

# ATS-3100 VRS Tactical Radio Field Test System



Militaries around the world depend on the secure and reliable communication of tactical radios wherever they deploy: land, sea, air, and even space. The information they share is vital for completing their missions and returning home safely. Field test is the entire set of maintenance activities that ensures the mission readiness of the whole network, including the tactical radio. Automated and consolidated test systems for both depot and field environments, based on limited technical inspections (LTIs) per supplier recommendations, are essential to quickly determine go/no-go conditions and enable repair operations to maximize uptime.



Figure 1. Astronics offers a tactical radio maintenance solution that spans depot and field test scenarios while providing superior test coverage both today and tomorrow.

## Meeting Critical Tactical Radio Field Test Requirements

- Maximize network uptime:
  - Ensure existing tactical radio readiness through LTIs to ascertain radio conditions from any tactical radio supplier.
  - Ensure network readiness with a portable, secure communications test solution wherever tactical radios deploy (airborne, vehicular, manpacks, handheld, and terminals).
- Streamline complex maintenance operations with automation that is plug-and-play compatible with existing solutions (for example, GRM-122 and 3515N).
- Ensure future test program set (TPS) compatibility and secure waveform support with modular instrument architecture by simply removing outdated instruments and insert new technology as it becomes available.

## The Astronics and NI Advantage

- **Affordable, simple, and proven field test** - Provides scripted and automated execution of field tests for any popular tactical radio.
- **Superior test coverage** - Supports any secure waveform, whether in the depot or deployed in the field, with the new upgrade path based on NI's vector signal transceiver (VST), including 1 GHz bandwidth, frequency coverage to 6 GHz, and essential dual-channel capabilities.
- **Future-proof design** – Leverages modular PXI platform approach from NI to mitigate obsolescence with proven synthetic instrument technology.

## Enabling the Network Maintenance Workflow

Operators send tactical radios to the depot when they identify operational problems that need to be repaired. Most of the time, testing these radios results in a determination of no fault found (NFF) or cannot duplicate (CND). When radios are returned to operators with NFF or CND designations, operators need to identify the issues that caused the problems. Generally, this means testing the network surrounding the radio, and it is impractical to move the network to the bench instruments in the depot.

### Workflow (NFF/CND): Majority of Tactical Radios are OK

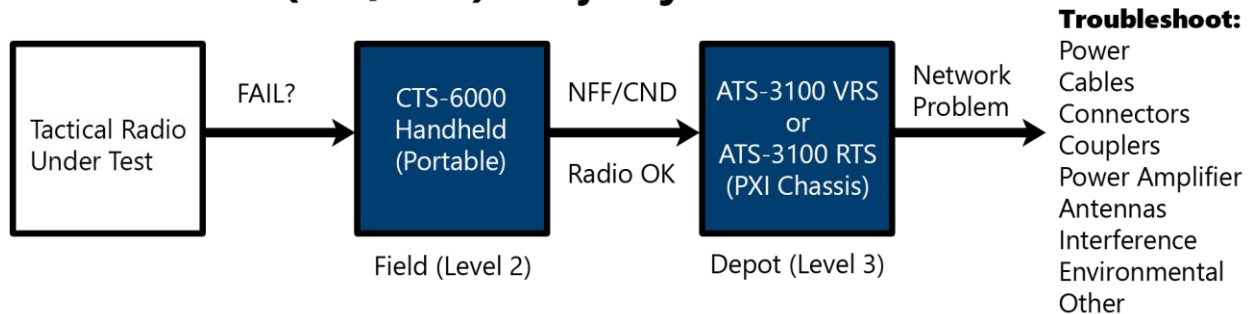


Figure 2. Maximize network uptime with broad test coverage from Astronics for field (level 2) and depot (level 3) with handheld and bench instruments, respectively.

Network problems are typically caused by factors such as power, cables, connectors, couplers, power amplifiers, antennas, possible interference, and environmental contamination. Many instruments must be used to thoroughly and confidently troubleshoot them. The portability of a consolidated field test solution enables quick fault isolation and validation of repair activities to optimize mission readiness. A single, consolidated portable system composed of synthetic instruments can replace up to 16 individual instruments. Consistent portable and benchtop test solutions can quickly identify and resolve faults to keep the network performing optimally.

## Preparing for Future Tactical Radio Field Test Requirements

- Minimize future equipment cost with the ATS-3100 VST-based Radio Solution (VRS), which addresses emerging software defined radio (SDR) waveforms that require up to 1 GHz of instantaneous bandwidth (for example, Link-16).
- Maximize flexibility to handle future requirements like multiband and multichannel radio test as well as electromagnetic environment test and simulation with the PXIe platform and PXI VST from NI.
- Minimize the time to deploy new tactical radios with fast TPS implementation.

# ATS-3100 VRS Tactical Radio Field Test System Diagram

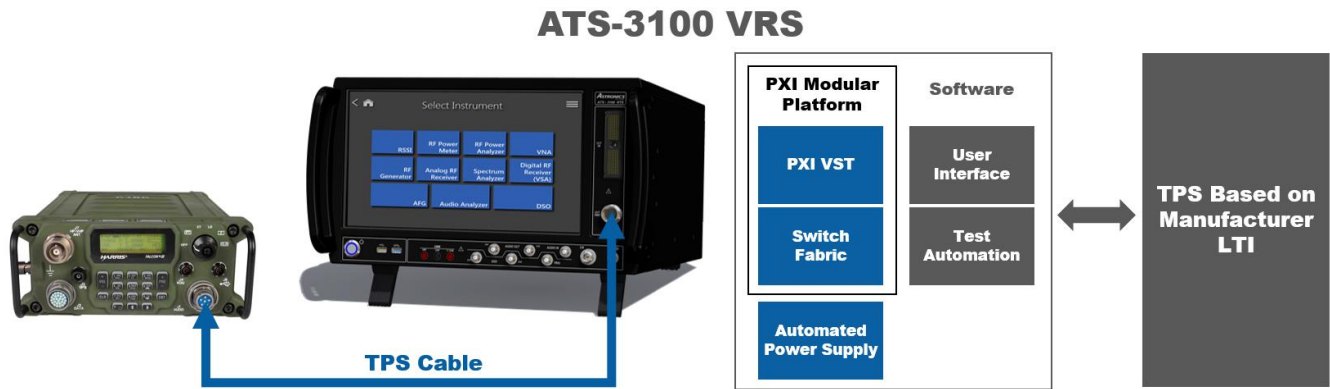


Figure 3. The ATS-3100 RTS and ATS-3100 VRS tactical radio field test systems are based on PXI modular instrumentation platforms and proven TPSs. They are turnkey solutions for any tactical radio depot deployment.

## Key Specifications

Test Program Sets (TPSs) and Limited Technical Inspections (LTIs)	L3 Harris Technologies (merger of L3, Harris), Raytheon, Thales, General Dynamics, Collins Aerospace, TrellisWare	
Radio Communications Frequency Range	1 MHz to 6 GHz	
Instantaneous Bandwidth	ATS-3100 VRS (benchtop)	1 GHz (ideal for SDR waveforms)
	ATS-3100 RTS (benchtop)	100 MHz (ideal for SINGARS)
	CTS-6000 (portable)	12 MHz
Consolidated Test Instruments and Measurements	RF signal generator, receiver, power meter RF analyzers: spectrum, EVM, VSWR, cable DTF AF signal generator Audio meters: SINAD/distortion Oscilloscope Digital interfaces Tracking generator	
Upgradability	ATS-3100 RTS can be upgraded to ATS-3100 VRS	
Plug-and-Play Replacement: GRM-122 (US Army)	Yes, both ground and airborne variants	
Plug-and-Play Replacement: 3515N (USMC)	Yes	

The ATS-3100 RTS and ATS-3100 VRS currently provide an upgrade path for the standard tactical radio depot test solution for the United States Army, the GRM-122, that preserves compatibility with existing TPSs, including cables.

The CTS-6000 handheld platform is an option to replace the popular, standard tactical radio field test solution for the US Marine Corps, the 3515N.

## Tactical Radio Field TPSs

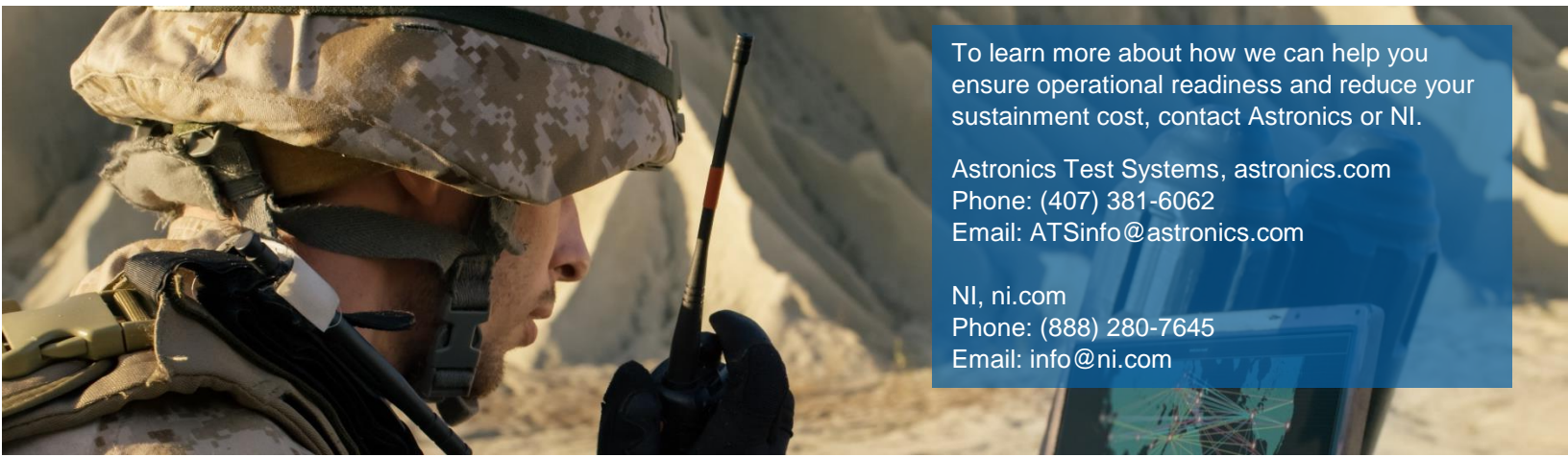
Astronics develops and supplies TPSs in collaboration with tactical radio suppliers. All TPSs follow the manufacturer’s guidelines for implementing LTIs. LTIs determine the go/no-go results of the tactical radio while the tester enables further diagnosis and repair of fault mechanisms.



The ATS-3100 RTS, ATS-3100 VRS, and CTS-6000 support the tactical radio TPSs listed below. Contact Astronics or your NI account representative for future roadmaps or TPS development inquiries.

Radio Type	Radio Designation	Radio Architecture	Frequency Range	Supplier(s)
Airborne	<a href="#">AN/ARC-201</a>	SINCGARS	30 MHz to 88 MHz	L3Harris
	<a href="#">AN/ARC-231</a>	SDR	30 Hz to 512 MHz	Raytheon
	<a href="#">AN/ARC-210</a>	SDR	30 to 512+ MHz	Collins
	<a href="#">AN/ARC-210 Talon</a>	SDR	30 to 400 MHz	Collins
Vehicular	AN/VRC-87F	SINCGARS	30 MHz to 88 MHz	L3Harris
	AN/VRC-88F			
	AN/VRC-89F			
	AN/VRC-90F			
	AN/VRC-91F			
	AN/VRC-92F	SDR	30 Hz to 512 MHz	L3Harris
	<a href="#">AN/VRC-110</a>			
	<a href="#">AN/VRC-111</a>			
<a href="#">AN/VRC-112</a>	SDR	30 MHz to 2 GHz	L3Harris	
<a href="#">AN/VRC-114</a>	SDR	30 MHz to 2 GHz	L3Harris	
Manpack	<a href="#">AN/PRC-117F</a>	SDR	30 Hz to 512 MHz	L3Harris
	<a href="#">AN/PRC-117G</a>	SDR	30 MHz to 2 GHz	L3Harris
	<a href="#">AN/PRC-119F</a>	SINCGARS	30 MHz to 88 MHz	L3Harris
	<a href="#">AN/PRC-150A(C)</a>	HF	1.6 Hz to 60 MHz	L3Harris
Handheld	<a href="#">AN/PRC-148</a>	SDR	30 Hz to 512 MHz	Thales
	<a href="#">AN/PRC-152 and AN/PRC-152A</a>	SDR	30 Hz to 520 MHz, 762 MHz to 870 MHz	L3Harris
	<a href="#">TW-400 CUB</a>	TSM	1775–1815 MHz, 2200–2250 MHz	TrellisWare Technologies
Combat Search and Rescue (CSAR)	<a href="#">AN/PRC-112G</a>	SDR	121.5, 123.1 MHz; 225–320 MHz; 406 SARSAT	General Dynamics
	<a href="#">HOOK3</a>	SDR	121.5, 123.1 MHz; 225–320 MHz; hardware capable of 100 - 512 MHz; 406 SARSAT	General Dynamics

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To learn more about how we can help you ensure operational readiness and reduce your sustainment cost, contact Astronics or NI.

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