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**UNESCO**

# Union Radio - Scientifique Internationale

INTERNATIONAL SCIENTIFIC RADIO UNION

## U. R. S. I.

BULLETIN MENSUEL ● MONTHLY BULLETIN

Mai 1948 Mai 1948

**INFORMATIONS**



**DOCUMENTS — TRAVAUX :**

# INFORMATIONS

## COMITE NATIONAL DANOIS

## DANISH NATIONAL COMMITTEE

En séance du 22 mars 1948, ce Comité a été réorganisé et constitué comme suit :

At a meeting held on March 22nd. 1948, this Committee has been reorganized and constituted as follows :

Président-President : Professor Jörgen Rybner, Danmarks Tekniske Hojskole, Laboratoriet for Telegrafi og Telefoni, Oster Voldgade, 10, Copenhagen.

Secrétaire-Secretary : Ing. Heegaard, Radiohuset, Copenhagen.

Membres-Members : Professor J. Oskar Nielsen ; Mr. Gunnar V. C. Pedersen ; Professor Bengt Strömgen.

## COMITE NATIONAL AMERICAIN

## AMERICAN NATIONAL COMMITTEE

Nous signalons à l'attention des Comités Nationaux l'extrait suivant du document n° B/143, signalé à la page 18.

We drawn the attention of the National Committees on the following abstract of document nr B/143 mentioned page 18.

« Radio is unique among the fields of scientific work in
» having special adaptability to large-scale international research
» programs, for the phenomena that must be studied are world
» in extent, and yet are in a measure subject to control by the
» experimenters. The U. R. S. I. has in this a distinct field of use-
» fulness in furnishing a meeting ground for the numerous wor-
» kers on the various aspects of radio research ; its meetings and
» committee activities have furnished a valuable means of pro-

» moting research through exchange of ideas.

» The American Section holds an annual spring meeting in » Washington, D.C., jointly with the Institute of Radio Engineers, » at which papers on the fundamental phases of radio are pre- » sented. Last year the precedent was set for a second similar » meeting in October. The American Section was organized » in 1920, under U. S. National Research Council. It is made up » of a general membership of about 700 and an Executive Commit- » tee ».

**CONSEIL INTERNATIONAL DES UNIONS SCIENTIFIQUES**

**INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS**

**Bulletin Mensuel d'Information**

N° 7. — Mars 1948.

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**Monthly Bulletin of Information**

Nr 7. — March 1948.

**Union Internationale de Mécanique Théorique et Appliquée :**

Une réunion s'est tenue à Paris, le 4 mars 1948.

**Union Internationale de Chimie Pure et Appliquée :**

Une réunion de la Commission de Chimie Macromoléculaire aura lieu à Bruxelles, le 5 et 6 avril 1948.

Un colloque sur la chimie et la physique des très grosses molécules aura lieu à Liège, les 6, 7 et 8 avril 1948.

**Grants-in-aid allocated by Unesco to I. C. S. U. and the Scientific Unions which it federates — 1948 :**

The general conditions attached to these grants-in-aid are the following :

1. In accordance with Article VIII (a) of the Formal Agreement with the International Council of Scientific Unions, Unesco expects to be notified of all meetings of committees concerned with expenditure of Unesco grants, in sufficient time in advance for Unesco to have the opportunity of sending a repressentative.

2. Unesco expects to receive a report on the activities supported by uhe grants-in-aid, before the end of September, for presentation to the General Conference : a financial report with audited balance sheet before the end of January 1949 ; and a statement of the unspent and uncommitted residue, if any, before the end of the first week of January, 1949.

3. Unesco expects to receive acknowledgments of grants in a suitable way on all publications issued by organisations in receint of grants when these are used for publication expenses.

4. While the selection of invited participants to the General Assemblies is in he hands of the Executive Committees of the Unions, Unesco desires that preference should be given to scientists forme war devastated countries and also to young scientists.

5. No portion of these Unesco grants is to be used for purposes other than those specified in the breakdown sent to each Union, without the previous consent of Unesco. Per diem living allowances to scientists attending meetings are not considered to constitute travelling expenses.

## CALENDAR (Abstract)

15-16 June 1948 - I. C. S. U. - Paris : Committee on Science and its Social Relations.

24 juin - 3 juillet 1948 - Paris : Conférence Internationale des Grands Réseaux Electriques.

28 juin - 3 juillet 1948 - Lyon : Colloque International sur le Calcul des Probabilités et Statistiques Mathématiques.

29 juin - 7 juillet 1948 - Paris : Commission Internationale de l'Eclairage.

12th-23th July 1948 - U. R. S. I. - Stockholm : General Assembly, Union Radio Scientifique Internationale.

23th-24th July 1948 - I. C. S. U. - Stockholm : Joint Commission on Radio-Meteorology.

28th-30rd July 1948 - I. C. S. U. - Brussels : Joint Commission on the Ionosphere.

14th-15th September 1948 - I. C. S. U. - Brussels : Executive Committee, International Council of Scientific Unions.

20th-23th September 1948 - I. C. S. U. - Scheveningen : Joint Commission on Rheology.

14th-16th September 1948 - I. C. S. U. - Copenhagen : General Assembly, International Council of Scientific Unions.

# COMMISSION II

## PROPAGATION DES ONDES
## WAVE PROPAGATIONS

### Evanouissements brusques — Fading

Le Comité National Marocain nous fait part de la communication suivante :

Le 13 mars 1948, les opérateurs du centre d'écoute du quotidien casablancais « La Vigie Marocaine » contataient à partir de 10 h. l'arrêt total du trafic sur les ondes courtes émises depuis Paris. Sur les bandes des ondes courtes de longueur moyenne les parasites étaient nombreux.

Le même jour, à partir de 10 h. 15, le trafic était arrêté au centre d'écoute des P. T. T., à Rabat, qui travaille dans les bandes des 20 et 25 mètres. Les opérateurs estiment qu'ils se sont trouvés brusquement dans une zone de silence.

# Documents - Travaux

## PAPERS - WORKS

Les documents ci-après ont été envoyés aux Secrétariats des Comités Nationaux.

Les Membres des Comités Nationaux que ces documents intéressent particulièrement et désireux d'en recevoir un exemplaire, sont priés de s'adresser au Secrétariat Général.

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The documents hereafter mentioned have been sent to the National Committees secretaryship.

Members of National Committees particularly interested by these documents and wishing to receive a copy, are requested to apply to the General Secretary's Office.

### AUSTRALIE — AUSTRALIA

Nr 560. — **Over estimations of Probables Errors,** by R. T. Leslie, reprinted from Nature, vol. 160, p. 751, November 29, 1947.

Nr 561. — **Solar radiation at radio frequencies and its relation to sunspots,** by L. L. Mc. Cready, J. L. Pawsey, and Ruby Payner-Scott. Reprinted from the Proceedings of the Royal Society A, vol. 190, 1947.

**Summary :**

Experimental studies of solar radiation on a frequency of 200 Mcyc./sec. are described.

This radiation has characteristics similar to those of thermal radiation but is always hudreds of time greater than the thermal radiation antic'ped from the photosphere and sometimes greater by a factor of $10^4$.

The day-to-day intensity variations over a period of six months confirm a correlation with sunspots. The received intensity of radiation is subject to rapid fluctuations ; sudden increases, or « bursts », of duration from a fraction of a second to a minute are characterstic. These rapid fluctuations are similar at widely-spaced receiving points, and t is concluded that most of them are extra-terrestrial, and presumably solar, in origin.

Directional observations, based on the interference phenomenon as the sun rises over the sea, indicate that the radiation originates not uniformly over the sun's disk but in restricted areas in the immediate vicinity of a sunspot group.

Values of received intensity are at times too great to be accounted for in terms of thermal radiation, so that another mechanism producing radiation must exist. Radiation from gross electrical discharges is suggested.

Les documents suivants ont été reçus au Secrétariat Général pendant le mois d'Avril 1948.

Les membres de l'Union, désireux d'obtenir l'un ou l'autre de ces documents sont priés de s'adresser au Secrétariat Général.

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The General Secretary's Office has receiveb during April 1948 the following documents.

Membres of the Union wishing to receive some of these documents are requested to apply to the General Secretary's Office.

## ARGENTINE

N° B/133. — **Ciencia e Investigacion**, vol. IV, Marzo 1948, n° 3.

## BELGIQUE — BELGIUM

N° B/134. — **Centre de Contrôle des Radiocommunications des Services Mobiles (C. C. R. M.).**
Rapport Mensuel Aé. 3/48 — Mars 1948.

Dans le courant du mois de mars, le C. C. R. M. a commencé à remplacer l'ancienne installation de mesure de fréquence par de nouveaux appareils entièrement différents. Il s'écoulera plusieurs semaines avant que la nouvelle installation soit complètement installée, et pendant ce temps les veilles seront réduites. Par conséquent, le nombre de résultats publiés pour le mois de mars et d'avril sera inférieur à ce qu'il est normalement. Dès que la nouvelle installation sera terminée, une notice spéciale sera publiée, qui décrira les nouvelles possibilités.

Le rapport comprend les résultats des mesures de fréquence effectuées à Bruxelles sur les transmissions des stations suivantes :

A. Radiophares Européens d'Aviation travaillant en ondes moyennes.

B. Stations Aéronautiques travaillant dans les bandes de fréquence suivantes :

6.200 — 6.676 Kc/s
8.200 — 8.900 Kc/s
12.300 — 13.350 Kc/s

C. Stations d'Aéronef travaillant dans les bandes de fréquence suivantes :

320 — 365 Kc/s
6.200 — 6.675 Kc/s

Les résultats des mesures sous A et B sont représentés sous forme de graphiques, ceux sous C sont mis sous forme de tableaux.

N° B/135. — **Centre de Contrôle des Radiocommunications des Services Mobiles (C. C. R. M.).**
Rapport Mensuel M. 3/48 — Mars 1948.

Le rapport comprend les résultats des mesures de fréquence effectuées à Bruxelles par le C. C. R. M. pendant le mois de mars, sur les transmissions des stations suivantes :

A. Radiophare maritimes.

B. Stations côtières travaillant dans les bandes de fréquence suivantes :

365 — 485 kc/s
485 — 515 kc/s
8.200 — 8.900 kc/s
12.300 — 13.350 kc/s

C. Stations de navire travaillant dans les bandes de fréquence suivantes :

365 — 515 Kc/s
8.200 — 8.900 Kc/s

Les résultats des mesures sous A et B sont présentés sous forme de graphiques, ceux sous C sous forme de tableaux.

N° B/136. — **Ciel et Terre.** Bulletin Mensuel de la Société Belge d'Astronomie, de Météorologie et de Physique du Globe. LXIVe année. Nos 1 et 2, janvier et février 1948.

**Sommaire :**

L'œuvre météorologique de T. A. Mann (1735-1809), L. Dufour.
La Phisicochimie des Comètes, P. Swings.
Le Temps en septembre, octobre, novembre, R. Sneyers.
Le maximum d'activité solaire, G. Coutrez.

Observation des taches solaires :
Rotations n° 1256 du 31, 34 juillet au 27, 57 août 1947;
1257 du 27, 57 août au 23, 83 septembre 1947 ;
1258 du 23, 83 septembre au 21, 12 octobre 1947.

Les renseignements publiés contiennent :
— les dates et heures d'observation,
— le nombre de groupes et de taches,
— le nombre relatif de Wolf,
— un tableau contenant les divers renseignements relatifs à la position des groupes,
— les caractéristiques des principaux groupes,
— une table d'évolution des groupes de taches.

Ephémérides astronomiques, février, mars 1948.

N° B/137. — **Ciel et Terre. Bulletin Mensuel de la Société Belge d'Astronomie, de Météorologie et de Physique du Globe.** LXIVe année. Nos 3 et 4, mars et avril 1948.

**Sommaire :**

La courbure de l'Espace, J. Gorren.
Mission astronomique et géodésique.
Quelques considérations sur l'œuvre météorologique de A. Quetelet (1796-1874), L. Dufour.
Une comète brillante observable en Belgique.
Un Astrolabe latin du XIIe siècle, P. Michel.
L'année Astronomique 1648, P. Humbert.
Le temps en décembre 1947, janvier et février 1948, R. Sneyers.

Observations des taches solaires :
Rotations n° 1259 du 21, 12 octobre au 17, 42 novembre 1947 ;
1260 du 17, 42 novembre au 14, 74 décembre 1947 ;
1261 du 14, 74 décembre au 11, 07 janvier 1948.

Ephémérides astronomiques, avril et mai 1948.

N° B/138. — **Ciel et Terre. Bulletin Mensuel de la Société Belge d'Astronomie, de Météorologie et de Physque du Globe.** LXIVe année. Nos 5 et 6, mai et juin 1948.

**Sommaire :**



N° B/139. — **Institut Météorologique de Belgique. Service du Rayonnement. Prévisions Ionosphériques. Juin 1948.**

**Table des matières :**

2. Amérique.
   Léo — Albany
   Léo — New York
   Léo — San Francisco
   Léo — Buenos Ayres
   Léo — Santiago
3. Afrique.
   Léo — Le Cap
4. Océanie.
   Léo — Batavia

Emissions et réceptions centrées à Bruxelles.

Cartes par directions (de 30° en 30°) de 0° à 360° pour distances de 0,500, 1.000, 2.000. 3.000 et 4.000 km.

Cartes par heures (de 2 en 2 heures) pour distances de 0 à 4.000 km.

Emissions et réceptions centrées à Léopoldville.

Cartes et directions (de 30° en 30°) de 0° à 180° pour distances de 0,500, 1.000, 1.500 et 2.000 km.

Cartes par heures (de 2 en 2 heures) pour distances de 0 à 2.000 km.

## CHINE — CHINA

**$F_2$ Ionization and Geomagnetic Latitudes,** P. H. Liang.

Reprinted from Nature, vol. 160, p. 642, November 8, 1947.

## ETATS-UNIS D'AMERIQUE — UNITED STATES AMERICA

Nr B/141. — **Program Joint Meeting International Scientific Radio-Union American Section and Institute of Radio Engineers.** May 5, 6 and 7, 1947.

**Communications Systems, Modulation and Radar.**

1. Some Practical Considerations Affecting FM Broadcast Station Coverage, P. A. de Mars and Thomas A. Wright, Raymond M. Wilmott, Inc., Washington D.C.

2. Considerations of Moon Relay Communication, D. D. Grieg. S. Metzger and R. Waer, Federal Telecommunication Laboratories, New York, N.Y.

3. Transmission of Audio Frequencies by Telegraphic Code, Elmer Baem, Coles Signal Laboratory, Red Bank, N.J.

4. Frequency Modulation on Microwaves, A. G. Clavier and E. Ostlund, Federal Telecommunication Laboratories, N.Y.

5. Telephony by Pulse Code Modulation, W.M. Goodall, Bell Telephone Laboratories, Inc. New York, N.Y.

6. Digital Modulation, J. V. Harrington and E. B. Staples, Air Material Command, Watson Lab., Cambridge, Mass.

7. Some Factors Influencing the Design of a Precision Tracking Radar, J. M. Bridges, Bureau of Ordnance, Navy Dpt., Washington, D.C.

8. Airborne Radar and Safety of Flight, Comdr. W.C. Hilgedick, Electronic Division, Bureau of Aeronautics, Navy Dept. Washington, D.C.

9. Automatic Radar Monitor Test Set, H. A. Finke, J. G. Rubenson, W. W. Griffing, Polytechnic Research and Development Co Inc., Brooklyn, N.Y.

10. The Mechanism of Radar Reflection, Paul B. Taylor, Air Material Command, Wright Field, Dayton, O. Navigation, Control and Telemetering.

11. Frequency Power and Modulation for a Long-Range Radio Navigation System, Paul R. Adams and Robert I. Colin, Federal Telecommunication Laboratories Inc., New York, N.Y.

12. Air Navigation and Traffic Control, H. K. Morgan, Bendix Radio, Baltimore, Md.

13. Fundamental Considerations Regarding the Use of Radar Beacons for Navigation, Ludlow B. Hallman, Jr., Air Material Command, Wright Field, Dayton, O.

14. Radio Navigation Using Non-Synchronized Ground Stations, Franklin M. Fletcher, National Bureau of Standards, Washington, D.C.

15. DOVAP — A Continuous Wave Doppler System for the Determination of Velocities and Spartial Positions of Guided Missiles L. G. de Bey, Ballistic Research Laboratories, Aberdeen Proving Ground, Md.

16. Integrating Devices as a Substite for Radio Doppler in V-2 Missile Control, Thomas M. Moore, Bureau of Ordnance, U. S. Army.

17. A Phase Shift Telemeter, M. G. Pawley, National Bureau of Standards, Washington, D.C.

18. Temperature Telemetering, Richard Ellis, Applied Physics Laboratory, The John Hopkings University, Silver Spring, Md.

19. Telemetering Techniques of Guided Missiles, M. S. Mc. Vay, Naval Research Laboratory, Washington, D.C.

20. A Review of the General Problem of the Circuit Constants of Piezoelectric Resonators, K. S. Van Dyke, Wesleyan University, Middletown, Conn.

21. Study of the Electrical Circuit Constants of Quartz Plates in Thickness-Shear Vibration, Gunnar Hok, Wesleyan University, Middletown, Conn.

## Ionospheric Propagation

22. The Determination of the Virtual Ionosphere Height for the 20 kc/sec. Region. William J. Kessler, Wallace F. Zetrouer and Harry K. Siler, Engineering and Industrial Experimental Station, University of Florida, Gainesville, Fla.

23. Wanted : New Indices of Solar Activity, Donald H. Menzel, Harvard Observatory, Cambridge, Mass.

24. Night E. in Auroral Regions, J. H. Meek, Canadian Radio Wave Propagation Committee, Ottawa, Canada.

25. Fine Structure of the Ionosphere in Northern Latitudes, James C. W. Scott and F. T. Davies, Canadian Radio Wave Propagation Committee, Ottawa, Canada.

26. Atmospheric Noise and Propagation Factors in the Artic. (Project « Nanook » Expedition 1946) W. M. Reith, Naval Research Laboratory, Washington, D.C.

27. Changes in the Diurnal Field Intensity Patters of WWM with the Recent Rise in the Sunspot Cycle as Received at Needham, Mass., Harlan T. Stetson, Cosmic Terrestrial Research, Mass. Inst. of Technology, Needham, Mass.

28. The Absorption of Radio Waves in the Ionosphere, A. H. Waynick, The Pennsylvania State College, State College, Penn.

29. Radiation Angle Variations from Ionosphere Measurements, Henry E. Hallborg and Simon Goldman, Radio Corporation of America, New York, N.Y.

30. Phase Shifts of a Composite Ground and Sky Wave, J. A. Pierce, Cruft Laboratory, Harvard University, Cambridge, Mass.

31. High Power Ionosphere Measuring Equipment, P. G. Sulzer, The Pennsylvania State College, State College, Penn.

## Measurement Methods

32. An Improved Conductance Meter, W. A. Mc. Cool, Naval Research Laboratory, Washington, D.C.

33. A reflection Grating for Measuring Wavelenght in the Millimeter Region, Harold Herman and R. J. Coates, Naval Research Laboratory, Washington, D.C.

34. The Importance of Overload Specification in Noise Meters, Conrad J. Fowler, University of Pennsylvania, Philadelphia, Pa.

35. Measurement of Surface Current and Charge Distributions on Metal Surfaces at Microwave Frequencies, Beverly C. Dunn, Jr. and Ronald King, Cruft Laboratory, Harvard University, Cambridge, Mass.

36. Megacycle Stepping Counter, Charles B. Leslie; Naval Ordnance Laboratory, Washington, D. C.

37. An Electronic Micrometer, M. L. Greenough, National Bureau of Standards, Washington, D.C.

38. Tracer Micrography, L. Marton, National Bureau of Standards and P. H. Abelson, Dept. of Terrestrial Magnetism, Carnegie Institution of Washington, Washington D.C.

## Geophysical and Cosmic Phenomena

39. Reflections of VHF Radio Waves from Meteoric Ionization, Edward W. Allen, Jr. Federal Communications Commission, Washington, D.C

40. A New Method for Investigation of the Upper Atmosphere, O. G. Villard, Jr., L. A. Manning, W. E. Evans and R. A. Helliwell, Stanford University, Calif.

41. Some Experimental Results obtained by Ionospheric Investigations in Sweden during the Total Solar Eclipse of the 9th July, 1945. Sven Gejer and Per Akerlind, Royal Board of Swedish Telegraphs, Stockholm, Sweden.

42. Recent Large Sunspots, Edison R. Hoge, Mt. Wilson Observatory, Pasadena, Calif.

43. Correlation of Coronal and Geomagnetic Observations, 1944-46, J. V. Lincoln and A. H. Shapley, National Bureau of Standards, Washington, D.C.

44. Comparison of Predictions of Atmospheric Noise with Observed Noise Levels, E. L. Schultz, National Bureau of Standards, Washington, D.C.

45. Microwave Solar Noise Observations at Ottawa, Canada, A. E. Covington, National Research Council of Canada, Ottawa.

46. Solar and Cosmic Radio Waves, Grote Reber, Wheaton, 111.

47. Codmic Noise, Jack W. Herbstreit, National Bureau of Standards, Washington, D.C.

48. Rate of Production of Ionization in the Ionosphere, S. L. Seaton, Air Meterial Command, Wright Field, Dayton, Ohio.

49. Virtual and True Height of the F2 Layer, G. R. White, National Bureau of Standards, Washington, D.C.

50. Absorption of Radio Waves as a Function of the Sun's Zenith Angle, E. W. Taylor, National Bureau of Standards, Washington, D.C.

## Circuits

51. Harmonic Generation at Microwave Frequencies, P. A. Hower, Polytechnic Research and Development Co, Inc., Brooklyn, N.Y.

52. Harmonic Generation, W. R. Ferris, Naval Research Laboratory, Washington, D.C.

53. A note on Cathode Follower Pulse Response, J. G. Rubenson, H. A. Finke, Polytechnic Research and Development Co, Inc. Brooklyn, N.Y.

54. An Improved Approach to the Analysis of Vacuum Tube Circuits, Keats A. Pullen, Pratt Institute of Brooklyn, N.Y.

55. Mercury Delay Lines, T. K. Sharpless, University of Pennsylvania, Philadelphia, Pa.

56. Spark-Excited Microwave Oscillator, M. Sanders and C. H. Page, National Bureau of Standards, Washington, D.C.

57. Directional Coupler Waveguide Mixer, E. F. Mc. Clain, Naval Research Laboratory, Washington, D.C.

58. A New Approach to Resonant Circuits for the 300 to 3.000 Megacycle Frequency Range, Franck C. Isely, Naval Research Laboratory, Washington, D.C.

59. Transmission Line Networks for VHF and UHF, M. K. Goldstein and A. Brodzinsky, Naval Research Laboratory, Washington, D.C.

60. Transient Phenomena in Wave Guides, Manuel V. Cerrillo, Massachuetts Institute of Technology, Cambridge, Mass.

## Microwave Propagation

61. Scattering and Attenuation of Microwave Radiation Through Rain, F. T. Haddock, Naval Research Laboratory, Washington, D.C.

62. Attenuation of Microwaves Estimated from Weather Data, Howard E. Bussey, National Bureau of Standards, Washington, D.C.

63. Attenuation of Plane Electromagnetic Waves in Sea Water, E. P. Trounson and S. J. Raff, Naval Ordnance Laboratory, Washington, D.C.

64. Variation in the Velocity of Propagation Through the Earth's Atmosphere, P. A. Hoffman and C. H. Hooppner, The Glenn L. Martin Co, Baltimore, Md.

65. The Field of a Microwave Dipole Antenna in the Vicinity of the Horizon, C. L. Pekeris, Naval Research Laboratory, Washington, D.C.

66. Diffraction Theory and Tests, Edna M. Pratt, Coles Signal Laboratory, Red Bank, N.J.

67. Diffraction of High-Frequelcy Radio Waves Around the Earth. M. D. Rocco and J. B. Smyth, U. S. Navy Electronics Laboratory, San-Diego, Calif.

68. Average Radio Ray Refraction in the Lower Atmosphere, M. Schulkin, National Bureau of Standards, Washington, D.C.

69. Results of Horizontal Microwave Angle-of-Arrival Measurements by Phase Difference Method, A. W. Straiton and J. R. Gerhardt, The University of Texas, Austin, Texas.

70. Comparison of Calculated and Measured Phase Difference at 3,2 centimeters Wave Lenght, E. W. Hamlin and W. E. Gordon, The University of Texas, Austin, Texas.

## Theory Calculations and Vacuum Tubes

71. The Calculation of the Magnetic Field, Due to a Steady Current in a Circular Coil or a Solenoid, Frederick W. Grover, Union College, Schenectady, N.Y.

72. Significance of Power Reflection, Bernard Salzberg, Naval Research Laboratory, Washington, D.C.

73. A Matrix Theory of Recurrent Networks, Burton N. David, Naval Research Laboratory, Washington, D.C.

74. Theory and Design of Network Type Pulse Generators, R. A. Herring, Jr., Naval Research Laboratory, Washington, D.C.

75. Single-Mode Operation of Reflex-Klystron Oscillators over Wide Frequency Ranges, J. W. Kearny, Airborne Instruments Laboratory, Inc. Mineola, N.Y.

76. Reflex Klystrons for Broad Band Application, Paul G. Bohlke, Sylvania Electric Products, Inc. Bayside, N.Y.

77. High-Freqency Parameters of Vacuum Tubes, E. H. Hurlburt, Naval Research Laboratory, Washington, D.C.

78. Characteristics of Hot-Cathode, Mercury-Vapor Rectifier Tubes, Carl S. Roys, Syracuse University, Syracuse, N.Y.

79. Tube Life Tests in Connection with ENIAC, F. R. Michael, University of Pennsylvania, Philadelphia, Pa.

80. Tube Ruggedization, I. L. Cherrick, Naval Research Laboratory, Washington, D.C.

## Antennas

81. A Modern Demonstration of Mc Donald's Equivalence Theorem in Electromagnetic Theory, A. G. Clavier, Federal Telecommunication Laboratories, Inc. New York.

82. Wave Lenght Lenses, Gilbert Wilkes, Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Md.

83. A Fresnel-Zone Plate Antenna, I. Maddaus and S. Silver, Naval Research Laboratory, Washington, D.C.

84. Broad-Band Antenna Design, R. S. Wehner, Airborne Instruments Laboratory, Inc. Mineola, N.Y.

85. Network Approach to Broad-Banding Antenna System, M.K. Goldstein, Naval Research Laboratory, Washington, D.C.

86. The Directly Fed Vertical Stabilizer as a Zero-Drag Broad-Band Aircraft Antenna for HF and VHF, R. S. Wehner, Airborne Instruments Laboratory, Inc., Mineola, N.Y.

87. Aberrations in Pill-Box Antennas, J. Certaine and I. Katz, Naval Research Laboratory, Washington, D.C.

88. Antenna Systems Design Considerations, A. W. Andrews, Bureau of Ships, Navy Department, Washington, D.C.

89. Remarks on Linear Arrays, J. E. Eaton, Naval Research Laboratory, Washington, D.C.

90. Wide-Band Lobing and Non-Lobing Dipole Arrays in the 30 centimeter Region, R. J. Adams, Naval Research Laboratory, Washington, D.C.

## Measurement Methods

91. An Expansion Theorem for Frequency-Modulated Circuits, Ernst Weber, Microwave Research Institute, Polytechnic Institute of Brooklyn, N.Y.

92. A Substitution Method of Impedance Measurement for the Frequency Range 20 to 100 Mc., Author to be announced, Airborne Instruments Laboratory, Inc., Mineola, N.Y.

93. New Microwave Measurement Techniques, F. J. Gaffney, Polytechnic Research and Development Co, Brooklyn, N.Y.

94. Decrement (Q) Measurements of Low Loss Cavities, John P. Hagen, Naval Research Laboratory, Washington, D.C.

95. Broadband Power Measuring Methods at Microwave Frequencies, L. E. Norton, Radio Corporation of American, Princeton, N.J.

96. A Method for the Measurement of the Dielectric Constant and Loss Angle of Gases at Microwave Frequencies, George Birbaum, National Bureau of Standards, Washington, D.C.

97. Measurement Techniques for Polarization Errors in High-Frequency Direction Finders, Harry Diamond, Harold Lyons, and La Verne M. Poast, National Bureau of Standards, Washington, D.C.

98. Minimum Sparking Potentials of Barium, Magnesium and Alu-

Nr B/142. — **Program Joint Meeting International Scientific Radio Union. American Section and Institute of Radio Engineers.** October 20, 21, 22, 1947.

## Radio Propagation and Radio Noise

1. Meteoric Effects in the Ionosphere, L. A. Manning, Stanford University, Calif.

2. Magneto-Ionic Effects at High Latitudes, James C. W. Scott and Frank T. Davies, Canadian Defense Research Board, Ottawa.

3. Harmonic Analysis of F2-Layer Characteristics, M. Lindeman Phillips, National Bureau of Standards, Washington, D.C.

4. Spatial and Time Variations in F2 Critical Frequencies, T. N. Gautier, National Bureau of Standards, Washington, D.C.

5. Ionospheric Observations during Solar Eclipse, May 20, 1947. Preliminary Report. A. H. Shapley and J. M. Watts, National Bureau of Standards, Washington, D.C.

6. Motion Pictures of the Ionosphere during a Total Solar Eclipse, J. M. Watts, National Bureau of Standards, Washington, D.C.

7. High-Frequency Attenuation in the Ionosphere, J. W. Cox, Canadian Defense Research Board, Ottawa, Canada.

8. « Extra-Receiver » Noise at 100 Megacycles, J. H. Trexler, Naval Research Laboratory, Washington, D.C.

9. Microwave Solar Radiation during à Total Eclipse, John P. Hagen, T. B. Jackson, R. J. Mc Ewan, C. B. Strang, Naval Research Laboratory, Washington, D.C.

10. Solar Noise Busts, 10.7 centimeters, A. E. Covington, National Research Council, Ottawa, Canada.

11. Atmospheric Noise Measurement in the Low-Frequency Range, Robert S. Hoff and Raymond C. Johnson, Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla.

12. A Method of Measuring angle-of-arrival, A. W. Straiton and W. E. Gordon, The University of Texas, Austin, Texas.

13. What are « Angles », Herbert B. Brooks, William B. Gould, and Raymond Wexler, Evans Signal Laboratory, Helmar, N.J.

14. Observations of Low-Frequency Propagation during sudden Ionosphere Disturbances, Martin Katzin, Naval Research Laboratory, Washington, D.C. and Arthur M. Braaten, RCA Laboratories, Riverhead, L.I., N.Y.

15. Vertical-Incidence Ionosphere Measurements at 100 Kc/s., R. A. Helliwell, Stanford University, Calif.

16. Simultaneous Observations of Field-Intensity Measurements of WWV at Needham, Mass. and at Intervale, N. H., during the Summer of 1947, H. T. Stetson and G. W. Pickard, Massachusetts Institute of Technology, Cambridge, Mass.

## Antennas, Circuits and Measurements

17. Withdrawn.

18. Shunt-Excited Flat-Plate Antennas with Application to Aircraft Structures, J. V. N. Granger, Electronics Research Laboratory, Harvard University, Cambridge, Mass.

19. Calculation of Doubly Curved Reflectors for Shaped Beams, A. S. Dunbar, Naval Research Laboratory, Washington, D.C.

20. Broad-Band Metallic Lenses, W. E. Kock, Bell Telephone Laboratories, Inc., Holmdel, N. J.

21. Fundamentals of Resonance, Keats A. Pullen, Jr. Balistic Research Laboratories, Aberdeen Proving Grand, Md.

22. Testing Repeaters with Circulated Pulses, A. C. Beck and D. H. Ring, Bell Telephone Laboratories, Inc. Homdel, N.J.

23. Criteria for Stability in Circuits Containing Non-Linear Resistance, Capt. L. V. Skinner, University of Illinois, Urbana, Ill.

24. Ultra-High-Frequency Measurements, W. R. Thurston, General Radio Co, Cambridge, Mass.

25. Electronic Phase Meter, E. F. Florman and A. Tait, National Bureau of Standards, Washington, D.C.

26. General Expressions for the « Q » of a Circuit, Paul J. Selgin, National Bureau of Standards, Washington, D.C.

27. Some notes on modern Quartz Oscillator Design, Bertram C Hill, Jr., Naval Research Laboratory, Washington, D.C.

28. A Magnetic Phase Modulator for use in Telemetering, M. G. Pawley, National Bureau of Standards, Washington, D.C.

29. Design and Performance of Vacuum-Tube Oscillators, Carl S. Royos, Syracuse University, Syracuse, N.Y.

30. A precise Resonance Method of Microwave Impedance Measurement with Application to Aircraft Antenna Models, Four-Terminal Networks and Waveguides, Ming S. Wong, Aircraft Radiation Laboratory, Wright Field, Dayton, Ohio.

**Tubes and Microwave Techniques and Systems**

31. Variations in the constants of Richardson's Equation as a function of Life for the Case of Oxide-Coated Cathodes on Nickel, Harold Jacobs and Geoge W. Hees, Sylvania Electric Products Inc., Kew Gardens, N.Y.

32. The Memory Tube and its Application to Electronic Computation, Andrew V. Haeff, Naval Research Laboratory, Washington, D.C.

33. A Magnetron Resonator System, E. C. Okress, Westinghouse Electric Corporation, Lamp Division, Bloomfield, N.J.

34. Modes in Interdigital Magnetrons, Joseph F. Hull, Signal Corps Engineering Laboratories, Bradley Beach, N.J.

35. Diode Magnetrons as a Reactance Tube for Ultra High Frequencies, L. Greenwald and A. Fischer, Signal Corps Engineering Laboratories, Bradley Beach, N.J.

36. Wide-Band Velocity-Modulated Amplifying Tubes, E. Touraton, R. Zwobada and C. Dumonsseau, Laboratoire Central de Télécommunications, Paris, France.

37. The Propgation of Electromagnetic Waves along Helical Wires, Philip Parzen, Federal Telecommunication Laboratory, Inc., New York 4, N.Y.

38. Analysis of Pulses with Frequency Shifts during the Pulse, R. T. Young, Naval Research Laboratory, Washington, D.C.

39. Results of the Flight Tests of a Course Line Computer with Omni Radio Range and Radio Distance Measuring Equipment, Francis J. Gross, CAA Experimental Station, Indianapolis, Indiana.

40. Dielectric Constants of $H_2O$, $D_2O$ and Nitrobenzene at 3,2 cm., A. H. Ryan, Naval Research Laboratory, Washington, D.C.

41. Conductivity of Ionized Gases in the Microwave Region, L. Goldstein and N. Cohen, Federal Telecommunication Laboratories, New York, N.Y.

42. Microwave « Q » Measurements in the presence of series losses, L. Malter and G. R. Brewer, Naval Research Laboratory, Washington, D.C.

43. Microwave Test Equipment, W. J. Jones, Signal Corps Engineering Laboratories, Bradley Beach, N.J.

44. R-F Components for Milimeter Wavelenghts, Harold Herman, Naval Research Laboratory, Washington, D.C.

45. Radio Direction Finder Set AN/CRD-1, William Todd, Signal Corps Engineering Laboratories, Bradley Beach, N.J.

## Supplementary Program

46. An Approach to the Approximate Solution of the Ionosphere Absorption Problems, J. E. Hacke, Jr., The Pennsylvania State College, Pa.

47. The NBS Primary Standards of Frequency, V. E. Heaton and J. M. Shaull, National Bureau of Standards, Washington, D.C.

48. Band-Pass Filter Utilizing Parallel-T Networks in Signal and Feedback Paths, Paul T. Stine, Naval Research Laboratory, Washington, D.C.

49. Transfer Characteristics of a Bridged Parallel-T Network, Charles F. White, Naval Research Laboratory, Washington, D.C.

50. Whithdrawn.

51. Withdrawn.

52. Single-Tube Harmonic Generator Design, H. H. Grimm, Naval Research Laboratory, Washington, D.C.

53. Noise in Vacuum Type Photocells at High Current Levels, Robert F. Morrison, National Bureau of Standards, Washington, D.C.

54. Amplification of Noise by a Tuned Amplifier, Israel Rotkin and Philip R. Karr, National Bureau of Standards, Washington, D.C.

55. Withdrawn.

Nº B/143. — **Program Joint Meeting International Scientific Radio Union, American Section and Institute of Radio Engineers.**
May 3, 4, 5, 1948.

### Description of International Scientific Radio Union Ionosphere Propagation

1. Sunspots and Radio Weather, A. M. Arzinger, H. E. Hallborg and J. H. Nelson, Radio Corporation of American, New York, N.Y.

2. Changes of Maximum Usable Frequency with Sunspot Number, Roswell C. Peavey and Gladys R. White, National Bureau of Standards, Washington, D.C.

3. Lunar Effects on F2-Layer Ionization, A. G. Mc Nish and T. N. Gautier, National Bureau of Standards, Washington, D.C.

4. Determination of Source Distances and the Virtual Ionosphere Height through the Graphical Analyses of Loran Pulse Wave, William J. Kessler, Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla.

5. Restricted Range Sky-Wave Transmission, J. E. Hacke, Jr. and A. H. Waynick, The Pennsylvania State College, Pa.

6. Ionospheric-Layer tilt Geometry by means of an Aplanatic Surface, L. B. Heilprin, National Bureau of Standards, Washington, D.C., and O. Koksharova, Inyokern Laboratory, Calif.

7. Interpretation of very low Frequency Propagation Data by Graphical Methods, M. Lindeman Phillips, National Bureau of Standards, Washington, D.C.

8. A Pulse-Type Ionosphere Recorder with Electronically Tracked Units, W. F. Torrington, National Research Council, Ottawa, Canada.

9. A Multiple-Trace Automatic Field-Intensity Recorder, H. P. Hutchinson, National Bureau of Standards, Washington, D.C.

10. Interim Report on Experimental Broad-Band Antennas for Vertical-Incidence Ionosphere Sounding, H. N. Cones, National Bureau of Standards, Washington, D.C.

11. Investigation of the Ionosphere by Rocket-Borne Radio Receiving Equipment, W. Cullen Moore, Project Supervisor, Upper Atmosphere Research Laboratory, Boston University, Boston, Mass.

## Tropospheric Propagation and Radio Noise

12. Microwave Phase Front Measurements for Over-Water Paths of 12 and 31 Miles, A. W. Straiton, The University of Texas, Austin, Texas.

13. Some Results of Field-Intensity Measurements between 44,1 and 97,3 Mc. Over 70 Mile Propagation Paths, Arthur M. Braaten, Radio Corporation of America, RCA Laboratories Div., Riverhead, L.I., N.Y.

14. Comparison of Tropospheric Reception at 44,1 Mc. with 92,1 Mc over the 167-Mile Path, Alpine, N.J. to Needham, Mass., G. W. Pickard and H. T. Stetson, Cosmic Terrestrial Research Laboratory, Massachusetts Institute of Technology, Needham, Mass.

15. Calculation of the Attenuation of Electrical Field Strenght, Harold J. Peake, Naval Research Laboratory, Washington, D.C.

16. Elimination of Reflected Signal Effects in Pulsed Systems, Dayle O. Collup, Naval Research Laboratory, Washington, D.C.

17. New Radiosonde for Upper-Air Measurements, Leo Graig, Meteorological Branch, Evans Signal Laboratory, Belmar, N.J.

18. Techniques in the Analysis of Noise, Duncan Harkin, Naval Research Laboratory, Washington, D.C.

19. Emission of Radio-Frequency Energy from the Sky, A. E. Covington, National Research Council, Ottawa, Canada.

20. Broad-Directivity Measurements of Cosmic Radio Noise at very High Frequencies, J. R. Johler, National Bureau of Standards, Washington, D.C.

21. Microwave Atmospheric Absorption and Cosmic Noise, M. Schulral Telecommunication Laboratories, Inc., New York. N.Y.

## Microwave Systems

22. 6.000-Megacycle Television Relay System, William H. Forster, Philco Corporation, Philadelphia, Pa.

23. An Optical Radar for Surveying, W. W. Hansen, Armour Research Foundation of Illinois Institute of Technology, Chicago, Ill.

24. The JHU/APL FM-FM Telemetering System, Richard T. Ellis, Applied Physics Laboratory, Johns Hopkins University, Silver Spring, Md.

## Antennas

25. Theory of Antennas driven from Two-Wire Lines, Ronold King, Cruft Laboratory, Harvard University, Cambridge, Mass.

26. Antenna Impedance Measurements on Open Two-Wire Lines, K. Tomiyasu, Cruft Laboratory, Harvard University, Cambridge, Mass.

27. Image-Line Measurements of Antenna Impedance as a function of the Gap at the Driving Point, Patrick Conley, formerly Cruft Laboratory, Harvard University, now Westinghouse Research Laboratories.

28. Travelling Waves and Unsymmetrically Fed Antennas, Erik Hallen, Royal Institute of Technology, Stockholm, Sweden, Temporarily Visiting Lecturer at Cruft Laboratory, Harvard University, Cambridge, Mass.

29. An Experimental Investigation of the Radiation Patterns of Electro-Magnetic Horn Antennas, Donald R. Rhodes, The Ohio State University Research Foundation, Columbus, Ohio.

30. Reciprocity between Generalized Mutual Impedances for Closed or Open Circuits, A. G. Glavier, Federal Telecommunication Laboratories, Inc., New York, N.Y.

31. Theory of Single and Multiple Helical Antennas Producing Radiation Fields with Maximum Radiation Intensity Broadside to the Axis of Helix and with Approximate Circular Polarization in all Directions, A. E. Marston, Naval Research Laboratory, Washington, D.C.

32. Development of a Zero-Drag VHF Communications Aircraft Antenna, J. Bolljohn, E. N. Keith, F. E. Boyd, Naval Research Laboratory, Washington, D.C.

33. A Notch Antenna designed for Aerodynamic Surfaces, Ralph O. Tobinson, Applied Physics Laboratory, Johns Hopkins University, Silver Spring, Md.

34. Analysis of Effect of Circulating Currents on the Radiation Efficiency of Broadcast Directive Antenna Designs, Glenn D. Gillett, Consulting Radio Engineer, Washington, D.C.

35. The Determination of the Low-Frequency Radiation Characteristics of Ground-Based Antennas by Means of Models, Ernest A. Jones, The Ohio State University Research Foundation, Columbus, Ohio.

## Microwave Techniques

36. Proposed New Mixer Circuits with Applications to Electronic Measurements, M. A. El-Said, Egyption Education Bureau, Washington, D.C.

37. Propagation of TE 01 Wawes in Curved Wave Guides, W. J. Albersheim, Bell Telephone Laboratories, Red Bank, N.J.

38. A New Microwave Filter, J. R. Pierce, Bell Telephone Laboratories, New York, N.Y.

39. Maximally-Flat Filters in Waveguide, W. W. Mumford, Bell Telephone Laboratories, Red Bank, N.J.

40. Notes on Ultra-High Frequency Bower Measurements, W. E. Leavitt, Naval Research Laboratory, Washington, D.C.

41. The Measurement of Antenna Impedances through Electrically long Cables by Slotted-Line Methods, K. W. Bewig, Naval Research Laboratory, Washington, D.C.

42. A Method of Measuring Voltage Standing-Wave Radio, A. M. Winzemer, Naval Research Laboratory, Washington, D.C.

43. An Investigation of Dielectric Rod as Waveguide, C. H. Chandler, W. M. Elsasser and H. A. Iams, Radio Corporation of America, RCA Laboratories, Princeton, N.J.

43a. Microwave Low Pass Filter, S. Frankel and B. Parzen, Federals Telecommunication Laboratories, Inc., New York, N.Y.

## Theory of Systems

44. Single Sideband Development, Donald E. Norgaard, General Electric Co, Schenectady, N.Y.

45. A new theory of the Transmission of FM through a Linear System, William E. Brarley, Director of Research, Philco Corporation, Philadelphia, Pa.

46. The Application of Projective Geometry to the Theory of Color Mixture, Frank J. Bingley, Chief Television Engineer, Philco Corporation, Philadelphia, Pa.

47. High Pulse Density Interrogator-Respondor Systems, G. P. Ohman, Naval Research Laboratory, Washington, D.C.

48. Correlation between Broad-Band and per Voice Channel Signal-to-Noise Ratios for Frequency-Modulated and Phase-Modulated Radio Relay Systems, Marshall L. Ribe and Saul Fast, Coles Signal Laboratory, Red Bank, N.J.

49. A New Approach to the Theory of the Superregenerative Receiver, Joseph Tellier, Project Engineer, Research Division, Philco Corporation, Philadelphia, Pa.

50. Error in the Measurement of Position in a Hyperbolic Navigation System, Arthur S. Westneat, Glenn L. Martin Co, Paltimore, Md.

51. A Stabilized and High Sensitivity Type spaced Adcock Medium-Frequency Direction Finder, M. K. Goldstein, Naval Research Laboratory, Washington, D.C.

51a. Stochastic Processes as Applied to Aerial Navigation and Direction Finders, L. A. de Rosa, Federal Telecommunication Laboratories, Inc., New York, N.Y.

## Circuits

52. Basic Digital Arithmetic Circuits, T. Kite Sharpless, Technitrol Engineering Co, Inc. Philadelphia, Pa.

53. An Improved Regenerative Frequency Standard Application F. E. Wyman, Naval Research Laboratory, Washington, D.C.

54. The Magnetic Amplifier, N. R. Castellini, Coles Signal Laboratory, Red Bank, N.J.

55. The Use of G. Curves in the Analysis of Vacuum-Tube Circuits, Keats A. Pullen, Aberdeen Proving Ground, Md.

56. Theory and Applications of the Parallel T. Resistance-Capacitance Network, C. E. Bergman and G, H. Fett, University of Illinois, Urbana, Ill.

57. A Network Performance analyser, C. F. White, Naval Research Laboratory, Washington, D.C.

58. A Two-Frequency Oscillator, Leo V. Skinner, Capt. USAF, University of Illinois, Urbana, Ill.

59. Basic Characteristics of H. F. Core Materials, W. J. Polydorff, Consulting Engineer, Washington, D.C.

Nº B/144. — **Central Radio Propagation Laboratory, National Bureau of Standards,** F. 43, March 1948.
Ionospheric Data.

**Contents :**

Terminology and Scaling Practices.
Monthly Average and Median Values of World-Wide.
Ionospheric Data.
Ionospheric Data for Every Day and Hour at Washington, D.C.
Ionosphere Disturbances.
American and Zürich Provisional Relative Suspot Numbers.
Solar Coronal Intensities observed at Climax, Colorado.

**Errata :**

Tables of Ionospheric Data.
Graphs of Ionospheric Data.
Index of Tables and Graphs of Ionospheric Data in CRPL-F.43.

Nr B/145. — **Basic Radio Propagation Predictions for March 1948,** issued by the National Bureau of Standards, U. S. A., December 1948.

**Contents :**

$F_2$ Zero-MUF, in Mc. W., I., E. Zones.
$F_2$ 4.000-MUF, in Mc. W., I., E. Zones.
E-layer 2.000-MUF, in Mc.
Median fEs, in Mc.

Percentage of Time occurence for $E_2$ 2.000-MUF in excess of 15 Mc.

Nomogram for transforming $F_2$-Zezo MUF and $F_2$-4.000 MUF to equivalent maximum usable frequencies at intermediate transmission distances; conversion scale for obtaining optimum working frequencies.

Nomogram for transforming E-layer 2.000-MUF to equivalent maximum usable frequencies and optimum working frequencies due to combined effect of E layer and $F_2$ layer at other transmission distances.

Nr B/146. — **Basic Radio Propagation for April 1948,** issued by the National Bureau of Standards , U. S. A., January 1948.

**Contents :**

$F_2$ zero-MUF, in Mc., W., I. and E. Zones.
$F_2$ 4.000-MUF, in Mc., W., I. and E. Zones.
E layer 2.000-MUF, in Mc.
Median fEs, in Mc.

Percentage of time occurence for $E_s$ 2.000-MUF in excess of 15 Mc.

World map showing zones covered by predicted charts, and auroral zones.

Great circle chart centered on equator.

## GRANDE-BRETAGNE — GREAT BRITAIN

Nr B/147. — **Department of Scientific and Industrial Research, Radio Division, National Physical Laboratory. Bulletin A. — Nr 16.** Predictions of Radio Wave Propagation Conditions for June 1948.

**Contents :**

Ordinary Ray Critical Frequencies F2 Zone E, I, W.
M. U. F. Factors for 3.000 km. F2 Zone E, I. W.
Maximum Usable Frequencies for 4.000 km. Zone E, I, W.
Optimum Working Frequencies :

| Zone E | Zone I | Zone W |
|---|---|---|
| Lat. 70° N. | Lat. 70° N. | Lat. 70° N. |
| Lat. 60° N. | Lat. 60° N. | Lat. 60° N. |
| Lat. 50° N. | Lat. 50° N. | Lat. 50° N. |
| Lat. 40° N. | Lat. 40° N. | Lat. 40° N. |
| Lat. 30° N. | Lat. 30° N. | Lat. 30° N. |
| Lat. 20° N. | Lat. 20° N. | Lat. 20° N. |
| Lat. 10° N. | Lat. 10° N. | Lat. 10° N. |
| Lat. 0° | Lat. 0° | Lat. 0° |
| Lat. 10° S. | Lat. 10° S. | Lat. 10° S. |
| Lat. 20° S. | Lat. 20° S. | Lat. 20° S. |
| Lat. 30° S. | Lat. 30° S. | Lat. 30° S. |
| Lat. 40° S. | Lat. 40° S. | Lat. 40° S. |

Nr B/148. — **Department of Scientific and Industrial Research. Radio Research Board. Radio Division. National Physical Laboratory. Bulletin B. — Nr 14. Februari 1948.**

Monthly Bulletin of Ionospheric Characteristics :
Falklands Islands for December 1947;
Slough for January 1948.

Nr B/149. — **Department of Scientific and Industrial Research. Radio Research Board. Radio Division. National Physical Laboratory. Bulletin B. — Nr 15. March 1948.**

Monthly Bulletin of Ionospheric Characteristics :
Falklands Islands for January, 1948.
Slough for February, 1948.

**Contents** for both nr B/148 and B/149 :

Terminology;
Note on Ionospheric Absorption Measurements;
Units and Abbreviations ;

Tables :

I. Noon Ionospheric Characteristics — Slough.
II. Monthly Mean Ionospheric Characteristics — Slough.
III. Median Hourly Values of Absorption — Slough.
IV. Hourly Values of hm. in km. for Region F. — Slough.
V. » » » ym/ho » » » — »
VI. of fF2 in Mc/s — Slough.
VII. » » » fEs » — »
VIII. Noon Ionospheric Characteristics -- Falkland Islands.
IX. Monthly Mean Ionospheric Characteristics — Falkland Islands
X. Hourly Values of hm. in km. for Region F. — Falkland Islands.
XI. » » » ym/ho for Region F. — Falkland Islands.
XII. » » » fF2 in Mc/s — Falkland Islands.
XIII. » » » fEs in Mc/s — Falkland Islands.

The observing stations are :

Slough, Bucks, England. Lat. 51° 30' N., Long. 0° 34' W.

(Frequency sweep of recorder 0,5 Mc/s to 14,0 Mc/ in 6 minutes supplemend, when necessary, by manually operated apparatus covering 14 Mc/s to 25 Mc/s.)

Port Stanley, Falkland Islands, Lat. 51° 40' S., Long. 57° 51' W.
(Frequency sweep recorder 2,2 Mc/s to 16,0 Mc/s in 1 minute.)