

Wireless

3500A Portable Radio Communications Test Set



New P25 Operation

Instantly Analyze Radio Systems Problems with Critical RF and Audio Tests Available at Your Fingertips

Featuring

- 2 MHz - 1 GHz operation
- AM/FM transmitter and receiver tests
- Spectrum analyzer with < -136 dBm noise floor
- Oscilloscope
- Antenna/cable tests

And now available in release 3.5.1

- P25 Testing
- Tracking Generator

The Aeroflex 3500A, the First Truly Rugged, Portable Radio Test Set.

With the latest in portability, battery life and performance, the Aeroflex 3500A builds upon Aeroflex's expertise in developing portable radio communications test sets with exclusive features and affordability that are destined to set a new standard in portable radio test sets. Designed to meet the needs of a multitude of radio tests, the 3500A provides fast, reliable measurements of the radio's transmitter and receiver parameters. With the additional capability to perform quick testing of antennas and cables, the 3500A provides the most complete portable test solution available to quickly isolate problems and assess performance of the radio, cable and antenna systems.. And now with P25 operation, the 3500A goes even further, providing you the tools to quickly check your P25 repeater, mobile, or handheld radio. In addition,

the new tracking generator gives you the ability to re-tune your antenna duplexer located at your remote repeater sites.

Portable and Rugged

- Easy portability - weighs less than 8 lbs. (3.6 kg)
- Rugged construction - solid magnesium alloy weatherproof case
- -20° to +50° C operating temperature range
- 5 hour battery life

Aeroflex engineers designed the 3500A from the ground up to be portable and rugged, weighing in at less than 8 lbs (3.6 kg) including the battery. It has a solid magnesium alloy weatherproof case, an operating temperature range of -20° to +50°C, and rugged construction specifications (Mil-PRF-28800A) for humidity, altitude, shock, and vibration. The battery gives the user 5 hours of operation and can be fully re-charged and ready to operate in only 4 hours. In addition, the 3500A and the optional accessories can be stored in a ruggedized transport case.

Radio Installation Failures

- Handset and antenna allow over the air "Talk Test"
- RSSI Meter
- RF Error Meter
- Modulation Measurements
- Audio Frequency Counter
- Spectrum Analyzer
- Audio Frequency Oscilloscope

We design the 3500A so that you could use it for quick installed radio testing and efficiently find radio failures. The 3500A is lightweight and perfect for hand-held testing. There is no need to connect to the radio under test, simply connect the supplied antenna, key up the radio and then measure the radio parameters over-the-air. You can even use the provided handset to check voice quality of the transmitter and receiver. The provided handset can be used to check voice quality of the transmitter and receiver. A push-to-talk button on the handset controls whether your 3500A is transmitting or receiving. The Duplex test screen, shown below, is ideal for making quick transmitter and receiver measurements on an installed radio system.

DUPLEX TEST		
52 <input type="button" value="F1"/> <input type="button" value="F2"/> 28 <input type="button" value="F3"/> <input type="button" value="F4"/> 32		
Generator MHz: 403.025000	Receiver MHz: 403.025000	More MOD-FMDEV
Port: ANT	Port: ANT	1.803 kHz PASS
Level: -50 dBm	Mod: FM 25k	
Ext Attn dB: 0	AFBW: 5k LP	
Modulator Gen 1: OFF 1000.0 Hz	Freq/Code 3.50 kHz	RSSI -24.69 dBm
Dcs: Non Inv 754	0.75 kHz	PASS
MIC: ON	3.00 kHz	
Ext Aud: OFF	Load: High Z	
Volume: 100	RF-ERROR -0.087 kHz	Analyzer
Squelch: -50 dBm	PASS	
Speaker: Demod		
AudOut: Mod		
Save Recall		
<input type="button" value="Edit"/>	<input type="button" value="Return"/>	<input type="button" value="Hold"/>
<input type="button" value="Setup"/>	<input type="button" value="Ptt on"/>	

Duplex Test Screen

Bench Top Testing

- RF power
- RF frequency error
- AM modulation/FM deviation
- Audio frequency counter
- Receive Signal Strength Indicator (RSSI)
- DCS encode/decode
- DTMF encode/decode
- Distortion meter
- SINAD/sensitivity
- Spectrum analyzer
- Audio frequency oscilloscope
- Frequency find
- Audio level meter

In addition to performing over the air measurements, the 3500A includes the capability to perform bench top type testing on a radio. All radio parameters including power, frequency error, modulation accuracy, receiver sensitivity and audio performance are easily accessed and tested with the 3500A.

- 1 - DUPLEX TEST
- 2 - RECEIVER TEST
- 3 - TRANSMITTER TEST
- 4 - ANT-CABLE TEST
- 5 - AUDIO
- 6 - ANALYZER
- 7 - OSCILLOSCOPE
- 8 - TRACK GEN

System Menu Screen

If the Receiver Test is selected, the 3500A operates as a signal generator, enabling the testing of the receiver portion of the radio. Audio SINAD, distortion, and frequency are among the tests that can be performed on the radio's receiver. With two internal generators that can be used as modulation sources, the 3500A 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.

RECEIVER TEST		
47 <input type="button" value="F1"/> <input type="button" value="F2"/> 27 <input type="button" value="F3"/> <input type="button" value="F4"/> 30		
Generator MHz: 151.625000	AF SCOPE-AUDIN	SINAD-AUDIN 27.5 dB PASS
Port: T/R		
Level: -115 dBm		
Ext Attn dB: 10		
Modulator Gen 1: ON 1000.0 Hz	Freq 3.00 kHz	DIST-AUDIN 4.2 % PASS
Gen 2: OFF 67.0 Hz	0.75 kHz	
MIC: OFF	6.25 kHz	
Ext Aud: OFF	Load: High Z	
Volume: 20	Audio Level-AudIn 0.532 V	AF CNTR-AUDIN 1000.0 Hz
Squelch: -50 dBm		
Speaker: Audio In		
AudOut: Mod		
Save Recall		
<input type="button" value="Edit"/>	<input type="button" value="Return"/>	<input type="button" value="Hold"/>
<input type="button" value="Setup"/>	<input type="button" value=""/>	<input type="button" value=""/>

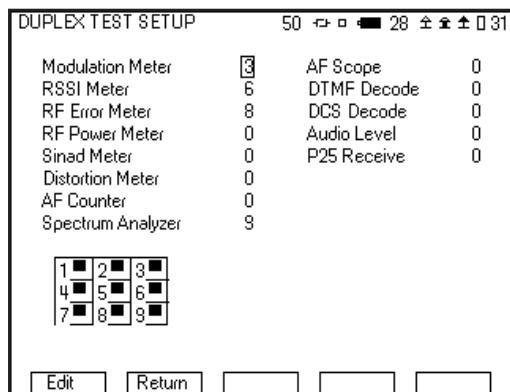
Receiver Test Screen

The Transmitter Test screen operates as a signal analyzer, measuring the parameters associated with the transmit portion of the radio being tested. Included in this screen are measurements of the modulation, the RF power, and RF frequency error.

TRANSMITTER TEST		
49 <input type="button" value="F1"/> <input type="button" value="F2"/> 28 <input type="button" value="F3"/> <input type="button" value="F4"/> 31		
Receiver MHz: 151.625000	RF-ERROR -0.127 kHz	MOD-FMDEV 2.477 kHz PASS
Port: T/R		
Mod: FM 25k	PASS	
AFBW: 15k LP		
Function Generator # 1: ON 1000.0 Hz	Freq 0.01 Vrms	Analyzer
# 2: OFF 2400.0 Hz	0.57 Vrms	
Volume: 100		
Squelch: -40 dBm	DOS Decode State Run NonInv 023	RF-POWER 1.07 Watts
Speaker: Demod		
AudOut: Fgen		
Save Recall		
<input type="button" value="Zoom"/>	<input type="button" value="Return"/>	<input type="button" value="Hold"/>
<input type="button" value="Setup"/>	<input type="button" value=""/>	<input type="button" value=""/>

Transmitter Test Screen

Any of the test screens can be easily configured with the meters that are needed according to the type of tests that the user wants to perform by selecting the meters from the setup screen. Users can quickly define the "look" of the instrument by configuring the way the meters are displayed on the screen.



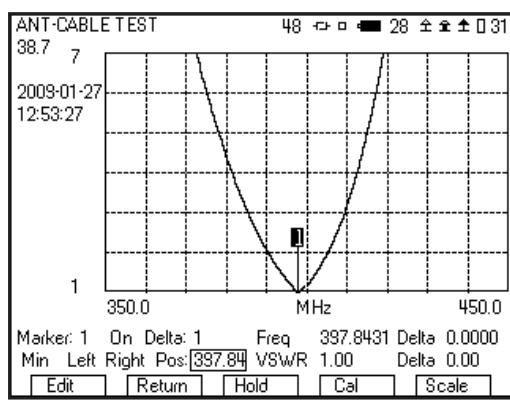
Duplex Test Setup Screen

Isolate Cable and Antenna Problems

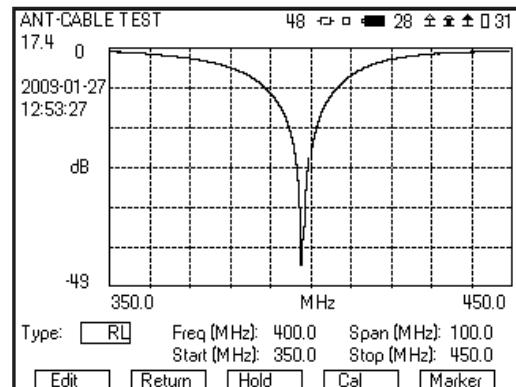
Since many radio faults lie in the cabling and/or antenna and not with the radio, the 3500A includes the capability to measure the VSWR or return loss of an antenna, and the loss or distance to fault of a cable. By isolating the problem to the cable, connector or antenna, you can avoid returning good radios to the depot or manufacturer for repair, thus avoiding radio system down time. The SWR Test screen provides the user with the option to display:

- VSWR versus frequency
- Return loss versus frequency
- Cable loss versus frequency
- Return loss versus feet

The display of VSWR or Return Loss (RL) versus frequency is useful for observing the characteristics of an antenna.

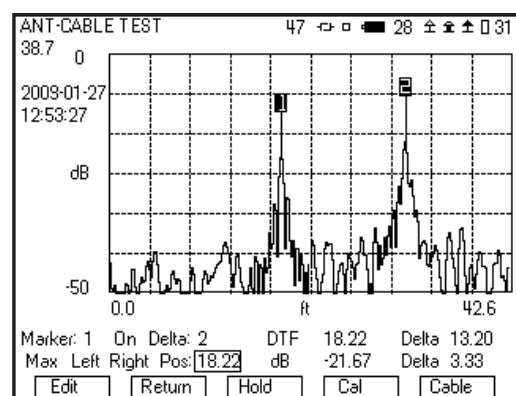


ANT-CABLE Test Screen Showing VSWR Versus Frequency



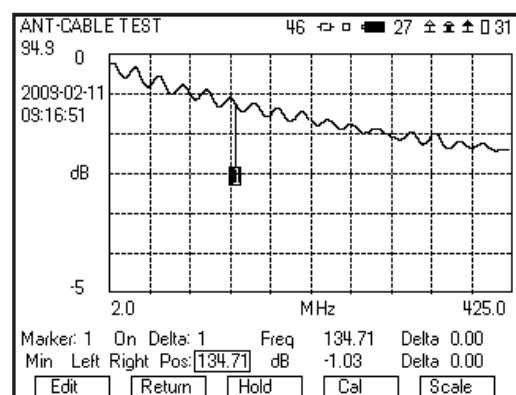
ANT-CABLE Test Screen Showing RL Versus Frequency

The display of return loss versus feet is descriptive of the characteristics of a cable, illustrating to the user the precise location of faults (DTF). For example, the following illustrates a cable that has a fault, with the location of marker 1 at the fault and marker 2 at the end of the cable.



SWR Test Screen Showing DTF

The cable loss feature enables the user to do a one port measurement of the loss of a cable over frequency. For example, the following screen shot shows the loss of a cable over the frequency range of 2 MHz to 425 MHz.



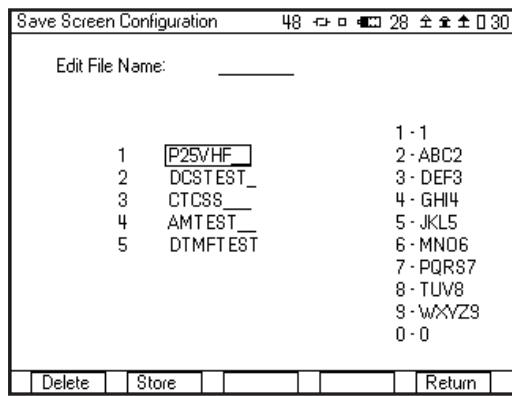
SWR Test Screen Showing LOSS

Up to three markers can be enabled for use in analyzing the graphical data that is acquired on the SWR test screen. The markers provide the user with information on the precise return loss at a given

distance for DTF mode or the exact VSWR at a given frequency for SWR mode. A delta function, associated with the markers, is also available in order to show the difference in VSWR and frequency, or return loss and feet, between two of the markers.

Save/Recall Features

The 3500A allows users to configure the test setup and then save these setups internally for future use. This feature allows fast testing on radios that require constant testing, base station verification and for testing a large number of the same radio.

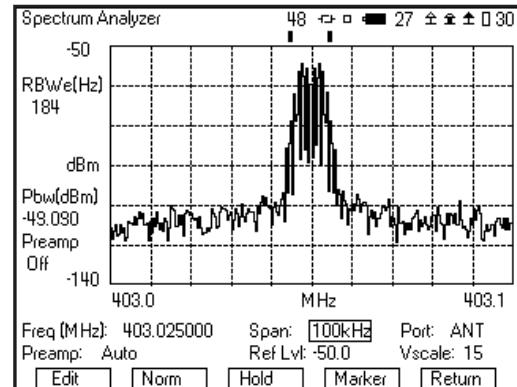


Save Screen

Spectrum Analyzer (35XXOPT01)

- Noise floor < -136 dBm
- Spans from 10 kHz to 5 MHz
- Effective Resolution bandwidths down to 19 Hz

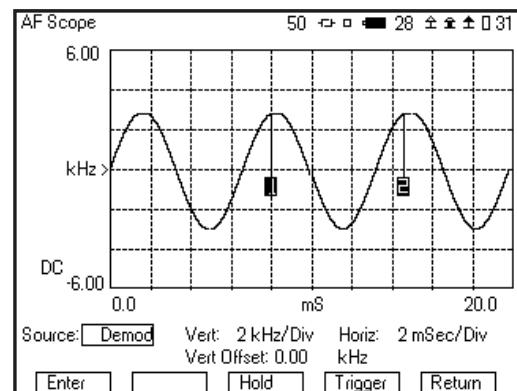
Now available as an option for 3500A is an FFT based spectrum analyzer. An FFT analyzer uses a snapshot of the incoming RF signal that is within the selected span and converts it to a frequency spectrum. The advantage of using this method is that the spectrum is converted from one set of data and not from a sweep where the RF signal may have changed from the start of the frequency sweep to the finish. The noise floor of the spectrum analyzer is < -136 dBm in the 10 kHz span. The 3500A analyzer has a span width that ranges from 10 kHz to 5 MHz with an effective resolution bandwidth as narrow as 19 Hz. A marker function includes the capability of measuring the power within a particular bandwidth and at a specified offset from the center frequency. The 3500A Spectrum Analyzer can be accessed from the Transmitter Test screen, the Duplex Test screen, and as a stand-alone spectrum analyzer.



Spectrum Analyzer

Oscilloscope (35XXOPT02)

With the oscilloscope option we can now display external audio or the demodulated audio of a received signal. The oscilloscope features 2 markers and a horizontal range of 50 mS/Div to 0.1 Sec/Div, sufficient for observing and analyzing audio signals. The oscilloscope is available from the Duplex, Transmitter, or Receiver Test screens for use during any type of testing.

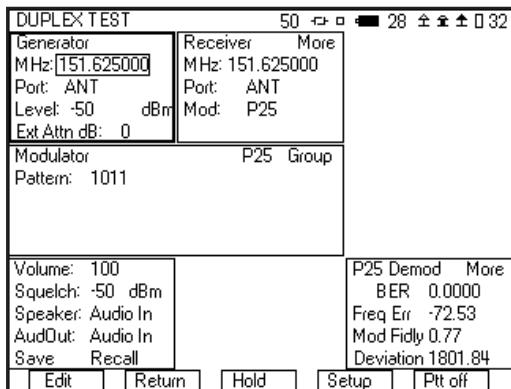


Audio Frequency Scope

P25 Test (35XXOPT07)

- Modulation Fidelity, Deviation, and Frequency error meters
- Transmit BER meter
- Signal Power meter
- Transmit Standard 1011 Hz, O.153, and Calibration patterns

With the 3500A you can now test P25 mobiles, hand-holds, repeaters and basestations. We measure Modulation fidelity, deviation and frequency error and transmit standard patterns as specified by TIA-102.CAAA-C. This function becomes part of the Duplex, Transmitter or Receiver testing screens when this option is installed.

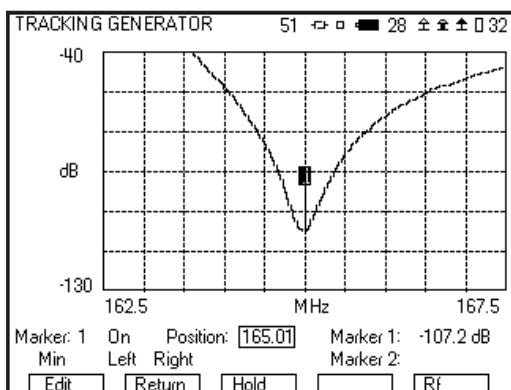


P25 Option

Tracking Generator (35XXOPT08)

- Spans from 10 kHz to full span
- Generate level from -5 to -65
- 2 markers for pinpointing level of signal

New to the latest release of the 3500A is a tracking generator option. This option is totally software based and is upgradable to units that are already in the field. This option was design specifically for aligning duplexers and filters.



Tracking Generator

SPECIFICATION

RF SIGNAL GENERATOR

FREQUENCY

Range

2 MHz to 1 GHz

Resolution

1 Hz

OUTPUT LEVEL

Range

T/R port: -50 to -120 dBm/707 μ V to .224 μ V

ANT port: -30 to -90 dBm/7071 μ V to 7.07 μ V

SWR port: -5 to -65 dBm/125743 μ V to 126 μ V

Resolution

1 dB/0.01 μ V

Accuracy

+/- 2 dB

+/- 3 dB (<-100 dBm)

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

RESIDUAL FM

<60 Hz in 300 Hz to 3 kHz BW

Typically <20 Hz

RESIDUAL AM

<5% in 300 Hz to 3 kHz BW

Typically <1%

PORT INPUT PROTECTION

ANT port: +20 dBm

SWR port: +20 dBm

T/R port: +44 dBm

PORT VSWR

ANT port: <1.5 : 1

SWR port: <1.5 : 1

T/R port: <1.25 : 1

MODULATION FREQUENCY (RATE) - AM AND FM

Range

0.0 Hz to 20.0 kHz

Resolution

0.1 Hz

Accuracy

Timebase ±2 Hz

FM DEVIATION (GEN 1 AND GEN 2)

Range

Off, 0 Hz to 100 kHz

Total Harmonic Distortion

3% (1 kHz rate, >2 kHz deviation, 300 Hz - 3 kHz BP filter)

Resolution

10 Hz

Accuracy

±10% (2 kHz to 50 kHz deviation, 150 Hz to 5 kHz rate)

Typically <2% (5.6 kHz deviation, 1 kHz rate)

EXTERNAL FM

MIC IN

With Mic set for 40 kHz deviation:

Range 1: 10 mVrms = 22 to 40 kHz (MIC Pins E & F OPEN)

Range 2: 85 mVrms = 22 to 40 kHz (MIC Pin E-GND, Pin F-OPEN)

Range 3: 8 mVrms = 22 to 40 kHz (MIC Pin E-OPEN, Pin F-GND)

Frequency range: 300 Hz to 3 kHz

MIC IN FM

Deviation off, 0 Hz to 40 kHz

Slope: Positive voltage yields positive deviation

AUDIO IN

Switchable loads: 150 ohms, 600 ohms, 1 K ohms High Z

Input levels: 0.05 to 3 Vrms

Frequency range: 300 Hz to 5 kHz

Level sensitivity: 1 kHz/35 mVrms

Slope: Positive voltage yields positive deviation

AM MODULATION (GEN 1 AND GEN 2)

Range

OFF, 0 to 100% (0Hz to 20 kHz)

Resolution

0.1%

Total Harmonic Distortion

3% (20% to 90% mod, 1 kHz rate, 300 Hz to 3 kHz BP filter)

Accuracy

10% of setting (150 Hz to 5 kHz rate, 10% to 90% Modulation)

EXTERNAL AM

MIC IN

With Mic set for 40% modulation:

Range 1: 10 mVrms = 22% to 44% (MIC Pins E & F OPEN)

Range 2: 85 mVrms = 22% to 44% (MIC E-GND, F-OPEN)

Range 3: 8 mVrms= 22% to 48% (MIC E-OPEN, F-GND)

Frequency range: 300 Hz to 3 kHz

AUDIO IN

Switchable loads: 150 ohm, 600 ohms, 1 K ohms High Z

Input levels: 0.05 to 3 Vrms

Frequency range: 300 Hz to 5 kHz

Level sensitivity: 1% / 35 mVrms nominal

AFGEN 1 AND AFGEN 2

FREQUENCY

Range

30 Hz to 5 kHz (spec)

0.0 Hz to 20.0 kHz (usable)

Resolution

0.1 Hz

Accuracy

Timebase ± 2 Hz

OUTPUT LEVEL

Load Impedance

600 ohms

Range

0 to 1.57 Vrms

Resolution

0.01 Vrms

Accuracy

$\pm 10\%$

Distortion

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

RF RECEIVER

FREQUENCY

Range

2 MHz to 1 GHz

Resolution

1 Hz

Accuracy

Same as timebase

INPUT AMPLITUDE

Minimum Input Level, Audio Sensitivity

ANT: -80 dBm (22.4 μ V), typical 10 dB SINAD (-110 dBm with pre-amp)

T/R: -40 dBm (2236 μ V), typical, 10 dB SINAD

Usable Input Level Range

ANT: -60 dBm (-80 dBm with RF Amp On) to -10 dBm (RF Error, Distortion, Modulation, AF Counter and AF Level)

ANT: -90 dBm (-110 dBm with RF Amp On) to -10 dBm (RSSI)

T/R: -20 dBm to maximum input level (RF error, Distortion, Modulation, AF Counter and AF Level)

T/R: -50 dBm to maximum input level (RSSI)

Maximum Input Level

ANT: +20 dBm/0.1 W for 10 seconds

T/R: +43 dBm/20 W (FM) and +37 dBm (AM)

AM/FM DEMODULATION

IF Bandwidth

FM: 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, 300 kHz

AM: 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz

Audio Filters Bandwidth

0.3-20 kBP, 0.3-5 kBP, 0.3-3 kBP, 0.3HP, CCITT BP, C-Wt BP, 15 KLP, 5 K LP, 3 KLP, 0.3 KLP

Audio Output Level Sensitivity

FM: (3 Vrms/kHz Dev)/IF BW (kHz) $\pm 15\%$

AM: 7 mVrms/% AM $\pm 15\%$

SPEAKER OUTPUT

75 dBa min. at 0.5 m, 600 - 1800 Hz, max volume

VOLUME CONTROL

Range

0 to 100

LO EMISSIONS

>-50 dBc

QUIETED CHANNELS

10 frequencies allowed between 2 MHz and 999.999 MHz quieted by no more than 30 dB RF TRANSMITTER TEST METERS

RF FREQUENCY ERROR METER

Range

± 200 kHz

Resolution	AM PERCENT METER
1 Hz	Range
Accuracy	5% to 100%
Same as timebase ± 2 Hz	Modes
RSSI INDICATOR (RF POWER WITHIN RECEIVER IF BANDWIDTH)	Peak+, Peak-, (Peak+ - Peak-)/2
Display Range	Resolution
dBm: -120 dBm to +43 dBm (+53 dBm with Ext Attn dB set to 20 dB)	1%
Watts: 10 pW to 20 W (200 W with Ext Attn dB set to 20 dB)	Accuracy
Usable Meter Reading RF Level Range	$\pm 5\%$ of reading, 1 kHz rate, 30% to 90% modulation, 3 kHz LPF
T/R port: -50 dBm to +43 dBm	SWR TEST
ANT port (without RF amp on): -90 dBm to -10 dBm	Frequency Range
ANT port (with RF amp on): -110 dBm to -10 dBm	2.0 MHz to 1000.0 MHz
Resolution	Span Range
0.01 dBm	10.0 MHz to 998 MHz
Accuracy	Start Range
± 3 dB (>-50 dBm into T/R, >-90 dBm into ANT or >-120 dBm into ANT with RF Amp On)	2.0 MHz to 990.0 MHz
RF POWER METER (BROADBAND RF POWER INTO T/R PORT)	Stop Range
Display Range	12.0 MHz to 1000.0 MHz
Ext Attenuation set to 0 dBm: 0 to 43 dBm (0 to 20 W)	Frequency Resolution
Ext Attenuation set to 20 dBm: 0 to 53 dBm (0 to 200 W)	0.1 MHz
Minimum Input Level	Markers
0.10 W/+20 dBm	3
Maximum Input Level	SWR MEASUREMENT
No external attenuator:	VSWR Range
20 W/43 dBm for 10 minutes at $+25^\circ$ C or until thermal alarm sounds	1.00 to 7.00
With external 50 W attenuator:	Resolution
50 W/47 dBm average at $+25^\circ$ C	0.04
With external 150 W attenuator:	VSWR Accuracy
150 W/51.8 dBm average for temperatures up to $+25^\circ$ C, linearly derated to 125 W at 55° C	$\pm 10\%$ of SWR readings (calibrated) < 300 MHz
200 W/53 dBm peak for 30 seconds on / 5 minutes off at $+25^\circ$ C	$\pm 20\%$ of SWR readings (calibrated) $= 300$ MHz
Resolution	RETURN LOSS (RL) MEASUREMENT
0.01 W/0.1 dBm	Range
Accuracy	0.0 to -50.0 dB
± 1 dB for internal attenuator	Resolution
± 1.5 dB using external attenuator	0.01 dB
FM DEVIATION METER	CABLE LOSS MEASUREMENT
Range	Range
500 Hz to ± 100 kHz	0.0 to -50.0 dB
Modes	Resolution
Peak+, Peak-, (Peak+ - Peak-)/2	0.01 dB
Resolution	DTF MEASUREMENT
1 Hz	Measurement Range
Accuracy	3ft to 328 ft
$\pm 10\%$ of reading 500 Hz to 100 kHz Deviation	Span Range
$\pm 5\%$ 1 kHz to 10 kHz Deviation, 150 kHz and 1 kHz rate	41 ft to 408 ft

Return Loss Range

0.0 to -50.0 dB

Cable types

USER, RG-8x, RG-8, RG-8foam, RG-8A, RG-55, RG-55A, RG-55B, RG-58, RG-58foam, RG-58A, RG-58B, RG-58C, RG-174, RG-213, RG-214, RG-223, RG-400

Velocity

0.00 to 1.00, automatically selected by cable type

Loss

0.00 to 100.00 dB per 100 ft, automatically selected by cable type

Est Length

42.0 to 408.0 ft

AUDIO METERS**AUDIO INPUT (AUDIO IN)****Source**

BNC Input on front panel

Frequency Range

300 Hz to 10 kHz

Level Range

0.2 Vp-p to 5 Vp-p

SINAD METER (WITH 1 KHZ AUDIO)**Measurement Sources**

Audio in, demod

Audio Frequency

1 kHz

Display Range

0 to 40 dB

Resolution

0.1 dB

Accuracy

±1.5 dB from 8 to 40 dB

DISTORTION METER**Measurement Sources**

Audio in, demod

Audio Frequency

1 kHz

Reading Range

0% to 100%

Resolution

0.1%

Accuracy

±10% from 1% to 20%

AUDIO FREQUENCY COUNTER**Range Demod****FM**

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

AM

15 Hz to 10 kHz (IF BW set appropriately for received modulation BW)

Range Audio Input

15 Hz to 20 kHz

Audio Input Level

10 mV p-p to 5 V p-p

Resolution

0.1 Hz

Accuracy

±/ 1 Hz

AUDIO FREQUENCY LEVEL METER**Measurement Sources**

AUDIO IN, DVM

Frequency Range

200 Hz to <5 kHz

Input Level

AUDIO IN 10 mV rms to 3 V rms (x1)

1 V rms to 30 V rms (÷10)

DVM 10 mV rms to 3 V rms (x1)

1 V rms to 30 V rms (÷20)

Display Unit Resolution

Volts 0.001 V

mV 0.001 mV

dBuV 0.001 dBuV

dBm 0.001 dBm

Watts 0.001W

Accuracy

±5% Audio In

ANALYZER (OPTIONAL)**FREQUENCY****Range**

2 MHz to 1 GHz

Resolution

1 Hz

Accuracy

Same as timebase

Span

10 kHz to 5 MHz in 1,2,5 sequence

EFFECTIVE RBW**Range**

19 Hz to 25 kHz (Effective RBW calculated based on FFT window type and Span)

POWER BANDWIDTH**Offset Range**

0 to ± 2.495 MHz

Bandwidth Range

1 kHz to 5 MHz in a 1,2,5 sequence (maximum bandwidth is the selected span)

Power Bandwidth Display Range

-137 dBm to +43 dBm

Power Bandwidth Display Resolution

0.001 dBm

Power Bandwidth Accuracy

±3 dB (>-50 dBm into T/R, > -90 dBm into ANT or > -110 dBm into ANT with RF Amp On)

Displayed Average Noise Level (DANL)

-120 dBm (Typical, 10 kHz span) -136 dBm with pre-amp enabled

Sweep time

700 ms (Typical)

OSCILLOSCOPE (OPTIONAL)**Source**

DVM, Audio In, Demod

Traces

One

Markers

Two

Trigger**Type**

Auto, Norm

Edge

Rising, Falling

Level

-50 to +50 V

Horizontal

0.5 ms/div to 0.1 sec/div

Vertical**FM demod**

100 Hz to 1 kHz per vertical division in a 1/2/5 sequence

AM demod

5%, 10%, 20%, 50% per vertical division

DVM and Audio in

10 mV to 10 V per vertical division in a 1/2/5 sequence

Coupling:

DVM Input: AC, DC and GND

AUDIO IN: AC

Bandwidth

5 kHz

TIMEBASE**Temperature Stability**

±0.25 ppm at 25°C

±0.5 ppm over temp range

Aging

1 ppm/year standard

Warm-up time

3 min.

ENVIRONMENTAL / PHYSICAL**Overall Dimensions**

231 mm x 285 mm x 70 mm (W x L x D)

9.1 in. x 11.2 in. x 2.8 in.

Weight

8 lbs. (3.6 kg); 12 lbs. (5.4 kg) with accessories and softbag

Temperature

Storage: -51°C to +71°C storage

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

Operation: -20°C to +50°C

Note: Battery to be charged at temperatures between 0°C and +45°C

Humidity

95% max. (non-condensing) (MIL-PRF-28800F Class 2)

Altitude

4,600 m max. (15,092 ft.) (MIL-PRF-28800F Class 2)

Shock, Functional

30G (MIL-PRF-28800F Class 2)

Vibration

Random 10 - 500 Hz (MIL-PRF-28800F Class 2)

Bench Handling

MIL-PRF-28800F, Class 2

COMPLIANCE**ENVIRONMENTAL****Use**

Pollution degree 2

Mil-PRF-28800F class 2

Salt fog

Splash proof

Acoustic noise

Explosive atmosphere

Fungus resistance

Dust resistance

Drip proof

Solar radiation

EMC**Emissions**

Mil-PRF-28800F

EN61326: 1998 class A

EN61000-3-2

EN61000-3-3

Immunity

Mil-PRF-28800F

EN61326: 1998
EN61000-6-1

SAFETY

Standard

UL 61010-1

Usage Environment

Indoor use, maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% RH at +40°C, Installation Category II, Pollution degree 2

AC INPUT POWER (AC TO DC CONVERTER / CHARGER UNIT)

AC Input Voltage Range

100 to 240 VAC, 1.5 A max., 47 Hz - 63 Hz

AC Input Voltage Fluctuation

Less than 10% of the nominal input voltage

Transient Overvoltage

According to Installation Category II

Usage Environment

Indoor use, maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% RH at +40°C, Installation Category II, Pollution degree 2

Operating Temperature

0°C to +40°C

Storage Temperature

-20°C to + 85°C

EMI

EN55022 class B, EN61000-3-2 class D

Safety

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

DC INPUT POWER

DC Input Voltage Range (DC INPUT CONNECTOR)

11 VDC to 32 VDC

DC Power Input, Max. (DC INPUT CONNECTOR)

55 W

DC Power Input, Nominal (DC INPUT CONNECTOR)

25 W

DC Fuse Requirement (DC INPUT CONNECTOR)

5A, 32VDC, 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

Battery Operation Time

5 hours continuous use

No backlight, duty cycle 80% transmitter and 20% Receiver tests, Auto shutoff if key is not pressed for 10 minutes

7 hours typical use

Battery Charge Time

4 hours

Note: Battery to be charged at temperatures between +0°C and +45°C only

DIRECTIONAL COUPLER

Coupling

30 dB

Frequency Range

20 MHz to 200 MHz

Power Rating

250 W CW

Insertion Loss

0.25 dB Max.

VSWR

1.10:1 Max.

Flatness

+/- 0.5 dB Max.

Directivity

20 dB Min

Connectors

RF In: Type N

RF Out: Type N

FWD: BNC

REV: BNC

Kit Includes

Coupler (Werlatone Model: C1569-13)

2 BNC cables (12 in)

2 Adapters (N-F to BNC-F)

1 10 dB attenuator

20 db/50 W ATTENUATOR

Attenuator Type

Bi-Directional

DC - 18 GHz

Power Rating

(mounted horizontally): 50 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 10 Watts @ 125°C. 1 kW peak (5 μsec pulse width; 2.5% duty cycle).

Kit Includes

20 dB/50 W attenuator

N-F, BNC-F adapter

TNC-M, N-M adapter

20 db/150 W ATTENUATOR

Attenuator Type

Uni-Directional

DC - 1.5 GHz

Power Rating

(mounted horizontally with fins vertical): 150 watts average (unidirectional) to 55°C ambient temperature, derated linearly to 10% @ 125°C.

Kit Includes

20 dB/150 W attenuator

N-F, BNC-F adapter

N-M, BNC-F adapter

P25 FUNCTIONS

- C4FM Modulation Fidelity
- C4FM Frequency Error
- Power
- Tx BER
- STD 1011, 0.153 CAL Generator for BER

VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers

Ordering Numbers	Description
3500A	Portable Radio Test Set
3500AUK	Portable Radio Test Set plus upgrade kit

3500A SUPPLIED ACCESSORIES

- Case, Soft -Sided Carrying
- External DC Power Supply
- Power Cable (AC)
- Handset
- Short-Open-Load VSWR Calibrator
- Comm Breakout Box
- 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)
- Case, Accessory
- Power Cable (DC 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)
- Flash Drive, 1 GB USB

3500AUK ADDITIONAL SUPPLIED ACCESSORIES

- Flip Cover
- Attenuator (20 dB / 50 W)
- Adapter (N-M to TNC-M)
- 2 X Adapter (N-F to BNC-F)
- Attenuator (20 dB / 150 W)
- Adapter (N-M to BNC-F)

Options

- 35XX0PT01 Spectrum Analyzer
- 35XX0PT02 Oscilloscope
- 35XXOPT07 P25 Test
- 35XXOPT08 Tracking Generator.

Optional Accessories

AC number	Description
AC27002	Attenuator (20 dB / 50 W), Adapter (N-F to BNC-F), Adapter (N-M to TNC-M)
AC27003	Attenuator (20 dB / 150 W), Adapter (N-F to BNC-F), Adapter (N-M to BNC-F)
AC27013	Directional Coupler (20 to 200 MHz), 2 X Adapter (N-M to BNC-F), Attenuator (10 dB), 2 X Cable (BNC) (M-M) (16 in)
AC27005	Battery, Spare
AC27001	Case, Transit
AC27006	Flip Cover
AC27009	CD Maintenance Manual (CD)
AC0820	Desk Top Stand
AC0826	Tripod
AC24006	Tripod, Dolly, Stand
AC25055	QMA Adapter Kit (Includes 24 assorted adapters)
AC25056	4 ft Blue Streak QMA to QMA quick connect cable
AC25057	AC25055 + AC25056 Combo

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