

Military Communications

3515 Military Portable Radio Communications Test Set

AEROFLEX
A passion for performance.



The Aeroflex 3515 was developed for military use and offers rugged construction and testing in the 2 MHz to 1 GHz frequency range.

- H-250 SINCGARS handset adaptor
- Military version of 3500
- Packaged options simplify ordering
- Easy portability - weighs only 8.5 lbs. (3.9 kg)
- 5 hour battery life
- 2 MHz - 1 GHz operation
- Rugged construction
- -20°C to +50°C operating temperature range
- Built-in generator and receiver to 1 GHz
- Spectrum Analyzer
- Oscilloscope
- AM/FM transmitter tests
 - RF power
 - RF frequency error
 - AM modulation / FM deviation
 - Audio frequency counter
 - Receive Signal Strength Indicator (RSSI)
- AM/FM receiver tests
 - DCS generator
 - Distortion
 - SINAD/sensitivity
- Antenna/cable tests
 - VSWR
 - Distance to fault
 - Return loss
 - Cable loss
- Software defined features allow field upgrades
- Handset and antenna allow over the air "Talk Test"

The Aeroflex 3515 is a Military Portable Radio Communications Test Set with the latest in portability, battery life and performance. The Aeroflex 3515 builds upon Aeroflex's expertise in developing portable radio test sets with exclusive features and affordability that are destined to set a new standard in portable radio test sets. The 3515 was developed for military use and is capable of measuring high power (20 W without an external attenuator, up to 150 W with an external attenuator provided), as well as finding faults in antennas, power amplifiers and interconnects. The 3515 meets the needs of a variety of vehicle radio tests, as well as commercial radio applications. With the additional capability to perform quick testing of antennas and cables, the 3515 provides the most complete in-vehicle test solution available to quickly isolate problems and assess performance of the radio, cable and antenna systems. The 3515 was designed to significantly reduce the number of radios incorrectly removed from vehicles where it was later determined to have no trouble found. With extensive operational capability, the 3515 provides portable test features that are typically found in bench top radio test equipment.

Portable and Rugged

The 3515 was designed from the ground up to be portable and rugged, weighing in at only 8.5 lbs (3.9 kg) including the battery. It has a solid aluminum weatherproof case, an operating temperature range of -20°C to +50°C, and rugged construction specifications for humidity, altitude, shock, and vibration. The battery gives the user 5 hours of operation and can be fully recharged and ready to operate in only 4 hours. In addition, the 3515 and the optional accessories can be stored in a ruggedized transport case.

For the very latest specifications visit www.aeroflex.com

Quick Drive By Testing To Isolate Radio Installation Failures - Military or Civilian

Designed to be used for quick Drive By Testing, the 3515 can efficiently and easily find radio failures. 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. A handset is provided to check voice quality of the transmitter and receiver. Additionally, the 3515 provides a standard H-250 adaptor to use with the standard H-250 SINCGARS handsets.

DRIVEBY TEST		
Generator MHz: 151.625000 Port: ANT Mod: FM Lvl: -40 dBm	Receiver MHz: 151.625000 Port: ANT Mod: FM 12.5k AFBW: 0.3-5k BP	MOD-FMDEV 4.178 0 kHz 100
Modulator Freq/Code FM Gen 1: ON 1000.0 Hz 3.00 kHz DCS ON 025 0.60 kHz MIC: ON 3.00 kHz Ext Aud: OFF Load: High Z		RSSI -61.94 -110 dBm 43
Bat: 85 Temp: 29 Vol: 10 Recall Save Aud Out Speaker	RF-ERROR 0.023 -200 kHz 200	Cable Offset: 0.0 RF Amp: On
<input type="button" value="Edit"/> <input type="button" value="Return"/> <input type="button" value="System"/> <input type="button" value="Setup"/> <input type="button" value="Ptt off"/>		

Drive By Test Screen

Bench Top Testing

Also included in the operation of the 3515 is 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 can be easily accessed and tested with the 3515. In the Bench Top Mode, the user has the ability to tailor the operation of the 3515 to the type of testing to be performed. The user can select a Receiver Test, Transmitter Test, or Duplex Test screen from the Bench Top Menu screen.

1 - RECEIVER TEST
2 - TRANSMITTER TEST
3 - DUPLEX TEST
4 - SWR TEST
5 - METERS
6 - AUDIO
7 - SETUP
<input type="button" value="Return"/> <input type="button" value="System"/> <input type="button" value="Setup"/> <input type="button" value="Ptt off"/>

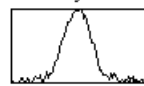
Bench Top Menu Screen

If the Receiver Test is selected, the 3515 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 3515 can modulate the carrier with both a test tone and a squelch tone. In addition, the operation of Gen 2 can be changed to be DCS or DCS invert, enabling the testing of mobiles requiring a digitally coded squelch.

RECEIVER TEST		
Generator MHz: 172.625000 Port: T/R Mod: FM Lvl: -99 dBm	SINAD-AUDIN 32.9 0 dB 60	DIST-AUDIN 2.8 0 % 100
Modulator Freq/Code FM Gen 1: ON 1000.0 Hz 3.50 kHz Gen 2: ON 67.0 Hz 0.75 kHz MIC: OFF 3.00 kHz Ext Aud: OFF Load: High Z		AF-COUNTER 999.7 15 Hz 20000
Bat: 71 Temp: 29 Vol: 10 Recall Save Aud Out Speaker	<input type="button" value="Edit"/> <input type="button" value="Return"/> <input type="button" value="System"/> <input type="button" value="Setup"/>	

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. The 3500 also has the capability to measure the frequency of the demodulated audio.

TRANSMITTER TEST		
Receiver MHz: 151.625000 Port: T/R Mod: FM 12.5k AFBW: 0.3-5k BP		RF-ERROR -0.023 -200 kHz 200
	MOD-FMDEV 1.586 0 kHz 100	RF-POWER 1.30 0 Watts 20
Bat: 60 Temp: 30 Vol: 0 Recall Save Aud Out Speaker		Analyzer 
<input type="button" value="Edit"/> <input type="button" value="Return"/> <input type="button" value="System"/> <input type="button" value="Setup"/>		

Transmitter Test Screen

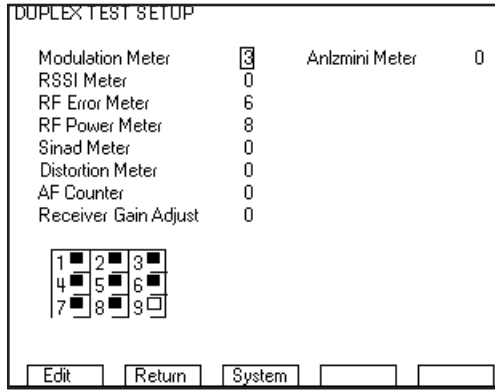
The Duplex Test Screen operates as both a signal generator and analyzer, allowing simultaneous testing of the transmitter and receiver of the radio being tested. All of the capabilities of the transmitter test screen and the receiver test screen are included in this screen.

DUPLEX TEST		
Generator MHz: 151.625000 Port: T/R Mod: FM Lvl: -50 dBm	Receiver MHz: 151.625000 Port: T/R Mod: FM 25k AFBW: C-wt BP	MOD-FMDEV 2.960 0 kHz 100
Modulator Freq/Code FM Gen 1: ON 1000.0 Hz 3.00 kHz DCS ON 026 0.60 kHz MIC: OFF 0.00 kHz Ext Aud: OFF Load: High Z		RF-ERROR -0.040 -200 kHz 200
Bat: 34 Temp: 30 Vol: 0 Recall Save Aud Out Speaker	RF-POWER 1.02 0 Watts 20	<input type="button" value="Edit"/> <input type="button" value="Return"/> <input type="button" value="System"/> <input type="button" value="Setup"/> <input type="button" value="Ptt off"/>

Duplex 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.



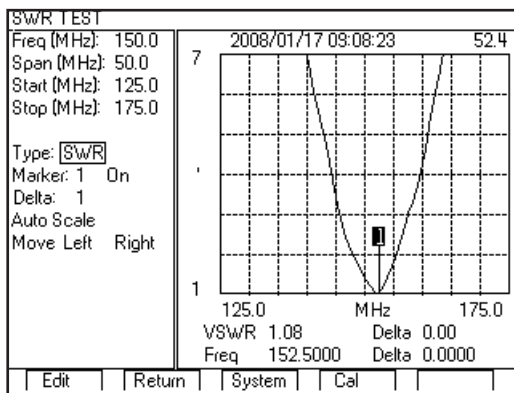
Setup Screen

Isolate Cable and Antenna Problems

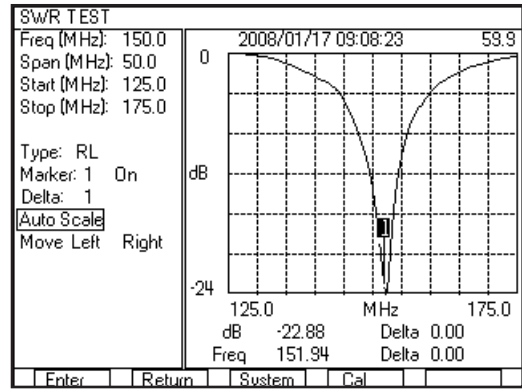
By utilizing Frequency Domain Reflectometry (FDR) techniques, the 3515 includes the capability to measure the VSWR and return loss of an antenna. In addition, FDR enables the 3515 to measure the cable loss and Distance to Fault (DTF) of a cable. By isolating the problem to the cable, connector or antenna, the user 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 versus frequency is useful for observing the characteristics of an antenna. The following two screenshots show examples of these two types of measurements.

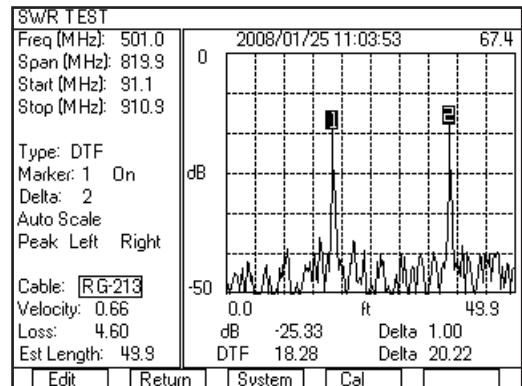


SWR Test Screen Showing VSWR Versus Frequency



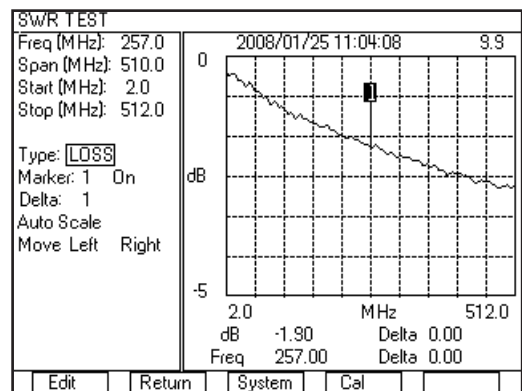
SWR Test Screen Showing RL Versus Frequency

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). The following screenshot shows a cable that has two faults, with the location of marker 1 at the first fault and marker 2 at the second fault.



SWR Test Screen Showing Return Loss Versus Feet

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 screenshot shows the loss of a cable over the frequency range of 150 MHz to 500 MHz.



SWR Test Screen Showing Loss versus Frequency

Up to three markers can be enabled for use in analyzing the

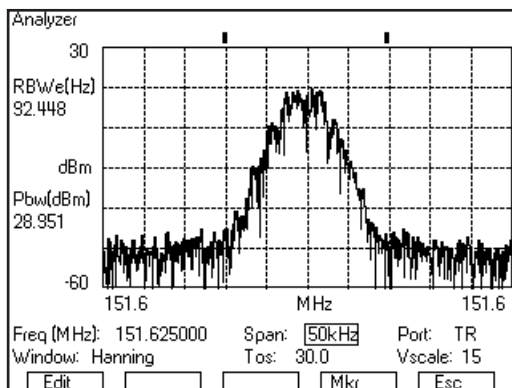
graphical data that is acquired on the SWR test screen. The markers provide the user with information on the precise return loss at a given distance for DTF mode or the exact VSWR at a given frequency for SWR mode. A delta function, associated with the markers, is also available in order to show the difference in VSWR and frequency, or return loss and feet, between two of the markers.

Save/Recall Features

The 3515 allows users to define pass/fail parameters and configure the test parameters and then save these files 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.

Spectrum Analyzer (35XXOPT01)

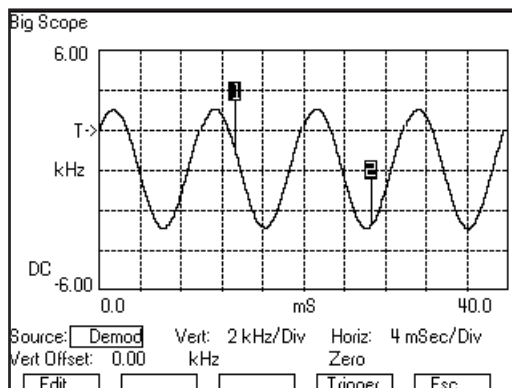
Now available as an option for 3500 is an FFT based spectrum analyzer. An FFT analyzer uses a snapshot of the incoming RF signal that is within the selected span and converts it to a frequency spectrum. The advantage of using this method is that the spectrum is converted from one set of data not from 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 3500 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 3500 Spectrum Analyzer can be accessed from the Transmitter Test screen, the Duplex Test screen, and as a stand-alone spectrum analyzer.



Full Screen Spectrum Analyzer

Oscilloscope (35XXOPT02)

The latest option for the 3500 is an audio bandwidth Oscilloscope. The option enables the 3500 to 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.



Full Screen Oscilloscope

Future Updates

The 3515 utilizes a software-defined radio architecture. The software defines almost all of the functionality of the test set from the RF physical layer and up. This software-defined feature allows for future updates and improvements to the capability of the instrument and allows the user to easily add options or update functional improvements in the field, without the need to return the instrument to the factory.

SPECIFICATION

RF SIGNAL GENERATOR

FREQUENCY

Range

2 MHz to 1 GHz

Resolution

1 Hz

Accuracy

Same as timebase

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/0.1 μ V

Accuracy

± 2 dB

SSB PHASE NOISE

-80 dBc/Hz at 20 kHz offset

SPURIOUS

Harmonics

-30 dBc

Non-Harmonics

-40 dBc ($> \pm 20$ 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 24.0 kHz

Resolution

0.1 Hz

Accuracy

Timebase ± 2 Hz

FM DEVIATION (GEN 1 AND GEN 2)

Range

Off, 500 Hz to 50 kHz

Total Harmonic Distortion

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

Resolution

10 Hz

Accuracy

$\pm 10\%$ (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

Level: 1 to 30 mVrms, voiced tone (whistle)

Frequency range: 400 Hz to 1.2 kHz

Slope: Positive voltage yields positive deviation

AUDIO IN

Switchable loads: 150 ohms, 600 ohms, High Z

Input levels: 0.05 to 3 Vrms

Frequency range: 300 Hz to 5 kHz

Level sensitivity: 1 kHz/35mVrms

Slope: Positive voltage yields positive deviation

AM MODULATION (GEN 1 AND GEN 2)

Range

OFF, 0 to 100% (0 Hz to 24 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

Frequency range: 400 Hz to 1.2 kHz

AUDIO IN

Switchable loads: 150 ohm, 600 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 24.0 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)

HANDSET

Frequency Range

300 Hz to 1.2 kHz

Input Level

0.03 Vrms to 8 Vrms

PTT Operation

PTT On/Off will change between TRANSMITTER TEST and RECEIVER TEST

PTT On Low GND

PTT Off Hi Open with Pull-up

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 preamp)

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 and modulation)

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

T/R: -20 dBm to max. input level (RF error, distortion and modulation)

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

Maximum Input Level

ANT: +20 dBm/0.1 W for 10 sec.

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

None, 15 k LP, 5 k LP, 0.3 k LP, 0.3-5 k BP, 0.3 k HP, C-Wt BP, CCITT BP

Audio Output Level Sensitivity

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

AM: $7 \text{ mVrms}/\% \text{ AM} \pm 15\%$

Speaker Output

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

VOLUME CONTROL

Range

0 - 100

LO Emissions

> -50 dBc

Quieted Channels

10 frequencies allowed between 2 MHz and 999.999 MHz quieted by no more than 30 dB

This is the replacement for the compliance section.

RF TRANSMITTER TEST METERS

RF FREQUENCY ERROR METER

Range

$\pm 200 \text{ kHz}$

Resolution

1 Hz

Accuracy

Same as timebase $\pm 2 \text{ Hz}$

RSSI INDICATOR (RF POWER WITHIN RECEIVER IF BANDWIDTH)

Display Range

dBm: -120 dBm to +43 dBm (+53 dBm with Ext Attn dB set to 20 dB)

Watts: 10 pW to 20 W (200 W with Ext Attn dB set to 20 dB)

Usable Meter Reading RF Level Range

T/R Port: -50 dBm to +43 dBm

ANT Port (without RF Amp On): -90 dBm to -10 dBm

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

Resolution

0.01 dBm

Accuracy

$\pm 3 \text{ dB}$ (> -50 dBm into T/R, > -90 dBm into ANT or > -120 dBm into ANT with RF Amp On)

RF POWER METER (BROADBAND RF POWER INTO T/R PORT)

Display Range

Ext attenuation set to 0 dBm: 0 to 43 dBm (0 to 20 W)

Ext attenuation set to 20 dBm: 0 to 53 dBm (0 to 200 W)

Minimum Input Level

0.10 W/+20 dBm

Maximum Input Level

No external attenuator:

20 W/43 dBm for 10 min. at +25° C or until thermal alarm sounds

With external 50 W attenuator:

50 W/47 dBm average at +25°C

With external 150 W attenuator:

150 W/51.8 dBm average for temperatures up to +25°C, linearly derated to 125 W at 55° C

200 W/53 dBm peak for 30 seconds on/5 min. off at +25°C

Resolution

0.01 W/0.1 dBm

Accuracy

$\pm 1 \text{ dB}$ for internal attenuator

$\pm 1.5 \text{ dB}$ using external attenuator

FM DEVIATION METER

Range

500 Hz to $\pm 100 \text{ kHz}$

Modes

Peak+, Peak-, (Peak+ - Peak-)/2

Resolution

1 Hz

Accuracy

$\pm 10\%$ of reading

Typically <3% (1 kHz rate, 5 kHz deviation)

AM PERCENT METER

Range

5% to 100%

Modes

Peak+, Peak-, (Peak+ - Peak-)/2

Resolution

1%

Accuracy

$\pm 5\%$ of reading, 1 kHz rate, 30% to 90% modulation, 3 kHz LPF

SWR TEST

Frequency Range

2.0 MHz to 1000.0 MHz

Span Range

10.0 MHz to 998 MHz

Start Range

2.0 MHz to 990.0 MHz

Stop Range

12.0 MHz to 1000.0 MHz

Frequency Resolution

0.1 MHz

Markers

3

SWR MEASUREMENT

VSWR Range

1.00 to 7.00

Resolution

0.04

Accuracy

±10% of SWR readings (calibrated) <300 MHz

±20% of SWR readings (calibrated) =300 MHz

RETURN LOSS (RL) MEASUREMENT

Range

0.0 to -50.0 dB

Resolution

0.01 dB

CABLE LOSS MEASUREMENT

Range

0.0 to -50.0 dB

Resolution

0.01 dB

DTF MEASUREMENT

Measurement Range

3ft to 328 ft

Span Range

41 ft to 408 ft

Resolution

0.1 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 (EXT AUDIN)

Source

BNC input on handset

Frequency Range

300 Hz to 10 kHz

Level Range

0 V 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%

SPECTRUM ANALYZER (OPTIONAL)

FREQUENCY

Range

2 MHz to 1 GHz

Resolution

1 Hz

Accuracy

Same as timebase

FM DEVIATION METER

Range

500 Hz to ±100 kHz

Modes

Peak+, Peak-, (Peak+ - Peak-)/2

Resolution

1 Hz

Accuracy

±10% of reading

Typically <3% (1 kHz rate, 5 kHz deviation)

AM PERCENT METER

Range

5% to 100%

Modes

Peak+, Peak-, (Peak+ - Peak-)/2

Resolution

1%

Accuracy

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

OSCILLOSCOPE (OPTIONAL)

Source

DVM, Audio In, Demod

Traces

One

Markers

Two

Trigger

Type

Auto, Norm

Edge

Rising, Falling

Level

-50 to +50 V

Horizontal10 μ s to 1 s per horizontal division in a 1/2/5 sequence**Vertical**

FM demod

10 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 μ V to 10 V per vertical division in a 1/2/5 sequence**Coupling**

DC

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

8.5 lbs. (3.9 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-288000F, 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

Usable 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

Usable 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, Maximum (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 min.

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

VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering numbers	Description
3515	Military Portable Radio Communications Test Set

3515 SUPPLIED ACCESSORIES

Case, Soft -Sided Carrying
External DC Power Supply
Power Cable (AC)
Handset
Handset Cable
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/Maintenance/ICW Manual (CD)
Attenuator (20 dB / 50 W)
Attenuator (20 dB / 150 W)
Adapter (N-F to BNC-F)
Adapter (N-M to BNC-F)
Adapter (N-M to TNC-M)
Flip Cover
Handset Adapter (H-250)
Antenna (BNC) (50 MHz)
Antenna (BNC) (150 MHz)
Antenna (BNC) (450 MHz)
Antenna (BNC) (800 MHz)
Power Cable (DC NATO adaptor)

Options

35XXOPT01	Spectrum Analyzer
35XXOPT02	Oscilloscope

OPTIONAL ACCESSORIES

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)
AC27001	1	Case, Transit
AC27005	1	Battery, Spare
AC0820	1	Desk Top Stand
AC0826	1	Tripod
AC24006	1	Tripod, Dolly, Stand
AC25055	1	QMA Adapter Kit (Includes 24 assorted adapters)
AC25056	1	4 ft Blue Streak QMA to QMA quick connect cable
AC25057	1	AC25055 + AC25056 Combo

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