

# Military Communications

## 3515A Military Portable Radio Communications Test Set

**AEROFLEX**  
A passion for performance.



### New Integrated Audio Connectors

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

#### Featuring

- 2 MHz - 1 GHz operation
- AM/FM transmitter and receiver tests
- Over-the-air testing
- Antenna/cable tests

#### And now available in release 3.5.x

- Scripting Language Option
- PRM-34 Test Script
- Improved Antenna and Cable Test Operation

The Aeroflex 3515A is a Portable Radio Communications Test Set with the latest in portability, battery life and performance. The Aeroflex 3515A 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 3515A 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 3515A 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 3515A provides the most complete in-vehicle test solution available to quickly isolate problems and assess performance of the radio, cable and antenna systems. The 3515A was designed to significantly reduce the number of radios incorrectly removed from vehicle where it was later determined to have no trouble found. With extensive operational capability, the 3515A provides portable test

features that are typically found in bench top radio test equipment.

#### 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

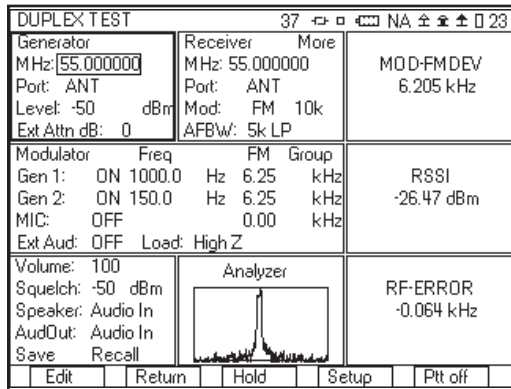
Aeroflex engineers designed the 3515A from the ground up to be portable and rugged, weighing in at less than 8 lbs (3.6 kg) including the battery. It has a solid magnesium alloy weatherproof case, an operating temperature range of -20° to +50°C, and rugged construction specifications (Mil-PRF-28800A) 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 3515A and the optional accessories can be stored in a ruggedized transport case.

#### Features and Functions

- Handset and antenna allow over the air "Talk Test"
- RSSI Meter
- RF Error Meter
- Modulation Measurements
- Audio Frequency Counter
- Spectrum Analyzer Option
- Audio Frequency Oscilloscope
- Scripting Language Option for Custom Applications

For the very latest specifications visit [www.aeroflex.com](http://www.aeroflex.com)

Designed to be used for quick installed radio testing, the 3515A 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. 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 the 3515A is transmitting or receiving. The Duplex test screen, shown below, is ideal for making quick transmitter and receiver measurements on an installed radio system.

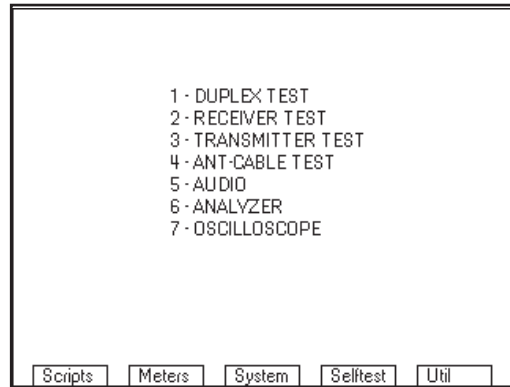


Duplex Test Screen

### Bench Top Testing

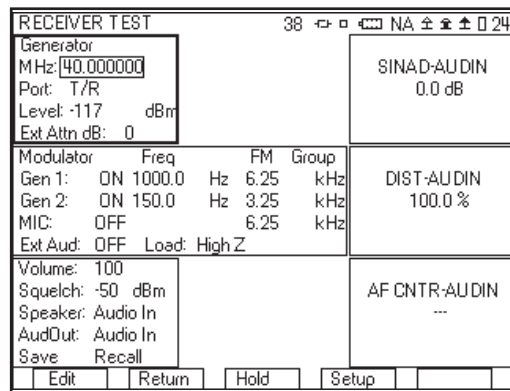
- RF power
- RF frequency error
- AM modulation/FM deviation
- Audio frequency counter
- Receive Signal Strength Indicator (RSSI)
- DCS encode/decode
- DTMF encode/decode
- Distortion meter
- SINAD/sensitivity
- Spectrum analyzer
- Audio frequency oscilloscope
- Frequency find
- Audio level meter

In addition to performing over the air measurements, the 3515A 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 3515A.



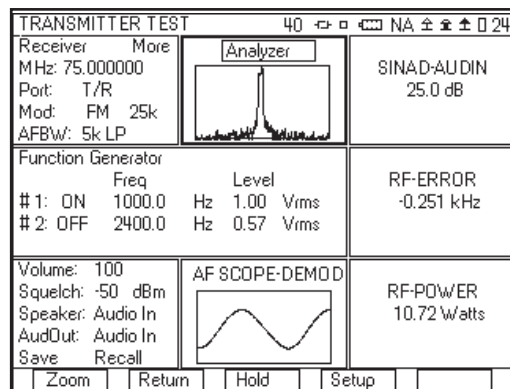
System Menu Screen

If the Receiver Test is selected, the 3515A 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 3515A can modulate the carrier with both a test tone and a squelch tone. Alternatively, the internal generators can generate both an audible test tone and squelch tone.



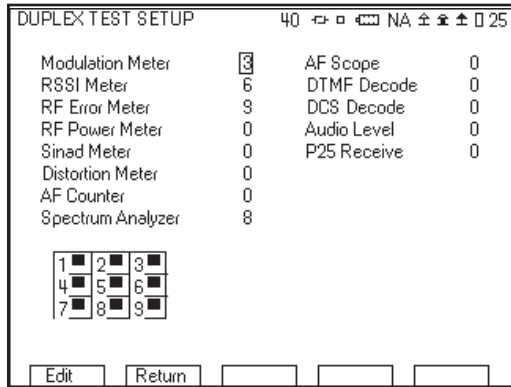
Receiver Test Screen

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 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.



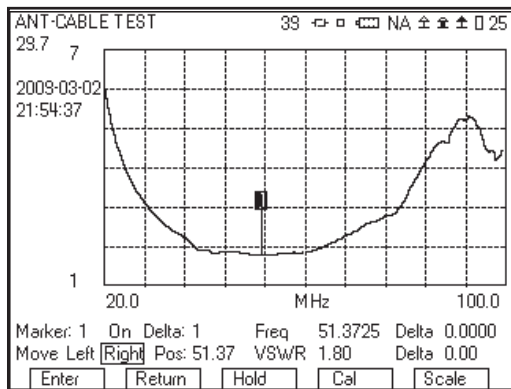
Duplex Test Setup Screen

**Isolate Cable and Antenna Problems**

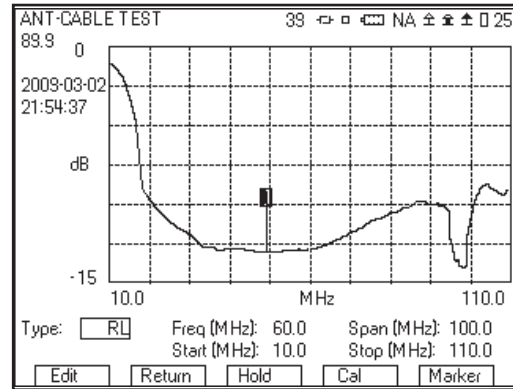
Since many radio faults lie in the cabling and/or antenna and not with the radio, the 3515A includes the capability to measure the VSWR or return loss of an antenna, and the loss or distance to fault of a cable. By isolating the problem to the cable, connector or antenna, you can avoid returning good 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. The following two screenshots show examples of these two types of measurements.

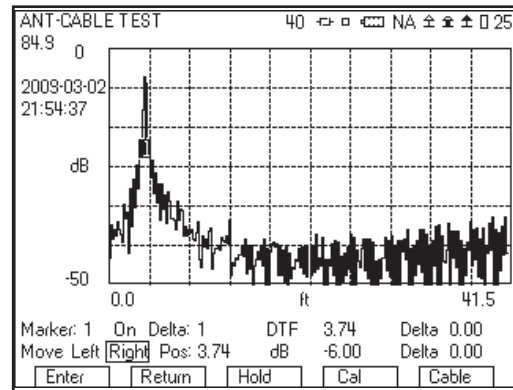


SWR Test Screen Showing VSWR Versus Frequency



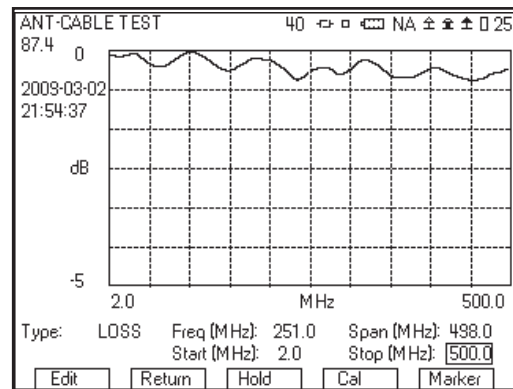
SWR Test Screen Showing RL Versus Frequency

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 display of a cable that is 3.74 feet in length.



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 500 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

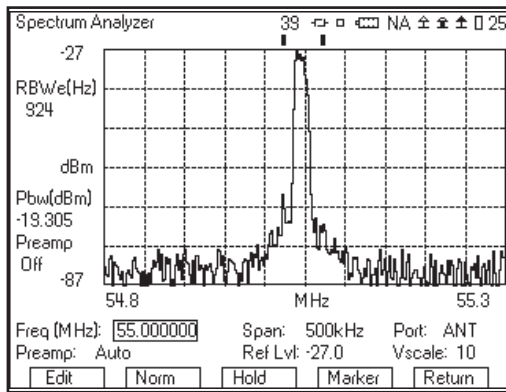
mode. A delta function, associated with the markers, is also available in order to show the difference in VSWR and frequency, or return loss and feet, between two of the markers.

**Save/Recall Features**

The 3515A 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.

**Spectrum Analyzer (35XXOPT01)**

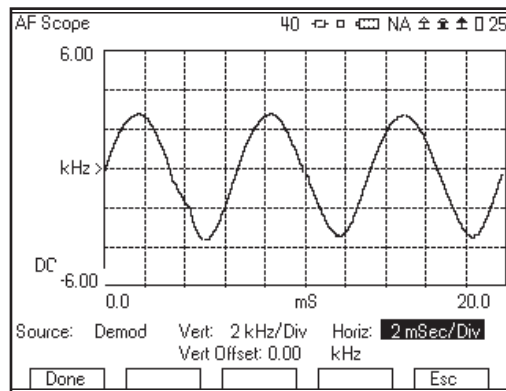
Now available as an option for 3515A is an FFT based spectrum analyzer. An FFT analyzer uses a snapshot of the incoming RF signal that is within the selected span and converts it to a frequency spectrum. The advantage of using this method is that the spectrum is converted from one set of data and not 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 3515A 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 3515A 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)**

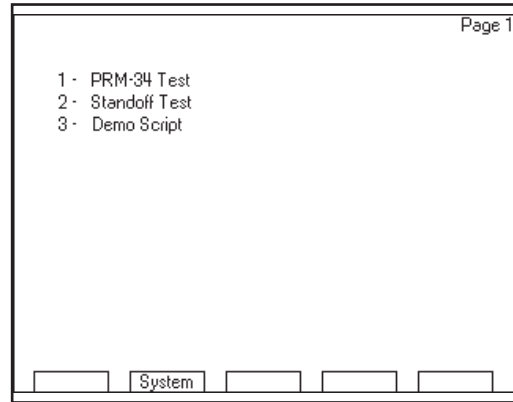
The Oscilloscope option enables the 3515A to display external audio or the demodulated audio of a received signal. The oscilloscope features 2 markers and a horizontal range of 0.5 mS/Div to 0.1 Sec/Div, sufficient for observing and analyzing audio signals.



*Audio Frequency Scope*

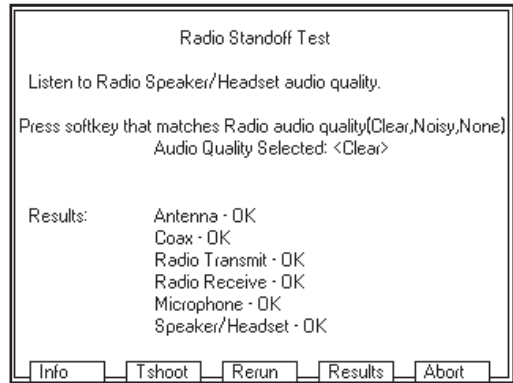
**Scripting Language (35XXOPT05)**

The latest option for the 3515A is the Scripting Language Option. The Scripting Language allows the user to develop and implement test procedures, including instrument settings, reading user prompts and instructions, plus collect and record data. This powerful feature reduces and helps to eliminate operator training, reduces errors and documents testing results.



*Script Set-up*

As shown in the screen above, a simple selection menu allows a particular script to be recalled for test. The Standoff Test screen (below) shows one example of how Scripting can be used to create a simple but effective means to isolate faulty components within a radio installation.



*Standoff Test Screen*

**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  $\mu$ V to .224  $\mu$ V  
ANT port: -30 to -90 dBm/7071  $\mu$ V to 7.07  $\mu$ V  
SWR port: -5 to -65 dBm/125743  $\mu$ V to 126  $\mu$ V

### Resolution

1 dB/0.01  $\mu$ 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 (>  $\pm$ 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 20.0 kHz

### Resolution

0.1 Hz

### Accuracy

Timebase  $\pm$ 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

$\pm$ 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

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  $\pm$ 2 Hz

## OUTPUT LEVEL

### Load Impedance

600 ohms

### Range

0 to 1.57 Vrms

### Resolution

0.01 Vrms

### Accuracy

±10%

### Distortion

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

## RF RECEIVER

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### 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  $\mu$ V), typical 10 dB SINAD (-110 dBm with pre-amp)

T/R: -40 dBm (2236  $\mu$ 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 k BP, 0.3-5 kBP, 0.3-3 kBP, 0.3HP, CCITT BP, C-Wt BP, 15 K LP, 5 K LP, 3 K LP, 0.3 K LP

#### 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

1 Hz

### Accuracy

Same as timebase  $\pm$ 2 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

±3 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 minutes 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 minutes off at +25° C

### Resolution

0.01 W/0.1 dBm

### Accuracy

±1 dB for internal attenuator

±1.5 dB using external attenuator

## FM DEVIATION METER

### Range

500 Hz to  $\pm 100$  kHz

### Modes

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

### Resolution

1 Hz

### Accuracy

$\pm 10\%$  of reading, 500 Hz to 100 kHz Deviation

$\pm 5\%$  1 kHz to 10 kHz Deviation, 150 kHz and 1 kHz rate

## 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

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### 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

### VSWR Accuracy

$\pm 10\%$  of SWR readings (calibrated) <300 MHz

$\pm 20\%$  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

### 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 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

$\pm 1.5$  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**

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**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**

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**Measurement Sources**

Audio In, DVM

**Frequency Range**

200 Hz to &lt;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)**

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**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

**Level**

Ref Lvl range

-70 to +10 dBm preamp off

-90 to +10 dBm preamp on

Ref Lvl resolution

0.1 dB

Vertical scales

2, 5, 10, 15, and 20 dB/division

**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 (&gt;-50 dBm into T/R, &gt; -90 dBm into ANT or &gt; -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)**

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**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/div1

## Vertical

FM demod

0.1 kHz to 50 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

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### Temperature Stability

±0.25 ppm at 25°C

±0.5 ppm over temp range

### Aging

1 ppm/year standard

### Warm-up time

3 min.

## ENVIROMENTAL / PHYSICAL

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### 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-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

### 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  $-20^{\circ}\text{C}$ , nor above  $+60^{\circ}\text{C}$

### 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  $+0^{\circ}\text{C}$  and  $+45^{\circ}\text{C}$  only

## DIRECTIONAL COUPLER

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### 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

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Attenuator Type

Bi-Directional

DC - 18 GHz

Power Rating

(mounted horizontally): 50 watts average (bi-directional) to  $25^{\circ}\text{C}$  ambient temperature, derated linearly to 10 Watts @  $125^{\circ}\text{C}$ . 1 kW peak (5  $\mu\text{sec}$  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

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Attenuator Type

Uni-Directional

DC - 1.5 GHz

### Power Rating

(mounted horizontally with fins vertical): 150 watts average (unidirectional) to  $55^{\circ}\text{C}$  ambient temperature, derated linearly to 10% @  $125^{\circ}\text{C}$ .

### Kit Includes

20 dB/150 W attenuator

N-F, BNC-F adapter

N-M, BNC-F adapter

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## VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers	Description
3515A	Military Portable Radio Communications Test Set

### 3515A SUPPLIED ACCESSORIES

Case, Soft -Sided Carrying  
External DC Power Supply  
Power Cable (AC)  
Power Cable (DC NATO adapter)  
Handset  
Comm Breakout Box  
Cable (TNC) (M-M) (48 in)  
2 X Cable (BNC) (M-M) (48 in)  
Case, Accessory  
5 X Adapter (BNC-F to TNC-M)  
2 X Fuse, Spare (5 A, 32 Vdc, Type F)  
Short-Open-Load VSWR Calibrator  
Adapter (N-F to BNC-F)  
Adapter (N-M to BNC-F)  
Adapter (N-M to TNC-M)  
Adapter (N-F to BNC-M)  
Antenna (BNC) (2 to 30 MHz)  
Antenna (TNC) (30 to 90 MHz)  
Antenna (BNC) (450 MHz)  
Attenuator (20 dB/50 W)  
Attenuator (20 dB/150 W)  
Flash Drive, 1 GB USB  
Getting Started Manual (Paper)  
Operation/Maintenance/ICW Manual (CD)

### Options

35XXOPT01	Spectrum Analyzer
35XXOPT02	Oscilloscope
35XXOPT05	Scripting Language
35XXOPT25	PRM34 Testing Script

### Optional Accessories

AC number	Description
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	Case, Transit
AC27005	Battery, Spare
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

### EXPORT CONTROL:

This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

### EXPORT WARNING:

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