METROLOGY BULLETIN

Measurement Science Department, Corona Division, Naval Surface Warfare Center — FEBRUARY 2006

In this issue:

Compliance with the Permanent-Record Keeping Requirement Using the Temperature and Humidity Recorder Standard

by Ronald W. Cichy II
(NSWC Corona, Code MS 33B)

The NAVAIR METCAL program recently modernized and deployed replacement temperature and humidity recorder standards from Hart Scientific Inc. (see Figure 1) to all NAVAIR calibration facilities. An article addressing the deployment and significant technical information regarding the initial setup and operation of these units was published in the March 2005 METBUL edition. However, the article did not provide specific guidance on the archiving process since this information can be found in the User's Guide. Recent follow-up and inquiries from the Fleet have revealed that there is some confusion regarding the process required to comply with the permanent record-keeping requirement. This article is meant to address and clear up this confusion and to provide additional technical information.

The principal function of the temperature and humidity recorder standards is to measure and record the ambient temperature and humidity in designated locations of the calibration facility to ensure compliance with the environmental requirements set forth in the Facility Requirements for Navy and Marine Corps Calibration Laboratories, NAVAIR 17-35FR-06 (FR-06), document. These environmental requirements act to preserve measurement integrity, ensure safety and comfort of laboratory personnel, and to preserve equipment in the special use, general and calibration areas. The laboratories are required to maintain records of these environmental conditions for a minimum of one (1) year as part of the permanent record-keeping requirement set forth in the Commander Naval Air Force Instruction (COMNAVAIRFORINST) 4790.2 (4790) document. Furthermore, the FR-06 and the Navy and Marine Corps Calibration Laboratory Audit/ Certification Manual, NAVAIR 17-35QAC-01A (QAC01), documents require that these records be maintained for a period of time as specified in the laboratory's quality assurance manual.

Figure 1.
Hart Scientific M/Ns 1620S / 1620H

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All activities are invited to submit material of general interest to the Editor for publication. Please include your name, activity, and DSN and/or commercial phone number. Color and black and white drawings, graphs, and/or photographs will be accepted.

Please circulate this Bulletin to all laboratory technicians and personnel.

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METROLOGY BULLETIN

EDITOR — Jeff Walden
EDITING STAFF — Tracee Stewart

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For questions, comments, or suggestions concerning the Metrology Bulletin, please write to the address below:

Commanding Officer
Corona Division (Attn: MS 30)
Naval Surface Warfare Center
P.O. Box 5000
Corona, CA 92878-5000

Or call: DSN 933-5317, Commercial (951) 273-5317
FAX #: DSN 933-5446, Commercial (951) 273-5446
E-mail: CRNA-METCAL@navy.mil

In This Issue...

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The first step in maintaining historical records is to match the temperature and humidity recorder with the location it will be monitoring. This can be accomplished by accessing the SENSOR ID function through the CHANNEL menu. The name of the sensor should be consistent with the location in the lab being monitored (e.g., temperature van, pressure room, low frequency) and may be a total of 16 characters in length. All environmental data will be digitally stamped with this name and will provide an accurate monitoring history. Once the unit is setup, the display and memory card should remain in that location.

In the past, saving the circular paper charts satisfied the permanent record-keeping requirement. These charts were collected on a weekly basis and annotated with the specific time period and location where they were used. However, the new temperature and humidity recorders do not have circular charts. The replacement temperature and humidity recorders measure, display, archive, and retrieve environmental data. In order to facilitate the permanent record-keeping requirement, the data must be archived on the external memory card that comes with each unit. This memory card should always remain with the display at that specific **location** (e.g., optical room, high frequency). Should the 1620 display require repair/replacement, archive the latest environmental data that is stored in its internal memory to the memory card and then remove the memory card and insert it into the spare/new display. The memory card acts as a storage device and permits the operator to retrieve and display the archived environmental data via the temperature and humidity recorder display. This process does not interrupt the normal operation. Furthermore, a computer is not required to view the archived data and to facilitate the permanent record-keeping process.

The replacement temperature and humidity recorder also has an internal memory. The unit *automatically* stores environmental data in the internal memory with the following information: Date, time, sensor serial number, and sensor name, and temperature and humidity values. The internal memory capacity is limited to storing 400,000 individual readings. This translates to approximately 8.5 months (36 weeks) at an archive rate of one (1) temperature and one (1) relative humidity reading per every two (2) minutes. The internal memory is not volatile, but if it is allowed to completely fill up, the latest environmental data will overwrite the oldest in a first-in first-out manner. In order to comply with the minimum one (1) year permanent record-keeping requirement, the data in the internal memory must be saved to the external memory card. This process is *not automatic* and must be done manually. Although there are no specific requirements for how often the data must be backed up to the memory card, it is recommended that this process be performed on a monthly basis versus the weekly requirement for the older circular chart recorders. At the same archiving rate stated previously, the external memory card can store a total of 48 years of environmental data when archived in binary format and 4 years when archived in text format.

There are two different rates used by the temperature and humidity recorder. The measuring rate determines how often the temperature and humidity recorder measures the environmental conditions and displays these results numerically and/or graphically. This setting is accessible via the CHANNEL menu and can be set from one (1) second to one (1) hour. A 15 second measuring rate is recommended and is based on the minimum time that must elapse before a reading is graphically displayed, and is limited by the display resolution. The archiving rate determines how often the environmental data will be stored into internal memory – not on the memory card. This setting is accessible via the DATA menu and can also be set from one (1) second to one (1) hour. The measuring rate and the archiving rate do not need to be the same. The lower the measuring rate, the more real-time the measurements are. Meanwhile, if the archiving rate is set to a very low setting (e.g., 30 seconds), the internal memory will quickly fill up and may result in lost environmental data. The recommended archiving rate is two (2) minutes, which stores a total of 30 temperature and relative humidity measurements every hour. This is an adequate compromise between maintaining adequate environmental records, the length of time between data transfer from the internal memory to the memory card, and the length of time before the memory card becomes full.

The temperature and humidity recorder allows the operator to store the environmental data on the memory card in either binary or text format. When data is stored in binary format, it is compressed and permits the maximum amount of data that can be stored on the memory card. Meanwhile, when the data is stored in text format, the memory card cannot hold as much data. Since data must be stored in binary format to view archived data using the temperature and humidity recorder display or the optional Hart Scientific LogWare software, once the data is stored in binary format it cannot be viewed in a spreadsheet or word document. Conversely, data stored in text format can be downloaded into an Excel spreadsheet or Word document; however, it can no longer be viewed using the 1620 display or by LogWare. The environmental data should be stored in binary format if the laboratory will not be downloading the data to a computer. Contact your Quality Assurance manager before archiving environmental data if you are unsure how the records will be maintained for quality assurance purposes. It should be re-emphasized once more that the temperature and humidity recorder does not require a computer to view archived data in order to comply with the permanent record-keeping requirements.

The Joint Navy Audit and Certification (JNAC) program office has indicated that downloading the environmental data to a computer and viewing the data via an Excel spreadsheet

(Continued on page 4)

(Continued from page 3)
and/or charts is an acceptable method to facilitate the permanent record-keeping requirement. Some laboratories are already using this method. However, some familiarity with the Excel program is required to do so. Instructions and figures are provided in Appendix A of this Metrology Bulletin to illustrate how to download environmental data to a computer and then import the data into Excel.

The older thermo-humidigraph standards required the technician to annotate the circular chart with specific date, time and nature of the occurrence causing out-of-range environmental conditions. The replacement units cannot electronically annotate the data to indicate the cause of out-of-range environmental conditions. Consequently, a separate logbook must be maintained. FR-06 and QAC01 currently permit the use of logbooks to annotate out-of-range conditions when the environmental data is archived electronically. Furthermore, it has been requested that the 4790 be revised to permit the use of logbooksInterim guidance was provided by Commander Naval Air Forces (CNAF) and the NAVAIR METCAL Program calibration standards manager during February 2005 to permit the use of logbooks until the 4790 is officially updated

The replacement temperature and humidity recorders were procured under a contract negotiated between Hart Scientific and the Naval Air Warfare Center (NAWC), Aircraft Division, Lakehurst. This contract involves a configuration that includes the memory card; extended warranty, wall bracket and an extension cable. Recently, these units became available through the General Services Administration (GSA). However, the special configuration that was arranged between Hart and NAVAIR is not available. In particular, activities ordering the model 1620S or 1620H under GSA will not receive the memory card. This memory card is necessary to facilitate the permanent record-keeping requirements whether it is used as data storage and/or a transfer device. Hart has indicated that the memory card is identified as model 2632-64MB and is also available through GSA, but must be purchased separately.

My thanks are extended to Mr. Curt Kiser, Quality Manager at the Mid-Atlantic Regional Calibration Center, Norfolk, Virginia, for providing guidance on importing environmental data into Excel. All questions or comments regarding the contents of this article should be directed to Ronald W. Cichy II, MS 33B at (951) 273-4816, DSN 933-4816 or email at Ronald.Cichy@navy.mil. ❖

APPENDIX A

The following information is complimentary to the Article titled "Compliance with the Permanent-Record Keeping Requirement Using the Temperature and Humidity Recorder Standard." These instructions and figures are provided to illustrate how to download environmental data to a computer and then import the data into Excel.

Step 1. Download the data from the 1620 display to the memory card as follows:

- Press the **ENTER** key on the 1620 display.
- Press the down arrow and select **DATA** from the menu and then press the **ENTER** key.
- Press the down arrow and select **DATA CARD** from the menu and then press the **ENTER** key.
- Select **FILE WRITE** from the menu and then press the **ENTER** key.
- Press the right arrow key until **TEXT** format is indicated and then press the **ENTER** key.
- Press **ENTER** once more to acknowledge the note.
- Select the start and end date that corresponds with the desire time period (e.g., weekly or monthly) as follows:
  - Use the right and/or left arrow keys to select the start date and then press the **ENTER** key.
  - Use the right and/or left arrow keys to select the end date and then press the **ENTER** key.
  - Press the **ENTER** key two (2) more times.
- Allow sufficient time for the data to be transferred to the card and then press the **ENTER** key. Note the file name for future reference.
- Remove the memory card from the 1620 display and then press the **EXIT** key three (3) times to return to the main display.

Step 2. Transfer the data from the memory card into an Excel spreadsheet as follows:

- Insert the memory card into the computer PCMCIA slot and use the Windows Explorer to view the contents of the memory card.
- Ensure that the text file that corresponds with the file name noted in step 1 is listed.
- Open Excel and select 'Open' from the 'File' drop-down menu (e.g., '125 partial.TXT').
- Change the 'Files of type:' from 'Microsoft Excel Files' to 'All Files' (see Figure 1). You will see the desired *.txt file. Select the file. The 'Text Import Wizard' will open it and allow you to specify the formats required.

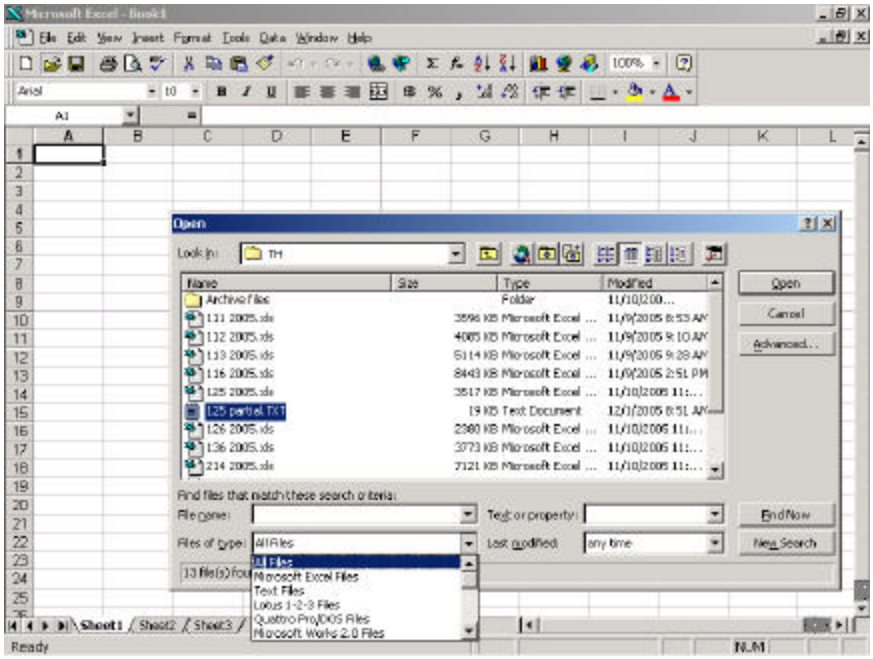


Figure 1. Importing the *.txt File Into Excel

- At the 'Text Import Wizard – Step 1 of 3' screen (see Figure 2), select 'Delimited' then click on the 'Next' button.

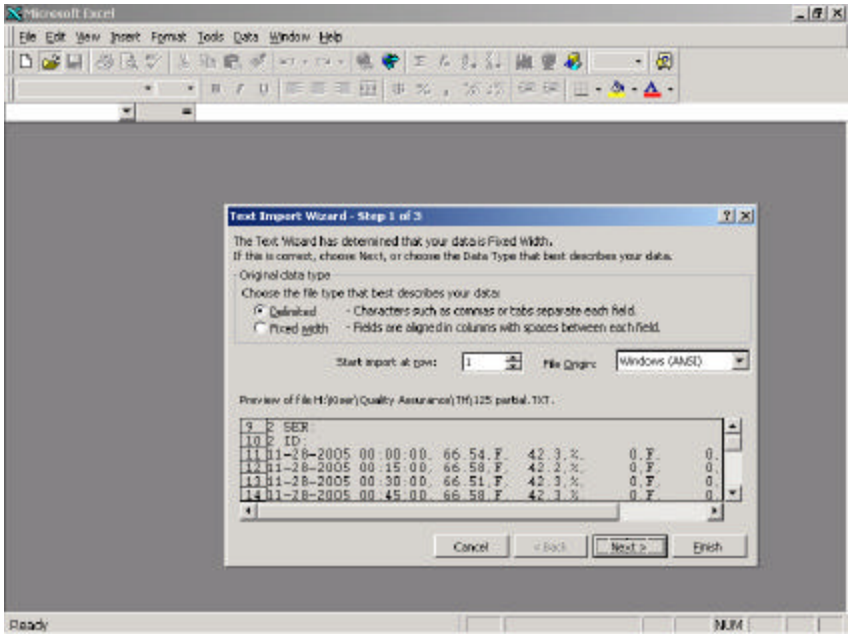


Figure 2. Specifying Environmental Data Format

- At the 'Text Import Wizard – Step 2 of 3' screen (see Figure 3), select 'Tab', 'Space', 'Comma', and 'Treat consecutive delimiters as one'. Then click on the 'Next' button.

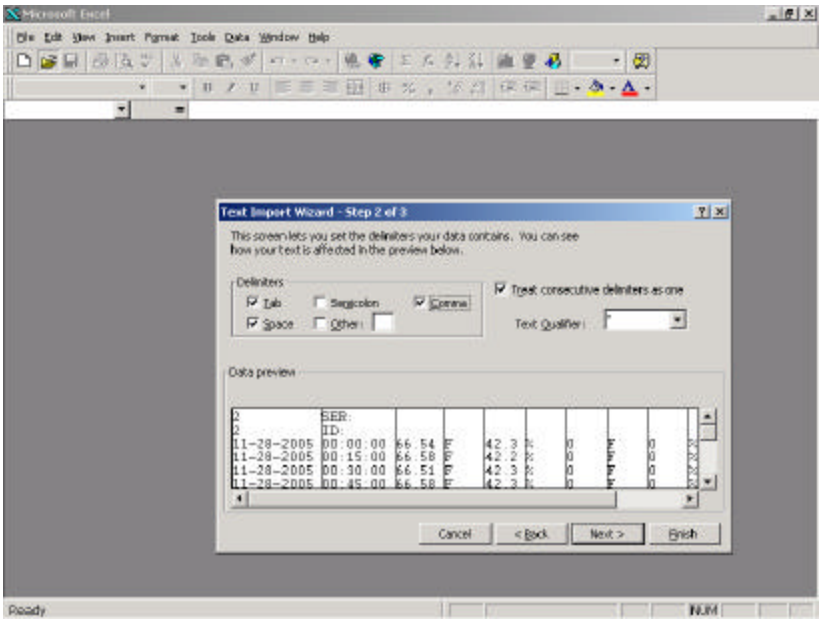


Figure 3. Specifying Environmental Data Format

- At the 'Text Import Wizard – Step 3 of 3' screen (see Figure 4) specify the first column data format as "Date…MDY", then click on the 'Finish' button.

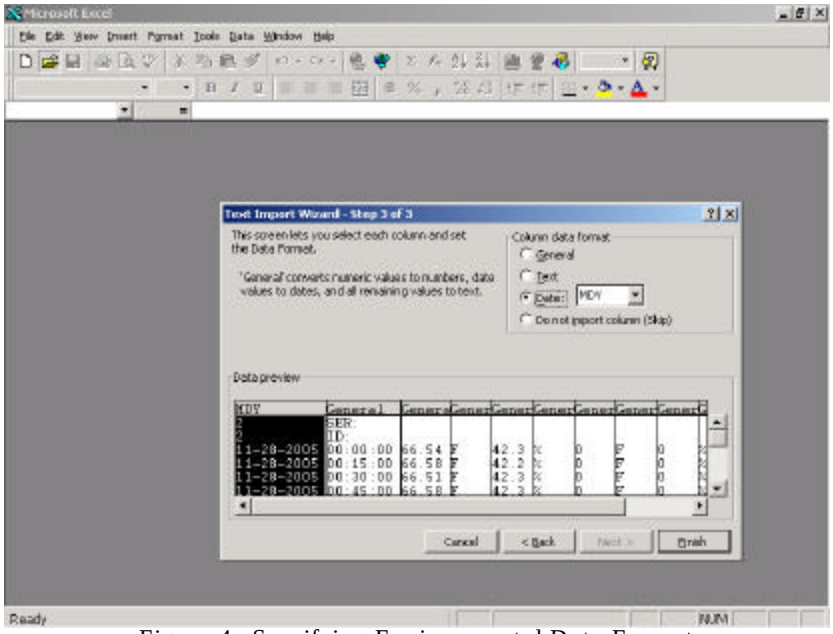


Figure 4. Specifying Environmental Data Format

Step 3. Save the file as an *.xls file format. If desired, the file can be renamed to a more intuitive description (e.g., September 2005).

Step 4. Once the data is imported into Excel, charts and/or graphs of the environmental data can be presented in different forms and then printed out. Some working knowledge of Excel is required and is not provided in this article. Several examples of the graphs that can be generated with the environmental data are provided in Figures 6 and 7.

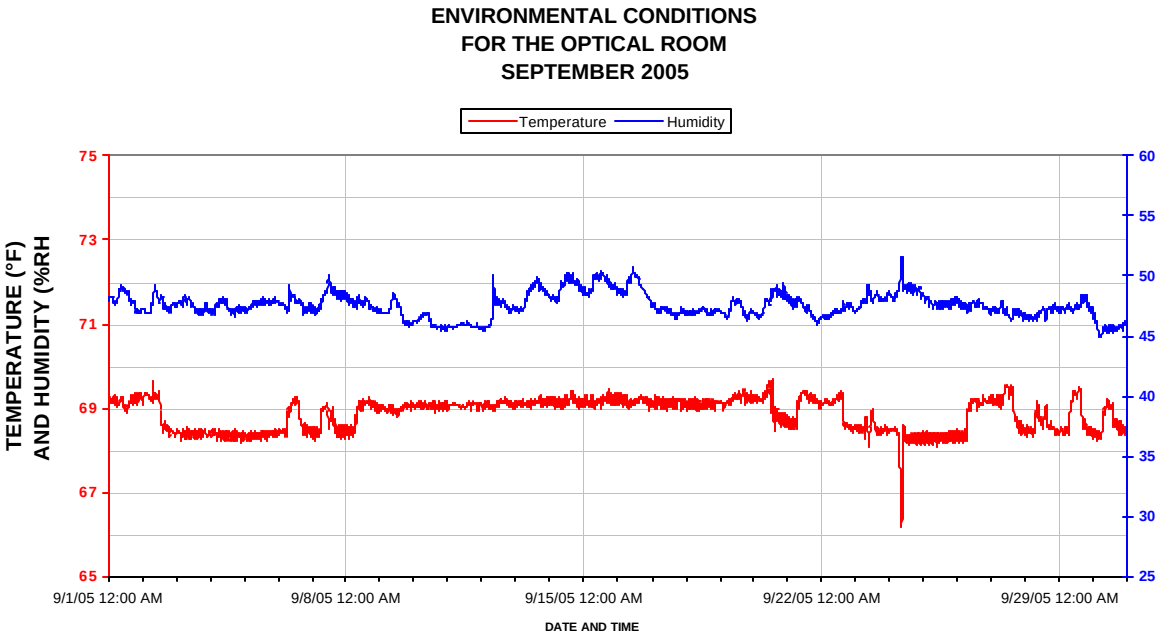


Figure 5. Example Graph of Environmental Data for a One-Month Time Period

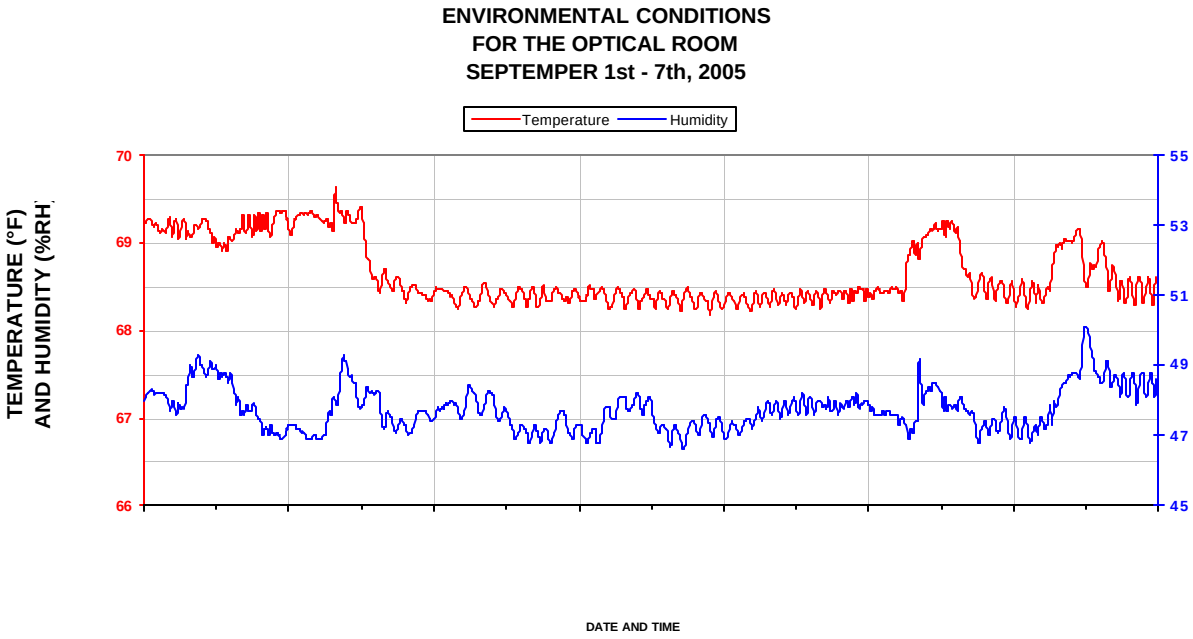


Figure 6. Example Graph of Environmental Data for a One-Week Time Period

Measurement Science Conference 2006 President's Message

In the 1990s we were fast approaching the year 2000 and the "Y2K" problem. Theories and predictions of disasters were rampant. Today, we have Y2K in our rear view mirror as we sail into the 21st century. The pace of technology matches the pace of life - - - fast and rapidly changing. Challenges are plentiful. In this context, I encourage you to pause for a minute and consider investing in yourself, your business, and your profession by attending and participating in the 2006 Measurement Science Conference (MSC). In order to stay current with today's ever changing world, it is important to allow some time to learn, reflect, and plan for the future. The 2006 Measurement Science Conference is a good place to start.

The theme for the 2006 Measurement Science Conference is "The Science, Technology, and Control of Measurements." The theme is basic to the core mission of MSC, which is to promote education and professionalism in measurement science and related disciplines.

"The Science" of measurement is to ensure we focus on education in the various measurement areas. It is foundational and essential to our profession.

"The Technology" of measurement opens our minds and thoughts towards advancements in technology and the corresponding advancements being pursued in measurement technology. It's where the future of the technical aspects of measurement is headed.

"And finally, "The Control" of measurement clearly embraces the processes and techniques used to assure measurement accuracy and reliability. It encompasses accreditation, certification, uncertainty, environmental considerations, reliability, LEAN/6 Sigma and more. All that we can do to embed trust and reliance on our measurement systems.

The goal of the 2006 MSC is to provide a professional forum and venue to advance education, renew, and further professional contacts and provide emerging ideas and insights in our profession. I hope you will join us for an informative and enlightening 2006 MSC. Please consider the NIST seminars, MSC tutorials and workshops as a valuable part of your 2006 MSC experience. It is your participation that will keep the conference and our profession alive and successful.

The Measurement Science Conference for 2006 will be February 27 through March 3, 2006 at the Disneyland Hotel in Anaheim, California. For more information please go to their website at www.msc-conf.com. ❖

Changes to ICPs to Accommodate New Model Numbers

by Jeff Walden
(NSWC Corona, Code MS 30)

As test instruments (TIs) are identified, their calibration procedure requirements are analyzed. Many newly identified TIs can be calibrated utilizing an existing Instrument Calibration Procedure (ICP) without any changes required to the ICP. These TIs are listed in METRL with the approved ICP. The ICP will not be modified to add the new TI until it is revised for some other reason. Enclosure (1) is a listing of TIs for which approved ICPs have been added to the METRL database since the last issue of METBUL. ❖

Correction to the October METBUL article "Calibration of the Fluke 5725A Amplifier"

by Ken Young
(NSWC Corona, Code MS 31M)

Fluke 5700AAN (top) and Fluke 5725A (bottom)

The recent article on the Calibration of the Fluke 5725A Amplifier stated incorrectly that it is not necessary to calibrate the Fluke 5700AAN together with the Fluke 5725A. Although it is feasible to do this using Fluke proprietary software, it is not recommended for technical reasons beyond the scope of this article. For Navy use both units must be calibrated together. The correct way to calibrate the 5725A is to attach it to the Fluke 5700AAN using the interface cable supplied with the 5725A, and follow instructions as directed by one of the four applicable ICPs (17-20AQ-403, 17-20AQ-322, 17-20AQ-358 or CF-AQ-006).

After the 5700AAN is calibrated with the 5725A, it can be detached from the 5725A and used as a stand-alone calibrator without having to be calibrated again for the duration of its calibration interval. ❖

Requests for Measurement Science Department Publications

NOTE: Requests should not be ordered via MILSTRIP, as NSWC COR does not have the capability to process electronically transmitted MILSTRIP orders.

Requests for documentation and software listed in METRL or METPRO, and produced by the Measurement Science Directorate, should be directed to the appropriate NSWC Corona point of contact (POC) as indicated below. Requests may be submitted by correspondence to:

Commanding Officer
Corona Division (Attn: Code)
Naval Surface Warfare Center
P.O. Box 5000
Corona, CA 92878-5000

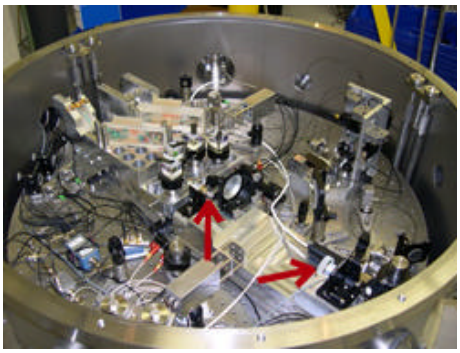
Or call the NSWC Corona POC at the number listed below. NSWC Corona DSN is 933+last 4 digits of Commercial phone number. Phone calls should be reserved for requests of an urgent nature.

- NAVAIR
  Sean Shehee, MS 11M
  (951) 273-4808
  DSN 933-4808
  Sean.shehee@navy.mil
- NAVSEA
  Kathy A. Ingenhousz,, MS 22C
  (951) 273-5361
  DSN 933-5361
  Kathleen.ingenhousz@navy.mil
- USMC Ground Systems
  Maxie A. Perdue, MS 13
  (951) 273-5764
  DSN 933-5764
  Maxie.perdue@navy.mil
- SSP
  Eric D. Steele, MS 12F
  (951) 273-5750
  DSN 933-5750
  Eric.d.steele@navy.mil
- FMS
  LaRon A. Scott, MS 14G
  (951) 273-5760
  DSN 933-5760
  Laron.scott@navy.mil

❖

"Long" Distances Measured with Picometer Accuracy

NIST Tech Beat
December 01, 2001



This NIST vacuum chamber is used to measure millimeter distances more accurately than ever before. Laser light is sent into the chamber through an optical fiber and stored between two highly reflective mirrors (left and bottom arrows), which form an optical cavity. By measuring the frequency of the light, which is tuned to match specific properties of the cavity, a scientist can determine changes in the lower mirror's position with picometer accuracy.

Image credit: J. Lawall/NIST

A new laser-based method for measuring millimeter distances more accurately than ever before—with an uncertainty of 10 picometers (trillionths of a meter)—has been developed and demonstrated by a physicist at the National Institute of Standards and Technology (NIST). This is akin to measuring the distance from New York to Los Angeles with an uncertainty of just 1 millimeter. The technique may have applications in nanotechnology, remote sensing and industries such as semiconductor fabrication.

Laser light is typically used to measure distances by counting the number of wavelengths (the distance between successive peaks of the wave pattern) of light between two points. Because the wavelength is very short (633 nanometers for the red light most often used), the method is intrinsically very precise.

Modern problems in nanotechnology and device fabrication, however, require uncertainty far below 633 nm.

A more precise method, described in the December issue of the *Journal of the Optical Society of America A*,* involves measuring the frequency of laser light rather than the wavelength. The laser light is stored between two highly reflective mirrors, to create the optical analog of an organ pipe. The length of an organ pipe can be measured by driving the pipe with sound waves of a known frequency (pitch). The sound emitted by the pipe is loudest when it is driven at one of its "natural" frequencies, commonly called harmonics. When one or more of these frequencies is identified, the pipe length can be determined. In the NIST work, light is transmitted through both mirrors only when the frequency of the light matches a harmonic frequency. This frequency can be used to determine the distance between the mirrors.

While this approach has been used previously for the measurement of short distances (of the order of 1 micrometer), the new work extends it 25,000-fold by demonstrating a range of 25 millimeters. (Ultimately, the design should accommodate a range of up to 50 mm.) In addition, the NIST approach described in the paper excites two harmonics of the optical system, rather than one, a redundancy that increases the range while achieving picometer accuracy.

*J.R. Lawall. Fabry-Perot metrology for displacements up to 50 mm. *Journal of the Optical Society of America A.* December 2005.

Significant Calibration Interval Changes

by Dr. Dennis Jackson
(NSWC Corona, Code MS 40)

We continually review accumulated calibration data and, when supported by adequate statistical evidence, adjust the calibration interval of applicable test instruments. These changes are then published in METRL. In order to take advantage of the calibration cost savings possible when calibration intervals are significantly extended, and to avoid reliability problems when calibration intervals are significantly reduced, advance information of such extensions and reductions is reported in the Metrology Bulletin prior to publication in METRL. The same method is used when a particular instrument is reclassified from periodic calibration to No Calibration Required (NCR) and vice versa. NAVAIR activities shall implement interval changes issued by NSWC COR upon receipt, in accordance with COMNAVAIRFORINST 4790.2, Volume V, Chapter 19.5 and NAVAIR METCAL Program policy. Non-NAVAIR activities may want to change the recall date for such instruments already serviced by forwarding a replacement calibration label, which reflects the new submission date, to the customer activity. Each label should indicate the serial number of the individual instrument involved to ensure the integrity of labeling. If this procedure is not practicable, initiate the use of the adjusted interval at the time of resubmission.

Significant calibration interval change is defined as:

1. An extension of more than 25 percent
2. A decrease of more than 25 percent
3. A change from an interval or SR to NCR
4. A change from NCR to an interval or SR

A list of instruments that have had recent significant calibration interval revisions is provided in Enclosure (4). ❖

Calendar of Upcoming Events

by METBUL Staff

February 2006	
27 - 28	**Selection, Calibration, and Use of Contact Thermometers** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **Time and Frequency Measurements and Applications** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **Experiment Design, Calibrations and Interlaboratory Studies** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **Double Substitution: Workhorse of Mass Metrology** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **Hands-On Workshop on Estimating and Reporting Measurement Uncertainty** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **Regression Analysis Using NIST/SEMATECH e-Handbook of Statistical Methods** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **NIST Pressure and Vacuum Measurement Course** Anaheim, CA http://www.nist.gov/public_affairs/news.htm
March 2006	
01	**MSC Workshops: (A.M.) Balance and Scale Calibration and Use** Anaheim, CA http://www.nist.gov/public_affairs/news.htm **MSC Workshops: (A.M.) Balance and Scale, and Weighting Process** Anaheim, CA http://www.nist.gov/public_affairs/news.htm
August 2006	
06—10	**NCSL International— Serving the World of Measurement** Nashville, TN Http://www.ncsli.org ❖

New and Revised Calibration Procedures

by Jeff Walden
(NSWC Corona, Code MS 30)

A list of new and revised calibration procedures and guides recently issued is provided in Enclosure (3). ❖

ICP Changes Resulting from CPR/ CTFR Submissions

by Sean Shehee (NSWC Corona, Code MS 11M), Keena Mancini (NSWC Corona, Code MS 22H), Lars Poling (NSWC Corona, Code MS 13J), Eric Steele (NSWC Corona, Code MS 12F) and LaRon Scott, (NSWC Corona, Code MS 14G)

The following is a list of Instrument Calibration Procedures (ICPs) that were published to incorporate corrections identified by Calibration Problem Reports (CPRs) or Calibration Trouble and Failure Reports (CTFRs).

Thank you for your participation in the CPR/CTFR program. The points of contact on this issue are:

- NAVAIR
  Sean Shehee, MS 11M
  (951) 273-4808
  DSN 933-4808
  Sean.shehee@navy.mil
- NAVSEA
  Keena Mancini, MS 22H
  (951) 273-4340
  DSN 933-4340
  Vicellen.mancini@navy.mil
- USMC Ground Systems
  Lars Poling, MS 13J
  (951) 273-5459
  DSN 933-5459
  Lars.poling@navy.mil
- SSP
  Eric Steele, MS 12F
  (951) 273-5750
  DSN 933-5750
  Eric.d.steele@navy.mil
- FMS
  LaRon Scott, MS 14G
  (951) 273-5760
  DSN 933-5760
  Laron.scott@navy.mil

ICP NUMBER	SPONSOR	CPR/CTFR
17-20AH- 63	NAVAIR	AKI050910
	NAVAIR	SDP051100
17-20AW-396	NAVAIR	JFB041252
	NAVSEA	KBS040438
17-20AX-954	NAVAIR	PRL041781
	NAVSEA	MAR040722
17-20GA- 31	NAVAIR	JFB041912
	NAVAIR	MAR051200
	NAVAIR	PRL050291
	NAVAIR	QLQ050762
	NAVSEA	OES050524
	NAVSEA	OES050703
	NAVSEA	OES050870
	NAVSEA	OES051374
	NAVSEA	OES051412
	SP	8623772
17-20GN- 19	NAVAIR	CPB021917
	NAVAIR	QLQ020565
	NAVSEA	KBS022050
	NAVSEA	KBS99082
	SP	8661636
17-20GX- 97	NAVAIR	PCQ040310
17-20MF- 46	NAVAIR	QLQ05763
17-20SJ- 12	NAVAIR	QLQ050761
17-20SX- 93L	NAVAIR	AKL041362
	NAVAIR	CCQ000216
	NAVAIR	PBQ040928
17-50A103	NAVAIR	SDP050042
	NAVAIR	VIQ041047 ❖

Navy METCAL Labels & Tags

by Jeff Davis
(NSWC Corona, Code MS 43)

Enclosure (5) provides ordering information for requisitioning Navy METCAL Labels and Tags. All orders should be coordinated through your local supply office.

Labels and Tags can be requisitioned via the internet by going to the "Navy Forms On-line" website at http://forms.daps.mil. Users can also determine the availability of Labels and Tags, as well as check on the status of previously placed orders at this same website.

The NSWC COR point of contact for issues relating to Labels and Tags is Jeff Davis, MS 43, DSN 933-5103, commercial (951) 273-5103, or e-mail jeffrey.a.davis1@.navy.mil. ❖

Instrument Calibration Procedure (ICP) Cancellations and Supersessions

by Julie Cunavelis
(NSWC Corona, Code MS 30B)

The following ICPs were cancelled or superseded during January 2006. Removal of these ICPs from the Metrology Requirements List (METRL), Section 4, resulted in changes to METPRO produced by the Measurement Science Directorate.

The point of contact on this issue is Julie Cunavelis, MS 30B, at (951) 273-4758, DSN 933-4758, or e-mail julie.cunavelis@navy.mil.

SUPERSEDED

ICP #	Workload	New ICP #
17-20SX-93L	Vibrex System	17-20SX-93

CANCELLED

ICP #	Workload
None	

❖

Additions to METRL

by Jeff Walden
(NSWC Corona, Code MS 30)

As requirements become known, new Test Instruments (TIs) which require calibration are identified. The calibration requirements for these items are analyzed and calibration intervals are established. The data is then entered into the METRL database and will appear in the next published issue of METRL. Enclosure (2) is a listing of TIs which have been added since the last issue of METBUL. ❖

CHANGES TO ICPS TO ACCOMMODATE NEW MODEL NUMBERS

MODEL NUMBER	CAGE	DESCRIPTION	PROCEDURE
123SFL50072-1	26512	VAPOR CYCLE TEST STAND	17-20MX-235
REMARKS: SAME AS AF37T22 (26512)			
37534-40001-20	97384	JOINT SERVICE ELECTRONIC COMBAT TESTER	17-20GX-108
REMARKS: SAME AS ANUSM670 (97384)			
74D110536-1003	76301	COMPOSITE REPAIR SET	17-20AX-968
8000000066	57057	RADIO T/S	17-20GX-112
REMARKS: SAME AS ANARM156 (57057)			
8000000066-1	57057	RADIO T/S	17-20GX-112
REMARKS: SAME AS ANARM156 (57057)			
AF37T22	26512	VAPOR CYCLE TEST STAND	17-20MX-235
REMARKS: SAME AS 123SFL50072-1 (26512)			
ANARM156	57057	RADIO T/S	17-20GX-112
REMARKS: SAME AS 8000000066-1 (57057) AND 8000000066 (57057)			
ANUSM670	97384	JOINT SERVICE ELECTRONIC COMBAT TESTER	17-20GX-108
REMARKS: SAME AS 37534-40001-20 (97384)			
GPC223	95750	GATED PULSE COMBINER	17-20GX-118
PWA56038	77445	AIRCRAFT ENGINE TS	17-20MP-238
REMARKS: SAME AS TTU471E (77445)			
TTU471E	77445	AIRCRAFT ENGINE TEST SET	17-20MP-238
REMARKS: SAME AS PWA56038 (77445)			

ADDITIONS TO METRL

MODEL NUMBER	CAGE	DESCRIPTION	INT
1395AS1557	30003	CHECKING FIXTURE	12

REMARKS: CAL @ NSWC CORONA "WPP" CAL LAB ONLY

SHIP TO:
COMMANDING OFFICER
ATTN; NAVY STANDARDS LABORATORY
BLD. 575, RECEIVING OFFICER
CORONA DIVISION, NAVAL SURFACE WARFARE CENTER
2300 FIFTH STREET
NORCO, CA. 92860-9154
PHONE: (951) 273-4604 DSN: 933-4604

NAVAIR GUN GAGE PROGRAM: CONTACT NAVAIR METCAL
TEAM-4 FOR AUTHORIZATION @ (301) 757-9154/9151 DSN: 757-9154/9151

1395AS852	30003	CHECK FIXTURE GUIDE BAR	12

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176F118	05606	GUIDE GAGE ASSEMBLY	12

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ADDITIONS TO METRL

MODEL NUMBER	CAGE	DESCRIPTION	INT
350705-1	0MGB3	TUNABLE BANDPASS FILTER	12
350705-2	0MGB3	TUNABLE BANDPASS FILTER	12
350705-3	0MGB3	TUNABLE BANDPASS FILTER	12
350705-4	0MGB3	TUNABLE BANDPASS FILTER	12
350705-5	0MGB3	TUNABLE BANDPASS FILTER	12
350705-6	0MGB3	TUNABLE BANDPASS FILTER	12
LA70N	90537	LOWPASS FILTER	60
REMARKS: SAMEA AS LA70N (00929)			
LA90N	00929	LOWPASS FILTER	60
TLA1200-7EF1	11882	LOWPASS FILTER	60
REMARKS: SAME AS TLA1200-7EF1 (04423)			
TLA1200-7EF2	04423	LOWPASS FILTER	60
TLC230-7EF1	04423	LOWPASS FILTER	60

NEW AND REVISED CALIBRATION PROCEDURES ISSUED

PROCEDURE	DATE	MODEL	CAGE	DESCRIPTION
17-20AC- 08	2/1/2006	1617A	24655	CAPACITANCE BRIDGE
17-20AH- 63	2/1/2006	6023A	28480	POWER SUPPLY
17-20AW-396	2/1/2006	2232	80009	DIGITAL STORAGE OSCILLOSCOPE
17-20AX-954	2/1/2006	153700	45413	IFF TRANSPONDER T/S
		155600	45413	IFF TRANSPONDER T/S
		ANAPM424V1	45413	IFF TRANSPONDER T/S
		ANAPM424V2	45413	IFF TRANSPONDER T/S
17-20AX-968	2/1/2006	74D110536-1003	76301	COMPOSITE REPAIR SET
17-20GA- 31	2/1/2006	VARIOUS MICROWAVE COMPONENTS		
17-20GN- 19	2/1/2006	VARIOUS POWER DIVIDERS POWER SPLITTERS		
17-20GX- 97	2/1/2006	4035500-0501	06845	TRANSPONDER T/S
		ANAPM378	06845	TRANSPONDER T/S
17-20GX-108	2/1/2006	37534-40001-20	97384	JOINT SERVICE ELECTRONIC COMBAT TESTER
		ANUSM670	97384	JOINT SERVICE ELECTRONIC COMBAT TESTER
17-20GX-112	2/1/2006	8000000066	57057	RADIO T/S
		8000000066-1	57057	RADIO T/S
		ANARM156	57057	RADIO T/S
17-20GX-118	2/1/2006	GPC223	95750	GATED PULSE COMBINER
17-20MA-26L	2/1/2006	VARIOUS PROPELLER SHAFT SPEED INDICATING SYSTEMS SPEED (RPM) INDICATORS		
17-20MP-238	2/1/2006	PWA56038	77445	AIRCRAFT ENGINE TS
		TTU471E	77445	AIRCRAFT ENGINE TEST SET
17-20MU- 55	2/1/2006	87500222	81873	NWS CALIBRATION KIT
		87500222-101	81873	NWS CALIBRATION KIT
17-20MX-235	2/1/2006	123SFL50072-1	26512	VAPOR CYCLE TEST STAND
		AF37T22	26512	VAPOR CYCLE TEST STAND
17-20SJ- 12	2/1/2006	13819-2A	55974	SYNCHRO T/S
		13819-2A	55972	SYNCHRO T/S
		13819-2A	19315	SYNCHRO T/S
		13819-3A	55974	SYNCHRO T/S
		TTU23AE	55974	SYNCHRO T/S
		TTU23E	05808	SYNCHRO INSTRUMENT TEST SET
17-20SX- 93	2/1/2006	VARIOUS VIBREX AIRCRAFT VIBRATION PROPELLER TRAC		
17-50A103	2/1/2006	SRM232	09SM5	SURFACE RESISTIVITY METER
17-50A109	2/1/2006	74D140080-1007	76301	SERVOCYLINDER TEST STATION
		87936003-104	81873	SERVOCYLINDER TEST STATION
17-50A169	2/1/2006	PM5190	5W667	LF SYNTHESIZER
17-50A365	2/1/2006	74D140080-1009	76301	SERVOCYLINDER TEST STATION
		87936003-105	81873	SERVOCYLINDER TEST STATION
CF-SX-001	2/1/2006	00006A0000	01365	VEHICLE AUTOMATED DIAGNOSTIC SYS-TEM

SIGNIFICANT CALIBRATION INTERVAL CHANGES

MODEL NUMBER	CAGE	DESCRIPTION	PREVIOUS INTERVAL	NEW INTERVAL
1404A	24655	REFERENCE STANDARD CAPACITOR	08	12
1404A	0PK96	REFERENCE STANDARD CAPACITOR	08	12
1404B	24655	REFERENCE STANDARD CAPACITOR	08	12
178	23338	PROGRAMMABLE WAVEFORM SYNTHESIZE	09	14
3208	90101	PHASE SHIFTER	06G	09
ANURM43	91161	RF WATTMETER	03	06
ANURM43A	91161	RF WATTMETER	03	06
ANURM43B	91161	RF WATTMETER	04	06
ANURM43C	91161	RF WATTMETER	03	06
LC101	33347	LC METER	12	23
ME11AU	91161	RF WATTMETER	03	06
ME11BU	02230	RF WATTMETER	04	06
ME11CU	91161	RF WATTMETER	03	06
ME11U	70998	RF WATTMETER	03	06
PM6654C	5W667	ELECTRONIC COUNTER	12	36
PM6665-431	5W667	TIMER COUNTER	12	36
PM6666	5W667	FREQUENCY COUNTER	12	36
PM6670	5W667	TIMER COUNTER	06	36
PM6671	5W667	TIMER COUNTER	06	36
PM6672	5W667	TIMER COUNTER	06	36
PM6675-151	5W667	UNIVERSAL COUNTER	12	36
PM6680	51946	ELECTRONIC COUNTER	18	36
PM6680-021	51946	ELECTRONIC COUNTER	18	36
PM6680B	51946	ELECTRONIC COUNTER	18	36

NAVY METCAL LABELS AND TAGS

TITLE	COLOR	WIDTH/LENGTH	NAVSEA #	COG—NSN	UI
CALIBRATED	Black on White	1-3/8 x 1-1/8	4734/8	1l—0116-LF-009-4700	BX
		1-3/8 x 1-1/8 (flap)	4734/9	1l—0116-LF-009-4800	BX
		7/8 x 5/8	4734/10	1l—0116-LF-009-4900	BX
		5/8 x 3/8	4734/11	1l—0116-1LF009-5000	BX
CALIBRATED -	Red/White	1-3/8 x 1-1/8	4734/12	1l—0116-LF-009-5100	BX
REFER TO REPORT		7/8 x 5/8	4734/13	1l—0116-LF-009-5200	BX
SPECIAL CALIBRATION	Black/Yellow	3-1/8 x 4-1/4 (tag)	4734/6	1l—0116-LF-018-5100	BX
		1-3/8 x 1-1/8	4734/14	1l—0116-LF-009-5300	BX
		2 x 3	4734/15	1l—0116-LF-009-5400	BX
		7/8 x 5/8	4734/16	1l—0116-1LF009-5500	BX
INACTIVE	Green/White	1-3/8 x 1-1/8	4734/17	1l—0116-LF-009-5600	BX
REJECTED	Black/Red	3-1/8 x 6-1/4 (tag)	4734/7	1l—0116-LF-009-4600	BX
		1-3/8 x 1-1/8	4734/18	1l—0116-LF-009-5700	BX
USER CALIBRATION	Black/White	1-1/4 x 7/16	4734/19	1l—0116-LF-009-5800	BX
WARNING—CLEANED	Black/Green	2 x 3	4734/20	1l—0116-LF-009-5900	BX
FOR OXYGEN SERVICE					
CALIBRATION STANDARD	Black/Blue	1-1/4 (diam)	4734/21	1l—0116-LF-009-6000	BX
		11/16 (diam)	4734/22	1l—0116-LF-009-6100	BX
CLEANED FOR	Black/Green	1 x 3/4 (oval)	4734/23	1l—0116-LF-009-6200	BX
OXYGEN SERVICE					
USE COUNTER-CLOCKWISE	Red/White	1 x 1/2	4734/24	1l—0116-LF-009-6300	BX
ONLY					
USE CLOCKWISE ONLY	Red/White	1 x 1/2	4734/25	1l—0116-LF-009-6400	BX
CALIBRATION	Orange/White	1-3/8 x 1-1/8	4734/26	1l—0116-LF-009-6500	BX
NOT REQUIRED		7/8 x 5/8	4734/27	1l—0116-LF-009-6600	BX
CALIBRATION VOID IF	Black/White	2 x 11/16	4734/28	1l—0116-LF-009-6700	BX
SEAL BROKEN		3/4 (diam)	4734/29	1l—0116-LF-009-6800	BX