CLASSIFICATION OF RADIO SUBJECTS
AN EXTENSION OF THE DEWEY DECIMAL SYSTEM

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CLASSIFICATION OF RADIO SUBJECTS—AN EXTENSION OF THE DEWEY DECIMAL SYSTEM

ABSTRACT

A systematic scheme of classification of subjects in radio science and engineering is necessary in classifying references to current radio publications and also for classifying all sorts of other radio material, such as reports, reprints, drawings, books, apparatus, etc. In an effort to fill the need for a radio classification this extension of the Dewey decimal system was prepared.

Since the publication of Circular No. 138 (superseded by this circular) in 1923, the subject classification it presents has been used extensively by many radio research workers and engineers as well as by the radio section of the National Bureau of Standards. The present circular brings the classification up to date and makes a few changes which use has shown to be necessary.

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I. INTRODUCTION

Since the publication of Circular No. 138, in 1923, the subject classification it presents has been used extensively by many radio research workers and engineers as well as by the radio section of the Bureau of Standards. The present circular brings the classification up to date and makes a few changes which use has shown to be necessary.

A systematic scheme of classification of subjects in radio science and engineering is necessary in classifying references to current radio publications and also for classifying all sorts of other radio material, such as reports, reprints, drawings, books, apparatus, etc. In an effort to fill the need for a radio classification this extension of the Dewey decimal system was prepared.

Such a system makes it easy to place books on related subjects near together on the shelves, or to file references on the same subject all in the same group and not by the order of their addition to the collection or file. If a classification is to be of the most use, any part of it must be capable of expansion, or it must be possible to disregard any part of the classification without interfering with the usefulness of the remaining parts. These requirements are met.

1 The original circular (C138) was prepared by L. E. Whittemore and R. S. Ould; this circular prepared by J. H. Dellinger and C. B. Jolliffe.
II. THE DEWEY DECIMAL SYSTEM OF CLASSIFICATION

Under the Dewey decimal system, of which the present classification is an extension, classification is by subject, numbers being used to show the relative positions of the books, cards, or other material. The numbers, therefore, show both what the material is (that is, its subject matter), and where the material is (that is, its location on the shelves or in the files). In the classification list the indentation and the figures prefixed to each item show the rank of each subject in the classification.

Accompanying the extended classification table used in Bureau of Standard files is an alphabetical index. The index is used in determining the number to assign to a given item or material, or to learn where to place it in the files. The index is also used by any person desiring to locate the material covering a given subject. The reference number tells immediately where all material on that and on related subjects can be found.

1. OUTLINE OF CLASSIFICATION

The whole subject of radio is given the number 621.384 in the Dewey classification. The relation of this place to the general field of knowledge is shown by the following table:

<table>
<thead>
<tr>
<th>Class</th>
<th>Useful arts.</th>
<th>Engineering</th>
<th>Mechanical</th>
<th>Electrical</th>
<th>Communication</th>
<th>Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td></td>
<td>20</td>
<td>1</td>
<td>0.300</td>
<td>.080</td>
<td>.004</td>
</tr>
</tbody>
</table>

In a strictly radio library or office it is convenient to represent the figure 621.384 by "R" and this abbreviation is used below in the further classification of radio. Thus, R211 indicates 621.384.211.

While some of the details of the Dewey system itself seem to be illogical (for example, electrical engineering a subdivision of mechanical engineering), the system has been widely adopted, and confusion would result from attempts to change it into a more logical form.

The Dewey system has some general features which are found especially advantageous. For example, all general material under a given class is put under the class itself (usually having a final figure 0). The ninth division under any class is usually reserved for miscellaneous items which are as yet of too small importance to classify separately; this should not be confused with the first item (0) under each class which is used for general material pertaining to many or all of the subdivisions under it. The ninth division should be used sparingly; that is, effort should always be made to find a more specific classification. This sometimes requires an extension to be made to the classification at some point.

3 The original circular (C138) was based on the tenth edition, 1919, of Decimal Classification and Relative Index for Libraries, Clipping Notes, etc., by M. Dewey, published by Forrest Press, Lake Placid Club, N. Y. Successive revisions of Dewey's book appeared, and the twelfth edition, 1927, is the basis of the present edition of this circular. Attention is also called to an elaboration of the Dewey system of decimal classification made by the International Institute of Bibliography (published in Classification Decimale Universelle, by Institut International de bibliographie, Bruxelles. 1905; second edition, 1929). The American Dewey and the International Institute expanded tables are similar in general plan, but differ in detail. For example, in the American Dewey tables radiocommunication is found at 621.384, as explained below, while in the International Institute tables it is found at 621.396.

4 By neglecting detailed numbers this index can be applied to the classification table given in III, 1.
2. DETAILED FORM CLASSIFICATION

The Dewey classification, as well as the extension for radio, is mainly by subject or content, regardless of form. For material covering a general field, special form subdivision of the subject is found practically useful. For classification as to form the following set of numbers may be used in connection with the number corresponding to any subject covered.

001 Statistics.
002 Quantities; cost.
003 Contracts; specifications.
004 Designs; drawings.
005 Executive; administrative; rules.
006 Working; maintenance.
007 Laws; regulations.
008 Patents.
009 Reports of tests; bulletins.
01 Theory; methods; programs.
02 Textbooks; outlines; manuals.
03 Cyclopedias; dictionaries.
04 Essays; addresses; lectures; letters; papers.
05 Periodicals; magazines; reviews; bibliography; publications.
06 Societies; associations; transactions; exhibitions.
07 Education; training; museums.
08 Tables; calculations; charts; maps.
09 History; progress; development; biographical.

The sequence of figures constituting the form number is simply placed to the right of the sequence of figures constituting the class number. Thus a periodical on any subject has the subject number followed by 05.

Examples:
R500.05 Periodicals on applications of radio.
R510.05 Periodicals on applications of radio to navigation.
R526.105 Periodicals on radiobeacon systems.
R526.100.7 Laws regarding radiobeacons.

Thus the classification of any subject may be expanded to meet the needs of an individual file. The complete number gives in a condensed form an indication of what the material is as well as its location in the files.

III. CLASSIFICATION OF RADIO SUBJECTS

1. DETAILS OF USE

In the classification of radio subjects the main features of the Dewey system as to subject and form classification are retained.

The class (R800) is anomalous. This space in the classification is actually used for nonradio matter. Such material should, however, be given its regular class number according to the Dewey system. If it were arranged in strictly numerical order, some of this material would come before radio and some after radio. By choosing arbitrarily to use the space denoted by R800 for this purpose it is possible to arrange the nonradio material in classified order, but to keep it subordinate to a larger volume of radio material. Accordingly, a number of nonradio items are included where R800
comes in the list under Section IV below, but are given their number according to the complete classification.

In filing a specific paper under a given class or subdivision, a convenient file number for it can readily be made by using its subject classification number plus a small letter; the order chosen for the letters used for subsequent papers can be according to author, chronological order of accession, or any other consideration depending on the circumstances.

In a card file of references to periodical literature, it is convenient to arrange the cards under each final class or subdivision either in chronological order or in alphabetical order by the names of authors. Cross references may be made conveniently in such a card file by preparing two or more cards and marking each card, after the file number, "X—-". For example, suppose an article on fading (R113.1) includes a method of measuring field intensity by radio-frequency comparison method (R273); two cards should be made out, one marked R113.1, XR273 and the other R273, XR113.1. Each of these should be filed under the first number.

The needs of individual collections of files vary widely, and expansions of the system can be made by any person using the system. The following classification table is given as a classification which in itself meets the needs of small collections or files. Persons interested in a particular subject or subjects will find it advantageous to expand the parts in which they are interested, and to use the classification as given for those parts in which they have only a general interest.

In Section V below there is given a detailed extension of this classification which has been evolved to meet the filing needs of the radio section of the Bureau of Standards. In that table there will be found examples of detailed extensions to meet particular circumstances.

In cases where files of an organization are numbered according to an extended system and are made available to another organization using a less extended system, the detailed portion of the classification numbers can be removed. An example of this is the monthly lists of references to current radio literature published by the Bureau of Standards. The reference numbers in the bureau's own files are according to the table given in Section V; for example, an article on radiobeacon systems for aircraft (visual type) is filed under R526.12. This may be filed in a less extended file under R520 (aircraft radio), R526 (radio as navigation aid), or R526.1 (beacon systems for aircraft), depending on how brief a system is being used.

2. CLASSIFICATION TABLE

R000 RADIO.
(Material of a general nature for which no specific classification can be used and which relates to the field as a whole.)

R100 Radio principles.
(Material having to do with underlying theory.)

R110 Radio waves.
(Transmission phenomena and theory; atmospherics.)

R120 Antennas.
R130 Vacuum tubes.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R140</td>
<td>Circuit theory and effects.</td>
</tr>
<tr>
<td>R150</td>
<td>Generating (transmitting) apparatus (except vacuum tubes. See R130.)</td>
</tr>
<tr>
<td>R160</td>
<td>Receiving apparatus.</td>
</tr>
<tr>
<td>R170</td>
<td>Interference.</td>
</tr>
<tr>
<td>R190</td>
<td>Other radio principles.</td>
</tr>
<tr>
<td>R200</td>
<td>Radio measurements and standardization. (Methods of, and apparatus for, measurement.)</td>
</tr>
<tr>
<td>R210</td>
<td>Frequency.</td>
</tr>
<tr>
<td>R220</td>
<td>Capacity.</td>
</tr>
<tr>
<td>R230</td>
<td>Inductance.</td>
</tr>
<tr>
<td>R240</td>
<td>Resistance; current; voltage.</td>
</tr>
<tr>
<td>R250</td>
<td>Generating (transmitting) apparatus.</td>
</tr>
<tr>
<td>R260</td>
<td>Receiving apparatus.</td>
</tr>
<tr>
<td>R270</td>
<td>Intensity (field intensity, signal intensity, noise, etc.)</td>
</tr>
<tr>
<td>R280</td>
<td>Properties of materials.</td>
</tr>
<tr>
<td>R290</td>
<td>Other radio measurements.</td>
</tr>
<tr>
<td>R300</td>
<td>Radio apparatus and equipment. (Component parts of apparatus, not complete communication systems.)</td>
</tr>
<tr>
<td>R320</td>
<td>Antennas.</td>
</tr>
<tr>
<td>R330</td>
<td>Vacuum tubes.</td>
</tr>
<tr>
<td>R350</td>
<td>Generating (transmitting) apparatus.</td>
</tr>
<tr>
<td>R360</td>
<td>Receiving apparatus.</td>
</tr>
<tr>
<td>R380</td>
<td>Parts; instruments.</td>
</tr>
<tr>
<td>R390</td>
<td>Other radio apparatus and equipment.</td>
</tr>
<tr>
<td>R400</td>
<td>Radio communication systems. (Complete communication systems, or parts of a system which are considered in relation to the complete system.)</td>
</tr>
<tr>
<td>R410</td>
<td>Modulated-wave systems.</td>
</tr>
<tr>
<td>R420</td>
<td>Continuous-wave systems.</td>
</tr>
<tr>
<td>R430</td>
<td>Interference elimination.</td>
</tr>
<tr>
<td>R440</td>
<td>Remote control (by wire).</td>
</tr>
<tr>
<td>R450</td>
<td>Connection of radio systems to wire systems.</td>
</tr>
<tr>
<td>R460</td>
<td>Duplex and multiplex systems.</td>
</tr>
<tr>
<td>R470</td>
<td>Radio-frequency carrier wire systems.</td>
</tr>
<tr>
<td>R480</td>
<td>Radio relay systems.</td>
</tr>
<tr>
<td>R490</td>
<td>Other systems.</td>
</tr>
<tr>
<td>R500</td>
<td>Applications of radio. (Radio as an instrument in other arts, industries, etc.)</td>
</tr>
<tr>
<td>R510</td>
<td>Marine applications.</td>
</tr>
<tr>
<td>R520</td>
<td>Aeronautic applications.</td>
</tr>
<tr>
<td>R530</td>
<td>Commercial and special services. (Commercial communications, press, railroads, mining, etc.)</td>
</tr>
<tr>
<td>R540</td>
<td>Private.</td>
</tr>
<tr>
<td>R550</td>
<td>Broadcasting.</td>
</tr>
<tr>
<td>R560</td>
<td>Military.</td>
</tr>
<tr>
<td>R570</td>
<td>Remote control by radio.</td>
</tr>
<tr>
<td>R580</td>
<td>Picture transmission; television.</td>
</tr>
<tr>
<td>R590</td>
<td>Other applications.</td>
</tr>
<tr>
<td>R600</td>
<td>Radio stations. (Equipment, operation, and management.)</td>
</tr>
<tr>
<td>R610</td>
<td>Equipment.</td>
</tr>
</tbody>
</table>
R620  Operation and management.
R700  Radio manufacturing.
R710  Factories.
R720  Processes.
R740  Sales.
(R800) Nonradio subjects.
(Material of interest, but not a part of radio. Give complete numbers according to the Dewey system. See Pt. V.)
R900  Miscellaneous radio.
(Material which has no specific place. See also R000.)

This is in substantial agreement with the classification as given in the first edition, with the exception of changes in R240, R250, R260, R340, R580, and R590, mostly made for the sake of consistency between parts of the classification.

IV. EXTENSIONS OF RADIO CLASSIFICATION

For larger collections and files a still more detailed extension might be required. The form classification (Sec. II, 2) is very useful for detailed extensions, and may be used under any item in the classification, as occasion requires.

The following extension of the subject classification has been developed for filing material in the radio section, Bureau of Standards. Form classifications (see Sec. II, 2) are not given in the table except under R000, but, as already stated, may be made anywhere in the classification. Radio reference lists and other material published by the bureau are classified according to this table.

V. EXTENDED CLASSIFICATION TABLE USED IN BUREAU OF STANDARD FILES

R000  RADIO.
R001  Statistics.
R004  Design.
R005  Executive; administrative; personnel.
R007  Laws; regulation.
R007.9  International conferences; treaties.
R009  Reports; bulletins.
R010  Research.
R020  Textbooks. (See also R050.)
R030  Terminology; symbols.
R040  Lectures.
R050  Publications.
R051  Books. (See also R020.)
R053  Periodicals.
R055  Bibliographies.
R060  Societies; meetings.
R070  Education; training.
R080  Collections; tables; miscellanies.
R081  Tables.
R082  Nomograms.
R083  Humor.
R084  Maps and charts.
R090  History.
R091 Radiotelegraphy.
R094 Radiotelephony.
R097 Biographical.
R100 Radio principles.
R110 Radio waves.
R111 Theory.
R111.1 Velocity of radio waves.
R111.2 Radiation.
R111.6 Reception.
R113 Radio wave transmission phenomena.
R113.1 Fading.
R113.2 Daily variations; seasonal variations.
R113.3 Direction variations.
R113.5 Meteorological, geophysical, and cosmical effects.
R113.55 Eclipses.
R113.6 Reflection; refraction; diffraction; absorption; polarization.
R113.61 Kennelly-Heaviside layer.
R113.62 Multiple signals.
R113.63 Wave front angle.
R113.7 Transmission formulas; range.
R114 Atmospheric disturbances; strays.
R115 Directional properties.
R116 Waves on wires.
R120 Antennas.
R121 Condenser type antennas (ordinary elevated type) with ground or counterpoise.
R125 Directional antennas (transmitting in, or receiving from, a particular direction).
R125.1 Beam antennas.
R125.2 Wave antennas.
R125.3 Coil antennas.
R125.31 Direction finding.
R125.4 Adcock antennas.
R126 Ground connections.
R129 Other types of antennas.
R129.1 Multiple tuned.
R130 Vacuum tubes.
R131 General properties; characteristic curves.
R132 Amplifying action.
R133 Generating action.
R134 Detector action.
R135 Modulating action.
R138 Electron emission; ionization.
R139 Other vacuum tube principles.
R140 Circuit theory and effects.
R141 Simple radio circuits.
R141.1 Frequency.
R141.2 Resonance.
R141.3 Impulse excitation.
R142 Coupled circuits.
R142.1 Direct coupling.
R142.3  Inductive coupling.
R142.5  Capacitive coupling.
R143    Filters.
R144    Radio-frequency resistance.
R144.1  Damping; decrement.
R145    Reactance.
R145.3  Inductance.
R145.5  Capacity.
R146    Harmonics.
R146.1  Harmonic amplification.
R146.2  Multivibrator.
R147    Beats.
R148    Modulation.
R148.1  Distortion.
R149    Rectification.
R150    Generating (transmitting) apparatus (except vacuum tubes, see R133.)

R152    Spark.
R153    Arc.
R154    Alternator.
R160    Receiving apparatus.
R161    Receiving sets.
R161.1  Selectivity.
R161.2  Sensitivity.
R161.3  Fidelity.
R161.4  Normal output.
R161.5  Interference output.
R162    Receiving set circuit arrangements.
R163    Heterodyne reception.
R165    Telephone receivers. (See also 621.385.97.)
R170    Interference.
R171    Beat interference.
R190    Other radio principles.
R191    Principles of piezo-electricity applied to radio.
R200    Radio measurements and standardization.
R201    General methods and apparatus.
R201.5  Shielding and grounding.
R201.7  Use of cathode-ray oscillograph.
R202    Resonance methods.
R203    Harmonic methods.
R204    Null methods.
R205    Substitution methods.
R206    Use of beat notes in measurements.
R206.1  Beat indicators.
R207    High-frequency bridge methods.
R210    Frequency.
R211    Circuit resonance methods.
R211.1  Frequency meters.
R212    Parallel wire methods.
R213    Harmonic methods.
R213.1  Harmonic amplifiers.
R213.2  Multivibrators.
R214    Piezo-electric standards.
R220    Capacity.
R220. 1 Capacity meters.
R223 Dielectric constant.
R225 Capacity of coils.
R230 Inductance.
R231 Self-inductance.
R232 Mutual inductance.
R240 Resistance; current; voltage.
R241 Resistance; power factor.
R241. 1 Resistance-variation method.
R241. 2 Reactance-variation method.
R241. 3 Substitution method.
R241. 4 Calorimeter methods. (See also 536.)
R241. 5 Bridge methods.
R242 Current.
R242. 1 Ammeters.
R242. 11 Hot-wire.
R242. 12 Thermoelement.
R242. 13 Current transformer.
R242. 14 Electrodynamometer.
R242. 15 Einthoven galvanometer.
R242. 16 Bolometer bridge.
R243 Voltage.
R243. 1 Vacuum tube voltmeters.
R243. 2 Sparking distance.
R243. 3 Electrostatic voltmeters.
R250 Generating (transmitting) apparatus.
R251 Power rating.
R253 Transmitting vacuum tubes.
R254 Modulation.
R255 Power amplifiers.
R256 Microphones.
R260 Receiving apparatus.
R261 Receiving sets.
R261. 1 Selectivity.
R261. 2 Sensitivity.
R261. 3 Fidelity.
R261. 4 Normal output.
R261. 5 Interference output.
R261. 6 Power supply.
R262 Receiving vacuum tubes.
R262. 1 Characteristic curves.
R262. 2 Grid conductance.
R262. 3 Plate conductance; plate resistance.
R262. 4 Amplification factor.
R262. 5 Mutual conductance.
R262. 6 Internal capacities.
R262. 7 Life tests.
R262. 8 Power output.
R262. 9 Other vacuum tube measurements.
R263 Amplifying apparatus.
R264 Component parts.
R264. 1 Condensers.
R264. 2 Coils.
R264. 3 Transformers.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R265</td>
<td>Telephone receivers. (See also 621.385.97.)</td>
</tr>
<tr>
<td>R265.1</td>
<td>Telephones.</td>
</tr>
<tr>
<td>R265.2</td>
<td>Loud speakers.</td>
</tr>
<tr>
<td>R270</td>
<td>Intensity (field intensity, signal intensity, noise, etc.).</td>
</tr>
<tr>
<td>R271</td>
<td>Shunted telephone method.</td>
</tr>
<tr>
<td>R272</td>
<td>Audio-frequency comparison method.</td>
</tr>
<tr>
<td>R273</td>
<td>Radio-frequency comparison method.</td>
</tr>
<tr>
<td>R280</td>
<td>Properties of materials.</td>
</tr>
<tr>
<td>R281</td>
<td>Electrical insulating materials. (See also R223, R241.)</td>
</tr>
<tr>
<td>R282</td>
<td>Electrical conducting materials.</td>
</tr>
<tr>
<td>R282.1</td>
<td>Metallic conductors.</td>
</tr>
<tr>
<td>R282.2</td>
<td>Electrolytes.</td>
</tr>
<tr>
<td>R282.3</td>
<td>Magnetic materials.</td>
</tr>
<tr>
<td>R290</td>
<td>Other radio measurements.</td>
</tr>
<tr>
<td>R300</td>
<td>Radio apparatus and equipment.</td>
</tr>
<tr>
<td>R320</td>
<td>Antennas.</td>
</tr>
<tr>
<td>R320.6</td>
<td>Antenna switches.</td>
</tr>
<tr>
<td>R320.8</td>
<td>Towers.</td>
</tr>
<tr>
<td>R321</td>
<td>Condenser type antennas (ordinary elevated type) with ground or counterpoise.</td>
</tr>
<tr>
<td>R325</td>
<td>Directional antennas (transmitting in, or receiving from, a particular direction).</td>
</tr>
<tr>
<td>R325.1</td>
<td>Beam antennas.</td>
</tr>
<tr>
<td>R325.2</td>
<td>Wave antennas.</td>
</tr>
<tr>
<td>R325.3</td>
<td>Coil antennas.</td>
</tr>
<tr>
<td>R325.31</td>
<td>Direction finders.</td>
</tr>
<tr>
<td>R325.4</td>
<td>Adcock antennas.</td>
</tr>
<tr>
<td>R326</td>
<td>Ground connections.</td>
</tr>
<tr>
<td>R327</td>
<td>Artificial antennas.</td>
</tr>
<tr>
<td>R329</td>
<td>Other types of antennas. (For airplane antennas see R525.)</td>
</tr>
<tr>
<td>R329.1</td>
<td>Multiple tuned antennas.</td>
</tr>
<tr>
<td>R330</td>
<td>Vacuum tubes.</td>
</tr>
<tr>
<td>R331</td>
<td>Construction; evacuation. (See also vacuum pumps, 533.85.)</td>
</tr>
<tr>
<td>R332</td>
<td>Two-electrode.</td>
</tr>
<tr>
<td>R333</td>
<td>Three-electrode.</td>
</tr>
<tr>
<td>R334</td>
<td>Four-electrode.</td>
</tr>
<tr>
<td>R335</td>
<td>Five-electrode.</td>
</tr>
<tr>
<td>R336</td>
<td>Alternating-current tubes.</td>
</tr>
<tr>
<td>R336.1</td>
<td>Directly-heated cathode.</td>
</tr>
<tr>
<td>R336.2</td>
<td>Indirectly-heated cathode.</td>
</tr>
<tr>
<td>R337</td>
<td>Rectifier tubes.</td>
</tr>
<tr>
<td>R338</td>
<td>Regulator tubes.</td>
</tr>
<tr>
<td>R339</td>
<td>Special types of tubes.</td>
</tr>
<tr>
<td>R350</td>
<td>Generating apparatus; transmitters.</td>
</tr>
<tr>
<td>R352</td>
<td>Spark.</td>
</tr>
<tr>
<td>R353</td>
<td>Arc.</td>
</tr>
<tr>
<td>R354</td>
<td>Radio-frequency alternators.</td>
</tr>
<tr>
<td>R355</td>
<td>Vacuum tube transmitters.</td>
</tr>
<tr>
<td>R355.1</td>
<td>Low frequency (10 to 100 kc.).</td>
</tr>
<tr>
<td>R355.2</td>
<td>Medium frequency (100 to 1,500 kc.).</td>
</tr>
</tbody>
</table>
R355. 21 Broadcast frequency (550 to 1,500 kc.).
R355. 3 Medium-high frequency (1,500 to 6,000 kc.).
R355. 4 High frequency (6,000 to 30,000 kc.).
R355. 5 Very high frequency (above 30,000 kc.).
R355. 6 Frequency control.
R355. 65 Piezo oscillators.
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