

August 22, 1947

RADIO:

Publications by the Staff of the National Bureau of Standards.

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General Information

Some of the publications in this list have appeared in the regular series of publications of the Bureau, and others in various scientific and technical journals. Unless specifically stated, papers are not obtainable directly from the National Bureau of Standards.

Where the price is stated, the publications can be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Remittances should accompany order and should be made either by coupons, obtainable from the Superintendent of Documents in sets of 20 for \$1.00 and good until used, or by check or money order payable to him. The prices in this Letter Circular are for delivery by mail to addresses in the United States and its possessions and in certain foreign countries that extend the franking privilege. In the case of all other countries, one-third the cost of the publication should be added to cover postage.

Publications marked "Free" are mimeographed pamphlets obtainable from the National Bureau of Standards without charge.

Publications marked "OP" are out of print, but, in general, may be consulted at technical and public libraries.

For papers in outside scientific or technical journals, the name of the journal or the organization publishing the article is given in abbreviated form, with the volume number (underscored), page, and year of publication, in the order named. The Bureau can not supply copies of these journals, or reprints from them, and it is unable to furnish information as to their availability or price. They, too, can usually be consulted at technical libraries. Inquiries for copies of such papers should be addressed directly to the publisher of the journal at the address given in list below.

This list includes all publications since Jan. 1, 1924, and also the publications earlier than 1924 issued by the Bureau, of which copies are still available.

The Bureau does not maintain a mailing list for distribution of its radio publications as issued. Persons who wish to keep in touch with the Bureau's radio publications should subscribe to the "Technical News Bulletin", a monthly pamphlet giving news on the Bureau's scientific and engineering work and announcements of all new publications. Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington 25, D.C. The price is \$1.00 a year for subscribers in the United States.

The monthly Journal of Research of the National Bureau of Standards contains the Bureau's Research Papers on all subjects.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington 25, D.C. The price is \$4.50 a year for subscribers in U.S.A.

All publications of the Bureau on all subjects, including those which are out of print, are listed in Circular C24, "Publications of the National Bureau of Standards," and the supplements thereto. The Circular and the set of supplements can be purchased for \$1.30, from the Superintendent of Documents. Copies may be consulted at technical and public libraries in the larger cities.

Series letters with serial numbers are used to designate Bureau publications:

S = "Scientific Paper". S1 to S329 are "Reprints" from the "Bulletin of the Bureau of Standards." S330 to S572 were published as "Scientific Papers of the Bureau of Standards". This series was superseded by the "Bureau of Standards Journal of Research" in 1928.

T = "Technologic Paper". T1 to T370. This series superseded by "Bureau of Standards Journal of Research" in 1928.

RP = "Research Paper". These are reprints of articles appearing in the "Bureau of Standards Journal of Research" and in the "Journal of Research of the National Bureau of Standards", the latter being the title of this periodical since July 1934 (Volume 13, number 1).

C = "Circular".

H = "Handbook".

M = "Miscellaneous Publication".

LC = "Letter Circular", a mimeographed pamphlet obtainable from the National Bureau of Standards without charge.

The underlined topics used as center-headings below are not the names of publications; they are general subjects given merely for convenience of classification of the various publications. The numbers under these topics are classification numbers according to the decimal classification system, and are not numbers by which any publications are known or ordered. A complete description of the classification system is given in Letter Circular No. 814 "Revised Classification of Radio Subjects used in the NBS (Jan. 11, 1947).

Addresses of Publishers of Journals

- Aeronautical World, 1709 W. 8th St., Los Angeles, Calif.
 The American Yearbook, The MacMillan Co., New York City.
 Annals of the American Academy of Political and Social Science,
 3457 Walnut St., Philadelphia, Pa.
 Bulletin of the National Research Council, National Academy of Sciences,
 Washington, D.C.
 Bulletin of the American Meteorological Society, Blue Hills Observatory,
 Harvard University, Milton, Mass.
 Electrical World, 330 W. 42nd St., New York City.
 Electronics, McGraw-Hill Bldg., 330 W. 42nd St., New York City.
 The Engineering Foundation, 29 West 39th St., New York City.
 Engineers and Engineering, 124 W. Polk St., Chicago, Ill.
 Horological Institute of America, 421 State Life Bldg.,
 Indianapolis 4, Ind.
 Jahrbuch d. drahtlosen Telegraphie, M. Krayn, Genthiner Strasse, 32,
 Berlin, Germany.
 Journal of the Aeronautical Sciences, 5341 RCA Bldg., Rockefeller Center,
 New York City.
 Journal of the Franklin Institute, Franklin Institute of the State of
 Pennsylvania, Philadelphia, Pa.
 Journal of the Optical Society of America and Review of Scientific
 Instruments, American Institute of Physics, 11 E. 38th Street,
 New York City.
 Journal of the Washington Academy of Sciences, Washington Academy of
 Sciences, Washington, D.C.
 Journal of the Western Society of Engineers, 205 W. Wacker Drive,
 Chicago, Ill.
 Mechanical Engineering, 29 W. 39th Street, New York City.
 National Aeronautical Association Review, 1909 Mass. Ave., N.W.,
 Washington, D.C.
 Nature, MacMillan Co. Ltd., St. Martin Street, London, W.C. 2, England.
 L'Onde Electrique, La Societe des Amis de la TSF, Paris, France.
 Papers of the General Assembly held in Washington, International
 Scientific Radio Union; International Scientific Radio Union,
 Brussels, Belgium.
 Papers of the International Civil Aeronautics Conference, Supt. of
 Documents, Government Printing Office, Washington, D.C.
 Papers of the Seventeenth Annual Safety Congress, National Safety
 Council, Chicago, Ill.
 Physical Review, American Institute of Physics, 11 E. 38th St., New York
 City.
 Proceedings of the Institute of Radio Engineers, 1 E. 79th Street,
 New York City.
 Proceedings of the National Academy of Sciences, National Academy of
 Sciences, Washington, D.C.
 Proceedings of the Third Pan-Pacific Science Congress, National Research
 Council of Japan, Tokyo, Japan.
 QST, American Radio Relay League, W. Hartford, Conn.

Radio, 342 Madison Ave., New York City.
 Radio Engineering, Bryant Publishing Co., 19 E. 47th St., New York City.
 Radio News, Ziff-Davis Pub. Co., 608 S. Dearborn St., Chicago, Ill.
 Science, The Science Press, Grand Central Terminal, New York City.
 Scientific American, 24 West 40th Street, New York City.
 Terrestrial Magnetism & Atmospheric Electricity, Johns Hopkins Press,
 Baltimore, Md.
 Trans. Amer. Geophysical Union, 12th Ann. Meeting, National Academy
 of Sciences, Washington, D.C.

Radio (General)
(R000)

<u>Title</u>	<u>Series</u>	<u>Price</u>
The principles underlying radio communication. 2nd ed., 1922. Signal Corps Radio Com- munication Pamphlet No. 40. (Textbook, 619 pages, with 300 illustrations, cover- ing radio principles and practice).		\$1.00
Electrical interference with radio reception. (1945).	LC784	Free
Revised classification of radio subjects used in the NBS (1947).	LC814	Free
Sources of radio information. (1947).	LC850	Free
Radio communication, review for year. J. H. Dellinger. The American Yearbook, 1925, 1926, 1927, 1928, 1929.		

Laws: Regulations
(R007)

Engineering aspects of the work of the Federal Radio Commission.
J. H. Dellinger. Proc. I.R.E. 17, 1326-1333 (1929).

Radio broadcasting regulation and legislation. J.H. Dellinger.
Proc. I.R.E. 17, 2006-2010 (1929).

Radio Research
(R010)

Survey of current progress in radio engineering. J.H. Dellinger.
J. Western Soc. Engineers 30, 39-49 (1925).

- The International Union of Scientific Radio Telegraphy. J. H. Dellinger. Science 64, 638-639 (1926).
- The International Union of Scientific Radio Telegraphy. J. H. Dellinger. Proc. I.R.E. 16, 1107-1112 (1928).
- Some contributions of radio to other sciences. J. H. Dellinger, J. Franklin Institute 228, 11-42 (1939).

Radio Wave Transmission Phenomena (General)
(R113)

<u>Title</u>	<u>Series</u>	<u>Price</u>
A statistical study of conditions affecting the distance range of radio telephone broadcasting stations. C. M. Jansky, Jr. Tech. Pap. BS <u>19</u> 641-650 (1925).	T297	OP
Some studies of radio transmission over long paths made on the Byrd Antarctic Expedition. L. V. Berkner. BS J. Research <u>8</u> , 265-272 (1932)	RP412	10¢
Bi-monthly reports, Receiving measurements and atmospheric disturbances at the Bureau of Standards. L.W. Austin. Proc. I.R.E. <u>10</u> , 239, 315, 421 (1922); <u>11</u> , 3, 83, 187, 333, 579 (1923); <u>12</u> , 3, 113, 227, (1924).		
Field intensity measurements in Washington on the Radio Corporation stations at New Brunswick and Tuckerton, N.J. L.W. Austin. Proc. I.R.E. <u>12</u> , 681-692 (1924).		
Some transpacific radio field intensity measurements. L.W. Austin Proc. I.R.E. <u>13</u> , 151-157 (1925). J. Washington Acad. Sciences <u>15</u> , 139-143 (1925).		
Facts and fallacies of radio wave transmission. J.H. Dellinger. Radio News, <u>7</u> , 1139, 1192, 1194 (1926).		
Application of radio transmission phenomena to the problems of atmospheric electricity. J.H. Dellinger. J. Wash. Acad. Sciences <u>16</u> , 162-167 (1926).		
Apparatus for recording radio phenomena. T. Parkinson. Bul. Nat. Research Council, No. 61, 183-191 (1927).		

- | <u>Title</u> | <u>Series</u> | <u>Price</u> |
|--|---------------|--------------|
| Summary of symposium on correlations of various radio phenomena with solar and terrestrial magnetic and electric activities.
J. H. Dellinger. Bul. Nat. Research Council, No. 61, 192-197 (1927). | | |
| Report of the Chairman of the Commission of Radio Wave Propagation.
International Union of Scientific Radio Telegraphy. L. W. Austin. Proc. I.R.E. <u>16</u> , 348-358 (1928). | | |
| Bibliography on radio wave phenomena and measurement of radio field intensity. Proc. I.R.E. <u>19</u> , 1034-1089 (1931). | | |
| Note on reception of radio broadcast stations at distances exceeding 12,000 km. L. V. Berkner. Proc. I.R.E. 20, 1324-1327 (1932). | | |
| Report of Committee on Radio Wave Propagation. J. H. Dellinger (co-author). Proc. I.R.E. <u>26</u> , 1193-1234 (1938). | | |
| Report of Commission II - Radio wave propagation, International Scientific Radio Union. J. H. Dellinger. Proc. I.R.E. <u>27</u> , 645-649 (1939). | | |
| The role of the ionosphere in radio wave propagation. J. H. Dellinger, AIEE Trans. <u>58</u> , 803-822 (1939). | | |
| Radio progress during 1938 - Wave propagation. J. H. Dellinger. (Co-author). Proc. I.R.E. <u>27</u> , 180-183 (1939). | | |
| Radio progress during 1939 - Wave propagation. J. H. Dellinger. (Co-author). Proc. I.R.E. <u>28</u> , 108-112 (1940). | | |
| A radio transmission anomaly; cooperative observations between the U.S.A. and Argentina. J. H. Dellinger and A. T. Cosentino. Proc. I.R.E. <u>28</u> , 431 (1940). Also (in Spanish), Revista Telegrafica <u>29</u> , 633. (1940). | | |
| Radio progress during 1940. - Radio wave propagation. J. H. Dellinger. (Co-author). Proc. I.R.E. <u>29</u> , 103 (1941). | | |
| Radio progress during 1941. - Radio wave propagation. J. H. Dellinger (Co-author). Proc. I.R.E. 30, 68-69 (1942). | | |

Fading
(R113.1)

- Cooperative measurements of radio fading in 1925.
J. H. Dellinger, C. B. Jolliffe, and T. Parkinson. Sci. Pap. BS 22, 419-449 (1927).

Fading (continued)

<u>Title</u>	<u>Series</u>	<u>Price</u>
Some observations of short-period radio fading. T. Parkinson. BS J. Research <u>2</u> , 1057-1075 (1929) Also published in Proc.I.R.E. <u>17</u> , 1042-1061 (1929).	RP70	OP
A radio method for synchronizing recording apparatus. T. Parkinson and T. R. Gilliland. BS J. Research <u>6</u> , 195-198 (1931). Also published in Proc.I.R.E. <u>19</u> , 335-340 (1931).	RP269	OP
Radio signal fading phenomena. J. H. Dellinger and L. E. Whitte- more. J. Wash. Acad. Sciences <u>2</u> , 245-259 (1921). Jahrbuch d. drahtlosen Telegraphie <u>24</u> , 66-70 (1924).		
Concerning the nature of fading. J. H. Dellinger. Radio News <u>7</u> , 270, 390 (1925).		
Results of cooperative measurements of radio fading. J. H. Dellinger, C. B. Jolliffe, and T. Parkinson. Radio News <u>8</u> , 146 (1926).		

Daily and Seasonal Variations
(R113.2)

Long-distance radio receiving measurements at the Bureau of Standards in 1923. L. W. Austin. Proc.I.R.E. <u>12</u> , 389-394 (1924).		
Long-distance receiving measurements in 1924. L. W. Austin. Proc.I.R.E. <u>13</u> , 283-290 (1925). J. Wash. Acad. Sciences <u>15</u> , 227-234 (1925).		
Long-distance radio receiving measurements and atmospheric dis- turbances at the Bureau of Standards in 1925. L. W. Austin, Proc.I.R.E. <u>14</u> , 663-673 (1926).		
Long wave radio measurements at the Bureau of Standards in 1926, with some comparisons of solar activity and radio phenomena. L. W. Austin. Proc.I.R.E. <u>15</u> , 825-836 (1927).		
Long wave radio receiving measurements at the Bureau of Standards in 1927. L. W. Austin. Proc.I.R.E. <u>16</u> , 1252-1257 (1928).		
Long wave radio receiving measurements at the Bureau of Standards in 1928. L. W. Austin. Proc.I.R.E. <u>18</u> , 101-105 (1930).		

Daily and Seasonal Variations (continued)
(R113.2)

<u>Title</u>	<u>Series</u>	<u>Price</u>
Long wave radio receiving measurements at the Bureau of Standards in 1929. L. W. Austin. Proc.I.R.E. <u>18</u> , 1481-1487 (1930).		
Long wave radio receiving measurements at the Bureau of Standards in 1930. L. W. Austin. Proc.I.R.E. <u>19</u> , 1767-1772 (1931).		
A method of representing radio propagation conditions. L. W. Austin. Proc.I.R.E. <u>19</u> , 1615-1617 (1931).		
Tables of North Atlantic radio transmission conditions for long wave length daylight signals for the years 1922 to 1930. L.W. Austin. Proc. I.R.E. <u>20</u> , 689-693 (1932).		
Low-frequency radio receiving measurements at the Bureau of Standards in 1931 and 1932. E. B. Judson. Proc.I.R.E. <u>21</u> , 1354-1363 (1933).		

Directional Variations of Radio Waves
(R113.3)

A suggestion for experiments on apparent radio direction variations. L. W. Austin. Proc.I.R.E. <u>13</u> , 3-4 (1925).		
A new phenomenon in sunset radio direction variations. L. W. Austin. J. Wash. Acad. Sciences <u>15</u> , No. 14, 317-319 (1925). Proc.I.R.E. <u>13</u> , 409-412 (1925).		
Apparent night variations with crossed-coil radio beacons. H. Pratt. Proc.I.R.E. <u>16</u> , 652-657 (1928).		

Solar and Cosmic Effects on Radio Wave Propagation
(R113.4)

Comparison of data on the ionosphere, sunspots and terrestrial magnetism. E.P. Judson. J.Research NBS <u>17</u> , 323-330 (1936). Also published in Proc.I.R.E. <u>25</u> , 38-46 (1937).	RF913	OP
Sudden disturbances of the ionosphere. J. H. Dellinger. Research NBS <u>19</u> , 111-149 (1937). Also published in Proc. I.R.E. <u>25</u> , 1253-1290 (1937).	RF1016	OP
Measurements of ultraviolet solar- and sky-radiation intensities in high latitudes. W.W.Coblentz, F.R. Gracely, and R. Stair. J.Research NBS <u>28</u> , 581-591 (1942).	RF1469	10c

Solar and Cosmic Effects on Radio Wave Propagation (continued)
(R113.4)

- Radio signal strength and temperature. L.W. Austin and I.J. Wymore. Proc.I.R.E. 14, 781-784 (1926).
- The relations between radio and other natural phenomena. L. W. Austin. Proc. of the Third Pan-Pacific Science Congress 2, 1257-1263 (1926).
- On the influence of solar activity on radio transmission. L. W. Austin and I. J. Wymore. Proc.I.R.E. 16, 166-173 (1928).
- The relation of radio propagation to disturbances in terrestrial magnetism. I. J. Wymore. Proc.I.R.E. 17, 1206-1213 (1929).
- Note on a comparison of sunspot numbers, terrestrial magnetic activity, and long wave radio signal strength. L. W. Austin. J. Wash. Acad. Sciences 20, 73-74 (1930).
- Solar and magnetic activity and radio transmissions. L. W. Austin, E. B. Judson, and I. J. Wymore-Shiel. Proc. I.R.E. 18, 1997-2002 (1930).
- Solar activity and radiotelegraphy. L. W. Austin. Proc.I.R.E. 20, 280-285 (1932).
- Observations on long-delay radio echoes. J. H. Dellinger. QST 18, pp. 42, 88 of August (1934).
- The ionosphere, sunspots and magnetic storms. S. S. Kirby, T. R. Gilliland, E. B. Judson, and N. Smith. Phys. Rev. 48, 849 (1935).
- A new cosmic phenomenon. J. H. Dellinger. Science 82, 351 (1935).
- A new radio transmission phenomenon. J. H. Dellinger. Phys.Rev. 48, 705 (1935).
- A new radio transmission phenomena. J. H. Dellinger. QST 19, pp. 21, 29 of Dec. 1935.
- Confirmation of cosmic phenomenon. J. H. Dellinger. Science 82, 548-549 (1935).
- The ionosphere, solar eclipses, and magnetic storms. S. S. Kirby, T. R. Gilliland, N. Smith, and S. E. Reymer. Phys. Rev. 50, 258-259 (1936).

Solar and Cosmic Effects on Radio Wave Propagation (continued)
(R113.4)

- A new solar radio disturbance. J. H. Dellinger. *Electronics* 9, pp. 25, 34 of Jan. (1936).
- New Cosmic phenomena. J. H. Dellinger. *QST* 20, pp. 8, 79 of Jan. (1936).
- High-frequency fadeouts continue. J. H. Dellinger. *QST* 20, p. 37 of June (1936).
- Direct effects of particular solar eruptions on terrestrial phenomena. J. H. Dellinger. *Phys. Rev.* 50, 1189 (1936).
- Ionosphere and magnetic storms. S. S. Kirby, N. Smith, T. R. Gilliland, and S. E. Reymers. *Phys. Rev.* 51, 992-993 (1937).
- Radio fadeouts through 1936. J. H. Dellinger. *QST* 21, p. 35, 86, 88 of Feb. (1937).
- Sudden ionospheric disturbances. J. H. Dellinger. *Ter. Mag. & Atmospheric Elec.* 42, 49-53 (1937).
- Sudden disturbances of the ionosphere. J. H. Dellinger. *J. Applied Physics* 8, 732 (1937).
- Remark on S. Chapman's "Note on radio fadeouts and the associated magnetic disturbances". S. S. Kirby. *Ter. Mag. & Atmos. Elec.* 42, 420 (1937).
- Discussion of S. Chapman's "Note on radio fadeouts and associated magnetic disturbances". J. H. Dellinger. *Ter. Mag. & Atmos. Elec.* 43, 179 (1938).
- The nature of the ionosphere storm. S. S. Kirby, N. Smith, T. R. Gilliland. *Phys. Rev.* 54, 234 (1938).
- The sun and the ionosphere. J. H. Dellinger. *Fifth Report of Commission on Solar and Terrestrial Relationships*, p. 72 (1939).
- Radars observations during meteor showers 9 Oct. 1946. R. Bateman, A. G. McNish, V. C. Pineo. *Science*, 104, 434, Nov. 8, 1946.

Eclipses
(R113.412)

<u>Title</u>	<u>Series</u>	<u>Price</u>
Radio observations of the Bureau of Standards during the solar eclipse of August 31, 1932. S. S. Kirby, L. V. Berkner, T. R. Gilliland, and K. A. Norton. BS J. Research <u>11</u> , 829-845 (1933). Also published in Proc.I.R.E. <u>22</u> , 247-264 (1934).	RP629	OP
Ionosphere studies during partial solar eclipse of Feb. 3, 1935. S. S. Kirby, T. R. Gilliland, and E. B. Judson. J. Research NBS <u>16</u> , 213-225 (1936). Also published in Proc.I.R.E. <u>24</u> , 1027-1040 (1936).	RP868	5c
Predictions of normal radio critical frequencies related to solar eclipses in 1940. N. Smith. J. Research NBS <u>24</u> , 225-228 (1940).	RF1279	5c
Observations radio telegraphiques pendant l'eclipse du soleil du 10 Septembre, 1923. (Radio observations during the eclipse of the sun, Sept. 10, 1923). L. W. Austin. L'Onde Electrique <u>3</u> , 591-594 (1924).		
Radio observations of the ionosphere (at the 1940 solar eclipse in Brazil). T. R. Gilliland. Monograph of the National Geographic Society, Solar Eclipse Series, No. 2, 1942.		

Ionosphere
(R113.5)

Kennelly-Heaviside layer height observations for 4045 and 8650 kc. T. R. Gilliland. BS J. Research <u>5</u> , 1057-1061 (1930). Also published in Proc.I.R.E. <u>19</u> , 114-119 (1931).	RP246	10c
Preliminary note on an automatic recorder giving a continuous height record of the Kennelly-Heaviside layer. T.R. Gilliland and G. W. Kenrick. BS J. Research <u>7</u> , 783-790 (1931). Also published in Proc.I.R.E. <u>20</u> , 540-547 (1932).	RP373	10c

Ionosphere - continued
(R113.6)

<u>Title</u>	<u>Series</u>	<u>Price</u>
Investigations of Kennelly-Heaviside layer heights for frequencies between 1600 and 8650 kc per second. T.R. Gilliland, G.W. Kenrick, and K.A. Norton. BS J. Research <u>7</u> , 1083-1104 (1931). Also published in Proc.I.R.E. <u>20</u> , 286-309 (1932).	RF390	10c
Continuous measurements of the virtual heights of the ionosphere. T. R. Gilliland. BS J. Research <u>11</u> 141-146 (1933). Also published in Proc.I.R.E. <u>21</u> , 1463-1475 (1933).	RF582	OP
Note on a multifrequency automatic recorder of ionosphere heights. T. R. Gilliland. BS J. Research <u>11</u> , 561-566 (1933). Also published in Proc.I.R.E. <u>22</u> , 236-246 (1934).	RF608	OP
Studies of the ionosphere and their application to radio transmission. S. S. Kirby, L. V. Berkner, and D. M. Stuart. BS J. Research, <u>12</u> , 15-51 (1934). Also published in Proc.I.R.E. <u>22</u> , 481-521 (1934).	RF632	OP
Multifrequency ionosphere recording and its significance. T. R. Gilliland. J. Research NBS <u>14</u> , 283-303 (1935). Also published in Proc.I.R.E. <u>23</u> , 1076-1101 (1935).	RF769	OP
Recent studies of the ionosphere. S. S. Kirby and E. B. Judson. J. Research NBS <u>14</u> , 469-486 (1935). Also published in Proc.I.R.E. <u>23</u> , 733-751 (1935).	RF780	OP
Characteristics of the ionosphere and their application to radio transmission. T. R. Gilliland, S. S. Kirby, S. E. Reymer and N. Smith. J. Research NBS <u>18</u> , 645-667 (1937). Also published in Proc.I.R.E. <u>25</u> , 823-840 (1937).	RF1001	10c
Maximum usable frequencies for radio sky-wave transmission, 1933 to 1937. T. R. Gilliland, S. S. Kirby, N. Smith, and S. E. Reymer. J. Research NBS <u>20</u> , 627-639 (1938). Also published in Proc.I.R.E. <u>26</u> , 1347-1350 (1938).	RF1096	OP
Application of vertical-incidence ionosphere measurements to oblique-incidence radio transmissions. N. Smith. J. Research NBS <u>20</u> , 683-705 (1938).	RF1100	OP

Ionosphere - continued
(R113.6)

<u>Title</u>	<u>Series</u>	<u>Price</u>
Trends of characteristics of the ionosphere for half a sun-spot cycle. N. Smith, T. R. Gilliland, and S. S. Kirby, J. Research NBS <u>21</u> , 835-845 (1938).	RP1159	5c
Recombination and electron attachment in the F layers of the ionosphere. F. L. Mohler. J. Research NBS <u>25</u> , 507-518 (1940). Also published in Physical Rev. <u>57</u> , 1071 of June 1, 1940.	RP1342	5c
Radio transmission and the ionosphere. (1940). Earlier edition republished in QST <u>24</u> , p. 32 of March (1940); and in T. & R. Bulletin <u>16</u> , 405; 28; 34-35; 69-70 (1940).		OP
Oblique-incidence radio transmission and the Lorentz polarization term. N. Smith. J. Research NBS <u>26</u> , 105-116 (1941).	RP1363	5c
Field equipment for ionosphere measurements. T. R. Gilliland and A. S. Taylor. J. Research NBS <u>26</u> , 377-384 (1941).	RP1384	15c
Kenelly-Heaviside layer studies. P. A. DeMars, T. R. Gilliland, and G. W. Kenrick. Proc. I.R.E. <u>20</u> , 106-113 (1931).		
Ionospheric investigations. T. R. Gilliland. Nature (London), <u>134</u> , 379 (1934).		
Averages of critical frequencies and virtual heights of the ionosphere observed by the National Bureau of Standards, Washington, D.C., 1934-1936. T. R. Gilliland, S. S. Kirby, N. Smith, and S. E. Reymer. Ter. Mag. & Atmos. Elec. <u>41</u> , 379-388 (1936).		
Averages of critical frequencies and virtual heights of the ionosphere observed by the National Bureau of Standards, Washington, D. C. Published quarterly in Ter. Mag. & Atmos. Elec., March 1937 to March 1942.		
Critical frequencies of low ionosphere layers. N. Smith and S. S. Kirby. Phys. Rev. <u>51</u> , 890-891 (1937).		

Ionosphere - continued
(R113.6)

<u>Title</u>	<u>Series</u>	<u>Price</u>
Characteristics of the ionosphere at Washington, D.C., Jan. to May 1937. T. R. Gilliland, S. S. Kirby, N. Smith, and S. E. Reymer. Proc.I.R.E. <u>25</u> , 1174-1184 (1937).		
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Radio instruments and measurements. 2nd ed. (1924, reprinted 1937).	C74	.75¢
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<u>Title</u>	<u>Series</u>	<u>Price</u>
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Theory of determination of ultra-radio frequencies by standing waves on wires. A. Hund. Sci. Pap. BS <u>19</u> , 487-540 (1924).	S491	OP
An improved type of wavemeter resonance indicator. M. S. Strock. Sci. Pap. BS <u>20</u> , 111-118 (1925).	S502	OP
Establishment of radio standards of frequency by the use of harmonic amplifier. C. B. Jolliffe and Grace Hazen. Sci. Pap. BS <u>21</u> , 179-189 (1926).	S530	OP
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(R214)

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(R240)

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(R363)

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A directive type of radio beacon and its application to navigation. F.H. Engel and F.W. Dunmore. Sci. Pap. BS <u>19</u> , 281-295 (1924).	S480	OP
Design of tuned reed course indicators for aircraft radio beacon. F.W. Dunmore. BS J. Research <u>1</u> , 751-769 (1928).	RF28	OP
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(R526.1. See also R520)

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(R526.2)

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Experiments with underground ultra-high frequency antenna for airplane landing beam. H. Diamond and F.W. Dunmore. J. Research NBS <u>19</u> , 1-20 (1937)	RP1006	10c
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(R553.1)

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<u>Title</u>	<u>Series</u>	<u>Price</u>
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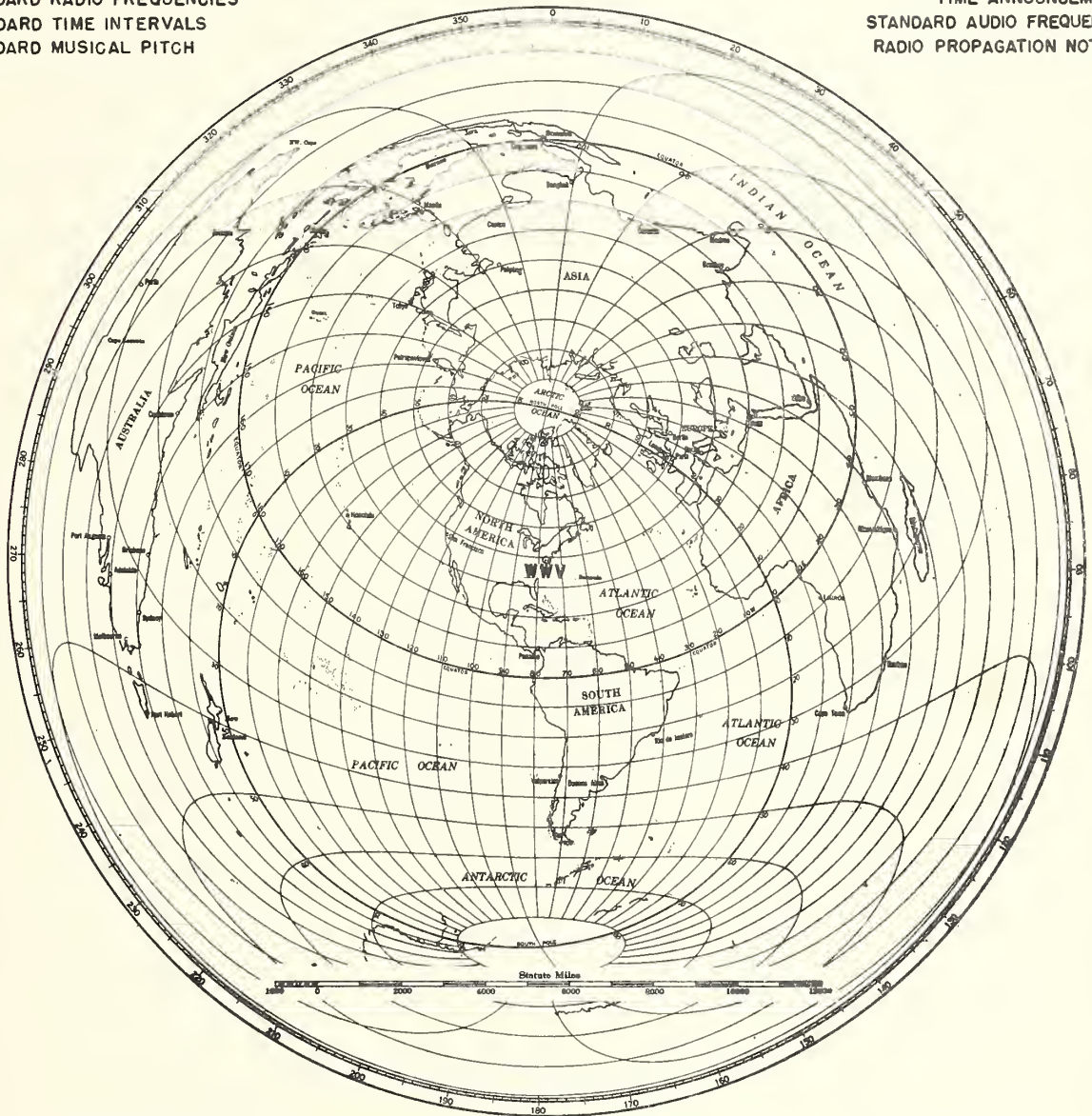
AUGUST 26, 1947

U. S. DEPARTMENT OF COMMERCE
 NATIONAL BUREAU OF STANDARDS
 CENTRAL RADIO PROPAGATION LABORATORY
 WASHINGTON, D. C.

TECHNICAL RADIO BROADCAST SERVICES

STANDARD RADIO FREQUENCIES
 STANDARD TIME INTERVALS
 STANDARD MUSICAL PITCH

TIME ANNOUNCEMENTS
 STANDARD AUDIO FREQUENCIES
 RADIO PROPAGATION NOTICES



MEGACYCLES
 2.5
 5
 5
 10
 15
 20
 25
 30
 35

BROADCAST, E. S. T.
 7:00 PM TO 9:00 AM
 7:00 PM TO 7:00 AM
 7:00 AM TO 7:00 PM
 CONTINUOUSLY
 CONTINUOUSLY
 CONTINUOUSLY
 CONTINUOUSLY
 CONTINUOUSLY
 CONTINUOUSLY

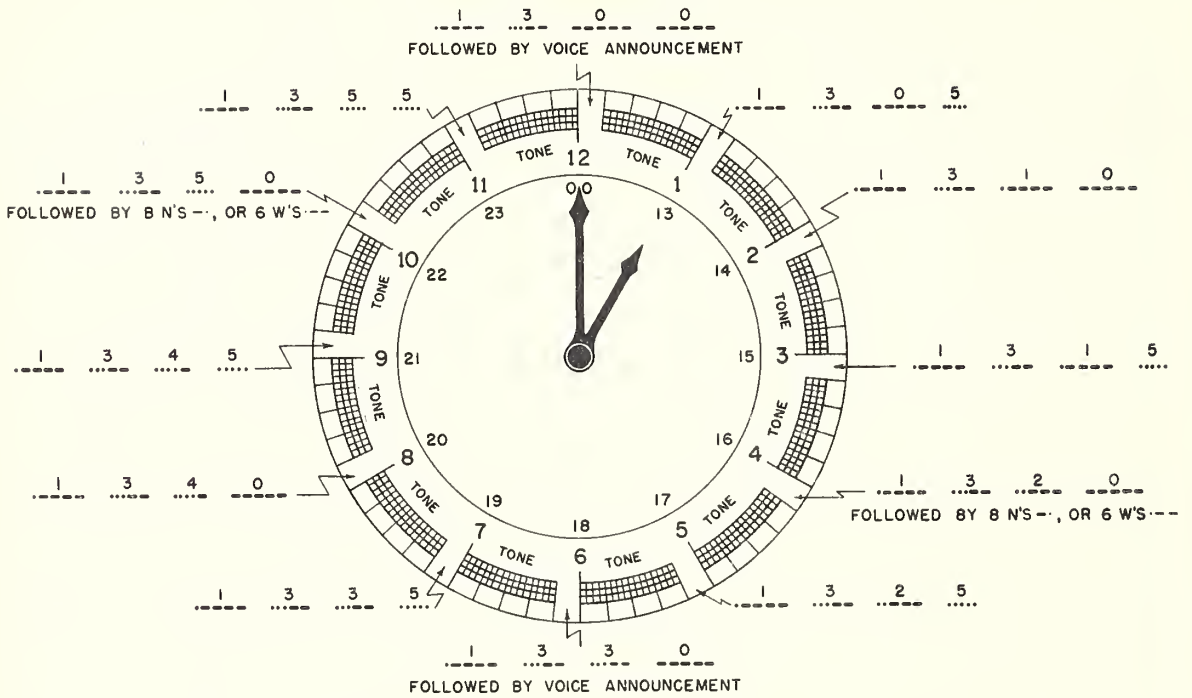
POWER, KW
 0.7
 8.0
 8.0
 9.0
 9.0
 8.5*
 0.1
 0.1
 0.1

MODULATION, C/S
 1 AND 440
 1 AND 440
 1, 440 AND 4000
 1, 440 AND 4000
 1, 440 AND 4000
 1, 440 AND 4000
 1, 440 AND 4000
 1 AND 440

* 0.1 KW. FOR FIRST 4 WORK DAYS AFTER 1st SUNDAY OF EACH MONTH

STATION WWV TIME ANNOUNCEMENTS

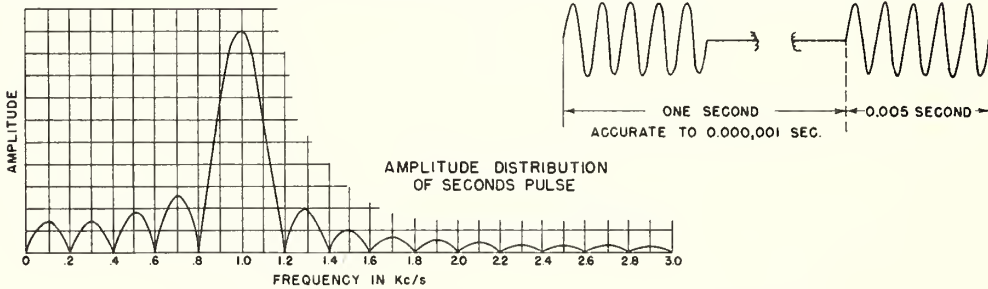
THE HOUR ILLUSTRATED IS 1 TO 2 PM, OR 1300 TO 1400 IN 24 HOUR TIME
EASTERN STANDARD TIME



NUMERALS IN INTERNATIONAL MORSE CODE

0 -----	2 -----	4 -----	6 -----	8 -----
1 -----	3 -----	5 -----	7 -----	9 -----

SECONDS PULSE (NO PULSE IS TRANSMITTED AT THE BEGINNING OF THE 59th SECOND OF EACH MINUTE)



WWV TIME SIGNALS, DEVIATIONS FROM U.S. NAVAL OBSERVATORY TIME JANUARY TO JUNE 1947

