Product Brief

VIAVI
3550R
Touch-Screen Radio Test System

The complete portable, on site radio communication test system for analog and digital communication systems. Now available with NEON® Signal Mapper for indoor signal mapping.

The first truly portable touch-screen radio communication system. The 3550R takes radio and repeater site testing to the next level with a quantum leap in an easy to use, integrated test system for complete radio receiver and transmitter performance testing, cable fault and antenna system analysis. With its ultra-responsive resistive touch-screen, the 3550R brings a whole new experience to RF testing.

Features

- Next generation touch-screen operation
- Define your own test screens and then save for future use
- Internal battery provides 4.5 hours of true portability on one charge
- Super light magnesium alloy – 8.3 lbs / 3.75 kg weight, almost half the weight of competitive units
- 0º to 50º C operating range
- 0.15 ppm timebase with exclusive "Freq-Flex" external flexible frequency reference

Technologies

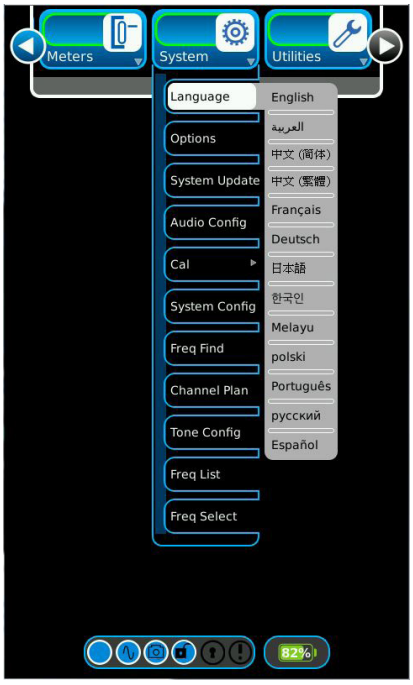
- AM
- FM
- DMR (MOTOTRBO™)
- P25
- TETRA
- NXDN™
- dPMR
- ARIB T98

Full Feature RF Test Functions

- -140 dBm DANL channel analyzer
- Multi-function oscilloscope
- Tracking generator for sweeping filters, antennas, and cables. Can also be used for measuring VSWR or return loss of antennas as well as finding the location of faults in cables.
- Precision RF power measurements using external USB wideband thru-line power sensor
- Analog demod measurements for demodulation, distortion and SINAD
- Digital demod measurements for modulation fidelity and symbol deviation
- RF generator for determining receiver performance of both digital and analog radios

Multi-Language Support

- Simplified Chinese
- Traditional Chinese
- Spanish
- Portuguese
- Malay / Indonesian
- Korean
- Arabic
- Polish
- Russian
- Japanese
- German
- French



The 3550R System Language Selection

A Complete Radio Test System

VIAVI's expertise in developing radio communications test sets with exclusive features and excellent return on investment put the 3550R at the front of affordable, high performance RF analysis. Designed for speed, the 3550R features a complete radio test system with an advanced touch-screen that simplifies cable and antenna testing.

Next Generation Touch-Screen Operation

The 3550R, with its resistive touch-screen, will meet the needs of users that require the test set to operate under all conditions, whether on the bench or in the field. Perfect for cold or wet weather applications, the 3550R also features a wider operating range of -20° C to +55° C and MILPRF28800F Class 2 specification for toughness required for extreme conditions.

Complete RF Transmitter Testing

With integrated RF power, RSSI, frequency error and modulation meters, the 3550R provides complete analysis of AM, FM, P25, DMR (MOTOTRBO), dPMR, NXDN and ARIB T98 radio systems.

VIAVi's exclusive "Freq-Flex" external frequency reference allows you to use any external reference from 2 MHz to 1 GHz to calibrate the 3550R's time

base. Simply connect a known good RF source to the 3550R antenna or T/R port and the 3550R time base is frequency corrected to the reference signal for super-accurate RF frequency measurements. Once calibrated, the 3550R can then be taken out and used for hours "un-tethered" to the reference oscillator.

With typical power accuracy of 0.5 dB, and with external cable path loss correction, the 3550R provides superior power measurements for results you can count on.

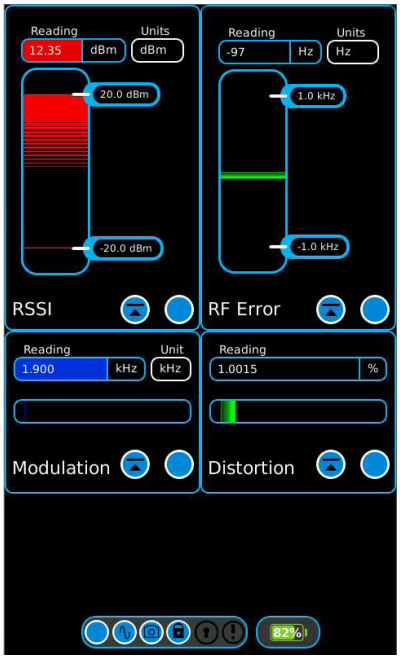
FM deviation analysis with accuracies of 4% (typical) and 0.0 dB flatness provides deviation measurements you can trust for FM and digital technologies using FSK modulations. Flatness of the deviation meter is important when aligning radios to ensure proper digital operation.

Complete RF Receiver Testing

With a fully integrated, multifunction RF generator and SINAD, Distortion and BER meters, the 3550R allows for simplified and accurate receiver sensitivity testing. Full function audio routing allows the 3550R to perform proven Analog SINAD and DISTORTION testing down to -125 dBm. Plus, digital bit pattern sequences provide the digital RF generator needed to perform digital BER sensitivity testing for DMR (MOTOTRBO), dPMR, P25 and NXDN systems.

Meters Any Way You Want It

Exclusive, easy to read color coded meters allow for fast "Go, No-Go" testing at a glance. Plus, adjustable size at the touch of the screen provides more or less data as you require. It's so simple to set up and use! After you have the screen defined in a matter of seconds, you can easily save the screen settings and set up parameters for use at a later time. You have 100's of set ups for future use, plus if you need more than that, the easy access front USB drive port allows you to quickly recall stored set ups from your USB drive.



Meter tiles showing color coded pass / fail

Complete Analog Test System

The 3550R includes the capability to perform direct connect type testing on a radio. All radio parameters including power, frequency error, modulation accuracy, receiver sensitivity and audio performance are easily accessed and tested.

To test receivers, the 3550R provides a signal generator, enabling the testing of the receiver portion of the radio. Audio SINAD, distortion, and frequency are among the tests that the 3550R can perform on the radio's receiver. With two internal generators that can be used as modulation sources, the 3550R can modulate the carrier with both a test tone and a squelch tone.

Alternatively, the internal generators can generate both a test tone and DCS, enabling the testing of mobiles requiring a digitally coded squelch.

Direct Connect Testing

- RF power and frequency error
- AM modulation / FM deviation
- Audio frequency counter
- Receive Signal Strength Indicator (RSSI)
- CTCSS / DCS encode / decode
- DTMF encode / decode

- Tone remote
- Two tone sequential
- Distortion meter
- SINAD / sensitivity
- Channel analyzer
- Audio frequency oscilloscope
- Frequency find
- Audio level meter
- Pass / fail limits

Snapshot and Clone Me!

The 3550R snapshot feature allows you to capture the perfect picture of the system's performance before and after you're done! Spectrum shots, Distance to Fault, SWR, and any other combination of meters and displays can be captured into digital picture for future reference.

If you've ever had to manage multiple instruments, you'll really appreciate our "Clone Me" function! If you have a fleet of test equipment that needs to do the exact same thing, and you have your 3550R defined exactly the way you want with screens and setups, the clone function allows you to transfer the same configuration to multiple 3550Rs through a simple internet connection.

Remote Operation and Remote File Access

Intermittent problems? The 3550R has the perfect solution for you to remotely monitor tough to find system anomalies through your smartphone, tablet, or PC anywhere on the planet. All you need is internet access and a VNC connection. This allows users to access a remote 3550R and view the live display as well as control the 3550R with the click of a mouse or a touch of your smartphone or tablet!

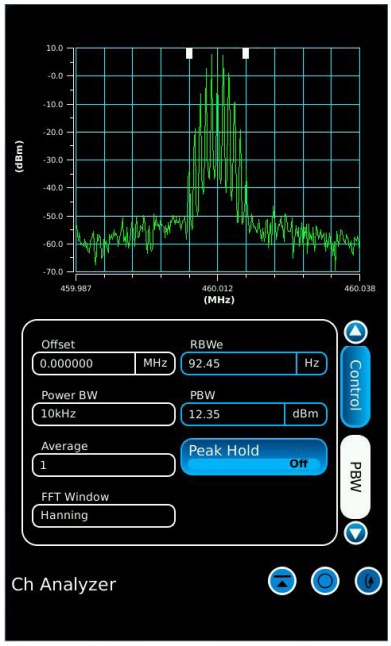
WinSCP or other FTP / SFTP clients can be used to easily transfer stored files, such as screen shots and memory setups, between the 3550R and a PC. This feature requires the following username and password to access the 3550R:

Username: user

Password: user

Channel Analyzer

RF signals can be graphically analyzed with the Channel Analyzer option of the 3550R. The channel analyzer allows the user to analyze up to a 5 MHz spectrum of signals from a repeater, a mobile radio, or a hand-held, while at the time demodulating the signal and taking modulation measurements. The 3550R Channel Analyzer includes the capability of measuring the amount of power within a bandwidth or the level of the signal at a marker position. The user can also store and recall traces for comparison with live traces.



The 3550R Channel Analyzer

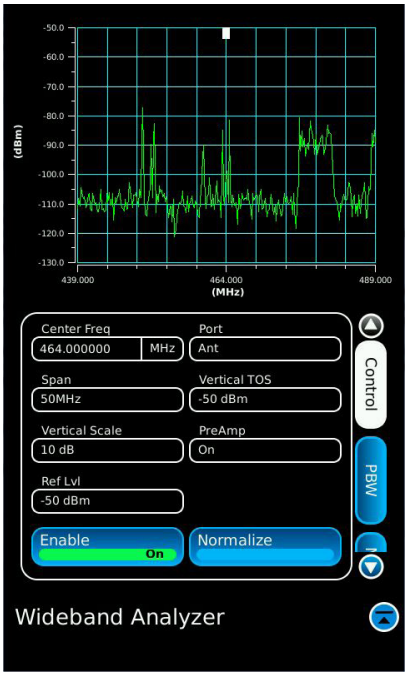
Oscilloscope

The 3550R Oscilloscope option is an important tool that is useful for viewing the demodulated audio of the transmitter under test. or to look at the audio from the receiver of a mobile or hand-held radio. The oscilloscope includes six markers for measuring timing and levels of the audio or demodulated signals.

Wideband Analyzer

In addition to the full suite of field-level test instrumentation, the 3550R features a 50 MHz Wideband Analyzer with up to six color markers. This powerful feature allows desired signals, interferer signals, and other spectrum anomalies to be viewed. Screen hold and capture features provide instant storage of screen images to be saved and exported to a

PC for later analysis and documentation.

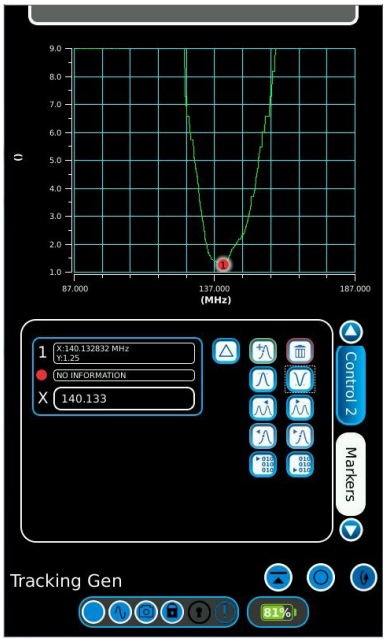


The 3550R Wideband Analyzer

Simplified Repeater Site Analysis and RF Installation Testing

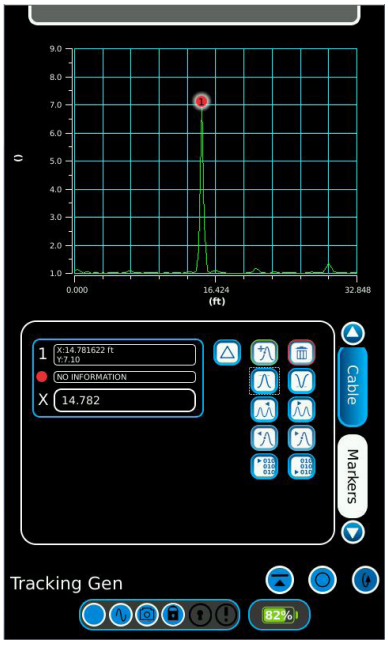
In addition to radio tests, test professionals must also isolate RF problems with cable and antenna systems as well as tune duplexers for maximizing RF system performance. Now these critical tests can be supported with a lightweight, portable 3550R Radio Test System with the optional full span tracking generator and precision DTF / VSWR accessory kit (kit items listed on page 13). Touch-screen menus provide easy setup and selection of VSWR, Return Loss, and Distance to Fault (DTF) measurements. Sweep results are displayed graphically and six color markers, which have manual and touch-screen controls, are available for identifying system anomalies. Numeric values for VSWR, Return Loss, and DTF (in feet or meters) are automatically calculated and displayed in the marker table.

VSWR and Return Loss



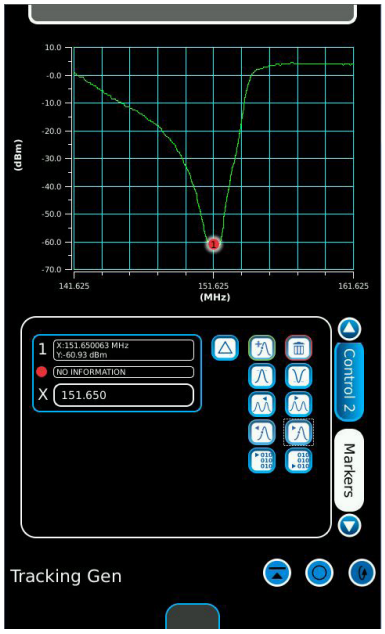
Tracking generator showing VSWR graph

Distance to Fault (DTF)



Tracking generator showing DTF

Duplexer Tuning



Tracking generator tuning a duplexer

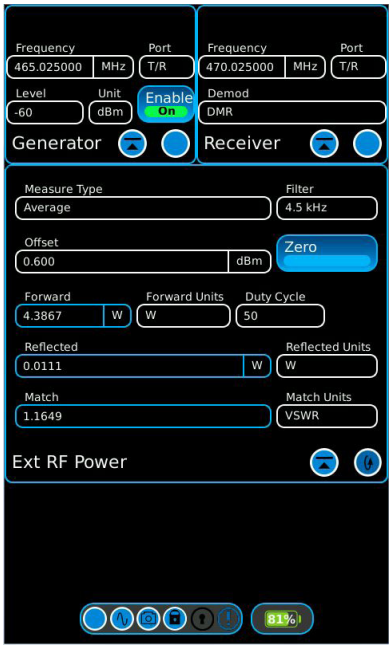
AAR Channel Plan Option

AAR stands for Association of American Railroads and is an association of US and Canadian railroads. The AAR Channel Plan consists of frequencies from 160.1775 to 161.5725. This option controls the RF frequency of both the generator and receiver of the 3550R based on the channel number. The channel number also automatically controls the modulation type with channel numbers 5 through 197 selecting FM modulation and channels 302 through 488 selecting NXDN modulation.

External RF Power Meter Option

The 3550R now includes support for the Bird 5017D Wideband Power Sensor. The 3550R connects to the 5017D through the USB port.

- This power sensor is a thru-line power meter that can measure power levels from 500 mW to 500 W.
- Covers a frequency range of 25 MHz to 1000 MHz.
- Measures Peak Power and True Average Power.
- Calculates and displays VSWR, Return Loss, Reflection Coefficient, Crest Factor and CCDF.



Bird External power sensor option

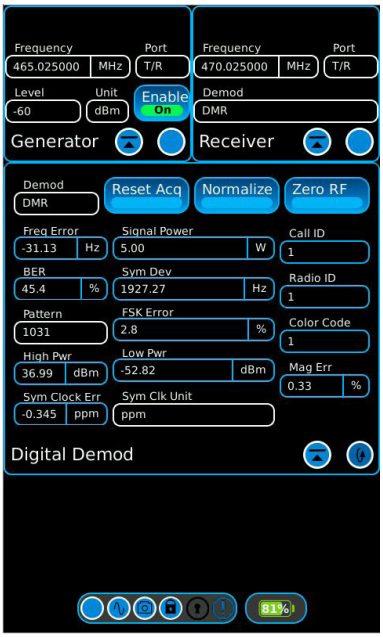
Digital Radio Test Options

DMR Test

- Burst Power Meter
- Frequency Error Meter
- FSK Error Meter
- Symbol Deviation Meter
- Magnitude Error Meter
- Transmit BER Meter
- Color Code, Call ID, and Radio ID decode
- Transmit 1031 Hz, O.153, and calibration patterns
- Base Repeater patter for duplex radio testing
- User programmable Color Code and Call ID

With the DMR Option, the 3550R can now perform a complete test on the transmitter and receiver of a DMR radio. This testing includes the measurement of the key modulation fidelity parameters, FSK error, magnitude error, symbol deviation, and frequency error. The 3550R can also measure the power during the burst and the power level between the bursts. In order to enable the testing of radios, without requiring them to be put into a special test mode, the 3550R also has a programmable color code and call ID. A key feature of the 3550R is the

base repeater (BR) pattern. A radio in duplex mode must synchronize with this BR pattern before it can transmit. It would not be possible to test a duplex radio without this feature.



The 3550R Digital Analysis Panel

P25 Test

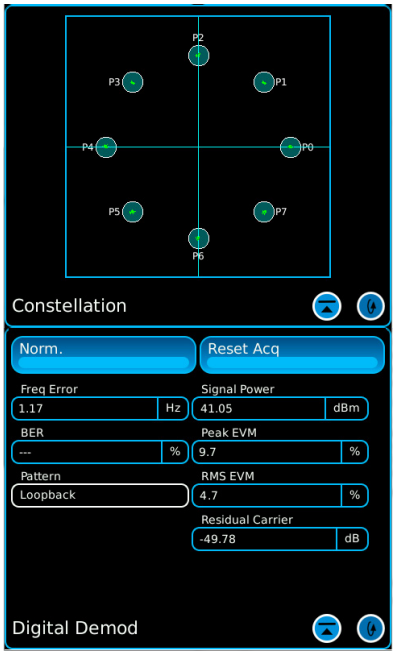
- Inband and Broadband Power Meters
- Frequency Error Meters
- Modulation Fidelity Meter
- Transmit BER Meter
- NAC Decode
- Transmit 1011 Hz, O.153, and CAL test patterns
- User programmable NAC for transmit

The 3550R P25 option gives you the capability to test P25 mobiles, hand-helds, repeaters and base stations. With this option, you can measure modulation fidelity, symbol deviation, and frequency error and transmit standard patterns as specified by TIA-102.CAAA-C. This function becomes part of the Generator or Receive testing functions when this option is installed.

TETRA Base Station Test

The 3550R includes a cost effective way to perform field-testing on TETRA base stations. Included are the critical tests for both the transmitter and receiver of the base stations. The following tests are included:

- Frequency Error
- Signal Power
- Peak EVM (Error Vector Magnitude)
- RMS EVM
- Residual Carrier
- BER (Bit Error Rate)
- Modulation Constellation Display
- Auto and Pulse Synchronization Modes
- Receiver Testing
- Base Station Identity Parameter



TETRA Base Station Test

NXDN Test

- 4800 or 9600 Selectable Baud Rates
- Signal Power Meter
- Frequency Error Meter
- FSK Error Meter
- Symbol Deviation Meter
- Transmit BER Meter
- RAN Decode
- Transmit 1031 Hz, O.153, and CAL test patterns
- User programmable RAN for transmit

With the NXDN test option, you will be able to measure the key NXDN RF parameters with the 3550R. These measurements verify the correct operation of the both the transmitter and receiver of a NXDN radio. The 1031 Hz pattern along with the selectable RAN enables a test of the audio of a NXDN radio without requiring it to be in test mode. With the O.153 random data pattern, you can perform BER testing of the receiver to verify that it meets its sensitivity requirements.

dPMR Test

- Signal Power Meter
- Frequency Error Meter
- FSK Error Meter
- Symbol Deviation Meter
- Transmit BER Meter
- Transmit O.153 patterns

With the dPMR test option, you will be able to measure the key dPMR RF parameters with the 3550R. These measurements verify the correct operation of both the transmitter and receiver of a dPMR radio. With the O.153 random data pattern, you can perform BER testing of the receiver to verify that it meets its sensitivity requirements.

Positive Train Control (PTC) Test

The 3550R PTC Option provides advanced transmitter and receiver test capabilities that are similar to vector signal analyzers and generators. This option enables the user to perform testing to verify the transmitter and receiver operation of PTC base stations, wayside and locomotive radios. Test capabilities of the 3550R for PTC include:

- EVM (Error Vector Magnitude)
- Carrier Feedthrough
- Signal Power
- Frequency Error
- BER (Bit Error Rate)
- Modulation Constellation Display
- Transmitter and Receiver data rates of 8000 and 16000
- Receiver testing

NEON Signal Mapper Package

VIAVI Solutions and TRX Systems are providing a new joint solution that integrates TRX's NEON Signal Mapper Application with the 3550R. NEON Signal Mapper automates the geo-referencing cloud storage, and 3D visualization of LMR test data for technicians who use VIAVI test equipment to record and analyze two-way radio signals inside buildings and outdoors.

The NEON Signal Mapper includes the following:

- TRX Systems Tracking Unit with Belt Clip (1 year warranty)
- USB Cable and Wall Adapter for Charging
- 1 Year Signal Mapper Software License with NEON Cloud Access
- Portable Wireless Router / Access Point

Ordering Information

Versions and Options

Order Number	Description
90849	3550R Touch-Screen Radio Test System (Ruggedized)
91819	3550OPT01 Channel Analyzer
91818	3550OPT02 Oscilloscope
83346	35XXOPT07 P25 Test
83347	35XXOPT08 Tracking Generator
89509	35XXOPT09 dPMR Test
89510	35XXOPT10 ARIB T98 Test
92468	3550OPT13 AAR Channel Plan
92803	3550OPT14 Precision Thru-Line Power Meter (Use with Bird Wideband Power Sensor; 5017D)
112401	3550OPT15 Occupied Bandwidth (Requires 3550OPT01)
114327	3550OPT16 Positive Train Control
89261	35XXOPT33 NXDN Test
89262	35XXOPT34 DMR Test
91820	German
91821	Japanese
91822	Korean
91823	Malay / Indonesian
91824	Polish
91825	Portuguese
91826	Russian
91827	Simplified Chinese
91828	Traditional Chinese
91829	Spanish
91830	Arabic
91832	CALFB3550 Calibration Certificate - 3550R
92240	French
141787	TETRA Base Station Test

Standard Accessories

External DC Power Supply	
Getting Started Manual (Paper)	
Operation / ICW Manual (CD)	
Regional Kits for the 3550R (with Hard Pelican Case)	
90603	US
90890	China
90889	International
Regional Kits for the 3550R (with Soft-Sided Case)	
92777	US
92775	China
92776	International
2 x Fuse, 3 Amp, 250 V	
Regional Kit Accessories	
Hard Pelican Transit Case or Soft-Sided Carrying Case	
Power Cable (AC)	
Handset	
Short-Open-Load VSWR Calibrator	
Cable (TNC) (M-M) (48 in)	
2 x Cable (BNC) (M-M) (48 in)	
5 x Adapter (BNC-F to TNC-M)	
2 x Fuse, Spare (5 A, 32 VDC, Type F)	
Accessory Case	
Power Cable (DC supply - cigarette lighter)	
Getting Started Manual (Paper)	
Operation / ICW Manual (CD)	
Antenna (BNC) (50 MHz)	
Antenna (BNC) (150 MHz)	
Antenna (BNC) (450 MHz)	
Antenna (BNC) (800 MHz)	
Combo Stand and Cover	

Optional Accessories

63927	AC25081 Site Survey Software
140747	NEON Signal Mapper Package for Indoor Coverage Mapping
89908	Mounting Bracket for AC27003 150 W Attenuator
91600	Yellow Hard Transit Case
91679	Combo Stand and Cover
91706	Black Hard Transit Case
10192	AC27004 Case, Soft-Sided Carrying
92723	Accessory Kit, Precision DTF / VSWR This kit contains: 12 inch coax cable (TNC-M to N-M) 7.5 inch coax cable (TNC-M to N-M) Return Loss Bridge, 5–3000 MHz Termination, 50 Ohm, Precision Power Divider, DC – 3.0 GHz Conn, Adapter (TNC-M to N-M) Accessory Case
92793	5017D Wideband Power Sensor (Use with 3550OPT14)

82559	AC27002 Attenuator (20 dB / 50 W), Adapter (N-F to BNC-F), Adapter (N-M to TNC-M)
82560	AC27003 Attenuator (20 dB / 150 W), Adapter (N-F to BNC-F), Adapter (N-M to BNC-F)
67076	AC27005 Battery, Spare
90520	3550 Series Op / ICW Manual (CD Only) (One Supplied Standard)
90523	3550 Series Maintenance Manual (CD Only)
90521	3550 Series Getting Started Manual (Paper Only) (One Supplied Standard)
67474	AC0826 Tripod
82553	AC24006 Tripod, Dolly, Stand

Extended Standard Warranties

84341	W3500 / 203 Extended Warranty 36 Months
84343	W3500 / 205 Extended Warranty 60 Months

Extended Standard Warranties with Calibration

84342	W3500 / 203C Extended Warranty 36 Months with Scheduled Calibration
84344	W3500 / 205C Extended Warranty 60 Months with Scheduled Calibration

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