CHAIRMAN'S INAUGURAL STATEMENT

In this, my first message to the Member Delegates of NCSL, I'll attempt to recap recent events and to set the tone of my administration for the elective year October 1, 1969 to September 31, 1970.

For openers, you have provided yourselves with a fine team of men to serve you on the Board of Directors; they also represent a good cross section of organizations to ensure the check and balance in their deliberations. My immediate predecessor, Past Chairman Harvey Lance of the National Bureau of Standards contributed much to NCSL members during his administration through an in-depth study of NCSL's missions, goals, and structures. He reshaped the mechanisms necessary to reach these goals and to get the machinery in motion to achieve them. I intend to pursue these newly-evaluated goals through an emphasis on greater activity of committees to produce specific results of clear value to NCSL's members. Our contribution to ISA's recent international conference at Houston underscored NCSL's efforts to increase emphasis on improved management control of measurement processes.

In my address at Houston, I reiterated the goals, purposes, and achievements of NCSL and, once again, reminded the attendees that NCSL is an association of organizations, not of individuals. Although we seem continually to say and to remind each other that NCSL is an organization of organizations, the words seem to lack credibility, or at least are not accepted at face value. I can only conclude that, perhaps we haven't put our money where our mouths are. That is, while we say that we represent organizations we haven't been acting that way in all ways.

Accordingly, I intend to undertake a concerted effort to make perfectly clear, in the output products of NCSL and in the handling of public relations, that NCSL is a spokesman for over 200 organizations representing the measurement community throughout our Nation. I intend to emphasize in our every action that we speak for the Nation's metrology managers, and act in the best interests of the organizations that we individually represent, as well as for the national good.

I also intend that, while we seek to emphasize the value of calibration and measurement control to the Nation's products, we cease the act of "poor mouthing" about why we exist. To me it is evident that we
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NCSL NEWSLETTER

EDITORIAL PANEL
C. E. White, Editor
F. J. Dyce, Reviewer
J. F. Hadley, Reviewer
A. S. Ingraham, Jr., Reviewer
W. L. Vandal, Reviewer

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R. S. Ingraham, Jr., 1st Vice-Chmn
P. H. Hunter, Secretary
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Gaithersburg, Md. 20761

The NCSL NEWSLETTER is published quarterly by NCSL, and is sent to NCSL-Member Organizations and to members or activities engaged in or concerned with measurements, Second Class Postage Paid at Gaithersburg, Maryland.
exist to represent our organizations to ensure adequate and cost-effective measurement controls in production and testing processes, consistent with desired product reliability levels. That can only be a valid, meaningful reason for our existence and for which apologies are inappropriate. I do, therefore, urge each of you to re-evaluate your representation of your company's interests and your company's contribution to NCSL's common goal.

In an effort to emphasize the "organization of organizations" aspects of NCSL, letters and publicity will be sent to the presidents and key officers of your companies or organizations, in order that they will be made aware of NCSL and its representation of their interests. I hope that through this awareness, they will recognize their need to support you as their Member Delegate if you're going to be able to serve their interests. This conceivably could put some of you on the spot if your existence in NCSL has been principally one of personal interest only. If, however, you and NCSL are to serve effectively, it is essential that you be both recognized and fully supported in your representation to the extent that your work for NCSL becomes a normal part of your job, not something you do on the side. Above all, I hope to make these officers aware that membership in NCSL is an admission ticket to a unique club giving them access to the Nation's management and technical resources and combined expertise in the field of calibration and measurement control.

I urge you to join me in this effort to emphasize the significance of NCSL. We represent a unique experiment; a combination of government, industry, and educational organizations providing a forum to confront and to debate issues, to seek mature and meaningful solutions, and to join together to institute programs of mutual benefit to the organization's members and to the Nation. It is truly a challenging venture; ennoble it with your total involvement.

--- Jerry L. Hayes
NCSL Chairman

NCSL ELECTION

O. L. Linebrink (Battelle Memorial), Chairman of the Nominating Committee, has announced the results of the annual election for Officer and Directors:

Chairman: J. L. Hayes (Navy Metrology Engrg Cntr)
Vice-Chairman (2 years): J. F. Hadley (Bendix - Kansas City)
Vice-Chairman (2 years): W. L. Vandal (McDonnell Aircraft)
Vice-Chairman (1 year): H. S. Ingraham, Jr. (RCA/DCSD)
Vice-Chairman (1 year): F. J. Dyce (Martin Marietta-Orlando)
Treasurer (2 years): D. I. Hervig (Army SENSAC)
Directors (1 year): E. J. Arsenault (GE-Phila)
W. E. Boyes (Sandia)
P. D. Long (WE-Reading)
W. H. McPhee (MIT-Inst Lab)

Remaining for one more year as Secretary is P. H. Hunter (WE-Winston-Salem).

During the meeting of the Board of Directors, October 28, H. S. Ingraham, Jr. was elected as NCSL First Vice-Chairman.
NCSL BOARD MEETING

Your Editor was an observer at the NCSL Board meeting, held at Houston on October 28. The following notes of actions are unofficial since the minutes of the meeting have not been distributed.

PastChmn LANCE opened the meeting then passed control to newly-elected Chmn HAYES. A first order of business was election of the First Vice-Chairman. The honor was bestowed upon H. S. INGRAHAM, Jr. Treas HERVIG noted that the annual audit had been successfully conducted by WES McPHEE as Finance Chairman.

A memorandum from Dr. E. AMBLER (NBS) requested change of Sponsors Delegate from himself to J. M. CAMERON of the Office of Measurement Services-NBS/IBS. Dr. Ambler also reported that the IBS Divisions of Metrology and Engineering Mechanics had been combined.

Some discussion was had regarding mailing of the NEWSLETTER. The Board decided to use first-class mailing services temporarily, to reduce work load at the Secretariat and to improve delivery of each issue.

W. VANDAL reported that the Program Committee had been forced to revise the meeting dates of the 1970 STANDARDS LABORATORY CONFERENCE (see details under NCSL Committee Reports). The committee also had considered and then decided against having a combined conference and annual meeting of the Precision Measurements Association, as requested by Pres D. Sharp. The committee felt that too much conflict would exist for attendees and that a better plan called for meetings back to back.

A. WOODINGTON suggested several changes in the Bylaws, such as election of both NCSL Chairman and First Vice-Chairman by the membership, with the thought that automatic accession would assure a more efficient transition from the lower to the upper office. Continuity of administration and planning would be one result. He also proposed a redefinition of duties of the two officers.

M. ANGELO proposed an action pertaining to NCSL awards which Chmn Hayes suggested be formalized for the agenda of the next Board meeting.

Next meeting of the Board is scheduled for Feb. 5, 1970 at Pomona, Cal.
Several NCSL Committees took advantage of the ISA Conference at Houston, October 27-30, to present activity progress reports either during formal conference sessions, or at the meeting of the NCSL Board of Directors. Available information appears below.

**Recommended Practices Committee**

Chairman K. W. HEDLUND reported for a committee of one.

- The first proposed recommended practice, "Procedure for Generation and Publication of NCSL Recommended Practices" has been completed and made a part of the NCSL Information Manual.
- RP-1, "Establishment and Adjustment of Calibration Intervals." In final typing -- will be sent to Board of Directors for approval about November 1, 1969.
- RP-2, "Operation of an Instrument Control System." Will be returned to Workload Control Committee 1 November 1969. Comment received indicates that it is unsuitable as presently rewritten.
- RP-3, "Preparation of Calibration Procedures." Being sent to Board of Directors for final approval at this time. Will be in the mail next week.
- RP-4, "Interlab Audit Practices," proposed and in preparation by Herb Ingraham's committee. Not received yet by Recommended Practices Chairman.
- RP-5, "National Audit Practices." Status same as item above.

No other proposed practices are known to me. Correspondence I inherited from Bill Holmes contained suggestions for the following subjects:

a. Laboratory structure
   1. Standards Laboratories
   2. Calibration Laboratories

b. Transportation, Packaging and Handling of Test Equipment and Standards.

c. Format - calibration record forms.

d. Laboratory equipment lists - basic requirements for standards and calibration.

e. Standards and Calibration Laboratories Charters - laboratory functions.

f. Laboratory environments
   1. Standards Laboratories
   2. Calibration Laboratories

g. Standard Terms and Definitions

It is recommended that attendees at the Houston meeting be urged to provide information on any standard practice in preparation to the RP Committee Chairman.

**Directory Committee**

Chairman P. LONG reported that completion date for printing the 1969 Directory was November 7. Xerox copies were made available to most Directors at the Board Meeting on October 28. Chmn. Long expects to share the Chairman's load of preparing for the 1970 Directory with L.R. WEARS of APL-John Hopkins.

**Calibration Systems Management Committee**

During a session at the ISA Conference, Chairman P.J. BARRA (Westinghouse) made a preliminary report on calibration interval versus cost, as reflected by the oscilloscope section of the recent questionnaire data returns and
analyses. He showed slides of a typical questionnaire-return summary of raw data, and some analyses in chart form. A set of Xerox copies of the slide originals can be made available to NCSL Member Delegates by writing to NCSL Editor C.E. White, General Radio Co., 300 Baker Ave., W. Concord, Mass. 01781.

Chairman Barra made the following points with regard to the oscilloscope data, as obtained by returns based upon 28,400 units requiring 170,000 calibration/maintenance hours:

a. 74% of the scopes are subjected to a 4-month calibration-recall interval, 16% are on a 6-month interval, and 5% are on a 3-month interval.

b. 93% of the scopes take 8 man-hours per year, 5% take 9-12 man-hours, and 1% take 13-16 man-hours.

c. Average calibration/maintenance time for the 28,400 oscilloscopes was 6.0 man-hours per scope per year.

Measurement Comparison Committee

Chairman H.S. INGRAHAM, Jr. presented an informal report during an ISA session which was later formalized and sent to the NCSL NEWSLETTER Editor. Member Delegates may receive a Xerox copy by writing directly to the Editor (see instructions in previous report). The report summarizes the current procedures status and future goals of the committee.

Specifications Committee

Chairman F.J. DYCE reviewed the work of his committee during the past year, with particular emphasis directed toward the committee's "Compilation of Ten Government Specifications Affecting Calibration Laboratories" circulated to NCSL Member Delegates in May. Delegates who have received the publication and who would like a Xerox copy of the formal committee report can obtain it upon direct request to the Editor.

Calibration Procedures Distribution Committee

Word from Chairman A.M. BAUGHMAN (Vandenberg AFB) is two more members have joined the library. The volume of the library is indicated by the size of the index--244 pages! Action to update and reprint the index is scheduled for February 1970. A meeting of the committee was rescheduled to Nov. 18-19 at SAMSO in El Segundo, Cal.

The new military specification MIL-L-38793, Preparation of Calibration Procedures, will be made available to library participants during November.

Organization Committee

Chairman A.J. WOODINGTON (GD-Convair); the Information Committee had been shipped copies of the Operation Manual Index, Guidelines for Committee Chairmen, and Publication of NCSL Members and Delegates.

Meetings and Program Committee

The committee met on October 27 to consider several vital matters. Chairman W.L. VANDAL introduced a change in the dates originally scheduled for the 1970 Standards Laboratory Conference (SLC). Non-availability of hotel
space forced the change. New dates for the conference are June 15-17, 1970. The committee also studied and discussed a proposal for a joint meeting with the Precision Measurements Association during the dates of the 1970 conference. It was decided that such a joint meeting would interfere with conduct of, and attendance at, scheduled meetings of the PMA or NCSL and that a more practical arrangement was for PMA to conduct its program back to back with NCSL.

Headquarters for the conference has been established at the Shoreham-Park Hotel in Washington, D.C., with bus service to and from the facilities of the National Bureau of Standards at Gaithersburg. Details of special events, including the Ladies Program, will be available in the March 1970 issue of the Newsletter, and also by means of announcements to be sent out in January.

Theme for the 1970 SLC is:

"INNOVATIVE METROLOGY-KEY TO PROGRESS"

The committee for the conference is composed of:

Co-chairmen, Technical Program - E. J. ARSENAULT
- R. J. BARRA
Arrangements - R. E. TILLEY (NBS-Gaithersburg)
Publications Editor - Dr. H. L. MASON (NBS-Gaithersburg)
Finances - R. T. COOK (NBS-Gaithersburg)

TECHNICAL TRAINING

Standards and Calibrations Laboratories

The Continuing Engineering Education Program of The George Washington University will present its fourth short course on "Standards and Calibration Laboratories" January 19-23, 1970 which will be co-sponsored by NBS. Write Mr. Jack E. Mansfield, Room 218, 2424 Pennsylvania Avenue, N.W., Washington, D.C. 20037 for details.

Conference on Electronic Technician Training

New teaching materials and ideas for two-year associate degree courses for electronics technicians will be presented in a three-day conference, with nationwide attendance, to be held Feb. 25-27, 1970 at the University of Illinois at Urbana-Champaign. The conference will hear reports about the two-year associate degree program in electronics technology being developed, with National Science Foundation support, by seven Illinois junior colleges in cooperation with the university.

Prof. Daniel S. Babb, of the U. of I. department of electrical engineering, project director, said today the conference will be of direct interest to industry personnel as well as to electronics teachers, school administrators and guidance counsellors. It will include discussions of technical and electronics education in the United States and of the interactions of industry and community colleges to develop curricula and identify job opportunities for graduates.
The NSF-support project to develop instructional materials and teaching techniques centers in the classrooms and laboratories of Parkland Junior College in Champaign. Prof. Joel D. Galloway of Parkland heads activities there. Other junior colleges involved are William Rainey Harper at Palatine, Triton at Northlake, Illinois Central at Peoria, Sauk Valley at Dixon, Lake-land at Mattoon and Danville Junior College at Danville.

Babb invited persons interested in more information about the conference to write to him at the department of electrical engineering of the University of Illinois at Urbana-Champaign.

WELCOME TO NEW NC SL MEMBERS

NCSL Secretary P.H. HUNTER advises that the following organizations have joined NCSL since May 20. We welcome you.

BaHa san Measurements Inc,
P.O. Box 425
Greenville, S.C. 29602
Edward B. Clark, Delegate

Bell and Howell Research Laboratories
360 Sierra Madre Villa
Pasadena, Cal. 91109
David H. Buckholtz, Delegate

Bissett-Berman Corporation
2941 Nebraska Avenue
Santa Monica, Cal. 90404
Everette Allen, Delegate

Brooks Instrument Division
Emerson Electric Company
Hatfield, Pa. 19440
Richard Evans, Delegate

Bureau of Standard Weights and Measures
Commonwealth of Pennsylvania
Department of Justice
E-130 Highway and Safety Building
Harrisburg, Pa. 17120
Ronald Roof, Delegate

Cahn Division
Ventron Instrument Company
7500 Jefferson Street
Paramount, Cal. 90723
Earl Schwartz, Delegate

Hamilton Watch Company
Metrology Laboratory
Box 420
Lancaster, Pa. 17604
R.B. Whitney, Delegate

Idaho Nuclear Standards Laboratory
P.O. Box 1845
Idaho Falls, Idaho 83401
R.R. Boyse, Delegate

Russak Instrument Company
6121 Hillcroft Avenue
P.O. Box 36010
Houston, Texas 77036
C.E. Miks, Delegate

Ryan Aeronautical Company
2701 Harbor Drive
San Diego, Cal. 92112
James L. Payton, Delegate

U.S. Navy
Underwater Sound Reference Division
Naval Research Laboratory
P.O. Box 8337
Orlando, Fla. 32806
Robert J. Bobber, Delegate
QUOTABLE QUOTES

A Standard Consumer?

The EIA Weekly Report to the electronics industry, November 17, posed an interesting problem of the type too often encountered, when dealing with "living" standards. It is as follows:

With more and more attention being paid to standards to protect the consumer--not only in the U.S. but throughout the world--standards makers are asking: How can we design a standard consumer to design standards for?

The point was brought up in a speech last week by Dr. Myron Tribus, assistant secretary of commerce for science and technology.

"Some people prefer to purchase an inexpensive product with a short life, rather than a sturdier, longer lasting product which costs twice as much," he surmised. "Clearly, a part of the solution is for the consumer to have a wide variety of choices; but a more important part is to make sure that he has enough information about the product, and knows how to interpret that information."

Are We Hooked on Noise?

William Zinsser had something to say on the subject of the escalation of "environmental din" in the October 31 issue of LIFE magazine, and challenged the U.S. government's procedure for establishing priorities in coping with national problems. He had this to say:

A group of scientists met in Chicago earlier this year to hold a symposium on noise pollution and, presumably keeping their voices low, agreed that "environmental din" is doubling with every decade and will have us all on the ropes by 1975.

"It might be a good thing if people's ears would bleed," one environmental psychologist told the meeting, which was held by the American Medical Association. "Then people might get aroused. It may take a disaster like the Santa Barbara oil slick to dramatize the situation..."

...What the nation really needs is a Secretary of Disaster, whose job would be to turn blunder into victory. He would repair all the erosions of everyday life that Washington is too inert to cure. The first person with ear-bleed, for instance, would go to see him, or the first person driven mad by air compressors or jackhammers in the street, or by jets in the air, or by noisy plumbing in the next apartment. The Secretary would hustle them over to a joint session of Congress and get the necessary legislation started.

What makes modern noise so insidious, the symposium experts said, is that we're getting hooked on the stuff, as dependent as an addict for our daily level of din. "A vacuum cleaner that was nearly silent, while technically feasible, would not be likely to sell very well," suggested Ray Donley, an acoustical engineer, "because today's housewife wants to hear the sound of power."

...A silent vacuum cleaner is technically feasible! Pass it on! The only catch, he says, is that no woman will buy it. Want to bet?

After all, it's not as if a silent vacuum cleaner will plunge the neighborhood into deathly stillness, the sort of place where you can
hear a pin drop. Dropped pins just aren't being heard in America today. Background noise in the average community has risen so sharply that it exceeds the standards accepted by industry. So don't be surprised, ladies, if your husband starts leaving home early and returning late. He just wants to get some quiet down at the plant.

And don't try to tell him that a vacation in the country is any answer. It isn't--power tools have seen to that. A vacationer who wakes with delight at 8 to the singing of birds will be enraged at 9 by the whine of a power saw a quarter-mile away. The notion that one man with one saw should not be allowed to destroy the sanity of several hundred people evidently doesn't trouble our lawmakers; otherwise they would write some silencing laws into the manufacturing laws. Nor is going to the lake any better--Thoreau's broad margin of life has been whittled away by water-skiers. The outboard motor that pulls the water-skier through his swoops and turns is one of the most strident creatures now loose in nature, and winter brings no relief. Then the 700,000 snowmobiles come out to play.

...Authorities say that excess noise is a growing cause of, among other things, rapid heartbeat, mental illness, family strife, suicide and murder.

...I know this is the tritest thought now in the public domain: that if we can put a man on the moon, we should at least be able to redeem our cities, educate our children, elevate our minorities, feed our hungry, and clean our environment. Still, it's no less true for being a cliché, and I refuse to be shamed out of repeating it--anything to keep us from forgetting that our priorities are here on earth and our commitments to the quality of life.

Noise is now one of life's cruelest enemies. Yet the Department of Health, Education and Welfare didn't request in its last legislative package that Congress do anything about it. All hope, however, need not be lost. As one spokesman said, "HEW is undergoing a lot of reprogramming, and I think noise is going to get a very good looking at."

That may be the trouble right there. Washington is going to take a good look at noise. But is anybody going to listen?

Thank Heavens for Little Jokes!

Maurice Chevalier, in one of his memorable pictures some years ago, sang a song entitled "Thank Heaven for Little Girls," and those who remember hearing it can also feel some twinges of nostalgia because simple things could give so much pleasure not too long ago.

In the same vein, your editor felt comparable lift of spirits recently during an extremely serious siege of technical effort devoted to establishing new definitions for a revised standard. The committee was tired and showed signs of frayed nerves. Then the mailman delivered, to each of us, a copy of a proposed collection of definitions for quite another standard. The intent of the author was to illustrate the advantages of presenting standard definitions in thesaurus format rather than lexicographic, as related to what was hoped to be a non-controversial subject. The two examples follow.
Standards on Kiddie Cars: Definitions of Terms
(Dictionary Version - 1967)

AXLE. A cylindrical bar or spindle.

BODY. The main part of a kiddie car on which the child sits and to which all other parts are, either directly or indirectly, affixed.

CHILD. A very young girl or boy.

CONTROL COLUMN. A vertical shaft located at, pivoted in, and passing through the body having the handlebar affixed to its upper end and the front wheel, via the front axle, affixed to its lower end.

FRONT AXLE. The axle located at the front of the body.

FRONT TRUNNION. (deprecated) See FRONT AXLE.

FRONT WHEEL. The wheel associated with the front axle.

HANDLEBAR. A hand control for positioning the front wheel relative to the body whereby the direction of motion of the kiddie car is (presumably) controlled.

KID. (deprecated) See CHILD.

KIDDIE CAR. A child's toy fitted with wheels and capable of being propelled by leg action of a child seated on said toy.

REAR AXLE. The axle located at the rear of the body.

REAR AXLE BRACE. A member which connects the rear axle to the body and provides longitudinal strength.

REAR AXLE SUPPORT. Either of two members (right or left) which connect the rear axle to the rear of the body and provide vertical and transverse strength.

REAR TRUNNION. (deprecated) See REAR AXLE.

REAR TRUNNION BRACE. (deprecated) See REAR AXLE BRACE.

REAR TRUNNION SUPPORT. (deprecated) See REAR AXLE SUPPORT.

REAR WHEEL. Either of two wheels (right or left) located at the rear of the body and mounted on opposite ends of the rear axle.

SEAT. (deprecated) See BODY.

STICK. (deprecated) See CONTROL COLUMN.

TOY. A plaything.

TRUNNION. (deprecated) See AXLE.

WHEEL. A circular structure capable of turning on an axle.
Standards on Kiddie Cars: Definition of Terms
(Thesaurus Version - 1967)

1. Fundamental Definitions
   1.1 CHILD. A very young girl or boy.
   1.2 TOY. A plaything.
   1.3 AXLE. A cylindrical bar or spindle.
   1.4 WHEEL. A circular structure capable of turning on an axle.
   1.5 KIDDIE CAR. A child's toy fitted with wheels and capable of being propelled by leg action of a child seated on said toy.

2. Component Parts Definitions
   2.1 BODY. The main part of a kiddie car on which the child sits and to which all other parts are, either directly or indirectly, affixed.
   2.2 FRONT AXLE. The axle located at the front of the body.
   2.3 FRONT WHEEL. The wheel associated with the front axle.
   2.4 HANDLEBAR. A hand control for positioning the front wheel relative to the body whereby a direction of motion of the kiddie car is (presumably) controlled.
   2.5 CONTROL COLUMN. A vertical shaft located at, pivoted in, and passing through the body having the handlebar affixed to its upper end and the front wheel, via the front axle, affixed to its lower end.
   2.6 REAR AXLE. The axle located at the rear of the body.
   2.7 REAR WHEEL. Either of two wheels (right or left) located at the rear of the body and mounted on opposite ends of the rear axle.
   2.8 REAR AXLE SUPPORT. Either of two members (right or left) which connect the rear axle to the rear of the body and provide vertical and transverse strength.
   2.9 REAR AXLE BRACE. A member which connects the rear axle to the body and provides longitudinal strength.

Alphabetical Listing of Terms
Terms shown in capitals are preferred terms; terms shown in lower case are deprecated.

AXLE, 1.3
BODY, 2.1
REAR AXLE BRACE, 2.9
REAR AXLE SUPPORT, 2.8
CHILD, 1.1 CONTROLS COLUMN, 2.5 FRONT AXLE, 2.2 front trunnion, 2.2 FRONT WHEEL, 2.3 HANDLEBAR, 2.4 kid, 1.1 KIDDIE CAR, 1.5 REAR AXLE, 2.6 REAR WHEEL, 2.7 seat, 2.1 front trunnion, 2.2 stick, 2.5 TOY, 1.2 trunnion, 1.3 WHEEL, 1.4

The examples given, in spite of the levity with which they were presented, are entirely capable of illustrating the points raised in committee. In fact, to those of you engaged in standards activities, our recommendation is: carry these examples into your next committee meeting, you may get on with your business more quickly! Credit for the material quoted belongs with Paul E. Stuckert of IBM's research center in Yorktown Heights, N.Y.

Poor Little Idea!

"When an idea has to struggle up the ladder, rung by rung, it can't win because when it finally gets to the summit, it has been slowed down so many times, niggled so often it is so filled with personal bias and the second guesses and fears of so many frightened people, it is panting so hard and is so covered with scabs and scars and Band Aids, that when it finally struggles onto the top man's desk it's mighty hard to recognize--and mighty hard to OK because so much mediocrity has been built in along the way."

(Source Unknown)

SEASONS GREETINGS FROM THE EDITOR

With this issue of the NEWSLETTER we complete seven years of publication. It is, once again, that time of the year when our thoughts turn to better and kinder things. Your Editor sincerely hopes that the year 1969 has been one of good cheer for all our readers and that the coming year will bring with it a better understanding and tolerance among all mankind.

MAY THE BEST BE YOURS - ALWAYS!
WWV User Survey

To provide NBS with the information necessary to develop the most useful format for transmission of time and frequency information, a survey of WWV users is now underway. A questionnaire has been sent to many known users of the broadcast services, and information about the survey is being broadcast on WWV once each hour. Additional comments are invited on a separate sheet of paper to be attached to the questionnaire. All users of WWV broadcast services, whether government, military, industrial, scientific or private individuals, who wish to receive the questionnaire are asked to write to WWV 1969, National Bureau of Standards, Boulder, Colo. 80302.

US Legal Volt Designation

The question has been raised as to how the new U.S. legal volt should be designated and how it should be distinguished from the one adopted in 1948. In answer, the U.S. legal volt adopted in 1969 should be referred to as the legal volt of 1969, VUS-69, and the legal volt adopted in 1948 should be referred to as the U.S. legal volt of 1948, VUS-48.

The volt used prior to 1948 was then referred to, in general terms, as the "international volt," or in specific terms (for the U.S.) as the "international volt (U.S.A.)" or "U.S. legal volt," and after 1948 as the "absolute volt" or in specific terms as the "U.S. legal absolute volt." Other countries designated their legal volt accordingly.

Improved Earphone Calibration Service

The National Bureau of Standards announces an improved earphone calibration service. Earphones must be suitable for use with the NBS 9-A coupler on which calibrations will be made. The procedure is equivalent to that described in the American National Standards Institute Method for the Coupler Calibration of Earphones, Z24.9-1949, now being revised. The latest version will be used. The coupler is described in Appendix (A) of S3.6-1969, Standard Specification for Audiometers.

The applied voltage response of the earphone is reported at ten audiometric frequencies from 125 to 8000Hz. The precision (3 sigma) is estimated as ±0.2 dB from 125 to 6000Hz and ±0.6 dB at 8000Hz. The estimate of creditable bounds to the systematic error is ±0.25 dB. A continuous response-vs-frequency curve is furnished as a convenience.


Proposed Field Strength Standard

An improved method of determining field strength at radiofrequencies has been developed by R.A. Lawton of the NBS Institute for Basic Standards, Boulder, Colo. The new technique involves measuring the current induced across the equator of a conducting sphere located in the electromagnetic field. The two halves of a hollow brass sphere, two inches in diameter, were threaded onto an inner sphere and electrically isolated from each other by a 0.025-mm dielec-
tric film. They were then connected to each other inside the inner sphere by a series LC circuit, resonating at the test frequency. The voltage induced in the circuit was detected and amplified by self-contained circuitry, and the output fed to a small lamp which could be observed through a hole in the wall of the sphere. The threshold value of voltage needed to light the lamp was preset and could be varied to calibrate the device.

New Field-Strength Standard

An analysis of the scattering of electromagnetic waves incident on conducting spheres provided equations relating the induced current to the field strength, including perturbations due to the finite conductance and size of the sphere, the 0.025-mm gap, and the hole. Experimental results were checked by placing the sphere in the known field of a parallel wire transmission line. The field measured was of the order of 200 V/m, but the range of intensities can be extended greatly in both directions by using precision attenuators. The device was designed and built for use at 30 MHz, where the measurement uncertainty is about 1 percent, but the technique can be applied to a wide range of frequencies.

The new device should find prompt application, since present standards of field strength have uncertainties of over 10 percent at frequencies of 30 MHz and beyond. One possible use is in the area of radiation hazards, where a means of determining radiation levels near high powered equipment and antennas is needed to ensure human safety. Also, the new standard could be used to calibrate near-field probes used in mapping the radiation patterns of shipboard antennas, which have been known to accidentally activate radio-sensitive detonators and explosives.

Crystal-Shaker Range Extended

Research at the NBS Institute for Basic Standards has greatly extended the frequency range over which a single piezoelectric shaker can provide acceptable response. Physicists Earle Jones, William Yelon, and Seymour Edelman accomplished this by adding to the basic shaker several elements contributing damped resonances that maintain the response over higher frequencies. Now
a single shaker can calibrate vibration transducers over a range for which several conventional piezoelectric shakers were formerly needed.

Shakers using piezoelectric materials produce "good" motion at useful frequencies but have sharp variations of displacement over any band of frequencies. Because the typical piezoelectric shaker has linear response over only a narrow range below its resonant frequency, several shakers are needed to perform a calibration. Both measurement accuracy and reproducibility would be improved if each piezoelectric shaker could be used over a wider frequency range.

The conventional piezoelectric shaker consists of a section of piezoelectric material sandwiched between a massive base and a "table," which has a threaded hole for mounting transducers. The piezoelectric material alternately thins and thickens with application of the sinusoidal driving signal. The base and table form with the piezoelectric layer a mechanically resonant system characterized by a high Q, which therefore has at its resonant frequency a sharp peak of displacement versus input power.

The new NBS shaker consists, typically, of a base-driver-table unit like a simple shaker, to the top of which is added an intermediate resonator section and another table. Thin butyl rubber layers couple the resonator section to the new table and to the original table below. The base of the basic shaker is mounted on a second resonator section with another layer of rubber.

One experimental shaker, S-89, requires for constant displacement a driving voltage that is relatively flat from 100 Hz to 55 kHz. Above this the driving voltage required for this displacement soars to a sharp peak. The plot of driving current versus frequency for this shaker has dips identifying four resonant frequencies of approximately 11, 16, 33, and 52 kHz, all of them within its useful frequency range. A similar shaker is used to perform calibrations from 1 to 20 kHz, over which range three conventional shakers formerly did a less satisfactory job.

It is interesting to note that widening the response of shakers by selecting added resonances is analogous to the stagger-tuning technique that is used to shape the bandwidths of electrical tuned circuits.

The piezoelectric material itself provides almost ideal pistonlike motion in its intended range, but the butyl-rubber layers degrade the motion progressively at frequencies above 50 kHz. For this reason Bureau scientists are investigating other materials for the damping layers. Some piezoelectric materials have been found to be satisfactory for this function. Particularly promising is the possibility of shaping the loss characteristics by connecting various electrical impedance networks between the two faces of the damping layer. Also being studied is application of part of the driving signal, suitably shifted in phase, to the damping layer.

Revised Publication Dates

Latest revisions of publication dates for the balance of NBS Spec Pub 300 (Precision Measurement and Calibration) are given by Lea Mason (NBS):

5. Time & Frequency Mar 1, 1970
6. Calorimetry Feb 1, 1970
8. Dimensional Metrology Jun 1, 1970
9. Radiometry & Photometry Apr 1, 1970
11. Spectrochemical Analysis May 15, 1970
12. Ionizing Radiation Jun 1, 1970
Driving voltages required for standard displacements

Configuration of S-89 shaker

NBS Annual Honors Awards

On October 14, the Department of Commerce held its 21st Annual Awards Program. Among the recipients of gold or silver medals were the following people whose work is of close interest to NCSL:

John L. Hall: for research on laser technology; ultimate use for length measurements and studies of atoms and molecules.

Bernadine L. Dunfee: for advancement of NBS voltage-ratio and current-ratio measurements; for development of highly-accurate dc voltage dividers and ac current transformers, plus calibration means.

Wilbur C. Sze: for development of inductive high-voltage dividers.

Douglas R. Tate: for work on absolute value of gravity acceleration.

Estal D. West: for leadership in accurate heat measurements.
An article in the September-October 1969 issue of *Measurements & Data*, entitled "Truth in Packaging of Scientific Information," is a scathing denouncement of writing practices followed by many workers in the field of science. It was written by Dr. L.M. Branscomb, newly appointed Director of the National Bureau of Standards, and appears to be a follow-up of another article he wrote for *Scientific Research* May 1968, labeled "Is the Literature Worth Reviewing?"

Dr. Branscomb is concerned with the deficiencies in scientific literature—not because they are new but because there is so much more material being printed. The extreme volume effectively inhibits an objective evaluation of the worth of what is printed. He points out that scientific news alerts a reader to something new but gives insufficient validity to the report. His feeling toward conference proceedings is that, were they printed on "crummy" paper which either fades or tears up in a year or so, they would be more useful. He further notes the existence of archival literature in which one prints results not to be forgotten right away, a storage place for results "where people who don't know about you or about your work may subsequently find them."

Continuing, Dr. Branscomb notes the need for a "new literature that deals primarily with the criteria by which scientific measurements are to be evaluated. Such papers would deal with proper procedures and techniques for carrying out essential kinds of experiments and kinds of measurements. Such a journal then sets a real standard for quality control in that part of science that is concerned with quantitative properties needed by users for important purposes.

"Finally, we need a critical review literature that carries out the overall evaluations of the material in the archival literature, distilling out of this material the important ideas and facts.........

"The scientist who wants to explore and measure some property of nature devises an apparatus in which this property is an important part of the set of phenomena which characterizes the functioning of this real piece of equipment. The prudent scientist will design his equipment and he will write down a theory for the function of this apparatus, including without prejudice, all operative phenomena. He must set out to explore quantitatively all that goes on in his equipment and everything that has a bearing on the experimental observables. All phenomena, including those called noise, must be given respect and attention equal to that given the signal. That is the route to the control of systematic error."

These words, by a man who heads an important part of the American scientific community, are a challenge not only to his own establishment but to the entire technical community. As a measure of the importance attributed to this philosophy, the NBS Office of Standard Reference Data (Dr. D.R. Lide, Director) has been attempting for several years to promote two goals 1) to provide critically evaluated data to scientists and engineers and 2) to upgrade the quality of experimental practice in laboratories and the reporting of experimental measurements in the public literature.

On May 1, 1969, E.L. Brady, Associate Director for Information Programs-NBS, as part of a statement made before the Subcommittee on Science, Research and Development, House Committee on Science and Astronautics, on H.R. 4284, Standard Reference Data System Authorization, quoted from Dr. Branscomb's
Scientific Research article as follows:

"It seems likely that about 1500 papers will be written in 1967-1971 containing reports of cross sections for electron collisions. These will cost somebody about $30,000 a piece, or about $45 million (total). Many of these papers surely will have value, even if they contain no reference data that can be critically evaluated; their primary purpose may have been altogether different, so the cost of the data quoted is relatively small.

"But, to the extent that the work has a measurement of such cross sections as its primary purpose, a substantial part of the $45 million might be saved. How? Simply by not doing the work at all unless it is written up in such a way that it can be evaluated and, therefore, become useful."

Harsh words, but they help to establish a reason for funding the work of the NBS agency. There remains, however, one important disturbing factor. In institutions controlled in part by the operating philosophy "Print or Perish" what compensatory steps will be taken if the philosophy becomes "Print Essential Data Only—and Only Once"?

**METRIC SYSTEM NEWS**

WASHINGTON SCIENCE TRENDS, October 20 issue, presents a progress report on the Metric Study Program, "Metric System: Cost vs Benefits." Transition to the metric system in the United States will not be as costly as originally estimated. The change, if it occurs, will not significantly increase foreign trade. The Study has been separated into two phases for the transition a) concern with language and b) concern with hardware. The latter phase involves the principal costs and difficulties. The investigators have developed a questionnaire to analyze the difficulties and to help estimate transition costs.

**COMMERCE STANDARDS JOB IS FINALLY FILLED**

(The following news item was extracted from the WEEKLY REPORT of the Electronic Industries Association, December 1, 1969.)

A significant new appointment was announced at the Commerce Department last week when Richard O. Simpson was named Deputy Assistant Secretary for Product Standards under Dr. Myron Tribus, assistant secretary of commerce for Science and Technology. In addition, Mr. Simpson will be Director of the Office of Product Standards. Mr. Simpson is presently an executive with the Oakland-based Rucker Co. (home electronic safety devices). His appointment was announced by Dr. Tribus during a speech at the American National Standards Institute annual meeting in Detroit.

Significance of appointment lies in the fact the office which Mr. Simpson will head is concerned with the development, adoption, or publication of voluntary product standards. It coordinates the work of private standards groups with Commerce Department activities and attempts to serve as a liaison between government and industry in the standards-making field.

A few months ago, the title of the office was changed with the aim of upgrading it. Until now, the office has been manned by an acting director and an assistant. There is a good possibility the staff will be beefed up as Commerce plans a bigger role in standards making.
NEWS OF PROFESSIONAL ACTIVITIES

Conference on Precision Electromagnetic Measurements (CPEM)

At NBS-Boulder facilities, June 2-5, 1970. For advancement of electromagnetic measurements at levels of precision and accuracy appropriate to national standards laboratories. Emphasis in 1970, upon rapidly developing field of precise measurements at very low temperatures.

1970 Standards Laboratory Conference

Sponsored by NCSL and NBS, to be held at NBS-Gaithersburg facilities, June 15-17, 1970. For further details see call for papers on page 24.

International Conference on Precision Measurement and Fundamental Constants

At NBS-Gaithersburg facilities, August 3-7, 1970. A limited number of contributed papers covering original work on the conference subjects will be accepted for presentation at the meeting. Abstracts of about 200 words should be submitted before April 1, 1970 to Program Chairman Prof. D. Langenberg, Dept. of Physics, U. of Pennsylvania, Philadelphia, Pa. 19104. Major topics to be covered include a) the impact of contemporary research development on the basic standards, particularly length, time, and electric standards, b) current and proposed research on the more precisely measurable fundamental constants (velocity of light, Rydberg constant, gravitational acceleration, etc.), c) current experimental and theoretical problems associated with the determination of those quantities which can make major contributions to our knowledge of fundamental constants.

ASA to USASI to ANSI

The Magazine of Standards, in the October issue, gave public notice of another change in name of the old American Standards Association thereby promoting more confusion in our filing and reference systems. Copy of the formal notice is presented below:

--- USASI Changes Its Name ---

The United States of America Standards Institute, Inc, has changed its name to the American National Standards Institute, Incorporated. The change was agreed to by members at a proxy meeting on September 17 and went into effect on October 6 when the Institute moved to new headquarters. At the same time the Standards Institute also changed the designation of the standards it approves from "USA Standard" to "American National Standard."

The Standards Institute requests its members and everyone else who has business with the organization, or occasion to refer to it in its publications, to use the following:

New Name: American National Standards Institute, Incorporated
New Designation for Standards: American National Standard
New Address: 1430 Broadway, New York, N.Y. 10018
Telephone: (212) 868-1220

Principal reason for the change in name and standards designation is the Standards Institute's contemplated entry into a public program of certification. Under the program the Institute will license use of its mark on products
found by independent test to meet requirements of standards it has approved as voluntary national standards. Before it embarks on this program, which will depend on public consumer acceptance of its mark, the Institute wants to eliminate any possibility that the public may confuse the organization with a government agency.

The Institute has also adopted the new emblem which appears below. It will be appearing from now on as the identifying mark on all American National Standards published by the Institute, on letterheads, booklets, and other Institute publications.

![American National Standards Institute](image)

The name "United States of America Standards Institute" and the designation "USA Standard" were adopted in 1966 when the Institute was reconstituted and reorganized to succeed the American Standards Association (ASA). At that time the Institute was chiefly involved in promoting the development of standards, approving them as voluntary national standards if they achieved national recognition and acceptance, and representing U.S. interests in the work of international standards organizations. Certification in its present form was not contemplated, nor did the founders foresee the impact that the reconstituted organization would have on national standardization. These new circumstances have led the Institute to conclude that the change to "American National Standards Institute, Incorporated" is desirable to avoid possible misunderstanding as the Institute embarks on public programs.

**SAMA & ANSI**

R. H. VERITY (Leeds & Northrup), the NCSL Liaison Delegate to the Scientific Apparatus Makers Association (SAMA), submitted a report of SAMA’s activities to the NCSL Board, October 28. Of interest to NCSL is the fact that SAMA has assumed administrative sponsorship of ANSI (formerly USASI) Committee C39. He reported the status of the several C-39 subcommittees' projects as follows:

- **C 39.1 - Indicating Instruments; Chmn Uiga, Sec Pross; Sixth edition (Sep 64) revision underway.**
- **C 39.2 - Direct-Acting Recorders; Chmn Jacobson, Sec French; Second edition (Mar 64) reaffirmation scheduled after review of IEC 258.**
- **C 39.3 - Shock Test Mechanism; Chmn Uiga, Sec Pross; Third edition (Feb 66), NEMA Technical Committee is reviewing work.**
- **C 39.4 - Self-Balancing Recorders; Chmn Jacobson; Second edition (Jan 66) should be reviewed in 1970.**
- **C 39.5 - Safety; Chmn Jacobson, Sec French; First edition (Dec 64) to be reaffirmed pending further consideration of legal aspects.**
- **C 39.6 - Digital Voltmeters; Chmn Holtje, Sec French; First edition (Apr 69), Second edition to be released early in 1970.**
- **C 39.7 - Analog Voltmeters; Chmn Triplett, Sec French; First edition (May 69) being circulated for one-year trial.**
The latest meeting of the C-39 Committee was in Washington, November 3. Chmn L. J. Lunas is also chairman of the Technical Advisory Group to ANSI for IECTC-13B.

The SAMA Standards Committee has been authorized to organize a task force to establish the position of the instrument industry as regards conversion to the metric system. It is anticipated the committee will recommend industry change-over priorities - comment from NCSL members is welcomed.

SAMA is planning a reception for international delegates, interested in instruments, who will attend the general meeting of the IEC in May 1970, in Washington, D. C.

The ANSI C-100 Committee (Electrical Reference Instruments and Devices) expects to have drafts available shortly of proposed international standards on Standard Cells and Resistors. ANSI Standard C 100J (Precision Resistors) has been approved and will be distributed shortly after Jan. 1, 1970. ANSI Standard C 100-1 (Potentiometer Voltage Dividers) has been in circulation for one year and is expected to be voted to full standard (5-year period) shortly.

ASTM

In a communication from HERB INGRAHAM, Jr. (NCSL Measurement Agreement Comparison Committee), he admits that the NCSL measurement-agreement program can't take care of all measurement categories. Whenever he learns of programs conducted by other activities he tries to pass the word along to where it will do the most good. In this connection he reports that the intercomparison of kinematic viscosity of Newtonian liquids is conducted each year under sponsorship of ASTM Committee D-2, Subcommittee RDVII-A, and supervised by the Cannon Instrument Company. Would participants please contact: Dr. R. E. Manning, Cannon Instrument Co., P.O. Box 16, State College, Pa. 16801.
The ISA Conference at Houston October 27-30, had a number of NCSL Delegates and friends as speakers. D. B. Sharp (1) (IBM-San Jose), J. L. Hayes (2) (USN-MEC), and D. C. Strain (3) (ESI) were among those who spoke on the subject of automation in the laboratory, stressing cost effectiveness. E. J. Arsenault (4) (GE-RES) introduced a metrology workshop panel which included R. Barra (Westinghouse-Balt), F. Dyce (Martin-Marietta/Orlando), and H. Ingraham, Jr. (RCA), T. L. Zapf (5) (NBS-Boulder) chaired a session on ac ratio measurements, during which H. P. Hall (6-L) (Gen Radio) and J. C. Riley (6-R) (ESI) assisted with the audio visual aids and Riley spoke of Coaxers.

During a session on education of metrology - chaired by C. V. Wells (U of Colorado), D. J. Franke (7) (NARC-Autronics) made his point with excellent visual aids. Throughout the entire four days of sessions, P. Painchaud (8) (E-H Res Lab) opened sessions, introduced speakers and panelists, and occasionally took a rest and collected attendance slips. C. Boyer, Jr. (9) (Honeywell), in addition to chairing a session on the changed volt and ohm, took time out to be pinned as Sheriff by a Honeywell attendant.

There were many other sessions of interest and importance to NCSL members but your Editor was unable to cover everything by himself. He remained content to catch, at least, those sessions noted above and pictured below.
CALL FOR PAPERS

1970 STANDARDS LABORATORY CONFERENCE

June 15-17, 1970

AT

NATIONAL BUREAU OF STANDARDS

GAITHERSBURG, MARYLAND

THEME

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I certify that the statements made in the above are correct and complete.

-H. L. Mason
LABORATORY OPERATIONAL SAFETY PRECAUTIONS

Hazard of Burning Cable

The following short report from NBS is presented for readers as an alert and a safety precaution:

A recent study at the NBS Building Research Division has shown that when polyvinyl chloride (PVC) wire insulation is heated it goes through two stages of decomposition. In the initial stage, when the level of heat input is relatively low, a white HCl mist is generated. In the latter phase, when the material is exposed to higher levels of heat input or an open flame, a dark sooty smoke is released.

The release of the HCl prior to the development of dense smoke presents a potentially hazardous situation, especially to fire-fighting personnel. The HCl in this state is colorless, but forms a white mist resembling steam by combining with moisture in the air. Although innocuous in appearance, the HCl acts as a primary irritant and corrosive agent to the respiratory system.

The decomposition phases of PVC are a function of the temperature of the material. Gaseous hydrogen chloride is released from PVC when the temperature reaches about 450°F. The rate of release depends upon the temperature and density of the material. The gas, on exposure to moisture in the air, forms white fumes of acid vapor by adsorption of moisture. The vapor is very reactive and can be easily adsorbed on contact with a surface. If the temperature is maintained below 650°F, dark smoke or soot will not form. Above 650°F, carbonaceous degradation products in the form of black smoke are present.

In the NBS study a specimen of an electric cable covered by black plastic insulation, composed mainly of PVC with some amounts of fillers and plasticizers, was tested. The insulation was cut and flattened to fit in the standard holder in a smoke density chamber. The specimens were irradiated with 2.5 watts/cm² heat energy for non-flaming exposure tests.

Results were obtained in terms of optical density and quantity of HCl concentration. In the 18 cu ft chamber, the combustion products from a 6.5 sq-in sample reached a HCl concentration of above 1,600 ppm. From 1,000-2,000 ppm of HCl are considered to be dangerous on short exposure, whereas 5,000 to 10,000 ppm of carbon monoxide are needed for comparable effect. Fire-fighting personnel should thus be alert to the possible dangers of electrical insulation decomposition in a fire situation.

Electrical Shock Hazard

The October issue of QUALITY ASSURANCE magazine reminded readers of the ever-present hazard of electrical shock. The article "New Method of Testing Appliances for Electrical Shocks" discussed physiological effects of various current levels in the body and also presented the facts in chart form. It was shown that the smallest detectable (human) current flow is a function of frequency. Tolerances for safety in handling electrical appliances are proposed.
TECHNICAL REFERENCES


criteria for analyses and suitable instrumentation.


R. "Impedance Transformation Without a Transformer," Vincent, G.A., Freq Tech, Sept 69. Technique for transforming a given termination to a more convenient level while preserving the input and output characteristics of the original network.


V. "Adjustable Calibrated DC Source of 10^-12 to 10^-18 A," Borzov, V.M. and Illyukovich, A.M., Meas Tech, Apr 69. Based on application of sawtooth generator and differentiating capacitor; source has high output resistance required for electrometric equipment.

W. "Power-Supply Finder," Staff, EID, Sept 69. Detailed listing by functional type commercial or custom equipment.

X. "Digital Multimeters-Who Makes What Types?" Staff, EID, Aug 69. Discussion and tabulation, useful when procuring.


CC. "Superheterodyne Measurement of Microwave Attenuation at a 10-kHz Inter-
mediate Frequency," Clark, R.F., IEEE Trans Inst & Meas, Sept 69. Two mw oscillators are phase-locked to a common reference signal to give an audio IF. Phase-lock feature also permits measurement of mw phase at the audio frequency.


HH. "New Method of Measuring the Peak Voltage of a Narrow Impulse," Uno, M., Proc of IEEE, Jul 69. Impulses as narrow as 30 ns measured, over range of +1 to -7 volts. Meter has long delay time--signal decreases 1% after 18 s.


PP. "Thermal Method Determines True Contact Resistance," Landis, J.L., EDN, Sept 69. Uses short current pulses to measure contact resistance, as distinguished from bulk resistance.


SS. "Alice in Statisticaland - 2," editorial, Meas & Data, Jul-Aug 69. Mr. Aronson defends the simplified approach made in his home-study course on statistics and amplifies his introduction to the course (May-June 69). Every engineer reviewing statistics courses taken at college, and every technician learning statistics for the first time, should encourage any simplification of this unpalatable (to most technical people) subject.

Some NBS Publications


"Some Applications of the Josephson Effect," NBS Technical Note 381, R.A. Kamper, L.O. Mullen, and D.B. Sullivan; order from Supt. of Documents for 65¢. Describes techniques for fabricating permanent Josephson junctions between thin films of niobium and lead and discusses absolute noise thermometry at very low temperatures using the Josephson effect.


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