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International Scientific Radio Union

U. R. S. I.

INFORMATION BULLETIN

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UNESCO

Unesco recommends scheme for safe transit of delicate scientific instruments

Unesco has asked its Member States to apply an international arrangement ensuring the safe and expeditious transit across frontiers of delicate physical standards. The scheme is designed to prevent such instruments from being delayed or damaged during customs inspection.

From time to time, research laboratories making delicate scientific measurements need to exchange instruments, for purposes of comparison, with similar laboratories in other countries. The apparatus concerned may be metric, optical, electrical or magnetic standards, such as interferometers, quartz piezo-electric resistance standards, or quartz horizontal magnetometers. If these very delicate instruments are to reach their destination undamaged, they must be handled with extreme care during customs inspection in both exporting and importing countries.

The arrangement proposed by Unesco provides for the inspection of these instruments to be made in the laboratories themselves, under competent supervision, rather than in customs depots at national frontiers or terminals. Each participating government would name the laboratory or laboratories in its country to which it wished to extend the privileges of the scheme.

The actual procedure might vary form country to country. Under an arrangement suggested by the United Kingdom, a customs officer would supervise the packing of an instrument at an exporting laboratory and affix an internationally recognized label. The authorities at the place of importation would allow the package to be forwarded unopened to its destination, where it would be opened in the presence of a customs official.

Unesco will keep a register of laboratories designated by governments and would periodically send to interested countries a list

of these laboratories, as well as details of operation. Information reaching Unesco by 1 June 1952 will be included in the first circular.

The scheme seeks to apply more widely an arrangement already operating among a limited number of laboratories. Institutions concerned in ensuring safe transit of delicate standards include the National Physical Laboratory at Teddington, near London ; le Conservatoire des Arts et Métiers, Paris ; the Physikalisch-Technische Bundesanstalt, Brunswick and the Deutsches Amt fuer Maasse und Gewichte, Weida, Germany ; the Electrotechnical Laboratory and the Central Inspection Institute of Weights and Measures, Tokyo ; the National Bureau of Standards, Washington, D. C. ; and the Institute of Metrology of the U. S. S. R. Leningrad.

These eight institutions at present conduct exchanges on a limited scale and also maintain regular contact with the International Bureau of Weights and Measures (IBWM) for the purpose of exchanging apparatus and scientific data. The IBWM itself maintains an international laboratory at its headquarters at Sèvres, near Paris, which exchanges physical standards and scientific data with leading national laboratories.

Both the IBWM and the International Council of Scientific Unions have endorsed the proposal as a practical means of reducing obstacles to the international exchange of scientific information. Unesco is sponsoring the scheme as part of its general campaign to reduce administrative and other barriers to the passage of educational and scientific materials from country to country.

NATIONAL COMMITTEES

India

We are informed that the Government of India has decided that the Radio Research Committee of the Council of Scientific and Industrial Research, Raisina Road, New Delhi, will be the National Committee in India for U.R.S.I. The membership of this Committee is as follows :

Chairman :

Dr. K. S. KRISHNAN, F. R. S., Director, National Physical Laboratory, New Delhi.

Members :

Dr. S. K. MITRA, University College of Science, 92, Upper Circular Road, Calcutta.

Mr. B. V. BALIGA, Adviser, Wireless, Planning and Coordination Ministry of Communications, New Delhi.

Mr. V. V. SOHONI, Director General of Observatories, New Delhi.

Dr. K. SRINIVASAN, Prof. Communication Engineering, Indian Institute of Science, Bangalore-3.

Mr. N. NAHALINGAM, Director of the Wireless, Post and Telegraph Department, New Delhi.

Dr. D. S. KOTHARI, Scientific Adviser of the Ministry of Defence, New Delhi.

Dr. M. B. SARWATE, Director of Communications, Department of Civil Aviation, New Delhi.

Mr. S. R. KANTIBET, General Manager, Overseas Communication Service, Apollo Bunder, Bombay.

Mr. G. R. S. RAO, National EKCO Radio Engineering Co., Ltd., Ewart House, Bruce Street, Bombay-1.

The Director, Scientific and Industrial Research, New Delhi (ex-officio).

U. S. A. National Committee

SPRING MEETING, 1952

(In collaboration with the I.R.E. Professional Group on Antennas and Propagation)

A large attendance was noted at the Spring 1952 meeting of the U. S. A. National Committee of U.R.S.I., in collaboration with the I.R.E. Professional Group on Antennas and Propagation, held at the National Bureau of Standards, Washington, D. C. on April 21, 22, 23 and 24, 1952. In view of the General Assembly of U.R.S.I. to be held this year, this will be the only meeting held in the U. S. during 1952 and undoubtedly this fact contributed to the large attendance and number of papers which were presented.

A total of 71 papers were presented which included subjects of interest to all of the seven commissions of U.R.S.I. As will be noted in the listing below several papers concerning each commission were presented with the exception of Commission V. This does not indicate a lack of interest of the work of Commission V. It is due to the fact that the major emphasis of the Fall 1951 meeting concerned the work of this Commission, as may be noted by referring to the report on this meeting which appeared in issue N° 71 of the Information Bulletin.

A listing of the papers presented follows. Abstracts are available at the General Secretariat.

Combined Session of Participating U.S.A. National Commissions

1. Modern Concepts in Amplifier Theory : J. M. PETTIT, Stanford University, Stanford, California.
2. Upper Atmosphere Physical Characteristics : M. NICOLET, The Pennsylvania State College, State College, Pennsylvania, (On leave from Royal Meteorological Institute of Belgium, Brussels, Belgium).
3. Anti-Friction Bearings as Radio Noise Generators : H. E. DINGER, Naval Research Laboratory, Washington, D. C.

4. Regularities in the Behaviour of Regions E and F of the Ionosphere : J. W. FINDLAY, Carnegie Institution of Washington, Washington, D. C. (On leave from Cambridge University, Cambridge, England).
5. Normal Tropospheric Propagation Deep into the Earth's Shadow : The Present Status of Suggested Explanations : T. J. CARROLL, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Commission I

6. A Microcalorimeter for the Measurement of Absolute Microwave Power : Alan C. MACPHERSON, National Bureau of Standards, Washington, D. C.
7. N.B.S. Magnetic Attenuator : Frank REGGIA, National Bureau of Standards, Washington, D. C.
8. The Measurement of Q of Resonant Cavities in the Normal and Superconducting State : C. J. GREBENKEMPER and J. P. HAGEN, Naval Research Laboratory, Washington, D. C.
9. An Electronic Ratio Meter for Reflection Coefficient Measurements : L. A. ROSENTHAL, J. L. POTTER and G. M. BADOYANNIS, Rutgers University, New Brunswick, New Jersey.
10. A Microwave Power Comparator : K. C. C. GUNN and K. O. HOLMES, Air Force Cambridge Research Center, Cambridge, Massachusetts.
11. A New Method of Calibrating Field Strength Measuring Equipment : H. E. DINGER and W. E. GARNER, Naval Research Laboratory, Washington, D. C.
12. Characteristics of Microwave Printed Lines with Applications to Bandpass Microwave Filter Design : M. ARDITI and J. ELEFANT, Federal Telecommunication Laboratories, Nutley, New Jersey.
13. Application of Non-Euclidean Geometry to the Analysis of Waveguide Functions : Georges DESCHAMPS, Federal Telecommunication Laboratories, Nutley, N. J.
14. Generation of Standard Frequencies Using a Selective Spectrum Generator : R. GUENTHER and A. HAHNEL, Signal Corps Engineering Laboratory, Fort Monmouth, New Jersey.

Commission II

15. The Measurement of Variations in Atmospheric Refractive Index : George BIRNBAUM, H. E. BUSSEY and H. R. LARSON, National Bureau of Standards, Washington, D. C.
16. Directly Recorded Tropospheric Refractive Index Fluctuations and Profiles : C. M. CRAIN. The University of Texas, Austin, Texas.
17. Tropospheric Propagation Well Beyond the Horizon : Thomas J. CARROLL, Massachusetts Institute of Technology, Cambridge Massachusetts.
18. Partial Reflections in Tropospheric Propagation : Joseph FEINSTEIN, National Bureau of Standards, Washington, D. C.
19. Tropospheric Propagation Beyond the Horizon : Martin KATZIN, Naval Research Laboratory, Washington, D. C.
20. Concerning the Radio Field Due to Internal Reflections In the Stratified Atmosphere : L.J. ANDERSON and J.F. COLWELL, Navy Electronics Laboratory, San Diego, California.
21. Random Processes in Wave Propagation : W. S. AMENT, Naval Research Laboratory, Washington, D. C.
22. A Method for Evaluating Trends in Time Series of Tropospheric Radio Field Strength Data : Philip L. RICE, National Bureau of Standards, Washington, D. C.
23. A Formula for the Transmission Loss of Space Waves Propagated over Irregular Terrain : Kenneth A. NORTON, National Bureau of Standards, Washington ,D. C.
24. Measurement of the Effect of Irregular Terrain on Directive Antenna Patterns : R. S. KIRBY, J. M. TAFF and H. S. MOORE, National Bureau of Standards, Washington, D. C.
25. The Constants of the Equation for the Refractive Index of Air : Ernest K. SMITH Jr., National Bureau of Standards, Washington, D. C.
26. Effect of Particle Shape and Composition on Microwave Attenuation and Scattering by Precipitation : Walter HITSCHFELD, Kenrick GUNN and T. W. R. EAST, McGill University, Montreal, Canada.

Commission III

27. Short Period Sky-Wave Fading of CW Emissions : H. P. HUTCHINSON, Department of the Army, Washington, D. C.
28. The Limiting Polarization of Magneto-Ionic Waves : J. FEINSTEIN, National Bureau of Standards, Washington, D. C.
29. Characteristic Waves : A. J. MALLINCKRODT, W. SNYDER and R. A. HELLIWELL, Stanford University, Stanford, California.
30. Polarization Control and Measurement in Ionosphere Vertical Incidence Echo Ranging : M. G. MORGAN, Dartmouth College, Hanover, New Hampshire.
31. Plane Waves in the Ionosphere : H. B. KELLER, New York University, New York, N. Y.
32. Low Frequency Propagation in an Exponential Ionospheric Layer : J. SHMOYS, New York University, New York, N. Y.
33. Theoretical and Experimental Investigation of the Group Heights of Reflection of 150 kc/s Radio Waves Vertically Incident on the Ionosphere : Norman DAVIDS and Rune LINDQUIST, The Pennsylvania State College, State College, Pennsylvania.
34. Turbulance in the Lower Ionosphere as Deduced from Increments in Absorption and Phase Path at 150 kc/s : R. E. JONES, G. H. MILLMAN and R. J. NERTNEY, The Pennsylvania State College, State College, Pennsylvania.
35. Ionospheric Wind Measurements at 150 kc/s : G. H. MILLMAN, The Pennsylvania State College, State College, Pennsylvania.
36. Sporadic-E Stratification and Correlation with Low-Frequency Soundings : R. A. HELLIWELL, Stanford University, Stanford, California.
37. A Sweep Frequency Ionosphere Recorder for the Low Frequencies : J. C. BLAIR, J. N. BROWN and J. M. WATTS, National Bureau of Standards, Washington, D. C.
38. Scatter-Sounding : A Technique for Study of the Ionosphere at a Distance : O. G. VILLARD Jr., and A. M. PETERSON, Stanford University, Stanford, California.

39. F-Region Effects of Solar Eclipse at Sunrise, September 1, 1951 : H. W. WELLS, Carnegie Institution of Washington, D. C.

40. Ionosphere Reflection Coefficients by Variational Technique : J. LURYE, New York University, New York, N. Y.

41. Distant Radio Communication Theory : M. J. DITORO, Federal Telecommunication Laboratories, Nutley, New Jersey.

42. The Differences in the Relationship Between Ionospheric Critical Frequencies and Sunspot Number for Different Sunspot Cycles : S. M. OSTROW and M. Po KEMPNER, National Bureau of Standards, Washington, D. C.

43. Continental Maps for Four Ionosphere Disturbances : R. S. LAWRENCE, National Bureau of Standards, Washington, D. C.

44. Relationship Between Auroral and Sporadic E Echoes : R. W. KNECHT, National Bureau of Standards, Washington, D. C.

45. Theory of Radio Scattering from the Aurora : R. K. MOORE, Sandia Corporation, Albuquerque, New Mexico.

46. The Length of Ionized Meteor Trails : L. A. MANNING, O. G. VILLARD and A. M. PETERSON, Stanford University, Stanford, California.

Joint Meeting Commissions IV and V

47. Atmospheric Noise in the Very Low Frequency Range : J. S. BARLOW, G. W. FREY and J. B. NEWMAN, The Johns Hopkins University, Baltimore, Maryland.

48. An Approach to the Application of Sunspot-Cycle Correction to Atmospheric Radio Noise Prediction : Edna SHULTZ, National Bureau of Standards, Washington, D. C.

49. Determination of Effective Bandwidths of Radio Noise Meters for Impulse and Random Type Noise : Francis T. NICHOLSON, The University of Pennsylvania, Philadelphia, Pennsylvania.

50. The Ogiver. A Radio Noise Meter : A. W. SULLIVAN, The University of Florida, Gainesville, Florida.

51. Solar Flares and Associated 200 Mc/s Radiation : Helen W. Dodson, E. Ruth Hedeman, McMath Hulbert Observatory, Ann Arbor, Michigan and Leif Owren, Cornell University, Ithaca, New York.

52. Symposium on the Measurement of Atmospheric Noise — An informal presentation and discussion of material by A. W. Sullivan and J. M. Barney, University of Florida ; W. Q. Crichlow, National Bureau of Standards ; Ralph Showers, University of Pennsylvania ; and others.

Commission VI

53. Control of Annular Slot Excitation by Selective Dielectric Filling : D. J. Angelakos and R. W. Bickmore, University of California, Berkley, California.

54. Antenna Pattern Calculation for Asymmetrical Aperture Distributions : C. C. Allen, General Engineering Laboratory, Schenectady, New York.

55. Theory of Waveguide-Fed Slots Radiating into Parallel-Plate Regions : H. Gruenberg, Canadian National Research Council, Ottawa, Canada.

56. Factor of Merit for Aircraft Antenna Systems for the Frequency Range from 3-30 Mc/s : Ernest J. Moore, Stanford Research Institute, Stanford, California.

57. Correlation versus Linear Transforms : Marcel J. E. Golay, Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey.

58. A Method for the Construction of Optimum Codes : David A. Huffman, Massachusetts Institute of Technology, Cambridge, Massachusetts.

59. A Note on Moving Poles in Nonlinear Oscillating Systems : William B. Wrigley, Air Force Cambridge Research Center, Cambridge, Massachusetts.

60. Rise-Time Modulation : Maxime G. Kaufman, Naval Research Laboratory, Washington, D. C.

61. Transfer Efficiency : Donald K. Weaver, Jr., Stanford Research Institute, Stanford, California.

62. Guided Wave Concept in Electromagnetic Theory : N. MARCUVITZ, Polytechnic Institute of Brooklyn, Brooklyn, New York.

63. A Further Study of the Patterns of Single Slots on Circular Conducting Cylinders : S. SENSIPER, W. G. STERNS and T. T. TAYLOR, Hughes Aircraft Company, Culver City, California.

64. A Synthesis Method for Circular and Cylindrical Antennas Composed of Discrete Elements : T. T. TAYLOR, Hughes Aircraft Company, Culver City, California.

65. The Geometrical Optics Field at a Caustic : Irwin KAY, New York University, New York, N. Y.

66. Investigation of a Surface Wave Line for Long Distance Communication : G. GOUBAU, C. SHARP and S. W. ATTWOOD, Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey.

Commission VII

67. The Effect of Velocity Distribution in a Modulated Electron Beam : D. A. WATKINS, Hughes Aircraft Company, Culver City, California.

68. Noise in Electron Beams with a Velocity Distribution : L. R. WALKER, Bell Telephone Laboratories, Murray Hill, New Jersey.

69. Space Charge Waves in Magnetically Focused Beams : M. CHODOROW and L. ZITELLI, Stanford University, Stanford, California.

70. Space Charge Wave : General Theory : Philippe A. CLAVIER, Sylvania Electiic Products Inc., Bayside, Long Island.

71. The Effect of Thermal Velocities on the D-C Behavior of Diodes : Philip PARZEN, Federal Telecommunication Laboratories, Nutley, New Jersey.

COMMISSIONS

Commission I

Hereunder copy of a letter sent by Dr. J. H. Dellinger, Chairman, to the members of the Commission on April 18.

This supplements my letter of December 14 which, incidentally, was published in the November-December 1951 Information Bulletin (N° 72) page 4. The President and Secretary of U.R.S.I. have asked me to emphasize that papers submitted should be kept brief, in order to make it possible to give them attention at the General Assembly. See in this connection the Zurich Resolutions on Publications (in Information Bulletin of July-October 1950 (N° 65) page 7). In particular, papers should be not over 1500 words and three lines drawings. Mere summaries, not over 250 words, should be submitted when the topic is not on a fundamental advance in radio science or major project in international cooperation. Papers should be in English or French (or both), with an abstract of not over 50 words attached. The Secretary desires to receive three copies of each papers. Titles of papers should be as explicit as possible, and the name of the author should be followed by his institution and country. In cases where the paper or a more complete account of the work is published or to be published, this should be mentioned in a footnote.

A project to prepare a history of the U.R.S.I. has been undertaken. Please bring with you to the General Assembly all information you have on the history of Commission I.

Please send all papers to the Secretary of the Union through your National Committee. Do not send them to me, as I shall be leaving here the end of next month.

(*sy*) J. Howard Dellinger
Chairman, Commission I, U.R.S.I.

SOLAR ECLIPSE, 25 FEBRUARY 1952

The following preliminary report was sent to Dr. Berkner, Chairman of the Special Eclipse Sub-Committee, by Prof. Y. Hagihara, Chairman of the Ionosphere Research Committee in Japan.

We have carried out simultaneous co-operative observations on solar phenomena, solar radio-noise, geomagnetism, ionospheric conditions, radio wave propagation, earth-current and cosmic rays at various stations scattered over Japan which are participating in our Ionosphere Research Committee during the interval February 1 to March 31, including the day of the total eclipse on February 25. I am sending you a preliminary report of our observation on February 23, 24, 25 and 26. A more detailed report will be published in our « Catalogue of Disturbances etc. » in a few months. We would appreciate your kindness if you would make it known to those interested. We should be glad to have the corresponding report sent to us from the observers of the eclipse.

I. — *Solar Phenomena observed at the Tokyo Astronomical Observatory*

It was cloudy on the day of the eclipse, but the solar activity was thought to be very weak. On February 24, two groups of minute sun-spots were observed near the west limb. The position is :

Date (U.T.)	group	l	φ	class
Feb. 24 : 4 h. 30 m.	1	75° W	10° S	H
Feb. 24 : 4 h. 30 m.	2	61° W	22° N	J

On February 26 no remarkable region could be found on the solar disk.

II. — *Solar Radio-Noise*

The solar radio emission on those days was very calm and no outstanding occurrence was observed. The observations were carried out on the frequencies of 60, 100 and 200 Mc/s at the Tokyo Astronomical Observatory, Mitaka, Tokyo, on 3260 Mc/s at the Osaka City University, Osaka, and on 3750 Mc/s at the Research Institute of Atmospherics, Toyokawa.

III. — *Geomagnetic Observation*

The observations were made at the following stations :

Observatory	Latitude	Longitude	Observed Elements
Aso	32°53′ N	131°01′ E	H, D, Z
Kakioka	36°14′ N	140°11′ E	H, D, Z, $\partial Z/\partial t$
Onagawa	38°26′ N	141°28′ E	H, D, $\partial H/\partial t$
Memanbetsu ..	43°55′ N	144°12′ E	H, D, Z, $\partial Z/\partial t$

Since a moderate magnetic storm with a sudden commencement took place from 21 h 26 m UT on February 23, geomagnetic field was fairly disturbed from 23rd through 26th.

IV. — *Ionospheric Conditions*

According to the observations made by the Central Radio Wave Observatory at the following stations, the time, when *fo*F*z* deviated more than ± 30 % from the monthly median value, was as follows :

	Wakkanai	Akita	Kokubunji	Yamagawa
11-24	(+)06.40~07.40	(+)05.00~06.40	(+)05.10~06.00	—
	—	(+)11.50~13.40	(+)10.40~14.20	(+)10.00~14.00
	—	(—)15.40~18.20	(—)15.50~18.00	(—)16.20~18.40
	(+)22.00~22.50	—	(+)23.20~24.10	—
25	Nothing			
26	Nothing			

V. — *Cosmic-Ray Intensity*

Y. Miyazaki, M. Wada and I. Kondo of the Scientific Research Institute, Tokyo, and Y. Sekido and T. Yagi of the Department of Physics, Fac. Sc., Nagoya University, Nagoya, observed cosmic-ray intensities by means of a counter telescope and their observations showed no appreciable fluctuations during the solar eclipse on Feb. 25, 1952.

RADIO PROPAGATION FORECASTS

Short Term Radio Propagation Forecasts

(North Atlantic Area)

Forecasts of North Atlantic radio propagation conditions a few hours in advance are issued by the C.R.P.L. Radio Warning Service four times each day. These forecasts are available by telephone in Washington and (beginning July 1, 1952) are broadcast twice each hour on WWV (2.5, 5, 10, 15, 20 and 25 Mc/s) in International Morse code at 19 ½ and 49 ½ minutes past each hour. Each forecast is broadcast unchanged until the next one is issued.

The forecast statement consists of two parts : (1) Description of propagation conditions at time of issue : « N », « U », or « W » ; and (2) Forecast of the average quality of conditions on North Atlantic transmission paths expected in the succeeding period of 12 hours : « 1 », « 2 »... « 9 ».

The forecasts are issued to the following schedule :

0500 UT, the forecast to refer to the interval 0600-1800	Universal
1130 UT, the forecast to refer to the interval 1200-2400	Time
1700 UT, the forecast to refer to the interval 1800-0600	UT
2300 UT, the forecast to refer to the interval 0000-1200	or GCT

The explanation of the letter is : At the time of issue, propagation conditions on North Atlantic transmission paths are :

« N » — normal ; i. e. fair-to-good (6) ; good (7) or better.

« U » — unsettled ; i. e. fair (5). Highly engineered or high powered circuits may have outages some of the time ; other circuits will have more difficulty.

« W » — disturbed ; i. e. fair-to-poor (4) ; poor (3) or worse.

The explanation of the number is : The average quality of propagation conditions on North Atlantic transmission paths in the 12-hour period ahead (see schedule above) is expected to be :

1 — useless	4 — poor-to-fair	7 — good
2 — very poor	5 — fair	8 — very good
3 — poor	6 — fair-to-good	9 — excellent

For example, a forecast statement of « N-5 » issued at 0500 UT means that at 0500 North Atlantic conditions were normal, and conditions were expected to be only fair in the period 0600 to 1800 UT. For telegraphic distribution the full statement would read « CRPL ATLANTIC RADIO SFORECAST 2606S NNNNN 55555 », where S stands for short term and 26 and 06 are the date and hour of the beginning of the 12-hour forecast period.

Special Forecasts. — Occasionally there will be circumstances which require special forecasts. These will be distributed by telephone, but will *not* be broadcast on WWV. The special forecast will give the quality of conditions at time of issue and a revised forecast for the remainder of the regular 12-hour period.

Inquiries regarding these forecasts should be addressed to C.R.P.L. Radio Warning Service, National Bureau of Standards, Washington 25, D. C. — Telephone : ORdway 4040 Ext. 7015 (or TEmple 5277, 5 p. m. to 8.30 a. m. and Saturdays, Sundays and holidays). The short term forecasts are described in greater detail in N.B.S. Technical News Bulletin, June 1952 (reprints available).

New Radio Propagation Disturbance Warnings

Beginning July 1, 1952, the National Bureau of Standards will broadcast new short wave radio disturbance forecasts via the NBS standard frequency broadcasting station WWV. This new service will replace the radio disturbance warning notices that have been transmitted by WWV since 1946. The broadcasts will tell users of radio transmission paths over the North Atlantic the condition of the ionosphere at the time of the announcement and also how good or bad communication conditions are expected to be for the next 12 hours.

The NBS radio disturbance forecasts, prepared four times daily, will be transmitted in Morse code twice each hour — 19 ½ and 49 ½ minutes past the hour — on WWV standard frequencies of 2.5, 5, 10, 15, 20, and 25 Mc/s, as was done prior to July 1. As in the past, the notices will include a letter indicating present radio reception conditions. *However, the new notices will also contain a digit indicating the expected quality of future reception.* As before, the letters used will be « N », « U », and « W », signifying that radio propagation conditions are normal, unsettled, or disturbed, respectively. The digit will be the forecast of expected quality of transmitting conditions on the NBS-CRPL scale of 1 (impossible) to 9 (excellent).

Digit (Forecast)	Propagation Condition	Letter (Current)
1	Impossible	W
2	Very Poor	W
3	Poor	W
4	Fair to Poor	W
5	Fair	U
6	Fair to Good	N
7	Good	N
8	Very Good	N
9	Excellent	N

If, for example, propagation conditions at the time the forecast is made are normal but are expected to be only « fair to poor » within the next 12 hours, the forecast statement would be broadcast as N4 in Morse code, repeated five times, i. e., « N4, N4, N4, N4, N4 ».

The NBS forecasts are based on information obtained from a world-wide network of geophysical and solar observatories. Data on the development of sunspots, solar eruptions, and other activities of the sun are funnelled into the NBS Central Radio Propagation Laboratory in Washington, D. C. Radio soundings of the upper atmosphere, short wave reception data, and similar information are also readily available. Trained forecasters digest the information and formulate the predictions. The forecasts are issued by NBS regularly each day at 0500, 1130, 1700 and 2300 UT (Universal Time). Each forecast statement will be

broadcast by WWV for a period of about six hours — until the next forecast is issued. Tnus the forecast prepared at 1700 UT will be first broadcast at 1719 1/2 and then at half hourly intervals through 2249 1/2. The broadcast 2319 1/2 will then carry the next disturbance forecast issued at 2300 UT.

The letter portion of the forecast statement, describing the quality of radio propagation conditions, is valid only for the North Atlantic transmission path at the time the forecast is issued from NBS. The digit portion is a forecast of the average quality of communication conditions along these paths in the 12-hour period beginning at 0000, 0600, 1200, or 1800 UT — about an hour after the time at which the letter describes the condition. For example, a forecast statement of « W5 » issued at 0500 UT means that at 0500 the conditions across the North Atlantic path were disturbed and that in the period 0600-1800 the average of conditions is expected to improve to quality 5 (fair).

The new NBS radio disturbance forecasts refer only to North Atlantic paths, such as Washington to London or New York to Berlin. The forecasters assume that the most suitable radio frequencies for communications are available and in use along these paths. Because of this assumption, their notices must be interpreted on a relative scale in terms of experience on each radio circuit in use. It is impossible to rate conditions on an absolute scale because the varied effects of transmitter power, type of communications traffic and procedure, antennas, and receivers prevent an evaluation that will be valid for all systems and all circuits. One purpose of broadcasting both a description and a forecast is to show more clearly whether propagation conditions are expected to deteriorate or improve in the 12-hour period.

For the past 18 months, the NBS Radio Warning Service has been marking continuous 24-hour daily studies of the North Atlantic circuits by specialized techniques. The new disturbance information to be transmitted by WWV is one of the results of this investigation. Other radio disturbance forecasts which NBS has supplied regularly for almost ten years are forecasts of propagation conditions 1 to 25 days in advance and daily 24-hour forecasts. Neither of these services are broadcast by WWV but are distributed by airmail, telephone, and telegraph. Similar forecasting services are provided for North Pacific circuits by the NBS North Pacific Radio Warning Service at Anchorage, Alaska.

IONOSPHERIC SOUNDING STATIONS

Canada

Station	Latitude	Longitude	Mean time
Baker Lake, N.W.T. ..	64.3° N	96.0° W	90° W
Churchill, Man.	58.8° N	94.2° W	90° W
Fort Chimo, Que.	58.1° N	68.3° W	75° W
Ottawa, Ont.	45.4° N	75.7° W	75° W
Prince Rupert, B. C. ..	54.3° N	130.3° W	120° W
Resolute Bay, N. W. T.	74.7° N	94.9° W	90° W
St. John's, NFLD ...	47.6° N	52.7° W	60° W
Winnipeg, Man.	49.9° N	97.4° W	90° W

SECOND INTERNATIONAL POLAR YEAR 1932-33

The following informations are extracted from « Bibliography for the Second International Polar Year 1932-33 » issued by the International Meteorological Organization.

Countries which have carried out observations on radio phenomena

Canada.

China.

Denmark. — Observations of reception intensity of special Polar Year emissions have been carried out by the expedition of Thule, Greenland (76°32′ N, 68°54′ W);

France. — The expedition organized by the French National Commission for the Polar Year at Scoresbysund, Greenland (70°29′ N, 21°58′ W) and the expedition organized by the Office National de Météorologie at Tamanrasset, Algiers (22°41′ N, 5°30′ E) carried out observations on radio wave propagation and on atmospherics.

Germany.

Great Britain. — Two expeditions were organized; one by the British National Committee for the Polar Year at Fort Rae, Canada (62°50′ N, 116°04′ W), the other by the Department of Scientific and Industrial Research at Tromsö, Norway (69°40′ N, 18°57′ E). They made radio observation and particularly on the behaviour of the ionosphere.

Italy.

Japan.

Netherlands. — Observations on wave propagation and measurements of the heigth of the Kennelly-Heaviside layer were carried out by the expedition organized at Angmagssalik, East Greenland (65°37′ N, 37°38′ W) by the Dutch Commission for the International Polar Year.

Poland. — Observations on atmospherics were carried out by the expedition organized at Bear Island (74°29′ N, 19°14′ E) by the National Meteorological Institute of Poland.

Switzerland. — Ionospheric study by the expedition organized at Snäfellsjökull, Iceland (64°48′ N, 23°48′ W) by the Swiss Federal Commission for Meteorology and the Danish Meteorological Institute.

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CALENDAR

1952

August 8-9, U.R.S.I., Sydney, Australia : Executive Committee, Union Radio Scientifique Internationale.

August 11-23, U.R.S.I., Sydney : Xth General Assembly, Union Radio Scientifique Internationale.

August 25-27, I.C.S.U., Canberra, Australia : Joint Commission on the Ionosphere.

August 20-28, I.U.T.A.M., Istambul : VIIth International Congress of Applied Mechanics.

Third General Assembly of the International Union of Theoretical and Applied Mechanics.

September 4-13, I.A.U., Rome : VIIIth General Assembly, International Astronomical Union.

I.C.S.U., Rome : Joint Commission on Solar and Terrestrial Relationships.

September 22-30, Stockholm : Conference and Exhibition of Instruments and Measurements.

September 29, I.C.S.U., Amsterdam : Sixth Meeting of the Bureau.

September 30, I.C.S.U., Amsterdam : Fourth Meeting, Executive Board.

October 1-3, I.C.S.U., Amsterdam : Sixth General Assembly, International Council of Scientific Unions.

November, Unesco, Paris : Seventh Session, General Conference.

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