



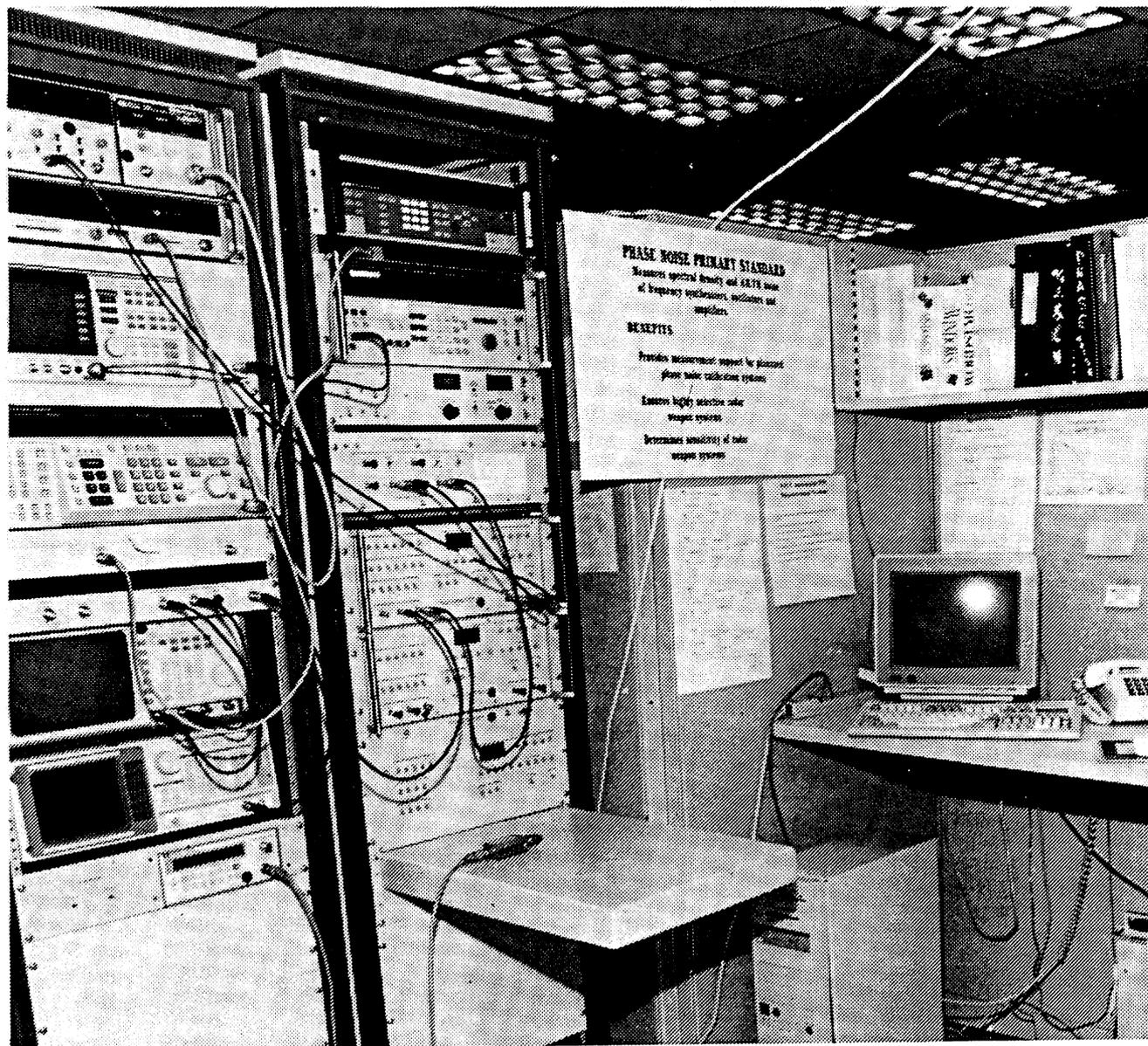
METROLOGY

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Measurement Science Directorate, Naval Warfare Assessment Division, Corona, CA

February 1994



PHASE NOISE PRIMARY STANDARD

Measures spectral density and dB/Hz level
of frequency oscillators, mixers and
amplifiers

BENEFITS

Provides measurement support for standard
phase noise calibration systems

Enables highly selective color
wedge systems

Determines sensitivity of color
wedge systems

Phase Noise Measurement Standard Laboratory

PUBLISHED BY AUTHORITY OF THE COMMANDER, NAVAL SEA SYSTEMS COMMAND

1. NAVY CALIBRATION INFORMATION

1.1 Phase Noise Measurement Capability at NPSL

James C. Wheeler, NPSL

Phase noise measurements are now available at the Navy Primary Standards Laboratory (NPSL) located at NADEP North Island, San Diego. The phase noise measurement system was designed and built by Dr. Fred Walls at National Institute of Standards and Technology (NIST), in Boulder CO. The measurement system can analyze phase noise characteristics of RF carriers from 5 MHz to 26 GHz. PM and FM phase noise measurements can be made from 0.1 Hz to 10% of carrier frequency up to 1 GHz. The system is modular to accommodate a range of signal frequencies, NIST now has capability to 75 GHz. A NIST designed phase modulator is used to correct for PLL and gain variations with Fourier frequency. Measurement errors are typically between 0.3 and 1 dB.

A 486/33 MHz computer controls the system using software written by Concurrent Software of Boulder, CO for NIST. A laserjet printer provides graphic output or tabular data output, as needed.

NPSL also has a NIST designed low phase noise reference standard with 5, 10, 100 MHz, and 10.6 GHz outputs. A comb output is available for 500 MHz harmonic outputs up to 18 GHz using bandpass filters. (See graph on page 8.)

The 10 MHz low noise reference can also be used to phase lock a synthesizer at other frequencies.

NPSL now has the capability to measure customer oscillators directly, or to provide NIST designed transfer standards, providing; (1) 5, 10, and 100 MHz, or (2) 10.6 GHz and 21.2 GHz outputs traceable to NPSL. The transfer standards can be used to verify phase noise measurement capability at a customer facility. The transfer standards would be measured at NPSL prior to shipment.

For further information please contact Jim Wheeler at the Navy Primary Standards Laboratory, Electromagnetics Branch, Code 363, at COMM (619) 545-9698, DSN 951-9698, or by FAX at (619) 545-9861. 

2. GENERAL INFORMATION

2.1 Fluke 80 Series Digital Multimeters (DMM)

Vince Thomas (MS-62)

NAVSAFECEN safety advisory 4-94 identified an operational problem in some Fluke 80 Series Digital Multimeters (DMM) which may cause misleading LCD readings and potentially a personnel hazard. There are five models which may be affected. They are the Fluke 83, 85, 86, 87, and 88 with imprinted serial numbers between 55350000 and 56789999. No other Fluke instruments are affected.

The problem concerns the failure of the rotary function selector switch which in turn may cause an LCD indication different from the function selected. For example, the LCD function display could indicate the DMM is in the "VAC FUNCTION" when the switch is in the "VDC POSITION," or the DMM is in the "MVDC FUNCTION" when the rotary switch is in the "OHMS POSITION." Random and erroneous LCD indications are possible for every rotary switch position. In the worst case, the DMM LCD may indicate a "Low AC voltage when a high DC voltage is present". This places the user in a potentially hazardous situation.

Calibration laboratories receiving Fluke 80 series DMM with imprinted serial numbers between 55350000 and 56789999 without a "R" Suffix, for either calibration and/or repair should return it to the manufacturer for modification even if the DMM LCD display agrees with the rotary switch selector function position. The manufacturer has agreed to update the 80 series DMM without charge. To return a suspect digital multimeter, contact the nearest Fluke representative at the following locations:

A. FREMONT, CA	GLEN BONDY	(510) 651-5112
B. ALTAMONTE SPRINGS, FL	WALT WITKO	(407) 331-2929
C. PARAMUS, NJ	JOHN HUGGINS	(201) 599-9500
D. EVERETT, WA	ED NESTER	(206) 356-5560
E. IRVINE, CA	RON FERNANDEZ	(714) 863-9031
F. PALATINE, IL	LARRY AZUS	(708) 705-0500
G. CARROLLTON, TX	JOHNNIE WINTERS	(214) 406-1000