

## NAVAIR Modernization Program—Extended Warranty Information

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### Current Standards:

<u>ITEM</u>	<u>NOMENCLATURE</u>	<u>WARRANTY</u>	<u>INITIAL ISSUE DATE</u>
8648BOPT1EA,1E2, 1E5,1E6,H31	Mid Band Signal Generator	5 YR	6/98
8903BOPT050	Distortion Analyzer	5 YR	9/98
LW420A	Arbitrary Waveform Gen.	5 YR	7/98
LW420B	Arbitrary Waveform Gen.	5 YR	9/01
53132AOPT10,30	Frequency Counter	8 YR	10/96
54750A/54751A	Oscilloscope (20Ghz)	5 YR	1/00
9500/600OPT5,9530-2	O'Scope Calibr (w/2 active heads)	3 YR	7/00
3604A-1-101	Port Temp Std (Hi)	5 YR	10/99
9007	Port Temp Std (Lo)	5 YR	11/00
2000-S3528	Phase Meter	3 YR	12/02
2251	Phase Angle Voltmeter	3 YR	10/01

### Upcoming Standards:

<u>ITEM</u>	<u>NOMENCLATURE</u>	<u>WARRANTY</u>	<u>INITIAL ISSUE DATE</u>
680N	Vibration Calibration System	1 YR	~ Oct 2003
5790AAN (4920M repl)	AC Measurement STD	1 YR	~ Nov 2003
2770 (PPTS101 repl)	IFF TACAN Test Set Calibrator	5 YR	~ Feb 2004
Temperature Baths	PNs 7040 (low), 6020 (med), and 605H (Hi)	1 YR	~ Sep 2003
??????	Thermohumidigraph	1 YR	~ Nov 2003

## Why is it Necessary to Verify Test Equipment Options Before Use?

by Ken Young  
(NSWC COR Code MS 31M)

Ken is an Electronics Engineer in the Low Frequency Branch of the Measurement Science Directorate. He graduated from the University of Maryland at College Park with a B.S. in Electrical Engineering. Recently, he received his M.S. in Electrical Engineering from Cal State University, Fullerton.

Manufacturers typically produce test equipment that can be configured with different options. Options are either performance-based or functionality-based. Performance-based options either limit or extend the performance of the unit beyond its normal characteristics. Functionality-based options add features that make the test equipment easy to use for their intended purposes and contexts.

Test equipment typically has the model number displayed on the front panel. A number of test equipment models, however, have additional options that are displayed on the back or on the sides. HP 5315A, for example, is an electronic counter that was designed for different input line voltages. HP 5315A OPT 120 is only for use with line voltages in the range of 108 to 126 V. HP 5315A OPT 100, on the other hand, is for use with line voltages in the range of 90 to 105 V. Obviously, the use of inappropriate line voltages could potentially damage this test instrument. Other options may extend the frequency range and/or input power protection. Two good examples of this are HP 5340A OPT 005 and HP 5340A OPT 006. In this case, OPT 005 extends the frequency range from 18 GHz to 23 GHz. OPT 006, on the other hand, extends the input power protection limit from +30

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## Completion of Upgrade to NPSL 6-Port VANA

by Jim Wheeler  
(NPSL)



Jim received a BSEEE from North Dakota State University in Fargo. He has taken graduate courses in microwave engineering at San Diego State University and is a Senior Member of the IEEE. He has worked at NPSL since 1986.

Jim served in the U. S. Navy for 6 years maintaining and installing cryptographic and communications equipment as a Cryptologic Technician (Maintenance). He lives in San Diego with his wife, Stephanie, and children, Allison and Daniel.

NIST Boulder has completed delivery and setup of the upgraded waveguide

6-Port Vector Automatic Network Analyzer (VANA) in the microwave measurements laboratory at the Navy Primary Standards Laboratory. This VANA is used to measure waveguide S-Parameter and RF Power from 18 to 40 GHz. The new VANA supports measurements of waveguide thermistor mounts, variable waveguide attenuators, standard mismatches, and terminations in WR-42 and WR-28 waveguide.

The measurement system is an improvement over the old VANA in several ways. Because four voltmeters instead of two are used to measure detector voltage changes in the 6-Port heads, measurements are improved. Software has also been enhanced, allowing for quicker measurements of

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## Why is it Necessary to Verify Test Equipment Options Before Use?

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dBm to +39 dBm. Both options are incompatible with one another.

Some models have special military significance. The new North Atlantic Instruments (NAI) Precision Phase Meter Model 2000S3528, for example, does not exist in the NAI commercial catalog. Its front panel shows it as Model 2000 Precision Phase Meter. It looks like any regular off-the-shelf Model 2000. The label on the rear panel says it is actually Model 2000S3528. The 2000S3528 is a Navy-only configuration that consists of the 2000F1 Precision Phase Meter and a separate 2000OPT19 current shunt unit.

In conclusion, one must use good judgment and common sense when dealing with any test instrument. Not only can test equipment be damaged when we get careless, the safety of one's life can also be at stake. Another benefit that arises when options are properly identified is that the correct Instrument Calibration Procedure (ICP) is used. The same instrument model with different options may have different ICPs. Therefore, a good rule of thumb is to check the front and back of the test instrument for any additional options and understand its capability before use. ❖

## Completion of Upgrade to NPSL 6-Port VANA

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variable waveguide attenuators and one-port devices such as waveguide standards mismatches. Other hardware advances include a new broadband RF amplifier, synthesized sweeper, and improvements in the switching scanner. Customers will now see Reports of Calibration for thermistor mounts with full waveguide band coverage of WR-42 and WR-28 (18 to 26 and 27 to 40 GHz) due to newer software and hardware and broadband calibration support from NIST. All of these improvements help to reduce turn-around time, improve uncertainty measurements, and provide a better product to the war-fighter through calibration.

The measurement system upgrade was funded by the Navy R&D program and completed as DOD / NIST Calibration Coordination Group (CCG) Project 478.



Mr. Ron Ginley, NIST Boulder Designer / Project Engineer, setting up the new 6-Port VANA at NPSL.

Two other NIST measurement systems reside in the microwave measurements lab at NPSL. First is the Direct Comparison Measurement System used to support coaxial RF thermistor mounts and power sensors. Second is the upgraded Coaxial 6-Port VANA used as a primary standard to support S-Parameter and RF thermistor mounts from 0.25 to 18 GHz. ❖

# Instrument Calibration Procedure (ICP) Cancellations and Supersessions

by Jeff Davis

(NSWC COR Code MS 35)

The following ICPs were cancelled or superseded during April 2003. Removal of these ICPs from the Metrology Requirements List (METRL) Section 4 resulted in changes to METPRO, PCMETROQ, and METRL microfiche produced by the Measurement Science Directorate.

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### CANCELLED

ICP #	Workload
17-20AQ-388	Various Digital Voltmeters and Digital Multimeters

### SUPERSEDED

ICP #	Workload	New ICP #
17-20AX-39L	121984-1 ANAPM245 ANAPM245A	17-20AX-39
17-20MX-13L	21C4060G001 21C4060G002 21C4060G003 21C4120G07	17-20MX-13

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