

Military Communications

COBHAM

3515 Series Portable Radio Communications Test Set

The most important thing we build is trust



The 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 3515 Test Set can answer these questions and more. The 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" cost* - 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:

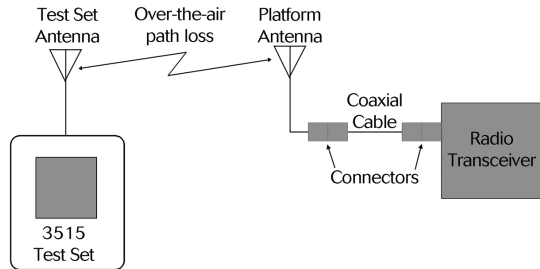
RF Signal Generator	SINAD/Distortion Meter
RF Receiver	Audio Generators
Modulation Meters	RF Power Meters



3515 Series

Portable Radio Communications Test Set

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?

Cobham AvComm 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. The 3515 performs radio tests without encryption and without COMSEC.

Radio Systems	In Vehicle Test	In Aircraft Test	Manual Test	Antenna/Coax Test
VHF Ground COMMS (SINCGARS, others)	X	X	X	X
VHF Airborne 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

Tracking Generator display of a band-pass filter

3515A

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

Scripts Meters System Selftest Util

3515A

- 1 - PRM-34 Test
- 2 - PRM-34 Quick Test
- 3 - PRC-117F (RT-1796) Radio Test
- 4 - PRC-148 Radio Test
- 5 - PRC-150 (RT-1694) Radio Test
- 6 - VRC-103 (RT-1796 w/ VAU) Radio Test
- 7 - A-10 Test
- 8 - A-10 Troubleshooting Test

System

3515 Series

Portable Radio Communications Test Set

SELECTED SPECIFICATIONS

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 pre amp)
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

3515 Series

Portable Radio Communications Test Set



OSCILLISCOPE

Source	DVM, Audio In, Demod
Display Level	-50 to +50 V
Horizontal	0.5 ms/div to 0.1 sec/div
Vertical	10 mV to 10 V per div

Battery Operation

-20°C to +40°C
(typical based on internal temperature rise and usage of the instrument*).

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

*- 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.

TIMEBASE (STANDARD)

Temperature Stability	±0.15 ppm
Aging	±500 ppb (year 1) ±300 ppb/year (after year 1)
Warm-up time	5 min.

CERTIFICATIONS

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

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

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

ENVIRONMENTAL / PHYSICAL

Overall Dimensions	9.1 in. x 11.2 in. x 2.8 in.
Weight	Less than 8 lbs. (3515 unit)

ENVIRONMENTAL / 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*).

Configuration, Equipment, Options, Accessories, Warranty

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 Cobham 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 - 6625-01-572-6346)
3515N	Military Portable Radio Test Set - USMC (Navy) Configuration (NSN - 6625-01-538-0285)
3515ARM	Military Portable Radio Test Set - ARM Configuration (NSN - 6625-01-617-3401)
3515AR-EP	Military Portable Radio Test Set - AR-EP Configuration (NSN - 6625-01-618-8588)

3515 Series

Portable Radio Communications Test Set

Equipment and Accessories	Order Number	NSN	3515AR	3515N	3515ARM	3515 AR-EP
Test Set, 3515AR (Base unit)	3515AR	6625-01-572-6346	Included	-	Included	Included
Test Set, 3515N	3515N	6625-01-538-0285	-	Included	-	-
Flip Cover	63966	6625-01-6218676	Included	Optional	Included	Included
Accessories						
Adapter (BNC-F to TNC-M, qty 5)	23758	5935-00-701-2215 5935-01-552-1849	Included	Included	Included	Included
Adapter (N-F to BNC-F)	23770	5935-01-505-4115	Included	Included	Included	Included
Adapter (N-F to BNC-M)	23769	5935-01-505-4191	Included	Included	Included	Included
Adapter (N-M to BNC-F)	20327	5935-00-821-6126	Included	Included	Included	Included
Adapter (N-M to TNC-M)	23762	5935-01-453-5761	Included	Included	Included	Included
Airborne Adapter Kit	63972		Optional	Optional	Included	Optional
Adapter, TPS-M to BNC-F	86064	5935-00-491-6302	Optional	Optional	Included	Optional
Adapter, TPS-F to BNC-M	86065	5935-00-785-9024	Optional	Optional	Included	Optional
Adapter, BNC-F to BNC-F	86066	5935-01-507-1732	Optional	Optional	Included	Optional
Adapter, HN-F to BNC-M	86067		Optional	Optional	Included	Optional
Adapter, TNC-F to TNC-F	86068	6060-01-569-1025	Optional	Optional	Included	Optional
Adapter, TNC-M to TNC-M	86069	5935-01-544-7750	Optional	Optional	Included	Optional
Cable, ICS to Audio	85893	6625-01-6206316	Optional	Optional	Included	Optional
Cable, H-250 to ICS	85892	6625-01-6206328	Optional	Optional	Included	Optional
Antenna (BNC) (2 to 30 MHz)	9138		Included	Included	Included	Optional
Antenna (BNC) (450 MHz)	9147		Included	Included	Included	Optional
Antenna (TNC) (30 to 90 MHz)	9151		Included	Included	Included	Optional
Antenna (TNC, 30 to 512 MHz, Flex)	88336		Optional	Optional	Optional	Optional
Antenna (TNC, 30 to 512 MHz, 13")	89173		Optional	Optional	Included (Qty. 2)	Included (Qty 2)
Antenna (TNC, 100 to 1000 MHz, 12")	89174		Optional	Optional	Optional	Optional
Attenuator (20 dB/150 W)	38242	5985-01-292-2384	Included	Included	Included	Included
Attenuator (20 dB/50 W)	38240		Included	Included	Included	Included
Battery, Spare	67076		Optional	Optional	Optional	Optional
BER Test Cable	62408		-	Included	-	-
Cable (BNC) (M-M) (48 in, qty 2)	62368		Included	Included	Included	Included
Cable (TNC) (M-M) (48 in)	62398		Included	Included	Included	Included
Case, Accessory 35xx series	91597		Included	Included	Included	Included

3515 Series



Portable Radio Communications Test Set

Equipment and Accessories	Order Number	NSN	3515AR	3515N	3515ARM	3515 AR-EP
Case, Soft-Sided Carrying	10192		Included	Included	-	-
Case, Transit (Pelican)	91600	6625-01-5409690	Optional	Optional	Included	Included
Case Transit, 35XX Series, Black	91706		Optional	Optional	-	Included
Comm Breakout Box	64598	6110-01-572-7127	Included	Included	Included	Included
Desktop, Stand	63656		Optional	Optional	Optional	Optional
Directional Coupler Kit (20 - 200 MHz)	63964		Optional	Optional	Optional	Optional
External DC Power Supply	67374		Included	Included	Included	Included
Fuse (5 A, 32 Vdc, Type F, qty 2)	56080	5920-01-414-6983	Included	Included	Included	Included
Handset (Speaker/Mic)	64606	6625-01-577-5101	Included	Optional	Included	Included
Manual, Getting Started 3515AR (Paper)	6134		Included	-	Included	Included
Manual, Maintenance 3515AR (CD)	6133		Optional	-	Optional	Optional
Manual, Operation/ICW 3515AR (CD)	6132		Included	-	Included	Included
Manual, Getting Started 3515N (Paper)	6126		-	Included	-	-
Manual, Maintenance 3515N (CD)	6118		-	Optional	-	-
Manual, System 3515AR EP (CD)	91921		-	-	-	Included
Manual, Operation/ICW 3515N (CD)	6114		-	Included	-	-
Power Cable (DC NATO)	62406		Included	Included	-	-
Power Cables (AC, 3-wire leads)	27516		-	-	-	-
Power Cables (AC, Cont. Europe)	27480		-	-	-	-
Power Cables (AC, N. America)	27478		-	-	-	Included
Power Cables (AC, UK)	27477		-	-	-	-
Power Cable (DC Cigarette Lighter)	62404		-	-	-	Included
Short-Open-Lead Calibrator	38245	6625-01-572-5285	Included	Included	Included	Included
Tripod	67474					
Dolly	6361		Optional	Optional	Optional	Optional
Stand	63659					
USB Flash Drive	67327		Included	Included	Included	Included
USMC Documentation	-		-	Included	-	-
USMC Labeling	-		-	Included	-	-
Site Survey Software	63927		Optional	Optional	Optional	Optional
Power Cable (AC)	62302		Included	Included	Included	-



3515AR



3515ARM

Software Options and Accessories	Order Number		3515AR	3515N	3515ARM	3515 AR-EP
Spectrum Analyzer	35XXOPT01		Included	Optional	Included	Included
Oscilloscope	35XXOPT02		Included	Optional	Included	Included
Script Language (includes training info)	3515OPT05		Included	Optional	Included	Included
P25 Test	35XXOPT07		Optional	Optional	Optional	Optional
Tracking Generator	35XXOPT08		Optional	Optional	Optional	Optional
DPMR Test	35XXOPT09		Optional	Optional	Optional	Optional
ARIB T-98 Test	35XXOPT10		Optional	Optional	Optional	Optional
AR Test System	3515AROPT24		Included	Optional	Included	Optional
PRM-34 Application	3515OPT25		Included	Optional	Included	Optional
NXDN Test	35XXOPT33		Optional	Optional	Optional	Optional
DMR Test	35XXOPT34		Optional	Optional	Optional	Optional
Spectrum Monitor	35XXOPT45		Optional	Optional	Optional	Optional
Warranty						
Standard Warranty, 24 months	-		Included	Included	Included	Included
Extended Warranty, 36 mo w/o cal	84345		Optional	Optional	Optional	Optional
Extended Warranty, 60 mo w/o cal	84347		Optional	Optional	Optional	Optional
Extended Warranty, 36 mo with cal	84346		Optional	Optional	Optional	Optional
Extended Warranty, 60 mo with cal	84348		Optional	Optional	Optional	Optional

EXPORT CONTROL:

Some of these products are 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 these products from the United States.

EXPORT WARNING:

Cobham'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.

For further information please contact:

Cobham AvComm
10200 W York Street
Wichita, KS 67215, USA

Tel: 1-316-522-4981
Fax: 1-316-524-2623
AvComm.TechSales@aeroflex.com



or contact your Cobham AvComm sales office

www.cobham.com/avcomm