SWR Calibration is completed ("Calibration Complete" displayed on screen), press the "OK" Key to return to the ANT-Cable Test Screen.

   NOTE: Calibration must be performed at the point the operator is connecting to the system under test:

   - If the supplied test cable is being used to connect to the system under test, calibration is to be performed at the end of the test cable. Test cable should not exceed four feet in length.

   - If the system under test cable is being connected directly to the 3550 / 3550R, then calibration is to be performed at the SWR Connector.

   NOTE: Once the SWR Connection is calibrated, the SWR Connector remains in the calibration state until the user changes the point of connection to the UUT. The ANT-Cable Test Screen displays the Date and Time of the last Calibration above the Graphical Display.

4. Connect the System Under Test to the SWR Connector at the point of calibration.

5. The Graphical Display is updated approximately every 20 seconds. Allow at least two updates of the Graphical Display to insure data is valid.

   NOTE: The 3550 / 3550R checks the electrical length of the load under test. If the frequency span selected is too wide, the 3550 / 3550R automatically adjusts the frequency span to insure an accurate measurement.

2-5-4.   MEASURING SWR (cont)

6.   Select the Markers Configuration Screen. With the data displayed on the Graphical Display, the Markers are used to determine the SWR at any point across the span. Select Marker Button to initiate a Marker.
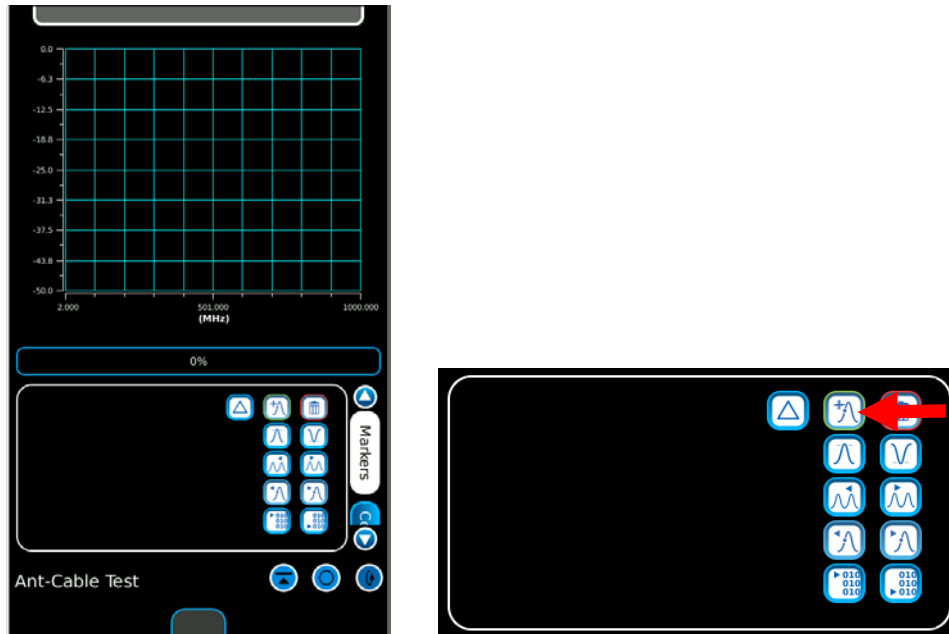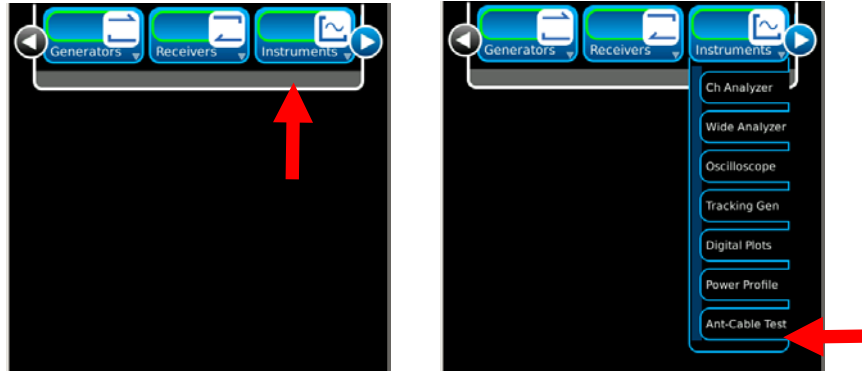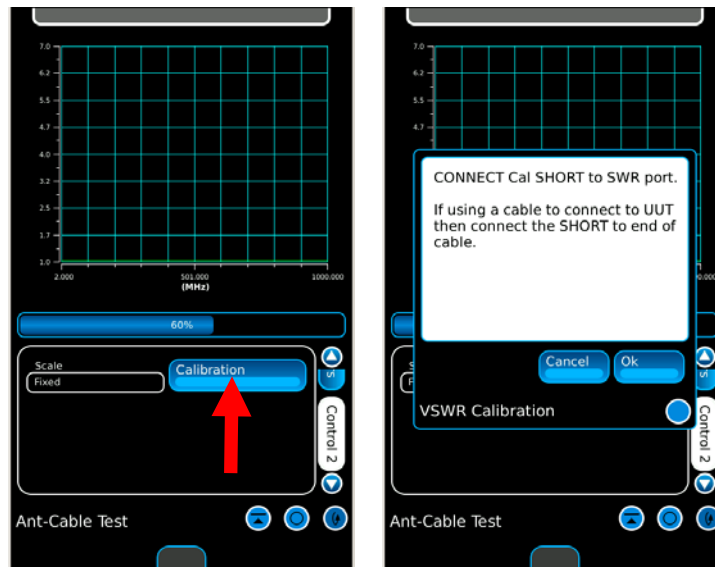

7.   Select and move the Marker to the desired location on the trace.

   NOTE: Up to three Markers may be placed on the Graphical Display at a time. Readings for each Marker, corresponding to the Marker position, are displayed with the Marker Buttons.
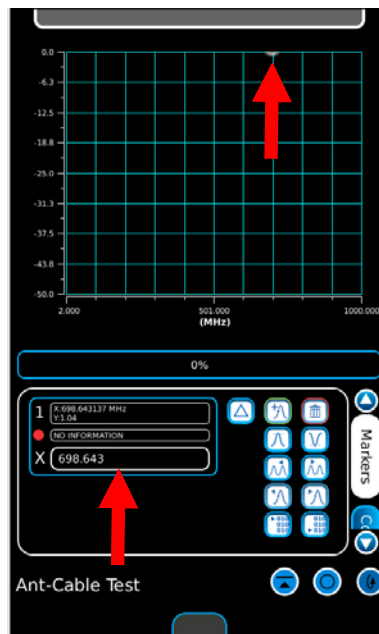
2-5-5. MEASURING DTF (Distance to Fault)

1. Select the Instruments Tab to display the Instruments Dropdown selections. Select the Ant-Cable Test Dropdown selection to display the Ant-Cable Test Screen.

2. Select the Calibration Button on the Control 2 Configuration Screen. Follow the instructions on the screen to complete the SWR Calibration. When SWR Calibration is completed ("Calibration Complete" displayed on screen), press the "Ok" Key to return to the ANT-Cable Test Screen.

   NOTE: Calibration must be performed at the point the operator is connecting to the system under test:

   - If the supplied test cable is being used to connect to the system under test, calibration is to be performed at the end of the test cable. Test cable should not exceed four feet in length.

   - If the system under test cable is being connected directly to the 3550 / 3550R, then calibration is to be performed at the SWR Connector.

   NOTE: Once the SWR Connection is calibrated, the SWR Connector remains in the calibration state until the user changes the point of connection to the UUT. The ANT-Cable Test Screen displays the Date and Time of the last Calibration above the Graphical Display.

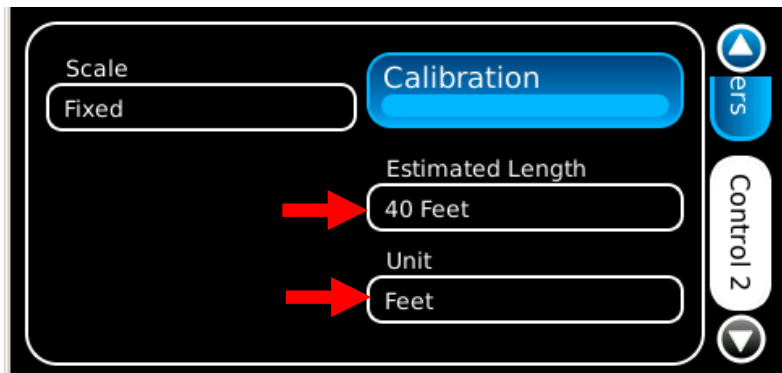## 2-5-5. MEASURING DTF (Distance to Fault) (cont)

3. Connect the System Under Test to the SWR Connector at the point of calibration.

4. The Graphical Display is updated approximately every 20 seconds. Allow at least two updates of the Graphical Display to ensure data is valid.

5. Select the following settings on the Control 1 Configuration Screen:

   Type   DTF

   Y Unit   dB

6. Select the following settings on the Control 2 Configuration Screen:

   Unit   Feet or Meters

   Estimated Length   Total Cable Length of System Under Test plus 15%

2-5-5. MEASURING DTF (Distance to Fault) (cont)

7. Select the following settings on the Cable Configuration Screen:

        Velocity   Velocity Factor of the Cable

        Loss   Cable Loss per 100 ft.

8. Select Store Cable or Recall Cable on the Cable Configuration Screen to store a Cable or select a Cable from the dropdown list.

9. Connect the System Under Test to the SWR Connector at the point of calibration.

10. The Graphical Display is updated approximately every 20 seconds. Allow at least two updates of the Graphical Display to ensure data is valid.

2-5-5.   MEASURING DTF (Distance to Fault) (cont)

11.   Select the Markers Configuration Screen. With the data displayed on the Graphical Display,
the Markers are used to determine the SWR at any point across the span. Select Marker
Button to initiate a Marker.
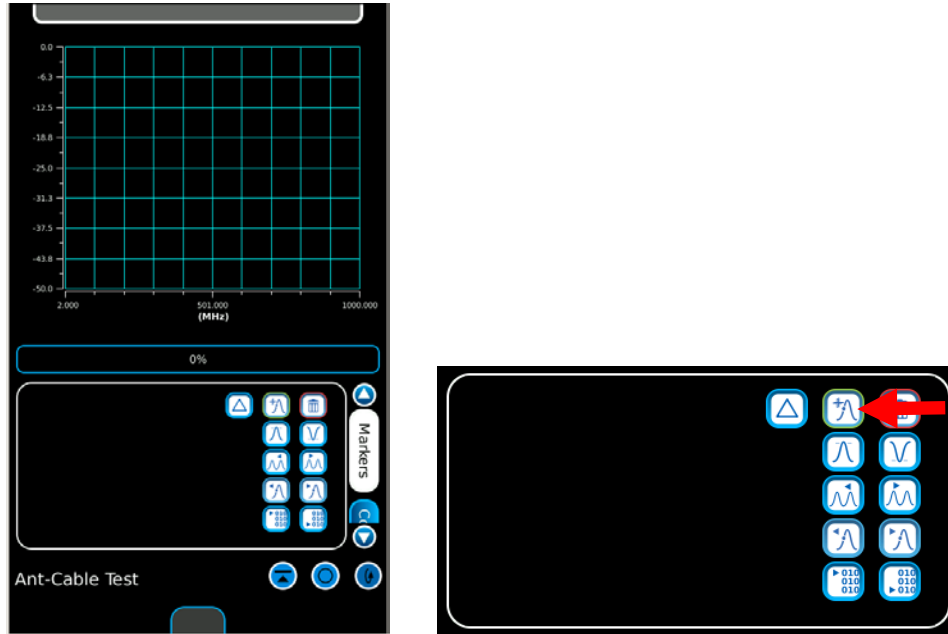
12.   Select and move the Marker to the desired location on the trace.

   NOTE: Up to three Markers may be placed on the Graphical Display at a time. Readings
for each Marker, corresponding to the Marker position, are displayed with the
Marker Buttons.
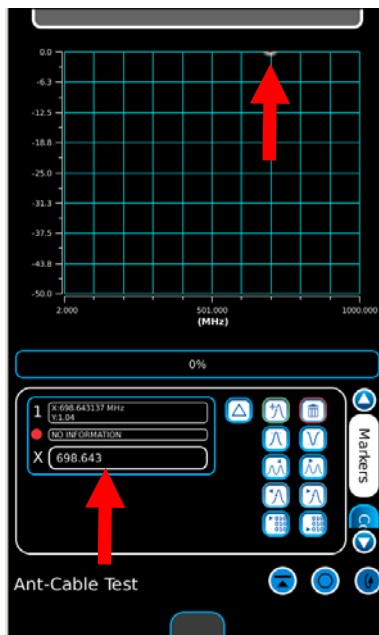
CHAPTER 3 - OPERATOR MAINTENANCE

3-1.   SERVICE UPON RECEIPT

3-1-1.   SERVICE UPON RECEIPT OF MATERIAL

A.   Unpacking

Use the following steps for unpacking the 3550 / 3550R.

- Cut and remove the sealing tape on top of the shipping container.
- Open the shipping container and remove the Transit Case.
- Place the Transit Case on a clean and dry surface.
- Open the Transit Case to inspect contents.
- Store the shipping carton for future use should the 3550 / 3550R need to be returned.

B.   Checking Unpacked Equipment

Check the equipment for damage incurred during shipment. If the equipment has been damaged or if items seem to be absent from the shipment, report the damage and/or discrepancies to VIAVI Customer Service.

CONTACT: VIAVI

Telephone: (800) 835-2350 (U.S. only)
                     (316) 522-4981
FAX: (316) 524-2623
E-Mail: *AvComm.Service@viavisolutions.com*
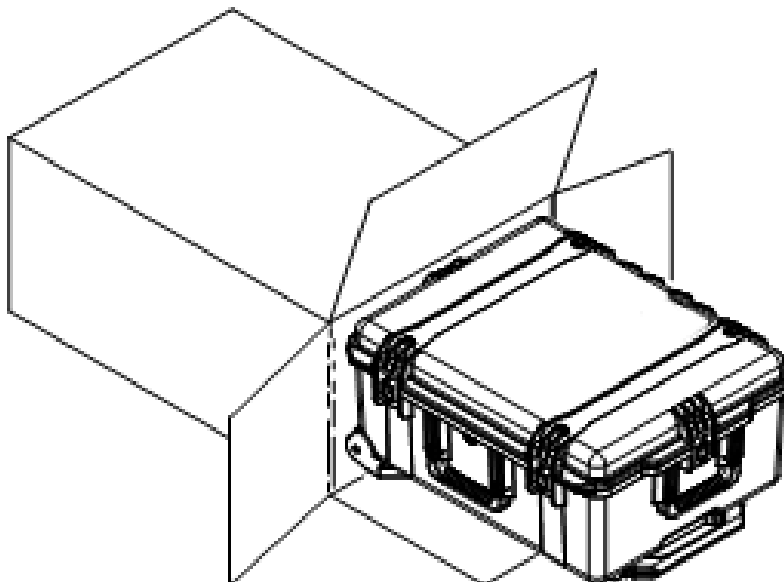
3-1-2.   PRELIMINARY SERVICING AND ADJUSTMENT OF EQUIPMENT

1.   Remove the 3550 / 3550R from the Transit Case or Soft Carrying Case (Option).

2.   Perform the Turn-On Procedure (para 2-4-1).

BATTERY PRECAUTIONS

The 3550 / 3550R is powered by an internal Lithium Ion battery pack. The 3550 / 3550R is supplied with an external DC Power Supply that enables the operator to recharge the battery when connected to AC power. The 3550 / 3550R can operate continuously on AC power via the DC Power Supply, for servicing and/or bench tests.

The internal battery is equipped to power the 3550 / 3550R for 4.5 hours of continuous use, after which time, the 3550 / 3550R battery needs recharging. When the POWER Indicator is GREEN, the battery is at >25% capacity. When the POWER Indicator is YELLOW, the battery is at <25% capacity.

If the battery level, shown in the BAT Field on most Test Screens, drops to 10 (10%), the 3550 / 3550R powers down automatically.

The battery charger operates whenever the supplied External DC Power Supply or a suitable (11 to 32 Vdc) DC Power source is applied to the 3550 / 3550R. When charging, the battery reaches a 100% charge in approximately four hours (Unit OFF) / eight hours (Unit ON). The internal battery charger allows the battery to charge between a temperature range of 0° to 45°C. The 3550 / 3550R can operate, connected to an external DC source, outside the battery charging temperature range (0° to 45°C). Allow 20 minutes for the battery to charge when turning the 3550 / 3550R ON from a dead battery condition.

The battery should be charged every three months (minimum) or disconnected for long term inactive storage periods of more than six months. The Battery must be removed when conditions surrounding the 3550 / 3550R are <-20°C and >60°C).

3-2.   TROUBLESHOOTING

Troubleshooting is divided into a Symptom Index and a Troubleshooting Table.

The Troubleshooting Table lists the common malfunctions which may occur during operation of the 3550 / 3550R. Perform the tests/inspections and corrective actions in the order listed.

NOTE

- This manual cannot list all the malfunctions that may occur, nor all the tests or inspections and corrective actions.

- If a malfunction is not listed or is not corrected by the listed corrective actions, route the 3550 / 3550R to an authorized Maintenance Facility for repair.

SYMPTOM	DESCRIPTION	PAGE
1	External DC Power Supply failure	3-5
2	SYS Indicator does not illuminate	3-5
3	BATT Indicator does not illuminate	3-6
4	Blows Fuse	3-6
5	Battery does not charge	3-7
6	Display is blank or abnormality exists in Display	3-7
7	Keys inoperable	3-7
8	Connector failure	3-7

TROUBLESHOOTING TABLE

NOTE

The Troubleshooting Table lists common malfunctions found during normal operation of the 3550 / 3550R. The tests or inspections and corrective actions should be performed in the order listed. Failure to do so may result in troubleshooting recommendations that replace working items.

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

---

1   External DC Power Supply failure

Step 1.   Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit.

◆   If incorrect, replace the External DC Power Supply.

Step 2.   Using a DMM on the External DC Power Supply output, verify 11 to 32 Vdc (±2 Vdc).

◆   If incorrect, replace the External DC Power Supply.

---

2   SYS Indicator does not illuminate

Step 1.   Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit.

◆   If incorrect, replace the External DC Power Supply.

Step 2.   Using a DMM on the External DC Power Supply output, verify 11 to 32 Vdc (±2 Vdc).

◆   If incorrect, replace the External DC Power Supply.

Step 3.   Verify the Battery is installed.

◆   If incorrect, install the Battery (para 3-3-2).

Step 4.   Verify the Fuse is not blown.

◆   If incorrect, replace the Fuse (para 3-3-3).

Step 5.   Remove any external power sources from the 3550 / 3550R. Using a DMM, verify 11.1 Vdc Nominal at the Battery Connector (Red wire).

◆   If incorrect, replace the Battery (para 3-3-2).

Step 6.   Connect the External DC Power Supply to the 3550 / 3550R. Using a DMM, verify 12.6 Vdc at the Battery Connector (Red wire).

◆   If incorrect, refer to Troubleshooting in the 3550 / 3550R Maintenance Manual.

◆   Contact VIAVI Customer Service.

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
        TEST OR INSPECTION
                CORRECTIVE ACTION

---

3   BATT Indicator does not illuminate

    Step 1.   Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit.

        ◆   If incorrect, replace the External DC Power Supply.

    Step 2.   Using a DMM on the External DC Power Supply output, verify 11 to 32 Vdc ($\pm$2 Vdc).

        ◆   If incorrect, replace the External DC Power Supply.

    Step 3.   Verify the Battery is installed.

        ◆   If incorrect, install the Battery (para 3-3-2).

    Step 4.   Verify the Fuse is not blown.

        ◆   If incorrect, replace the Fuse (para 3-3-3).

    Step 5.   Remove any external power sources from the 3550 / 3550R. Using a DMM, verify 11.1 Vdc Nominal at the Battery Connector (Red wire).

        ◆   If incorrect, replace the Battery (para 3-3-2).

    Step 6.   Connect the External DC Power Supply to the 3550 / 3550R. Using a DMM, verify 12.6 Vdc at the Battery Connector (Red wire).

        ◆   If incorrect, refer to Troubleshooting in the 3550 / 3550R Maintenance Manual.

        ◆   Contact VIAVI Customer Service.

---

4   Blows Fuse

    Step 1.   Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit.

        ◆   If incorrect, replace the External DC Power Supply.

    Step 2.   Using a DMM on the External DC Power Supply output, verify 11 to 32 Vdc ($\pm$2 Vdc).

        ◆   If incorrect, replace the External DC Power Supply.

    Step 3.   Replace the Fuse (para 3-3-3).

        ◆   If the Fuse continues to blow, refer to Troubleshooting in the 3550 / 3550R Maintenance Manual.

        ◆   Contact VIAVI Customer Service.

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

5   **Battery does not charge**

        Step 1.   Connect the External DC Power Supply to the 3550 / 3550R and verify the BATT Indicator is Green or Yellow.

            ◆   If incorrect, replace the Battery (para 3-3-2).

        Step 2.   Allow four hours (Unit OFF) / eight hours (Unit ON) for Battery to fully charge and verify the BATT Indicator is Green.

            ◆   If incorrect, replace the Battery (para 3-3-2).

6   **Display is blank or abnormality exists in Display**

        Step 1.   Press the POWER Key.

        Step 2.   Check and/or adjust Contrast and Backlight levels.

            Refer to Troubleshooting in the 3550 / 3550R Maintenance Manual.

            Contact VIAVI Customer Service.

7   **Keys inoperable**

            Refer to Troubleshooting in the 3550 / 3550R Maintenance Manual.

            Contact VIAVI Customer Service.

8   **Connector failure**

        Inspect connector for damage and/or wear.

            Refer to Troubleshooting in the 3550 / 3550R Maintenance Manual.

            Contact VIAVI Customer Service.

3-3. MAINTENANCE PROCEDURES

3-3-1. BATTERY RECHARGING

The battery charger operates whenever the supplied External DC Power Supply or a suitable (11 to 32 Vdc) DC Power source is applied to the 3550 / 3550R. When charging, the battery reaches a 100% charge in approximately four hours (Unit OFF) / eight hours (Unit ON). The internal battery charger allows the battery to charge between a temperature range of 0° to 45°C. The 3550 / 3550R can operate, connected to an external DC source, outside the battery charging temperature range (0° to 45°C). Allow 20 minutes for the battery to charge when turning the 3550 / 3550R ON from a dead battery condition.

The Battery should be charged every three months (minimum) or disconnected for long term inactive storage periods of more than six months. The Battery must be removed when conditions surrounding the 3550 / 3550R are <-20°C or >60°C).

DESCRIPTION

This procedure is used to recharge the Battery in 3550 / 3550R with an External DC Power Supply.

WARNING

Do not recharge the Lithium Ion Battery Pack outside the 3550 / 3550R.

1.   Connect the External DC Power Supply to the DC IN Connector on the 3550 / 3550R.

2.   Connect the AC Power Cable to the AC PWR Connector on the External DC Power Supply and an appropriate AC power source.

3.   Verify the BATT Indicator is YELLOW.

3-3-1.   BATTERY RECHARGING (cont)

4.   Allow four hours (Unit OFF) / eight hours (Unit ON) for Battery charge or until the BATT Indicator is GREEN.

If the BATT Indicator is YELLOW and/or the Battery fails to accept a charge and the 3550 / 3550R does not operate on Battery power, refer to Troubleshooting (para 3-2).

3-3-2.   BATTERY REPLACEMENT

DESCRIPTION

This procedure is used to replace the Battery in the 3550 / 3550R.

⚠ CAUTION

REPLACE ONLY WITH THE BATTERY SPECIFIED. DO NOT ATTEMPT TO INSTALL A NON-RECHARGEABLE BATTERY.

WARNING

- **DISPOSE OF THE LITHIUM ION BATTERY PACK ACCORDING TO LOCAL STANDARD SAFETY PROCEDURES. DO NOT CRUSH, INCINERATE OR DISPOSE OF THE LITHIUM ION BATTERY PACK IN NORMAL WASTE.**

- **DO NOT SHORT CIRCUIT OR FORCE DISCHARGE OF THE LITHIUM ION BATTERY PACK AS THIS MIGHT CAUSE THE LITHIUM ION BATTERY PACK TO VENT, OVERHEAT OR EXPLODE.**

REMOVE

1.   Fully loosen the captive screws (on each side of the bumper) in the two lower bumpers and remove the bumpers from the 3550 / 3550R.

2.   Fully loosen five captive screws holding the Battery Cover to the 3550 / 3550R and remove the Battery Cover from the 3550 / 3550R.

3-3-2.   BATTERY REPLACEMENT (cont)

REMOVE (cont)

3.   Disconnect the Battery Wire Harness and remove the Battery from the 3550 / 3550R.

INSTALL

1.   Install the Battery in the 3550 / 3550R and connect the Battery Wire Harness.

2.   Install the Battery Cover on the 3550 / 3550R and tighten five captive screws (8 in/lbs.).

3-3-2. BATTERY REPLACEMENT (cont)

INSTALL (cont)

3. Install the two lower bumpers on the 3550 / 3550R and tighten the captive screws (on each side of the bumpers) (8 in/lbs.).

3-3-3.   FUSE REPLACEMENT

DESCRIPTION

This procedure is used to replace the internal fuse in the 3550 / 3550R.

CAUTION

FOR CONTINUOUS PROTECTION AGAINST FIRE, REPLACE ONLY WITH
FUSES OF THE SPECIFIED VOLTAGE AND CURRENT RATINGS. (5 A,
32 VDC, TYPE F - MINI BLADE FUSE)

REMOVE

1.   Fully loosen the captive screws (on each side of the bumper) in the two lower bumpers and remove the bumpers from the 3550 / 3550R.

2.   Fully loosen five captive screws holding the Battery Cover to the 3550 / 3550R and remove the Battery Cover from the 3550 / 3550R.
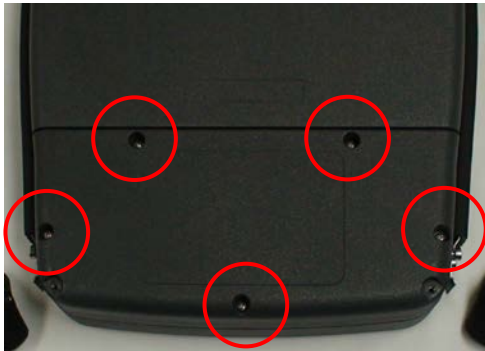
3-3-3.   FUSE REPLACEMENT (cont)

REMOVE (cont)

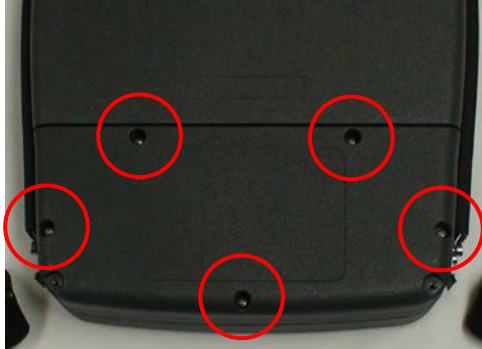3.   Locate and remove the Fuse.

INSTALL

1.   Install the Fuse.

3-3-3.   FUSE REPLACEMENT (cont)

INSTALL (cont)

2.   Install the Battery Cover on the 3550 / 3550R and tighten five captive screws (8 in/lbs.).

3.   Install the two lower bumpers on the 3550 / 3550R and tighten the captive screws (on each side of the bumpers) (8 in/lbs.).

3-3-4.   HANDLE REPLACEMENT

DESCRIPTION

This procedure is used to replace the handle(s) on the 3550 / 3550R.

REMOVE

1.   Fully loosen the captive screws (on each side of the bumper) in the two bumpers (on the right or left side of the 3550 / 3550R) and remove the bumpers from the 3550 / 3550R.

2.   Remove the four shoulder bolts securing the Handle to the 3550 / 3550R and remove the Handle.

3-3-4.   HANDLE REPLACEMENT (cont)

INSTALL

1.   Install the Handle and the four shoulder bolts (8 in/lbs.).

2.   Install the two bumpers (on the right or left side of the 3550 / 3550R) and tighten the captive screws (on each side of the bumper) (8 in/lbs.).

3-3-5.   BUMPER REPLACEMENT

DESCRIPTION

This procedure is used to replace the bumper(s) on the 3550 / 3550R.

REMOVE

Fully loosen the captive screws on each side of the bumper and remove the bumper from the 3550 / 3550R.

INSTALL

Install the bumper on the 3550 / 3550R and tighten the captive screws (on each side of the bumpers) (8 in/lbs.).

3-4.   PREPARATION FOR STORAGE OR SHIPMENT

A.   Packaging

Package the 3550 / 3550R in the original shipping container. When using packing materials other than the original, use the following guidelines:

- Wrap the 3550 / 3550R transit case in plastic packing material.

- Use a double-wall cardboard shipping container.

- Protect all sides with shock-absorbing material to prevent the 3550 / 3550R transit case from moving within the container.

- Seal the shipping container with approved sealing tape.

- Mark "FRAGILE" on the top, bottom and all sides of the shipping container.

B.   Environment

The 3550 / 3550R should be stored in a clean, dry environment. In high humidity environments, protect the 3550 / 3550R from temperature variations that could cause internal condensation. The following environmental conditions apply to both shipping and storage:

Temperature:.. -30°C to +71°C*

Relative Humidity:..0% to 95%

Altitude:.. 0 to 4600 m

Vibration:...<2 g

Shock: ....<30 g

* The Battery must not be subjected to temperatures <-20°C or >+60°C.

APPENDIX A - CONNECTOR PIN-OUT TABLES

A-1.   I/O CONNECTORS
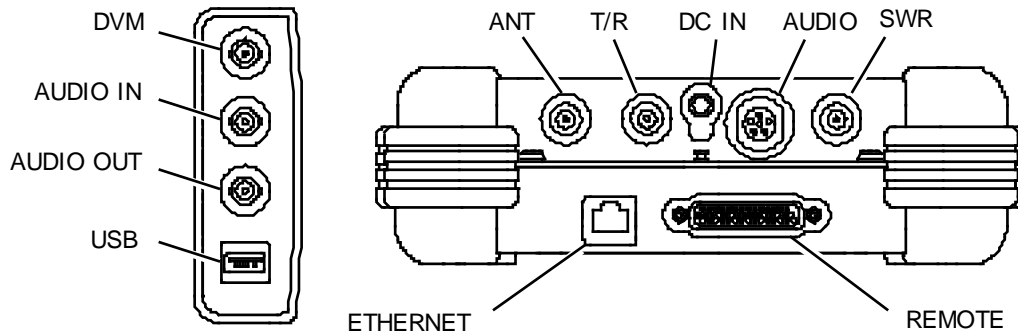
CONNECTOR	TYPE	SIGNAL TYPE	INPUT/OUTPUT
ANT	TNC Female		INPUT/OUTPUT
T/R	TNC Female		INPUT/OUTPUT
SWR	TNC Female		OUTPUT
DC IN	2.5 mm CIRCULAR (2.5 mm center, 5.5 mm outer diameter, center positive)		INPUT
AUDIO	6-Pin CIRCULAR Female	MIXED	INPUT/OUTPUT
	Refer to Appendix A, Table 2 for AUDIO Connector description		
REMOTE	44-Pin D-SUB Female	MIXED	INPUT/OUTPUT
	Refer to Appendix A, Table 3 for REMOTE Connector description		
ETHERNET		MIXED	INPUT/OUTPUT
	Refer to Appendix A, Table 4 for ETHERNET Connector description		
DVM	BNC Female		INPUT
AUDIO IN	BNC Female		INPUT
AUDIO OUT	BNC Female		OUTPUT
USB		MIXED	INPUT/OUTPUT
	Refer to Appendix A, Table 5 for USB Connector description		

Table A-1. I/O Connectors

A-2.   AUDIO CONNECTOR PIN-OUT TABLE
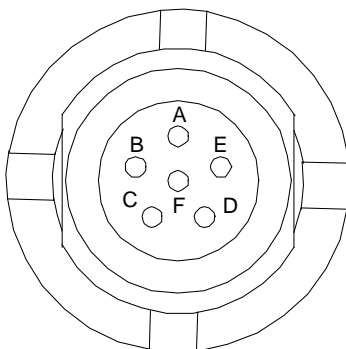
PIN NO.	SIGNAL NAME
A	GND
B	SPEAKER+
C	PTT
D	MIC
E	MICSEL1
F	MICSEL2

Table A-2. AUDIO Connector Pin-Out Table

A-3.   REMOTE CONNECTOR PIN-OUT TABLE
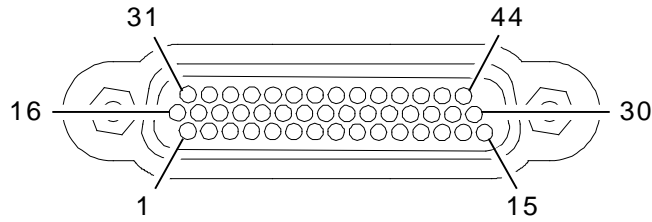
PIN NO.	SIGNAL NAME	PIN NO.	SIGNAL NAME
1	USB3_VBUS	23	GND
2	USB3_GND	24	PPC_ETX_P
3	+5V_ACC	25	GND
4	PPCDBUG_TXD	26	PPCUSR_CTS
5	GND	27	PPCUSR_TXD
6	OMAPRCI_RTS	28	REM_GPIO(5)
7	GND	29	REM_GPIO(1)
8	PPC_ERX_N	30	REM_GPIO(3)
9	PPC_ETX_N	31	USB3_VBUS
10	GND	32	USB3_GND
11	PPCUSR_RTS	33	+5V_ACC
12	PPCUSR_RXD	34	PPCDBUG_RXD
13	REM_GPIO(7)	35	GND
14	REM_GPIO(6)	36	OMAPRCI_RXD
15	REM_GPIO(2)	37	GND
16	USB3_FD_N	38	PPC_ERX_P
17	USB3_FD_P	39	GND
18	OMAPCON_TXD	40	REM_GPIO(4)
19	OMAPCON_RXD	41	REM_GPIO(0)
20	GND	42	OMAPCON_RTS
21	OMAPRCI_TXD	43	OMAPCON_CTS
22	OMAPRCI_CTS	44	BKBOX#

Table A-3. REMOTE Connector Pin-Out Table

A-4. ETHERNET CONNECTOR PIN-OUT TABLE
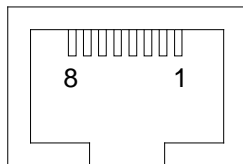
PIN NO.	SIGNAL NAME
1	TX+
2	TX-
3	RX+
4	NOT USED
5	NOT USED
6	RX-
7	NOT USED
8	NOT USED

Table A-4. ETHERNET Connector Pin-Out Table

A-5.   USB CONNECTOR PIN-OUT TABLE
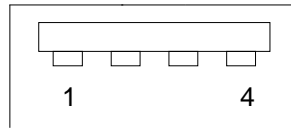
PIN NO.	SIGNAL NAME
1	VCC
2	D-
3	D+
4	GND

Table A-5. USB Connector Pin-Out Table

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APPENDIX B - ABBREVIATIONS

A

A	Amperes
AC	Alternating Current
AF	Audio Frequency
AFBW	Audio Frequency Bandwidth
AM	Amplitude Modulation
ANT	Antenna
Assy	Assembly
ATTN	Attenuation
Aud	Audio

B

Bat	Battery
Batt	Battery
BER	Bit Error Rate
BNC	Bayonet Neill-Concelman
BP	Bandpass
BW	Bandwidth

C

C	Celsius or Centigrade
CAL	Calibrate/Calibration
CD	Compact Disk (CD-ROM)
CFM	Coldfire Firmware
CH	Channel
Config	Configure/Configuration
CPLD	Complex Processing Logic Device
CW	Continuous Wave

D

D	Day
dB	Decibel
dBc	Decibels below Carrier
dBm	Decibels above one Milliwatt
DC	Direct Current
DCS	Digitally Coded Squelch
Demod	Demodulation
DEV	Deviation
DIST	Distortion
DTF	Distance to Fault
DVM	Digital Voltmeter

E

e.g.	For Example ...
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
Err	Error
ESC	Escape
Est	Estimated

F

F	Female
FH	Frequency Hop
Fgen	Function Generator
FM	Frequency Modulation
FPGA	Field Programmable Gate Array
FREQ	Frequency

G

Gen	Generate / Generator
GHz	Gigahertz (10^9 Hertz)

H

H	Hour
HI	High
HP	High-Pass
Hr	Hour
HW	Hardware
Hz	Hertz

I

ID	Identification
i.e.,	That is ...
IF	Intermediate Frequency
IN	Input or Inch
In/lbs.	Inch/Pounds
I/O	Input/Output

K

kHz	Kilohertz (10^3 Hertz)

L

LCD	Liquid Crystal Display
LO	Low
LP	Low-Pass
Lvl	Level

M

M, m	Month, Meters, Minutes or Male
MFIO	Multi-Function I/O
MHz	Megahertz (10^6 Hertz)
MIC	Microphone
MIN, min	Minimum or Minutes
mm	Millimeter (10^{-3} Meters)
MOD	Modulation

N

N/A	Not Applicable
NORM	Normal or Normalize

O

OUT	Output
Ovr	Overload

P

para	Paragraph
PC	Printed Circuit
PCB	Printed Circuit Board
PPC	PowerPC
ppm	Parts per Million
PTT	Push to Talk
Pwr	Power

R

REC	Receive
RF	Radio Frequency
RSSI	Received Signal Strength Indication
RX	Receive

S

SWR	Standing Wave Ratio
SYS	System

T

TDM	Time-Division Multiplexing
Tem	Temperature
Temp	Temperature
TNC	Threaded Neill-Concelman
T/R	Transmit/Receive
TX	Transmit

U

UHF	Ultra High Frequency
UI	User Interface
USB	Universal Serial Bus
UUT	Unit Under Test

V

V	Volt
VAC	Volts, Alternating Current
Vdc	Volts, Direct Current
VHF	Very High Frequency
Vol	Volume
Vp	Volta Peak
Vrms	Volts Root Mean Square
VSWR	Voltage Standing Wave Ratio

W

W	Watt

Y

Y	Year

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