Military Communications

3515 Series Portable Radio Communications Test Set

AEROFLEX
A passion for performance.

The Aeroflex 3515 is a first-line radio test set designed to verify that portable radios, man-pack radios, vehicle and aircraft radios are mission ready.

Does my radio meet mission requirements?

Will your radio work when you are far away from base? Does the microphone and speaker provide undistorted, clear audio? Will you be understood?

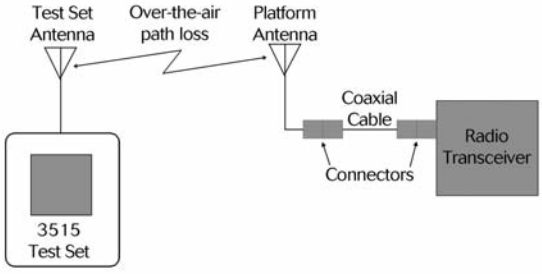
The Aeroflex 3515 Test Set can answer these questions and more. The Aeroflex 3515 includes the instruments and features needed to solve field testing problems for modern military radios, including digital radios.

Features and Functions

- *Reduces "No Fault Found"* - find broken components and faulty installations at the source, reducing warranty repair cost and minimizing down time.
- *Designed for field use* - the 3515 weighs less than 8 pounds, is battery operated and meets MIL-PRF-28800F, Class II environmental specifications.
- *Test radios over-the-air* - verifies the transmitter, receiver, antenna, microphone and speakers are mission ready - fast and unobtrusive, no need to "break open" a vehicle or aircraft to test it, eliminating test-induced failures.
- *Automated test applications* (optional) - automated test applications can guide novice users through the radio test process step-by-step, even providing "how-to" instructions on setting up the radio. A test script may also store vehicle/aircraft inventory, test results or other important information.
- *Full-Featured Radio Test Set* - the 3515 includes the radio instruments and testing functions needed for testing antennas, coax cables, transmitters, receivers and audio systems.
- *Powerful and Expandable* - optional capabilities include automated test applications, a spectrum analyzer for signal monitoring and an oscilloscope for audio signal analysis.
- Reduces your test equipment footprint - the compact and portable 3515 will reduce the test equipment inventory required in the field. Standard instruments included in the 3515:

RF Signal Generator	SINAD/Distortion Meter
RF Receiver	Audio Generators
Modulation Meters	RF Power Meters

The 3515 tests the radio in its normal operation mode without having to disconnect any radio components to take measurements. The 3515 acts as an external radio and tests through your radios' antenna to perform a complete system operation check. The 3515 provides detailed and accurate measurements of critical parameters such as transmit power, frequency error, modulation and receiver sensitivity to ensure peak radio operation throughout the mission.



Previous generation field testers, such as through-line watt meters and others, require opening the system and "breaking" connections within the radio signal path to insert the tester. This invasive activity requires extra time, causes disruption to deployment activities and is a source for test-induced failures.

What about digital radios?

Aeroflex understands that in today's military, digital communications are just as important as voice communications. The 3515 verifies digital radios over-the-air and non-intrusively. The 3515 supports EPLRS, SADL and P25 radios.

Military Radios Systems and Platforms

Below is a partial list of radio systems and models that may be tested with the 3515 Series equipment. Some tests require optional testing application scripts and/or accessories.

Radio Systems	In Vehicle Test	In Aircraft Test	Manual Test	Antenna/Coax Test
VHF Ground COMMS (SINCGARS, others)	X	X	X	X
VHF Airbrone COMMS	-	X	X	X
UHF Airborne COMMS	-	X	X	X
UHF SATCOM/SLOS/BLOS	X	X	X	X
EPLRS/SADL	X	X	X	X
Public Safety/APCO-P25	X	X	X	X
Conventional AM/FM COMMS	X	X	X	X
Audio and Intercom	X	X	X	-
Force Protection	X	-	X	X
Life Support	X	X	X	X

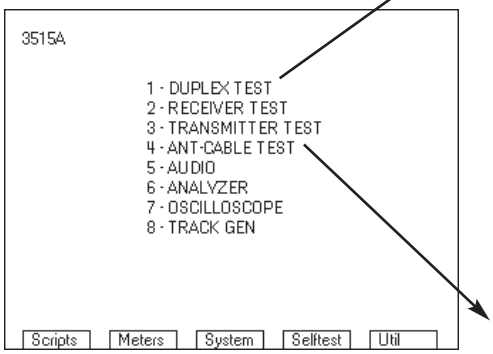
Ground Radio Models	OTA Test	Troubleshooting	Manual Test	Antenna/Coax Test
RT-1523()	X	X	X	X
PRC-117F	X	X	X	X
PRC-148	X	X	X	X
PRC-150	X	X	X	X
PRC-152	X	X	X	X
VRC-103	X	X	X	X
VRC-110	X	X	X	X

Airborne Radio Models	OTA Test	Troubleshooting	Manual Test	Antenna/Coax Test
ARC-164	X	X	X	X
ARC-186	X	X	X	X
ARC-190	X	X	X	X
ARC-201	X	X	X	X
ARC-210	X	X	X	X
ARC-222	X	X	X	X
ARC-231	X	X	X	X

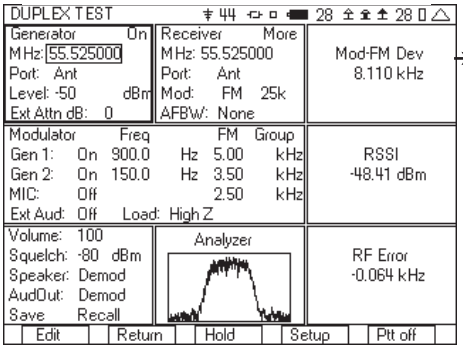
Data Radio Models	OTA Test	Troubleshooting	Manual Test	Antenna/Coax Test
RT-1720G (EPLRS/SADL)	X	X	X	X
RT-1922 (EPLRS/SADL)	X	X	X	X

Easy to Use - Powerful Test Capabilities

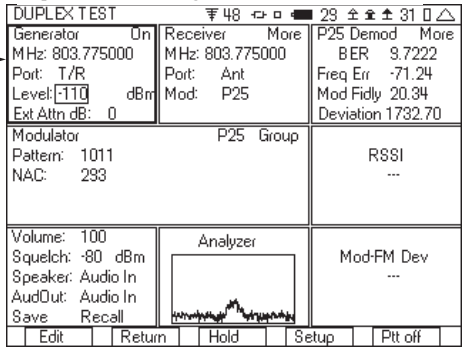
As shown below from actual screen displays, the 3515 provides an easy to use human interface and powerful radio testing capabilities, including application scripts that reduce or eliminate the learning curve. All the instructions for a test may be put into the application and the test results can be saved for documentation, data collection and analysis.



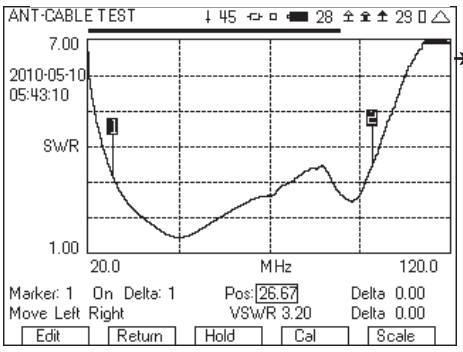
Duplex Screen showing VHF FM radio test



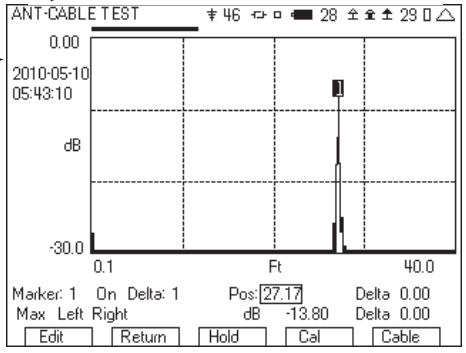
Duplex Screen showing a P25 radio test

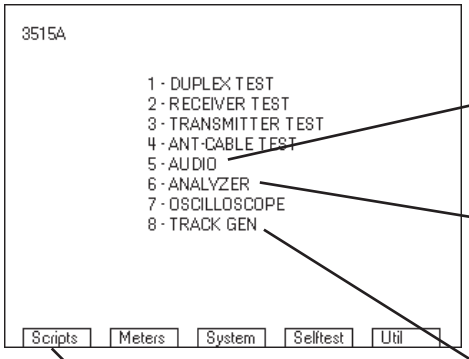


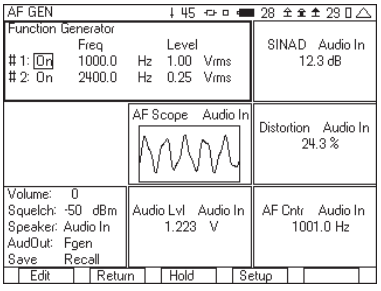
Ant-Cable Test showing a VSWR sweep of a 30 to 90 MHz antenna



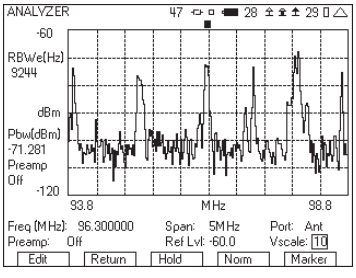
Ant-Cable Test showing a distance measurement of a 27 foot coax



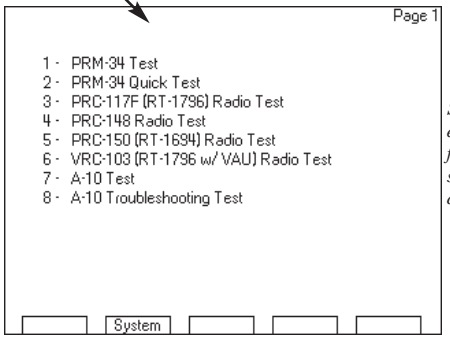




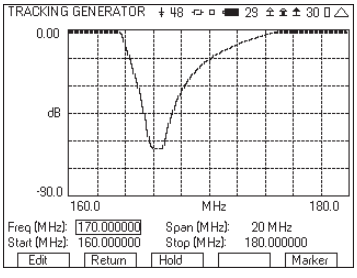
Audio Test showing a typical stimulus and response of an audio intercom



Spectrum Analyzer monitoring over the air showing multiple transmitters



Script applications provide extended test capabilities for specific model of radio of specific vehicle or aircraft



Tracking Generator display of a band-pass filter

SELECTED SPECIFICATIONS

(For complete specifications, refer to the Operation Manual)

RF SIGNAL GENERATOR

FREQUENCY

2 MHz to 1 GHz

OUTPUT LEVEL

T/R port: -50 to -120 dBm

ANT port: -30 to -90 dBm

SWR port: -5 to -65 dBm

FM DEVIATION

Internal Sources	*Off, 0 Hz to 100 kHz*	
External	*FM Inputs*	*AUDIO GEN, MIC IN, AUDIO IN*

AFGEN 1 AND AFGEN 2

Range

0.0 Hz to 20.0 kHz

RF RECEIVER

FREQUENCY

Range

2 MHz to 1 GHz

INPUT AMPLITUDE

Minimum Input Level, Audio Sensitivity

T/R: typical, 10 dB SINAD -70 dBm

ANT: typical 10 dB SINAD (-110 dBm with preamp)

Maximum Input Level

T/R: +43 dBm

ANT: +20 dBm for 10 seconds

RF FREQUENCY ERROR METER

Range

±200 kHz

RSSI INDICATOR

Display Range

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

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

RF POWER METER

Display Range

Ext Attn, 0 dBm: 0 to 43 dBm (0 to 20 W)

Ext Attn, 20 dBm: 0 to 53 dBm (0 to 200 W)

Maximum Input Level

No external attenuator:

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

FM DEVIATION METER

Display Range

0 Hz to ±100 kHz

AM PERCENT METER

Display Range

0% to 100%

ANTENNA/CABLE TEST

Frequency Range

2.0 MHz to 1000.0 MHz

VSWR Range

1.00 to 7.00

RETURN LOSS Range

0.0 to -50.0 dB

CABLE LOSS Range

0.0 to -50.0 dB

Distance to Fault Range

3 ft to >300 ft

AUDIO METERS

AUDIO INPUT (EXT AUDIN)

Source

BNC

Frequency Range

300 Hz to 10 kHz

Level Range

0.2 Vp-p to 5 Vp-p

SINAD METER

Sources

AUDIO IN, DEMOD

Display Range

0 to 40 dB

DISTORTION METER

Sources

AUDION IN, DEMOD

Display Range

0 to 100%

AUDIO FREQUENCY COUNTER

Range

15 Hz to 20 kHz

AUDIO FREQUENCY LEVEL METER

Sources

AUDIO IN, DVM

Input Level

Audio In 10 mV rms to 30 V rms

DVM 10 mV rms to 30 V rms

SPECTRUM ANALYZER

FREQUENCY

Range

2 MHz to 1 GHz

Span

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

Vertical scales

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

EFFECTIVE RBW

Range

20 Hz to 25 kHz

Displayed Average Noise Level (DANL)

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

OSCILLOSCOPE

Source

DVM, Audio In, Demod

Display Level

-50 to +50 V

Horizontal

0.5 ms/div to 0.1 sec/div1

Vertical

10 mV to 10 V per div

TIMEBASE (STANDARD)

Temperature Stability

±0.5 ppm over temp range

Aging

1 ppm/year

Warm-up time

3 min.

TIMEBASE (OPTION 03)

Temperature Stability

±0.15 ppm

Aging

±500 ppb (year 1)
±300 ppb/year (after year 1)

Warm-up time

5 min.

ENVIROMENTAL/PHYSICAL

Overall Dimensions

9.1 in. x 11.2 in. x 2.8 in.

Weight

less than 8 lbs. (3515 unit)

Temperature

Storage: -51°C to +71°C storage

External DC Operation: -20°C to +55°C (battery removed, contingent upon applied RF power over time[1]).

Battery Operation: -20°C to +40°C (typical based on internal temperature rise and usage of the instrument[1])

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

[1] - Consider the use of the instrument for thermal operating temperature. All thermal ratings are dependent upon applied RF power. The 3515 will alarm once the internal temperature exceeds safety limits. Applying power continuously in high ambient temperature environment will result in a heat build-up within the instrument. The 3515 is rated for 20 W (43 dBm) for 10 minutes at +25° C or until thermal alarm sounds. Exceeding these conditions will result in thermal shutdown.

MIL-PRF-28800F CLASS 2 for the following

Humidity, Altitude, Shock, Vibration, Bench Handling, 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
UL61010-1
Installation Category II
Pollution degree 2

CONFIGURATION, EQUIPMENT, OPTIONS, ACCESSORIES, WARRANTY

When ordering please quote the full ordering number information.

The 3515 Series Test Sets are available in several configurations. These different configurations have been made to support customer usage and/or contractual items. Contact Aeroflex if you have questions regarding items within these configurations.

Included *indicates the item is contained within the specified configuration.*

Optional *indicates the item is not contained within the specified configuration, but may be purchased as an add-on option.*

Dash ("-") *indicates the item is not contained within the configuration and is not available as an option.*

Configuration	*Description*
3515AR	*Military Portable Radio Test Set - AR Configuration (NSN - 6625015726346)*
3515N	*Military Portable Radio Test Set - USMC (Navy) Configuration (NSN-6625015380285)*
3515ARM	*Military Portable Radio Test Set - ARM Configuration*

Equipment and Accessories	Order Number	3515AR	3515N	3515ARM
Test Set, 3515AR	3515AR	Included	-	Included
Test Set, 3515N	3515N	-	Included	-
Accessories				
Adapter (BNC-F to TNC-M, qty 5)	23758	Included	Included	Included
Adapter (N-F to BNC-F)	23770	Included	Included	Included
Adapter (N-F to BNC-M)	23769	Included	Included	Included
Adapter (N-M to BNC-F)	20327	Included	Included	Included
Adapter (N-M to TNC-M)	23762	Included	Included	Included
Airborne Adapter Kit Adapter, TPS-M to BNC-F Adapter, TPS-F to BNC-M Adapter, BNC-F to BNC-F Adapter, HN-F to BNC-M Adapter, TNC-F to TNC-F Adapter, TNC-M to TNC-M Cable, ICS to Audio Cable, H-250 to ICS	63972 86064 86065 86066 86067 86068 86069 85893 85892	Optional	Optional	Included
Antenna (BNC) (2 to 30 MHz)	9138	Included	Included	Included
Antenna (BNC) (450 MHz)	9147	Included	Included	Included
Antenna (TNC) (30 to 90 MHz)	9151	Included	Included	Included
Antenna (TNC, 30 to 512 MHz, Flex)	88336	Optional	Optional	Optional
Antenna (TNC, 30 to 512 MHz, 13")	89173	Optional	Optional	Included (Qty. 2)
Antenna (TNC, 100 to 1000 MHz, 12")	89174	Optional	Optional	Optional
Attenuator (20 dB/150 W)	38242	Included	Included	Included
Attenuator (20 dB/50 W)	38240	Included	Included	Included
Battery, Spare	67076	Optional	Optional	Optional
BER Test Cable	62408	-	Included	Optional

Equipment and Accessories	Order Number	3515AR	3515N	3515ARM
Cable (BNC) (M-M) (48 in, qty 2)	62368	Included	Included	Included
Cable (TNC) (M-M) (48 in)	62398	Included	Included	Included
Case, Accessory	5762	Included	Included	Included
Case, Soft-Sided Carrying	10192	Included	Included	-
Case, Transit (Pelican)	91600	Optional	Optional	Included
Comm Breakout Box	64598	Included	Included	Included
Desktop, Stand	63656	Optional	Optional	Optional
Directional Coupler Kit (20 - 200 MHz)	63964	Optional	Optional	Optional
External DC Power Supply	67374	Included	Included	Included
Flash Drive, USB	37327	Included	Included	Included
Flip Cover	63966	Included	Optional	Included
Fuse (5 A, 32 Vdc, Type F, qty 2)	56080	Included	Included	Included
Handset (Speaker/Mic)	64606	Included	Optional	Included
Manual, Getting Started 3515AR (Paper)	6134	Included	-	Included
Manual, Maintenance 3515AR (CD)	6133	Optional	-	Optional
Manual, Operation/ICW 3515AR (CD)	6132	Included	-	Included
Manual, Getting Started 3515N (Paper)	6126	-	Included	-
Manual, Maintenance 3515N (CD)	6118	-	Optional	-
Manual, Operation/ICW 3515N (CD)	6114	-	Included	-
Power Cable (DC NATO)	62406	Included	Included	-
Power Cables (AC, 3-wire leads)	27516	Included	Optional	-
Power Cables (AC, Cont. Europe)	27480	Included	Optional	-
Power Cables (AC, N. America)	27478	Included	Included	-
Power Cables (AC, UK)	27477	Included	Optional	-
Short-Open-Lead Calibrator	38245	Included	Included	Included
Tripod Dolly Stand	67474 6361 63659	Optional	Optional	Optional
USMC Documentation	-	-	Included	-
USMC Labeling	-	-	Included	-
Site Survey Software	63927	Optional	Optional	Optional
Power Cable (AC)	62302	-	-	Included

3515AR

3515ARM

Software Options and Accessories	Order Number	3515AR	3515N	3515ARM
Spectrum Analyzer	35XX0PT01	Included	Optional	Included
Oscilloscope	35XX0PT02	Included	Optional	Included
High Stability Oscillator	3515OPT03	Optional	Optional	Optional
BER Test	35XX0PT04	Optional	Included	Optional
Script Language (includes training info)	3515OPT05	Included	Optional	Included
P25 Test	35XX0PT07	Optional	Optional	Optional
Tracking Generator	35XX0PT08	Optional	Optional	Optional
DPMR Test	35XX0PT09	Optional	Optional	Optional
ARIB T-98 Test	35XX0PT10	Optional	Optional	Optional
AR Test System	3515AR0PT24	Included	Optional	Included
PRM-34 Application	3515OPT25	Included	Optional	Included
VRC-103 Application	3515OPT26	Optional	Optional	Optional
PRC-117F Application	3515OPT27	Optional	Optional	Optional
PRC-148 Application	3515OPT28	Optional	Optional	Optional
PRC-150 Application	3515OPT29	Optional	Optional	Optional
PRC-152 Application	3515OPT30	Optional	Optional	Optional
NXDN Test	35XX0PT33	Optional	Optional	Optional
DMR Test	35XX0PT34	Optional	Optional	Optional
EPLRS/SADL Application	3515OPT36	Included	Optional	Included
A-10 Aircraft Application	3515OPT37	Optional	Optional	Optional
Spectrum Monitor	35XX0PT45	Optional	Optional	Optional
Warranty				
Standard Warranty, 24 months	-	Included	Included	Included
Extended Warranty, 36 mo w/o cal	84345	Optional	Optional	Optional
Extended Warranty, 60 mo w/o cal	84347	Optional	Optional	Optional
Extended Warranty, 36 mo with cal	84346	Optional	Optional	Optional
Extended Warranty, 60 mo with cal	84348	Optional	Optional	Optional

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:

Aeroflex's military products are controlled for export under the International Traffic in Arms Regulations (ITAR) and may not be sold or proposed or offered for sale to certain countries including: Belarus, Burma, China, Cuba, Haiti, Iran, Liberia, Libya, North Korea, Somalia, Syria, Sudan, and Vietnam. See ITAR 126.1 for complete information.

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AEROFLEX
A passion for performance.

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

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