

THE OCTOBER 1929

RADIO IN DEX

The Non-Technical Radio Magazine



Two Singers of Great Promise

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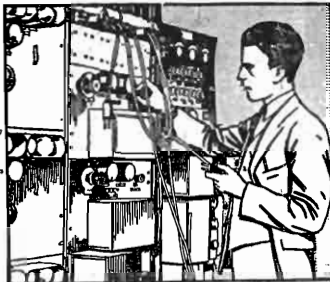
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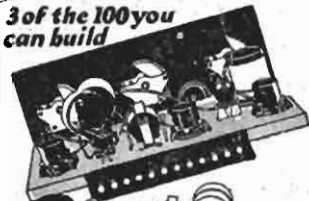
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RADIO INDEX

REG. U. S. PATENT OFFICE

FRED CLAYTON BUTLER

Editor and Publisher



SIXTH YEAR

Contents

NUMBER 32

Frontispiece. Two Singers of Great Promise.	
See Story on Page 18.	
Common Tube Troubles, by E. R. Haan	2
Information That Will Save You Grief.	
A New Radio Marvel, by Harry K. Hobart	5
A Speaker With a Different Principle.	
Radio and the Hard of Hearing, by Persis Vose	7
Broadening Limited Lives.	
Radio Reunites Pals, by Archie W. Thomas	9
Program Brings War Buddies Together.	
Cross Calls	11
Here's a Hard Puzzle for Real Fans.	
"Dear Mr. Editor"	13
Readable Comment by Our Friends.	
The Question Mill, Conducted by Enno R. Haan	15
Light On Things That Give Us Trouble.	
Banish the Direct Advertiser, from "Radio"	17
Swatting the Pestiferous Nuisance.	
Is Telepathy Akin to Radio?	19
An Interesting Experiment in Spirit Waves.	
Radio Becomes Big Business	21
Growth of Chicago Station Exemplifies It.	
What's On the Air Tonight?	24
Hour-by-Hour and Alphabetical Index to Programs	
Table of Air-Line Distances	32
Broadcasting Map of U. S. A.	34
A Complete Index by Frequencies	36
Cross-Indexed by Dial Numbers and Wave Lengths	
A Complete Index by States and Cities	50
With Key to Location of Station on Broadcasting Map	
A Complete Index by Call Letters	56
A Log for 750 Stations	

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Common Tube Troubles

By E. R. HAAN

BESIDES the common trouble of tubes weakened by overloading them, there are other acute troubles, which may prevent tubes from functioning properly or may even endanger other parts of the receiver. The most common of these troubles are grid-to-filament and grid-to-plate short circuits, loose tube bases causing short circuits inside of the base, faulty contacts of socket prongs and tube tips, the incorrect use of tubes, inadequate filament supply and "microphonics," a trouble to which many tubes are subject.

Grid-to-Filament Short Circuits.

Grid-to-filament short circuits are usually caused by the filament sagging against the grid. This trouble is especially likely to occur in receivers where the tubes are mounted at an angle, or perhaps are held horizontally. Owing to the constant heating and cooling of the filament, and partly owing to its weight, the filament may sag, finally making contact with the grid. In case of 3-volt, dry-cell tubes, which are used extensively in portable sets, the grid surrounds the filament, and their close proximity increases the danger of such short circuits. Hissing, crackling, and frying noises will then be heard, which spoil all reception. The results of this trouble may be a burned-out secondary winding of the transformer to which the grid of the offending tube is connected. In case the tube is used for radio-frequency amplification, where successive stages are coupled with air-core transformers, the transformers are usually not seriously injured. If the receiver is subjected to

considerable vibration, as is the case in portable sets or those installed in automobiles, trains, or similar places, there may be trouble from occasional short circuits between the grid and filament, producing rasping and crackling noises. If these elements vary without touch-

ing each other, there will be fluctuations in signal intensity, corresponding to the physical vibration taking place.

Grid-to-Plate Short Circuits.

Grid-to-plate short circuits, are fortunately not so common as grid-to-filament short circuits. When the former occur the other tubes in the receiver are in danger of being burned out as well as the windings of the transformers on each side of the defective tube. A burned-out potentiometer may also

result from this trouble. Such short circuits are possible because the B-negative line is connected to either the A-positive or the A-negative line at some point inside of the receiver or at the batteries. The grid usually carries an A-negative charge and is therefore connected to the negative side of the filament wiring. As the plate carries a B-positive potential, there would be a path for the B-current over the grid, through the winding of the transformers to which the grid and plate are connected, over one of the filament lines, and passing through one or more tubes, depending on the wiring of the receiver.

Testing for Short Circuits. A pair of headphones and a 4½-volt C-battery are used to test for internal short circuits in tubes. On the later-model tubes, the heavy tips are connected to the filament,



A talented pianiste with a charming voice and beauty of form and features, is Bernice Yanecek of WBBM

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and the two lighter tips are connected to the grid and plate. Hold one testing tip to the grid and the other to the plate terminal of the tube. If the tube is in good condition, no click will be heard, but if clicks can be heard, there is a short circuit between the grid and the plate. Then, while still holding one testing tip on the grid, touch the other to either one of the filament terminals. A click again indicates a short circuit. Be sure not to use a testing voltage higher than the filament voltage of the tube being tested, or the filament may accidentally be burned out. Some tubes develop occasional short circuits. To find such defects, one should gently tap the tube while testing, holding it in a horizontal position and turning it around gradually. For such tests it will be found handy to use clips on the end of the phone cords, which are snapped to the tube tips, and the operator can then manipulate the tube more easily.

Loose Tube Bases. Some tubes become loose in their base, especially if they are inserted and removed from the sockets frequently. The cement holding the glass to the bakelite base sometimes dries out so that it cracks and loosens from the glass. There is then danger of twisting the wires inside of the base when inserting or removing the tube from a socket, and such twisted wires would result in short circuits. Tubes otherwise in good condition may develop this trouble, but it is not necessary to discard them, as a simple and effective repair can readily be made. Wrap a layer of adhesive tape partly over the glass and partly over the top of the base. This will prevent the tube from being turned around in the base, although care should nevertheless be taken when removing it and reinserting it in the socket. Another remedy for this trouble, is to scrape away the surplus cement protruding above the base, and as much as possible between the base and the tube. Then apply some collodion or "New Skin," letting it run down between the bulb and the base, and permitting a liberal film to dry on the outside over both. When collodion is so thick that it will not flow readily, use some ether to thin it down to a suitable consistency.

Faulty Contact in Sockets. After a receiver has been in use for some time, trouble may be experienced from faulty contacts between the tube tips and the socket prongs. Crackling and frying noises, reduced volume, and sometimes total inaudibility may result. The reason for the trouble may be the gradual formation of corrosion on the socket prongs and on the tube tips, which makes a high-resistance joint, or the trouble may be due to the socket prongs being bent down too far. The latter is often the case, especially with cheap sockets in which the prongs do not have enough "spring" and are therefore apt to bend easily. Frequent changing of tubes in sockets is also responsible for this trouble. The prongs can be lifted up again with the aid of an ordinary buttonhook, the batteries being disconnected while this is done. Another reason for a loose socket prong is the loosening of the screw-and-nut assembly, which holds the socket prong in place. Go over the sockets periodically to see that the locking nut is tight; if not, get a small socket wrench used for radio work and tighten it down securely. Some types of sockets have prongs which make a "wipe" contact on the tube tips. These are sometimes so tight that the soldered ends of the tube tips are pulled off when removing a tube and this ruins it.

To avoid recurrence of loose nuts, get some small lock washers and insert these under the locknuts. Then replace the soldering lugs, to which the connecting wires are attached, and turn down the thumbnuts. The thumbnuts also have a tendency to get loose, sometimes as a result of vibration, especially if the receiver is being transported, and they should therefore be carefully inspected. The same procedure of using lock washers is advisable, and the thumbnuts should be replaced with hexagon nuts, these being turned down tight with a socket wrench. When the screw assembly is examined, clean off the soldering lug and the adjacent nuts with alcohol, for it often happens that a film of soldering flux will be found here, due to using an excessive amount while soldering.

(Continued on page 22)

A New Radio Marvel

By HARRY K. HOBART

COLIN KYLE, a school-teacher in California, has invented the latest piece of radio apparatus. It will soon be on the market and is the most direct method ever evolved for converting electricity into sound waves. It is an electrostatic speaker.

The simplicity of the speaker makes it all the more remarkable. There are no coils or magnets, and no moving parts. Essentially it is nothing but a condenser, two flat plates separated by a thin sheet of insulation. In the form in which it is being produced, it consists of an aluminum stamping about nine by twelve inches, with edges turned back about three-quarters of an inch. The face of the plate is punched to form approximately 700 small slits, an eighth of an inch by about five-eighths.

Over the face, a sheet of insulation, only one-five hundredths of an inch in thickness, is placed, and a thin coating of metal sprayed over the surface, or, in lieu of the spray method, a sheet of tin-foil is glued down.

The principle of an electrostatic speaker is not new, but until Kyle's invention no one had discovered a practical way of making one. Two appeared in Germany some time ago, one by Hans Voght and another by Eugene Reisz. Both inventors used essentially the same principle, stretching a membrane or diaphragm between two plates of metal, the latter being separated from the diaphragm by a dielectric. Both speakers had the drawback of being difficult to make and expensive, so that neither one became popular. Kyle, while using

the same principle, developed a new kind of dielectric which provided sufficient insulation in sheets only one-five hundredths of an inch thick, and a construction plan which is cheap, simple and commercially practical.

In tests performed in a laboratory of acoustics, it was found that Kyle's speaker is more nearly perfect than anything that has been produced up to this time.

A single plate can be used as a speaker, or any number of them can be bolted together through holes drilled in the turned back flanges. Large ones for auditorium use may be made eight feet square. The average household size will probably be about nine by twelve inches and have from four to six units in operation. The

greater the number of plates in operation the greater the volume of sound. The radio receiver output goes on one side, to the metallic plate and on the other side to the metal or foil coating which forms the diaphragm. In addition, a positive bias of 450 volts of direct current is applied to the aluminum plate. The result is that the portion of the diaphragm in front of the slits in the plate vibrates; 690 separate vibrating units in a single plate, or 4,140 in a six-plate speaker, all of them working in unison.

The reproduction of voice and music is exceedingly clear and true, with none of the imperfections of the dynamic type of speaker. There is none of the over-emphasis of the base, no alternating current hum, no noticeable muffling in the



Phillips Carlin of NBC has a reputation as an announcer second only to Graham McNamee

voice, and the range, from the lowest note to the highest is well covered.

The static speaker rounds out the field of radio sound producers. First there were magnetic speakers, both air-column and cone types, following closely the idea of the telephone receiver. Then came the dynamic types, and now the static. How far the new speaker may go toward replacing the others is problematical, for, as recently pointed out, the test of a good speaker is not so much its technical perfection as its effect on the listener's ear, and not all ears are alike. A speaker will be highly praised by one listener and as greatly condemned by another.

Why it is necessary to have a constant potential current of a higher voltage than the highest to which the membrane will be subjected by the radio-receiver output is interesting. Without it the membrane would respond twice to each fluctuation of the alternating current output of the receiver, instead of once, and the result would be a note just one octave higher than it should be.

Because of its shape, Kyle's speaker can be built up in cabinets no more than an inch thick. It can be hung or mounted flat against the wall, built into ornamental screens, or into a table type cabinet, as a part either of the lid or the front panel.

Two problems of interest to radio users, one of which is of special interest to the general public, are being studied now by Colin Kyle. First is the question of proper acoustics to get good reproduction, and the other is the problem of soundproofing walls to prevent transmission of sounds to adjoining rooms or apartments.

As it happens, the ordinary living room, with its curtains, drapes, rugs and furniture, is the best setting for music reproduction. The reason is that people are accustomed to the acoustic properties of the ordinary home, and therefore music reproduced in such a room sounds right.

In regard to sound deadening, it has been found that whether a sound carries or not depends entirely on the weight of the material in the wall. Sound-absorbing materials which are soft and porous, are ineffective. Instead, the walls must be built of material so heavy that their ability to vibrate, and therefore transmit sounds to the other side, is minimized if not entirely eliminated. A wall of heavy bricks, plaster or tile can be made even more effective as a sound deadener by dividing it into two sections with an air space between them. Whatever vibrations may be transmitted through the first section of wall will be greatly reduced in crossing the air space and will have a correspondingly lessened ability to vibrate the outer wall.

Patrick Kelly, NBC announcer and lately in several Broadway musical productions, spent many years at sea before he discovered his singing voice. He shipped on many of the old-time sailing vessels.

Maude Deist, cornetist, and Beulah Mowers, pianist, have to leave their perfectly new husbands at home when they broadcast over WBBM but they have worked out a love-code by little quirks in their notes to carry home messages for them.

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Radio and the Hard of Hearing

By PERSIS VOSE

JUST listening is not the best thing I do these days, but "listening in" on the radio is quite a different matter. I belong to that army of people who find it hard to hear. Believe me or not, it *is* hard and it lasts all day and every day and often far into the night.

The pure unadulterated joy of listening in and *not* finding it hard! When I am at the end of my rope with trying to hear and trying to read the lips and nearly on the point of screaming from tiredness of it all, I adjust my ear-phones, turn on the radio and listen—without trying.

It is true I cannot hear with the loud speaker—it doesn't speak loud enough, that is all—but with ear-phones I can hear from Maine to California, or rather from California to Maine. This is no joke either, because don't I live in Maine and didn't I hear Will Rogers from out in Beverly Hills, California?

Why more hard-of-hearing people don't tie up with a radio I can't understand, although I ought to, for I myself had to be "shown." In the early days of radio and my own deafness, I was asked by countless well-meaning friends and relatives to come to hear their radio. It was so clear and so loud! Many the weary dreary hours I sat staring into space, hating myself and the

whole world, yet lacking the courage to announce I couldn't distinguish a sound. Instead, I feebly smiled and at the end of a ghastly evening—radio parties were always in the evening then—vowed

bitterly to myself "Never again!" only to weakly accept another invitation the next day. Why? Because I didn't dare say what a beastly bore I found the radio.

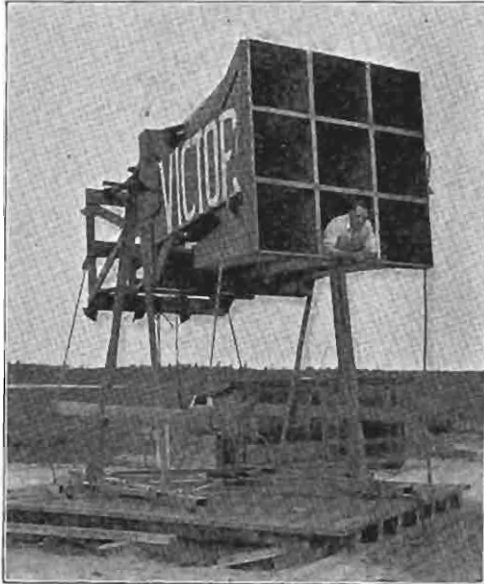
This was before we bought our own radio and knew about the powerful ear-phones. Now I sit in my comfortable pet chair "close up," with ear-phones over my head while family and friends sit wherever they please and we *all* hear, only I with dull ears occasionally

hear best and repeat to the others.

Interesting, amusing, instructive, thrilling, gay, and sad things heard over the radio from all parts of the country—these make me feel just like other people, hearing people.

It certainly is exciting to be in a room full of men and women listening to an honest-to-goodness "big fight" being broadcast from coast to coast, and to cheer and groan at the proper moments. To hear the President of the United States speak from his desk in Washington, to hear the Prince of Wales at the opening of the Canadian-American Peace Bridge, to hear Charles Lindbergh from

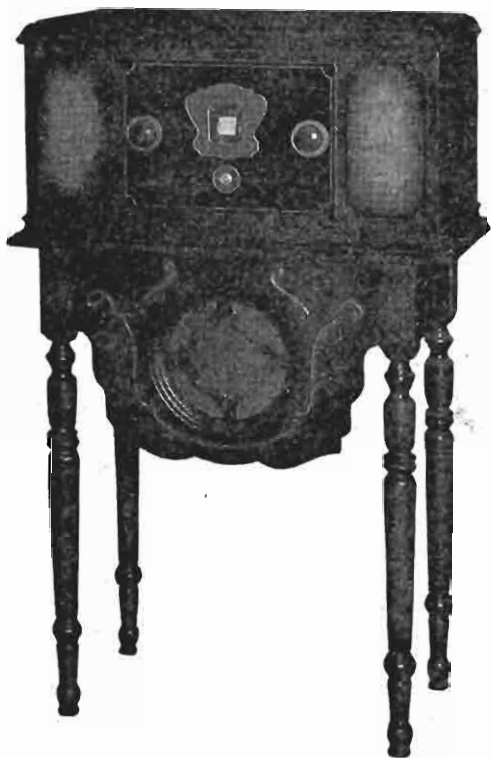
(Continued on page 20)



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Radio Reunites Pals

Program Brings War Buddies Together

By ARCHIE W. THOMAS

A FEW nights ago, as Capt. J. D. Payne, decorated Royal Air Force war hero, turned on his radio, the room was filled with the strumming of a ukulele and a man's voice singing an old flying song: a song that had once been a very familiar part of Capt. Payne's life, as he and his fellow officers had lounged around the mess after a daily dozen dog fights had been taken care of.

Yes, the song was familiar. Curiously enough, the voice and strumming seemed familiar. As he listened tensely, he lived again those days back in 1917, when he was Flight Commander of the Twenty-ninth Squadron of the Royal Air Force.

Among his officers was Capt. Douglas Hail Robertson, the daredevil of the company, who would drape his long legs around a chair after the day's work was done, and sing and play to his buddies.

And, Capt. Payne remembered one terrible day, when out of the squadron of eight who had gone out that morning, there had been only three to come back. The three had been Capt. Robertson, Capt. Leach and himself.

That night, though the ukulele and

songs had gone on as usual, Capt. Robertson's voice had held the same note of forced courage that was in the voice now coming over the radio.

The song ended . . . the announcer was

saying, "The number you've just listened to was given by Capt. Douglas Hail Robertson British Ace" . . .

Capt. Payne didn't wait to hear the rest of the announcement. He was at the telephone. And, half an hour later was standing beside his old buddy, listening to the strange circumstances that had brought this once wild eagle into the studio of a broadcasting station.

For six years Captain Robertson had watched from his bedside [the

world drift past him as he lay helpless and crippled, seriously ill, while he fought his courageous battle, first for the chance to live, then a chance for happiness, and now for the chance of a future for himself, wife and child.

And six years is a long, long time to a man who had crossed the German lines 1,500 times in the four years of war service and had been shot down four times while doing it. Then there had been the three years as test pilot in the

Lo, the Poor Indian



Many interesting characters visit the broadcasting studios. Here is Chief Isaac, an Onondaga Indian, during his visit to WG Y. The chief and his braves performed a war dance around the microphone.

United States after the war, which isn't listed as dull business.

Until that day, which mercifully the gallant Captain Robertson didn't remember much about, when he and his fellow pilot had been dug, more dead than alive, out of seven feet of New Jersey marsh when their seaplane had crashed 1,000 feet.

It took the combined skill of five doctors and several nurses eight months to accomplish the miracle that mended his broken back and his crushed feet, one of which was too badly pulverized to entirely restore. And it took a never failing courage, an abiding faith, a gallant determination on the part of Captain Robertson to get well that made possible the success of the doctors and nurses.

After the hospital had done all it could for him, his private nurse, Miss Margaret Hogentogler, took him back to Pine Valley, where he had been stationed at the time of his accident. There he hoped to regain strength and once more take his place in the world.

It was this gentle, patient little nurse who had helped Captain Robertson to keep smiling through the pain . . . who had helped him remember the beauty of a blue summer sky, and who took him to the landing field almost the first thing after he was back at Pine Valley.

After he had been lifted into the cockpit, she sat beside him as he took the plane off the ground, only to find that the crooked foot and leg wouldn't work the rudder. With the use of only one foot the crippled flyer managed to make a safe landing, but he knew his flying days were over.

That day his nurse told him she believed he needed her more than anyone else in the world ever would, and on July 4 they were married.

A month later, spurred on by the love and faith of this wonderful girl, he had arranged to pick up the tangled reins of his life again, when once more fate stepped in. Through the fracture of his vertebrae, a very serious kidney complication set in, and from then on, Captain Robertson has faced three times each week the ordeal of the operating table.

And, still he wasn't licked. There were two reasons why he just couldn't be, his wife and little son. So he laughed and strummed on his ukulele and sang as he waited during the long months that somehow turned into years, for his chance to come back.

Among Captain Robertson's wartime buddies was Casey Jones, world famous ace, now president of the Curtiss Flying Service and associated companies. And when he came to see his old friend, Captain Robertson would bring out his ukulele and sing his flying songs in remembrance of the days they had flown together over the German lines.

A few weeks ago when the Curtiss Flying Service began broadcasting their programs over Station WRNY, Casey Jones went to the director and told him of those songs and Captain Robertson's ukulele. The next Friday, when the Curtiss Flying Service came up from Atlantic City, among the passengers on the Sikorsky was a very happy Captain Robertson and his wife, the ukulele with them. And that night, as he faced the microphone, there came to this gallant fighter the joyous realization that there was, after all, a place for him in the world . . . work to do . . . again he was flying through space, though in another way.

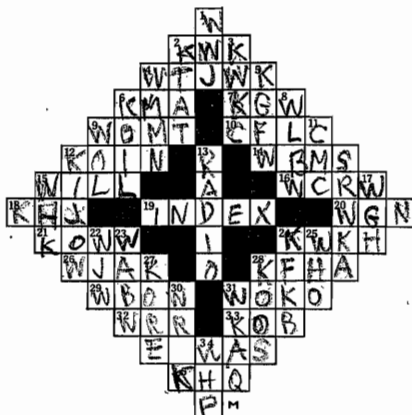
So, if you listen to your radio on Friday nights, between 8 and 9 o'clock, there comes the strumming of a ukulele and a war flying song, you probably never heard of before, LISTEN carefully.

**Show RADEX to
your friends and explain
how it enables
you to set your dials
for stations you have
never heard. They will
appreciate it.**

Cross Calls

Here's a Hard One for Real Fans

ONLY four readers were able to solve the puzzle in the September RADEX. This was undoubtedly due to an error in the description of "No. 3 Vertical," which read "On a low wave length," whereas it should have read, "On a low frequency," or "On a high wave length." This error on our part undoubtedly discouraged many puzzlers, although the following four assumed an error and thus solved the puzzle correctly: Frederick J. Orner, Maplewood, N. J., John A. Greer, Jr., Atlanta, Ga., N. J. McCroden, Albuquerque, N. M., and Mrs. George S. Vawter, Mansfield, Ohio. Leatherette covers have been mailed to the successful contestants.



This month's puzzle is so difficult that we are increasing the prizes offered. To the first one sending a correct solution of this month's puzzle, we will give a copy of Mr. Haan's book "Radio Trouble Shooting." To the next three, a full year's subscription to RADEX. To the next five, a leatherette cover, and to all others submitting correct solutions, a copy of the November RADEX.

The key to the puzzle follows:

Horizontal

2. A Missouri chain station.
6. A "seed" station.
7. Home of the "Hoot Owls."
9. In eastern Wisconsin.
10. On the "Mighty St. Lawrence."
12. Of the Portland "News."

Several assumed that "No. 8 Vertical" was also a mistake because WWJ of Detroit is now 920 kilocycles. They will find, however, that in the reallocation of November 11, 1928, WWJ was given 820 kilocycles but shortly after that was moved to 920. This description was therefore correct.

Mrs. Vawter comments that she had grown tired of ordinary crossword puzzles but enjoys this new form in RADEX with new zest as they compel one to work more than fifteen minutes to find the solution.

The correct solution of the September puzzle will be found at the end of this article.

The symmetrical and very clever puzzle in this issue was designed by a Maine subscriber, who modestly requests us not to use his name. This friend is very evidently a DX fan of long standing for some of his descriptions indicate a familiarity with call letters of several years ago.

14. A Jersey station.
15. A midwest university.
16. An Illinois station.
18. The old Los Angeles "Times" station.
19. A form of guide.
20. Of a great newspaper.
21. Formerly call of a station in Walla Walla, Wash.
24. "Hello World!"
26. Once located in Kokomo, Ind.
28. Owned by a western college.
29. Formerly used the call WRPI.
31. The Voice from the Clouds.
32. Oldest operating municipal station.
33. Most powerful college station.
35. N.B.C. outlet in Spokane.

Vertical

1. Pioneer Detroit broadcaster.
2. Formerly KFQB.
3. In western Missouri.
4. On 890 Kcy.
5. Low-powered Nebraska station.
6. Home of Mona Motor Oil.
8. Another oil city.

9. In Washington.
11. Old DX friend, with a new call.
13. Your hobby.
15. The home of RADEX.
17. At the "World's Greatest Harbor."
22. Formerly was WLBV.
23. A station in Wooster, Ohio, deleted a year.
24. Owned by a doctor.
25. A Life Insurance Co. station.
27. Last three letters stand for its state.
28. Farthest west U.S. station.
30. Ohio station, call formerly used in Michigan.
31. "Where the World's best coffee grows."
34. Recently changed call from WMBS. Here is the answer to September puzzle:

K
 W K Y
 W P S W
 W A A D
 W K B W
 W E B C
 W O A N
 W R R
 J

Sam Herman, NBC percussion expert, boasts of being the shortest xylophone player in radio. He is only five foot five inches tall, but despite that, the leverage he applies to the mallets for his instrument is said to be terrific.

From the "Sidewalks of New York" to the Fifth Avenue studios of the NBC in two jumps is the achievement of Bob, the street musician, wandering saxophone player familiar to theater crowds on Broadway.

His first jump was to the Victor recording studios last month, when Director Nat Shilkret heard him playing on 96th Street near Broadway.

"Bill" Munday, Jr., famed announcer of football games and boxing matches and sports writer for the Atlanta Journal, claims the record for traveling the longest distance to the shortest job. Twice within recent weeks, Munday has ridden from Atlanta to New York for a five-minute sports talk during the Gillette program. It takes him twenty-four hours to make the journey each way.



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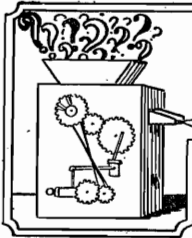
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The QUESTION MILL

Conducted by
ENNO R. HANN, Technical Editor

I have a neutrodyne receiver using A and B-batteries. How can it be arranged to work on direct current? The tubes used in the set are of the 201A type.

Some time ago Philco units were manufactured for use on direct current. These units supplied both A and B-current for receivers using 201A tubes. It seems to me that the cheapest and easiest way to make your receiver work on direct current would be to get such a unit. They are not being made at the present time owing to the increasing demand for all-electric receivers using A.C. tubes, but it will be comparatively easy to pick one up at a mail-order house. You can continue to use your 201A tubes provided they are in good condition.

It is nearly impossible for me to get a good ground connection for my radio set as the soil is dry and sandy. What can I do to obtain better reception?

If you can drive a pipe or rod deep enough to reach moist earth, or if you can connect to a water pump, your problem is solved. However, another remedy is to use a counterpoise instead of a ground. A simple counterpoise can be made by stringing a wire under the aerial, a few feet above the ground. This wire should be just as long as the aerial and it should be erected directly under and parallel to the aerial. A lead-in wire is connected to the counterpoise in the same manner as the lead-in wire on the aerial, and the counterpoise lead-in should be connected to the ground binding post of the receiver. The counterpoise acts as a counter-capacity and provides a condenser effect, making a good substitute for a ground.

In our apartment building aerials of all sorts run on the roof in every direction. One of them runs parallel to mine and as about two feet away. Will this interfere with my reception?

If your neighbor's receiver on the aerial that parallels yours, is of the regenerative type, you will hear squeals and whistles in your reception when both sets are in operation. Make arrangements with him to tune in the same station at the same time. When he twists his dials in tuning, you will hear the whistles if his set is of the reradiating type. If, after such a test, no interference is experienced, you may be assured that his aerial does not cause you any trouble.

I have a few old audio-frequency transformers and none of the terminals are marked. How can I tell how to make the right connections when installing them in a radio set?

The coil ends furthest away from the core of the transformer are the ends of the secondary winding, while those nearest the core are the ends of the primary winding. The secondary tap close to the outside goes to the grid, the other secondary tap is the filament negative. On the primary side the tap close to the core goes to the B-positive while the other tap goes to the plate.

I have a 6-tube receiver using UX-199 tubes. When anyone walks across the room, or the set is jarred, there is a growling noise. How can I remedy this trouble?

You are troubled with "microphonic" noises which are especially likely to occur with UX-199 tubes such as you have. Vibration causes the tubes to shake, which in turn causes variations in the electrical action of the tube. Mount the set on sponge-rubber cushions. If this does not cure the trouble, change the detector socket for one of the cushion type. Also mount the loud-speaker on a piece of sponge-rubber and do not allow it to face the receiver. Often the trouble can even be overcome by merely switching tubes.

When I turn one of my dials to 97 there is a rasping noise which stops the moment I cease turning the dial. What causes this and what can I do to cure it?

Most likely the rotor side of the variable condenser to which the dial in question is attached, is making contact with the stator side of the condenser. In other words the plates are touching when you turn the dial to 97. Readjust the condenser so that the movable plates run freely between the stationary ones without touching them. Perhaps only one plate is bent and touches. It has even been found that a metal burr on a rotor plate, if the rotor plates have been punched out of sheet metal in the manufacturing process, has loosened, and forms a hairlike projection, which is hardly visible but nevertheless is sufficient to cause the trouble.

My portable receiver, a 6-tube affair, using UX-199 tubes works fine at home, but when I try to operate it at my office, on the third floor of a modern 12-story building, it is nearly impossible to get signals. Local stations are very faint and it is entirely impossible to tune in an outside station. The moment I return home with the set the trouble is over. What causes this and how can I cure it?

Your portable receiver, like most others of this type, has a small loop to pick up signals from the air. When a loop-operated receiver is placed inside of a steel-constructed building, and I infer that your office building is of this construction, the steel absorbs most of the radio energy and grounds it, acting as a shield over the receiver. The remedy is to hang a length of insulated, stranded wire out of the window, and connect it to a primary winding on the loop, which can be made by merely wrapping a single length of lampcord around the loop four or five times. Take care, however, that no part of this improvised aerial is grounded.

I live in a large apartment house where new tenants have the habit of cutting down some of the old aerials to make room for their own, thinking, perhaps, that they are no longer in use. Mine has been cut down three times and I wonder whether I can substitute an inside aerial. Will you kindly advise?

Get a Dubilier socket antenna and your troubles will be over. Plug it in at any wall socket. The only person likely to interfere with it will be the maid, when she sweeps, and that will be entirely accidental.

Several months ago I obtained a 3-tube receiver. It has been working well up to this time, when, for no apparent reason, the set went dead. I know very little about radio and live quite a distance from any one who can help me. The set works on dry cells and I have replaced them, but this did not help. Where should I look for the trouble?

It is possible that you have one or more defective tubes, a short circuit in the set or in the aerial system, a broken connection, or a broken loudspeaker cord. Probably you did not connect the new batteries correctly.

I have a set having only one stage of radio frequency, a detector and two stages of audio-frequency amplification. Will an additional stage of radio frequency increase the volume?

Radio-frequency amplification will increase the range of a receiver but it will not increase the volume of signals coming from nearby stations. Only the distant stations will be brought in louder by an additional r.f. tube.

I notice that when my storage battery is fully recharged, the liquid seems to be disturbed and bubbles arise at the surface, while the charge is still connected. Is this a symptom of overcharging?

Moderate "boiling" or bubbling at the surface of the electrolyte is quite normal under the conditions you mention. This is typical of all storage batteries at the end of a charge. However, it is well to remember that the rate of charge of a radio storage battery should not exceed five amperes. A slow overcharge, now and then, is beneficial for the battery as it tends to cure a slightly sulphated condition of the plates. Any spray left on the top of the cells should be wiped off with a cloth moistened with a diluted solution of ammonia after the charge has been completed and the caps replaced on the cells.

We have an Amrad Model 70 A.C. receiver, and are experiencing trouble in
(Continued on page 63)



MANY interesting comments and suggestions are contained in a letter this month from R. W. Herzer, 338 Kingsway, Winnipeg, Manitoba. "I picked up a RADEX by accident in a Minneapolis news stand last spring," he writes. "Now you can bet your boots that I'm not going to let it go. It has given me my first real thrill in DX. Our set is Canadian-make, a Rogers Batteryless. To date I have logged 142 stations, chiefly from the central and western states. More are coming in continually."

Mr. Herzer thinks it too bad that so many of our English letters sound so much alike, such as F and S, C and G, and suggests that announcers use words beginning with the letter, like "J as in John." He states, however, that oftentimes he identifies stations even where he cannot distinguish the actual call letters "a thing that is easily possible through RADEX."

A thing puzzles our Winnipeg friend that many people have written us about. That is, why they receive distant stations of lesser power than other stations nearer home. There are of course many factors in distant reception which affect their waves — geological, meteorological and environment. There are "blind spots" in this country, particularly in California, in which no radio waves seem to penetrate. Here in Cleveland we have great difficulty in receiving Buffalo, but no trouble at all with stations beyond.

Direction of Aerial

Mr. Herzer asks, "Is it true that programs are loudest from a station when a line drawn between the two cities is at right angles to the aerial and least loud when the line is parallel to the aerials?" Mr. E. R. Haan, in his book "Radio Trouble Shooting," says: "It has been found that aerials manifest a slight directional tendency which is more pro-

nounced the longer and the lower the aerial is erected. The pick-up value is greatest for broadcasting stations directly in line with the aerial and toward which the lead-in end of the aerial points." We imagine this is very largely a theoretical difference, however, and doubt if it would be noticeable in actual practice. Perhaps some of our readers who are using two aerials pointing in different directions can tell us of their experiences.

Permits to Construct

"Can you give me any information about KPWF, listed in RADEX at 1490 kilocycles and located at Westminster, Calif.?" asks Dr. Frank Cameron Kinsey, of Grand Rapids, Mich. "I have never heard this station, although I get Cuba, Seattle, and five other California stations, some with only a fifth of the 5000 watts you list for KPWF. I wrote a letter to this station and it was returned marked 'Unclaimed.' Can you give me the hours on which this station broadcasts?"

The radio law requires that anyone desiring to erect a new station must first file an application with the Federal Radio Commission. If their application is acted upon favorably they are given a Construction Permit. They then proceed with their station and as they may take to the air at any time, RADEX has been listing them as regular stations. When our type is again reset, however, we shall designate such stations with a symbol, indicating that they may not yet be on the air.

Better Than Ever

"It is a pleasure to subscribe to a magazine knowing that each issue will be better than the last. I am more than pleased with your September issue," writes H. Linden Zell, of Birmingham, Ala. We have had many similar comments upon the improved appearance of RADEX, due to the use of illustrations, the tabbed index, and other features.

Our old friend, C. M. Falconer, of Baltimore writes: "The September RADEX is bigger and better than ever. With its help I have continued to DX definitely for the stations that I want. Many persons overlook the fact that several stations divide time and frequency. Consequently when they fail to get a station that they know, they jump to the conclusion that that channel is silent when with a little patience they could easily add a new station to their list." We expect to adopt a system of symbols when we reset our type, which will indicate those stations which share time and frequency as well as those which broadcast during daytime only. This will help materially in "fishing."

"Last March I purchased one of the new Sparton Equasonne 930 electric sets. Within a few days after, upon the advice of a friend, I secured a copy of RADEX. I immediately began 'fishing' with its help. We live in the exact center of New York state, in the midst of the high powered stations. However, to the present writing, with the aid and assistance of RADEX, I have logged over 126 stations extending from WCSH at Portland, Maine, to KFSD at San Diego, Calif. The west coast stations come over in wonderful form during the winter and are right on the dial markings that RADEX gives them." Thus writes Ronald W. Coates, of Oneida, N. Y., when sending in a subscription for a friend and for himself.

Those Leatherette Covers

We have had a number of inquiries as to whether we can have their name stamped in gold letters on those blue, leatherette binders for RADEX. We will be glad to do this when requested and will charge only the actual cost to us, namely, 25 cents per line. Sets are so beautiful nowadays that many people are ordering these covers to be in harmony with their sets as well as to protect their RADEX and make it easy to enter dial readings because of the stiff backing.

Christmas will soon be looming over the horizon and we hope our readers will remember that RADEX makes a most acceptable gift. From 25c for a single copy up to \$3.50 for two years subscription with leatherette cover, RADEX will

prove to be a Christmas gift that will please your friends. Perhaps we ought to write (Advertisement) here but we thought you ought to know about it.

Low Powered DX

Adding to the discussion of the possibility of receiving far-distant stations of low power, Frederick J. Orner, Maplewood, N. J., writes: "I have been interested in the letters in the question mill regarding reception of KFEL. I, for one, would certainly not doubt the word of this listener. In the spring of 1928 I heard KGEW of Fort Morgan, Colo., and KDYL of Salt Lake City, both supposedly using 100 watts at the time. This reception was with a one-tube home-made receiver. I have verifications from both stations. During the previous winter my log included WHBM, Excelsior Springs, Mo., and WRCV, Norfolk, Va., each using 100 watts, WLWQ, Atwood, Illinois, with 25 watts, and WMBG, Richmond, Va., with 15 watts, and several other low-powered stations within a radius of 1,000 miles."

Off Their Frequency?

"In locating stations from RADEX most of them come in on my set from 20 to 50 kilocycles away from their rate in RADEX," writes W. E. Peck, of Detroit, Mich. Mr. Peck has a radio set with the dial marked in kilocycles. Because stations do not come in with the kilocycle rating shown in RADEX does not mean that their rating is wrong, or that they are off their frequency. The ratings in RADEX are correct and the Government does not allow any station to vary from its frequency more than one-half kilocycle either way, or less than one point on the dial. The trouble is that it is quite impossible to show the kilocycle readings on a dial correctly, unless each individual set is calibrated. We have said before, that we believe manufacturers make a mistake when they mark their dials in kilocycles. Persons owning such sets ought to use their kilocycle numbers merely as dial numbers and enter them as dial readings in the spaces in their RADEX rather than attempt to tune in stations by the kilocycle numbers on the dials.

(Continued on page 20)

Banish the Direct Advertiser

FROM "RADIO"

THE stage is set for the greatest season in the history of radio broadcasting. The manufacturers are geared to top production, the salesmen are pepped up to beat last year's bogie, and the stations promise the finest programs ever. But there is one bad actor who must be hissed off the stage if all the preparations are not to be for naught. This discordant note in the symphony of radio is the direct advertiser. For a long time he caused only a relatively few stations to lose their audiences. But now he monopolizes nearly all of them at least part of the time. And as a consequence those who own radios turn them off when the selling talk starts and those who don't own sets refuse to buy until after the selling talk stops.

Direct advertising over the radio benefits nobody except the agent who gets a commission for selling the time. It harms the advertiser by breeding ill-will for his product. It hurts the station by causing it to lose listeners. It sickens the industry by decreasing sales. And, if not stopped soon, it will kill radio broadcasting.

Nobody objects to a little publicity during a program. We can all be broad-minded enough to laugh with good grace at the patronizing manner in which we are told that we are enjoying some good music because of the good-heartedness of Whosis & Co. in sponsoring a program.

We will even suffer them to tell us that they manufacture false teeth for false-faced falsettos, and we will buy them when we become so afflicted.

But when they tell us that their false teeth are better even than the molars which nature gave us and that everyone should have his present dental appendages yanked out by the roots so as to enjoy food chewed with Whosis' teeth, we rise up in our wrath and shut off the set for the night. And then when they tell us tomorrow night that Whosis' teeth are guaranteed to chew 10,000 miles of macaroni without wearing out and that they are insoluble in the denatured alcohol that masquerades as fine old Scotch, we get real mad and shut off the set for the rest of the week.

Nor is there undue exaggeration in this picture of

BALLY HOO

Then and Now

1899

"Now, ladies and gents, kindly gather closely around the wagon. Small boys keep back so that the older people wishing to make purchases may get in where they can hear. The boys are going to play on the banjos in a few minutes—ho, this way everybody. Now, ladies and gents, we are introducing in this locality for advertising purposes only Doctor Leapliver's Famous Compound Remedy for man and beast at a price so low as to be amazing. I am not going to ask a dollar for this large home-size bottle. I am not going to ask even 75, 50 or 30 cents, but for the breath-taking pittance of 25 cents, a quarter of a dollar, two dimes and a nickel, you get the full, over-sized bottle with complete directions for taking. Now as the boys play on the banjos, my assistants will pass among you. Remember this remedy will cure coughs, headaches, goitre, rheumatism, spavin, ringworm, or —"

1929

"Good evening, ladies and gentlemen. The following program is brought to you by the courtesy of the Talkitup Chewing Gum company, makers of the chewing gum with a personality. We trust you will apply at your nearest dealer for a sample of this meritorious product. Remember, it does not stick to the teeth, enmesh the gums, or lose its flavor on the bedpost over night. Our first number tonight will be "There's a Rainbow Around My Left Wrist," played by the Talkitup Jazz orchestra. There will be a brief pause for station announcements."

human reaction against the bally-hoo with which the air is filled. Mr. Whosis may like it because he likes to hear his own name—the first thing he ever heard, wrote or learned to spell, his most precious gift to his wife and children, and the great heritage which he bequeaths to posterity. But no one else would pay a burned-out tube for all the Whosis hoey that was ever perpetrated on a long-suffering public.

Radio advertising is, like all forms of advertising, an intrusion. It is not invited. Yet even an uninvited guest may be made welcome, or at least received on sufferance, if he is not obnoxious and does not stay too long. If program sponsors can get this point of view they can help the broadcasters to hold a worthwhile audience.

The listeners can roar, the radio men can rail, and the public-respecting advertisers can object, but the only one who can put a stop to this evil is the manager of the offending station from which such halitosis emanates. Nobody has to tell him that he is in bad odor. He knows it but lacks the backbone to say no to an advertiser who should know better. Why should radio's obituary be "died from halitosis?"

Our Frontispiece

THE two attractive young people on this month's cover are Thelma Walette, soprano, and William Henry Miller, lyric tenor. These are two among the many to whom the Atwater Kent auditions opened new fields. They are now heard regularly over WTAM, Cleveland, in the Guardian Helpfulness Hour, together with a symphonic orchestra.

Thelma Walette, who says that one of her earliest recollections is that of standing on kindergarten chairs with her sister singing for the children, entered the Atwater Kent contest last year, with the result that she won both local and state contests and stood second in the semi-finals at Chicago. She has a delightful voice and her fresh, youthful singing has won many admirers.

William Henry Miller began his musical career when eight years old. His home was in Akron, Ohio, where he

gained seven years' experience in the St. Paul's Episcopal choir. He entered the local Akron audition in 1927, achieving first place. At the Cleveland audition, which was open to all Northern Ohio, he again stood first and went on to Chicago to sing in the district finals. Miller is a favorite with radio audiences and has achieved a high place in musical circles in Cleveland, his present home, for a young man of only 22. He has a strong voice of remarkable volume, colorful and of much warmth.

The Guardian Trust Company of Cleveland is among the first of the financial institutions of the country to sponsor programs, and the two young voices which will be heard every Tuesday evening at 7:30 over WTAM will be well worth tuning in.

*Subscribe to RADEX by
the year. Keep up-to-
date in radio.*

AT LAST—



A Radio Book

that passes right over theory and goes directly into what to do when something goes wrong.

Stripped of confusing theory and deals with practical facts in a manner amazingly easy to understand.

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Chicago, Illinois

Is Telepathy Akin to Radio?

Interesting Experiment in Broadcasting

RADIO waves are mysterious enough when they carry the vibrations of the human voice. The question now arises, are they also capable of carrying the mental processes of the human brain? In a test on July 11th a leader in psychic research, whose name was announced merely as "Dunniger" experimented in the broadcasting of mental images through WJZ, New York; WJR, Detroit; WREN, Kansas City; KWK, St. Louis; and KDKA, Pittsburgh. Dun-

ned when Dunniger announced that more than 55 per cent of the listeners to his "ghost hour" had accurately received at least one of the three thought projections which opened the psychic broadcast series.

Had the 55 per cent been accurate in two of the three test ideas psychic experts would have been forced to admit the results as evidence of thought transmission. As it was, Dunniger claims to have established the most impressive case for

Here we have the Arcadians of KOA. This interesting group is heard every Tuesday from 6:30 to 7:00 p.m. (Mountain Time). Standing: J. Alden Grubb, tenor; Mary Wood Beaty, soprano; Lucile Fowler, contralto; Clarence C. Moore, bass. Seated: Freeman H. Talbot, director; Faye Sewell, pianiste.



niger concentrated his mind on three different objects and attempted to transmit his thoughts to radio listeners throughout the country. The three things he thought of were written down and sealed in an envelope and delivered to a committee of reputable persons before the broadcast. Listeners were invited to concentrate likewise and to send to the station from which they received the program the mental images which they received. The records from the listeners of their thought impressions were checked against the written record, and the possibility of thought projection by radio was indi-

telepathy in the whole history of psychical research. "It is extremely significant," Dunniger declares, "that it was by the aid of radio that the new record was established. No one is positive by what means radio waves reach the listeners and perhaps in its rays will be found a clue to the understanding of telepathy."

The sealed envelope containing a note of the three thoughts was placed in the hands of Reinald Werrenrath before the broadcast and this was not opened by the test committee until "Roxy," the chairman, read the contents in the second ghost hour on July 18th.

Of the replies received more than 40 per cent clearly received the thought of Abraham Lincoln. Considerably less than this percentage saw "397" as the "number of three digits," although over 40 per cent had two of the digits correct and many others reported 793 instead of 397. This latter is a common phenomena in telepathy, known as reverse mental reflection, which has given rise to the theory that in thought transference the mind is like a mirror.

An amazing number of the listeners clearly identified the "geometrical figure" as Dunniger intended, that is, a small house with four windows and one door, with a crude chimney and simple triangular roof. Many even had an intuition that the ideas in No. 1 and No. 3 were connected. They associated the thought of President Lincoln with a crude log cabin.

Only 2.5 per cent were completely accurate, but even this is unusual when it is considered that 2000 replies were merely a cross section of the potential audience.

The nature of the replies indicated that most of the interest in the tests was centered among more highly educated people. Professional men were predominant among those who replied.

From the University of Pennsylvania one correspondent in the Wharton School of Finance and Commerce asked for booklets and literature on the subject, explaining, "It might be an asset in playing the stock market."

The Hard of Hearing

(Continued from page 7)

a hotel in my own home town, to hear the roar of mighty Niagara Falls, to hear a symphony concert, to hear a sermon by a favorite New York clergyman speaking in New York, to hear the whirr of the giant Graf Zeppelin at Lakehurst — Wonderful? Why, it's nothing short of a miracle to me.

I have also had the interesting experience of speaking into the mike, fortunately with a pleasant result. I had broadcast one afternoon about our work for the hard-of-hearing. Not long afterwards a charming woman came to our

Club room and asked for me. She told me she wanted me to know how much my story over the radio had helped her and that she was eager to work with us. She explained that she was slightly deafened, a stranger in the city, and rather depressed and lonely. When she idly picked up the radio that day and heard some one telling in a cheerful voice of the joys to be found in life, for the hard-of-hearing, she felt the message had been sent straight from the sky to her.

To think I had been the means of helping a person by a twenty-minute radio story. Talking through the air? I was *walking on it!*

I should like to go on the air daily and implore: "Hard-of-hearing people, try the radio! Try! There is untold pleasure and profit to be had from listening in."

"Dear Mr. Editor"

(Continued from page 14)

Poor Volume

Mr. Peck also complains that he is unable to bring in stations of the lower frequencies (higher wave lengths) with satisfactory volume. This is a very common complaint and one method of meeting it is to prepare a loading coil, preferably in spider-web form, of 40 or 50 turns. Attach the lead-in firmly to one end of this coil and the other end to the antenna post of the set. This, in effect, lengthens the aerial and should increase the volume of the low frequency stations, but it will also decrease the volume of the higher frequency stations. Therefore if this device proves satisfactory, it is best to arrange a double-pole, double-throw switch so that the coil can be cut in and out of the aerial as desired.

Loose Connections

A subscriber in Oshkosh, Wis., writes that the set shuts off suddenly and starts up again. He discovered that there was considerable play in the volume control and that if it were pressed sidewise the set would shut off. This indicated a loose connection somewhere in the volume control and this was found to be the case.

Radio Becomes Big Business

Chicago's Growth an Example

THE importance of radio in modern life is being demonstrated by important changes and improvements being made by several of the big stations in the mid-western metropolis.

Station KYW, owned by the Westinghouse Electric & Manufacturing Company, programs presented by the Chicago Herald and Examiner, has recently received a construction permit for the erection of a 50,000 watt transmitter which is to cost approximately \$250,000. It is contemplated that this figure will run to \$500,000 some time in the future. In addition this station, it is reported, is considering removal to new and elaborate studios.

Station WENR, owned and operated by the Great Lakes Broadcasting Company. This 50,000 watt station has recently contracted for an expenditure of \$100,000 for the installation of a one hundred per cent modulation system in its transmitter near Downers Grove, Illinois. In addition, approximately \$100,000 will be spent on the new studios and studio equipment which will occupy two and one-half floors on top of the 20 Wacker Drive Building, one of the city's largest building projects, which is to house the new Chicago Civic Opera House. Incidentally, this will give WENR the highest studios in the world, as they are to be on the forty-first, forty-second and part of the forty-third floors.

Station WMAQ, owned and operated by the Chicago Daily News, is about to move to its new home in the new Chicago Daily News Building. It will occupy two and one-half floors and will be one of the finest broadcasting plants in the country. The approximate cost of the new offices and studios is \$100,000.

Station WBBM, owned and operated by the Atlass Company, Incorporated, which broadcasts in association with the Chicago Evening American, has received a construction permit for the erection of a 50,000 watt transmitter. According to Ralph Atlass, one of the owners, it will be in operation with 25,000 watts within the next five weeks, and with 50,000 watts in

approximately two months. Construction of the new transmitter is under the supervision of W. E. Branch, chief engineer of WBAP, Fort Worth, Texas, and it is expected to cost approximately \$125,000.

Station WGN, owned and operated by the Chicago Tribune, has nearly completed the remodeling of its studios and offices on the eleventh and twelfth floors of the Drake Hotel. One new studio has been built and another, which was rarely used, has been entirely redesigned and remodeled. This change in reality adds two new studios to the two that are already in operation in the Drake Hotel. The station has just purchased and installed a new Wurlitzer pipe organ that is being used in conjunction with a popular orchestra. The approximate total expenditure is \$35,000.

While no information is forthcoming from the western headquarters of the National Broadcasting Company, some of the details of its magnificent new studios and offices here have been learned from outside sources. Now at 180 North Michigan Avenue, the new mid-western home of NBC is to be on the nineteenth and twentieth floors of the Merchandise Mart, said to be the largest building in the world. It is understood NBC will have equipment for at least ten studios and floor space of approximately 60,000 square feet.

Excerpt from a letter received by Ian Firth, an NBC production manager, from a friend in England who heard the re-broadcast description of the recent Graf Zeppelin's arrivals at Lakehurst:

"The announcer fellows who did the running commentary from the hangar and the roof of the hangar were excellent. Their American good English was understood well on 'this side.'"

Feminine fans of Rudy Vallee will listen in vain for his crooning voice from now on. He played and sang his farewell this month before leaving for Hollywood with his band.

Common Tube Troubles

(Continued from page 4)

When the tube tips and the socket prongs have a film of corrosion over them, the grid and plate circuits are especially apt to be affected, but the filament connections usually do not suffer from slight corrosion at these points. However, loose contacts at the filament prongs may cause the tube to flicker or go out entirely. Every radio owner should occasionally remove all the tubes from the sockets and clean off the tips with a small nail file or with a piece of emery cloth. The socket prongs should be given a similar treatment, and this is best done by holding a strip of emery cloth over the end of a spudger or any flat stick about 5 or 6 inches long, which permits one to get at the prongs without any trouble. It is advisable to disconnect the B-battery leads while performing this work, as one of the socket prongs might be loose and by pushing it over against an adjacent prong, a short circuit might result.

Microphonic Action of Tubes. Almost every radio owner who uses a "hard" tube for a detector, has, at some time or other experienced a loud, howling noise, which increases in volume and rises in pitch, making reception an impossibility. This is what is known as a "microphonic," a noise caused by one or more vibrating tubes, the detector usually being the offending one. To make sure whether the trouble really is a microphonic, grasp the tube securely while the noise is heard; if it stops the trouble has been located. As just stated, the cause of a microphonic is vibration of the tube. There may be a number of sources of such vibration, and the removal of the source is the most positive remedy. This, however, is not always possible, as the source may be the loudspeaker, and without this one could have no reception at all. Then again the vibration may be caused by street traffic, by machinery in the building, by persons walking around, or even by a battery eliminator.

The vibration is transmitted through the walls, floors, table, or stand on which the receiver is placed, or it may even be

transmitted through the air. Sometimes there seems to be no external source of vibration at all, and the tube just starts to produce the noise, seemingly of its own accord. The quality of each tube is slightly different from that of another and one tube may therefore be much more microphonic than another, a variation of uniformity which can naturally be expected when tubes are manufactured by the thousands in rapid quantity production. Also, it will be found that the small, 3-volt, dry-cell tubes have a greater tendency toward being microphonic than the large 5-volt tubes.

Sometimes the trouble can be cured by merely "switching" tubes, or by decreasing the plate voltage of the detector or of the first audio tube. There are also many devices on the market for curing this trouble. These are usually heavy shields or weights to be placed on the tube, or some means of holding the tube rigidly in position. It is better to arrest the vibration before it enters the set. This can be done in various ways. Get a few pieces of one-inch sponge-rubber and provide cushions of this material under both the receiver cabinet, the eliminator, and the loudspeaker, the latter being the most common cause of microphonic trouble. The provision of cushion sockets, instead of rigid sockets will also be found an effective method of eliminating this trouble. If this is not entirely effective, remove the loudspeaker as far as possible from the set preferably on another stand or table. Also be sure to turn the bell of the loudspeaker away from the set, instead of toward it, for it has been found that the air vibration caused by reproduction of sound by the loudspeaker is transmitted to the tubes, and in many cases this alone is enough to cause them to vibrate.

These measures are certain to reduce the trouble considerably, and in most cases will eliminate it entirely. But should it still persist, change the hard detector for a detector tube of the "soft" type, such as a UX 200A or CX 300A tube. These tubes are less microphonic, will give better tone quality, and are much more sensitive than the "hard"

tubes. With the popular use of consoles nowadays, much trouble from microphonics is experienced, by the proximity of the built-in horn to the receiver and its rigid attachment to the console. In such cases the speaker should be unfastened from the console, and then suspended less rigidly.

General Care of Tubes

Always treat the tubes with care; never tap them severely or put them down with a jar. Dropping a tube nearly always ruins it, even if the glass does not break and even if the filament still lights. Keep the ends of the tube tips clean with fine sandpaper or emery cloth to prevent corrosion, which sets up a high electrical resistance and reduces the efficiency of the receiver considerably. It should be remembered that tubes are the most important factor in a radio receiver and should always be kept in good condition. They should be replaced if defective, in order to obtain good reception.

Changing programs while dancing is easy with the remote control.



For Football Fans

FOOTBALL enthusiasts from coast to coast face the most interesting season in the history of broadcast football this year. Nineteen outstanding intercollegiate football games will be described for listeners through NBC networks this year.

Almost every Saturday from October 12th to December 28th, radio listeners will have a choice between two outstanding grid contests according to the schedule. While all of the nineteen games are definitely scheduled, the names of the contesting teams in two of the events are being withheld for a short time by agreement with the college athletic organizations involved.

The complete schedule of games follows:

October 12th

Navy vs. Notre Dame at Baltimore.

Yale vs. Georgia U at Athens, Ga.

October 19th

Harvard vs. Army at Boston.

Other game to be announced later.

October 26th

Harvard vs. Dartmouth at Boston.

Army vs. Yale at New Haven.

November 2nd

Princeton vs. Chicago.

Navy vs. Univ. of Penna.

November 9th

Army vs. Univ. of Illinois.

Harvard vs. Michigan.

November 16th

Yale vs. Princeton.

Other game to be announced later.

November 23rd

Harvard vs. Yale.

Ohio State vs. Univ. of Illinois.

November 28th

Univ. of Penna, vs. Cornell at Philadelphia.

November 30th

Dartmouth vs. Navy.

Army vs. Notre Dame.

December 7th

Georgia Tech. vs. U. of Ga. at Athens.

December 28th

Army vs. Leland Stanford at Palo Alto.

WHAT'S ON THE AIR TONIGHT?

A WEEKLY CALENDAR

Leading Features of the Network Programs

Time is given by Eastern Standard. For Central Time, subtract one hour, for Mountain Time, two hours, and the Pacific Time, three hours.

Station lists beginning with WFAF and WJZ are the National Broadcasting Co., Inc., while those beginning with WABC are the Columbia Broadcasting System.

Daily (Except Saturday and Sunday)

6:45-8:00 Tower Health Exercises	WEAF WEEI WFI WRC WGY	KOIL WSPD WHK WLBW WMAL WCCO WISN WFBM
8:15-8:30 Morning Devotions	WEAF WRC WGY WCAE WGR	WJZ WLW KWK WREN KSTP WSB WBT KVOO WJAX KSL WBAL KDKA WHAS WJZ WBZA WAPI WRVA WFAA
8:30-8:50 Cheerio	WEAF WRC WGR WGY WCAE	3:30-4:00 Songs and Bows
8:50-9:00 Parnassus Trio	WEAF WEEI WRC WCAE	WEAF WRC WGR WGY WWJ WOW WHO
11:00-11:30 Ida Bailey Allen	WABC WCAU WNAC WEAN WFBL WMAK WCAO WJAS WADC WGHP WBBM WOWO KOIL WSPD WHK WLBW WMAL WISN KMOX KMBC WKRC WCCO	4:00-5:00 Cathedral Hour
11:15-11:30 Radio Household Institute	WEAF WEEI WTIC WJAR WTAG WCSH WLIT WRC WGY WGR WCAE WTAM WWJ WSAI KSD KFKX WDAF KSTP WTMJ	WABC WCAU WNAC WEAN WFBL WKBW WCAO WJAS WADC WKRC WGHP KMBC KOIL WSPD WHK WMAL WCCO WFBM WISN KVI KDYL
12:03-12:45 Twelve o'Clock Trio	WEAF WWJ WAPI WTAG	4:00-5:30 National Sunday Forum
12:45-1:45 Luncheon Music	WEAF WWJ WAPI WTAG	WEAF WTIC WTAG WCSH WGY WGR WCAE WSAI WOW WRVA WBT WJAX WHAS WMC WSB KVOO WKY KOA KHO KPO KGO KOMO WAPI WAOI WFAA KPRC WJAR WOC WWJ
2:00-2:30 Montgomery-Ward Program	KFKX KSTP WHO WOW KOA KWK WDAF WHAS WSM WMC WSB KVOO WFAA	4:00-5:30 National Light Opera
2:30-3:15 National Farm and Home Hour	WJZ WBZ WBZA WBT WJR WHAM WLW KWK WREN WRC WHO WTMJ KSTP WEBC KDKA WBAL WRVA WDAF WJAX WSM KOA WFAA KPRC KVOO WHAS KYW WMC WAOI WIOD WPTF WKY WOW	WJZ KDKA KWK WBAL KSTP 5:00-5:30 French Trio
2:45-3:00 Theronoid Health Talk	WABC WCAU WFBL WKBW WCAO WJAS WADC WOWO KOIL WSPD WHK WLBW WMAL KMOX WKRC	WABC WISN WJAS KMBC WCAO WADC WFBM WMAL WSPD KOIL WKRC WKBW WEAN WNBC WDYL WCAU
6:00-6:45 Black and Gold Room Orchestra	WEAF WRC WCAE WLS WWJ	5:30-5:40 Tea Time Tunes
11:00-11:15 Amos 'n' Andy	WJZ WBZ WBZA WHAM KDKA WJR KYW KWK WREN WTMJ KSTP WEBC KOA KSL WDAF WRC WMAQ	WEAF WCAE WRC KSTP KVOO WKY KOA WGY
11:15-12:00 Slumber Music	WJZ WHAM KDKA WREN WRC	5:30-6:00 The Ballad Hour
		WABC WISN WJAS KMBC WADC WFBM WMAL WSPD KOIL WKRC WKBW WEAN WNAC WFBAN KDYL KVI
		5:30-6:30 Twilight Reveries
		WJZ WBAL WHAM WLW WREN WBZ WBZA KDKA
		5:45-6:00 Miami American Legion Bugle and Drum Corps
		WEAF WGY WGR WOC KSTP WHAS WKY KOA
		6:00-6:15 Echoes of the Orient
		WEAF WRC WGR WWJ KSD WCAE WHO KOA WGY
		6:00-6:30 Fox Fur Trappers
		WABC WNAC WHK WCAU
		6:30-6:58 Our Romantic Ancestors
		WABC WJAS WFBM WEAN WNAC WCAU WHK KVI KDYL WSPD
		6:30-7:00 Maestro's Hour
		WEAF WRC WGY WFI WGR WCAE WWJ KSD WOC
		6:30-7:00 Whittall Anglo-Persians
		WJZ WBZ WBZA WBAL WHAM KDKA WLW WJR KYW KWK WTMJ KSTP WEBC KOA KSL KPO KGO KOMO KHQ KGW KFI WREN
		7:00-7:30 Old Company Songalogue
		WEAF WEEI WJAR WTAG WCSH WLIT WRC WGY WGR
		7:05-7:30 The American Singers
		WJZ WBAL KDKA KWK WREN KOA WJR

Sunday

2:00-2:30 Troika Bells	WEAF WWJ WHO KSL WLS WOC
2:30-3:00 Milady's Musicians	WEAF WGY WWJ WHO WOW KSL WOC
2:00-3:00 Roxy Symphony Concert	WJZ WBZ WBZA WBAL KDKA WLW WTMJ KSTP KYW WJR WRC WFAA WEBC KWK
3:00-4:00 Symphonic Hour	WABC WCAU WNAC WEAN WFBL WKBW WCAO WJAS WADC WKRC WGHP WMAQ KMBC KVI KDYL

7:30-7:45 Sergei Kotlarsky
WABC WJAS WFBM WCCO WKRC
WFAN WMAL KVI

7:30-8:00 Retold Tales
WJZ WBZ WBZA KDKA KWK
WREN WKY KOA WJR WLW

7:35-8:30 Major Bowes' Family
WEAF WTIC WJAR WRC WGY
WCAE WWJ WSAI KSD WTAM
WOW WFJC WIOD WHAS WMC
WSB WKY WPTF WSM WOC
WRVA WAPI WTMJ KTHS

7:45-8:00 "The World's Business"
WABC WJAS KMBC WFBM WMAL
WCCO WKRC WFAN

8:00-8:15 Enna Jettick Melodies
WJZ WBZ WBZA WBAL WHAM
WKY WJR KWK WLW WREN
WFAA KPRC WOAI WHAS WSM
WSB WTMJ KSTP WMC KOA
KDKA KYW WEBC WIOD WBT
WRVA WAPI KVOO

8:00-8:30 La Palina Program
WABC WNAC WCAU WEAN WFBL
WCAO WJAS WADC WKRC WFBM
KMOX KMBC KOIL WLWB WMAL
WISN WMAK WGHP WOWO WSPD
WMAQ WCCO

8:15-9:15 Collier's Radio Hour
WJZ WBZ WBZA WHAM KDKA
WJR WLW KYW KWK WREN
WTMJ KSTP KOA

9:00-9:15 "Our Government," David Lawrence
WEAF WTIC WJAR WTAG WCSH
WRC WGY WCAE KSD WHAS
WKY WSAI WFJC WGR WSB
WMC WSM WFAA WOV WOA
WHO

9:00-10:00 Majestic Theatre of the Air
WABC WCAU WNAC WEAN WFBL
WMAK WCAO WJAS WADC WKRC
WGHP WBBM WOWO KMOX KMBC
KOIL WSPD WHK WLWB WLAC
WMAL WDBJ WJAR WNNC WDDO
WBRC WREC KLRA KFJF KRLD
WDSU WCCO WISN KLZ KDYL
WFBM KFH CFRB CKAC KVI
KFPY KFBK KMJ KOIN KHJ
K TSA KPRC

9:15-9:45 Tone Pictures
WJZ KDKA WREN WHAM KWK

9:15-9:45 Atwater-Kent Concert
WEAF WEI WFI WRC WGY
WGR WCAE WTAM WWJ WSAI
WGN KSD WOV KSTP KOA
KSL KPO KGO KFI KGW
KOMO KHQ WSM WMC WSB
WFAA KPRC WOAI WKY WDAF
WHO WSMB

9:45-10:15 Biblical Drama
WEAF WJAR WTAG KSL KPO
KGO WRC WGY WCAE WWJ
WSAI KSD WKY KPRC WMC
KOA WOW WFI WGR WHO
WFAA WTIC KHQ

9:45-10:15 At the Baldwin
WJZ WBZ WBZA WHAM KDKA
WLW KYW KWK WREN WJR
WEBC KSTP WTMJ

10:00-10:30 Arabesque
WABC WNAC WEAN WCAO WJAS
WADC WKBW WKRC WGHP WBBM
KMBC KOIL WSPD WHK WMAL
WCCO WISN KVI KDYL

10:15-10:45 Studebaker Champions
WEAF WTAG WJAR WTIC WCSH
WFI WRC WGY WGR WCAE
WTAM WWJ WGN KSTP WTMJ
WEBC KOA KPO KGO KGW
KOMO KFI KHQ WOW KSL
WOC

10:15-10:45 The Fuller Man
WJZ WBZ WBZA WHAM KDKA
WJR KYW KWK WREN

10:30-11:00 Around the Samovar
WABC WCAO WNAC WEAN WFBL
WKBW WCAO WJAS WKRC WGHP
KVI KDYL KMBC KOIL WSPD
WLWB WMAL WISN WCCO WMAQ
WHK

10:45-11:15 Sunday at Seth Parker's
WEAF WOW WHAS WJAX WKY
WCAE WWJ KOA WFJC WIOD
WRC WOC

11:00-11:30 Brokenshire's Coral Islanders
WABC WCAO WISN KMBC WADC
WFBM WMAL WSPD WKRC WMAK
WEAN WNAC WCAU KVI KDYL

11:15-11:45 Russian Cathedral Choir
WEAF WRC WJAX WIOD WKY
KOA WWJ WOW WBAP WOC

11:30-12:00 Choral Reverie
WABC WISN WCAO WFBM WMAL
WSPD KOIL WKRC WMAK WEAN
WNAC WCAU KVI KDYL

11:45-12:00 Armchair Quartet
WJZ KDKA WJR KWK WREN

11:45-12:00 Sam Herman, Xylophonist
WEAF WRC WOW WIOD WKY
KOA WWJ WOC WJAX WBAP

Monday

6:00-6:30 Mormon Tabernacle Choir
WJZ KPO KGO KOMO KDKA
WSM KOA WLW KWK KSL
WBAL

7:00-7:30 Buck and Wing
WEAF WRC WCAE KSD

7:30-8:30 Roxy and His Gang
WJZ WBZ WBZA WHAM KDKA
WJR KWK WRC WSM WSB
WIOD WCFL WSMB WAPI WPTF
WREN

7:45-8:00 Back of the News in Washington
WEAF WGR KSD WKY

8:00-8:30 Grand Opera Concert
WABC WNAC WEAN WFBL WFBM
WMAK WCAO WJAS WADC WKRC
WMAQ KMBC KOIL KVI WSPD
WMAL WISN WHK

8:00-8:30 Voice of Firestone
WEAF WEI WTIC WJAR WTAG
WCSH WLIT WRC WGY WGR
WCAE WWJ KYW KSD WOC
WOW WDAF WIOD KTHS WSMB
KSTP WTMJ WEBC WJAX WHAS
WSM WMC WSB WBT WRVA
KVOO KPRC WOAI WKY WFJC
WSAI WTAM WFAA WAPI

8:30-9:00 Ceco Couriers
WADC WCAU WNAC WEAN WFBL
WMAK WCAO WJAS WADC WKRC
WGHP WMAQ KMOX KMBC KOIL
WHK WLWB WMAL WCCO WHEC
WSPD

8:30-9:00 White House Concert
WJZ WBZ WBZA WJR WLW
KWK WREN WHAM KDKA KYW
WBT WIOD WRVA WJAX

8:30-9:30 A. & P. Gypsies
WEAF WEI WTIC WJAR WTAG
WCSH WLIT WRC WGY WGR
WCAE WWJ WSAI WGN KSD
WOC WDAF WTAM

9:00-9:30 Edison Program
WJZ WBZ WBZA KDKA WTMJ
WJR KYW WREN WEBC KSL
KPO KGO KOMO KFI KGW
KHQ KOA KWK WHAM KSTP

9:00-9:30 Physical Culture Magazine Hour	WHK	WLBW	WMAL	WBMB	KMBC
WADC WCAU WNAC WEAN WFBL	WCAO	WGHP	WSPD	WAIU	WJAS
WMAK WCAO WJAS WADC WKRC					
WGHP WMAQ WGL KMOX KMBC					
KOIL WSPD WHK WLBW WMAL					
9:30-10:00 General Motors Family					
WEAF WEEI WTIC WJAR WTAG					
WCSH WLIT WRC WGY WGR					
WCAE WTAM WWJ WSAI WGN					
KSD WOC WOW WDAF KSTP					
WTMJ WHAS WSM WMC WSB					
WBT WJAX WFAA KPRC WOAI					
WKY KOA KSL KPO KGO					
KFI KGW KOMO KHQ					
9:30-10:00 Chesebrough Real Folks					
WJZ WBZ WBZA WHAM KDKA					
KWK KYW WREN WLW					
10:00-10:30 Cabin Nights					
WJZ WBZ WBZA WJR KYW					
KWK WREN WHAM KDKA					
10:00-10:30 Burns Panatela Country Club					
WABC WCAU WNAC WEAN WFBL					
WMAK WCAO WJAS WADC WKRC					
WGHP WMAQ WOWO KMOX KMBC					
KOIL WSPD WHK WLBW WMAL					
WFMB					
10:30-11:00 Fio-Rito's Orchestra					
WJZ WREN KYW KWK WJR					
10:30-11:00 Floyd Gibbons—Headline Hunter					
WEAF WRC WGY WCAE KSD					
WOC WOW WWJ WGN WHAS					
WFAA KPRC KOA KSL WBT					
WTIC WTAG WMC WKY KPO					
KGO KOMO					
11:00-12:00 New Yorker Hotel Orchestra					
WEAF WGR KSD WOW WRVA					
WSM WMC WKY WTAM WWJ					
WOC WFJC WECB WAPI WJAX					
WSB WTIC WCAE					
12:00-1:00 Jack Albin and His Orchestra					
WEAF WRC WOW WSM					
Tuesday					
7:00-7:30 Roads of the Sky					
WEAF WTIC WRC WWJ WIOD					
WSM KOA WHO WCSH WFI					
KPRC WLS KSTP WTAG WCAE					
WTAM KSD WPTF KVOO WOAI					
KSL WAPI WRC WHAS					
7:30-8:00 Seconyland Sketches					
WEAF WEEI WTIC WJAR WTAG					
WCSH WGY WGR					
7:30-8:00 Lew White Organ Recital					
WJZ KWK WKY KOA WIOD					
WPTF WREN					
8:00-8:30 Pure Oil Band					
WJZ KDKA WHAM WJR WLW					
KYW KWK WREN KSTP WTMJ					
WEEC WHAS WSM WMC WSB					
WBT WJAX WRVA WBAL					
8:00-8:30 Michelin Men					
WEAF WJAR WTAG WCSH WFI					
WRC WGY WGR WCAE WFJC					
WSAI KSD WOW WDAF WEEI					
WTAG					
8:30-9:00 Master Musicians					
WJZ WBAL WREN KDKA					
8:30-9:00 Prophylactic Program					
WEAF WJAR WTAG WCSH WOW					
WFI WRC WGY WGR WCAE					
WSAI KSD WLS WEEI WHO					
WDAF WWJ					
8:30-9:00 Flying Stories					
WABC WCAU WNAC WEAN WFBL					
WKBW WADC WOWO KMOX KOIL					
9:00-9:30 Johnson & Johnson					
WJZ WBZ WBZA WHAM KDKA					
WJR KYW KWK WREN WBAL					
9:00-10:00 Eveready Hour					
WEAF WEEI WJAR WFI WRC					
WGY WGR WCAE WTAM WWJ					
WGN KSD WHO WDAF KSTP					
WEEC WHAS WSM WMC WSB					
KVOO WOAI					
9:00-10:00 Old Gold—Paul Whiteman Hour					
WABC WCAU WJAR WADC WGHP					
WBMB WHK WLBW WMAL WCCO					
WDEJ WREC KFJF KTSA WISN					
WNAC WEAN WFBL WKBW WCAO					
WOWO KMOX KMBC KOIL WSPD					
KLZ KDYL KLRA WTAR WWNC					
WLAC WDOD WBRC WDSU WFBM					
KFH KRLD WKRC WFRF WHJ					
KOIN KVI KFPY KFBK KMJ					
9:30-10:00 Dutch Masters Minstrels					
WJZ WBZA WBAL WBZ WHAM					
KDKA WLW KYW KWK WREN					
WJR WTMJ					
10:00-10:30 Williams' Oilomatics					
WJZ WBZ WBZA WHAM KDKA					
WLW KWK WREN WGN WBAL					
10:00-10:30 Fada Orchestra					
WABC WCAU WNAC WEAN WFBL					
WKBW WCAO WJAS WADC WKRC					
WGHP WBMB WOWO KMOX KMBC					
KOIL WSPD WHK WLBW WMAL					
WFMB KLRA KFJF KRLD KTSA					
WCCO WISN KFH					
10:00-10:30 Clicquot Club Eskimos					
WEAF WEEI WJAR WFI WRC					
WGY WGR WCAE WWJ WSAI					
WOW KYW KSD WHO WDAF					
KSTP WHAS WSM WMC WSB					
WOAI KOA KSL WTMJ KPRC					
WRVA WBT WJAX WKY KPO					
KGO KFI KGW KOMO KHQ					
WEEC WCSH WBAP WTAG					
10:30-11:00 Story in a Song					
WABC WNAC WEAN WKBW WCAO					
WJAS WADC WKRC KOIL WSPD					
WLBW WMAL WISN WFMB WHK					
KLRA KFJF KRLD KFH KTSA					
KMBC KVI KDYL WCAU					
10:30-11:00 C. A. Earl Orchestra					
WJZ WBZ WBZA WBAL WHAM					
KDKA WJR KYW KWK WREN					
KSTP KOA KSL KPO KGO					
KOMO KGW KFI WBAP KHQ					
10:30-11:30 Radio-Keith-Orpheum Hour					
WEAF WEEI WJAR WTAG WCSH					
WFI WRC WKY WGR WCAE					
WFJC WWJ WSAI KSD WHO					
WOW WDAF WTMJ KSTP WEEC					
WRVA WBT WJAX WIOD WHAS					
WSM WMC KHQ WSB WAPI					
WSMB KVOO KFRC WOAI WKY					
KTHS KOA KSL KGO KGW					
KFI KOMO					
11:00-11:30 Jesse Crawford					
WABC WNAC WEAN WKBW WCAO					
WJAS WADC WKRC WBMB KMBC					
WSPD WLBW WMAL WISN WCCO					
WFMB WCAU KOIL KVI KDYL					
11:30-12:00 Harbor Lights					
WEAF WCAE WFI WWJ WRC					
WGY WGR WFJC WTMJ WRVA					
WPTF WKY KGO KGW KOMO					
12:00-1:00 Bill Scotti's Orchestra					
WEAF WOW WSM					

Wednesday

4:00-5:00 Pacific Vagabonds
WEAF WRC WWJ WOW KOA
KGO KOMO WHO

5:00-5:30 Band of a Thousand Melodies
WEAF WRC WTAM WWJ

7:30-8:00 Golden Gems
WEAF WTAG WCSH WCAE

8:00-8:30 Mobiloil Concert
WEAF WEEI WTIC WJAR WTAG
WCSH WLIT WRC WGR WCAE
WWJ WSAI KSD WOC WOW
WDAF WFJC WTAM WCFL KOA
KVOO WFAA KPRC WOAI WKY

8:00-8:30 The Yeast Foamers
WJZ WBZ WBZA WBAL WHAM
KDKA WJR KYW KWK WLW
WREN WTMJ KSTP WEBC

8:00-9:00 Voice of Columbia
WABC WISN WJAS KMBC WADC
WCAO KVI WHK WFBM WMAQ
KOIL WKRC WKBW WEAN WNAC
WCAU KFPY

8:30-9:00 Sylvania Foresters
WJZ WBZ WHAM KDKA KWK
WREN WBZA WLW WBT WRVA
KYW WJR

8:30-9:00 Happy Wonder Bakers
WEAF WEEI WTIC WJAR WTAG
WCSH WLIT WRC WGY WGR
WWJ WSAI KSD WOC WOW
WDAF WFJC KSTP WTMJ WMC
KVOO WOAI KPRC WKY WLS
WFAA

9:00-9:30 Ingram Shavers
WEAF WTIC WEEI WJAR WTAG
WCSH WRC WGY WGR WCAE
WWJ WGN KSD WOC WOW
WSAI

9:00-9:30 MacFadden Red Seal Hour
WABC WCAU WNAC WEAN WFBL
WMAK WCAO WJAS WADC WKRC
WGHP WMAQ WOWO KMOX KMBC
KOIL WSPD WHK WLBW WMAL

9:00-9:30 The Salon Singers
WJZ WBZ WBZA WBAL KDKA
WJR KWK WREN

9:30-10:00 Forty Fathom Trawlers
WJZ WBZ WBZA WHAM KWK
KDKA WLW WREN WJR WCFL

9:30-10:00 La Palina Smoker
WABC WCAU WNAC WEAN WFBL
WMAK WCAO WJAS WADC WGHP
WMAQ WOWO KMOX KMBC KOIL
WSPD WCCO WHK WLBW WMAL
WISN WKRC

9:30-10:30 Palmolive Hour
WEAF WEEI WTIC WJAR WTAG
WCSH WLIT WRC WGY WGR
WCAE WTAM WWJ WSAI WGN
KSD WOC WOW WDAF WSMB
KSTP WTMJ WHAS WSM WMC
WSB WBT WJAX KVOO KPRC
WOAI KOA KSL KPO KGO
KFI KGW KOMO KHQ WFAA

10:00-10:30 ABA Voyagers
WJZ KWK WJR WBZ WBZA
WHAM WREN KDKA

10:00-10:30 Kolster Radio Hour
WABC WCAU WNAC WEAN WFBL
WMAK WCAO WJAS WADC WKRC
WGHP WMAQ WOWO KMOX KMBC
KOIL WSPD WHK WLBW WMAL
WCCO KLZ KDYL KOIN KVI
KPRC KHJ KFPY KFBK KMJ
CJGC

10:30-11:00 Stromberg-Carlson Program
WJZ WBZ WBZA WBAL KDKA
KYW KWK WREN WRVA KSTP
WTMJ WEBC WIOD WHAS WSM
WMC WSB WBT WJAX KVOO
WBAP KPRC WOAI WKY KOA
KSL KPO KGO KFI KGW
KOMO WJR WHAM WSMB KHQ

10:30-11:00 Dixie Echoes
WABC WCAU WNAC WEAN WFBL
WMAK WCAO WJAS WADC WKRC
WMAQ WSPD KVI KDYL KFPY
WHK WLBW WMAL WISN KOIL

10:30-12:00 National Light Opera
WEAF WRC WCAE WWJ KSD
WOW WSAI WIOD WKY WOAI
KOMO KGW WTC

Thursday

7:00-7:30 Midweek Hymn Sing
WEAF WCSH WRC KOA WMC
WJAR WHAS

7:30-8:30 Coward Comfort Music
WEAF WEEI WTIC WJAR WTAG
WCSH

7:30-8:00 Vincent Lopez
WJZ WBZ WBZA WHAM KDKA
WJR KYW KWK WREN WTMJ
KSTP WEBC KPRC WOAI WKY
WLW WFAA

8:00-8:30 Lenn and Fink Serenade
WJZ WBZ WBZA WHAM KDKA
WJR KYW KWK WREN WBAP
KPRC WOAI WKY WBAL WLW

8:00-9:00 Fleischmann Sunshine Hour
WEAF WEEI WTAG WJAR WCSH
WFI WRC WGY WGR WCAE
KSD WFJC WHO WOW WDAF
WWJ WTMJ WPTF WBT WJAX
WIOD WHAS WMC WSB WSMB
WKY WSAI KPRC KOA WEBC
WRVA KSL WOAI WSM KGO
KGW KOMO KHQ WBAP WCFL

8:15-8:30 Frederic William Wile
WABC WISN WJAS KMBC
WKBW WEAN WCAO WADC WFBM
KOIL WKRC WNAC KVI KFPY

8:30-9:00 U.S. Army Band
WABC WNAC WEAN WFBL WKBW
WJAS KOIL WLBW WMAL WBBM
WISN KVI WKRC WFBM WSPD
KDYL KFPY

9:00-9:30 True Detective Mysteries
WABC WCAU WNAC WEAN WFBL
WKBW WCAO WJAS KMOX KOIL
WLBW WMAL WSPD WHK WADC
WGHP WBBM WOWO WFBM WKRC

9:00-9:30 Veedol Program
WJZ WBZ WBZA WHAM WBAL
KDKA WJR WLW WCFL KWK
WREN WAPI KSTP WTMJ WEBC
WJAX WHAS WSM WMC WSB
WBT WRVA WBAP KPRC WOAI
WKY WPTF KTHS WSMB

9:00-9:30 Seiberling Singers
WEAF WEEI WJAR WTAG WCSH
WFI WRC WGY WGR WCAE
WTAM WWJ WSAI KYW KSD
WHO WOW WDAF WFJC

9:30-10:00 Gold Seal Hour
WABC WCAU WJAS WKBW WADC
WKRC WGHP WBBM WSPD WHK
WLBW WMAL WNAC WEAN WFBL
WCAO WOWO KMOX KMBC KOIL

9:30-10:00 Jack Frost Melody Moments
WEAF WJAR WTAG WCSH WFI
WRC WGY WGR WCAE WWJ
WSAI WLS WTAM

9:30-10:00 Maxwell House Concert

WJZ WBZ WBZA WBAL WHAM
 KDKA WJR WLW KSD WDAF
 KSTP WTMJ WEBC WHAS WBAP
 WSM WMC WBT KPRC KOA
 WHO WOW WJAX WRVA WSB

10:00-10:30 Atwater-Kent Program

WJZ WBZ WBZA WHAM WJR
 KWK WBAL WREN KDKA WGN

10:00-10:30 Halsey-Stuart Program

WEAF WTIC WJAR WTAG WCSH
 WFI WRC WGY WGR WCAE
 WWJ WSAI KYW KSD WHO
 WOW WSMB WAPI KSTP WTMJ
 WJAX WHAS WSM WMC WSB
 WBT WRVA WBAP KPRC WOAI
 KOA KSL KPO KGO KFI
 KGW KOMO KHQ WKY WEEI

10:00-10:30 Temple Hour

WABC WNAC WEAN KMBC KOIL
 WSPD WHK WAIU WFBM WCAO
 WOWO WFBL WJAS WADC WGHP
 WBBM KMOX WLBW WMAL WCCO
 WKRC WKBW WCAU

10:30-11:00 Victor Program

WEAF WEEI WTIC WJAR WTAG
 WFI WRC WGY WCSH WGR
 WCAE WTAM WWJ WSAI WHO
 WOW WFJC WTMJ WEBC WBT
 WBAP KPRC WOAI WKY KOA
 KSL KGO KGW KOMO KHQ
 WRVA KSD KPO

10:30-11:00 Hank Simmons' Show Boat

WABC WFAN WISN WJAS KVI
 WHK WKBW WCAO WADC WMAL
 KOIL WKRC WEAN WNAC KDYL

10:30-11:00 Around the World with Libby

WJZ WBZ WBZA WREN WHAM
 KDKA WJR KWK WHAS WSM
 WMC WSB WAPI WSMB KYW
 WLW WBAL

10:30-11:30 Concert Bureau Hour

WEAF WFI WRC WGY WGR
 WRVA WIOD WMC WFJC WSM
 WTAG WCAE WWJ KSD WKY
 KOA WSAI

11:30-12:00 Jack Albin's Orchestra

WEAF WWJ WHO WKY KOA

12:00-1:00 Phil Spitalny's Music

WEAF WRC KSD WDAF WSM
 WOW

Friday

11:30-12:00 Evening Star

WEAF WTAG WRC WWJ KSD
 WHO WOW WJAX KSTP WTMJ
 WSM WRVA WKY KOA KSL
 WCSH WGY WCAE WDAF KPRC
 WAPI WLIT WTAM WBT WBAP

6:30-7:00 Raybestos Twins

WEAF WTAG WCSH WRC WGY
 WCAE WTAM WWJ WJAR

7:00-7:30 The Eternal Question

WEAF WJAR WRC KSD

7:00-7:30 Mallory Hatters

WJZ WBZ WBZA WBAL WCFL
 KWK WREN KDKA WLW WRVA
 WPTF WJAX WIOD

7:30-8:00 Dixie Circus

WJZ WBZ WBZA WBAL KDKA
 WLW WJR KYW WHAS WSM
 WSB WBT WMC

8:00-8:30 Triadors

WJZ KDKA WREN WBZ WBZA
 KWK WHAM WJR WLW WCFL

8:00-8:30 National Forum from Washington

WABC WISN WJAS KMBC WCAO
 WADC WBBM WFBM KOIL WKRC
 WKBW WEAN WNAC KVI KFPY

8:00-9:00 Cities Service Orchestra

WEAF WEEI WTIC WLIT WRC
 WGR WCAE WTAM WWJ KYW
 KSD WOC WKY WOW WDAF
 KSTP KOA WTMJ WFAA

8:30-9:00 Gillette Program

WJZ WBZ WBZA KDKA KWK
 WREN WHAM WLW WCFL

9:00-9:30 Interwoven Program

WJZ WBZ WBZA WHAM KDKA
 WMC KYW WREN KPRC WOAI
 KOA WHAS WSM WSB WBT
 WJAX KWK WRVA KSL KPO
 KGO KOMO KHQ KGW KFI
 WKY WAPI WSMB KTHS WIOD
 WLW WFAA

9:00-9:30 An Evening in Paris

WEAF WEEI WTIC WJAR WTAG
 WCSH WLIT WRC WGY WGR
 WCAE WWJ WSAI WFJC WGN
 KSD WOC WOW WDAF

9:00-10:00 True Story Hour

WABC WCAU WNAC WEAN WKRC
 WFBL WMAK WCAO WJAS WADC
 WGHP WMAQ WOWO KMOX KMBC
 KOIL WSPD WHK WLBW WMAL
 WHBC WCCO WDBJ WTAR WWNC
 WLAC WDOD WBRC WREC KFJC
 KLRA KRLD KFH KTSA WDSU
 KLZ KDYL KHJ KFRC KOIN
 KVI KFPY KFBK KMJ

9:30-10:00 Schradertown Band

WEAF WTIC WJAR WTAG WCSH
 WLIT WGY WGR WCAE WWJ
 KSD WOC WOW WDAF WEEI
 WRC WSAI WFJC

9:30-10:00 Philco's Theatre Memories

WJZ WBZ WBZA WHAM KDKA
 WJR KYW KWK WREN WTMJ
 KSTP

10:00-10:30 Armstrong Quakers

WJZ WBZ WBZA KDKA WJR
 WLW KYW KWK WREN WHAM

10:00-10:30 Stars of Melody

WEAF WTAG WCAE WWJ WSAI
 KSD WOC WKY KPO KGO
 KOMO WSM

10:00-10:30 Bremer-Tully Time

WABC WCAU WNAC WEAN WFBL
 WMAK WCAO WJAS WADC WKRC
 WGHP WMAQ KMOX KOIL WSPD
 WHK WLBW WMAL WISN KMBC
 WOWO

10:30-11:00 Jesse Crawford

WABC WCAU WISN WJAS KMBC
 WCAO WHK WMAL WSPD WKRC
 WEAN WNAC WMAK KVI

10:30-11:00 Armour Program

WJZ WBZ WBZA WEAL WHAM
 KDKA WJR WLW KYW KWK
 WREN WBT WJAX WHAS WSM
 WMC WSB WAPI WSMB WRVA
 WFAA KPRC WOAI WKY WTMJ
 KSL KSTP WEBC KPO KGO
 KFI KGW KOMO KHQ KVOO
 KOA

11:00-11:30 In a Russian Village

WABC WCAU WISN WJAS KMBC
 WCAO WADC WHK WMAL WSPD
 KOIL WKRC WKBW WEAN WNAC
 KVI KDYL

11:00-12:00 Hotel St. Regis Orchestra

WEAF WTIC WWJ WSAI WFJC
 KSD WOW WGY WOC

11:30-12:00 "In the Dream Maker's Studio"
 WABC WISN WCAO WMAL WSPD
 KOIL WKBW WEAN KVI KDYL
 12:00-1:00 Park Central Hotel Orchestra
 WEAF WRC KSD WOW WWJ

Saturday

3:15-3:30 Band of a Thousand Melodies
 WJZ WLW WSM WHAM KDKA
 KWK
 3:30-4:30 RCA Demonstration Hour
 WJZ WBZ WBZA WHAM KDKA
 WMC WLW WJR KYW KWK
 WRC WOC WDAF KVOO WBAP
 KPRC WOAI WHAS WOW WSB
 WBT WTMJ KSTP KOA WFAA
 WBAL WSM
 6:30-7:00 Gold Spot Orchestra
 WJZ WBZ WBZA KDKA WLW
 7:00-8:00 Phil Spitalny's Music
 WEAF WTIC WEEL WFI WRC
 WWJ WHO WSAI WSM WGY
 KSD WPTF KOA WCAE KHQ
 KOMO WJAR
 8:00-8:30 Chicago Celebrities
 WJZ KDKA WJR WREN WSM
 WJAX
 8:00-8:30 The Lyric Challengers
 WEAF WEEL WJAR WTAG WCSH
 WRC WRC WGY WGR WCAE
 WTAM WFJC WWJ WSAI KSD
 WHO WOW WDAF KYW WTMJ
 KSTP WEBC WRVA WPTF WBT
 WJAX WIOD WHAS WMT WMC
 WSB WAPI WSMB WBAP KPRC
 WOAI WKY KTHS KOA KSL
 KGO KFI KGW KOMO KHQ
 8:00-8:30 Nit Wit Hour
 WABC WCAU WNAC WEAN WKBW
 WCAO KMBC KOIL WLWB WCCO
 WFBM WJAS WKRC WBBM WHK
 WISN WGHF
 8:30-9:00 Babson's Finance Period
 WABC WCAJ WNAC WEAN WFBL
 WCAO WJAS WADC WKRC WGHF
 WBBM WOWO KMBC KOIL WSBF
 WLWB WMAL WCCO WKBW WHK
 8:30-9:00 Marvin Musicians
 WJZ WBZ WBZA WBAL WHAM
 KDKA WJR WLW KYW KWK
 WREN
 8:30-9:00 When Summer is Gone
 WEAF WJAR WTAG WCSH WRC
 WGY WCAE WTAM KSD WSM
 KOA KGO KGW KOMO
 9:00-9:30 Graybar's "Joe and Vi"
 WABC WCAU WNAC WEAN WFBL
 WKBW WCAO WJAS WADC WKRC
 WGHF WMAQ WOWO KMOX KMBC
 KOIL WSPD WHK WLWB WMAL
 WFBM WDBJ WTAR WNNC WLAC
 WIOD WBRC WREC KRDL KFH
 KTSA WCCO WISN WDSU KLZ
 KDYL KFRK KHJ KOIN KVI
 KFPY KFBK KMJ WKBN KFJF
 KLRA
 9:00-10:00 General Electric Hour
 WEAF WEEL WJAR WTAG WSM
 WCSH WFI WRC WGY WGR
 WCAE WTAM WWJ WLS KSD
 WHO WOW WDAF WJAX WSMB
 WEBC WHAS WMC WSB WBT
 KOA KSL KPO KGO KFI
 KGW KOMO KHQ WBAP KPRC
 WOAI WKY WRVA WSAI KSTP
 WAPI WTMJ

9:30-10:00 The Romany Patteran
 WABC WCAU WISN WJAS WCAO
 WADC WHK WFBM WSPD KOIL
 WKRC WKBW WEAN WNNC WDBJ
 WTAR WNNC WLAC WDOD WBRG
 WREC KRDL KFH KTSA WDSU
 KVI KFPY

10:00-11:00 Paramount-Publix Hour
 WABC WCAU WNAC WEAN WFBL
 WKBW WCAO WJAS WADC WKRC
 WGHF WMAQ WOWO KMBC KOIL
 WSPD WHK WLWB WMAL WFBM
 WHCC CFRB WDBJ WTAR WNNC
 WLAC WDOD WBRC WREC KLRA
 KFJF KRDL KFH KTSA WCCO
 WISN WDSU KLZ KDYL KHJ
 KFRK KOIN KVI KFPY KFBK
 KMJ

10:00-11:00 Lucky Strike Orchestra
 WEAF WEEL WEBC WJAR WTAG
 WCSH WFI WRC WGY WGR
 WCAE WWJ WGN KSD WHO
 WOW WDAF WIOD KSTP WTMJ
 WSMB WHAS WMC WSB WBT
 WJAX WBAP KPRC WOAI WKY
 KOA KSL KPO KGO KFI
 KGW KOMO KHQ KTHS WAPI
 WSAI WFJC

11:00-11:30 Guy Lombardo and His Royal
 Canadians

WABC WISN WJAS WCAO WFBM
 WMAL WSPD KOIL WKRC WKBW
 WEAN WNNC WCAU KVI KDYL

11:00-11:30 Lew White Organ Recital
 WEAF WCAE WOW WFI WWJ
 WHO WIOD WMC WOAI WKY
 WEBC WDAF

11:30-12:00 Park Central Hotel Orchestra
 WEAF WCAE WHO WDAF WKY
 WIOD

12:00-1:00 Hotel Manger Orchestra
 WEAF KSD WDAF WOW KSTP

Alphabetical Index

A. & P. Gypsies	Mon.	8:30 p.m.
ABA Voyagers	Thurs.	10:30 p.m.
Albin's Orchestra, Jack	Mon.	12 m.
Albin's Orchestra, Jack	Thurs.	11:30 p.m.
Allen, Ida Bailey	Daily	11:00 a.m.
American Legion Drum Corps	Sun.	5:45 p.m.
American Singers	Sun.	7:05 p.m.
Amos 'n' Andy	Daily	11:00 p.m.
Arabesque	Sun.	10:00 p.m.
Armchair Quartet	Sun.	11:45 p.m.
Armour Program	Fri.	10:30 p.m.
Armstrong Quakers	Fri.	10:00 p.m.
Around the Samovar	Sun.	10:30 p.m.
Around the World with Libby	Thurs.	10:30 p.m.
At the Baldwin	Sun.	9:45 p.m.
Atwater Kent Program	Thurs.	10:00 p.m.
Atwater Kent Program	Sun.	9:15 p.m.
Babson Finance Period	Sat.	8:30 p.m.
Back of the News in Washington	Mon.	7:45 p.m.
Ballad Hour	Sun.	5:30 p.m.
Band of a Thousand Melodies	Wed.	5:00 p.m.
Band of a Thousand Melodies	Sat.	3:15 p.m.
Biblical Drama	Sun.	9:45 p.m.
Black and Gold Room Orch.	Daily	6:00 p.m.
Bremer-Tully Time	Fri.	10:00 p.m.
Brokenshire's Choral Islanders	Sun.	11:00 p.m.
Buck and Wing	Mon.	7:00 p.m.
Burns' Panatela Country Club	Mon.	10:00 p.m.
Cabin Nights	Mon.	10:00 p.m.
Cathedral Hour	Sun.	4:00 p.m.
Ceco Couriers	Mon.	8:30 p.m.
Cheerio	Daily	8:30 a.m.
Chesebrough Real Folks	Mon.	9:30 p.m.
Chicago Celebrities	Sat.	8:00 p.m.

Choral Reverie	Sun.	11:30 p.m.	New Yorker Hotel Orchestra	Mon.	11:00 p.m.
Cities Service Orchestra	Fri.	8:00 p.m.	Nit Wit Hour	Sat.	8:00 p.m.
Clicquot Club Esquimos	Tues.	10:00 p.m.	Old Company Songalogue	Sun.	7:00 p.m.
Collier's Radio Hour	Sun.	8:15 p.m.	Our Government	Sun.	9:00 p.m.
Concert Bureau Hour	Thurs.	10:30 p.m.	Our Romantic Ancestors	Sun.	6:30 p.m.
Coward Comfort Music	Thurs.	7:30 p.m.	Pacific Vagabonds	Wed.	4:00 p.m.
Crawford, Jesse	Tues.	11:00 p.m.	Palmolive Hour	Wed.	9:30 p.m.
Crawford, Jesse	Fri.	10:30 p.m.	Paramount-Publix Hour	Sat.	10:00 p.m.
Dixie Circus	Fri.	7:30 p.m.	Park Central Hotel Orchestra	Fri.	12:00 m.
Dixie Echoes	Wed.	10:30 p.m.	Park Central Hotel Orchestra	Sat.	11:30 p.m.
Dream Maker's Studio, In the	Fri.	11:30 p.m.	Parnassus Trio	Daily	8:50 a.m.
Dutch Masters Minstrels	Tues.	9:30 p.m.	Pepsodent Program	Daily	11:00 p.m.
Earl Orchestra, C. A.	Tues.	10:30 p.m.	Philco's Theatre Memories	Fri.	9:30 p.m.
Echoes of the Orient	Sun.	6:00 p.m.	Physical Culture Mag. Hour	Mon.	9:00 p.m.
Edison Program	Mon.	9:00 p.m.	Prophylactic Program	Tues.	8:30 p.m.
Enna Jettick Melodies	Sun.	8:00 p.m.	Pure Oil Band	Tues.	8:00 p.m.
Eternal Question	Fri.	7:00 p.m.	Radio Household Institute	Daily	11:15 a.m.
Evening in Paris	Fri.	9:00 p.m.	Radio Keith-Orpheum Hour	Tues.	10:30 p.m.
Evening Stars	Fri.	11:30 a.m.	Raybestos Twins	Fri.	6:30 p.m.
Eveready Hour	Tues.	9:00 p.m.	RCA Demonstration Hour	Sat.	3:30 p.m.
Fada Orchestra	Tues.	10:00 p.m.	Retold Tales	Sun.	7:30 p.m.
Fio-Rito	Mon.	10:30 p.m.	Roads of the Sky	Tues.	7:00 p.m.
Fleischmann's Sunshine Hour	Thurs.	8:00 p.m.	Romany Patteran	Sat.	9:30 p.m.
Flying Stories	Tues.	8:30 p.m.	Roxy and His Gang	Mon.	7:30 p.m.
Forty Fathom Trawlers	Wed.	9:30 p.m.	Roxy Symphony Concert	Sun.	2:00 p.m.
Fox Fur Trappers	Sun.	6:00 p.m.	Russian Cathedral Choir	Sun.	11:30 p.m.
Freed Orchestrians	Tues.	10:30 p.m.	Russian Village, In a	Fri.	11:00 p.m.
French Trio	Sun.	5:00 p.m.	Salon Singers	Wed.	9:00 p.m.
Friendly Hour	Sun.	3:00 p.m.	Sam Herman, Xylophonist	Sun.	11:15 p.m.
Fuller Man, The	Sun.	10:15 p.m.	Schraderstown Band	Fri.	9:30 p.m.
General Electric Hour	Sat.	9:00 p.m.	Scotti's Orchestra, Bill	Tues.	12:00 m.
General Motors Family	Mon.	9:30 p.m.	Seiberling's Singers	Thurs.	9:00 p.m.
Gibbons, Floyd, Headline Hunter	Mon.	10:30 p.m.	Sergei Kotlarsky	Sun.	7:30 p.m.
Gillette Program	Fri.	8:30 p.m.	Show Boat, Hank Simmons'	Thurs.	10:30 p.m.
Gold Seal Hour	Thurs.	9:30 p.m.	Slumber Music	Daily	11:15 p.m.
Gold Spot Orchestra	Sat.	6:30 p.m.	Soconyland Sketches	Tues.	7:30 p.m.
Golden Gems	Wed.	7:30 p.m.	Songs and Bows	Sun.	3:30 p.m.
Grand Opera Concert	Mon.	8:30 p.m.	Spitalny's Music, Phil	Sat.	7:15 p.m.
Graybar's, Joe and Vi	Sat.	9:00 p.m.	Spitalny's Music, Phil	Thurs.	12:00 m.
Halsey, Stuart Program	Thurs.	10:00 p.m.	St. Regis Hotel Orchestra	Fri.	11:00 p.m.
Happy Wonder Bakers	Wed.	8:30 p.m.	Stars of Melody	Fri.	10:00 p.m.
Harbor Lights	Tues.	11:30 p.m.	Story In a Song	Tues.	10:30 p.m.
Harmon, Dave, and His Orch.	Wed.	12:00 m.	Stromberg, Carlson Program	Wed.	10:30 p.m.
Ingram Shavers	Wed.	9:00 p.m.	Studebaker Champions	Sun.	10:15 p.m.
Interwoven Program	Fri.	9:00 p.m.	Summer Is Gone, When	Sat.	8:30 p.m.
Jack Frost Melody Moments	Thurs.	9:30 p.m.	Sunday at Seth Parker's	Sun.	10:45 p.m.
Johnson & Johnson	Tues.	9:00 p.m.	Sylvania Foresters	Wed.	8:30 p.m.
Kolster Radio Hour	Wed.	10:00 p.m.	Symphonic Hour	Sun.	3:00 p.m.
LaPalina Smoker	Wed.	9:30 p.m.	Tea Time Tunes	Sun.	5:30 p.m.
LaPalina Program	Sun.	8:00 p.m.	Temple Hour	Thurs.	10:00 p.m.
Lehn and Fink Serenade	Thurs.	8:00 p.m.	Theronoid Health Talk	Tues.	2:45 p.m.
Lombardo, Guy	Sat.	11:00 p.m.	Theronoid Health Talk	Thurs.	2:45 p.m.
Lucky Strike Orchestra	Sat.	10:00 p.m.	Three Kings and a Queen	Thurs.	7:15 p.m.
Luncheon Music	Daily	12:45 p.m.	Troika Bells	Sun.	2:00 p.m.
Lyric Challengers, The	Sat.	8:00 p.m.	True Detective Mysteries	Thurs.	9:00 p.m.
MacFadden Red Seal Hour	Wed.	9:00 p.m.	Tone Pictures	Sun.	9:45 p.m.
Maestro's Hour	Sun.	6:30 p.m.	Tower Health Exercises	Daily	8:00 a.m.
Majestic Theatre of the Air	Sun.	9:00 p.m.	Triadors	Fri.	8:00 p.m.
Major Bowes' Family	Sun.	7:35 p.m.	True Story Hour	Fri.	9:00 p.m.
Mallory Hatters	Fri.	7:00 p.m.	Twelve O'Clock Trio	Daily	12:03 p.m.
Manger Hotel Orchestra	Sat.	12:00 p.m.	Twilight Reveries	Sun.	5:30 p.m.
Marvin Musicians	Sat.	8:30 p.m.	Two Troupers	Sat.	10:30 p.m.
Master Musicians	Tues.	8:30 p.m.	U. S. Army Band	Thurs.	8:30 p.m.
Maxwell House Concert	Thurs.	9:30 p.m.	Veedol Program	Thurs.	9:00 p.m.
Michelin Men	Tues.	8:00 p.m.	Victor Program	Thurs.	10:30 p.m.
Mid-Week Hymn Sing	Thurs.	7:00 p.m.	Vincent Lopez	Thurs.	7:30 p.m.
Milady's Musicians	Sun.	2:30 p.m.	Voice of Columbia	Wed.	8:00 p.m.
Mobiloil Concert	Wed.	8:00 p.m.	Voice of Firestone	Mon.	8:00 p.m.
Montgomery-Ward Program	Daily	2:00 p.m.	White House Concert	Mon.	8:30 p.m.
Mormon Tabernacle Choir	Mon.	6:00 p.m.	Whiteman Hour, Paul	Tues.	9:00 p.m.
Morning Devotions	Daily	8:15 a.m.	White Organ Recital, Lew	Tues.	7:30 p.m.
National Farm and Home Hour	Daily	2:30 p.m.	White Organ Recital, Lew	Sat.	11:00 p.m.
National Forum	Fri.	8:00 p.m.	Whittall Anglo-Persians	Sun.	6:30 p.m.
National Light Opera	Sun.	4:00 p.m.	Wile, Frederick William	Thurs.	8:15 p.m.
National Light Opera	Wed.	10:30 p.m.	Williams' Ollomatics	Tues.	10:00 p.m.
National Sunday Forum	Sun.	4:00 p.m.	World's Business	Sun.	7:45 p.m.
			Yeast Foamers	Wed.	8:00 p.m.

The World Series

WITH the pennant races in both major leagues decided and plans complete to begin the 1929 World Series in Chicago, Tuesday, October 8th, the NBC today announced final arrangements to broadcast every game between the Cubs and the Philadelphia Athletics through a nation-wide hook-up.

Graham McNamee, veteran of several baseball classics and dozens of other major events of sport, will bring a vivid word picture of every important happening in the ball parks to the radio audience.

The World Series schedule, subject to revision because of weather or other conditions, as announced by Judge K. M. Landis, baseball's High Commissioner, is: Tuesday and Wednesday, October 8 and 9, Chicago. Thursday will be an open date while the two teams travel from Chicago to Philadelphia, and the next two games will be unreeled at the latter city, Friday and Saturday, October 11 and 12. Should further games be necessary, the two teams will resume their warfare in Philadelphia Monday, October 15. Sunday will be another off day, due to the Pennsylvania state Sunday-closing law. The next and final two games, should either team have failed to score the necessary four wins to clinch the title, will be unfolded in the home of the Cubs.

The opening game is scheduled to begin at 2:30 o'clock, Eastern Standard

Time, with McNamee going on the air half an hour earlier with a pre-battle description as the two outstanding teams of 1929 prepare to vie with each other for the highest honors of the diamond.

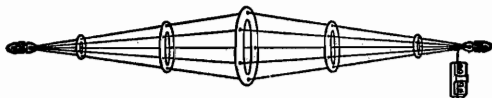
Other Chicago contests are scheduled to begin at the same hour, with the announcer starting fifteen minutes before every game. The Quaker City games will begin at 1:30 o'clock. Each battle is expected to last two hours.

Radio accounts of Saturday's games in Philadelphia will be interspersed with press association bulletins regarding the Navy-Notre Dame football game at Baltimore and the Yale-Georgia inter-sectional tilt at Athens, Ga. A special telegraph wire to the press box will give McNamee these bulletins. NBC announcers have been assigned to Baltimore and Athens and if the baseball epic should be cancelled or postponed on account of rain, both football games will be given the networks.

Preparations have also been made to describe the remaining half of both football games direct from Baltimore and Athens should the World Series game end before the gridiron contests. In this case the Navy-Notre Dame game will be broadcast over an NBC network headed by WJZ and the Yale-Georgia game over one headed by WEAf.

All in all it promises to be a very large week for sport lovers who must participate via the radio.

LIFE-TIME DX AERIAL



Guaranteed Double Volume and Sharper Tuning

powerful aerial in 30-ft. space (preferably outside). Sharpens tuning of any receiving set because of short length but has enormous pick-up because 150 feet of No. 12 enameled wire is used. Made for owners of fine radio sets who want great volume on distance without destroying sharp tuning. (Also used by many owners of short-wave outfits.) "Makes a good radio set better." **Price \$10.00**

No. 60—Length 60 feet. Price \$12.50

Assembled—ready to string up. "BIG BOY" Size. (Same description as above, except that 300 feet of wire is used making this the most efficient and powerful aerial possible to manufacture.)

Manufactured by

THOROLA RADIO PRODUCTS

1014 So. MICHIGAN BLV'D.
CHICAGO, ILLINOIS

No. 30 Length 30 feet

Assembled ready to string up. Brings in great volume, but retains the selectivity of a 30-ft. aerial. Rings are heavy gauge solid zinc. Duplicates in design and non-corrosive materials the aeriels used by most of largest Broadcasting Stations. Design permits using this

AIR-LINE DISTANCES

Atlanta, Ga.	1273	1670	774	1967	036	1577	1126	1248	1417	532	833	1360	228	968	561	803	588	773	1252	1492	717	663	1174	938	1710	980	895
Baltimore, Md.	-	575	1830	938	960	695	583	368	550	1208	738	590	1293	1112	750	688	901	498	947	286	675	1935	317	335	610	905	1794
Boise, Idaho	-	2055	358		1525	273	603	423	305	1505	913	398	1750	1143	1239	1245	1154	964	808	682	962	2313	498	792	958	948	1947
Boston, Mass.	-	2266			1601	1872	1453	1663	1754	637	1155	671	969	975	1263	1538	934	1384	1367	2098	1158	663	1623	1508	2368	1140	252
Brownsville, Tex.	-	1681	398	849	737	550				1766	1159	613	2087	1304	1574	1598	1415	1302	922	1015	1250	2590	823	1133	1258	1125	2154
Buffalo, N. Y.	-	1575	1234	1184	1402					1047	1102	1398	688	1445	471	287	1013	650	1543	1025	923	1790	1093	777	1100	1335	1706
Chicago, Ill.	-	454	392	175						1368	762	218	1690	923	1221	1289	1019	956	560	880	852	2195	483	802	1184	733	1743
Cincinnati, Ohio	-	249	307							918	310	236	1249	571	820	954	566	585	367	861	413	1741	268	481	1190	356	1348
Cleveland, Ohio	-	218								1090	509	234	1333	818	839	897	742	569	589	628	541	1842	92	410	957	603	1578
Denver, Colo.	-	1223	617	94	1521					1223	617	94	1521	838	1046	1116	871	787	518	768	700	2044	309	627	1088	632	1640
Des Moines, Iowa	-	607	1153	554	642					643	925	353	749	970	643	925	353	749	970	1468	555	828	1035	878	1732	699	670
Detroit, Mich.	-	545	980	397						640	851	258	488	458	1024	180	1433	477	485	1338	235	1074			1468	399	891
El Paso, Tex.	-	1475	745							1018	1111	800	761	427	832	643	1976	315	621	1156	542	1552			1668	1156	1115
Fargo, N. Dak.	-	1161								973	1218	440	875	893	1400	548	1426	618	882	1721	219	819			1150	870	1312
Fort Worth, Tex.	-	289	544	273	1093					943	480	1212	751	448						952	2153	595	591	328	1192	2070	
Gulveston, Tex.	-	808	375	1277						799	677	1423	607	492						1352	460	370	1947	413	1117		
Hastings, Neb.	-	513	666							906	1178	226	1177	693	591	1468	399	891		1885	1602	2355	1522	910	1768	722	1385
Hot Springs, Ark.	-	901	728	326	1437					800	128	326	1437	480	176	983	722	1385		319	823	605	1550		878	700	1483
Houghton, Mich.	-	1216	633	1787	636	830				1216	633	1787	636	830	1545	872	1208			1516	2359				1010		
Jacksonville, Fla.	-	952	2153	595	591					952	2153	595	591	328	1192	2070				1352	460	370	1947	413	1117		
Kansas City, Mo.	-	1885	1602	2355	1522	910				1885	1602	2355	1522	910	1768	722	1385			319	823	605	1550		878	700	1483
Los Angeles, Calif.	-	878	700	1483						878	700	1483								1516	2359				1010		
Louisville, Ky.	-																										
Memphis, Tenn.	-																										
Miami, Fla.	-																										
Minneapolis, Minn.	-																										
Missoula, Mont.	-																										

How To Use Your RADEX

ALL stations in America are listed in RADEX in three tables:

- 1st by Frequencies.
- 2nd by Call Letters.
- 3rd by States and Cities.

The Index by Frequencies is the one to be used, the other two are merely supplementary.

Let us assume you have just bought your first RADEX. Proceed as follows:

Tune in some station—any station that comes in. Tune it sharply, turning down your rheostats (volume control) until we find the marks on your dials at which it comes in most clearly and with greatest volume.

Let us assume that the station we are hearing is WEAF in New York. First we must ascertain the frequency for this station. Look it up under WEAF in the Index by Call Letters or under New York in the Index by States and Cities. In either of these indexes we find that the frequency of WEAF is 660. Now we turn to 660 kilocycles in the Index by Frequencies and Dial Numbers. Here we find that WEAF is one of the two stations which have been assigned the 660 keys, frequency by the Federal Radio Commission. We also find that it has a power of 50,000 watts, that it is located in New York City and is owned by the National Broadcasting Co., Inc.

In the blanks for dial numbers opposite 660 kilocycles (which is the wave length of 454.3 meters) enter the dial readings of your set. It is immaterial whether your set has one, two or three dials. Use as many of three spaces provided as you need. The set used in the illustration had two dials. In this case we entered the dial readings for 660 kilocycles as 69-67.

Let us now tune in some other station. We repeat the same procedure in tuning and find that we are hearing, let us say, WOS at Jefferson City. Proceed as before in ascertaining the frequency of WOS. This we find to be 630 kcys. We turn to 630 in the Index by Frequencies and enter our dial readings for this band which on the set we are using was 72-70.

We now have found that the dial numbers for 630 kcys. are 72-70 and the dial numbers for 660 kcys. are 69-67. If we now will set our dials for 70-68 it is obvious we will have our set tuned for 650 kcys. We listen carefully and if they are on the air and within range of our set we will tune in WSM of Nashville at this point. We then enter the dial readings for WSM opposite 660 kcys. Now it is clear that if we reset our dials at 71-69 our set will be tuned to 640 kcys. and at that point KFI of Los Angeles will be heard, always assuming of course that it is on the air and within range of our particular set.

Now we tune in some other station, proceeding

INDEX BY FREQUENCIES AND DIAL NUMBERS

590 kilocycles 508.2 meters 76 74

EHO	1005	Spokane, Wash.	Louis Warner, Inc.
WCAJ	800	Lissinn, Neb.	Schwarz, Western University
WUOL	800	Huron, Mo.	Schwarz, Western University
WOP	1002	Omaha, Neb.	Woodman of the World
WEMC	1000	Hotchkiss Springs, Mich.	Woodman of the World
			Evangelical Ministry College

600 kilocycles 499.7 meters 75 73

KFCH	358	Prosser Falls, Ont.	Ashby Power & Paper Co.
KFEU	508	Laramie, Wyo.	Blodgett, S. Thomas
KSJD	598	San Diego, Calif.	Airnet Radio Corp.
WCAO	352	Baltimore, Md.	Monogram Radio Co., Inc.
WBSW	350	Bellevue, Wis.	Bellevue College
WCAJ	500	Lawrenceburg, Tenn.	Teachers School of Music
WREK	500	Memphis, Tenn.	WRIC, Inc.
WTRC	500	Hartford, Conn.	Travelers Insurance Co.

610 kilocycles 491.5 meters 74 72

KFRC	1009	San Francisco, Calif.	Don Lee, Inc.
WDAF	1005	Kansas City, Mo.	Kansas City Star Co.
WFSN	1000	Philadelphia, Pa.	Kavanaugh Broadcasting Co., Inc.
WIP	1000	Philadelphia, Pa.	Clebot Bros., Inc.
WFO	1000	Kansas City, Mo.	City School of Christianity

620 kilocycles 483.6 meters 73 71

KPAD	500	Phoenix, Ariz.	Electrical Equipment Co.
KCV	1000	Portland, Ore.	Freeman Publishing Co.
WDAE	1000	Tampa, Fla.	Freeman Publishing Co.
WDDO	1000	Orlando, Fla.	Freeman Publishing Co.
WLEL	1000	Dover-Foxcroft, Me.	Thompson & Giersey
WTK	1000	Milwaukee, Wis.	Milwaukee Journal

630 kilocycles 475.9 meters 72 70

CCCT	508	Victoria, B. C.	Victoria Broadcasting Ass'n.
CKCB	508	Vancouver, B. C.	Victoria Broadcasting Ass'n.
CNRA	508	Monroton, N. B.	Winnipeg Grain Exchange
CYR	508	Montreal, Que.	Cambridge National Railway
KFRS	500	Washington, Mo.	Carroll Library
WCRP	500	Seattle, Wash.	Stephen College
WVAL	500	Washington, D. C.	Executive on the Air, Inc.
WTK	500	San Francisco, Calif.	M. A. Lese Co.
			Spokane Marketing Bureau

640 kilocycles 468.5 meters 71 69

EFF	1008	Los Angeles, Calif.	Faris C. Anshoxy, Inc.
WATU	1000	Columbus, Ohio	American Insurance Union

650 kilocycles 461.3 meters 70 68

WSM	1008	Nashville, Tenn.	National Life & Accident Ins. Co.
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660 kilocycles 454.3 meters 69 67

WAAV	500	Omaha, Neb.	Omaha Credit Exchange
WEAF	1008	New York City	National Broadcasting Co., Inc.

670 kilocycles 447.5 meters 68 66

WMAQ	1000	Chicago, Ill.	Chicago Daily News, Inc.
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680 kilocycles 440.9 meters 67 65

KFTO	1000	San Francisco, Calif.	Hale Bros. & The Chronicle
WPO	1008	Katigh, N. C.	Durham Life Insurance Co.

IN STATUTE MILES

Memphis, Tenn.	New Orleans, La.	New York, N. Y.	Hortok, Va.	Oklahoma, Okla.	Omaha, Nebr.	Philadelphia, Pa.	Phoenix, Ariz.	Pittsburgh, Pa.	Portland, Me.	Portland, Ore.	Richmond, Va.	St. Louis, Mo.	Salt Lake City, Utah	San Francisco, Calif.	Schenectady, N. Y.	Seattle, Wash.	Shreveport, La.	Spokane, Wash.	Springfield, Mass.	Vermillion, S. Dak.	Washington, D.C.
117 1030	2810 1696	518 718 1748	330 1498 2015	1107 1628	938 483 893 1823 1178	764 1028 1889 742 1648	Albuquerque, N. Mex.														
218 427	747 507 753 815 663	1592 520 1022 2172 470	467 1580 2133 840 2180	548 1960 863 917 542	Atlanta, Ga.																
597 1001	170 167 1173 1026 90	2002 194 446 2367 128	731 1858 2451 278 2341	1064 2110 822 1083 33	Baltimore, Md.																
631 1713	2153 2137 1138 1044 2113	733 1863 2282 349 2060	1389 292 516 2120 405	1433 290 2196 973 2045	Boise, Idaho																
941 1359	188 467 1490 1280 288	2295 478 100 2553 471	1036 2099 2696 150 2508	1410 2279 79 1214 392	Boston, Mass.																
952 536	1695 1465 659 1061 1614	1023 1424 1961 1944 1428	975 1317 1675 1770 2015	510 1852 1805 1161 1493	Brownsville, Tex.																
626 1087	291 435 1117 883 278	1904 178 438 2167 375	662 1701 2298 249 2130	1080 1900 325 916 290	Buffalo, N. Y.																
394 831	711 696 689 432 664	1451 411 892 1765 616	259 1260 1855 702 1743	725 1514 774 479 594	Chicago, Ill.																
239 708	568 474 755 620 501	1578 258 602 1987 399	308 1450 2037 605 1974	688 1744 659 694 403	Cincinnati, Ohio.																
456 922	404 429 946 738 343	1745 115 603 2063 353	490 1567 2162 408 2035	904 1804 472 785 303	Cleveland, Ohio																
018 1079	1628 1562 503 485 1575	585 1320 1803 985 1488	793 372 946 1618 1020	799 827 1692 468 1940	Denver, Colo.																
523 825	1023 933 469 122 972	1156 718 1197 1479 905	270 952 1547 1012 1470	624 1243 1085 187 895	Des Moines, Iowa																
468 938	483 522 905 666 444	1685 208 657 1975 445	452 1890 2087 467 1945	891 1715 540 705 397	Detroit, Mich.																
169 986	1902 1555 578 875 1834	347 1592 2126 1286 1695	1033 689 993 1930 1373	753 1238 1980 920 1726	El Paso, Tex.																
900 1221	1213 1258 786 390 1186	1825 952 1313 1248 1180	658 865 1447 1157 1206	1002 976 1240 284 1141	Fargo, N. Dak.																
643 470	1398 1226 188 590 1394	856 1097 1642 1612 1170	868 977 1454 1445 1658	809 1470 1495 689 1210	Fort Worth, Tex.																
666 288	1415 1195 456 828 1335	1065 1140 1678 1885 1154	697 1249 1693 1487 1938	233 1753 1584 938 1214	Galveston, Tex.																
697 870	1275 1216 357 133 1222	901 987 1454 1271 1142	455 708 1297 1267 1288	615 1061 1340 167 1139	Hastings, Nebr.																
370 358	1125 955 260 490 1051	1094 825 1371 1733 897	325 1116 1648 1175 1759	142 1552 1284 605 936	Hot Springs, Ark.																
780 1187	849 946 926 547 827	1550 630 924 1638 870	591 1242 1833 776 1588	1043 1360 860 110 813	Houghton, Mich.																
502 511	838 548 988 1098 758	1800 703 1113 8442 953	755 1840 2375 960 2450	733 2239 957 5203 647	Jacksonville, Fla.																
472 678	1097 1009 293 165 1037	1045 784 1300 1397 937	238 922 1500 1107 1505	326 1286 1173 280 943	Kansas City, Mo.																
777 1675	2446 2352 1168 1312 2388	357 2155 2631 835 2283	1585 577 345 2445 956	1420 939 2515 1291 2295	Los Angeles, Calif.																
153 623	650 528 875 579 580	1512 345 892 1953 457	342 1400 1983 695 1945	598 1720 745 663 473	Louisville, Ky.																
195 358	955 778 422 529 878	1264 660 1805 1852 722	342 1250 1600 1010 1867	279 1652 1055 642 763	Memphis, Tenn.																
821 681	1095 802 1233 1402 1023	1998 1014 1357 2718 831	1067 2098 2603 1229 2740	505 2528 1210 1510 927	Miami, Fla.																
695 1050	1119 1047 692 291 985	1879 745 1145 435 988	464 988 1565 975 1403	659 1179 1056 238 936	Minneapolis, Minn.																
582 1732	2030 2045 1162 978 1997	932 1756 2133 430 1967	1331 435 762 1978 395	1457 170 2060 887 1940	Missoula, Mont.																
470 75	936 566 602 604 1683	1416 922 1015 1970 536	253 1390 1958 820 1973	480 1752 863 704 567	Nashville, Tenn.																
- 1178	532 875 845 1040	1318 925 1445 1852 899	899 1433 1923 1259 2098	280 1898 1287 960 968	New Orleans, La.																
- 293	1334 1144 83 2142	313 247 9455 287	873 1972 2568 142 2419	1230 2190 120 1189 204	New York, N. Y.																
- 1186	1095 2280 2027	316 565 9458 79	771 1925 2510 426 2460	1037 2211 411 1166 145	Norfolk, Va.																
- 405	1256 843 1013 1550 1488 1122	456 862 1386 1354 1523	897 1324 1412 502 1510	897 1324 1412 502 1510	Oklahoma, Okla.																
- 1094	1032 837 1318 1373 1020	352 833 1425 1133 1372	617 1149 1205 115 1012	814, Omaha, Nebr.																	
2079 254 360 2419 205	808 1923 2518 205 2398	1153 2152 201 1143 122	1067 1080 2220 1043 1980	1067 1080 2220 1043 1980	Philadelphia, Pa.																
1823 2245 1007 1960	1270 504 652 2152 1112	1067 1080 2220 1043 1980	1067 1080 2220 1043 1980	1067 1080 2220 1043 1980	Phoenix, Ariz.																
545 2174 242	561 1670 2264 350 2145	939 1918 400 891 188	1484 2285 159 1345 480	1484 2285 159 1345 480	Pittsburgh, Pa.																
2563 655	1094 2127 2725 197 2513	1484 2285 159 1345 480	1484 2285 159 1345 480	1484 2285 159 1345 480	Portland, Me.																
2381	1723 636 536 2405 143	1783 295 2488 1293 2360	1783 295 2488 1293 2360	1783 295 2488 1293 2360	Portland, Ore.																
- 692 1850 2436 406 2362	985 2132 407 1099 96	985 2132 407 1099 96	985 2132 407 1099 96	985 2132 407 1099 96	Richmond, Va.																
- 1158 1738 898 1722	466 1500 958 450 710	466 1500 958 450 710	466 1500 958 450 710	466 1500 958 450 710	St. Louis, Mo.																
- 592 1950 697	1155 548 2027 785 1945	1155 548 2027 785 1945	1155 548 2027 785 1945	1155 548 2027 785 1945	Salt Lake City, Utah																
- 2548 880	1655 730 825 1383 2437	1655 730 825 1383 2437	1655 730 825 1383 2437	1655 730 825 1383 2437	San Francisco, Calif.																
- 2363	1290 2138 86 1165 313	1290 2138 86 1165 313	1290 2138 86 1165 313	1290 2138 86 1165 313	Schenectady, N. Y.																
- 1820	2249 2445 1282 2325	2249 2445 1282 2325	2249 2445 1282 2325	2249 2445 1282 2325	Seattle, Wash.																
- 1621 1393 728 1035	Shreveport, La.	Shreveport, La.	Shreveport, La.	Shreveport, La.	Shreveport, La.																
- 2216 1055 2105	Spokane, Wash.	Spokane, Wash.	Spokane, Wash.	Spokane, Wash.	Spokane, Wash.																
- 1242 321	Springfield, Mass.	Springfield, Mass.	Springfield, Mass.	Springfield, Mass.	Springfield, Mass.																
- 1073	Vermillion, S. Dak.	Vermillion, S. Dak.	Vermillion, S. Dak.	Vermillion, S. Dak.	Vermillion, S. Dak.																

before un-
after an eve-
ng or two, we have
unks filled on every
ge. We are now able to
our dials for any frequency
desire and consequently any
ation we may want whether we have
er received it before or not.

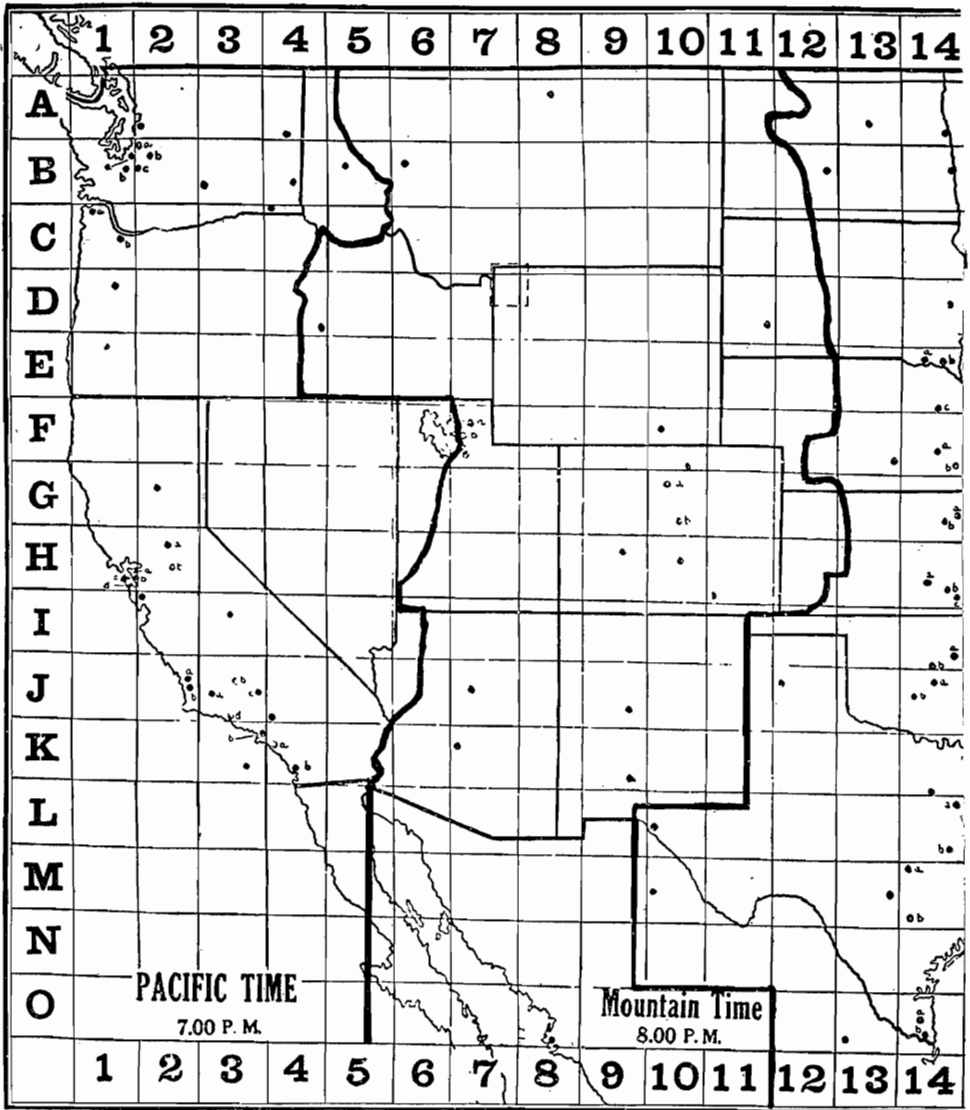
Our index now becomes of great value to us
identifying programs. Let us say that we hear
isic at 67-65 on our dials. We refer to our
dex by Frequencies and Dial Numbers and we
d that we are in tune to 680 kilocycles. On this
ve there are two stations: KPO at San Fran-
co and WPTF at Raleigh, N. C. Both of these
stations have 5000 watts in power. But knowing
ich is the closer to our set, we can tell almost
variably which station we are hearing. The
dio Commission has had to give the same fre-
quency in most cases to several station but they
ve distributed them geographically so they
ould not interfere. When two stations in the
me locality have the same frequency, they are
quired to divide time. In this case of course it
not possible to tell which one of the two sta-
tions is broadcasting at the particular moment
hear it but we do know it is one or the other of
em.

The second column in the index by Frequencies,
we have seen, gives the power of the station as
asured in watts. This power also aids us in

identifying
stations as we
will not ordinarily
hear those stations with
500 watts or less unless they are close to our
home city.

The Index by Call Letters also has spaces pro-
viding for logging dial numbers but these are
provided merely for the convenience of those who
want to be able to turn instantly to some favorite
station. They may or may not be used as you
desire. Remember that it is the Index by Fre-
quencies that we must use to get the most value
and pleasure out of our radios.

The Index by Frequencies is now printed with
marginal tabs. If you will fill in under the word
"dial" your reading for this particular frequency,
you can then turn instantly to any frequency de-
sired. Take a pair of shears and cut along the
dotted line, as shown.

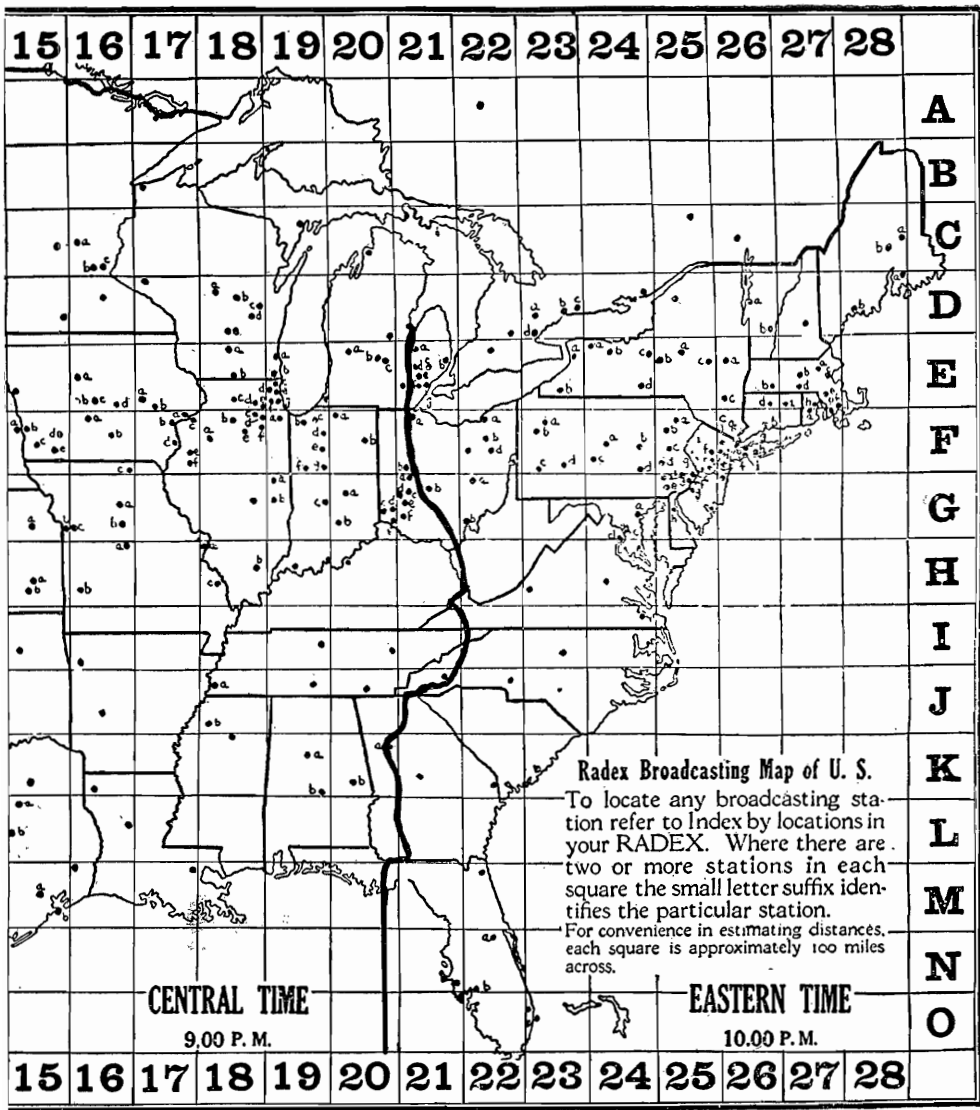


The Radex Press,
P. O. Box 143, Cleveland, Ohio

Begin With No. 32 Renewal or
33 New Subscription

Please enter my subscription for one year (ten issues) for which I enclose \$1.75.
Also send me leatherette cover for which I enclose 50c. (Cross out if not wanted.)

Write Name Plainly.....
Street and No.....
City and State.....



Radex Broadcasting Map of U. S.

To locate any broadcasting station refer to Index by locations in your RADEX. Where there are two or more stations in each square the small letter suffix identifies the particular station.

For convenience in estimating distances, each square is approximately 100 miles across.

CENTRAL TIME

9.00 P.M.

EASTERN TIME

10.00 P.M.

RADEX is published monthly throughout the year with the exception of July and August. The price is 25c per copy or \$1.75 for the year of ten issues. If you desire to be up-to-date in radio and to be kept informed of the frequent changes in stations, please fill in the coupon on this page and mail it at once.

In answer to many requests we have had prepared a beautiful leatherette cover stamped in gold. This cover is not only an ornament to even the finest set but it protects your RADEX from wear and gives a solid backing for making entries. The price of this cover is 50c or we will send one free for two yearly subscriptions. Send your own and a friend's subscription and we will send you one of these beautiful covers free.

INDEX BY FREQUENCIES AND DIAL NUMBERS

NOTICE OF COPYRIGHT

The method of logging by wave-lengths or frequencies was devised by The Radex Press in 1924 and has been copyrighted and re-copyrighted each year since that time. The arrangement of stations in groups by frequencies or wave-lengths with dial readings in connection therewith is fully covered by our copyright and all infringers will be vigorously prosecuted.

540 kilocycles 555.6 meters

CKX 500 Brandon, Manitoba
XFA 50 Mexico City

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Manitoba Telephone System
Sria. de Agricultura y Fomento

550 kilocycles 545.1 meters

KFDY 1000 Brookings, S. D.
KFUO 500 St. Louis, Mo.
KFYR 500 Bismarck, N. D.
KSD 500 St. Louis, Mo.
KTAB 500 Oakland, Cal.
WGR 1000 Buffalo, N. Y.
WKRC 500 Cincinnati, Ohio
XEY 105 Merida, Yucatan
KOAC **Corvallis, Ore**

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S. D. State College
Concordia Theological Seminary
Hoskins-Meyer
Pulitzer Publishing Co.
Associated Broadcasters
Radio Station WGR Inc.
Kodel Electric & Mfg. Co.
Partido Socialista del Sureste

560 kilocycles 535.4 meters

KFDM 500 Beaumont, Texas
~~KFEQ 2500 St. Joseph, Mo.~~
KLZ 1000 Dupont, Colo.
~~KOAC 1000 Corvallis, Ore.~~
WFI 500 Philadelphia, Pa.
~~WIOD 500 Miami Beach, Fla.~~
WLIT 500 Philadelphia, Pa.
WNXX 1000 Knoxville, Tenn.
~~WOL 5000 Ames, Iowa~~
WQAM **Miami, Fla.**

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Magnolia Petroleum Co.
Sroggin & Co. Bank
Reynolds Radio Co., Inc.
State Agricultural College
Strawbridge & Clothier
Isle of Dreams Brdcstg. Co.
Lit Brothers
Sterchi Bros.
Iowa State College

570 kilocycles 526.0 meters

KGKO 250 Wichita Falls, Tex.
KMTR 500 Hollywood, Cal.
KUOM 500 Missoula, Mont.
KXA 500 Seattle, Wash.
WBAO 750 Columbus, Ohio
WIBO 1000 Chicago, Ill.
WKBN 500 Youngstown, Ohio
WMAC 250 Cazenovia, N. Y.
WMCA 500 New York City
WNAK 1000 Yankton, S. D.
WNYC 500 New York City
WPCC 500 Chicago, Ill.
WSYR 250 Syracuse, N. Y.
WWNC 1000 Asheville, N. C.

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Wichita Falls Brdcstg. Co.
KMTR Radio Corp.
University of Montana
American Radio Tel. Co.
Ohio State University
Nelson Bros. Bond & Mtg. Co.
W. P. Williamson, Jr.
Clive B. Meredith
Knickerbocker Broadcasting Co., Inc.
Gurney Seed & Nursery Co.
Dept. of Plants and Structures
North Shore Congregational Church
Clive B. Meredith
Citizens Brdcstg. Co., Inc.

580 kilocycles 516.9 meters

CFCL 500 Toronto, Ont.
CHMA 250 Edmonton, Alta.
CJBC 500 Toronto, Ont.
CJCA 500 Edmonton, Alta.
CJSC 500 Toronto, Ont.
CKCL 500 Toronto, Ont.
CKNC 500 Toronto, Ont.
CKUA 500 Edmonton, Alta.
KNRE 500 Edmonton, Alta.
XKGF 200 Pierre, S. D.
KSAC 500 Manhattan, Kans.
WOBU 250 Charleston, W. Va.
WSAZ 250 Huntington, W. Va.
~~WSUI 500 Iowa City, Iowa~~
WTAG 250 Worcester, Mass.
WIBW **Topeka, Kans**

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Dominion Battery Co.
Christian and Missionary Alliance
Jarvis Street Baptist Church
The Edmonton Journal, Ltd.
The Evening Telegram
The Dominion Battery Co.
Canadian National Carbon Co., Ltd.
University of Alberta
Canadian National Railways
Dana McNeil
State Agricultural College
Charleston Radio Brdcstg. Co.
WSAZ Inc.
University of Iowa
Telegram Publishing Co.

INDEX BY FREQUENCIES AND DIAL NUMBERS

590 kilocycles 508.2 meters

KHQ	1000	Spokane, Wash.
WCAJ	500	Lincoln, Nebr.
WEEI	1000	Boston, Mass.
XWEMC	1000	Berrien Springs, Mich.
WOW	1000	Omaha, Nebr.
XFI	1000	Mexico City

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Louis Wasmer, Inc.
Nebraska Wesleyan University
Edison Elec. Illuminating Co.
Emmanuel Missionary College
Woodmen of the World
Sria. de Industria, Comercio y Trabajo

KCYS.
670
MTRS.
447.5
DIAL

600 kilocycles 499.7 meters

CFCH	250	Iroquois Falls, Ont.
CJRM	500	Moose Jaw, Sask.
CJRW	500	Fleming, Sask.
KFSD	500	San Diego, Cal.
KWYO	500	Laramie, Wyo.
WCAC	250	Storrs, Conn.
WCAO	250	Baltimore, Md.
XWEBW	350	Beloit, Wis.
WOAN	500	Lawrenceburg, Tenn.
WREC	500	Memphis, Tenn.
WTIC	250	Hartford, Conn.

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Abitibi Power & Paper Co.
Jas. Richardson & Sons, Ltd.
Jas. Richardson & Sons, Ltd.
Airfan Radio Corp.
Bishop N. S. Thomas
Conn. Agricultural College
Monumental Radio, Inc.
Beloit College
James D. Vaughan
WREC, Inc.
Travelers Brdcastg. Service Corp.

610 kilocycles 491.5 meters

KFRF	1000	San Francisco, Cal.
WDAF	1000	Kansas City, Mo.
WFAN	500	Philadelphia, Pa.
WIP	500	Philadelphia, Pa.
WQQ	1000	Kansas City, Mo.

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Don Lee, Inc.
Kansas City Star Co.
Keystone Broadcasting Co., Inc.
Gimbel Bros., Inc.
Unity School of Christianity

620 kilocycles 483.6 meters

KFAD	500	Phoenix, Ariz.
KGW	1000	Portland, Ore.
WDAE	1000	Tampa, Fla.
WDBQ	1000	Orlando, Fla.
WYAY	500	Cleveland, Ohio
WLBZ	250	Bangor, Me.
WTMJ	1000	Milwaukee, Wis.

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Electrical Equipment Co.
Oregonian Publishing Co.
Tampa Publishing Co.
Rollins College, Inc.
Cleveland Radio Brdcastg. Corp.
Maine Brdcastg. Co., Inc.
Milwaukee Journal

630 kilocycles 475.9 meters

CFCT	500	Victoria, B. C.
CJGX	500	Yorkton, Sask.
CNRA	500	Moncton, N. B.
KFRU	500	Columbia, Mo.
WGCB	500	Evansville, Ind.
WMAL	250	Washington, D. C.
WOS	500	Jefferson City, Mo.
XEC	350	Jalapa, Ver.

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Victoria Broadcasting Association
Winnipeg Grain Exchange
Canadian National Railways
Stevens College
Evansville on the Air, Inc.
M. A. Leese
State Marketing Bureau
Gobierno Estado de Veracruz

640 kilocycles 468.5 meters

KFI	5000	Los Angeles, Cal.
XWAU	500	Columbus, Ohio
XFG	2000	Mexico City

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Earle C. Anthony, Inc.
American Insurance Union
Sria. de Guerra y Marina

650 kilocycles 461.3 meters

WSM	5000	Nashville, Tenn.
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National Life & Accident Ins. Co.

660 kilocycles 454.3 meters

XWAAW	500	Omaha, Nebr.
WEAF	50000	New York City

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Omaha Grain Exchange
National Broadcasting Co., Inc.

670 kilocycles 447.5 meters

WMAQ	5000	Chicago, Ill.
XEB	1000	Mexico City

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Chicago Daily News, Inc.-
El Buen Tono, S. A.

KFER *st. Joseph, Mo*

CUT OUT ON DOTTED LINES

INDEX BY FREQUENCIES AND DIAL NUMBERS

680 kilocycles 440.9 meters

KPO 5000 San Francisco, Cal.
 X WPTF 1000 Raleigh, N. C.

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Hale Bros. & The Chronicle
 Durham Life Insurance Co.

690 kilocycles 434.5 meters

CFAC 500 Calgary, Alta.
 CFEN 500 Calgary, Alta.
 CHCA 500 Calgary, Alta.
 CJCJ 500 Calgary, Alta.
 CKCO 100 Ottawa, Ont.
 CKGW 5000 Toronto, Ont.
 CNRC 500 Calgary, Alta.
 CNRO 500 Ottawa, Ont.
 NAA 1000 Arlington, Va.

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The Calgary Herald
 Western Broadcasting Co.
 The Western Farmer
 Albertan Publishing Co., Ltd.
 Dr. G. M. Geldert
 Gooderham & Worts, Ltd.
 Canadian National Railways
 Canadian National Railways
 U. S. Navy

700 kilocycles 428.3 meters

WLW 5000 Cincinnati, Ohio

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Crosley Radio Corp.

710 kilocycles 422.3 meters

~~KEIK 250 Los Angeles, Calif.~~
~~WOR 500 Newark, N. J.~~
~~WWS 500 Kansas City, Missouri~~

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Los Angeles Brdcastg. Co.
 L. Bamberger & Co.

720 kilocycles 416.4 meters

WGN 25000 Chicago, Ill.

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Chicago Tribune

730 kilocycles 410.7 meters

CHLS 50 Vancouver, B. C.
 CHYC 500 Montreal, Que.
 CKAC 5000 Montreal, Que.
 CKCD 50 Vancouver, B. C.
 CKFC 50 Vancouver, B. C.
 CKMO 50 Vancouver, B. C.
 CKWX 100 Vancouver, B. C.
 CNRM 1650 Montreal, Que.
 XEN 1000 Mexico City
 CNK *Havana, Cuba*

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W. G. Hassell
 Northern Electric Co., Ltd.
 La Presse Publishing Co., Ltd.
 Vancouver Daily Province
 United Church of Canada
 Sprout-Shaw Radio Co.
 A. Holstead & Wm. Hanlon
 Canadian National Railways
 General Electric, S. A.
Plaza Hotel

740 kilocycles 405.2 meters

XKMMJ 1000 Clay Center, Neb.
 WSB 1000 Atlanta, Ga.

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The M. M. Johnson Co.
 Atlanta Journal Co.

750 kilocycles 399.8 meters

WJR 5000 Detroit, Mich.

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WJR, The Goodwill Station, Inc.

760 kilocycles 394.5 meters

XKVI 1000 Tacoma, Wash.
 XWEW 1000 St. Louis, Mo.
 WJZ 30000 New York City

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Puget Sound Brdcastg. Co.
 St. Louis University
 Radio Corp. of America, Inc.

770 kilocycles 389.4 meters

KFAB 5000 Lincoln, Nebr.
 WBEM 25000 Chicago, Ill.
 WJBT 10000 Chicago, Ill.

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Nebraska Buick Automobile Co.
 The Atlas Co., Inc.
 The Atlas Co., Inc.

780 kilocycles 384.4 meters

CKY 5000 Winnipeg, Manitoba
 CNRW 5000 Winnipeg, Manitoba
 KELW 500 Burbank, Cal.
 KTM 500 Los Angeles, Cal.
 WEAN 2500 Providence, R. I.
 WMC 500 Memphis, Tenn.
 WPOR 500 Norfolk, Va.
 WTAR 500 Norfolk, Va.

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Manitoba Telephone System
 Canadian National Railways
 Earl L. White
 Pickwick Brdcastg. Corp.
 The Shepard Co.
 Memphis Commercial-Appeal
 WTAR Radio Corp.
 WTAR Radio Corp.

INDEX BY FREQUENCIES AND DIAL NUMBERS

790 kilocycles 379.5 meters

KGO 7500 Oakland, Cal.
 WGY 5000 Schenectady, N. Y.
 6KW 1500 Tuinucu, Cuba

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General Electric Co.
 General Electric Co.
 Frank H. Jones

800 kilocycles 374.8 meters

WBAP 50000 Fort Worth, Tex.
 WFAA 500 Dallas, Texas

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Carter Publications, Inc.
 News & Journal

810 kilocycles 370.2 meters

WCCO 7500 Minneapolis, Minn.
 WPCB 500 New York City

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Washburn-Crosby Co., Inc.
 Eastern Broadcasters, Inc.

820 kilocycles 365.6 meters

WHAS 5000 Louisville, Ky.

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Courier-Journal & Times

830 kilocycles 361.2 meters

HHK 1000 Port au Prince, Haiti
 KOA 12500 Denver, Colo.
 XWHDH 1000 Gloucester, Mass.
 WRVF Gainesville, Fla

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Republic of Haiti
 General Electric Co.
 Matheson Radio Co., Inc.

840 kilocycles 356.9 meters

CFCA 500 Toronto, Ont.
 CHCT 1000 Red Deer, Alta.
 CJBC 1000 Toronto, Ont.
 CKLC 1000 Red Deer, Alta.
 CKOW 500 Toronto, Ont.
 CMC 500 Havana, Cuba
 CNRT 500 Toronto, Ont.
 XFX 500 Mexico City

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Star Publishing & Ptg. Co.
 G. F. Tull & Ardern, Ltd.
 Jarvis Street Baptist Church
 Alberta Pacific Grain Co., Ltd.
 Nestle's Food Co.
 Cuban Telephone Co.
 Canadian National Railways
 Sria. de Educacion Publica

~~XWBB Kansas City~~
 850 kilocycles 352.7 meters

KWKH 10000 Shreveport, La.
 WWL 5000 New Orleans, La.

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W. K. Henderson
 Loyola University

860 kilocycles 348.6 meters

KFOZ 250 Hollywood, Cal.
 WABC 5000 New York City
 WBOQ 5000 New York City
 2OK 100 Havana, Cuba
 7SR 500 Elia, Cuba
 XWBB Kansas City

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Taft Radio & Brdcastg. Co.
 Atlantic Broadcasting Corp.
 Atlantic Broadcasting Corp.
 Merio G. Velez
 Salvador Rionda

870 kilocycles 344.6 meters

WENR 50000 Chicago, Ill.
 WLS 5000 Chicago, Ill.

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Great Lakes Brdcastg. Co.
 Agricultural Brdcastg. Co.

880 kilocycles 340.7 meters

CHCS 10 Hamilton, Ont.
 CHML 50 Hamilton, Ont.
 CHRC 25 Quebec, Que.
 CJCB 50 Sydney, N. S.
 CJCBI 22.5 Quebec, Que.
 CKCV 50 Quebec, Que.
 CKOC 50 Hamilton, Ont.
 CNRQ 50 Quebec, Que.
 KFKA 500 Greeley, Colo.
 KLX 500 Oakland, Cal.
 KPOF 500 Denver, Colo.
 WCOC 500 Columbus, Miss.
 WGBI 250 Scranton, Pa.
 WQAN 250 Scranton, Pa.

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The Hamilton Spectator
 Maple Leaf Radio Co.
 E. Fontaine
 N. Nathanson
 Le "Soleil," Ltd.
 G. A. Vandry
 Wentworth Radio Supply Co.
 Canadian National Railways
 State Teachers College
 Tribune Publishing Co.
 Pillar of Fire, Inc.
 Crystal Oil Co.
 Scranton Broadcasters, Inc.
 Scranton Times

KCYS
 880
 MTRS.
 340.7
 DIAL

CUT OUT ON DOTTED LINES

INDEX BY FREQUENCIES AND DIAL NUMBERS

890 kilocycles 336.9 meters

CFBO	50	St. John, N. B.
KFNF	500	Shenandoah, Iowa
KGJF	250	Little Rock, Ark.
KUSD	500	Vermillion, S. D.
WGST	250	Atlanta, Ga.
WILL	250	Urbana, Ill.
WJAR	250	Providence, R. I.
WKAQ	500	San Juan, P. R.
WMAZ	250	Macon, Ga.
WMMN	250	Fairmont, W. Va.

WSVI Iowa City, Iowa

900 kilocycles 333.1 meters

KGBU	500	Ketchikan, Alaska
KHJ	1000	Los Angeles, Cal.
KSEI	250	Pocatello, Idaho
WFBL	750	Syracuse, N. Y.
WFLA	1000	Clearwater, Fla.
WKY	1000	Oklahoma City
WLBL	2000	Stevens Pt., Wis.
WMAK	750	Buffalo, N. Y.
WSEN	1000	St. Petersburg, Fla.

WJAX Jacksonville, Fla.

910 kilocycles 329.6 meters

CFQC	500	Saskatoon, Sask.
CJGC	500	London, Ont.
CJHS	250	Saskatoon, Sask.
CNRL	500	London, Ont.
CNRS	500	Saskatoon, Sask.

920 kilocycles 325.9 meters

KOMO	1000	Seattle, Wash.
KPRC	1000	Houston, Tex.
WAAF	500	Chicago, Ill.
WBSO	250	Wellesley Hills, Mass.
WWJ	1000	Detroit, Mich.
XEX	500	Mexico City
XFF	250	Chihuahua, Chih.

930 kilocycles 322.4 meters

CHNS	500	Halifax, N. S.
CKIC	50	Wolfville, N. S.
KFWI	500	San Francisco, Cal.
KFWM	500	Oakland, Cal.
KGBZ	500	York, Nebr.
KMA	500	Shenandoah, Iowa
WBRC	500	Birmingham, Ala.
WDBJ	250	Roanoke, Va.
WIBG	50	Elkins Park, Pa.

940 kilocycles 319.0 meters

KFEL	250	Denver, Colo.
KFXF	250	Denver, Colo.
KGU	500	Honolulu, Hawaii
KOIN	1000	Portland, Ore.
WCSE	500	Portland, Maine
WFTW	1000	Hopkinsville, Ky.
WHA	750	Madison, Wis.

WDAY Fargo, N.D.

950 kilocycles 315.6 meters

KFWB	1000	Hollywood, Cal.
KGHL	500	Billings, Mont.
KMBC	1000	Independence, Mo.
KPSN	1000	Pasadena, Cal.
WFB	500	Kansas City, Mo.
WRC	500	Washington, D. C.
2RK	20	Havana, Cuba

C. A. Munro, Ltd.
Henry Field Seed Co.
Church of the Nazarene
University of South Dakota
Georgia School of Technology
University of Illinois
The Outlet Co.
Radio Corp. of Porto Rico
Junior Chamber of Commerce
Holt-Rowe Novelty Co.

Alaska Radio & Service Co.
Don Lee, Inc.
KSEI Broadcasting Association
The Onondaga Co., Inc.
Chamber of Commerce
WKY Radiophone Co.
Wisconsin Dept. of Markets
WMAK Brcdstg. System, Inc.
Chamber of Commerce

The Electric Shop, Ltd.
Free Press Printing Co., Ltd.
Radio Service, Ltd.
Canadian National Railways
Canadian National Railways

Fisher's Blend Station, Inc.
Houston Printing Co.
Drivers Journal Publishing Co.
Babson Statistical Organization
The Detroit News
Excelsior, Cia. Editorial, S. A.
Gobierno Estado de Chihuahua

Halifax Herald, Ltd.
Acadia University
Radio Entertainments, Inc.
Oakland Educational Society
Dr. George R. Miller
May Seed & Nursery Co.
Birmingham Broadcasting Co.
Richardson-Wayland Elec. Corp.
St. Pauls P. E. Church

Eugene P. O'Fallon, Inc.
Pikes Peak Broadcasting Co., Inc.
Marion A. Mulrony
KOIN, Inc.
Congress Square Hotel Co.
The Acme Mills, Inc.
University of Wisconsin

Warner Bros. Broadcasting Corp.
Northwestern Auto Supply Co.
Midland Broadcasting Co., Inc.
Pasadena Star-News
Sweeney Automobile School Co.
Radio Corp. of America
Raoul Karman

INDEX BY FREQUENCIES AND DIAL NUMBERS

960 kilocycles 312.3 meters

CFCY 250 Charlottetown, P. E. I.
 CFRB 4000 Toronto, Ont.
 CHCK 30 Charlottetown, P. E. I.
 CHWC 500 Pilot Butte, Sask.
 CJBC 5000 Toronto, Ont.
 CJBK 500 Regina, Sask.
 CKCK 500 Regina, Sask.
 CNRR 500 Regina, Sask.
 XBE 101 Pueblo, Pue.

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The Island Radio Co.
 Rogers-Majestic Corp., Ltd.
 W. E. Burke
 R. H. Williams & Sons
 Jarvis St. Baptist Church
 Cooperative Wheat Producers
 Leader Pub. Co., Ltd.
 Canadian Nat'l. Railways
 Ramon Huerta G.

970 kilocycles 309.1 meters

KJR 5000 Seattle, Wash.
~~WCFL 4000 Chicago, Ill.~~
 XEH 101 Monterey, N. L.

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Northwest Radio Service Co.
 Chicago Federation of Labor
 Ing. Constantino de Tarnava

980 kilocycles 305.9 meters

KDKA 5000 Pittsburgh, Pa.

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Westinghouse Elec. & Mfg. Co.

990 kilocycles 302.8 meters

WBZ 15000 Springfield, Mass.
 WBZ 500 Boston, Mass.

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Westinghouse Elec. & Mfg. Co.
 Westinghouse Elec. & Mfg. Co.

1000 kilocycles 299.8 meters

~~KPLA 1000 Los Angeles, Calif.~~
 WHO 5000 Des Moines, Iowa
 WOC 5000 Davenport, Iowa
 XBT 101 Morelia, Mich.
KFVD Colver City, Calif.

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Pacific Development Radio Co., Inc.
 Bankers Life Co.
 Palmer School of Chiropractic
 Carlos Gutierrez M.

1010 kilocycles 296.8 meters

CFLC 50 Prescott, Ont.
 CKCR 50 Brantford, Ont.
 CKSH 50 St. Hyacinthe, Que.
 KGGF 500 Picher, Okla.
 KOW 500 San Jose, Cal.
 WHN 250 New York City
 WNAD 500 Norman, Okla.
 WPAP 250 New York City
 WQAO 250 New York City
 WRNY 250 New York City
 WSIS 250 Sarasota, Fla.

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Radio Association
 John Patterson
 City of St. Hyacinthe
 D. L. Connell, M. D.
 First Baptist Church
 Marcus Loew Booking Agency
 University of Oklahoma
 Calvary Baptist Church
 Calvary Baptist Church
 Aviation Radio Station, Inc.
 Chamber of Commerce

1020 kilocycles 293.9 meters

KFKX 5000 Chicago, Ill.
 KYW 5000 Chicago, Ill.
 WRAX 250 Philadelphia, Pa.

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Westinghouse Elec. & Mfg. Co.
 Westinghouse Elec. & Mfg. Co.
 Berachah Church, Inc.

1030 kilocycles 291.1 meters

CFCF 1650 Montreal, Que.
 CJOR 50 Sea Island, B. C.
 CNRV 500 Vancouver, B. C.

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Canadian Marconi Co.
 G. C. Chandler
 Canadian National Railways

1040 kilocycles 288.3 meters

~~KRLD 10000 Dallas, Texas~~
 KTHS 10000 Hot Springs, Ark.
 WKAR 1000 East Lansing, Mich.
 WKEN 1000 Buffalo, N. Y.

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KRLD, Radio Corp.
 Chamber of Commerce
 Michigan Agricultural College
 Radio Station WKEN, Inc.

1050 kilocycles 285.5 meters

XKFKB 5000 Milford, Kansas
 KNX 5000 Hollywood, Cal.
 2MG 20 Havana, Cuba

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John R. Brinkley, M. D.
 Western Broadcast Co.
 M. y G. Salas

KCYS.
1050
 MTRS.
285.5
 DIAL

CUT OUT ON DOTTED LINES

INDEX BY FREQUENCIES AND DIAL NUMBERS

1060 kilocycles 282.8 meters

XKWJJ	500	Portland, Ore.
WBAL	10000	Baltimore, Md.
XWJAG	1000	Norfolk, Nebr.
WTIC	50000	Hartford, Conn.

Wilbur Jerman
Consolidated Gas, Elec. & Pwr. Co.
Norfolk Daily News
Travelers Brdcastg. Service Corp.

1070 kilocycles 280.2 meters

XKJBS	100	San Francisco, Cal.
XWAAT	300	Jersey City, N. J.
XWCAZ	50	Carthage, Ill.
XWDZ	100	Tuscola, Ill.
WEAR	1000	Cleveland, Ohio
WTAM	3500	Cleveland, Ohio

Julius Brunton & Sons Co.
Bremer Broadcasting Corp.
Carthage College
James L. Bush
WTAM and WEAR, Inc.
WTAM and WEAR, Inc.

1080 kilocycles 277.6 meters

WBT	5000	Charlotte, N. C.
XWCBD	5000	Zion, Ill.
WMBI	5000	Chicago, Ill.

Station WBT, Inc.
Wilbur Glenn Voliva
Moody Bible Institute

1090 kilocycles 275.1 meters

KFQA	5000	St. Louis, Mo.
KMOX	5000	St. Louis, Mo.
.2UF	10	Havana, Cuba

Voice of St. Louis, Inc.
Voice of St. Louis, Inc.
Benito V. Ferro

1100 kilocycles 272.6 meters

XKGDW	50	Stockton, Cal.
WLWL	5000	New York City
WPG	5000	Atlantic City, N. J.

E. F. Peffer
Missionary Society of St. Paul
Municipality of Atlantic City

1110 kilocycles 270.1 meters

XKSOO	2000	Sioux Falls, S. D.
WRVA	5000	Richmond, Va.
2TW	20	Havana, Cuba

Sioux Falls Broadcast Assn.
Larus & Bros. Co., Inc.
Roberto E. Ramirez

1120 kilocycles 267.7 meters

CFJC	15	Kamloops, B. C.
CFRC	500	Kingston, Ont.
CHGS	25	Summerside, P. E. I.
CJOC	50	Lethbridge, Alta.
CKPR	50	Midland, Ont.
KFSG	500	Los Angeles, Cal.
KMIC	500	Inglewood, Cal.
KRSC	50	Seattle, Wash.
KUT	500	Austin, Texas
WGCA	500	Pensacola, Fla.
WDEL	250	Wilmington, Del.
WHAD	250	Milwaukee, Wis.
WISN	250	Milwaukee, Wis.
WTAW	500	College Station, Texas
W100-WD80		Miami Beach, Fla.

N. S. Dalglish & Sons
Queen's University
R. T. Holman, Ltd.
Harold R. Carson
Midland Brdcastg. Corp.
Echo Park Evang. Assn.
Dalton's, Inc.
Radio Sales Corp.
KUT Broadcasting Co.
City of Pensacola
WDEL, Inc.
Marquette University
Evening Wisconsin Co.
Agricultural & Mec. College

1130 kilocycles 265.3 meters

KSL	5000	Salt Lake City
XWJJD	20000	Mooseheart, Ill.
XWOV	1000	New York City
XEF	105	Oaxaca, Oax.

Radio Service Corp. of Utah
Loyal Order of Moose
International Brdcastg. Corp.
Federico Zorrilla

1140 kilocycles 263.0 meters

KVOO	5000	Tulsa, Okla.
WAPI	5000	Birmingham, Ala.

Southwestern Sales Corp.
Alabama Polytechnic Institute

1150 kilocycles 260.7 meters

WHAM	5000	Rochester, N. Y.
6BY	200	Cienfuegos, Cuba

Stromberg-Carlson Tel. Mfg. Co.
Jose Ganduxe

INDEX BY FREQUENCIES AND DIAL NUMBERS

1160 kilocycles 258.5 meters

WOWO 10000 Ft. Wayne, Ind.
 WWVA 5000 Wheeling, W. Va.

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Main Auto Supply Co.
 West Virginia Brdctg. Corp.

1170 kilocycles 256.3 meters

~~KEJK 500 Los Angeles, Cal.~~
 XKTNT 5000 Muscatine, Iowa
 WCAU 10000 Philadelphia, Pa.
 2OL 100 Havana, Cuba

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R. S. MacMillan
 Norman Baker
 Universal Broadcasting Co.
 Oscar C. Orta

1180 kilocycles 254.1 meters

KEX 5000 Portland, Ore.
 KOB 10000 State College, N. M.
 XWDGY 1000 Minneapolis, Minn.
 XWGBS 500 New York City
 XWHDI 500 Minneapolis, Minn.

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Western Broadcasting Co.
 College of Agriculture
 Dr. George W. Young
 General Broadcasting System, Inc.
 Wm. Hood Dunwoody Indus. Inst.

1190 kilocycles 252.0 meters

XWICC 500 Bridgeport, Conn.
 WOAI 5000 San Antonio, Texas

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Bridgeport Broadcasting Station, Inc.
 Southern Equipment Co.

1200 kilocycles 249.9 meters

KFHA 100 Gunnison, Colo.
 KFJB 100 Marshalltown, Iowa
 KFKZ 15 Kirksville, Mo.
 KFWC 100 Pomona, Cal.
 KFWF 100 St. Louis, Mo.
 KGCU 100 Mandan, N. D.
 KGDE 50 Fergus Falls, Minn.
 KGDY 15 Oldham, S. D.
 KGEK 50 Yuma, Colo.
 KGEW 100 Fort Morgan, Colo.
 KGFK 50 Hallock, Minn.
 KGY 10 Lacey, Wash.
 KMJ 100 Fresno, Cal.
 KPCC 50 Pasadena, Cal.
 KSMR 100 Santa Maria, Cal.
 KVOS 100 Bellingham, Wash.
 KWG 100 Stockton, Cal.
 KXO 100 El Centro, Cal.
 WABI 100 Bangor, Maine
 WABZ 100 New Orleans, La.
 WBBY 75 Charleston, S. C.
 WBBZ 100 Ponca City, Okla.
 WCAT 100 Rapid City, S. D.
 WCLO 100 Kenosha, Wis.
 WCOD 100 Harrisburg, Pa.
 WEPS 100 Gloucester, Mass.
 WFBC 50 Knoxville, Tenn.
 WHBC 10 Canton, Ohio
 WHBY 100 West De Pere, Wis.
 WIBX 100 Utica, N. Y.
 WIL 100 St. Louis, Mo.
 WJBC 100 La Salle, Ill.
 WJBL 100 Decatur, Ill.
 WJBW 30 New Orleans, La.
 WKJC 100 Lancaster, Pa.
 WLAP 30 Louisville, Ky.
 WLBG 100 Ettrick, Va.
 WMAY 100 St. Louis, Mo.
~~WMPT 100 Waterloo, Iowa~~
 WNBO 100 Washington, Pa.
 WNBW 5 Carbondale, Pa.
 WNBX 10 Springfield, Vt.
 WORC 100 Worcester, Mass.
 WRAF 100 La Porte, Ind.
 WRBL 50 Columbus, Ga.
 WRWE 100 Hammond, Ind.
 XEA 101 Guadalajara, Jal.
 XES 250 C. Lerdo, Dgo.
 2BB 15 Havana, Cuba

Western College of Colorado
 Marshall Electric Co., Inc.
 State Teachers College
 James R. Fouch
 St. Louis Truth Center, Inc.
 Mandan Radio Association
 Jaren Drug Co.
 J. Albert Loesch
 Beehler Elec. Equipment Co.
 City of Fort Morgan
 Lautzenheiser & Mitchell
 St. Martin's College
 The Fresno Bee
 Pasadena Presbyterian Church
 Santa Maria Valley R. R. Co.
 KVOS, Inc.
 Portable Wireless Tel. Co.
 E. R. Irely and F. M. Bowles
 First Universalist Church
 Coliseum Place Baptist Church
 Washington Light Infantry
 C. L. Carrell
 State School of Mines
 C. E. Whitmore
 Norman R. Hoffman
 Matheson Radio Co., Inc.
 First Baptist Church
 St. John's Catholic Church
 St. Norbert's College
 WIBX, Inc.
 Missouri Broadcasting Corp.
 Hummer Furniture Co.
 Wm. Gushard Dry Goods Co.
 Charles C. Carlson, Jr.
 Kirk Johnson & Co.
 American Brdctg. Corp. of Ky.
 Robert Allen Gamble
 Kingshighway Pres. Church
 Waterloo Broadcasting Co.
 John Brownlee Spriggs
 Home Cut Glass & China Co.
 First Congregational Church
 K. & B. Electric Co.
 The Radio Club, Inc.
 David Parmer
 Hammond-Calumet Brdctg. Co.
 Alberto Palos Sauza
 Cervecería de Durango, S. A.
 Bernardo Barrie

KCY.S.
1200
 MTRS.
249.9
 DIAL

CUT OUT ON DOTTED LINES

WFBE

Cincinnati, Ohio

INDEX BY FREQUENCIES AND DIAL NUMBERS

1210 kilocycles 247.8 meters

CFCO	50	Chatham, Ont.
CFNB	50	Fredericton, N. B.
CHWK	5	Chilliwack, B. C.
CKMC	15	Cobalt, Ont.
CKPC	50	Preston, Ont.
KDFN	100	Casper, Wyo.
KDLR	100	Devils Lake, N. D.
KFOR	100	Lincoln, Nebr.
KFVS	100	Cape Girardeau, Mo.
KGCR	100	Watertown, S. D.
KPCB	50	Seattle, Wash.
KPQ	100	Seattle, Wash.
KWEA	100	Shreveport, La.
WBAX	100	Wilkes-Barre, Pa.
WCBS	100	Springfield, Ill.
WCOH	100	Yonkers, N. Y.
WCRW	100	Chicago, Ill.
WDWF	100	Cranston, R. I.
WEBE	100	Cambridge, Ohio
WEBQ	100	Harrisburg, Ill.
WEDC	100	Chicago, Ill.
WGGB	100	Freeport, N. Y.
WGCM	100	Gulfport, Miss
WHBF	100	Rock Island, Ill.
WHBU	100	Anderson, Ind.
WIBA	100	Madison, Wis.
WINR	100	Bay Shore, N. Y.
WJBI	100	Red Bank, N. J.
WJBU	100	Lewisburg, Pa.
WJBY	50	Gadsden, Ala.
WJW	100	Mansfield, Ohio
WLCI	50	Ithaca, N. Y.
WLSI	100	Cranston, R. I.
WMAN	50	Columbus, Ohio
WMBG	100	Richmond, Va.
WMBR	100	Tampa, Fla.
WOCL	25	Jamestown, N. Y.
WOMT	100	Manitowoc, Wis.
WPAW	100	Pawtucket, R. I.
WRBQ	100	Greenville, Miss.
WRBU	100	Gastonia, N. C.
WSBC	100	Chicago, Ill.
WSIX	100	Springfield, Tenn.
WTAX	50	Streator, Ill.

Western Ontario "Better Radio" Club
James S. Neill & Sons, Ltd.
Chilliwack Brdcstg. Co., Ltd.
R. L. MacAdam
Wallace Russ
Donald Lewis Hathaway
Radio Electric Co.
Howard A. Shuman
Hirsch Battery & Radio Co.
Cutler's Radio Brdcstg. Service
Pacific Coast Biscuit Co.
Taft & Wasmer, Inc.
William E. Antony
John H. Stenger, Jr.
H. L. Dewing & Chas. Messter
Westchester Brdcstg. Corp.
Clinton R. White
Dutee W. Flint
Roy W. Waller
First Trust & Savings Bank
Emil Denemark, Inc.
Harry H. Carman
Gulf Coast Music Co., Inc.
Beardsley Specialty Co.
Citizens Bank
Capital Times-Strand Theatre
Radiotel Mfg. Co., Inc.
Robert S. Johnson
Bucknell University
Charles J. Black
Mansfield Broadcasting Assn.
Lutheran Assn. of Ithaca
The Lincoln Studios, Inc.
W. E. Heskett
Havens & Martin, Inc.
F. J. Reynolds
A. E. Newton
Francis M. Kadow
Shartenburg & Robinson Co.
J. Pat Scully
A. J. Kirby Music Co.
World Battery Co., Inc.
638 Tire & Vulcanizing Co.
Williams Hardware Co.

1220 kilocycles 245.8 meters

KFKU	1000	Lawrence, Kans.
XWCAD	500	Canton, N. Y.
WCAE	500	Pittsburgh, Pa.
WREN	1000	Lawrence, Kans.
WDAE		Tampa, Fla

University of Kansas
St. Lawrence University
Kaufman & Baer Co., Inc.
Jenny Wren Co.

1230 kilocycles 243.8 meters

KFIO	100	Spokane, Wash.
KGGM	500	Albuquerque, N. Mex.
KYA	1000	San Francisco, Cal.
WBIS	1000	Boston, Mass.
WFBM	1000	Indianapolis, Ind.
WNAC	1000	Boston, Mass.
XWPSC	500	State College, Pa.
WSBT	500	South Bend, Ind.

Spokane Broadcasting Corp.
New Mexico Broadcasting Co.
Pacific Broadcasting Corp.
Shepard-Norwell Co.
Indianapolis Power & Light Co.
Shepard-Norwell Co.
Pennsylvania State College
South Bend Tribune

1240 kilocycles 241.8 meters

KTAT	1000	Ft. Worth, Texas
WGHP	750	Detroit, Mich.
WJAD	1000	Waco, Texas
WQAM	1000	Miami, Fla.
WRBC	500	Valparaiso, Ind.

Texas Air Transport Brdcst. Co.
American Brdcstg. Corp.
Frank P. Jackson
Miami Brdcstg. Co.
Immanuel Lutheran Church

INDEX BY FREQUENCIES AND DIAL NUMBERS

1250 kilocycles 239.9 meters

KFMX 1000 Northfield, Minn.
 KFOX 1000 Long Beach, Cal.
 KIDO 1000 Boise, Idaho
 KXL 500 Portland, Ore.
 WAAM 1000 Newark, N. J.
 WCAL 1000 Northfield, Minn.
 WDSU 1000 New Orleans, La.
 WGCP 250 Newark, N. J.
 WGMS 500 Minneapolis, Minn.
 WLB 500 Minneapolis, Minn.
 WODA 1000 Paterson, N. J.
 WRHM 1000 Minneapolis, Minn.
WTOC Savannah, Geo

Carleton College
 Nichols & Warinner, Inc.
 Boise Brdcstg. Station
 KXL Broadcasters, Inc.
 WAAM, Inc.
 St. Olaf College
 Jos. H. Uhalt
 May Radio Broadcast Corp.
 University of Minnesota
 Washburn-Crosby Co.
 Richard E. O'Dea
 Rosedale Hospital Co., Inc.

1260 kilocycles 238.0 meters

KOIL 1000 Council Bluffs, Iowa
 KRGV 500 Harlingen, Texas
 KVOA 500 Tucson, Ariz.
 KWWG 500 Brownsville, Texas
~~WJAX 1000 Jacksonville, Fla.~~
 WLBW 500 Oil City, Pa.
~~WFOA Pensacola, Fla.~~

Mona Motor Oil Co.
 Valley Radio-Electric Corp.
 Robert M. Riculfi
 Chamber of Commerce
 City of Jacksonville
 Petroleum Telephone Co.

1270 kilocycles 236.1 meters

KFUM 1000 Colorado Spgs., Colo.
 KGCA 50 Decorah, Iowa
 KOL 1000 Seattle, Wash.
 KTW 1000 Seattle, Wash.
 *KWLC 100 Decorah, Iowa
 WASH 500 Grand Rapids, Mich.
 *WEAI 500 Ithaca, N. Y.
 WFBR 250 Baltimore, Md.
 WJDX 500 Jackson, Miss.
 WOOD 500 Grand Rapids, Mich.

W. D. Corley
 Charles W. Greenley
 Seattle Brdcstg. Co., Inc.
 First Presbyterian Church
 Luther College
 WASH Broadcasting Corp.
 Cornell University
 Baltimore Radio Show, Inc.
 Lamar Life Insurance Co.
 Walter B. Stiles, Inc.

1280 kilocycles 234.2 meters

WCAM 500 Camden, N. J.
 WCAP 500 Asbury Park, N. J.
~~WDAY 1000 Fargo, N. D.~~
 WDOD 1000 Chattanooga, Tenn.
~~WEBC 1000 Duluth, Minn.~~
 WOAX 500 Trenton, N. J.
 WRR 500 Dallas, Texas
 ZLR 50 Havana, Cuba
~~WFFL Chicago, Ill.~~
~~WFLA Tampa, Fla.~~

City of Camden
 Radio Industries Broadcast Co.
 WDAY, Inc.
 Chattanooga Radio Co., Inc.
 Head of Lake Brdcstg. Co.
 Franklin J. Wolff
 City of Dallas
 Jose Lara

1290 kilocycles 232.4 meters

KDYL 1000 Salt Lake City
 KFUL 1000 Galveston, Texas
 KLCN 50 Blytheville, Ark.
 KTSN 1000 San Antonio, Texas
 WJAS 1000 Pittsburgh, Pa.
 WNBZ 50 Saranac Lake, N. Y.
WEBC Superior, Wis.

Intermountain Brdcstg. Corp.
 Will H. Ford
 C. L. Linzenich
 Lone Star Broadcast Co.
 Pittsburgh Radio Supply House
 Smith & Mace

1300 kilocycles 230.6 meters

KFH 500 Wichita, Kansas
 KFJR 500 Portland, Ore.
 KGFE 1000 Los Angeles, Cal.
 KTBI 750 Los Angeles, Cal.
 KTBR 500 Portland, Ore.
 WBBR 1000 Rossville, N. Y.
 WEVD 500 New York City
 WHAP 1000 New York City
 WHAZ 500 Troy, N. Y.
~~WIBW 1000 Topeka, Kansas~~
WOQ Kansas City, Mo.

Radio Station KFH Co.
 Ashley C. Dixon & Son
 Trinity Methodist Church
 Bible Institute of Los Angeles
 M. E. Brown
 Peoples Pulpit Association
 Debs Memorial Radio Fund, Inc.
 Defenders of Truth Society, Inc.
 Rensselaer Polytechnic Institute
 Topeka Brdcstg. Assn. Inc.

1310 kilocycles 228.9 meters

KFBK 100 Sacramento, Cal.
 KFGQ 100 Boone, Iowa
 KFJY 100 Ft. Dodge, Iowa

Jas. McClatchy Co.
 Boone Biblical College
 C. S. Tunwall

KCY.S.
1310
 MTRS.
228.9
 DIAL

CUT OUT ON DOTTED LINES

INDEX BY FREQUENCIES AND DIAL NUMBERS

KFPL	15	Dublin, Texas
KFFM	15	Greenville, Texas
KFUP	100	Denver, Colo.
KFXJ	50	Edgewater, Colo.
KFXR	100	Oklahoma City
KGCCX	100	Wolf Point, Idaho
KGEZ	100	Kalispell, Mont.
KGFW	50	Ravenna, Nebr.
KGHG	50	McGehee, Ark.
KMED	50	Medford, Ore.
KRMD	50	Shreveport, La.
KTSL	100	Shreveport, La.
KTSM	100	El Paso, Texas
KWCW	100	Cedar Rapids, Iowa.
WAGM	50	Royal Oak, Mich.
WBOW	100	Terre Haute, Ind.
WBRE	100	Wilkes-Barre, Pa.
WCLS	100	Joliet, Ill.
WDAH	100	El Paso, Texas
WEBR	100	Buffalo, N. Y.
WEHS	100	Evanston, Ill.
WFBG	100	Altoona, Pa.
WFDL	100	Flint, Mich.
WFKD	50	Philadelphia, Pa.
WGAL	15	Lancaster, Pa.
WGH	100	Newport News, Va.
WHFC	100	Cicero, Ill.
WIBU	100	Poynette, Wis.
WJAC	100	Johnstown, Pa.
WJAK	50	Marion, Ind.
WJIZ	100	Winston-Salem, N. C.
WKAV	100	Laconia, N. H.
WKBB	100	Joliet, Ill.
WKBC	100	Birmingham, Ala.
WKBI	50	Chicago, Ill.
WKBS	100	Galesburg, Ill.
WLBC	50	Muncie, Ind.
WMBL	100	Lakeland, Fla.
WNAT	100	Philadelphia, Pa.
WNBH	100	New Bedford, Mass.
WNBJ	50	Knoxville, Tenn.
WOBT	15	Union City, Tenn.
WOL	100	Washington, D. C.
WRAW	100	Reading, Pa.
WRBI	20	Tifton, Ga.
WRK	100	Hamilton, Ohio
WSAJ	100	Grove City, Pa.

C. C. Baxter
 The New Furniture Co.
 Fitzsimmons General Hospital
 R. G. Howell
 Exchange Ave. Baptist Church
 First State Bank of Vida
 Chamber of Commerce
 Otto F. Sothman
 Chas. W. McCollum
 Mrs. W. J. Virgin
 Robert M. Dean
 Houseman Sheet Metal Works, Inc.
 W. S. Bledsoe & W. T. Blackwell
 Harry F. Paar
 Robert L. Miller
 Banks of Wabash, Inc.
 Louis G. Baltimore
 WCLS, Inc.
 Trinity Methodist Church
 Howell Broadcasting Co., Inc.
 Victor C. Carlson
 Wm. F. Gable Co.
 Frank D. Fallain
 Foulkrod Radio Engineering Co.
 Lancaster Electric Supply Co.
 Virginia Brdcastg. Co., Inc.
 Triangle Broadcasters
 William C. Forrest
 Johnstown Automobile Co.
 Marion Brdcastg. Co.
 Winston-Salem Journal Co.
 Laconia Radio Club
 Sanders Bros.
 R. B. Broyles Furn. Co.
 Fred L. Schoenwolf
 Permil N. Nelson
 Donald A. Burton
 Benford's Radio Studios
 Lennig Bros. Co.
 New Bedford Broadcasting Co.
 Lonsdale Baptist Church
 Tittsworth's Radio & Music Shop
 American Broadcasting Co.
 Avenue Radio & Electric Shop
 Kent's Furniture and Music Store
 S. W. Doron & J. C. Slade
 Grove City College

1320 kilocycles 227.1 meters

KGHF	250	Pueblo, Colo.
KGIQ	250	Twin Falls, Idaho
KID	250	Idaho Falls, Idaho
WADC	1000	Akron, Ohio
WSMB	500	New Orleans, La.

1330 kilocycles 225.4 meters

KSCJ	1000	Sioux City, Iowa
WDRG	500	New Haven, Conn.
WSAI	500	Cincinnati, Ohio
WTAQ	1000	Eau Claire, Wis.

1340 kilocycles 223.7 meters

KFPW	50	Cartersville, Mo.
KFPY	500	Spokane, Wash.
KMO	500	Tacoma, Wash.
WSPD	500	Toledo, Ohio

1350 kilocycles 222.1 meters

KWK	1000	St. Louis, Mo.
WBNY	250	New York City
WCDA	250	New York City
WKBQ	250	New York City
WMSG	250	New York City

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C. P. Ritchie & J. E. Finch
 Radio Broadcasting Corp.
 Jack W. Duckworth, Jr.
 Allen T. Simmons
 Saenger Theatre & Maison Blanche

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Perkins Bros. Co.
 Doolittle Radio Corp.
 Crosley Radio Corp., Lessee
 Gillette Rubber Co.

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Rev. Lannie W. Stewart
 Symons Broadcasting Co.
 KMO, Inc.
 Toledo Broadcasting Co.

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Greater St. Louis Brdcastg. Corp.
 Baruchrome Corp.
 Italian Educ. Brdcastg. Co., Inc.
 Standard Cahill Co., Inc.
 Madison Square Garden

INDEX BY FREQUENCIES AND DIAL NUMBERS

1360 kilocycles 220.4 meters

KFBB	500	Havre, Mont.
KGB	250	San Diego, Cal.
KGIR	250	Butte, Mont.
WGES	500	Chicago, Ill.
WKKS	500	Gary, Ind.
WLEX	500	Lexington, Mass.
WMAF	500	S. Dartmouth, Mass.
WQBC	300	Utica, Miss.

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Buttery Broadcast, Inc.
 Pickwick Brdcastg. Corp.
 Symons Broadcasting Co.
 Oak Leaves Brdcastg. Station, Inc.
 Johnson-Kennedy Radio Corp.
 Lexington Air Stations
 Round Hills Radio Corp.
 Chamber of Commerce

1370 kilocycles 218.7 meters

KCRC	100	Enid, Okla.
KFBL	50	Everett, Wash.
KFJI	100	Astoria, Ore.
KFJM	500	Grand Forks, N. D.
KFJZ	100	Ft. Worth, Texas
KFLX	100	Galveston, Texas
KGAR	100	Tucson, Ariz.
KGBX	100	St. Joseph, Mo.
KGCI	100	San Antonio, Texas
KGDA	50	Dell Rapids, S. D.
KGER	100	Long Beach, Cal.
KGFG	100	Oklahoma City
KGFL	50	Raton, N. M.
KGKL	100	San Angelo, Texas
KGRC	100	San Antonio, Texas
KIT	50	Yakima, Wash.
KLO	100	Ogden, Utah
KOH	100	Reno, Nevada
KOOS	50	Marshfield, Ore.
KRE	100	Berkeley, Cal.
KVL	100	Seattle, Wash.
KWKK	100	Kansas City, Mo.
KZM	100	Hayward, Cal.
WBBL	100	Richmond, Va.
WCBM	100	Baltimore, Md.
WELK	100	Philadelphia, Pa.
WFBJ	100	Collegeville, Minn.
WGL	100	Fort Wayne, Ind.
WHBD	100	Bellefontaine, Ohio
WHBQ	100	Memphis, Tenn.
WHDF	100	Calumet, Mich.
WIBM	100	Jackson, Mich.
WJBK	50	Ypsilanti, Mich.
WJBO	100	New Orleans, La.
WJDW	100	Emory, Va.
WMBO	100	Auburn, N. Y.
WRAK	50	Erie, Pa.
WRBT	100	Wilmington, N. C.
WRJN	100	Racine, Wis.
WSVS	50	Buffalo, N. Y.

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Champlin Refining Co.
 Leese Bros.
 George Kincaid
 University of North Dakota
 H. C. Meacham
 George Roy Clough
 Tucson Motor Service Co.
 Foster-Hall Tire Co.
 Liberto Radio Sales Co.
 Home Auto Co.
 C. Merwin Dobyns
 Faith Tabernacle Assn.
 Hubbard & Murphy
 KGKL Inc., Opr. by Ragsdale Auto
 Eugene J. Roth
 Carl E. Haymond
 Peery Building Co.
 Jay Peters
 H. H. Hanseth
 First Congregational Church
 Arthur C. Dailey
 Wilson Duncan Brdcastg. Co.
 Leon P. Tenney
 Grace Covenant Presbyterian Church
 Baltimore Brdcastg. Corp.
 Howard R. Miller
 St. John's University
 Fred C. Zieg
 F. P. Moler
 Broadcasting Station WHBQ, Inc.
 Upper Michigan Brdcastg. Co.
 C. L. Carrell
 James F. Hopkins
 Valdemar Jensen
 Emory & Henry College
 Radio Service Laboratories
 C. R. Cummins
 Wilmington Radio Association
 Racine Broadcasting Corp.
 Seneca Vocational School

1380 kilocycles 217.3 meters

KOV	500	Pittsburgh, Pa.
KSO	500	Clarinda, Iowa
WKBH	1000	La Crosse, Wis.
WSMK	200	Dayton, Ohio

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Doubleday-Hill Electric Co.
 Berry Seed Co.
 Joseph Callaway
 Stanley M. Krohn, Jr.

KCYS.
 1390
 MTRS.
 215.7
 DIAL

1390 kilocycles 215.7 meters

KLRA	1000	Little Rock, Ark.
KOY	500	Phoenix, Ariz.
KUOA	1000	Fayetteville, Ark.
KWSC	500	Pullman, Wash.
WHK	1000	Cleveland, Ohio

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Arkansas Broadcasting Co.
 Nielson Radio Supply Co.
 University of Arkansas
 State College of Washington
 Radio Air Service Corp.

CUT OUT ON
 DOTTED LINES

INDEX BY FREQUENCIES AND DIAL NUMBERS

1400 kilocycles 214.2 meters

KOCW	250	Chickasha, Okla.
WBBC	500	Brooklyn, N. Y.
WCGU	500	Coney Island, N. Y.
WCMA	500	Culver, Ind.
WKBF	500	Indianapolis, Ind.
WLTH	500	Brooklyn, N. Y.
WSDA	500	Brooklyn, N. Y.
WSGH	500	Brooklyn, N. Y.

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College for Women
 Brooklyn Broadcasting Corp.
 U. S. Broadcasting Corp.
 Culver Military Academy
 Indianapolis Broadcasting, Inc.
 The Voice of Brooklyn, Inc.
 Amateur Radio Specialty Co.
 Amateur Radio Specialty Co.

1410 kilocycles 212.6 meters

KFLV	500	Rockford, Ill.
KGRS	1000	Amarillo, Texas
WBGM	500	Bay City, Mich.
WDAG	250	Amarillo, Texas
WHBL	500	Sheboygan, Wis.
WSGP	500	Savannah, Ga.

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A. T. Frykman
 Gish Radio Service
 James E. Davidson
 National Radio & Brdcastg. Corp.
 Press Pub. Co. & C. L. Carrell
 Chamber of Commerce

1420 kilocycles 211.1 meters

KFIF	100	Portland, Ore.
KFIZ	100	Fond du Lac, Wis.
KFOU	100	Holy City, Cal.
KFQW	100	Seattle, Wash.
KFXD	50	Jerome, Idaho
KFXV	100	Flagstaff, Ariz.
KFYO	100	Abilene, Texas
KGFF	100	Alva, Okla.
KGEJ	100	Los Angeles, Cal.
KGC-C	50	San Francisco, Cal.
KGIW	100	Trinidad, Colo.
KGLX	100	Las Vegas, Nevada
KGKX	15	Sand Point, Idaho
KICK	100	Red Oak, Iowa
KLPM	100	Minot, N. Dak.
KORE	100	Eugene, Ore.
KTAP	100	San Antonio, Texas
KTUE	5	Houston, Texas
KXRO	75	Aberdeen, Wash.
WEDH	30	Erie, Pa.
WHDL	10	Tupper Lake, N. Y.
WHIS	100	Bluefield, W. Va.
WIAS	100	Ottumwa, Iowa
WIBR	50	Stuebenville, Ohio
WILM	100	Wilmington, Del.
WKBP	50	Battle Creek, Mich.
WLEF	100	Kansas City, Mo.
WLEY	100	Lexington, Mass.
WMBC	100	Detroit, Mich.
WMBH	100	Joplin, Mo.
WMRJ	10	Jamaica, N. Y.
WPOE	30	Patchogue, N. Y.
WQBZ	60	Weirton, W. Va.
WSSH	100	Boston, Mass.
WTBO	50	Cumberland, Md.

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Benson Polytechnic Institute
 Reporter Printing Co.
 W. E. Riker
 KFQW, Inc.
 Service Radio Co.
 Mary M. Costigan
 T. E. Kirksey
 KGFF Broadcasting Co.
 Ben S. McClashan
 Golden Gate Brdcastg. Co.
 Trinidad Creamery Co., Inc.
 Las Vegas, Nevada, Radio Corp.
 C. E. Twiss and F. H. McCann
 Red Oak Radio Corp.
 E. C. Reineke
 Eugene Broadcasting Station
 Alamo Brdcastg. Co.
 Uhalt Electric
 KXRO, Inc.
 Erie Dispatch-Herald
 George Franklin Bissell
 Daily Telegraph
 Poling Electric Co.
 George W. Robinson
 Delaware Broadcasting Co., Inc.
 Enquirer-News Co.
 Everett L. Dillard
 Lexington Air Stations
 Michigan Broadcasting Co., Inc.
 Edwin Dudley Aber
 Peter J. Prinz
 Nassau Broadcasting Corp.
 J. H. Thompson
 Tremont Temple Baptist Church
 Cumberland Broadcasting Co.

1430 kilocycles 209.7 meters

WBAK	500	Harrisburg, Pa.
WBRL	500	Manchester, N. H.
WCAH	500	Columbus, Ohio
WGBC	500	Memphis, Tenn.
WHP	500	Harrisburg, Pa.
WNBR	500	Memphis, Tenn.

KOLA

Los Angeles, Calif.

1440 kilocycles 208.2 meters

X KLS	250	Oakland, Cal.
WABO	500	Rochester, N. Y.
WBCA	250	Allentown, Pa.
WHEC	500	Rochester, N. Y.

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Penna. State Police
 Booth Radio Laboratories
 Commercial Radio Service Co.
 First Baptist Church
 Pennsylvania Brdcastg. Co.
 John Ulrich

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Warner Bros.
 Hickson Electric Co.
 B. B. Musselman
 Hickson Electric Co.

INDEX BY LOCATIONS WITH MAP KEY

ILLINOIS

Carthage F-17-e	50	WCAZ	1070
Chicago E-19-g	5000	KFKX	1020
	5000	KYV	1020
	500	WAAF	920
	25000	WBBM	770
	1500	WCFL	970
	100	WCRW	1210
	100	WEDC	1210
	50000	WENR	870
	500	WGES	1360
	25000	WGN	720
	1000	WIBO	570
	5000	WJAZ	1480
	10000	WJBT	780
	50	WKBI	1310
	5000	WLS	870
	5000	WMAQ	670
	5000	WMBI	1080
	5000	WORD	1480
	500	WPCC	570
	100	WSBC	1210
Cicero	100	WHFC	1310
Decatur G-18	100	WJBL	1200
Evanston E-19	100	WEHS	1310
Forest Park	5000	WSOA	1480
Galesburg F-18-a	100	WKBS	1310
Harrisburg H-18-b	100	WEBQ	1210
Joliet E-19-f	100	WCLS	1310
	100	WKBB	1310
La Salle F-18-d	100	WJBC	1200
Mooseheart E-18-e	20000	WJJD	1130
Peoria Heights G-18	500	WMBD	1440
Quincy G-17	500	WTAD	1440
Rockford E-18-c	500	KFLV	1410
Rock Island F-17-c	100	WHBF	1210
Springfield G-18	100	WCBS	1210
Streator F-18-e	50	WTAX	1210
Tuscola G-19-b	100	WDZ	1070
Urbana G-19-a	250	WILL	890
Zion E-19-c	5000	WCBG	1080
		WCHI	

INDIANA

Anderson G-20-a	100	WHBU	1210
Brookville G-20	100	WKBV	1500
Culver F-19-d	500	WCMA	1400
Evansville H-19	500	WGBF	630
Fort Wayne F-20-b	100	WGL	1370
	10000	WOWO	1160
Gary F-19	500	WJKS	1360
Hammond F-19	100	WWAE	1200
Indianapolis G-19-c	1000	WFBM	1230
	500	WKBF	1400
La Porte F-19-c	100	WRAF	1200
Marion	50	WJAK	1310
Muncie G-20	50	WLBC	1310
South Bend F-20-a	500	WSBT	1230
Terre Haute G-19	100	WBOW	1310
Valparaiso F-19-b	500	WRBC	1240

IOWA

Ames E-16-c	5000	WOI	560
Boone E-16	100	KFGQ	1310
Cedar Rapids E-17-a	100	WKCR	1310
Clarinda E-15-c	500	KSO	1380
Council Bluffs F-15-b	1000	KOIL	1260
Davenport F-17-a	5000	WOC	1000
Decorah D-17	50	KGCA	1270
	100	KWLC	1270
Des Moines F-16-a	5000	WHO	1000
Fort Dodge E-16-a	100	KFYJ	1310
Iowa City E-17-b	500	WSUI	580
Marshalltown E-16-d	100	KFTB	1200
Muscatine F-17-b	5000	KTNT	1170

Ottumwa F-17	100	WIAS	1420
Red Oak F-15	100	KICK	1420
Shenandoah F-15-c	500	KFNF	890
	500	KMA	930
Sioux City E-15	1000	KSCJ	1330
Waterloo F-17	100	WMT	1200

KANSAS

Lawrence G-15-a	1000	KFKU	1220
	1000	WREN	1220
Manhattan G-14-a	500	KSAC	580
Milford G-14	5000	KFKB	1050
Topeka G-14	1000	WIBW	1300
Wichita H-14-a	500	KFH	1300

KENTUCKY

Covington	5000	WKCY	1480
Hopkinsville I-19	1000	WFIW	940
Louisville H-20	5000	WHAS	820
	30	WLAP	1200

LOUISIANA

New Orleans M-17	100	WABZ	1200
	1000	WDSU	1250
	100	WJBO	1370
	30	WJBW	1200
	500	WSMB	1320
	5000	WWL	850
Shreveport K-16	50	KRMD	1310
	1000	KTBS	1450
	100	KTSL	1310
	100	KWEA	1210
	10000	KWKH	850

MAINE

Bangor C-28-b	100	WABI	1200
	250	WLBZ	620
Portland D-28-b	500	WCSH	940

MARYLAND

Baltimore G-24-a	10000	WBAL	1060
	250	WCAO	600
	100	WCBM	1370
	250	WFBR	1270
Cumberland G-23	50	WTBO	1420

MASSACHUSETTS

Boston E-27-c	1000	WBIS	1230
	500	WBZA	990
	1000	WEEI	590
	100	WLOE	1500
	50	WMES	1500
	1000	WNAC	1230
	100	WSSH	1420
Fall River E-27	250	WSAR	1450
Gloucester E-27	100	WEPS	1200
	1000	WHDH	830
Lexington E-27	500	WLEX	1360
	100	WLEY	1420
	100	WNBH	1310
New Bedford E-27-g	500	WMAF	1360
S. Dartmouth E-27	15000	WBZ	990
Springfield E-26-b	250	WBOS	920
Wellesley Hills E-27	100	WORC	1200
Worcester E-27-b	250	WTAG	580

MICHIGAN

Battle Creek E-20	50	WKBP	1420
Bay City D-21	500	WBCM	1410
Berrien Spgs. E-19	1000	WEMC	590
Calumet B-18	100	WHDF	1370

ART P. 46

INDEX BY LOCATIONS WITH MAP KEY

Detroit E-21-g	750	WGHP	1240
	5000	WJR -	750
	100	WMBG	1420
	1000	WWJ -	920
East Lansing E-20-b	1000	WKAR	1040
Flint E-21-a	100	WFDL	1310
Grand Rapids E-20-a	500	WASH -	1270
	500	WOOD	1270
Jackson E-20	100	WIBM	1370
Lapeer E-21	100	WMPG	1500
Ludington D-19	50	WKBB	1500
Royal Oak E-21-e	50	WAGM	1310
Ypsilanti E-21-f	50	WJBK	1370

MINNESOTA

Collegeville C-15	100	WFBJ	1370
Duluth B-17	1000	WBEA -	1280
Fergus Falls B-15	50	KGDE	1200
Hallock A-14	50	KGFK	1200
Minneapolis C-16-b	7500	WCCO -	810
	1000	WDGY -	1180
	500	WGMS	1250
	500	WHDI	1180
	500	WLB	1250
	1000	WRHM -	1250
Northfield D-16	1000	KFMX	1250
	1000	WCAL	1250
St. Paul C-16-c	10000	KSTP -	1460

MISSISSIPPI

Columbus K-18	500	WCOC -	880
Greenville K-17	100	WRBG	1210
Gulfport M-18	100	WGCM	1210
Hattiesburg L-18	10	WRBJ	1500
Jackson	500	WJDX -	1270
Utica L-17	300	WQBC	1360

MISSOURI

Carterville	50	KFPW	1340
Cp. Girardeau H-18-c	100	KFVS -	1210
Columbia G-16-b	500	KFRU -	630
Independence G-16-c	1000	KMBC -	950
Jefferson City H-16-a	500	WOS -	630
Joplin H-16	100	WMBH -	1420
Kansas City G-15-b	100	KWKC -	1370
	1000	WDAF -	610
	500	WHB -	950
	100	WLBG -	1420
	1000	WOO -	610
Kirksville F-16-c	15	KFKZ	1200
St. Joseph G-15	2500	KFEQ -	560
	100	KGBX -	1370
St. Louis H-18-a	5000	KFOA	1090
	500	KFUO -	550
	100	KFWF	1200
	5000	KMOX -	1090
	500	KSD -	550
	1000	KWK -	1350
	1000	WEW	760
	100	WIL -	1200
	100	WMAY	1200

MONTANA

Billings C-8	500	KGHL	950
Butte C-7	250	KGRB	1360
Havre A-8	500	KFBB	1360
Kalispell A-5	100	KGZE	1310
Missoula B-6	500	KUOM	570

NEBRASKA

Clay Center G-14	1000	KMMJ -	740
Lincoln F-14-b	5000	KFAB -	770
	100	KFOR -	1210
	500	WCAT -	590
Norfolk E-14-c	1000	WJAG -	1060
Omaha F-15-a	500	WAAW -	660
	1000	WOW -	590
Ravenna F-13	50	KGFV	1310
York F-13	500	KGBZ -	930

NEVADA

Las Vegas	100	KGIX	1420
Reno G-3	100	KOH	1370

NEW HAMPSHIRE

Laconia D-27	100	WKAV	1310
Manchester E-27	500	WBRL	1430

NEW JERSEY

Asbury Park G-26	500	WCAP	1280
Atlantic City G-25	5000	WPG -	1100
Camden F-25-f	500	WCAM	1280
Elizabeth F-26-h	250	WIBS	1450
Fort Lee F-26	250	WBMS	1450
Jersey City F-26-d	300	WAAT	1070
	250	WKBO	1450
Newark F-25-h	1000	WAAM	1250
	250	WGCP	1250
	250	WNJ	1450
	5000	WOR	710
Paterson F-26-c	1000	WODA	1250
Red Bank G-26	100	WJBI	1210
Trenton F-25	500	WOAX	1280

NEW MEXICO

Albuquerque	500	KGGM	1230
Raton I-11	50	KGFL	1370
State College K-9	10000	KOB -	1180

NEW YORK

Auburn E-24	100	WMBO	1370
Bay Shore F-26-h	100	WJNR	1210
Binghamton E-25	50	WNBF	1500
Brooklyn F-26-f	500	WBBC	1400
	250	WCDA	1350
	100	WCLB	1500
	500	WLTH	1400
	100	WMBQ	1500
	500	WSGH	1400
Buffalo E-23-a	100	WEBR	1310
	1000	WGR -	550
	5000	WKBW -	1470
	1000	WKEN	1040
	750	WMAK	900
	50	WSVS	1370
Canton D-25	500	WCAD	1220
Cazenovia E-25-b	250	WMCU	570
Coney Island F-26	500	WCGO	1400
Freeport F-26-1	100	WGBB	1210
Ithaca E-24-d	500	WEAI	1270
	50	WLCI	1210
Jamaica F-26-f	10	WMRJ	1420
Jamestown E-23-b	25	WOCL	1210
Long Island City F-26	100	WLTX	1500

INDEX BY FREQUENCIES AND DIAL NUMBERS

WMBD 500 Peoria Heights, Ill.
WNRC 250 Greensboro, N. C.
WOKO 500 Poughkeepsie, N. Y.
WSAN 250 Allentown, Pa.
WTAD 500 Quincy, Ill.

Peoria Heights Radio Laboratory
 Wayne M. Nelson
 Harold E. Smith and R. M. Curtis
 Allentown Call Publishing Co.
 Ills. Stock Medicine Brdctsg. Corp.

1450 kilocycles 206.8 meters

KTBS 1000 Shreveport, La.
WBMS 250 Fort Lee, N. J.
WCOS 500 Springfield, Ohio
WFJC 500 Akron, Ohio
WIBS 250 Elizabeth, N. J.
WKBO 250 Jersey City, N. J.
WNJ 250 Newark, N. J.
WSAR 250 Fall River, Mass.
WTFI 250 Toccoa, Ga.

Elliott & Steere
 WBMS Broadcasting Corp.
 Wittenberg College
 W. F. Jones Broadcast, Inc.
 New Jersey Broadcasting Corp.
 Carnith Corp.
 Radio Investment Co.
 Doughty & Welch Electric Co.
 Toccoa Falls Institute

1460 kilocycles 205.4 meters

KSTP 10000 St. Paul, Minn.
WJSV 10000 Mt. Vernon Hills, Va.

National Battery Brdctsg. Co.
 Independent Publishing Co.

1470 kilocycles 204.0 meters

KFJF 5000 Oklahoma City
KGA 5000 Spokane, Wash.
WKBW 5000 Buffalo, N. Y.
~~**WRUF** 5000 Gainesville, Fla.~~

National Radio Mfg. Co.
 Northwest Radio Service Co.
 Churchill Evangelistic Assn.
 University of Florida

1480 kilocycles 202.6 meters

WCKY 5000 Covington, Ky.
WJAZ 5000 Chicago, Ill.
WORD 5000 Chicago, Ill.
WSOA 5000 Forest Park, Ill.
~~**WJFJ** 5000~~

L. B. Wilson, Inc.
 Zenith Radio Corp.
 People's Pulpit Association
 Radiophone Brdctsg. Corp.

1490 kilocycles 201.2 meters

KPWF 5000 Westminster, Cal.
WFBL 750 Syracuse, N. Y.
WLAC 5000 Nashville, Tenn.
WTNT 5000 Nashville, Tenn.

Pacific Western Brdctsg. Fed.
 The Onondaga Co.
 Life & Casualty Insurance Co.
 Tennessee Publishing Co.

1500 kilocycles 199.9 meters

KDB 100 Santa Barbara, Cal.
KGDR 100 San Antonio, Texas
KGFI 100 Corpus Christi, Texas
KGHI 100 Little Rock, Ark.
KGHX 50 Richmond, Texas
KGKB 100 Brownwood, Texas
KPJM 100 Prescott, Ariz.
KUJ 10 Longview, Wash.
KVEP 15 Portland, Ore.
KWTC 100 Santa Ana, Cal.
WCLB 100 Brooklyn, N. Y.
WKBV 100 Brookville, Ind.
WKBZ 50 Ludington, Mich.
WLBX 100 Long Island City, N. Y.
WLOE 100 Boston, Mass.
WMBA 100 Newport, R. I.
WMBJ 100 Pittsburgh, Pa.
WMBQ 100 Brooklyn, N. Y.
WMBS 50 Boston, Mass.
WMPC 100 Lapeer, Mich.
WNBF 50 Binghamton, N. Y.
WOPI 100 Bristol, Tenn.
WPEN 100 Philadelphia, Pa.
WRBJ 10 Hattiesburg, Miss.
WRRL 100 Woods, N. Y.

Santa Barbara Brdctsg. Co.
 KGDR Brdctsg. Co.
 Eagle Brdctsg. Co., Inc.
 Berean Bible Class
 Ft. Bend County School Board
 Eagle Publishing Co.
 Miller & Klahn
 Columbia Brdctsg. Co., Inc.
 Schaeffer Radio Co.
 Pacific Western Brdctsg. Foundation
 Arthur Faske
 Knox Battery & Electric Co.
 K. L. Ashbacher
 John N. Brahy
 Boston Brdctsg. Co.
 LeRoy Joseph Beebe
 Rev. John W. Sproul
 Paul J. Gollhofer
 Mass. Educational Society
 First M. E. Church
 Hewitt-Wood Radio Co.
 Radiophone Service Co.
 Wm. Penn Broadcasting Co.
 Woodruff Furniture Co., Inc.
 Long Island Brdctsg. Corp.

KCYS.
1500
MTRS.
199.9
DIAL

~~**WJFJ**~~
~~**WKBT**~~
~~**WHFC**~~
KREG WEHS
WKBI WILM
WHFC

INDEX BY LOCATIONS WITH MAP KEY

New York City F-26	5000	WABC	850
	250	WBNY	1350
	5000	WBOQ	860
	50000	WEAF	660
	500	WEVD	1300
	500	WGBS	1180
	1000	WHAP	1300
	250	WHN	1010
	30000	WJZ	760
	250	WKBO	1350
	5000	WLWL	1100
	500	WMLA	570
	250	WMSG	1350
	500	WNYC	570
	1000	WOV	1130
	250	WPAP	1010
	500	WFCH	810
	250	WQAO	1010
	250	WRNY	1010
	30	WPOE	1420
Patchogue	500	WOKO	1440
Poughkeepsie F-26-a	500	WABO	1440
Rochester E-24-b	5000	WHAM	1150
	500	WHEC	1440
	1000	WBRR	1300
Rossville F-26	50	WNEZ	1290
Saranac Lake D-26	50000	WGY	790
Schenectady E-25-c	750	WFBL	900
Syracuse E-24-c	250	WSYR	570
Troy E-21-a	500	WHAZ	1300
Tupper Lake D-25	10	WHDL	1420
Utica E-25-a	100	WIBX	1200
Woodside F-26	100	WWRL	1500
Yonkers E-26	100	WCOH	1210

NORTH CAROLINA

Asheville J-21	1000	WWNC	570
Charlotte J-22	5000	WBT	1080
Gastonia J-22	100	WRBU	1210
Greensboro I-22	250	WNRC	1440
Raleigh I-23	1000	WPTF	680
Wilmington J-24	50	WRBT	1370
Winston-Salem	100	WJDZ	1310

NORTH DAKOTA

Bismarck B-12	500	KFYR	550
Devils Lake A-13	100	KDLR	1210
Fargo B-14	1000	WDAY	1280
Grand Forks A-14	500	KFJM	1370
Mandan B-12	100	KGCU	1200
Minot A-12	100	KLPM	420

OHIO

Akron F-22-b	1000	WADC	1320
	500	WFJC	1450
Bellefontaine G-21-a	100	WHBD	1370
Cambridge F-22	100	WEBE	1210
Canton F-22-d	10	WHBC	1200
Cincinnati G-20-e	500	WKRC	550
	5000	WLW	700
	500	WSAI	1330
Cleveland F-22-a	1000	WEAR	1070
	1000	WHK	1390
	500	WJAY	620
	3500	WTAM	1070
Columbus G-21-b	500	WAU	640
	500	WCAH	1430
	750	WEAO	570
	50	WMAN	1210
Dayton G-21-e	200	WSMK	1380
Hamilton G-20-d	100	WRK	1310
Mansfield F-21	100	WJW	1210
Springfield G-21-c	500	WCOS	1450

Steubenville F-22	50	WIBR	1420
Toledo F-21-a	500	WSPD	1340
Youngstown F-22	500	WKBN	570

OKLAHOMA

Alva I-13	100	KGFF	1420
Chickasha J-14-b	250	KOCW	1400
Enid I-14	100	KCRC	1370
Norman J-14-a	500	WNAD	1010
Oklahoma I-14-b	5000	KFJF	1470
	1000	KFXR	1310
	100	KGFG	1370
	1000	WKY	900
Picher I-15	500	KGGF	1010
Ponca City F-14	100	WBBZ	1200
Tulsa I-15	5000	KVOO	1140

OREGON

Astoria C-1-a	100	KFJI	1370
Corvallis D-1	1000	KOAC	560
Eugene D-1	100	KORE	1420
Marshfield E-1	50	KOOS	1370
Medford E-1	50	KMED	1310
Portland C-1-b	5000	KEX	1180
	100	KFIF	1420
	500	KFJR	1300
	1000	KGW	620
	1000	KOIN	940
	500	KTBR	1300
	15	KVEP	1500
	500	KWJJ	1060
	500	KXL	1250

PENNSYLVANIA

Allentown F-25-c	250	WCBA	1440
	250	WSAN	1440
Altoona F-24-c	100	WFBG	1310
Carbondale F-25	5	WNBW	1200
Elkins Park G-25-c	50	WIBG	930
Erie E-23	30	WEDH	1420
	50	WRAK	1370
Grove City F-23-b	100	WSAJ	1310
Harrisburg F-24-d	500	WBAK	1430
	100	WCOD	1200
	500	WHP	1430
Johnstown F-23-d	100	WJAC	1310
Lancaster G-25-a	15	WGAL	1310
	100	WKJC	1200
Lewisburg F-24-b	100	WJBU	1210
Oil City F-23-a	500	WLBW	1260
Philadelphia G-25-d	10000	WCAU	1170
	100	WELK	1370
	500	WFAN	610
	500	WFI	560
	50	WFKD	1310
	500	WIP	610
	500	WLIT	560
	100	WNAT	1310
	100	WPEN	1500
	250	WRAX	1020
Pittsburgh F-23-c	50000	KDKA	980
	500	KQV	1380
	500	WCAE	1220
	1000	WJAS	1290
	100	WMBJ	1500
	100	WRAW	1310
Reading F-25-d	250	WGBI	880
Scranton F-25-a	250	WQAN	880
	500	WPSC	1230
State College F-24-a	100	WNBO	1200
Washington F-23	100	WBAX	1210
Wilkes-Barre F-25-b	100	WBRE	1310

INDEX BY LOCATIONS WITH MAP KEY

PORTO RICO				San Antonio M-14-a			
San Juan	500	WKAQ	890	100	KGCI	1370	
RHODE ISLAND				100	KGDR	1500	
Cranston F-27-a	100	WDWF	1210	100	KGRC	1370	
Newport F-27	100	WLSI	1210	100	KTAP	1420	
Pawtucket E-27	100	WBMA	1500	1000	KTSA	1290	
Providence E-27-h	250	WPAW	1210	5000	WOAI	1190	
	250	WEAN	780	1000	WJAD	1240	
	250	WJAR	890	250	KGKO	570	
SOUTH CAROLINA				UTAH			
Charleston K-23	75	WBBY	1200	Ogden F-7-b	100	KLO	1370
SOUTH DAKOTA				Salt Lake City F-7-c	1000	KDYL	1290
Brookings D-14	1000	KFDY	550	5000	KSL	1130	
Dell Rapids D-14	50	KGDA	1370	VERMONT			
Oldham D-14	15	KGDY	1200	Springfield D-26-b	10	WNBX	1200
Pierre D-12	200	KGFX	580	VIRGINIA			
Rapid City D-11	100	WCAT	1200	Arlington G-24-d	1000	NAA	690
Sioux Falls D-14	2000	KSOD	1150	Emory	100	WJDW	1370
Vermillion E-14-b	500	KUSD	890	Ettrick	100	WLBG	1200
Watertown	100	KGCR	1210	Mt. Vernon Hills	1000	WJSV	1460
Yankton E-14-a	1000	WNAX	570	Newport News	100	WGH	1310
TENNESSEE				Norfolk I-24	500	WPOR	780
Bristol	100	WOPI	1500	500	WTAR	780	
Chatanooga J-20	1000	WDOD	1280	100	WBBL	1370	
Knoxville I-20	50	WFBC	1200	100	WMBG	1210	
	50	WNBK	1310	5000	WRVA	1110	
Lawrenceburg J-19	1000	WNOX	560	250	WDBJ	930	
Memphis J-18-a	500	WOAN	600	WASHINGTON			
	500	WGBC	1430	Aberdeen B-1	75	KXRO	1420
	100	WHBQ	1370	Bellingham A-1	100	KVOS	1200
	500	WMC	780	Everett A-2	50	KBFL	1370
	500	WNBR	1430	Lacey B-2-b	10	KGY	1200
	500	WREC	600	Longview B-1	10	KUJ	1500
Nashville I-19	5000	WLAC	1490	Pullman B-4	500	KWSC	1390
	5000	WSM	650	Seattle B-2-a	100	KFQW	1420
	5000	WTNT	1490	5000	KJR	970	
Springfield I-19	100	WSIX	1210	1000	KOL	1270	
Union City I-18	15	WOBT	1310	1000	KOMO	920	
TEXAS				50	KPCB	1210	
Abilene	100	KFYO	1420	100	KPQ	1210	
Amarillo J-12	1000	KGRS	1410	50	KRSC	1120	
	250	WDAG	1410	1000	KTW	1270	
Austin L-14-b	500	KUT	1120	100	KVL	1370	
Beaumont M-16	500	KFDM	560	500	KXA	570	
Brownsville O-14-b	500	KWWG	1260	100	KFTO	1230	
Brownwood L-13	100	KGKB	1500	500	KFPY	1390	
College Sta. M-13	500	WTAW	1120	5000	KGA	1470	
Corpus Christi	100	KGFI	1500	1000	KHQ	590	
Dallas L-15-a	10000	KRLD	1040	500	KMO	1340	
	500	WFAA	800	1000	KVI	760	
	500	WRR	1280	50	KIT	1370	
Dublin K-14	15	KFPL	1310	WEST VIRGINIA			
El Paso L-10	100	KTSM	1310	Bluefield	100	WHIS	1420
	100	WDAH	1310	Charleston H-22	250	WOBV	580
Fort Worth L-14-a	100	KFJZ	1370	Fairmount G-23	250	WMMN	890
	1000	KTAT	1240	Huntington G-22	250	WSAZ	580
	5000	WBAP	800	Weirton G-22	60	WQBZ	1420
Galveston M-15-b	100	KFLX	1370	Wheeling G-22	5000	WWVA	1160
	1000	KFUL	1290	WISCONSIN			
Greenville K-15	15	KFPM	1310	Beloit E-18-b	350	WEBW	600
Harlingen O-14	500	KRGV	1260	Eau Claire D-17	1000	WTAQ	1330
Houston M-15-a	1000	KPRC	920	Fond du Lac D-18-d	100	KFIZ	1420
	5	KTUE	1420	Kenosha E-19	100	WCLO	1200
Richmond M-15	50	KGHX	1500	La Crosse E-17	1000	WKBH	1380
San Angelo M-12	100	KGKL	1370	Madison E-18-2	750	WHA	940
				Manitowoc D-19	100	WIBA	1210
					100	WOMT	1210

INDEX BY LOCATIONS WITH MAP KEY

Milwaukee E-19-a	250	WHAD	1120	Toronto	4000	CFRB	960
	250	WISN	1120		500	CJBC	580
	1000	WTMJ	620		1000	CJBC	840
Poynette D-18-e	100	WIBU	1310		5000	CJBC	960
Racine E-19	100	WRJN	1370		500	CJSC	580
Sheboygan C-18	500	WHBL	1410		500	CKCL	580
Stevens Pt. D-18-b	2000	WLBL	900		5000	CKGW	690
West De Pere D-19	100	WHBY	1200		500	CKNC	580
					500	CKOW	840
					500	CNRT	840
WYOMING				PRINCE EDWARD ISLAND			
Casper	100	KDFN	1210	Charlottetown	250	CFCY	960
Laramie F-10	500	KWYO	600	Summerside	30	CHCK	960
					25	CHGS	1120
CANADA				QUEBEC			
ALBERTA				Montreal			
Calgary	500	CFAC	690		1650	CFCF	1030
	500	CFCN	690		500	CHYC	730
	500	CHCA	690		5000	CKAC	730
	500	CJ CJ	690		1650	CNRM	730
	500	CNRC	690	Quebec	25	CHRC	880
Edmonton	250	CHMA	580		22	CKCI	880
	500	CJCA	580		50	CKCV	880
	500	CKUA	580		50	CNRO	880
	500	CNRE	580	St. Hyacinthe	50	CKSH	1010
Lethbridge	50	CJOC	1120				
Red Deer	1000	CHCT	840	SASKATCHEWAN			
	1000	CKLC	840	Fleming	500	CJRW	600
BRITISH COLUMBIA				Moose Jaw	500	CJRM	600
Chilliwack	5	CHWK	1120	Pilot Butte	500	CHWC	960
Kamloops	15	CFJC	1120	Regina	500	CJBR	960
Sea Island	50	CJOR	1030		500	CKCK	960
Vancouver	50	CHLS	730		500	CNRR	960
	50	CKCD	730	Saskatoon	500	CFQC	910
	50	CKFC	730		250	CJHS	910
	50	CKMO	730	Yorkton	500	CNRS	910
	100	CKWX	730		500	CJGX	630
	500	CNRY	1030	HAITI			
Victoria	500	CFCT	630	Port au Prince	1000	HHK	830
MANITOBA				MEXICO			
Brandon	500	CKX	540	Chihuahua	250	XFF	920
Winnipeg	5000	CKY	780	C. Lerdo, Dgo	250	XES	1200
	5000	CNRY	780	Guadalajara, Jal.	101	XEA	1200
				Jalapa, Ver.	350	XFC	630
NEW BRUNSWICK				Merida, Yucatan	105	XEY	550
Fredericton	50	CFNB	1210	Mexico City	1000	XEB	670
Moncton	500	CNRA	630		1000	XEN	730
St. John	50	CFBO	890		500	XEX	920
NOVA SCOTIA					50	XFA	540
Halifax	500	CHNS	930		2000	XFG	640
Sydney	50	CJCB	880		1000	XFI	590
Wolfville	50	CKIC	930		500	XFX	840
ONTARIO				Monterrey, N. L.	101	XEH	970
Brantford	50	CKCR	1010	Morelia, Mich.	101	XEI	1000
Chatham	50	CFCO	1210	Oaxaca, Oax.	105	XEF	1130
Cobalt	15	CKMC	1210	Puebla, Pue.	101	XEE	960
Hamilton	10	CHCS	880	CUBA			
	50	CHML	880	Cienfuegos	200	6BY	1150
	50	CKOC	880	Elia	500	7SR	860
	250	CFCH	600	Havana	500	CMC	840
Iroquois Falls	500	CFRC	1120		15	2BB	1200
Kingston	500	CJGC	910		50	2LR	1280
London	500	CNRL	910		20	2MG	1050
Midland	50	CKPR	1120		100	2OK	860
Ottawa	500	CKCO	690		100	2OL	1170
	500	CNRO	690		20	2RK	950
Prescott	50	CFLC	1010		20	2TW	1110
Preston	50	CKPC	1210		10	2UF	1090
Toronto	500	CFCA	840	Tuinucu	1500	6KW	790
	500	CFCL	580			CNK	

KFKU 1220 Lawrence, Kans.	KFYR 550 Bismarck, N.D.	KGIQ 1320 Twin Falls, Ida.
KFKX 1020 Chicago, Ill.	KGA 1470 Spokane, Wash.	KGIR 1360 Butte, Mont.
KFKZ 1200 Kirksville, Mo.	KGAR 1370 Tucson, Ariz.	KGIW 1420 Trinidad, Colo.
KFLV 1410 Rockford, Ill.	KGB 1360 San Diego, Cal.	KGIX 1420 Las Vegas, Nev.
KFLX 1370 Galveston, Tex.	KGBU 900 Ketchikan, Al'ka	KGJF 890 Little Rock, Ark.
KFMX 1250 N'thfield, Minn.	KGBX 1370 St. Joseph, Mo.	KGKB 1500 Brownwood, Tex.
KFNF 890 Shenandoah, Ia.	KGBZ 930 York, Nebr.	KGKL 1370 San Angelo, Tex.
KFOR 1210 Lincoln, Nebr.	KGCA 1270 Decorah, Iowa	KGKO 570 Wichita Flls, Tex.
KFOX 1250 Long Beach, Cal.	KGCI 1370 San Ant'nio, Tex.	KGKX 1420 Sand Point, Ida.
KFPL 1310 Dublin, Texas	KGCR 1210 Watertown, S.D.	KGO 790 Oakland, Cal.
KFPM 1310 Greenville, Tex.	KGCU 1200 Mandan, N.D.	KGRC 1370 San Antonio, Tex.
KFPW 1340 Cartersville, Mo.	KGCC 1310 Wolf Point, Ida.	KGRS 1410 Amarillo, Texas
KFPY 1340 Spokane, Wash.	KGDA 1370 Dell Rapids, S.D.	KGU 940 Honolulu, Hawaii
KFQA 1090 St. Louis, Mo.	KGDE 1200 Ferg's F'lls, Minn	KGW 620 Portland, Ore.
KFQU 1420 Holy City, Cal.	KGDM 1100 Stockton, Cal.	KGY 1200 Lacey, Wash.
KFQW 1420 Seattle, Wash.	KGDR 1500 San Antonio, Tex.	KHJ 900 Los Angeles, Cal.
KFQZ 860 Hollywood, Cal.	KGDY 1200 Oldham, S.D.	KHQ 590 Spokane, Wash.
KFRC 610 San F'nscisco, Cal.	KGEF 1300 Los Angeles, Cal.	KICK 1420 Red Oak, Iowa
KFRU 630 Columbia, Mo.	KGEK 1200 Yuma, Colo.	KIB 1320 Idaho Falls, Ida.
KFSD 600 San Diego, Cal.	KGER 1370 Long Beach, Cal.	KIDO 1250 Boise, Idaho
KFSG 1120 Los Angeles, Cal.	KGEW 1200 Ft. Morgan, Colo.	KIT 1370 Yakima, Wash.
KFUL 1290 Galveston, Tex.	KGEZ 1310 Kalispell, Mont.	KJBS 1070 San F'nscisco, Cal.
KFUM 1270 Col. Spgs., Colo.	KGFF 1420 Alva, Okla.	KJR 970 Seattle, Wash.
KFUO 550 St. Louis, Mo.	KGFG 1370 Oklahoma City	KLCN 1290 Blytheville, Ark.
KFUP 1310 Denver, Colo.	KGFI 1500 C'pus Ch'sti, Tex.	KLO 1370 Ogden, Utah
KFVD 710 Culver City, Cal.	KGfJ 1420 Los Angeles, Cal.	KLPM 1420 Minot, N. Dak.
KFVS 1210 Cape Gir'd'u, Mo	KGFK 1200 Hallock, Minn.	KLRA 1390 Little Rock, Ark.
KFWB 950 Hollywood, Cal.	KGFL 1370 Raton, N. M.	KLS 1440 Oakland, Cal.
KFWC 1200 Pomono, Cal.	KGFW 1310 Ravenna, Nebr.	KLX 880 Oakland, Cal.
KFWF 1200 St. Louis, Mo.	KGFX 580 Pierre, S.D.	KLZ 560 Dupont, Colo.
KFWI 930 San F'nscisco, Cal.	KGGC 1420 SanF'nscisco, Cal.	KMA 930 Shenandoah, Ia.
KFWM 930 Oakland, Cal.	KGGF 1010 Picher, Okla.	KMBC 950 Indep'd'nce, Mo.
KFXD 1420 Jerome, Idaho	KGGM 1230 Alb'q'rque, N.M.	KMED 1310 Medford, Ore.
KFXF 940 Denver, Colo.	KGHF 1320 Pueblo, Colo.	KMIC 1120 Inglewood, Cal.
KFXJ 1310 Edgewater, Colo.	KGHG 1310 McGehee, Ark.	KMJ 1200 Fresno, Cal.
KFXR 1310 Oklahoma City	KGHI 1500 Little Rock, Ark.	KMMJ 740 Clay Ctr., Nebr.
KFXY 1420 Flagstaff, Ariz.	KGHL 950 Billings, Mont.	KMO 1340 Tacoma, Wash.
KFYO 1420 Abilene, Texas	KGHX 1500 Richmond, Tex.	KMOX 1090 St. Louis, Mo.

WBRC 930 Birmingham, Ala.	WBRE 1310 Wilkes-Barre, Pa.	WBRL 1430 Manchester, N.H.	WBSS 920 Well'Ty'H'ls, Mass	WBT 1080 Charlotte, N.C.	WBZ 990 Springfield, Mass.	WBZA 990 Boston, Mass.	WCAC 600 Storrs, Conn.	WCAD 1220 Canton, N.Y.	WCAE 1220 Pittsburgh, Pa.	WCAH 1430 Columbus, Ohio	WCAJ 590 Lincoln, Nebr.	WCAL 1250 Northfield, Minn.	WCAM 1280 Camden, N.J.	WCAO 600 Baltimore, Md.	WCAP 1280 Asbury Pk., N.J.	WCAT 1200 Rapid City, S.D.	WCAU 1170 Philadelphia, Pa.	WCAZ 1070 Carthage, Ill.	WCBA 1440 Allentown, Pa.	WCBD 1080 Zion, Ill.	WCBM 1370 Baltimore, Md.	WCBS 1210 Springfield, Ill.	WCCO 810 Minneap., Minn.	WCDA 1350 New York City	WCFL 970 Chicago, Ill.	WCGU 1400 Coney Is., N.Y.	WCKY 1480 Covington, Ky.	WCLB 1500 Brooklyn, N.Y.	WCLO 1200 Kenosha, Wis.	WCLS 1310 Joliet, Ill.	WCMA 1400 Culver, Ind.	WCOA 1120 Pensacola, Fla.	WCOC 880 Columbus, Miss.	WCOD 1200 Harrisburg, Pa.	WCOH 1210 Yonkers, N.Y.	WCRW 1210 Chicago, Ill.	WCSH 940 Portland, Maine	WCSSO 1450 Springfield, Ohio	WDAE 620 Tampa, Fla.	WDAF 610 Kansas City, Mo.	WDAG 1410 Amarillo, Texas	WDAH 1310 El Paso, Texas	WDAY 1280 Fargo, N. D.	WDBJ 930 Roanoke, Va.	WDBO 620 Orlando, Fla.	WDEL 1120 Wilmington, Del.	WDGY 1180 Minneap., Minn.	WDOD 1280 Chattana'ga, Tenn	WDRC 1330 N. Haven, Conn.	WDSU 1250 New Orleans, La.	WDWF 1210 Cranston, R.I.	WDZ 1070 Tuscola, Ill.	WEAF 660 New York City	WEAI 1270 Ithaca, N.Y.	WEAN 780 Providence, R.I.	WEAO 570 Columbus, Ohio	WEAR 1070 Cleveland, Ohio	WEBC 1280 Duluth, Minn.	WEBE 1210 Cambridge, Ohio	WEBQ 1210 Harrisburg, Ill.	WEBR 1310 Buffalo, N.Y.	WEBW 600 Beloit, Wis.	WEDC 1210 Chicago, Ill.	WEDH 1420 Erie, Pa.	WEEL 590 Boston, Mass.	WEHS 1310 Evanston, Ill.	WELK 1370 Philadelphia, Pa.	WEMC 590 Ber'n Spgs., Mich	WENR 870 Chicago, Ill.	WEPS 1200 Gloucester, Mass.	WEVD 1300 New York City	WEW 760 St. Louis, Mo.	WFAA 800 Dallas, Texas	WFAN 610 Philadelphia, Pa.	WFBC 1200 Knoxville, Tenn.	WFBG 1310 Altoona, Pa.	WFBJ 1370 Coll'geville, Minn.	WFBL 900-1490 Syracuse, N.Y.	WFBM 1230 Indianapolis, Ind.	WFBR 1270 Baltimore, Md.	WFDL 1310 Flint, Mich.	WFI 560 Philadelphia, Pa.	WFIW 940 Hopkinsville, Ky.	WFJC 1450 Akron, Ohio	WFKD 1310 Philadelphia, Pa.	WFLA 900 Clearwater, Fla.	WGAL 1310 Lancaster, Pa.	WGBB 1210 Freeport, N.Y.	WGBC 1430 Memphis, Tenn.	WGBF 630 Evansville, Ind.	WGBI 880 Scranton, Pa.	WGBS 1180 New York City	WGCM 1210 Gulfport, Miss.	WGCP 1250 Newark, N.J.	WGES 1360 Chicago, Ill.	WGH 1310 Newp't News, Va.	WGHP 1240 Detroit, Mich.	WGL 1370 Ft. Wayne, Ind.	WGMS 1250 Minneap., Minn.	WGN 720 Chicago, Ill.	WGR 550 Buffalo, N.Y.	WGST 890 Atlanta, Ga.	WGY 790 Schneec'd'y, N.Y.	WHA 940 Madison, Wis.	WHAD 1120 Milwaukee, Wis.	WHAM 1150 Rochester, N.Y.	WHAP 1300 New York City	WHAS 820 Louisville, Ky.	WHAZ 1300 Troy, N.Y.	WHB 950 Kansas City, Mo.	WHBC 1200 Canton, Ohio	WHBD 1370 Bellefontaine, O.	WHBF 1210 Rock Island, Ill.
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WHBL 1410 Sheboygan, Wis.	WJAS 1290 Pittsburgh, Pa.	WKEN 1040 Grand Isl'd, N.Y.
WHBQ 1370 Memphis, Tenn.	WJAX 1260 Jacksonville, Fla.	WKJC 1200 Lancaster, Pa.
WHBU 1210 Anderson, Ind.	WJAY 620 Cleveland, Ohio	WKRC 650 Cincinnati, O.
WHBY 1200 W. De Pere, Wis.	WJAZ 1480 Chicago, Ill.	WKY 900 Oklahoma City
WHDF 1370 Calumet, Mich.	WJBC 1200 La Salle, Ill.	WLAC 1490 Nashville, Tenn.
WHDH 830 Gloucester, Mass.	WJBI 1210 Red Bank, N.J.	WLAP 1200 Louisville, Ky.
WHDI 1180 Minneapolis, Minn.	WJBK 1370 Ypsilanti, Mich.	WLB 1250 Minneapolis, Minn.
WHDL 1420 Tupper Lake, N.Y.	WJBL 1200 Decatur, Ill.	WLCB 1310 Muncie, Ind.
WHEC 1440 Rochester, N.Y.	WJBO 1370 New Orleans, La.	WLBK 1420 Kansas City, Mo.
WHFC 1310 Cicero, Ill.	WJBT 770 Chicago, Ill.	WLBG 1200 Etrick, Va.
WHIS 1420 Bluefield, W. Va.	WJBU 1210 Lewisburg, Pa.	WLBL 900 Stevens Pt., Wis.
WHK 1390 Cleveland, Ohio	WJBW 1200 New Orleans, La.	WLBW 1260 Oil City, Pa.
WHN 1010 New York City	WJBY 1210 Gadsden, Ala.	WLBX 1500 L.I. City, N.Y.
WHO 1000 Des Moines, Ia.	WJDW 1370 Emory, Va.	WLBZ 620 Bangor, Me.
WHP 1430 Harrisburg, Pa.	WJDX 1270 Jackson, Miss.	WLCI 1210 Ithaca, N.Y.
WIAS 1420 Ottumwa, Iowa	WJDZ 1310 Winst.-Sal., N.C.	WLEX 1360 Lexington, Mass.
WIBA 1210 Madison, Wis.	WJJD 1130 Mooseheart, Ill.	WLEY 1420 Lexington, Mass.
WIBG 930 Elkins Park, Pa.	WJKS 1360 Gary, Ind.	WLTT 560 Philadelphia, Pa.
WIBM 1370 Jackson, Mich.	WJR 750 Detroit, Mich.	WLOE 1500 Boston, Mass.
WIBO 570 Chicago, Ill.	WJSV 1460 Mt. Vern. H'ls, Va.	WLS 870 Chicago, Ill.
WIBR 1420 Steubenville, O.	WJW 1210 Mansfield, Ohio	WLSI 1210 Cranston, R.I.
WIBS 1450 Elizabeth, N.J.	WJZ 760 New York City	WLTH 1400 Brooklyn, N.Y.
WIBU 1310 Ponette, Wis.	WKAQ 890 San Juan, P.R.	WLW 700 Cincinnati, Ohio
WIBW 1300 Topeka, Kansas	WKAR 1040 E. Lansing, Mich.	WLWL 1100 New York City
WIBX 1200 Utica, N.Y.	WKAV 1310 Laconia, N.H.	WMAC 570 Cazenovia, N.Y.
WICC 1190 Bridgeport, Conn.	WKBB 1310 Joliet, Ill.	WMAF 1360 S. D'rtm'th, Mass.
WIL 1200 St. Louis, Mo.	WKBC 1310 Birmingham, Ala.	WMAK 900 Buffalo, N.Y.
WILL 890 Urbana, Ill.	WKBF 1400 Indianapolis, Ind.	WMAL 630 Washington, D.C.
WILM 1420 Wilmington, Del.	WKBH 1380 La Crosse, Wis.	WMAN 1210 Columbus, Ohio
WINR 1210 Bay Shore, N.Y.	WKBI 1310 Chicago, Ill.	WMAQ 670 Chicago, Ill.
WIOD 560 Miami Bch., Fla.	WKBN 570 Youngstown, O.	WMAY 1200 St. Louis, Mo.
WIP 610 Philadelphia, Pa.	WKBO 1450 Jersey City, N.J.	WMAZ 890 Macon, Ga.
WISN 1120 Milwaukee, Wis.	WKBP 1420 Battle Crk., Mich	WMBA 1500 Newport, R.I.
WJAC 1310 Johnstown, Pa.	WKBQ 1350 New York City	WMBC 1420 Detroit, Mich.
WJAD 1240 Waco, Texas	WKBS 1310 Galesburg, Ill.	WMBD 1440 Peoria Hghts., Ill.
WJAG 1060 Norfolk, Nebr.	WKBV 1500 Brookville, Ind.	WMBG 1210 Richmond, Va.
WJAK 1310 Marion, Ind.	WKBW 1470 Buffalo, N.Y.	WMBH 1420 Joplin, Mo.
WJAR 890 Providence, R.I.	WKBZ 1500 Ludington, Mich.	WMBI 1080 Chicago, Ill.

WMBJ 1500
 Pittsburgh, Pa.
 WMBL 1310
 Lakeland, Fla.
 WMBO 1370
 Auburn, N.Y.
 WMBQ 1500
 Brooklyn, N.Y.
 WMBR 1210
 Tampa, Fla.
 WMC 780
 Memphis, Tenn.
 WMCA 570
 New York City
 WMES 1500
 Boston, Mass.
 WMMN 890
 Fairmont, W.Va.
 WMPC 1500
 Lapeer, Mich.
 WMRJ 1420
 Jamaica, N.Y.
 WMSG 1350
 New York City
 WMT 1200
 Waterloo, Iowa
 WNAC 1230
 Boston, Mass.
 WNAD 1010
 Norman, Okla.
 WNAT 1310
 Philadelphia, Pa.
 WNAX 570
 Yankton, S.D.
 WNB 1500
 Bingham'tn, N.Y.
 WNBH 1310
 New B'd'f'd, Mass.
 WNBK 1310
 Knoxville, Tenn.
 WNBO 1200
 Washington, Pa.
 WNBR 1430
 Memphis, Tenn.
 WNBW 1200
 Carbondale, Pa.
 WNBX 1200
 Springfield, Vt.
 WNBZ 1290
 SaranacL'ke, N.Y.
 WNJ 1450
 Newark, N.J.
 WNOX 560
 Knoxville, Tenn.
 WNRC 1440
 Greensboro, N.C.
 WNYC 570
 New York City
 WOAI 1190
 San Antonio, Tex.
 WOAN 600
 Law'nceb'g, Tenn.
 WOAX 1280
 Trenton, N.J.
 WOBT 1310
 Union City, Tenn.
 WOBW 580
 Charlest'n, W.Va.
 WOC 1000
 Davenport, Iowa
 WOCL 1210
 Jamestown, N.Y.
 WODA 1250
 Paterson, N.J.
 WOI 560
 Ames, Iowa

WOKO 1440
 P'ghkeepsie, N.Y.
 WOL 1310
 Washington, D.C.
 WOMT 1210
 Manitowoc, Wis.
 WOOD 1270
 Gr. Rapids, Mich.
 WOPI 1500
 Bristol, Tenn.
 WOQ 610
 Kansas City, Mo.
 WOR 710
 Newark, N. J.
 WORC 1200
 Worcester, Mass.
 WORD 1480
 Chicago, Ill.
 WOS 630
 Jeff's'n City, Mo.
 WOV 1130
 New York City
 WOW 590
 Omaha, Nebr.
 WOWO 1160
 Ft. Wayne, Ind.
 WPAP 1010
 New York City
 WPAW 1210
 Pawtucket, R.I.
 WPCC 570
 Chicago, Ill.
 WPCB 810
 New York City
 WPEN 1500
 Philadelphia, Pa.
 WPG 1100
 Atl'ntic City, N.J.
 WPOE 1420
 Patchogue, N.Y.
 WPOR 780
 Norfolk, Va.
 WPSC 1230
 State College, Pa.
 WPTF 680
 Raleigh, N.C.
 WQAM 1240
 Miami, Fla.
 WQAN 880
 Scranton, Pa.
 WQAO 1010
 New York City
 WQBC 1360
 Utica, Miss.
 WQBZ 1420
 Weirton, W. Va.
 WRAF 1200
 La Porte, Ind.
 WRAK 1370
 Erie, Pa.
 WRAW 1310
 Reading, Pa.
 WRAX 1010
 Philadelphia, Pa.
 WRBC 1240
 Valparaiso, Ind.
 WRBI 1310
 Tifton, Ga.
 WRBJ 1500
 Hattiesburg, Miss.
 WRBL 1200
 Columbus, Ga.
 WRBQ 1210
 Greenville, Miss.
 WRBT 1370
 Wilmington, N.C.

WRBU 1210
 Gastonia, N.C.
 WRC 950
 Washington, D.C.
 WREC 600
 Memphis, Tenn.
 WREN 1220
 Lawrence, Kans.
 WRHM 1250
 Minneap., Minn.
 WRJN 1370
 Racine, Wis.
 WRK 1310
 Hamilton, Ohio
 WRNY 1010
 New York City
 WRR 1280
 Dallas, Texas
 WRUF 1470
 Gainesville, Fla.
 WRVA 1110
 Richmond, Va.
 WSAI 1330
 Cincinnati, Ohio
 WSAJ 1310
 Grove City, Pa.
 WSAN 1440
 Allentown, Pa.
 WSAR 1450
 Fall River, Mass.
 WSAZ 580
 Hunt'gton, W.Va.
 WSB 740
 Atlanta, Ga.
 WSBK 1210
 Chicago, Ill.
 WSBT 1230
 South Bend, Ind.
 WSDA 1400
 Brooklyn, N.Y.
 WSGH 1400
 Brooklyn, N.Y.
 WSGP 1410
 Savannah, Ga.
 WSIS 1010
 Sarasota, Fla.
 WSIX 1210
 Springfield, Tenn.
 WSM 650
 Nashville, Tenn.
 WSMB 1320
 New Orleans, La.
 WSMK 1380
 Dayton, Ohio
 WSOA 1480
 Forest Park, Ill.
 WSPD 1340
 Toledo, Ohio
 WSSH 1420
 Boston, Mass.
 WSUI 580
 Iowa City, Ia.
 WSUN 900
 St. Petersb'g, Fla.
 WSVS 1370
 Buffalo, N.Y.
 WSYR 570
 Syracuse, N.Y.
 WTAD 1440
 Quincy, Ill.
 WTAG 580
 Worcester, Mass.
 WTAM 1070
 Cleveland, Ohio
 WTAQ 1330
 Eau Claire, Wis.

WTAR 780		WWL 850		XEN 730	
Norfolk, Va.		New Orleans, La.		Mexico City	
WTAW 1120		WWNC 570		XES 1200	
College Sta., Tex.		Asheville, N. C.		C. Lerdo, Dgo.	
WTAX 1210		WWRL 1500		XEX 920	
Streator, Ill.		Woodside, N.Y.		Mexico City	
WTBO 1420		WWVA 1160		XEY 550	
Cumberland, Md.		Wheeling, W.Va.		Merida, Yucatan	
WTFI 1450		XEA 1200		XFA 540	
Toccoa, Ga.		Guadalajara, Jal.		Mexico City	
WTIC 1060		XEB 670		XFC 630	
Hartford, Conn.		Mexico City		Jalapa, Ver.	
WTMJ 620		XEE 960		XFF 920	
Milwaukee, Wis.		Pueblo, Pue.		Chihuahua, Chih.	
WTNT 1490		XEF 1130		XFG 640	
Nashville, Tenn.		Oaxaca, Oax.		Mexico City	
WWAE 1370		XEH 970		XFI 590	
Hammond, Ind.		Monterey, N.L.		Mexico City	
WWJ 920		XEI 1000		XFX 840	
Detroit, Mich.		Morelia, Mich.		Mexico City	

The Short Wave Stations

Call	Station	Owner	City and State	Meters	Watts
1 XAA	WRAH	Stanley N. Read	Providence, R. I.		7.5
1 XAE	WBZ	Westinghouse Elec. & Mfg. Co.	Springfield, Mass.	70.0	
1 XAF	WEEI	Edison Elec. Illuminating Co.	Boston, Mass.		
1 XAG		Edison Elec. Illuminating Co.	Boston, Mass.		
1 XY	WBRL	Booth Radio Laboratories	Tilton, N. H.	105-109	250
2 XA	WRMU	Yacht, "MU-1" Grebe Co.	New York		
2 XAC	WGY	General Electric Co.	Schenectady, N. Y.		
2 XAD	WGY	General Electric Co.	Schenectady, N. Y.		
2 XAE	WGY	General Electric Co.	Schenectady, N. Y.		
2 XAF	WGY	General Electric Co.	Schenectady, N. Y.	32.7	
2 XAG	WGY	General Electric Co.	Schenectady, N. Y.		
2 XAH	WGY	General Electric Co.	Schenectady, N. Y.		
2 XAK	WGY	General Electric Co.	Schenectady, N. Y.		
2 XAL	WRNY	Aviation Radio Station, Inc.	New York	30.91	500
2 XAO		Atlantic Broadcasting Co.	New York	105.9	100
2 XAO	WOR	L. Bamberger Co.	Newark, N. J.	65.4	50
2 XAW	WGY	General Electric Co.	Schenectady, N. Y.		
2 XBA	WAAM	WAAM, Inc.	Newark, N. J.	65.18	50
2 XBH		Chas. G. Ungar	Coney Island, N. Y.	54.02	150
2 XE	WABC	Atlantic Broadcasting Co.	Richmond Hill, N. Y.	21.1	50
2 XZ		National Broadcasting Co.	Bellmore, L. I.	49.15	50000
3 XK		C. Francis Jenkins Labs	Washington, D. C.		
3 XL		Radio Corp. of America	Bound Brook, N. J.	59.96	30000
3 XN		Bell Telephone Laboratory	Whippany, N. J.		
4 XE		William Justice Lee	Winter Park, Fla.	200.	250
6 XA	KNX	Los Angeles Express	Los Angeles, Cal.	107.1	100
6 XAF	KNRC	Clarence B. Juneau	Santa Monica, Cal.	108.2	100
6 XAI	KGGM	Los Angeles Radio Club	Los Angeles, Cal.	66.04	50
6 XAK	KFWH	F. W. Morse	Chico, Cal.	108.2	50
6 XAL	KFOZ	L. E. Taft	Hollywood, Cal.	66.04	50
6 XAN	KRLO	Freeman Lang	Los Angeles, Cal.	105.9	250
6 XAR	KJBS	J. Brunton & Sons	San Francisco, Cal.	32.	50
6 XAU	KHJ	Times-Mirror Co.	Los Angeles, Cal.	104.1	50
6 XAZ		Nelson Radio Co.	San Diego, Cal.	106.	50
6 XBA	KFSG	Air-Fan Radio Corp.	Los Angeles, Cal.	108.2	250
6 XBE	KFCB	W. K. Azbill	San Diego, Cal.		
6 XBH	KFQV	W. E. Riker	Holy City, Cal.	31-106	50
6 XBR	KFWB	Warner Bros. Picture Studio	Los Angeles, Cal.	40-105	50
6 XBZ	KFVD	McWhinnie Elec. Co.	Venice, Cal.	105.	50
7 XAB	KFPY	Symons Investment Co.	Spokane, Wash.	105.9	
7 XAO	KWJJ	Wilbur Jerman, Inc.	Portland, Ore.	53-54	100
7 XC	KJR	Northwest Radio Service	Seattle, Wash.		
7 XO		Northwest Radio Service	Seattle, Wash.		
8 XAC	WHAM	Stromberg-Carlson Tel. Mfg. Co.	Rochester, N. Y.		
8 XAL	WLW	Crosley Radio Corp.	Cincinnati, Ohio	52.05	500
8 XOA	WJR	WJR, Inc.	Detroit, Mich.	32.	75
8 XF	WHK	Radio Air Service Corp.	Cleveland, Ohio	66.04	500
8 XJ	WEO	Ohio State University	Columbus, Ohio	54.02	250
8 XK	KDKA	Westinghouse Elec. & Mfg. Co.	Pittsburgh, Pa.	62.5	40000
8 XP	KDKA	Westinghouse Elec. & Mfg. Co.	Pittsburgh, Pa.	10-150	500
9 XAB	WNAL	R. J. Rockwell	Omaha, Nebr.	105.	50
9 XU	KOIL	Mona Motor Oil Co.	Council Bluffs, Iowa	61.06	500

The Question Mill

(Continued from page 16)

that the set does not bring in any stations except those in the immediate vicinity. Can you advise what the trouble may be?

The probable cause of your trouble may be any of the following: 1. Dead or defective tubes; 2. Phono-radio switch left on phono position; 3. Low line voltage; 4. Open or grounded lead most likely in the radio-frequency section; 5. Defect in the antenna on ground system; 6. Open circuit or antenna bobbin located in end of first r.f. transformer.

Is it necessary to insulate the ground wire from the set to the ground?

It is not necessary for a ground wire to be insulated, only in so far as it might be advisable if there is any danger of it touching other wires and then causing a short circuit.

I have been told to place a 1 or 2-mfd. by-pass condenser across the B-battery negative and high voltage, in order to smooth out the battery noises. Upon trying this I find the noise is much worse than before. Please advise what to do?

The condenser you have used is evidently defective. Try another one of the same capacity. A good one will eliminate many of the B-battery noises.

I am thinking of converting my battery set into an A.C. set. It is a 6-tube tuned radio frequency, employing two tuned r.f. stages, one detector, a first stage audio and two 171A in push-pull. It has a three-gang condenser on a single dial. I have a heavy-duty Kingston B-eliminator using a Raytheon tube. I wish to inquire if this kind of an eliminator could be used for an A.C. set. It delivers 250 volts under load, so I believe that it would handle the 245 tubes if I wished to use them instead of the 171A tubes. I notice that most of the A.C. sets use a B-eliminator using the 280 or 380 tubes and have been wondering if the Raytheon type could be used successfully.

The Kingston B-eliminator should prove entirely satisfactory on your A.C. receiver after you have made the necessary circuit changes and have installed 245-type tubes. The Raytheon tube is satisfactory for the purpose, although

the UX-280, being a full-wave rectifier, would be preferable. Changing your receiver to an all-electric type involves more than merely inserting the new tubes. Here are the fundamental points that must be taken into consideration: 1. All filament connections to the ground line must be removed; 2. The filament terminals of all tubes operating at the same voltage are connected in parallel preferably with the use of twisted wire to prevent inductive effects. At any rate the filament wires must be run close together; 3. All grid leads to the negative filament circuit must be disconnected, and must be run to the ground line, except in a few cases where the grid return to the transformer or resistance-coupler supplying the power tube is expressly connected to the negative line of the filament circuit, and in cases where the detector is given a positive bias by the introduction of a C-battery; 4. Rheostats and potentiometers formerly used are disconnected. If this information is not sufficient I will be very glad to help you in any way. I may add that four and one-half pages of *Radio Trouble Shooting* are devoted to changing of old receivers to work on A.C. tubes with the necessary circuit diagrams.

In the shipment of my radio receiver the bakelite panel was cracked. I have a piece of 3-16-inch veneer with an excellent grain. Can I substitute this for the bakelite panel?

Wood is a poor material to use for a radio panel unless all the instruments are thoroughly insulated from it by means of bakelite bushings and washers. Wood is never entirely free from moisture and if the instruments make contact with it a certain amount of loss is almost certain. The very small amount of radio energy picked up by the aerial of a radio receiver must be conserved as much as possible if good results are to be expected. Bakelite, formica, hard-rubber, glass and other commercial products especially designed for panel purposes should be used.

I have purchased a 6-tube receiver having push-pull amplification and have connected the B-eliminator, which I formerly used on a 3-tube receiver. There is now a pronounced hum, which was not

KFKX
the case when I heard the new receiver demonstrated. Neither was there any appreciable hum in my old set. My conclusion was that the rectifier tube of the eliminator was defective so I purchased a new one, but this did not remedy the trouble. Will you suggest what I can do?

WIRE (KLX CKCK WNP KGA KJR
Your B-eliminator has an output capacity that was well able to take care of the plate-current required by the 3-tube set but it is now sadly overloaded and this is the cause of the hum. Although a good B-eliminator can furnish a current slightly above its rated capacity, it has been found that as the maximum drain is approached, the filtering unit ceases to operate so efficiently as it does on a minimum load, due to the magnetic saturation of the choke coils. The result is an overloading of the rectifier unit and of the filter condensers, which greatly decreases the smoothness of the current delivered by the unit, which is evident from the hum. It is, therefore, advisable to equip your receiver with a new B-eliminator that will provide more current than is actually needed. If the total load required from the eliminator is equal to about two-thirds of its maximum capacity, little trouble will be had in respect to hum caused by an overloaded unit.

WCAE WJBY
What is the simplest method of making a battery-operated receiver work entirely on the house-lighting circuit? I know very little about radio circuits and would not like to make any changes in the wiring if this is not absolutely necessary.

If you do not desire to rewire your receiver for the installation of A.C. tubes, which is quite a task for an amateur to undertake unless he has definite instructions covering every step, but you nevertheless desire the advantages of all-electric operation, the simplest thing to do is to substitute a good A-eliminator for the storage battery, and a B-eliminator for the B-batteries. Excellent results can be obtained with such an arrangement and all the old tubes can be used, provided they are in good condition. There are several good eliminators on the market and some of these are combination units furnishing both A and B supply.

I have a Graybar all-electric No. 330 receiver. It gives an annoying hum, which has developed gradually after having been in use for one year. Can you suggest where the trouble lies?

In the Graybar 330 a UX 280 rectifier tube is used. After a period of use this tube, like all others, gradually loses its emission rate. In other words it does not pass as much current as it did at first, due to the exhausted condition of the filament. As soon as the emission rate decreases, which is gradual, a hum will be noticed, and this will become more and more pronounced as the emission rate declines. This fits in exactly with your symptoms. Get a new rectifier tube UX 280 or CX 380 and the hum will be over.

I have heard that a crystal detector can be used instead of the usual gridleak and gives better reception. Is this so? What kind of crystal should be used for this purpose?

An ordinary crystal detector of the mineral-to-mineral type or the cat-whisker type can be used. A good crystal, when properly adjusted, works nicely instead of the usual type of gridleak.

How long will a storage battery last for radio? I have used one for four years and think that it is worn out.

The life of a storage battery depends on the number of times that it is charged and discharged. If the receiver is used every day for six or eight hours, the battery will have to be recharged much more frequently than a battery of the same size used only one or two hours a day at the same rate of discharge. The thickness of the battery plates determines the number of times that they can be recharged, the positive plates being twice as thick as the negative plates. Storage batteries in autos have an average life of two years, and radio storage batteries, which are not subjected to nearly such hard usage as auto batteries, last from four to eight years with proper care. If you are in doubt about the condition of your battery it is best to take it to a reputable battery-service station for examination.

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The following tubes are required for its operation: 2-UX-281 (for full-wave rectification); 1-UX-210 (for super power amplification); 1-UX-874 (for voltage regulation). For use with phonograph pick-up, one additional audio stage is recommended between the pick-up and this Reproducer.

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