

# RADIO CHARTS AID AGAINST SHIPWRECKS

BY LARRY BOARDMAN

(NEA Service Writer) WASHINGTON, D. C., Feb. 14.—Shipwrecks due to vessels going around may soon be a thing of the past as a result of a radio invention by Dr. E. A. Eckhardt and M. Keiser, both of the Bureau of Standards.

The invention is being used by the Coast Survey to make a chart of United States waters so accurate that the exact location of every reef and shoal will be known.

The marine chart is covered with figures showing the water depth at various points. These points must, of course, be accurately fixed—that is, the ship making the chart must know its exact position when taking each sounding.

The old-fashioned method was for sights to be taken from the ship to various prominent objects on land—church spires, water towers, mountain peaks and the like. By taking three such sights and measuring the angles between them it was possible to calculate the ship's location.

But this method was inefficient in the extreme. Anything that interfered with the visibility of shore objects—fog, rain, haze, storms, darkness—prevented it from being carried out.

By using Eckhardt's and Keiser's invention a charting ship can determine its exact location at any time, and the depth sounding taken at that location, therefore, may be accurately placed on the chart.

Three hydrophones are set at known points a little way off shore in about 60 feet of water. A receiving instrument is used for recording underwater soundings.

Each hydrophone is connected by cable with a radio transmitter on land.

The charting ship, at sea, fires a small bomb under water. The exact instant of firing is automatically recorded. The sound of the explosion travels through the water to the hydrophones, each hydrophone automatically keys its radio transmitter, and each transmitter then flashes a signal back to the ship. The time of these is also automatically recorded.

Distance Is Figured  
The time taken to transmit the radio signals is virtually instantaneous. Therefore the lapse between the time the bomb is set off and the time the radio signal is received is figured as the exact time it takes the sound wave to reach the hydrophone.

By figuring the rate sound travels under water it is then possible to tell the exact distance of the ship from each hydrophone—and from this to figure the exact location of the ship at sea.

The hydrophones are tuned so they can return the sounding at the same time.

## New Wave Lengths For Pacific Given

Dial readings in Eugene will be changed, but not to any large extent, by the new wave lengths for Pacific coast radio broadcasting stations announced yesterday by the department of commerce at Washington, D. C. The new lengths are:  
KXN, Los Angeles, 336.9 meters.  
KFAE, Pullman, Wash., 348.6.  
KGO, Oakland, 361.2.  
KFOA, Seattle, 384.4.  
KIL, Los Angeles, 405.2.  
KIV, San Francisco, 428.3.  
KFL, Los Angeles, 468.7.  
KJW, Portland, Ore., 491.5.  
KLN, Oakland, 508.2.

Oregon Agricultural college's new 500-watt broadcasting set will operate on a wave length of 280.2 meters, the government decided.

Wave lengths assigned to other points where new broadcasting stations are to be built are: Los Angeles, 263.0; Phoenix, Ariz., 290.8; Seattle, Wash., 305.9; Pasadena, Cal., 315.8; Salt Lake City, 331.1; Missoula, Mont., 394.5; and Seattle, 454.3.

## Canadian National Has Radio Service

"The only railroad in the world to adopt radio receiving sets as part of its regular service on transcontinental trains is the Canadian National," said E. W. Choate, traveling passenger agent of the company, who was a visitor at the local offices of the Southern Pacific this week. "The Canadian National cars have modern sets, equipped so every passenger can have a set of headphones."

"These sets are operated to keep passengers in touch with the events of the day and giving them entertainment during the trip. World news and enjoyable concerts from many of the important cities of the United States and Canada are received daily through these instruments while the trains are in motion."

"Our stations begin at Vancouver, and are located at Calgary, Edmonton, Regina, Saskatoon, Winnipeg, Toronto, Ottawa, Montreal and Moncton."

## Jail Looms Abroad

A radio fan in Czechoslovakia just finished six weeks' imprisonment because he built a receiving set and occasionally sold parts without a license.

## Graduation Over Air

Fans listening to station WCCO, at Minneapolis-St. Paul, "attended" graduation exercises of the station's radio cooking school. They heard the appropriate addresses and the names of graduates as the received their diplomas.

## Concerts Applauded

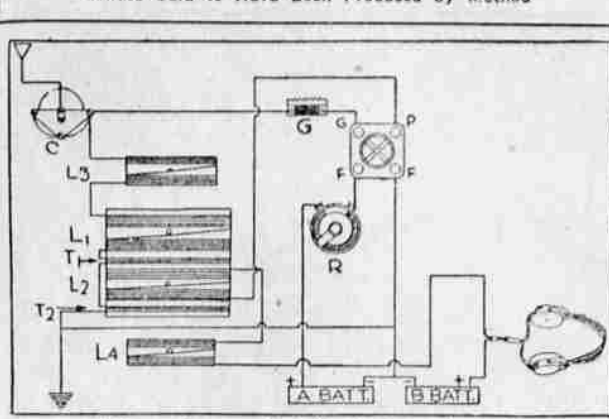
More than 20,000 letters came to station WEAJ alone, after the first concert in which Jim McCormack and Lucretia Bori sang. That's not counting the thousands of letters that went to the other six stations that broadcast their concerts.

## Soundhouse for Ships

Instead of a lighthouse, ships at sea with special receiving equipment, get their hearing from a soundhouse, situated on an island in the Firth of Forth.

## DOUBLE TUNING OF COILS BRINGS BETTER RESULTS

Greater Selectivity and Better Quality Over Remarkable Distances Said to Have Been Produced by Method



Hook-up diagram of double tuning coil circuit

By ISRAEL KLEIN

(NEA Service Radio Editor) FOR the fan who would wind a coil that stays wound, here is a simple one-tube circuit that should please him. The trick of it lies in the double-tuning coil, shown in the diagram with the rotors out of the main winding so that the connections may be more clear.

The coil has produced greater selectivity and better quality, over reasonable distances. The parts consist of the following: 1. L1, L2, L3, L4, T1 and T2, special astor and rotor windings, to be described.

C, one .0005 or 23-plate variable condenser.

G, variable grid condenser and leak.

R, filament rheostat, resistance G ohms.

One tube socket, seven binding posts, wire, etc.

Winding Needs Care  
The inductance is wound as follows:

Both L3 and L4, the rotors, are wound alike. They consist of 38 turns of No. 26 DCC wire, wound on tubing 2 5/8 inches in diameter.

The other four windings, L1, L2, T1 and T2, go on one piece of tubing 6 inches long by 3/4 inches in diameter.

About one-quarter of an inch from the end begin by winding 10 turns of No. 24 DCC wire, jump an inch and continue winding this wire for 10 more turns. Bore a tiny hole at the end of this winding, big enough to take the wire through it to the inside of the coil. This completes coil L1.

Take this end out from the inside and solder to it the end of No. 26 DCC wire which has been cut to a length of 10 feet. Bore another tiny

hole and on the same side of the tuning, and carry this 10-foot length of wire from the inside out.

Now draw the wire tight and wind six turns of the 26 wire in the same direction as the other winding. This is coil T1.

Bore another tiny hole at the end of this winding, bring the rest of the wire to the inside and leave it hang out for a while.

One-eighth of an inch from this last hole, bore another one. Then start coil L2, consisting of 16 turns of No. 24 DCC wire, a jump of 15-16 of an inch and continue of the winding for 16 more turns. At the end of this winding bring the wire through the inside again, as in the other cases.

Now take the five feet of No. 26 wire, left from winding coil T1, and 1-8 of an inch from the end of coil L2 bring it out and begin winding coil T2, consisting of six turns.

Other Connections Needed  
In the middle of the spaces for coils L1 and L2, bore quarter-inch holes for rotor shafts.

The connections are made as follows:

The beginning of rotor coil, L3 goes to the antenna post. The end of rotor coil L4 goes to one of the phone terminals. The other phone terminal is connected to the positive voltage of a 45 degree B-battery.

The end of coil T2 goes to the ground, which is also connected with the filament of the tube and the negatives of A and B batteries.

Rotor L3 is attached to the shaft going through coil L1, and the other rotor, L4, is on the L2 shaft.

ent orchestra, Hotel St. Francis, Vinton La. Ferrera, conductor; 8 "Elm" Carl Anderson, director; Zilpha Hughes, Jenkins, soprano; Beatrice I. Sherwood, soprano; Ruth Waterman, contralto; Mabel Walsh, contralto; Gwyneth Jones, tenor; Robert E. Saxo, tenor; Henry L. Perry, bass; Richard L. Lundgren, bass; "Mendelssohn's Oratorios." Ray C. B. Brown; 10-11, dance music, Henry Halstead's orchestra.

KIL—Los Angeles, Cal.—404 meters; 10-12, a. m., class in radio broadcast; 12:30-1:30, Charlie Wellman's Saturday afternoon frolic; 6:30, Art Hickman's Biltmore hotel concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, Professor Walter Sylvester Hertzog, little stories, American history; Eleanor Borg, 10-year-old reader; Uncle John, 7:45, Captain John T. Riley, "Income."

KJW—8-10, program, "Radio Revivator" company, arranged by G. Allison Phelps; 10-11, Earl Burnett's Biltmore hotel dance orchestra; 11-2, a. m., The Lost Angels of KJH frolic.

KXN—Hollywood, Cal.—337 meters; 10 a. m., Hired Hand's morning message; 10:30, Forbes W. Van Why, Radio technical talk; 11, news of 25 and 30 years ago; 12-1 p. m., Wuritzer organ recital; 5:45-6:15, Wuritzer organ studio, Sid Ziff, sports talk; 6:15-7, dinner hour music; 7:30-8, Wuritzer pipe organ recital; 8-9, feature program; 9-10, program, Western Avenue Opening association; 10-11, Abe Layman's Coconut Grove dance orchestra from Ambassador hotel; 11-12, June Parsell, the KXN popular songs.

KJW—San Francisco, Cal.—429.5 meters; 1-2 p. m., Rudy Seiger's Fairmont hotel orchestra; 2:30-3:30 Navy Jazz band of Mare Island; 3:30-5:30, tea dance, Gene James' Rose Bowl orchestra; 8-10, program, U. S. army band; 10-12, dance music, Art Weidner's orchestra.

SUNDAY PROGRAMS  
Pacific Coast

KGW—Portland—492 meters; 10:30 a. m., services, First Presbyterian church, Dr. Harold Leonard Boxman, pastor; 3 p. m., municipal concert; 6, church service, Portland Council of churches; 7, dinner concert, Colburn concert orchestra; Nellie Towler, pianist.

KFL—Los Angeles, Cal.—407 meters; 10-10:45 a. m., L. A. Church Federation services; 11-2:30 p. m., services, Temple Baptist church; 4-5, vesper musical hour, June Evans, soprano; 6:45-7, editorial talk; 7-8, orchestra and specialties of Metropolitan theater; 8-9, instrumental quartet; 9-10, Examiner, Cinderella Ballroom orchestra of Long Beach; 10-11, Packard Eight orchestra, Bill Henney, director.

KFSG—Los Angeles, Cal.—278 meters; 10:30-12:30 p. m., complete morning service of Angelus temple with sermon, Almoa Seiple McPherson, pastor-evangelist; Esther Fricke Green, organist; 3:30-4:30 p. m., afternoon auditorium service and sermon, Temple choir and Silver band; 7-9:45, regular evening services of the temple opening with special musical hour; 10-11, organ recital, Esther Fricke Green.

KGO—Oakland, Cal.—299.8 meters; 11 a. m., service, First Presbyterian church, Rev. Frank M. Sisley; 3:30 p. m., KGO Little Symphony orchestra; Arthur S. Garbett, musical interpretative writer; 7:30, service, First Presbyterian church.

KIII—Los Angeles, Cal.—404 meters; 10 a. m., Rev. S. H. Hall, evangelist of Nashville, Tenn.; 10:30-12:30 p. m., complete morning services of First Methodist Episcopal church, E. E. Helms, pastor; Arthur Blakeley, organist; 6:30-7, Art Hickman's Biltmore hotel concert orchestra, Edward Fitzpatrick, director; 7-7:30, organ recital, First Methodist church, Arthur Blakeley, organist; 8-10, program Martin Music company, arranged by J. Howard Johnson; presenting a patriotic program in honor of Washington's birthday.

KIS—Los Angeles, Cal.—263 meters; 10:45-12:30 p. m., services, Church of Open Door, Dr. French E. Oliver, pastor; 6-6:45, vesper musical hour with short scriptural talk, Rev. Pike; 7-9:30, complete evening services of the Church of Open Door, musical program and sermon, Dr. French E. Oliver, pastor.

KNN—Hollywood, Cal.—337 meters; 5 p. m., Radio Sunset service, Rev. Chas. F. Aked and Dr. Frank Dyer from theater of Ambassador hotel; 7-7:45 International Association of Bible students' hour of music; 8-9, Ambassador hotel concert orchestra, Josef Rosenfeld, director; 9-11, program, El Encanto concertists, Maud Felton, soprano; Lucille Bowley, soprano; Laurine Smith, soprano; Ivy May Travis, piano; Paul Finstein's KXN string quartet.

KPO—San Francisco, Cal.—429.5 meters; 11-12 m., undenominational and nonsectarian church service, Rev. Louis J. Sawyer; 8:30-10, concert, Rudy Seiger's Fairmont hotel orchestra.

home-made reflex set, and get the coast stations loud and clear."

While milking the cows after midnight a fan in Wisconsin reports that he listens in to WJZ, Chicago. He has extension wires from his set to the cow stable.

B. P. Junction City: "My farthest station has been Winnipeg, Canada, where I've heard some dandy entertainments, monologues, orchestra skits, vocal solos and speeches. Have heard four stations out of Chicago, Buffalo, Springfield, Mass., and almost every station of any consequence in the east."

A. Morgenson, 857 Third avenue west: "I surprised myself the other night by bringing in WJZ, New York."

Oregon Agricultural college is planning to broadcast correspondence courses over the radio, much after the fashion of Kansas State college. A large class attended the opening of the radio course of the University of Iowa this week. A special program is broadcast from this station every Wednesday morning for the classes in high schools.

## QUESTIONS

Question—What should be the length of an outdoor antenna? (2) What type of wire should be used? (3) What type of insulator should be used? (4) How far should the insulators be from the point of attachment? (5) What gauge wire should be used as the lead-in and ground wire?—H. G. F. Answer—The ideal length for an antenna suitable for reception of broadcasting stations varies from 100 to 150 feet, including the length of the lead-in. If the receiver is close to a broadcasting station sharp tuning will not be possible with a long antenna. In the outlying sections the 150 feet is a good length, but in the city 100 feet is generally plenty. (2) No. 14 copper. (3) Any good antenna insulator about four inches long. (4) At least a foot. (5) No. 14 can be used for both lead-in and ground wire. It is not necessary to have a joint in the antenna if the wire is purchased long enough to be extended to serve as the lead-in.

Question—What is the call of the Canadian National Railway radio station at Montreal? (2) I have trouble with the programs of distant stations fading out and then coming back. How can this be stopped?—O. D. S. Answer—CXRM. (2) Fading is a natural phenomenon of the ether which cannot be controlled at the receiving or transmitting station. It is thought to be due to the electrical constitution of the upper atmosphere. Scientists believe that a layer of electrified and rarified air exists about sixty miles above the earth's surface and that this layer acts as a reflector of Herztian waves. Owing to natural causes the reflecting power of the conducting sheet varies from time to time in the same way a mirror reflects well at one minute and then becomes dim when a person breathes upon it.

Question—I have a detector and two-stage audio frequency amplifier set that gives fine results. What will be gained if I add a radio frequency amplifier unit?—H. H. Answer—Increased volume of distant stations and slightly more selectivity. Radio frequency amplification gives strength to feeble signals from distant stations, thereby giving them sufficient power to actuate the detector, otherwise they would be inaudible in many cases.

NEW YORK, Feb. 21.—The plan to furnish radio fans with the world's best music has been abandoned.

The announcement comes from Adolph A. Berle, treasurer of the fund which had been proposed last February by Clarence H. Mackay, musical impresario, and a committee composed of some of New York's wealthiest music patrons.

At the time it was adopted it was believed broadcasting of the classics in music by famous orchestras, such as the New York Philharmonic, the Cincinnati and the Philadelphia Symphonies, would bring nation-wide response from fans.

It did. Thousands set in contributions, and so far as financial considerations were concerned, it is believed the plan would have been successful.

But "insurmountable difficulties" arose, according to Berle. The concerts were to be broadcasted only through WJZ, here.

Producers pointed out this would be difficult to carry out because it provided artists only for one station without regard to the 230 others.

Several other stations from coast to coast have tried to raise a similar fund, but were unsuccessful for the same reason—that of considering the monopoly of this sort of entertainment by one station.

The broadcasting of music by famous concert artists is only a partial solution of this problem.

## DAMPNESS HURTS SET

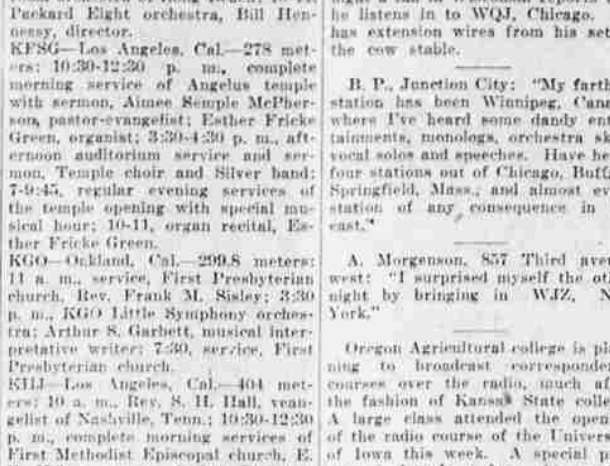
Never let the radio set stand before an open window. It might rain and the set would be damaged if it were to get wet. Even if the set were not touched by the water itself, it might be damaged by the moisture carried in by the atmosphere.

## By Roy Grove

P. L. Lammers, 715 Seventeenth avenue east; 11, got WTAM, Cleveland, very clearly on the loudspeaker, very clearly on the loudspeaker, recently. Heard a first class orchestra selection. I have a four-tube

## Tests Herself

casting favorites, puts on a set of headphones and goes through a rigid test before the microphone at WEAJ and other New York stations. She hears what she is singing, so that she can tell when her voice is too loud, when her high notes "blast," and corrects them accordingly. Here she is seen softening her voice. At other times she steps back to prevent "blasting" of high notes.



High Power Inaugural

When station WCRB, at Zion, N.H., begins transmitting on 1500 watts, the evening of Feb. 22, the radio dieties is going to be entertained with a special radio program designed for the occasion. It will last from 8 o'clock until midnight, central time.

## B BATTERIES LAST LONGEST

Dry cell "B" batteries are used according to amper-hour capacity and also by weight. The same volume may be delivered by one battery in the plumb position, but the battery will deliver the voltage over the longest period of time.

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Radio exports alone for last year are estimated to have exceeded \$20,000,000. This is expected to go much higher during 1925, due to the lifting of restrictions against radio transmission and reception in foreign countries.

The little liberties given radio in last year in Europe and other countries has been reflected in the increased exports of radio material during 1924 over those of 1923.

## SAVIOR

Laying the foundations for a radio life saver. It's the base for the hydrophone which, near the bottom of the sea, is connected to radio receivers, relays and transmitters on land, so that a ship making a sounding at sea can tell more accurately than ever before exactly where it is. The U. S. Coast Survey has been charting the coastline by this method.



## Radio Gossip

C. L. Sigman, 113 Eighteenth avenue west: "I've just installed my new 8-tube set, and haven't logged anything out of Chicago yet. All the coast stations, from Los Angeles to Seattle, have been coming wonderfully clear, and with very little interference. We have picked up Zion City several times, and got some wonderful music out of it."

If you can get WGN, Chicago, on your set tomorrow night, you'll hear a program that ought to be good, entitled "Old English Ballads."

This will be followed next week by "Creole Songs and Composers." These are among a series of lectures now being given entitled "Evenings with the Composers."

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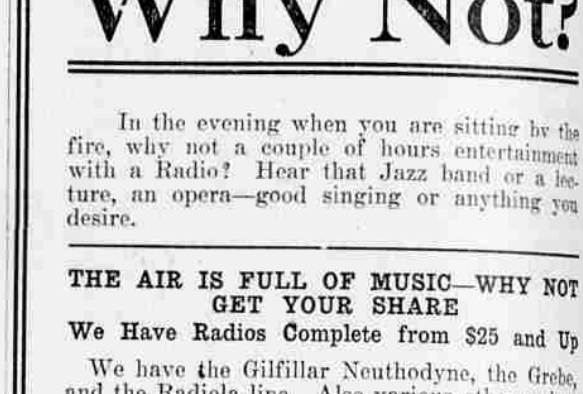
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