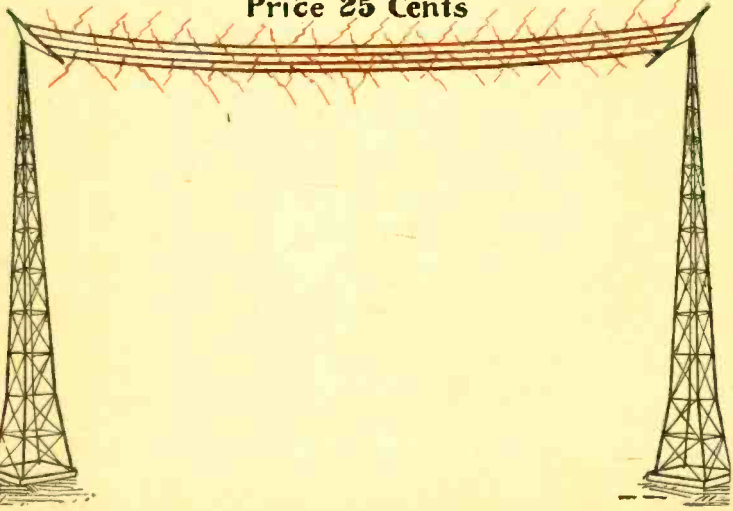
RADIO STATION DIRECTORY AND TROUBLE FINDER

Companion of the Radio Set

A Friend in Need
in Case of Trouble

Written in Plain English

Price 25 Cents



1925

RADIO

BROADCASTING STATION

DIRECTORY

—and—

TROUBLE FINDER

by

BERTRAM W. DOWNS.
B. Sc., Assoc. A. I. E. E.

A complete list of Broadcasting Stations in North America and a Guide for the location and elimination of trouble in Radio Receiving Sets.

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INTRODUCTORY NOTE

RADIO, as a means for entertainment, education and the dissemination of general information, has reached a high degree of development.

Standard radio instruments themselves have reached a degree of excellence comparable to the precision work in fine motor cars.

The "Trouble Finder" portion of the title of this booklet should not be taken as an insinuation that radio sets are continually out of operation; for such is not the case. The normal condition of a radio set is a healthy one. This booklet is offered as an instructor in the proper operation of a radio set, comparable to the instruction book which every wise owner of a motor car will buy.

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INFORMATION
FOR THE BEGINNER

WHEN the "around the world" aviators reached the end of their trip at Boston, one of them made a speech over the radio. The newspapers wrote this event up under the headlines "Air Hero Makes Radio Speech From Boston While Mother Listens In From Pacific Coast." When a political speaker recently talked over the radio, the papers told of the millions who listened to him.

Such articles as these, often written by reporters who have never even operated a home radio set, give the impression that all the radio owner has to do is to push a button, call the number he wants, and listen in, just as over a telephone, regardless of time of day or night, winter or summer, in fair or stormy weather.

To avoid disappointment, you should realize at the start, that a radio is not like a phonograph. It is not always ready to bring in any station you want, for weather conditions, local buildings, hills, and other obstructions exercise a marked effect on the operation of **all** radio sets.

Broadcasting stations that are entirely out of range in the daytime may come in loud and clear at night. The night range is approximately ten times that of the daylight range. In winter, when trees have lost their conductive sap, when the air is dry, and atmospheric electricity (static) is at a minimum, greater distances can be covered, and more freedom from static interference is enjoyed.

If the above is new to you, don't let it discourage your interest in radio, for it is this very uncertainty that makes radio attractive. How many fishermen would there be if it were only necessary to drop in the hook in order to pull out a five pound bass? One of the most fascinating features about radio is the fact that you can sit down at your set and listen to nearly any form of entertainment that you please, from coast to coast; and the next night you may hear an entirely different set of stations. Of course the powerful stations that are near, will be readily tuned in night after night, at will, but for real distant stations this is not the case. Some radio enthusiasts find their pleasure in listening an hour at a time to the excellent programs; most of them would rather listen to one number, just long enough to find out the location of the station, and then they are ready to turn to another, content with tuning in as many stations as possible.

General Information

THERE are as many types and classes of radio sets as motor cars. There are broad principles of design that must be followed in **all** sets. In addition to the necessary parts there are many refinements and improvements which are found in the better class sets.

Fifteen years ago automobiles were sold without top, windshield, or side curtains. These "unnecessaries" were available, but at a higher price. Today a good automobile is really not complete unless it has a closed body, balloon tires, speedometer, bumpers, and countless other refinements that we now look upon as things which should go with any good car.

Likewise, in the early days of radio, an amplifier and loud-speaker was looked upon as admirable equipment for the scientific laboratory, but beyond the hopes of the amateur enthusiast. Today nearly any radio fan contemplates a ten-tube super-heterodyne with considerably less emotion than we used to display toward the first "quick-detachable" tire. So when you buy a radio set remember that you have the opportunity to purchase anything from a "flivver" to the Rolls-Royce of radio; your choice depending on your needs—and also on your purse.

Radio Essentials. Every radio set must have in some form or another, these two units; (1) the tuning unit, (2) the detector unit.

The tuning unit, or tuner, is for the purpose of **selecting** the broadcasting station you wish to hear, and **rejecting** all others. It is composed of one or more coils (of wire) and condensers, the electrical values of which can be varied by means of the knobs on the panel of the radio cabinet. Just as the violinist tunes his instrument to the piano which is to accompany him, so the radio set must be tuned to the broadcasting station it is desired to hear.

The detector changes the electrical impulses received from the broadcasting station into such a form that they will actuate the phones, and thus reproduce the sounds which originate in the broadcasting station studio.

Radio Refinements. The above units represent the radio set in its simplest form. Improvements on this two-unit radio set almost invariably take the form of (1) low-frequency amplifiers (commonly called audio-frequency or tone-frequency amplifiers), and (2) high-frequency amplifiers (radio frequency), and the tuning units which the latter include.

The low-frequency, or audio-frequency amplifier, serves one purpose; to build up the currents given out by the detector to a point where they are stronger, usually for the purpose of operating a loud-speaking horn. Regardless of the strength of the incoming signals, a detector alone is not sufficient for this.

The high-frequency, or radio-frequency amplifier serves one or more of three purposes; (1) it builds up signals which are received in the aerial but too weak to actuate the detector, to a point where satisfactory reception is possible, or (2) it makes the use of an aerial unnecessary, due to its great

sensitivity, or (3) by means of the tuning coils embodied in the amplifier, it gives great **selectivity**; that is, assists the primary tuner to reject unwanted signals. The radio-frequency amplifier comes ahead of the detector, and is used **only** for the three purposes mentioned, and never for the operation of a loud speaker.

A study of the above will make it easy to understand the part which follows, on "Types of Radio Sets."

Types of Radio Sets

1. **The Crystal Set.** Simplest of all radio sets, this consists of a tuner and a crystal detector containing Galena. Silicon, or some patented composition which functions as a detector without the use of batteries or vacuum tubes. Its average range with a good aerial does not exceed 25 miles. Its outstanding features are low cost, simplicity, and clearness of signals received. Worthless for long distance reception except where used with a radio-frequency amplifier.
2. **Single-Tube Non-Regenerative.** Simplest of all vacuum tube sets, consisting of tuner and vacuum-tube detector unit. A little more sensitive than the crystal set, and much more reliable. Requires batteries.
3. **Single-Tube Regenerative.** The most popular cheap long-distance set. Consists of same as No. 2, with the addition of a tuning coil, or like device, in the vacuum tube detector circuits, which causes the vacuum tube to serve as both radio-frequency amplifier and detector. Will give good results with phones over distances of 500 to 1,000 miles, and more in good weather.

These three comprise the simple sets, as found in general use. The following are variations and improvements, which include amplifiers of several designs:

4. **Three-Tube Regenerative.** Same as No. 3, with the addition of a two stage amplifier. Has approximately the same range, but will operate a loud-speaker over similar distances. The receiving radius with phones will be slightly greater.
5. **Five to Six-Tube Radio-Frequency.** Such sets usually have two to three stages of radio-frequency amplification, a non-regenerative detector, and two stages of audio-frequency amplification. If well built they have a somewhat greater range than the three tube regenerative set, and, depending on their design and the skill of the operator, they may be more or less selective than the regenerative set.
6. **Neutrodyne Radio Frequency.** Usually built in four, five, or six-tube models, these sets have two or three stages of radio-frequency amplification so balanced (by the patented neutrodyne principle) that high selectivity is obtained, as well as great amplification. Two stages of audio amplification permit the use of a loud speaker on nearly all occasions.

7. **Super-Heterodyne.** The super-heterodyne is built in all sizes, from six to twelve vacuum tubes being most common, with the average about eight. In principle it is decidedly different from other sets. Instead of tuning each stage of radio-frequency amplification to the incoming signal, the super-heterodyne requires no variation of the amplifier circuits, but instead changes the frequency of the signal to meet the fixed values of the amplifier circuits. Although the most complex in construction, it is one of the easiest sets to operate. It is primarily meant for use with a loop aerial, which may fit inside the cabinet, thus making the set entirely portable. As with any "loop" set, however, best results will be obtained when an outside aerial is used. When an aerial is used with such sets, however, it must be connected to a coil several feet from the set, instead of direct-connected, as the high sensitivity of these sets makes a closer connection unnecessary. Your dealer can give exact information with regard to any particular set, and the best connections.

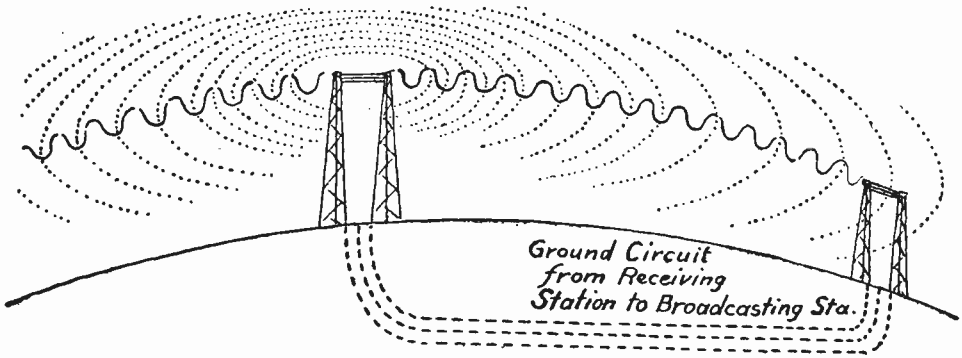
NOTE. It is impossible to give all the variations of sets that are found on dealers' shelves and in home workshops, for there are probably two hundred variations. Those above, however, represent the leading classes of sets which are manufactured for the market.

Aerials, Loops and Counterpoises

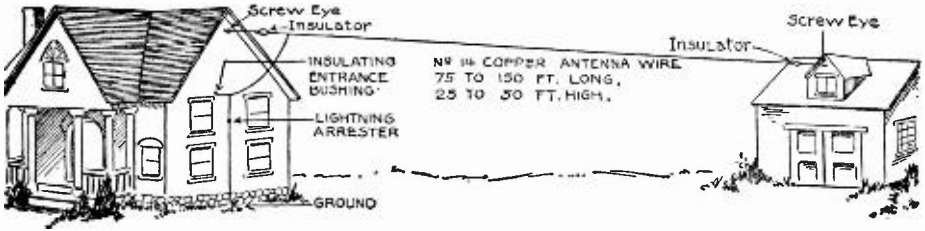
IN THE past all radio sets depended on an aerial, or elevated wire or wires to "catch" the radio impulses and bring them to the set. With the widespread popularity of the home radio, the erection of an aerial has been something of a problem, particularly in districts where there were many apartment buildings. This condition has led to the adoption of "trick" aerials of many kinds, and also to the popularity of many-tube sets, which will operate over long distances without the use of an outdoor aerial.

Substitute aerials include bedsprings, fire escapes, indoor clothes lines (metal), wires concealed behind picture mouldings, and the like. All of these fulfill their purpose in some degree. Still more effective substitutes are small aerials built in the top story of the buildings, and patterned after the outdoor aerial. These work, in many cases, nearly as well as the outdoor installation. "Aerial Plugs," to be connected to the lamp socket, are often as satisfactory as aerials; although they sometimes fail completely, the results being dependent mainly on the conditions in the wiring of the house. For this reason, most dealers will sell these plugs on a trial basis. Whenever practical, however, it is urged that a standard installation be used.

In order to make up for the inefficiency of the above make-shifts, it was found desirable to increase the sensitivity of the radio set itself, to overcome the losses introduced at the start. This has been accomplished mainly by the use of more and more vacuum tubes as amplifiers. Eighteen months ago a five tube set was a curiosity; today eight and ten tube sets are common. It was found that by increasing the sensitivity of the set, the same



Radio waves traveling out in all directions from transmitting to receiving stations.



A typical antenna system for a radio receiving station.

results could be obtained with smaller and smaller aerials, until finally it was found that a simple coil of wire about eighteen inches in diameter, and with about ten to twenty turns of wire, would serve as a collector, without the use of a ground connection or aerial of any other kind. This "loop" aerial is all that is needed with many sets of three to twelve tubes, for receiving from distances up to several thousand miles. The loop also possesses the property of receiving best from the direction in which it is pointed, which is an aid in eliminating unwanted signals. To operate a loop it is necessary to use several stages of radio frequency amplification. The most popular loop sets are those with plain radio-frequency amplification or those with the super-heterodyne feature. By using the reflex principle, the same tubes can be made to serve as radio frequency and audio frequency amplifiers, and satisfactory loop sets may be made with as few as three tubes.

The natural thing might seem to be the combination of these ultra-sensitive sets with an outdoor aerial; but the advantage of both can be secured only to a limited degree; for this reason. There seems to be a certain distance, beyond which no set can receive. Of course the actual distance will be governed on any particular date, by atmospheric conditions. But, although the super-sensitive sets may bring in signals that are inaudible to the ordinary good sets, the static and other interferences will also be amplified by the super set, so that the very distant signals are unintelligible, though audible. There is always some static in the atmosphere; although you may not hear it. Connect up a more sensitive set than the one you have been using, and, while you may bring in more distant stations, you will usually also bring in static enough to blanket them.

But there is this much to be said for the use of an aerial with a loop set: If the set does not bring in distant stations as well as others which use an aerial, a small aerial can be erected, and merely passed through the room in which the set is located, the lead-in being one or two feet from the loop. This will usually increase the range of the set. Or instead of leading directly to the ground the lead-in may pass through a small tuning coil, or fixed coil and condenser. Your dealer can give you data on the size of coil that will be best for your set. As a rule, a tapped coil, with fifty turns and about ten taps, will be right for all purposes. The loop will pick up energy from the lead-in without any physical connection. Of course this will remove the directive property of the loop to some degree.

In the case of sets using an outdoor aerial, it has been found that under some conditions better results could be obtained by using a "counterpoise" in place of a connection to the ground. The customary means to a "ground" is by connection to water pipes, radiators, or rods driven into moist ground. The counterpoise is really little more than a second aerial, ordinarily nearer the earth than the aerial, but not necessarily so. The counterpoise is insulated from other objects in the same way as the aerial itself. It may be twenty to fifty feet or more from the aerial, or it may be a fraction of an inch from it. Some manufacturers are now making "counterpoise aerial wire," which has a core of copper wire, which is the aerial, a composition insulating jacket, and a braided wire covering over that, the latter

being the counterpoise. The unit is erected just as an aerial, with two lead-ins, one from the inner wire, which attaches to the "aerial" post on the set, and the other from the outer braided covering, which goes to the "ground" terminal. In dry climates a counterpoise is usually preferable to a ground, and the same is often true in other places where the ground connection is not perfect.

As to the aerial itself, the best length for broadcasting purposes is about fifty to sixty feet. The day of the long aerial is past. The lead-in should be as direct as possible, and should touch as few insulators (and nothing else) as possible. There is a theoretical advantage in using stranded wire, which advantage is seldom evident in a practical sense. Theoretically the best aerial wire is that which is made up of a number of strands of enameled wire braided together. There is absolutely no advantage in using more than one wire in the aerial, although some people persist in erecting three and four wire aerials. A four wire aerial is only of advantage when a transmitting outfit is used.

Lightning Protection. With a loop or an indoor aerial there is of course no need for lightning protectors. In the case of the outdoor aerial, the condition is somewhat different. During a lightning storm the aerial picks up a considerable amount of static electricity, which should have a fairly easy path to the ground, in order to protect the receiving instruments. The danger is **not** that the lightning will strike the aerial and then set fire to the house; if lightning strikes an aerial it burns up the wire before it gets to the ground—but the static charges coming from flashes of lightning some distance away are liable to do some harm if not provided for by a grounding switch or protector of some kind.

Any good lightning protector, approved by the Underwriters will serve, and an aerial so protected actually makes the house more safe than when there is no aerial. If a counterpoise is used, it should be protected in the same way as the aerial.

Radio Batteries

BATTERIES are used in radio to operate the vacuum tubes. These batteries serve three different purposes, and are named, for convenience, "A", "B", and "C" batteries.

The "A" Battery is used to heat the filaments of the tubes. The exact type of battery needed depends on the tubes used. Storage battery tubes UV-200, C-300, UV-201-A, C-301-A, and a few others require a six volt storage battery for best results. The storage battery must be re-charged from time to time, as it runs down, and distilled water should be added every few weeks, just as in the case of the automobile storage battery.

The most popular vacuum tubes, however, use dry cells, and no storage battery is necessary. These tubes include the WD-11, WD-12, C-11, C-12, UV-199, C-299, and others. The WD-11, WD-12, C-11, and C-12, will operate on one dry cell per tube. In a two tube set, two dry cells, connected in parallel, would be used. The 199 and 299 tubes require three

dry cells in series, and four or five tubes, can be operated for a considerable time from three such cells.

Of course dry cells wear out in course of time, and have to be replaced. When the filaments of the tubes will no longer light up to normal brilliance, it is a pretty good sign that the "A" battery needs replacing. An accurate test can be made with a good voltmeter. With all tubes turned on, test the voltage across the terminals of the battery. In the case of the cells in parallel, this voltage should be nearly 1½; in the case of three cells in series, the voltage should be between 4 and 4½. The voltmeter test is, however, scarcely necessary, as the color of the filament will tell the practiced operator whether or not his batteries are in good shape.

The "B" Battery has no connection with the lighting of the filament. It serves only as a local battery, to add strength to the incoming currents. The incoming wave, by acting on the grid of the tube, serves as a "trigger," to release some of the energy in the B battery, resulting in a magnified current in the output circuit. The detector requires one block of B battery, or 22½ volts, approximately, while the amplifier tubes take anything from 45 volts to 110 or more, depending on conditions. It is frequently advisable to test the B battery with a voltmeter (never with an ammeter). Each 22½ volt block should test 17 volts or more. A new "22½ volt" battery should test 21½ or more, and when the voltage is down to 17, the battery is about ready for discard.

The "C" Battery is found only in sets having amplifier tubes. Its purpose is to give louder signals, and permit the use of high B voltages. The "C" battery is usually about 1½ volts when 67½ volts B is used, and from 3 to 6 volts when 90 to 110 volts B is used. The "C" battery can be tested by a voltmeter, and should be discarded when its voltage has dropped about 20% or 25%.

Vacuum Tubes

THE vacuum tube is the very heart of a modern radio set. It is used in transmitting stations as well as in receiving sets. In the home radio set vacuum tubes are used for two purposes; as detectors, and as amplifiers. The detector serves to change the character of the waves into electrical impulses which will operate the "phones." When used as an amplifier, the vacuum tube either strengthens this phone current so that it will operate a loud speaker, (audio frequency amplifier) or it builds up weak incoming waves to a point where they will operate the detector (radio frequency amplifier). As mentioned before, all sets use a detector, many use both detector and audio frequency amplifiers, and some use radio frequency amplifiers as well.

The vacuum tube consists of three essential parts, enclosed in a glass envelope, from which the air has been exhausted. In the center is the **filament,** which is heated to a point near incandescence by the "A" battery. Next to the filament is the **grid,** a metal ladder or screen, and on the other side of the grid is the **plate,** a square or tubular piece of metal.

The heated filament gives off electrically charged particles of matter, which fly past the grid, to the plate. The incoming current, which is impressed on the grid, causes that element to regulate the flow of current from the filament to the plate, so that the tube may serve as a relay or amplifier. A weak current entering at the grid, is increased by the local current emanating from the hot filament, so that the current leaving the plate is a **magnified duplicate** of the current that entered by way of the grid. This is the function of amplification. The detecting of the wave, or making it change to such a form as will operate the phones, is also done by means of the grid electrode, which modifies the current passing through the tube. The four prongs at the base of the tube are the terminals of the enclosed elements; two for the filament, and one each for grid and plate. The prongs should be kept clean, to assure good contact with the socket.

Tuning Units

THE radio set is adjusted or "tuned" to any particular station by means of **condensers** and **coils** (of insulated wire). In order to make the range of tuning continuously variable, so as to include the greatest number of stations, either or both the coils and condensers are variable in capacity. That is, the tuning unit may be made up of fixed coils and variable condensers, or fixed condensers and variable coils, or variable condensers and variable coils. Any or all of these combinations may be found in a set.

Variability in a tuning coil is commonly secured in one of two ways; taps are taken off from the coil at regular intervals, and so connected that by means of a switch any desired number of turns can be secured. Or the tuning coil may consist of two identical coils, one of which rotates within, or in close proximity to the other. This combination is called a variometer. When the movable coil is parallel to the other, in one position the tuning value is maximum, while a half turn reduces the tuning value to approximately zero.

A condenser is made up of sheets of conducting material, separated from each other by some insulator. In the case of fixed condensers, it is common to have copper foil conductors, and sheet mica insulators. A variable condenser, due to mechanical requirements, is somewhat different. The plates are semicircular in shape, and are made of aluminum or brass. The insulator is air, and the movable plates are so mounted as to permit them to "sandwich" between the stationary plates without touching. One connection is made to each set of plates. A tuning coil should show a continuous electrical circuit from one terminal to the other; a condenser should show no circuit, or "open circuit." To preserve the good operation of a variable condenser, frequently remove the dust from the plates, so that there will be no danger of the metal particles or moisture in the dust accidentally making a conductive path between the rotating and stationary plates. A pipe cleaner can be used advantageously in cleaning.

Locating and Eliminating Trouble

WHEN your set doesn't work, or does not work right, remember that the trouble is pretty sure to be due to some mistake of your own. Every manufactured set is tested at the factory, and most dealers test sets a second time; so before you call on the dealer for help, first make sure that you have not done something wrong. Look over the instructions that came with the set, make sure that you are right, and then refer to the instructions which follow here. In nine cases out of ten you will be able to correct the trouble without help.

A radio set, like any other piece of fine electrical or mechanical apparatus, is a delicate and sensitive instrument, and must be treated as such. Certain troubles are bound to occur if proper attention is not given to it, or if instructions are not followed. The following pages give a fairly complete list of the evidences that your set is not working properly, with instructions for locating and remedying the trouble. If something "goes wrong" with your set, always remember that it may be your own fault, and make sure that you are right before you complain to the dealer from whom you bought your set. You wouldn't expect your car to run without gasoline; don't expect your radio to work if the battery is dead or if your aerial has fallen to the ground. Note that the instructions which follow apply to both home made and factory-built sets. Where mention is made that the trouble may be due to faulty design, this will probably refer only to home made sets. However, such things as loose wires, faulty connections in socket, too much "B" battery, etc., may refer equally to home made and manufactured sets.

Troubles Outside of the Set

Troubles that are not in the set or batteries, are usually in the aerial or of the local disturbance type. The quickest way to make sure that a disturbing noise is not in the set is to remove the aerial wire from the set; then if the noise stops you can be sure that it was caused by the aerial rubbing against some obstruction, or by static or some local electrical disturbance. Static can not be eliminated, for it is essentially identical to the very impulses your set was meant to receive. Buzzing, humming sounds, which disappear when the aerial connection is removed, may be due to battery chargers in the neighborhood, defective electric lighting transformers, arc lights, telephone exchanges, power houses, X-Ray machines, and the like. The best remedy for these is to ask the people controlling the interfering elements to "desist or repair."

Troubles in Set or Installation

Tubes do not light. This may be caused by: dead "A" battery, defective rheostat, dirty or poor contact on socket or tube prongs, burnt out tubes, broken wire from "A" battery to set, broken or disconnected wire inside of set, "A" battery connected wrong, so that cells oppose each other, or in parallel when connection should be series.

Tubes light, but no sound in phones or loud speaker. Dead "B" battery, "B" battery reversed (negative terminal where positive should be connected), "B" batteries connected together wrong, poor contact in tube socket at plate or grid terminal, broken phone or loud speaker cord, tubes paralyzed from too much "B" battery, short circuit in phone condenser, broken wire in phone circuit, amplifying transformer, phones or loud speaker.

Signals good in detector circuit, weak in amplifier. "A" battery in poor condition, transformer reversed or burned out, poor contact in amplifier sockets, section of "B" battery dead, "A" battery polarity reversed. "C" battery reversed or disconnected, moisture in transformers, condenser across transformer short-circuited, defective amplifier tube, defective jacks or plugs.

Signals in detector weak, amplifier O. K. Batteries run down, phone condenser short circuited, "A" battery reversed, defective tuner, too much or too little grid leak, poor grid connection on socket, aerial or ground disconnected, aerial grounded outside, too much or not enough "B" battery on detector, moisture in coils, dirty variable condenser, short circuited aerial protector.

Signals clear in detector, distorted in amplifier. Too little "B" battery on amplifier, too much "B" battery without "C" battery to prevent distortion, broken wire in amplifying transformer, poor contact in socket, disconnected or broken wire leading to transformer, transformers too close together, too many stages of amplification, transformers have too high step-up ratio, signals too loud for tubes, transformers need grid leak or condenser across secondaries, connections to transformers reversed.

Knocking, scraping, scratching, popping sounds, effected by tuning. Dust between plates of variable condenser, fingers of operator touching set-screw on dial, or other metal, too much "B" battery on detector, too much wire in tickler coil or radio frequency transformer, too much "A" battery current, poor contact in rheostat, not enough grid leak.

Same as above, but not effected by tuning. Poor connection to aerial or ground, aerial rubbing against grounded object, loose contact in set, dirty variable condenser, defective detector circuit jack, tubes burning too bright, transformer burned out, not enough grid leak, transformers need grid leak or condenser across secondaries.

Howls, hisses, squeals, whistles, effected by tuning. Too much "B" battery on detector, too much wire in tickler or radio frequency transformer, too much filament current, tickler advanced too far, improper resistance in grid leak, near-by regenerative sets improperly operated, aerial or ground disconnected, poor ground, broken wire in tuning coil, lack of shielding (in case of R. F. or regenerative set).

Same as above, not effected by tuning. Too much filament current, too much "B" battery, short circuited grid condenser, improper resistance of grid leak, poor contact in socket, local regenerative sets interfering, transformers too close together, transformers with too high step-up ratio, wiring in set bunched together too much, too many stages of amplification,

primary of transformer connections reversed, transformers need condenser or leak across secondaries.

Unsteady, wavering signals. Leakage in aerial, due to swinging against other objects, sooty insulators, batteries run down, loose bearings in coils or condensers, tickler advanced too far, no grid leak, local regenerative receiver interfering.

Simple Repairs

WHEN you have located a source of trouble, by referring to the trouble-finding guide just given, the following instructions will tell you how to make most repairs yourself. You should have an electric soldering iron, small screw driver, tweezers, and wire cutters. With these tools, you can make most radio repairs.

PHONES OR LOUD SPEAKER. To find out if the phones or loud speaker are in working order, hold one cord terminal on one binding post of a single dry cell, while you touch the other cord terminal on the remaining binding post. A loud click shows that all is well. If no sound is made, the trouble may be either in the cord or in the instrument itself. Unscrew the cap of the phone or speaker, and apply the battery current to the binding posts inside the instrument. A click shows the instrument to be all right, which definitely locates the trouble in the cord. It is best to get a new one, as a worn out cord is like a rotten inner tube, ready to give trouble again at any time. If the phone still fails to respond, look for broken wires, solder them together, and drop a trace of shellac on the joint. If nothing wrong can be seen, take the instrument to a repair shop.

TUBES. A tube which has become paralized from too much "B" battery can usually be restored to working order by disconnecting the "B" battery entirely and lighting the filament for about 20 minutes. If the filament is burned out, there is nothing to do but get a new tube.

LOOSE OR BROKEN WIRES. Broken wires in tuning coils, connections, etc., should be soldered, and the connection wrapped with a layer or two of insulating tape. Wires which are loose under the set-screws, should be clamped down tightly by means of a screw driver.

FIXED CONDENSERS. A fixed condenser is practically impossible to repair. The cost of replacement is slight, and a new one of the proper capacity should be provided. The capacity will be found stamped on most condensers.

VARIABLE CONDENSERS. These sometimes short-circuit due to dust on the plates. Clean the spaces between plates with a pipe cleaner, being careful not to bend the plates. If the rotating plates get out of alignment, so that the whole gang rubs against the stationary plates, use the adjusting screw on the end of the instrument to set them in alignment again. If only one or two plates touch, due to accidental bending, the judicious use of tweezers and screw driver may restore them to position. Poor connections within the condenser may be due to grease or weak spring contacts, or unsoldered or broken flexible contacts.

SOCKETS. The most common trouble with a tube socket is in weak or dirty springs. Polish the springs with sandpaper or a knife edge, and tighten the retaining screws. If any springs have become bent out of shape, bend them back with the tweezers.

RHEOSTATS. Sometimes the rheostat becomes loose, and causes the filament of the tubes to flicker. By means of the set-screw on the rotating arm, re-adjust the arm so that it bears down on the resistance coil with more pressure. In some rheostats there is a metal strip under the rotating collar, which should make contact with the collar. If the spring in this strip is weak, remove the collar and bend up the connecting strip; then replace the collar. This will put most any wire rheostat into working order.

LOOSE DIALS. Dials are held on by a set screw or clutch. Tighten the set screw, and if the threads are stripped, take out the screw, insert a tiny cylinder made by rolling a piece of paper, and again insert the screw, using only as much pressure as is needed to hold the dial.

BURNED-OUT TRANSFORMERS usually can not be repaired. It is so hopeless a task that you run little risk of further damage in opening the instrument yourself and searching for broken wires to solder. In most cases a burned out transformer is ready for discard.

LOOSE TUBE PRONGS AND BASES do no harm if not irritated by constant handling and twisting. The glass envelope is sealed independent of the base, and a loose base in no way affects the vacuum. The best course is to put the tube into the socket, and leave it there for the rest of its period of service.

JACKS. The usual trouble that comes to radio jacks is the weakening of the springs, which are, of course, the heart of the instrument. The only practical repair is to disconnect the wires from the back, by means of a soldering iron, completely take down the jack, bend the springs into shape, file lightly the contacts, and re-assemble. Don't push in the plug farther than necessary, and you will have no jack trouble.

DUST AND MOISTURE. These are the worst enemies of the radio set. Keep the cover of your set closed as much as possible, and keep it away from moist air currents. Dust contains much mineral matter, which causes leakage of the currents that should go to your phones. Frequently dust off the coils and other parts, and keep the set in a dry place.

Common Questions and Answers

Q. If a three-tube set will receive 1,500 miles, why won't a six or eight tube set receive 3,000 or 4,000 miles?

A. Because the sensitivity of a receiving set is not the only factor that determines receiving range. If a broadcasting station can only send radio impulses to a distance of 1,000 miles, under normal conditions, it stands to reason that no receiving set will pick up the messages from that station at a distance of 1,500 miles, because (in a practical sense) the signals will not be there to pick up at that distance. **By increasing the sensitivity of a set to weak signals, you are at the same time increasing its sensitivity to static impulses.** There is a certain "threshold point" where statie will drown signals completely, and any signals which are weaker than those which can barely be heard, will be lost in the static noise. Conceive of a gasoline tractor which would climb a 50% grade. Could you, by increasing the power of the machine, induce it to climb a vertical surface? The answer is obvious; on such a grade there would be no traction, nothing for the wheels to grip, and the increase in power would count for nothing. Too many persons look upon receiving range as merely a matter of getting an infinitely sensitive set, without considering that to get unlimited range they must first develop a transmitter with unlimited range, and reduce static and interference to zero; an impossibility.

Q. If I get good results with a 60 foot aerial, why won't I get better results by adding more wires, and making them longer?

A. Because there is a certain aerial that is best for your set. A shorter or a longer aerial will result in diminished sensitivity. Too long an aerial will absolutely prevent your receiving radio signals at all. Remember the story of the lady who had a mania for patent medicines? She acted on the supposition that "if a little's good, more's better," and took four times the prescribed dose. The analogy is evident.

Q. If my set works well with 22½ volts "B" battery on the detector, as the instructions said, why not use a stronger battery, and get better results?

A. See answer above. The same reasoning applies to batteries.

Q. If I buy a set today, isn't it liable to be obsolete within a year?

A. Although refinements in radio are constantly being made, no set built in the past ten years has become really obsolete. The underlying principles of radio do not change, and a set that does satisfactory service today, will perform just as well a year from today. Changes that are being made from day to day are concerned more with the cabinet work, and attractive workmanship of a set rather than with radical developments in design and principle. Take, for instance, the Superhetrodyne, which is frequently referred to as the latest development. This set has been in use by advanced amateurs for six or seven years. It has only sprung into popularity recently because people have become convinced of the permanency of radio, and are willing

to pay for higher priced sets. When radio was considered as a fad, buyers hesitated to spend as much money on a radio set as they would on a phonograph. Now that radio is established as an institution, and there is a market for high priced sets, the principles which have been known for years are finding expression in the production for the market.

Q. My set has a range of 200 to 600 meters wave length. How far does that mean it will receive?

A. The term "wave-length" or "wave-frequency" has no direct relation to the sending power or range of a sending set, nor does it refer to the distance from which you can receive with a given receiving set. To say that a station is sending at 417 meters wave length is comparable to the statement that a violin string is tuned to "G" of the pianoforte. A low power radio transmitter with a maximum range of ten miles might be tuned to 417 meters, while another transmitter with a range of 1,000 miles could use the same wave length. Likewise, the violin string at "G" might be heard from a distance of 200 feet; a steam whistle also pitched at "G" might be audible from two miles away. The question "How far will that set receive?" is seldom answered in an intelligent manner. Probably this is because the question itself is somewhat ambiguous. It amounts to saying: "How far can you hear the tone of middle C?" The answer to the latter is of course that it depends on the volume of that tone at its source; whether the tone is emitted by a steam whistle or a child's mouth organ; whether the sound originated in a valley or from a hill top; whether the listener was on a country prairie or in the midst of city traffic noises; whether the air was rare or dense, humid or dry. A rather mediocre receiving set may bring in signals from a 1,000 watt broadcasting station 800 miles away; but a receiving set that will record the signals from a "10 watter" 100 miles away will have accomplished a much greater feat.

Radiophone Broadcasting Stations With Operator and Wave Length

UNITED STATES STATIONS

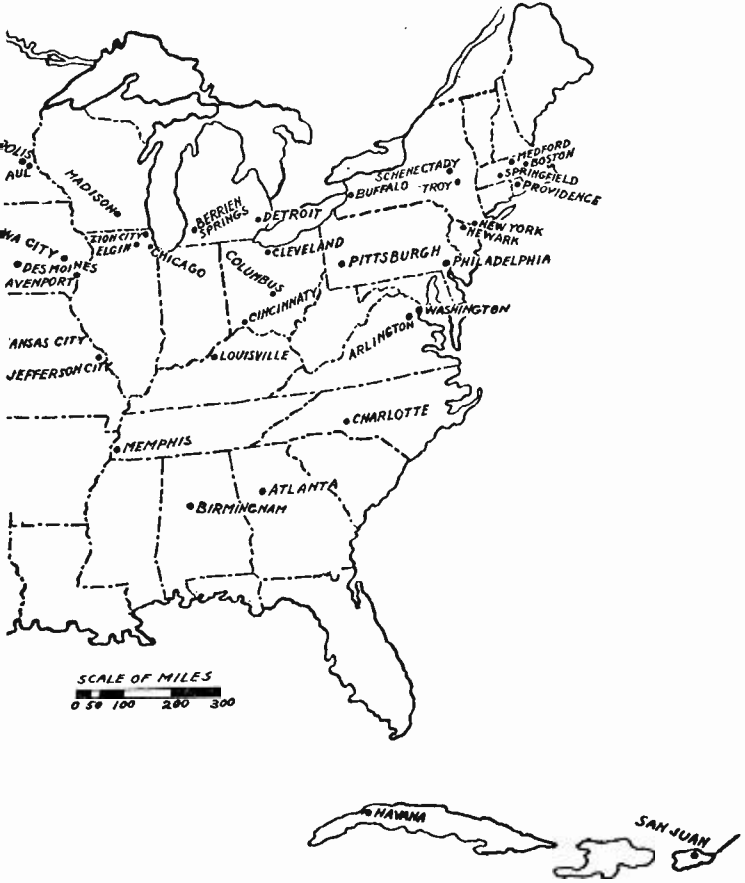
Call	Operator	City	Wave Length Meters
AA3	Fitzsimmons General Hospital, U. S. A.	Denver, Colo.	440
AQ6	135th Field Artillery, O. N. G.	Canton, Ohio	425
AT9	U. S. Field Artillery	Fort Bragg, N. C.	345
AV7	6th Inf. Minn. Nat'l Guard	St. Paul, Minn.	400
AW5	McCook Field, U. S. A.	Dayton, Ohio	
KDBG	Thos. H. Ince Studios	Culver City, Calif.	146
KDKA	Westinghouse Elec. & Mfg. Co.	E. Pittsburgh, Pa.	309
KDPM	Westinghouse Elec. & Mfg. Co.	Cleveland, O.	270
KDPT	Southern Electric Co.	San Diego, Calif.	244
KDYL	Newhouse Hotel	Salt Lake City, Utah	360
KDYM	Savoy Theater	San Diego, Calif.	280
KDYQ	Oregon Institute of Technology	Portland, Ore.	360
KDZB	Frank E. Siefert	Bakersfield, Calif.	240
KFAB	Nebraska Buick Auto Co.	Lincoln, Nebr.	240
KFAD	McArthur Bros. Mercantile Co.	Phoenix, Ariz.	360
KFAE	State College of Washington	Pullman, Wash.	330
KFAF	Western Radio Corp.	Denver, Colo.	360
KFAJ	University of Colorado	Boulder, Colo.	360
KFAR	Studio Lighting Service Co.	Hollywood, Calif.	280
KFAU	Boise H. S.	Boise, Idaho	270
KFAW	The Radio Den	Santa Ana, Calif.	280
KFBB	F. A. Buttrey & Co.	Havre, Mont.	360
KFBC	W. K. Azvill	San Diego, Calif.	278
KFBG	First Presbyterian Church	Tacoma, Wash.	360
KFBK	Kimball-Upson Co.	Sacramento, Calif.	283
KFBL	Leese Bros.	Everett, Wash.	224
KFBU	The Cathedral	Laramie, Wyo.	283
KFCB	Nielsen Radio Supply Co.	Phoenix, Ariz.	278
KFCC	First Congregational Church	Helena, Mont.	248
KFCF	Frank A. Moore	Walla Walla, Wash.	360
KFCL	Leslie E. Rice	Los Angeles, Calif.	236
KFCP	Ralph W. Flygars	Ogden, Utah	360
KFCV	Fred Mahaffey, Jr.	Houston, Tex.	360
KFCZ	Omaha Central High School	Omaha, Nebr.	258
KFDD	St. Michael's Cathedral	Boise, Idaho	252
KFDH	University of Arizona	Tuscon, Ariz.	268
KFDJ	Oregon Agricultural College	Corvallis, Ore.	360
KFDL	Knight Campbell Music Co.	Denver, Colo.	226
KFDN	Magnolia Petroleum Co.	Beaumont, Texas	315.6
KFDX	First Baptist Church	Shreveport, La.	360
KFDY	South Dakota State College	Brookings, S. Dak.	360
KFDZ	Harry Q. Iverson	Minneapolis, Minn.	231
KFEC	Meier & Frank Co.	Portland, Ore.	248
KFEL	Winner Radio Corporation	Denver, Colo.	254
KFEQ	J. L. Scroggin	Oak, Nebr.	268
KFER	Auto Electric Service Co.	Fort Dodge, Iowa	231
KFEV	Felix Thompson Radio Shop	Casper, Wyo.	263
KFEX	Augsburg Seminary	Minneapolis, Minn.	261
KFEY	Bunker Hill & Sullivan Mining & Concentrating Co.	Kellogg, Idaho	360

Call	Operator	City	Wave Length Meters
KFEZ	Associated Engineering Societies of St. Louis	St. Louis, Mo.	248
KFFP	First Baptist Church	Moberly, Mo.	266
KFFR	Nevada State Journal	Sparks, Nev.	226
KFFV	Graceland College	Lamoni, Iowa	280
KFFY	Pineus & Murphy, Inc.	Alexandria, La.	275
KFGB	Heidbreder Radio Supply Co.	Utica, Nebr.	224
KFGC	Louisiana State University	Baton Rouge, La.	254
KFGD	Chickasha Radio & Elec. Co.	Chickasha, Okla.	248
KFGH	Leland Stanford Junior University	Stanford Univ., Calif.	273
KFGQ	Crary Hardware Co	Boone, Iowa	226
KFGX	First Presbyterian Church	Orange, Tex.	250
KFGZ	Emmanuel Missionary College	Berrien Springs, Mich.	286
KFHA	Western State College of Colo	Gunnison, Colo.	252
KFHL	Penn College	Oskaloosa, Iowa	240
KFHR	Star Electric & Radio Co	Seattle, Wash.	263
KFI	Earle C Anthony (Inc)	Los Angeles, Calif.	469
KFIF	Benson Polytechnic Institute	Portland, Ore.	360
KFIO	North Central High School	Spokane, Wash.	252
KFIQ	Yakima Valley Radio Boradcasting Association	Yakima, Wash.	242
KFIU	Alaska Elec Light & Power Co	Juneau, Alaska	226
KFIX	Reorganized Church of Jesus Christ of Latter Day Saints	Independence, Mo	240
KFIZ	Daily Commonwealth and Oscar A Huelsman	Fond-du-Lac, Wis.	273
KFJB	Marshall Electric Co.	Marshalltown, Iowa	248
KFJF	National Radio Mfg. Co.	Oklahoma City, Okla.	252
KFJI	Liberty Theater	Astoria, Ore.	252
KFJK	Delano Radio & Electric Co.	Bristow. Okla.	233
KFJM	University of North Dakota	Grand Forks, N D.	280
KFJR	Ashley C. Dixon & Son	Stevensville, Mont.	258
KFJX	Iowa State Teachers College	Cedar Falls, Iowa	280
KFJY	Tunwall Radio Co.	Fort Dodge, Iowa	246
KFJZ	Texas Nat'l Guard, 112 Cav.	Fort Worth, Tex.	240
KFKA	Colorado State Teachers' Coll.	Greeley, Colo.	273
KFKB	Brinkley-Jones Hospital Assn.	Milford, Kans.	286
KFKQ	Conway Radio Laboratories	Conway, Ark.	250
KFKU	University of Kansas	Lawrence, Kansas	275
KFKV	F. F. Gray	Butte, Mont.	283
KFKX	Westinghouse Elec & Mfg. Co.	Hastings, Nebr.	341
KFLA	Abner R. Wilson	Butte, Mont.	254.1
KFLE	National Education Service	Denver, Colo.	268
KFLQ	Bizzell Radio Shop	Little Rock, Ark.	261
KFLR	Univ. of New Mexico	Albuquerque, N. M.	254
KFLU	Rio Grande Radio Supply House	San Benito, Tex.	236
KFLV	A. T. Frykman	Rockford, Ill.	229
KFLX	George R. Clough	Galveston, Tex.	240
KFLZ	Atlantic Automobile Co.	Atlantic, Iowa	273
KFMB	Christian Churches of Little Rock	Little Rock, Ark	254
KFMQ	University of Arkansas	Fayetteville, Ark.	263
KFMR	Morningside College	Sioux City, Iowa	261
KFMT	George W. Young	Minneapolis, Minn.	231
KFMW	M. G. Satern	Houghton, Mich.	266
KFMX	Carleton College	Northfield, Minn.	337
KFNF	Henry Field Seed Co.	Shenandoah, Iowa	266
KFNG	Wooten's Radio Shop	Coldwater, Miss.	254
KFNJ	Warrensburg Electric Shop	Warrensburg, Mo.	234
KFNL	Radio Broadcast Assn	Paso Robles, Calif.	240
KFNV	L. A. Drake	Santa Rosa, Calif.	234
KFNY	Montana Phonograph Co.	Helena, Mont.	261

Call	Operator	City	Wave Length Meters
KFNZ	Royal Radio Co.	Burlingame, Calif.	231
KFOA	Rhodes Co.	Seattle, Wash.	455
KFOC	First Christian Church	Whittier, Calif.	236
KFOD	The Radio Shop	Wallace, Idaho	224
KFOJ	Moberly High School Radio Club	Moberly, Mo.	246
KFOL	Leslie M. Schalbuch	Marengo, Iowa	234
KFON	Echophone Radio Shop	Long Beach, Calif.	234
KFOO	Latter Day Saints University	Salt Lake City, Utah	261
KFOR	David City Tire & Elect. Co.	David City, Nebr.	226
KFOT	College Hill Methodist Church	Wichita, Kans.	231
KFOU	Hommel Mfg. Co.	Richmond, Calif.	254
KFOX	Board of Ed., Tech. High	Omaha, Nebr.	248
KFOY	Beacon Radio Service	St. Paul, Minn.	226
KFOZ	Leon Hudson Real Estate Co.	Fort Smith, Ark.	233
KFPB	Edwin J. Brown	Seattle, Wash.	224
KFPG	Garretson & Dennis	Los Angeles, Calif.	238
KFPH	Harold Chas. Mailander	Salt Lake City, Utah	242
KFPL	C. C. Baxter	Dublin, Texas	252
KFPM	New Furniture Co.	Greenville, Texas	242
KFPP	G. & G. Radio & Elec. Shop	Olympia, Wash.	236
KFPR	Los Angeles Co. Forestry Dept.	Los Angeles, Calif.	231
KFPT	Cape & Johnson	Salt Lake City, Utah	268
KFPV	Heintz & Kohlmoos, Inc.	San Francisco, Calif.	236
KFPW	St. John M. E. Church	Carterville, Mo.	268
KFPX	First Presbyterian Church	Pine Bluff, Ark.	242
KFPY	Symons Investment Co.	Spokane, Wash.	283
KFQA	The Principia	St. Louis, Mo.	261
KFQB	Searchlight Publishing Co.	Fort Worth, Texas	254
KFQC	Kidd Bros. Radio Shop	Taft, Calif.	227
KFQD	Chovin Supply Co.	Anchorage, Alaska	280
KFQE	Dickenson-Henry Radio Laboratories,	Colorado Springs, Colo.	224
KFQG	Southern Cal. Radio Assn.	Los Angeles, Calif.	226
KFQH	Albert Sherman	Hillsborough, Calif.	231
KFQL	Okla. Free State Fair Assn.	Muskogee, Okla.	252
KFQM	Texas Highway Bulletin	Austin, Texas	268
KFQN	Third Baptist Church	Portland, Ore.	283
KFQP	George F. Carson, Jr.	Iowa City, Iowa	224
KFQR	Walter LaFayette Ellis	Oklahoma City, Okla.	250
KFQT	Texas National Guard	Dennison, Texas	252
KFQU	W. Riker	Holy City, Calif.	234
KFQW	The Photo, Radio & Elec. Shop	North Bend, Wash.	248
KFQX	Alfred M. Hubbard	Seattle, Wash.	233
KFQY	Farmers' State Bank	Belden, Nebr.	273
KFQZ	Taft Radio Co.	Hollywood, Calif.	240
KFRA	Marvin S. Olson	Carver, Minn.	240
KFRB	Hall Brothers	Beeville, Texas	248
KFRC	Radiocast Studio	San Francisco, Calif.	280
KFRF	W. R. Brown	Alexandria, La.	242
KFRJ	Guy Simmons, Jr.	Conway, Ark.	250
KFRM	James F. Boland	Fort Sill, Oklahoma	263
KFRN	M. Laurence Short	Hanford, Calif.	224
KFRO	Curtis Printing Co.	Fort Worth, Texas	246
KFRP	Trinity Episcopal Church	Redlands, Calif.	211
KFRQ	Radio Market Service	Portland, Ore.	213
KFRU		Bristow, Okla.	381
KFRW	United Churches of Olympia	Olympia, Washington	220
KFRX	J. Gordon Klemgard	Pullman, Washington	217
KFRY	New Mexico College of Ag. & M. A.	State College, N. M.	266
KFRZ	The Electric Shop	Hartington, Nebr.	222

Call	Operator	City	Wave Length Meters
KFSG	Echo Pk. Evangelistic Assn.	Los Angeles, Calif.	278
KFSY	The Van Blaricom Co.	Helena, Mont.	261
KFUJ	Hoppert Plum. & Htg. Co.	Breckenridge, Minn.	242
KFUL	Thos. Goggan & Bros.	Galveston, Texas	258
KFUM	W. D. Corley	Colorado Springs, Colo.	242
KFUO	Concordia Theological Sem.	St. Louis, Mo.	549.1
KGB	Tacoma Daily Ledger	Tacoma, Wash.	252
KGO	General Electric Co.	Oakland, Calif.	312
KGU	Marion A. Mulrony	Honolulu, Hawaii	360
KGW	Portland Morning Oregonian	Portland, Ore.	492
KGY	St. Martins College	Lacey, Wash.	258
KHJ	Times-Mirror Co.	Los Angeles, Calif.	395
KHQ	Louis Wasmer	Seattle, Wash.	360
KIAF	Steele Co.	Siihtipoc, Minn.	421
KJQ	C. O. Gould	Stockton, Calif.	273
KJR	Northwest Radio Service Co.	Seattle, Wash.	283
KLS	Warner Bros. Radio Supplies Co.	Oakland, Calif.	360
KLX	Tribune Publishing Co.	Oakland, Calif.	509
KLZ	Reynolds Radio Co.	Denver, Colo.	283
KMJ	San Joaquin Light & Power Corp.	Fresno, Calif.	248
KMO	Love Electric Co.	Tacoma, Wash.	360
KNT	Walter Hemrich	Kukak Bay, Alaska	263
KNX	Electric Lighting Supply Co.	Los Angeles, Calif.	360
KOA	General Elec. Co.	Denver, Colo.	323
KOB	New Mexico College of Agriculture & Mechanic Arts,	State College, N. Mex.	360
KOP	Detroit Police Department	Detroit, Mich.	286
KPO	Hale Bros.	San Francisco, Calif.	423
KQV	Doubleday-Hill Electric Co.	Pittsburgh, Pa.	270
KQW	Charles D. Herrold	San Jose, Calif.	360
KRE	Berkeley Daily Gazette	Berkeley, Calif.	275
KSD	Post-Dispatch	St. Louis, Mo.	549.1
KTHS	New Arlington Hotel	Hot Springs, Arkansas	375
KTW	First Presbyterian Church	Seattle, Wash.	360
KUO	Examiner Printing Co.	San Francisco, Calif.	360
KWG	Portable Wireless Telephone Co.	Stockton, Calif.	360
KWH	Los Angeles Examiner	Los Angeles, Calif.	360
KYQ	The Electric Shop	Honolulu, Hawaii	270
KYW	Westinghouse Electric & Mfg. Co.	Chicago, Ill.	535.4
KZM	Preston D. Allen	Oakland, Calif.	360
NAA	United States Navy Dept.	Radio, Va.	435
WAAB	Valdemar Jensen	New Orleans, La.	268
WAAC	Tulane University	New Orleans, La.	360
WAAD	Ohio Mechanics Institute	Cincinnati, Ohio	360
WAAF	Chicago Daily Drovers Journal	Chicago, Ill.	286
WAAM	I. R. Nelson Co.	Newark, N. J.	263
WAAN	University of Missouri	Columbia, Mo.	254
WAAW	Omaha Grain Exchange	Omaha, Nebr.	286
WABA	Lake Forest University	Lake Forest, Ill.	227
WABB	Harrisburg Sporting Goods Co.	Harrisburg, Pa.	266
WABD	Parker High School	Dayton, Ohio	283
WABH	Lake Shore Tire Co.	Sandusky, Ohio	240
WABI	Bangor Railway & Electric Co.	Bangor, Me.	240
WABL	Connecticut Agricultural College	Storrs, Conn.	283
WABM	F. A. Doherty Automotive & Radio Equipment Co.,	Saginaw, Mich.	254
WABN	Ott Radio ,Inc.	La Crosse, Wis.	244
WABO	Lake Avenue Baptist Church	Rochester, N. Y.	283
WABQ	Haverford College Radio Club	Haverford, Pa.	261
WABR	Scott High School	Toledo, Ohio	270

UNITED STATES
LOCATIONS OF BROADCASTING STATIONS
WITH RANGE OF 1000 MILES OR MORE
UNDER GOOD WEATHER CONDITIONS


MADISON
BERRIEN SPRINGS
DETROIT
SCHENECTADY
BUFFALO
TROY
MEDFORD
BOSTON
SPRINGFIELD
PROVIDENCE
NEW YORK
NEWARK
ZION CITY
ELGIN
CHICAGO
CLEVELAND
PITTSBURGH
PHILADELPHIA
DES MOINES
COLUMBUS
CINCINNATI
WASHINGTON
LOUISVILLE
ARLINGTON
JEFFERSON CITY
CHARLOTTE
MEMPHIS
ATLANTA
BIRMINGHAM
SCALE OF MILES
0 50 100 200 300
HAVANA
SAN JUAN

Call	Operator	City	Wave Length Meters
WABT	Holliday-Hall Radio Engineers	Washington, Pa.	252
WABU	Victor Talking Machine Co.	Camden, N. J.	226
WABW	College of Wooster	Wooster, Ohio	234
WABX	Henry B. Joy	Mount Clemens, Mich.	270
WABY	John Magaldi, Jr.	Philadelphia, Pa.	242
WABZ	Coliseum Place Bapt. Church	New Orleans, La.	263
WAHG	A. H. Grebe & Co.	Richmond Hill, N. Y.	316
WAR	Kopp Radio Co.	Sisiht, Wisc.	406
WBAA	Purdue University	West Lafayette, Ind.	283
WBAK	Pennsylvania State Police	Harrisburr, Pa.	400
WBAN	Wireless Phone Corporation	Paterson, N. J.	244
WBAO	James Millikin University	Decatur, Ill.	360
WBAP	Wortham-Carter Publ Co. (Star Telegram),	Fort Worth, Texas	472.9
WBAV	Erner & Hopkins Co.	Columbus, Ohio	393.9
WBAX	John H. Stenger, Jr.	Wilkes-Barre, Pa.	360
WBAY	Am. Tel. & Tel. Co.	New York, N. Y.	492
WBBB	Plymouth Congregational Church	Newark, Ohio	240
WBBD	Barbey Battery Service	Reading, Pa.	234
WBBF	Georgia School of Technology	Atlanta, Ga.	270
WBBG	Irving Vermilya	Mattapoisett, Mass.	248
WBBH	J. Irving Bell	Port Huron, Mich.	246
WBBJ	Neel Electric Co.	West Palm Beach, Florida	258
WBBL	Grace Covenant Church	Richmond, Va.	283
WBBM	H. Leslie Atlass	Chicago, Illinois	226
WBBP	Petoskey High School	Petoskey, Mich.	246
WBBR	Peoples Pulpit Association	Rossville, N. Y.	273
WBBS	First Baptist Church	New Orleans, La.	252
WBBT	Lloyd Bros.	Philadelphia, Pa.	234
WBBU	Jenks Motor Sales Co.	Monmouth, Ill.	224
WBBV	Johnstown Radio Co.	Johnstown, Pa.	243
WBBW	Ruffner Junior High School	Norfolk, Va.	222
WBBY	Washington Light Infantry	Charleston, S. C.	268
WBBZ	Noble S. Watson	Indianapolis, Ind.	227
WBCN	Southtown Economist	Chicago, Ill.	266
WBR	Pennsylvania State Police	Butler, Pa.	159
WBS	D. W. May (Inc.)	Newark, N. J.	360
WBT	Southern Radio Corporation	Charlotte, N. C.	360
WBZ	Westinghouse Elec. & Mfg. Co.	Springfield, Mass.	337
WCAD	St. Lawrence University	Canton, N. Y.	280
WCAE	Kaufmann & Bauer Co.	Pittsburgh, Pa	462
WCAG	Clyde R. Randall	New Orleans, La.	268
WCAH	Entrekin Electric Co.	Columbus, Ohio	286
WCAJ	Nebraska Wesleyan University	University Place, Nebr.	283
WCAL	St. Olaf College	Northfield, Minn.	360
WCAO	Sanders & Stayman Co.	Baltimore, Md.	360
WCAP	Chesapeake & Potomac Tel. Co.	Washington, D. C.	469
WCAR	Southern Radio Corp. of Texas	San Antonio, Tex.	360
WCAT	South Dakota State School of Mines	Rapid City, S. Dak.	240
WCAU	Durham & Co.	Philadelphia, Pa.	286
WCAV	J. C. Dice Electric Co.	Little Rock, Ark.	360
WCAY	Milwaukee Civic Broadcasting Station	Milwaukee, Wis.	266
WCAZ	Carthage College	Carthage, Ill.	246
WCBA	Charles W. Heimbach	Allentown, Pa.	280
WCBC	University of Michigan	Ann Arbor, Mich.	280
WCBD	Wilbur G. Voliva	Zion, Ill.	345
WCBE	Uhalt Radio Co.	New Orleans, La.	263
WCBG	Howard S. Williams	Pascagoula, Miss.	268
WCBH	University of Mississippi	Oxford, Miss.	242
WCBJ	J. C. Mans	Jennings, La.	244

Call	Operator	City	Wave Length Meters
WCBK	E. Richard Hull	St. Petersburg, Fla.	255
WCBL	Northern Radio Mfg. Co.	Houlton, Me.	280
WCBM	Charles Schwarz	Baltimore, Md.	360
WCBO	The Radio Shop, Inc.	Memphis, Tenn.	250
WCBQ	First Baptist Church	Nashville, Tenn.	236
WCBR	Chas. H. Messter	Providence, R. I.	246
WCBT	Clark University	Worcester, Mass.	238
WCBU	Arnold Wireless Supply Co.	Arnold, Pa.	254
WCBV	Tullahoma Radio Club	Tullahoma, Tenn.	252
WCBW	Maitland Soloman & G. P. Rankin, Jr.	Macon, Ga.	226
WCBX	Radio Shop of Newark	Newark, N. J.	233
WCBY	Forks Elec. Shop	Buck Hill Falls, Pa.	268
WCBZ	Coppotelli Brothers' Music House	Chicago Heights, Ill.	248
WCCO	Washburn Crosby Co.	Minneapolis-St. Paul, Minn.	417
WCEE	Chas. E. Erbstein	Elgin, Ill.	535.4
WCK	Stix-Baer & Fuller Dry Goods Co.	St. Louis, Mo.	360
WCM	Texas Markets & Warehouse Depts.	Austin, Texas	268
WCX	Detroit Free Press	Detroit, Mich.	516
WDAE	Tampa Daily Times	Tampa, Fla.	360
WDAF	Kansas City Star	Kansas City, Mo.	411
WDAG	J. Laurance Martin	Amarillo, Tex.	263
WDAH	Trinity Meth. Church (South)	El Paso, Tex.	268
WDAR	Lit Brothers	Philadelphia, Pa.	395
WDAY	Radio Equipment Corporation	Fargo, N. Dak.	244
WDBB	H. Waite & Co.	Taunton, Mass.	229
WDBC	Kirk, Johnson & Co.	Lancaster, Pa.	258
WDBD	H. E. Burns	Martinsburg, W. Va.	268
WDBF	Robert G. Phillips	Youngstown, Ohio	246
WDBH	C. T. Sherer Co.	Worcester, Mass.	268
WDBI	Radio Specialty Co.	St. Petersburg, Fla.	226-300
WDBJ	Richardson-Wayland Elec. Corp.	Roanoke, Va.	229
WDBN	Maine Elec. Light & Power Co.	Bangor, Me.	254
WDBO	Rollins College, Inc.	Winter Park, Fla.	240
WDBP	Superior State Normal School	Superior, Wis.	
WDBQ	Morton Radio Supply Co.	Salem, N. J.	234
WDBR	Tremont Temple Baptist Church	Boston, Mass.	256
WDBS	S. M. K. Radio Corp.	Dayton, Ohio	283
WDBT	Taylor's Book Store	Hattiesburg, Miss.	236
WDBW	The Radio Den	Columbia, Tenn.	268
WDBX	Otto Baur	New York, N. Y.	233
WDBY	North Shore Cong. Church	Chicago, Ill.	258
WDBZ	Boy Scouts of America	Kingston, N. Y.	233
WDM	Church of the Covenant	Washington, D. C.	234
WDZ	James L. Bush	Tuscola, Ill.	278
WEAA	Frank D. Fallain	Flint, Mich.	250
WEAE	Polytechnic Institute	Blacksburg, Va.	360
WEAF	American Tel. & Tel. Co.	New York, N. Y.	492
WEAH	Wichita Board of Trade	Wichita, Kans.	280
WEAI	Cornell University	Ithaca, N. Y.	286
WEAJ	University of South Dakota	Vermilion, S. Dak.	283
WEAM	Borough of North Plainfield	North Plainfield, N. J.	286
WEAN	Shepard Co.	Providence, R. I.	273
WEAO	Ohio State University	Columbus, Ohio	360
WEAP	Mobile Radio Co.	Mobile, Ala.	360
WEAR	Goodyear Tire & Rubber Co.	Cleveland, Ohio	389.4
WEAU	Davidson Bros. Co.	Sioux City, Iowa	360
WEAY	Iris Theater	Houston, Tex.	360
WEB	Benwood Co.	St. Louis, Mo.	273
WEBA	The Electric Shop	New Brunswick, N. J.	233
WEBC	Walter Cecil Bridges	Superior, Wis.	242

Call	Operator	City	Wave Length Meters
WEBD	Elec. Equipment & Serv. Co.	Anderson, Ind.	246
WEBE	Roy W. Waller	Cambridge, Ohio	248
WEBH	Edgewater Beach Hotel Co.	Chicago, Ill.	360
WEBI	Walter H. Gibbons	Salisbury, Md.	242
WEBJ	Third Ave. Railway Co.	New York, N. Y.	273
WEBK	Grand Rapids Radio Co.	Grand Rapids, Mich.	261
WEBL	Radio Corp. of America	(Portable Station)	226
WEBM	Radio Corp. of America	Portable Station	226
WEBO	Radio Co.	Hamilton, Ohio	250
WEBP	E. Budd Peddicord	New Orleans, La.	242
WEBQ	Tate Radio Co.	Harrisburg, Illinois	226
WEBR	H. H. Howell	Buffalo, N. Y.	240
WEBT	Dayton Coop. Industrial School	Dayton, Ohio	270
WEBW	Beloit College	Beloit, Wisc.	283
WEBX	John E. Cain, Jr.	Nashville, Tenn.	263
WEBY	Hobart Radio Co.	Roslindale, Mass.	266
WEBZ	Savannah Radio Corp.	Savannah, Ga.	280
WEEI	Edison Station	Boston, Mass.	475.9
WEV	Hurlburt-Still Electrical Co.	Houston, Texas	263
WEW	St. Louis University	St. Louis, Mo.	248
WFAA	Dallas News and Dallas Journal	Dallas, Tex.	472.9
WFAM	Times Publishing Co.	St. Cloud, Minn.	273
WFAN	Hutchinson Elec. Serv. Co.	Hutchinson, Minn.	360
WFAV	University of Nebraska	Lincoln, Nebr.	275
WFBB	Eureka College	Eureka, Ill.	240
WFBC	First Baptist Church	Knoxville, Tenn.	250
WFBG	Wm. F. Gable Co.	Altoona, Pa.	261
WFBH	Concourse Radio Corp.	New York, N. Y.	273
WFBI	Galvin Radio Supply Co.	Camden, N. J.	236
WFBJ	St. John's University	Collegeville, Minn.	236
WFBK	Dartmouth College	Hanover, N. H.	256
WFBL	Onondaga Hotel Co.	Syracuse, N. Y.	286
WFBM	Merchants Heat & Light Co.	Indianapolis, Ind.	268
WFBN	Radio Sales & Service Co.	Bridgewater, Mass.	226
WFBQ	Wynne Radio Co.	Raleigh, N. C.	252
WFBR	Fifth Regiment, Md. N. G.	Baltimore, Md.	254
WFBT	Glouster Co. Civic League	Pitman, N. J.	231
WFBY	Signal Officer	Fort Benjamin Harrison, Ind.	258
WFI	Strawbridge & Clothier	Philadelphia, Pa.	395
WGAL	Lancaster Elec. Sup. & Const. Co.	Lancaster, Pa.	248
WGAN	Cecil E. Lloyd	Pensacola, Fla.	360
WGAQ	W. G. Patterson	Shreveport, La.	252
WGAZ	South Bend Tribune	South Bend, Ind.	360
WGBA	Jones Elec. & Radio Mfg. Co.	Baltimore, Md.	254
WGBB	Harry H. Carman	Freeport, N. Y.	244
WGBC	First Baptist Church	Memphis, Tenn.	266
WGBS	Gimbel Bros.	New York, N. Y.	316
WGI	American Radio and Research Corporation,	Medford Hillside, Mass.	360
WGL	Thomas F. J. Howlett	Philadelphia, Pa.	360
WGN	Chicago Radio Laboratory	Chicago, Ill.	448
WGR	Federal Tel. & Tel. Co.	Buffalo, N. Y.	319
WGY	General Electric Co.	Schenectady, N. Y.	380
WHA	University of Wisconsin	Madison, Wis.	535.4
WHAA	State University of Iowa	Iowa City, Iowa	498
WHAD	Marquette University	Milwaukee, Wis.	280
WHAG	University of Cincinnati	Cincinnati, Ohio	222
WHAM	University of Rochester (Eastman School of Music),	Rochester, N. Y.	283
WHAR	Seaside House	Atlantic City, N. J.	275

Call	Operator	City	Wave Length Meters
WHAS	Courier-Journal and Louisville Times	Louisville, Ky.	400
WHAV	Wilmington Elec. Spec. Co.	Wilmington, Del.	360
WHAZ	Rensselaer Polytechnic Institute	Troy, N. Y.	380
WHB	Sweeney School Co.	Kansas City, Mo.	411
WHDI	Wm. Hood Dunwoody Institute	Minneapolis, Minn.	280
WHK	Radiovox Co.	Cleveland, Ohio	283
WHN	Loew's Theater	New York, N. Y.	360
WHO	Bankers Life Co.	Des Moines, Iowa	522.3
WIAC	Galveston, Tribune	Galveston, Tex.	360
WIAD	Howard R. Miller	Philadelphia, Pa.	254
WIAK	Journal-Stockman Co.	Omaha, Nebr.	278
WIAS	Home Electric Co.	Burlington, Iowa	283
WIK	K. & L. Electric Co.	McKeesport, Pa.	234
WIL	Continental Elec. Supply Co.	Washington, D. C.	360
WIP	Gimbel Bros.	Philadelphia, Pa.	509.9
WJAB	American Elec. Co.	Lincoln, Nebr.	229
WJAD	Jackson's Radio Eng'g Laboratories	Waco, Tex.	360
WJAG	Norfolk Daily News	Norfolk, Nebr.	283
WJAM	D. M. Perham	Cedar Rapids, Iowa	268
WJAN	Peoria Star	Peoria, Ill.	280
WJAQ	Capper Publications	Topeka, Kans.	360
WJAR	The Outley Co.	Providence, R. I.	360
WJAS	Pittsburgh Radio Sup. House	Pittsburgh, Pa.	286
WJAX	Union Trust Co.	Cleveland, Ohio	390
WJAZ	Chicago Radio Laboratory	Chicago, Ill.	268
WJD	Denison University	Granville, Ohio	229
WJJD	Mooseheart Radio Station	Mooseheart, Ill.	278
WJY	Radio Corporation of America	New York, N. Y.	405
WJZ	Radio Corporation of America	New York, N. Y.	455
WKAA	H. F. Paar	Cedar Rapids, Iowa	278
WKAD	Charles Looff (Crescent Park)	E. Providence, R. I.	240
WKAF	W. S. Radio Supply Co.	Wichita Falls, Tex.	360
WKAN	United Battery Service Co.	Montgomery, Ala.	226
WKAQ	Radio Corp. of Porto Rico	San Juan, P. R.	360
WKAR	Michigan Agri. College	East Lansing, Mich.	280
WKAV	Laconia Radio Club	Laconia, N. H.	254
WKBF	Dutee W. Flint, Inc.	Providence, R. I.	286
WKY	WKY Radio Shop	Oklahoma, Okla.	360
WLAL	Naylor Electrical Co.	Tulsa, Okla.	360
WLAP	W. V. Jordon	Louisville, Ky.	286
WLAX	Putnam Electric Co.	Greencastle, Ind.	231
WLB	University of Minnesota	Minneapolis, Minn.	360
WLBL	Wisconsin Dept. of Markets	Stevens Point, Wis.	278
WLS	Sears, Roebuck & Co.	Chicago, Ill.	345
WLW	Crosley Manufacturing Co.	Cincinnati, Ohio	423
WMAC	Clive B. Meredith	Cazenovia, N. Y.	261
WMAF	Round Hills Radio Corp.	Dartmouth, Mass.	360
WMAH	General Supply Co.	Lincoln, Nebr.	254
WMAK	Norton Laboratories	Lockport, N. Y.	273
WMAN	First Baptist Church	Columbus, Ohio	260
WMAQ	Chicago Daily News	Chicago, Ill.	448
WMAV	Alabama Polytechnic Institute	Auburn, Ala.	250
WMAY	Kingshighway Presbyterian Church	St. Louis, Mo.	280
WMAZ	Mercer University	Macon, Ga.	261
WMC	Commercial Appeal	Memphis, Tenn.	503.9
WMH	Ainsworth-Gates Radio Co.	Cincinnati, Ohio	325.9
WNAC	Shepard Stores	Boston, Mass.	380.2
WNAD	University of Oklahoma	Norman, Okla.	360
WNAL	R. J. Rockwell	Omaha, Nebr.	266
WNAP	Wittenberg College	Springfield, Ohio	275

Call	Operator	City	Wave Length Meters
WNAR	C. C. Rhodes	Butler, Mo.	231
WNAT	Lenning Brothers Co.	Philadelphia, Pa.	360
WNAW	Henry Kunzman	Box 167, Fort Monroe, Va.	360
WNAX	Dakota Radio Apparatus Co.	Yankton, S. Dak.	244
WNJ	W. A. Bingenheimer	Newark, N. J.	233
WNYC	Municipality of New York	New York City	528.8
WOAC	Page Organ Co. (H. P. Maus)	Lima, Ohio	266
WOAE	Midland College	Fremont, Nebr.	280
WOAF	Tyler Commercial College	Tyler, Tex.	360
WOAI	Southern Equipment Co.	San Antonio, Tex.	394.5
WOAN	James D. Vaughn	Lawrenceburg, Tenn.	360
WOAR	Henry P. Lundskow	Kenosha, Wisc.	229
WOAV	Pennsylvania Nat. Guard, 112th Inf.	Erie, Pa.	242
WOAW	Woodmen of the World	Omaha, Nebr.	522.3
WOAX	Franklyn J. Wolff	Trenton, N. J.	240
WOC	Palmer School of Chiropractic	Davenport, Iowa	498
WOI	Iowa State College	Ames, Iowa	360
WOO	John Wanamaker	Philadelphia, Pa.	509.9
WOQ	Western Radio Co.	Kansas City, Mo.	360
WOR	L. Bamberger & Co.	Newark, N. J.	405
WORD	Peoples Pulpit Association	Batavia, Ill.	278
WOS	Missouri State Marketing Bur.	Jefferson City, Mo.	441
WPAB	Pennsylvania State College	State College, Pa.	283
WPAC	Donaldson Co.	Okmulgee, Okla.	330
WPAJ	Doolittle Radio Corp.	New Haven, Conn.	268
WPAK	North Dakota Agricultural College,	Agricultural College, N. D.	283
WPAU	Concordia College	Moorhead, Minn.	286
WPAZ	John R. Koch	Charleston, W. Va.	273
WPG	Municipality of Atlantic City	Atlantic City, N. J.	296
WQAA	Horace A. Beale, Jr.	Parkersburg, Pa.	360
WQAC	E. B. Gish	Amarillo, Texas	234
WQAE	Moore Radio News Station	Springfield, Vt.	275
WQAM	Electrical Equipment Co.	Miami, Fla.	283
WQAN	Scranton Times	Scranton, Pa.	280
WQAO	Calvary Baptist Church	New York, N. Y.	360
WQAS	Prince-Walter Co.	Lowell, Mass.	266
WQJ	Calumet Rainbow Broadcasting Co.	Chicago, Ill.	448
WRAA	The Rice Institute	Houston, Texas	256
WRAF	The Radio Club	Laporte, Ind.	224
WRAL	Northern States Power Co.	St. Croix Falls, Wis.	248
WRAM	Lombard College	Galesburg, Ill.	244
WRAN	Black Hawk Electrical Co.	Waterloo, Iowa	236
WRAO	St. Louis Radio Service Co.	St. Louis, Mo.	360
WRAV	Antioch College	Yellow Springs, Ohio	242
WRAW	Avenue Radio Shop	Reading, Pa.	238
WRAX	Flexon's Garage	Gloucester City, N. J.	268
WRBC	Immanuel Lutheran Church	Valparaiso, Ind.	278
WRC	Radio Corp. of America	Washington, D. C.	469
WREO	Reo Motor Car Co.	Lansing, Mich.	288.5
WRHF	Washington Rad. Hosp. Fund	Washington, D. C.	256
WRK	Doron Bros. Electrical Co.	Hamilton, Ohio	360
WRM	University of Illinois	Urbana, Ill.	360
WRR	City of Dallas, Police and Fire Signal Dept.	Dallas, Texas	360
WRW	Tarrytown Radio Research Lab.	Tarrytown, N. Y.	273
WSAB	Southeast Missouri State Teachers College,	Cape Girardeau, Mo.	360
WSAC	Clemson Agricultural College	Clemson College, S. C.	360
WSAD	J. A. Foster Co.	Providence, R. I.	261
WSAI	United States Playing Card Co.	Cincinnati, Ohio	325.9
WSAJ	Grove City College	Grove City, Pa.	360

Call	Operator	City	Wave Length Meters
WSAN	Allentown Radio Club	Allentown, Pa.	229
WSAP	Seventh Day Adventist Temple	New York City	263
WSAR	Doughty & Welch Elec. Co.	Fall River, Mass.	254
WSAU	Camp Marienfeld	Chesham, N. H.	229
WSAZ	Chase Electric Shop	Pomeroy, Ohio	258
WSB	Altanta Journal	Atlanta, Ga.	429
WSL	J. & M. Electrical Co.	Utica, N. Y.	273
WSOE	School of Engineering of Milwaukee	Milwaukee, Wisc.	246
WTAB	Fall River Daily Herald	Fall River, Mass.	266
WTAC	Penn Traffic Co.	Johnstown, Pa.	275
WTAF	Louis J. Gallo	New Orleans, La.	268
WTAL	Toledo Radio & Electric Co.	Toledo, Ohio	252
WTAM	Willard Storage Battery Co.	Cleveland, Ohio	390
WTAP	Cambridge Radio & Elec. Co.	Cambridge, Ill.	242
WTAQ	S. H. Van Gorden & Son	Osseo. Wis.	254
WTAR	Reliance Electric Co.	Norfolk, Va.	280
WTAS	Charles E. Erbstein	Elgin, Ill.	286
WTAT	Edison Electric Illuminating Co.	Boston, Mass.	244
WTAU	Ruegg Battery & Elec. Co.	Tecumseh, Nebr.	242
WTAW	Agricultural and Mechanical College of Texas,	College Station, Tex.	280
WTAX	Williams Hardware Co.	Streator, Ill.	231
WTAY	Oak Leaves Broadcasting Station	Oak Park, Ill.	283
WTAZ	Thomas J. McGuire	Lambertville, N. J.	283
WTG	Kansas State Agricultural College	Manhattan, Kans.	273
WWAD	Wright & Wright (Inc.)	Philadelphia, Pa.	360
WWAE	Lawrence J. Crowley	Joliet, Ill.	227
WWAO	Michigan College of Mines	Houghton, Mich.	244
WWI	Ford Motor Co.	Dearborn, Mich.	273
WWJ	Detroit News	Detroit, Mich.	516
WWL	Loyola University	New Orleans, La.	280

CANADIAN STATIONS

CFAC	Calgary Herald	Clagary, Alta.	430
CFCA	Toronto Star	Toronto, Ont.	400
CFCF	Marconi Wireless Tel. Co.	Montreal, P. Q.	400
CFCH	Abitibi Power & Paper Co.	Iroquois Falls, Ont.	400
CFCJ	Le Cie de L'Evenement	Quebec, P. Q.	410
CFCK	Radio Supply Co., Ltd.	Edmonton, Alta.	410
CFCN	W. W. Grant	Calgary, Alta.	440
CFCO	Semmelhaack-Dickson, Ltd.	Bellevue, P. Q.	450
CFCQ	Radio Specialties, Ltd.	Vancouver, B. C.	450
CFCR	Laurentide Air Service	Sudbury, Ont.	450
CFCT	Victoria City Temple	Victoria, B. C.	410
CFCW	London Radio Co.	London, Ont.	420
CFDC	Sparks Co.	Nanaimo, B. C.	430
CFQC	The Elec. Shop, Ltd.	Saskatoon, Sask.	400
CFRC	Queen's University	Kingston, Ont.	450
CFUC	University of Montreal	Montreal, P. Q.	400
CFXC	Westminster Trust Co.	New Westminster, B. C.	440
CFYC	Victor W. Odlum	Vancouver, B. C.	400
CHAC	Radio Engineers	Halifax, N. S.	400
CHBC	The Calgary Albertan	Calgary, Alta.	410
CHCB	Marconi Wireless Tel. Co.	Toronto, Ont.	440
CHCD	Canadian Wireless & Elec. Co.	Quebec, P. Q.	410
CHCE	Western Canadian Radio Supply, Ltd.	Victoria, B. C.	310-400
CHCL	Vancouver Merchants Exch., Ltd.	Vancouver, B. C.	440
CHCM	W. W. Grant	Calgary, Alta.	440

Call	Operator	City	Wave Length Meters
CHCS	Hamilton Spectator Bldg.	Hamilton, Ont.	410
CHNC	Toronto Radio Research Soc.	Toronto, Ont.	350
CHYC	Northern Elec. Co.	Montreal, P. Q.	341
CJCA	Edmonton Journal, Ltd.	Edmonton, Alta.	450
CJCD	T. Eaton Co.	Toronto, Ont.	410
CJCE	Sprott-Shaw Radio Co.	Vancouver, B. C.	420
CJCI	Maritime Radio Corp., Ltd.	St. John, N. B.	400
CJCM	Dr. J. L. P. Landry	Mont Joli, P. Q.	312
CJCN	Simons Agnew & Co.	Toronto, Ont.	410
CJCX	Percival W. Shackleton	Olds, Alta.	400
CJGC	London Free Press	London, Ont.	430
CKAC	La Presse	Montreal, P. Q.	425
CKCD	Vancouver Daily Province	Vancouver, B. C.	410
CKCE	Can. Ind. Telephone Co.	Toronto, Ont.	450
CKCI	Daily "Le Soleil"	Quebec City	285
CKCK	Leader Pub. Co.	Regina, Sask.	420
CKCO	Dr. G. M. Geldert	Ottawa, Ont.	400
CKCX	P. Burns & Co., Ltd.	Calgary, Alta.	440
CKOC	Wentworth Radio Supply Co.	Hamilton, Ont.	410
CKY	Manitoba Tel. System	Winnipeg, Man.	450
CNRA	Canadian National Railways	Moncton, N. B.	313
CNRC	Canadian National Railways	Calgary, Alberta	440
CNRE	Canadian National Railways	Edmonton, Alta.	450
CNRM	Canadian National Railways	Montreal, P. Q.	341
CNRO	Canadian National Railways	Ottawa, Ont.	435
CNRR	Canadian National Railways	Regina, Sask.	420
CNRS	Canadian National Railways	Saskatoon, Sask.	400
CNRT	Canadian National Railways	Toronto, Ont.	400
CNRW	Canadian National Railways	Winnipeg, Man.	450

BRITISH STATIONS

2LO	London	365
5IT	Birmingham	475
5WA	Cardiff	350
6BM	Bournemouth	385
2ZY	Manchester	375
5NO	Newcastle	400
5SC	Glasgow	420
2BD	Aberdeen	495
6SL	Sheffield (relay station)	303

FRENCH STATIONS

YN	Lyon	740
FL	Paris (Eiffel Tower)	2,600
ESP	Paris	450
8AJ	Paris	1,780

CUBAN STATIONS

PWX	Cuban Telephone Co.	Havana	400

MEXICAN STATIONS

CYB	El Buen Tono	Mexico City, Mex.	370
CYL	La Casa Del Radio	Mexico City, Mex.	480
CYX	Excelsior & Cia. Parker	Mexico City, Mex.	333
CYZ	Liga Central Mexicana del Radio	Mexico City, Mex.	400
XICE	Chihuahua State Radio Broadcasting Sta.	Chihuahua City	400
24A	Tarnava & Cia	Monterey	200

THE PUBLISHERS WOULD APPRECIATE CRITICISMS AND CORRECTIONS WHICH COULD BE USED IN FUTURE EDITIONS OF THIS BOOKLET.

Radiophone Broadcasting Stations in North America, Classified Alphabetically by States and Cities

State, City, Call

Alabama:

Auburn, WMAV
Mobile, WEAP
Montgomery, WKAN

Arizona:

Phoenix, KFAD, KFCB
Tucson, KFDH

Arkansas:

Conway, KFKQ
Fayetteville, KFMQ
Fort Smith, KFOZ
Hot Springs, KTHS
Little Rock, KFLQ, KFMB, WCAV
Pine Bluff, KFPX

California:

Bakersfield, KDZB
Berkeley, KRE
Burlingame, KFNZ
Culver, KDBG
Fresno, KMJ
Hanford, KFRN
Hillsborough, KFQH
Hollywood, KFAR, KFOZ
Holy City, KFQU
Long Beach, KFON
Los Angeles, KFCL, KFI, KFPG, KFPR, KFQG, KFSG, KHJ, KJS, KNX, KFCL,
Oakland, KGO, KLS, KLX, KZM
Paso Robles, KFNL
Redlands, KFAP
Richmond, KFQU
Sacramento, KFBK
San Diego, KDPT, KDYM, KFBC
San Francisco, KFPY, KPO, KUO, KFRC
San Jose, KQW
Santa Ana, KFAW
Santa Rosa, KFNV
Stanford Univ., KFGH
Stockton, KJQ, KWG
Taft, KFQC
Whittier, KFOC

State, City, Call

Colorado:

Boulder, KFAJ
Colorado Springs, KFQE, KFUM
Denver, AA3, KFAF, KFEL, KFLE, KLZ, KFDL, KOA
Greeley, KFKA
Gunnison, KFHA

Connecticut:

Hartford, WDAK
New Haven, WPAJ
Storrs, WABL

Delaware:

Wilmington, WHAV

District of Columbia:

Washington, WCAP, WDM, WIL, WRC, WRHF

Florida:

Miami, WQAM
Pensacola, WGAN
St. Petersburg, WCBK, WDBI
Tampa, WDAE
West Palm Beach, WBBJ
Winter Park, WDBO

Georgia:

Atlanta, WBBF, WSB
Columbus, WDBA
Macon, WCBW, WMAZ
Savannah, WEBZ

Idaho:

Boise, KFAU, KFDD
Kellogg, KFEY
Wallace, KFOD

Illinois:

Batavia, WORD
Belvidere, WQAG
Cambridge, WTAP
Carthage, WCAZ
Chicago, KYW, WAAF, WBBM, WDBY, WEBH, WGN, WJAZ, WLS, WMAQ, WQJ, WBCN

State, City, Call

Illinois:

Chicago Heights, WCBZ
Decatur, WBAO
Elgin, WTAS, WCEE
Eureka, WFBB
Galesburg, WRAM
Joliet, WWAE
Monmouth, WBBU
Mooseheart, WJJD
Oak Park, WTAY
Peoria, WJAN
Rockford, KFLV
Streator, WTAX
Tuscola, WDZ
Urbana, WRM
Zion, WCBD

Indiana:

Anderson, WEBD
Fort Benjamin Harrison, WCBN, WFBY
Fort Wayne, WDBV
Greencastle, WLAX
Greentown, WJAK
Indianapolis, WBBZ, WFBM
Laporte, WRAF
Marion, WIAQ
Mooseheart, WJJD
South Bend, WGAZ
Valpariso, WRBC
West Lafayette, WBAA

Iowa:

Ames, WOI
Atlantic, KFLZ
Boone, KFGQ
Burlington, WIAS
Cedar Falls, KFJX
Cedar Rapids, WJAM, WKAA
Davenport, WOC
Des Moines, WHO
Fort Dodge, KFER, KFJY
Iowa City, KFQP, WHAA
Lamoni, KFFV
Marengo, KFOL
Marshalltown, KFJB
Oskaloosa, KFHL
Shenandoah, KFNF
Sioux City, KFMR, WEAU
Waterloo, WRAN

Kansas:

Laurence, KFKU
Manhattan, WTG
Milford, KFKB
Topeka, WJAQ
Wichita, KFOT, WEAH

State, City, Call

Kentucky:

Louisville, WHAS, WLAP

Louisiana:

Alexandria, KFFY
Baton Rouge, KFGC
Jennings, WCBJ
New Orleans, WAAB, WAAC, WABZ, WCAG, WCBE, WEBP, WTAF, WWL, WBBS
Shreveport, KFDX, WGAQ

Maine:

Bangor, WABI, WDBN
Houlton, WCBL
Portland, WTAJ
Skowhegan, WDBU

Maryland:

Baltimore, WCAO, WCBM, WFBR, WGBA
Salisbury, WEBI

Massachusetts:

Boston, WDBR, WNAC WTAT, WEEI
Bridgewater, WFBN
Dartmouth, WMAF
Fall River, WSAR, WTAB
Lowell, WQAS
Mattapoisett, WBBG
Medford Hillside, WGI
Roslindale, WEBY
Springfield, WBZ
Taunton, WDBB
Worcester, WCBT, WDBH

Michigan:

Ann Arbor, WCBC
Berrien Springs, KFGZ
Dearborn, WWJ
Detroit, KOP, WCX, WWJ
East Lansing, WKAR
Flint, WEAA
Grand Rapids, WEBK
Houghton, KFMW, WWAO
Lansing, WREO
Mt. Clemens, WABX
Petoskey, WBBP
Port Huron, WBBH
Saginaw, WABM

State, City, Call

Minnesota:

Breckenridge, KFUJ
Carver, KFRA
Collegeville, WFBJ
Hutchinson, WFAN
Minneapolis, KFDZ, KFEX, KFMT, WCCO, WLB, WHDI
Moorhead, WPAU
Northfield, KFMX, WCAL
St. Cloud, WFAM
St. Paul, AV7, KFOY
Sihtipoc, KIAF

Mississippi:

Coldwater, KFNG
Hattiesburg, WDBT
Oxford, WCBH
Ruleville, WCBG

Missouri:

Butler, WNAR
Cape Girardeau, WSAB
Carterville, KFPW
Columbia, WAAN
Independence, KFIX
Jefferson City, WOS
Kansas City, WDAF, WHB, WOQ
Moberly, KFFP, KFOJ
St. Joseph, KFHD
St. Louis, KFQA, KSD, WCK, WEB, WEW, WMAY, WRAO, KFUO
Warrensburg, KFNJ

Montana:

Butte, KFKV, KFLA
Havre, KFBB
Helena, KFNY, KFCC
Missoula, KFLW

Nebraska:

Belden, KFQY
David City, KFOR
Fremont, WOAE
Hastings, KFKX
Hartington, KFRZ
Lincoln, WFAV, WJAB, WMAH, KFAB
Norfolk, WJAG
Oak, KFEQ
Omaha, KFCZ, KFOX, WAAW, WIAK, WNAL, WOAW
Tecumseh, WTAU
University Place, WCAJ

State, City, Call

Nevada:

Sparks, KFFR

New Hampshire:

Chesham, WSAU
Hanover, WEBK
Laconia, WKAV

New Jersey:

Atlantic City, WHAR, WPG
Camden, WABU, WFBI
Gloucester City, WRAX
Lambertville, WTAZ
Newark, WAAM, WBS, WCBX, WOR, WNJ
New Brunswick, WEBA
North Plainfield, WEAM
Paterson, WBAN
Pitman, WFBT
Salem, WDBQ
Trenton, WMAL, WOAX, WWAB

New Mexico:

Albuquerque, KFLR
State College, KOB, KFRY

New York:

Buffalo, WGR
Canton, WCAD
Cazenovia, WMAC
Freeport, WGBB
Ithaca, WEAI
Kingston, WDBZ
Lockport, WMAK
New York, WBAY, WBBR, WDBX, WEAF, WEBJ, WFBH, WHN, WJY, WJZ, WNYC, WQAO, WSAP
Richmond Hill, WAHG
Rochester, WABO, WHAM
Schnectady, WGY
Syracuse, WFBL
Tarrytown, WRW
Troy, WHAZ
Utica, WSL

North Carolina:

Charlotte, WBT
Fort Bragg, AT9
Raleigh, WFBO
Wilmington, WBBN

North Dakota:

Fargo, WDAY, WPAK
Grand Forks, KFJM

State, City, Call

Ohio:

Akron, WEAR
Canton, AQ6
Cambridge, WEBE
Cincinnati, WAAD, WHAG, WLW, WMH, WSAI
Cleveland, KDPM, WDBK, WHK, WJAX, WTAM
Columbus, WBAV, WCAH, WEAO, WMAN
Dayton, AW5, WABD, WDBS
Dover, WABP
Granville, WJD
Hamilton, WRK, WEBO
Lima, WOAC
Newark, WBBB
Pomeroy, WSAZ
Sandusky, WABH
Springfield, WNAP
Toledo, WABR, WTAL
Wooster, WABW
Yellow Springs, WRAV
Youngstown, WDBF

Oklahoma:

Bristow, KFJK, KFRU
Chickasha, KFGD
Fort Sill, KFRM
Muskogee, KFQL
Norman, WNAD
Oklahoma City, KFJF, KFQR, WKY
Okmulgee, WPAC
Tulsa, WGAF, WLAL

Oregon:

Astoria, KFJI
Corvallis, KFDJ
Medford, KFAY
Portland, KDYQ, KFEC, KFIF, KFQN, KGW, KFRQ

Pennsylvania:

Allentown, WCBA, WSAN
Altoona, WFBG
Arnold, WCBU
Buck Hill Falls, WCBY
Butler, WBR
East Pittsburgh, KDKA
Erie, WOAV
Grove City, WSAJ
Harrisburg, WABB, WBAK
Haverford, WABQ
Johnston, WBBV, WTAC
Lancaster, WDBC, WGAL
McKeesport, WIK
Parkersburg, WQAA
Philadelphia, WABY, WBBT, WCAU, WDAR, WFI, WGL, WIAD, WIP, WNAT, WOO, WWAD
Pittsburgh, KQV, WCAE, WCBF, WJAS
Reading, WBBD, WRAW
Scranton, WQAN
State College, WPAB
Washington, WABT
Wilkes-Barre, WBAX

Rhode Island:

Cranston, WKBF
East Providence, WKAD
Providence, WCBR, WEAN, WJAR, WKBF, WSAD

South Carolina:

Charleston, WBBY
Clemson College, WSAC

South Dakota:

Brookings, KFDY
Rapid City, WCAT
Vermilion, WEAJ
Yankton, WNAX

Tennessee:

Columbia, WDBW
Knoxville, WFBC
Lawrenceburg, WOAN
Memphis, WCBO, WMC, WGBC
Nashville, WCBQ, WEBX
Tullahoma, WCBV

Texas:

Amarillo, WDAG, WQAC
Austin, KFQM, WCM
Beeville, KFRB
College Station, WTAW
Dallas, WFAA, WRR
Denison, KFQT
Dublin, KFPL
El Paso, WDAH
Fort Worth, KFJZ, KFQB, WBAP, KFRO
Galveston, KFLX, WIAC, KFUL
Greenville, KFPM
Houston, KFCV, WEAY, WEV, WSAV, WRAA

New Stations

CALL	OPERATOR	CITY	Wave Length

Stations Heard

CALL	LOCATION	DIAL SETTING		

Stations Heard

CALL	LOCATION	DIAL SETTING		

Stations Heard

CALL	LOCATION	DIAL SETTING		

Stations Heard

CALL	LOCATION	DIAL SETTING		

Stations Heard

CALL	LOCATION	DIAL SETTING		

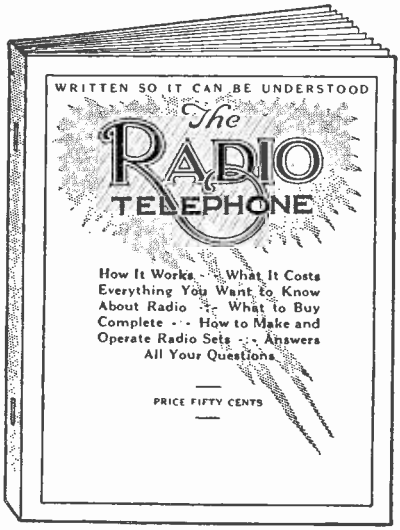
Stations Heard

CALL	LOCATION	DIAL SETTING		

Stations Heard

CALL	LOCATION	DIAL SETTING		

Every Radio Enthusiast Should Read This Book



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1925

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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13	14	15	16	17	18	19
20	21	22	23	24	25	26
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