



On the Short Waves



"OLD FAITHFUL" OF THE SHORT WAVES

Short-wave broadcasting, though a novelty to most of the general radio public as yet, is nevertheless practically as old as broadcasting on the present "regular" band which centers somewhere below 360 meters. As with the latter, station KDKA (whose transmitters at East Pittsburgh, Pa., are illustrated on these pages) was the pioneer and still a leader.

In the spring of 1922, only a few months after KDKA had commenced systematic broadcasting to the public on a longer wave, H. P. Davis, vice-president of the Westinghouse Electric & Mfg. Co., the owner of the station, conceived the idea of using radio relays to link together stations for simultaneous broadcasts. Dr. Frank Conrad, the technical authority to whom has been entrusted the direction of the necessary engineering development, was convinced at once that the short waves (then dismissed contemptuously to the realm of amusement, rather than experiment) would offer the solution. An experimental short-wave station, KDPM, was put in operation at Cleveland to work with KDKA, and in the following year at Hastings, Neb., KFKX undertook a regular schedule of re-broadcasting KDKA's nightly program as transmitted and received on short waves.

It was not long before the success obtained warranted an attempt to relay a program for international broadcasting; this was accomplished on Dec. 31, 1923, when a New Year's Eve program was transmitted by KDKA and successfully re-broadcast at Manchester, England. On Dec. 12, 1924, the regular short-wave program was picked up and re-broadcast at Johannesburg, South Africa, at a distance of nearly nine thousand miles; and in the following month KDKA was received and re-broadcast in Melbourne, Australia; thus spanning the diameter of the world. Each of these feats set a record in international radio telephone work.

Into the White Wastes

Since 1923 the short-wave transmitter of KDKA has been engaged in a work which exceeds in human

RADIO NEWS will welcome any definite information from our readers about unlisted stations which you may hear putting on programs, only if you hear the call or the announcement of location. Please give the wavelength as closely as you can estimate it. Because of the number of experimental transmissions by amateurs and others, we cannot undertake to list such stations in the short-wave broadcast list on another page, unless confirmation is received of their having a regular schedule; but all definite information received will be published here. Please consult data we have published before writing for information; we have no way to identify a station by its program or language, since many foreign stations transmit in several languages; nor even by its approximate wavelength, unless it is one of the larger and best-known transmitters.

interest, undoubtedly, its many scientific and engineering achievements—that of keeping in touch with civilization's pioneers in the frozen Arctic. It began with the distribution by the Canadian Westinghouse Co. of receivers to the Royal Canadian Mounted Police; now traders, explorers, missionaries, and others rely upon the messages thus sent to them for news and entertainment, especially in the midday night of the northern winter. In fact, many lives have been saved through the directions sent out from this station for the organization of relief expeditions at posts capable of aiding isolated parties whose plight would not otherwise have been known in time. At present KDKA is transmitting also "Far South" programs for the benefit of Commander Byrd's expedition; these transmissions represent a most carefully prepared series of distance programs. To reinforce the service of KDKA, the Westinghouse stations WBZ,

Springfield, Mass., and KYW, Chicago, are also equipped with short-wave equipment which is kept ready for use.

In addition to regular programs of music and speech, and the special messages which have been from time to time sent out to individuals in the Arctic regions, as above described, the short-wave transmitters at East Pittsburgh have been used for motion-picture and radio-photo broadcasts: some of this work was illustrated and explained in the November 1928 issue of RADIO NEWS (page 416). As yet no attempt has been made to present television on a regular schedule from this station; and it is stated by the company that it has no intention of doing so until the system has been developed to a point of greater efficiency, comparable with that of audible broadcasting. In the meantime, of course, experiments may be expected to continue, and will be of interest to amateurs.

Recently great success has been shown in the broadcast of radio pictures by the Zworykin system; by this a photograph five inches by eight may be reproduced at the receiving end in less than one minute. The reproduction is an actual photograph; being made on regular sensitized paper by the action of light. The receiver must be synchronized to the transmitter by a special device operated by a constant-frequency signal with which the carrier of the image-frequency is simultaneously impressed. This apparatus was demonstrated at the Radio World's Fair in New York recently; we have not, however, any constructional data of the apparatus, which must be constructed with much precision to duplicate such results as have been obtained in the demonstrations.

The transmitters illustrated on these pages operate on 62.50 and 25.40 meters; ultra-short telephone work is no longer carried on with any degree of regularity. It is stated that these wavelengths have been determined to be quite satisfactory for the purpose of long-distance work; and it is not the desire of the technical staff to alter them, unless the progress of television research shall show others to be better fitted for that special purpose.

SUGGESTS ESPERANTO

Editor, RADIO NEWS:

As you will certainly know, atmospheric conditions are very bad here on the broadcast waves, thus leaving us the short waves as our only hope. Lately I have been very idle, but it might interest you to hear that W2XAF and KDKA come in regularly, signal strength being very good on a carefully designed two-tube. It is a pity that we have to be up so late in the night (or early in the morning!) to get your short-wave broadcasters (*The compliment is returned!*—EDITOR.), but it is hoped that sooner or later you will follow PCJJ's policy of addressing special programs to different countries. This would undoubtedly bring us closer together and do a lot for your radio market. Another point I should mention is the linguistic problem. (*Ouch!*) Now that anyone possessing a single tube short-wave receiver can pick up stations from all over the world, there is no reason why a language common to all should not be used for international broadcasting. Why not broadcast in Esperanto at least once a week?

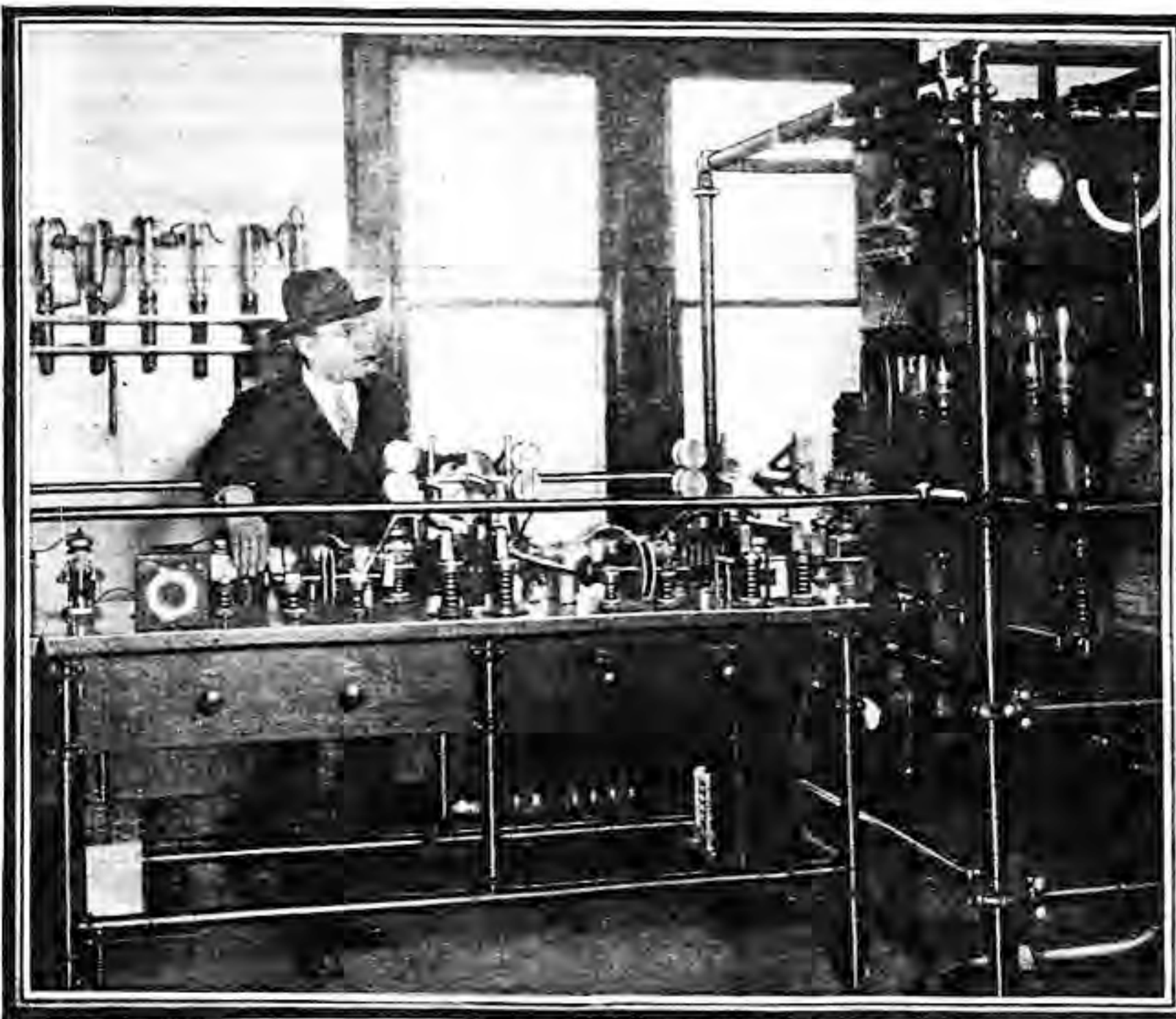
TELESFORO JOSE GORDINHO,
Radio-Polano, Lourenco Marques,
Portuguese East Africa.

(*Sr. Gordinho asks a question which has been on the lips of many before him. The problem is entirely too much for us to attempt an answer. We might say, however, that Esperanto has been attempted with discouraging results in this country, at least, though it is still in use elsewhere. Our own WRNY tried it for a season in 1925-26 and gave up.*)

COSTA RICA'S BROADCASTER SPEAKS

Editor, RADIO NEWS:

I am most thankful for your publication of Mr. Charles Schroeder's letter in your monthly, and I am inclosing herewith the whole story of such wonderful and unusual reception as that experienced by the Philadelphia fan. I have been transmitting ever since the first of last May, using during that month a 38-meter wave; at that time I was reported by many as being interfered with, and so lowered my wave to 30 meters. Since that change in June



One of the short-wave transmitters at KDKA. C. W. Horn, superintendent of radio operations for the Westinghouse company, is making adjustments on one of the early R.F. amplifying stages.

I have had reports from points within a 3000-mile radius around this city: Chile, Peru, Ecuador, Colombia, Venezuela, West Indies, Nicaragua, Salvador, Honduras, Guatemala, Mexico, Cuba, and Tampa, Florida; but now your magazine establishes my DX at Philadelphia—a distance of 2,500 miles and this on a 7½-watt tube. (A 210-type).

I am on the air regularly every evening, 9:30 to 10:30 Central Standard Time, using a 30.3-meter wave. I use a 7½-watt oscillator but expect to change this for a 75- or 150-watt tube pretty soon. My calls are NRH and NR4AC. Please include these in your list of short-wave stations of the world.

AMANDO CESPEDÉS MARIN,
Heredia, Costa Rica, Central America.
(Sr. Céspedes' call has been listed in our short-wave tables, starting with the January issue.)

stay up that late to make a speech. (Perhaps Melbourne, Australia, with a call beginning 3A). I also hear a number of station harmonics such as WAAM on 24.5 meters and Toronto on 70. I have been reading RADIO NEWS since 1921.

ARTHUR J. GREEN,
700 Alpha Street, Klondyke, Ohio.

I have heard Hiroshima, Japan, at about 33 meters, on Friday evenings at about 9 p. m. (EST). His signal is so weak that I cannot make out the call letters.

I would like to communicate with short-wave enthusiasts in my locality, and also any in foreign countries. The only fault I can find with RADIO NEWS is that the short-wave section is so small.

JAMES IZATT,
2616 Forest Street, McKeesport, Penna.

at their best, very loud and steady, with no swinging; 3LO, Melbourne on 32 meters has plenty of wallop; 2ME, Sydney, on 28.50 and especially 6AG, Perth, on 32.90 come in very loud. These, with 2BL, Sydney, 32.50 and 2FC, Sydney, 28.50 are doing a lot of experimenting. After 7:00 a. m. (EST) 3LO is on a chain program with 5CL, Adelaide, announced jointly. Perth announces "Hello, hello! This is 6AG, Perth, in Western Australia." (This is the farthest station in the world, from the Eastern United States.) He is 9,000 miles from San Pedro, yet I believe his wallop and wavelength will cover all U. S. A. (Not necessarily; this is the first report we have received.)

ANE, Bandoeng, Java will be found on 31.86 and 33 meters, also on 15.93 and sometimes other waves. The Japanese station JOAK on 30, 35, 60 and 70 meters uses a different one each morning; the lowest are his best waves. JHBB on 37.50 is at Ibarikiken, Hirasio, Japan.

My set uses Karas parts, wired for 112A Radiotrons; Exide wet batteries for both "A" and "B." My aerial is a single-strand of No. 12 enamelled wire, 84 feet high, 100 feet long, pointing east. The aerial is very taut, and is led direct to the set through the center of a plate-glass window. The ground is made of large copper plates, buried sixteen feet deep in water-bearing ground. My short-wave set was built by Mrs. C. S. Pugh, a radio operator of Melbourne, Australia; the parts cost me \$43.10 and I have been getting more thrills and pleasure out of it than out of my 10-tube broadcast set; I receive all stations without static. What is more, I am having a four-tube short-waver made to use the screen-grid tube.

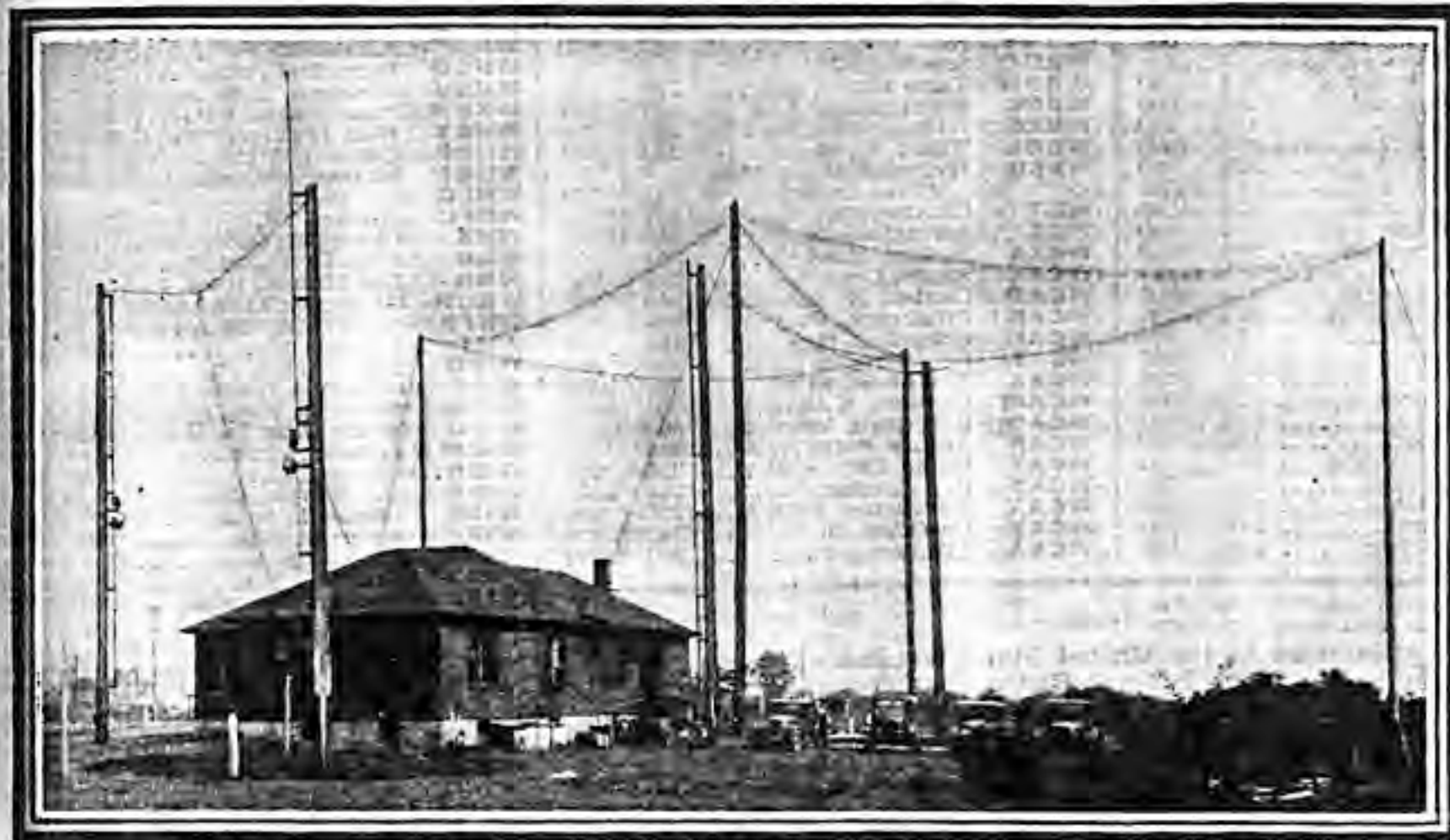
But now is the time to receive Australia, between 4:30 a. m. and 8:30 a. m. (EST); while the Russian RFM on 70 meters at Khabarovsk comes in like a local all the time. He says he uses ten kilowatts, but I really believe he is pumping in fifty.

DONALD F. WRIGHT,
1123 South Meyler St., San Pedro, Calif.

(Even with the elaborate and efficient antenna system described, the results obtained seem remarkable; the location is probably favored. Many, of course, would be unable to make such a record with any equipment; but, as the rooster said when he showed his wives an ostrich egg, "This is not a criticism, but only to let you see what can be done.")

GOOD WORK ON FOREIGNERS

Editor, RADIO NEWS:
I wish to report the following as received by me, using a screen-grid two-tube set which I have remodeled. A three-plate tuning condenser requires seven coils between 15 and 80 meters, but
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From this modest building at East Pittsburgh, Pennsylvania, went the first radio program heard around the world. The antennas of the short-wave transmitters are at the left.

SHORT-WAVE STATIONS HEARD

So many of our readers have heard what are obviously telephone tests on the short waves, and have written in to ask for verifications, that we must point out that these are not broadcasts, but in the nature of private communications. While it is impossible, with ordinary radiophone work, to prevent listeners who are tuned in from hearing the speech, the commercial companies which are conducting this work do not give out any information on the subject—which is, of course, none of the public's business, so long as the tests are conducted in commercial channels. Radio listeners are forbidden by the Radio Act of 1927 from making public or otherwise using anything which they may hear, either in voice or phone transmission, other than broadcasts and other matter obviously intended by its nature to be for everybody.

Editor, RADIO NEWS:

About a month ago I made a short-wave receiver somewhat like the "Junk-Box" using three-plate condensers in place of midgets, a .0001 grid condenser and two stages of audio. I also put a second aerial on the plate coil (Why?) and have heard about forty stations below eighty meters. Chelmsford (5SW) is a regular and I often get them loud enough to be heard through the eight-room house; PCJJ I have heard five times, twice on loud speaker. I hear them on Thursdays, at about 7:30 to 10 (EST) broadcasting special American programs. I also heard Sydney, Australia, "closing down."

I heard several others I could not identify; one on 25 meters called "Hello, New York" and New York answered (transatlantic phone—see note above.) Another on 18 meters or so was calling in a foreign tongue; and another on 38 meters spoke the most unintelligible tongue I have ever heard (Japanese? Or Russian?)

I especially wish to identify a Spanish-speaking station I heard on about 26 meters Nov. 3, from 11:30 to midnight, playing records. Another was heard on about 33 meters Nov. 23 at 4 a. m. A member of the department of agriculture was followed by some Columbia records and a talk on short-wave receivers and reception. They said they had been heard around the world. The call letters began with CA or ZA; but I don't think it is a Canadian station, for I don't think a member of the department of agriculture would

GOOD LOCATION, WHAT?

Editor, RADIO NEWS:

I am forwarding photo of verifications of reception of a few foreign stations on short waves (5SW, RFM, JOAK, 3LO, 2FC, PCLL). I have no trouble receiving 5SW or PCLL; I can play the former with good tone on a 9-inch Peerless speaker with three-foot baffle board.

Right now Australian stations are coming in



The short-wave transmitters of KDKA are housed in the same building with the long-wave sender. Above is shown some of the short-wave equipment, with a transmitter at the rear.

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gives wonderful volume, with no body capacity. I use a 400-foot aerial, a three-stage audio amplifier, plus a 210 power stage leading into a dynamic speaker; 5SW, 2ME, 3LO, PCJJ and PCLL, as well as the transatlantic phone at times will operate the speaker.

KDKA on 63 meters is good day or night; on 25.4 meters only by day like W2XAD and W2XAF. Chelmsford, 5SW, is variable; it can be heard nearly every afternoon but Saturday and Sunday.

The London end of the transatlantic phone, between 7 a. m. and 6 p. m. (EST) comes in variably, best about noon. The New York end, 23, 28 and 33 meters, between 7 a. m. and 9 p. m., is good on all wavelengths.

PCJJ from 2 to 3 p. m. on Fridays is fair; PCLL at Kootwijk from 7:30 to 10 a. m. on Wednesdays and Thursdays is good. Bandoeng, Java, from 8 a. m. onwards Wednesday and Thursday is always weak. RFN, Khabarovsk, Russia, at 6 a. m. Saturdays has fair music but the announcements are poor.

Sydney, Australia, 2ME, is received around 6 a. m. four times a week, and is best around 6:30; Melbourne, 3LO, is good at 8 a. m. Saturdays and poor on Sundays, from 2 to 3 p. m. I have heard unidentified stations in foreign languages on 16 and 35 meters.

BRUCE T. O'LEARY,
Postal Dept., Marshall, Mich.

A JOLLY MARINER

Editor, RADIO NEWS:

I am using the regular RADIO NEWS Special Short-Wave Receiver described by Kendall Clough with a couple of changes of my own. The coils are old B.T. units with the three prongs thwartships and one prong aft with the tickler and secondary grounded; and instead of using an audio-transformer secondary as grid-leak I used a Bradleyleak which pepped the set up about 500 per cent. With the Bradleyleak knob as a control, volume can be brought from good phone reception absolutely minus static or dynamo noises to loud-speaker volume but with some mechanical noise which does not interfere much. All this is with antediluvian tubes; my detector is an old brass-baser with the short prongs and the others have been rejuvenated so much I think I'll have to have their glands renewed! Aerials are not critical and I am now using a 40-foot, four wire cage which seems as good as any I've tried, and a ground is optional.

WALTER EWART,
Chief Mate, S.S. Mariana,
Off Great Inagua Island, West Indies.

(Chief Ewart's log of short-wave stations received looks like the index to an atlas. However, reception conditions on land cannot be compared with those at sea where conditions are comparatively ideal.)

THE "JUNK BOX" AGAIN—AND YET

Editor, RADIO NEWS:

I have added, with excellent results, an additional stage of audio amplification to the "Junk-Box." Some of the receiver's efficiency may be due to the antenna which is 100 feet long and strung between two 12-foot poles. Also, I have seven distinct grounds, (Combined or used singly)—EDITOR.) which aid in improving reception. For those who have trouble with an extra stage, try a .002-mf. condenser across the "B+" post and the plate post of the first transformer, and a .006-mf. condenser from the plate of the last tube to the "F—" post. Also, my aerial is grounded at the far end.

JAMES FERGUSON,
124 Fourth Avenue, Verdun, Montreal, Canada.

A SHORT-WAVE SUPER

Editor, RADIO NEWS:

Having been a constant reader of RADIO NEWS for about five years and enjoying very much the articles in the short-wave section, I would like to suggest to short-wave fans who have access to a good superheterodyne receiving set that the possibilities of this set on short wavelengths are exceptional.

I have two eight-tube sets; one is used on a loop, the other on an outside antenna. On this set I have constructed a separate oscillator and detector unit, using the Silver Marshall Laboratory circuit, with S.-M. coil-form bases and .00035 tuning condensers.

I have at the present only one set of two coils; the oscillator coil has three- and four-turn windings, and the antenna coil two equal windings of three turns each. The rotors are the ones usually

used for ordinary broadcast reception. The output of this unit is connected to the first intermediate-frequency transformer primary in the set.

With this set of coils I have already been able to obtain very fine reception of the following stations: CJRX 25.60 meters; 5SW 24.30 meters; PCTT 21 meters; KDKA 27, 42 and 75 meters; W2XAL 49.96 meters; W2XAF 31.40 and W2XAD 11.96 meters; also a large number of amateur stations. The set handles very easily; the tuning of the oscillator is of course rather sharp. With the midjet condenser in the detector circuit I am able to make the set oscillate on the very short waves without any critical adjustments.

This unit may also be constructed to plug into the first-detector socket of the set. I obtain slightly better results by using separate batteries on the units.

Hoping to see more in the short-wave column, I am, yours for short waves,

J. ROBERT JOHNSON,
1026½ Vermont St., Quincy, Ill.

A CORRECTION

Editor, RADIO NEWS:

I have before me the November issue of RADIO NEWS, and, in going over diagram as given by me for the construction of a short-wave set, I notice an omission in the specifications as given which I would thank you to correct; so that no misunderstanding will be occasioned to parties desiring to build the receiver as mentioned. In the specification following the words: Up to 50 meters, grid windings, 3 turns of No. 28 wire on ¼-inch tube—same should read 3 turns of No. 28 wire on 1¼-inch tube.

After sending you the diagram, I have made a slight change in the 40-meter band which I use in my present receiver. The construction of coil is as follows:

3 turns of No. 20 enameled wire wound on a 3-inch tube for tickler, and 2 turns for the secondary wound over the other. All other coils remain the same as originally given by me.

EUGENIO D'ANGELO,
69-71 Dundas St. West
Toronto 2, Ontario, Canada.

AN OLD TRICK, BUT GOOD

Editor, RADIO NEWS:

I will say the "Junk-Box" has got everything skinned a mile for distance and enjoyment. I hooked up my set and got KDKA and five other stations, including one in Los Angeles, in about half an hour the first night, on one coil. I found that, by taking a potentiometer instead of an R.F. choke coil, you will get results just as good and will be able to set it at any desired number of turns. (An old "ham" trick—the potentiometer, of course, must be wire-wound and not of the non-inductive type. This is good only on short waves.) By using rheostats instead of ballasts, also, you will have greater control of oscillation. I have shielded the panel, and am no longer troubled with body capacity.

JOHN COLLIER,
Monroeville, Ohio.

THE PLUGLESS WONDER

Editor, RADIO NEWS:

I constructed the Plugless Short-Wave Receiver described in your December issue and have had very good results. For the tuning condenser I used an old variable condenser of .0005-mf., which I cut down to six plates. This circuit worked the first time I tried it, and the first phone station to be received was CJRX at Winnipeg, Manitoba, on 25.6 meters. However, I find that a tube of the 199-type will not oscillate below thirty meters, so it is a waste of time to try them in any such circuit. (Whoa!—EDITOR.) Although I am only 15 years of age, I am an ardent radio fan, and would like to communicate with other boys about short-wave and broadcast equipment.

J. LAWRENCE EVANS, JR.,
893 Park Avenue, Woodcliff, N. J.

(Our correspondent seems to be experiencing some difficulty with his tubes. Amateurs doing research work on waves as low as 10 meters have had no trouble in getting the 199-tube to oscillate. We suggest a different 199 tube.)

MISCELLANEOUS PRESCRIPTIONS

Editor, RADIO NEWS:

No doubt there are many who are troubled with the second stage of audio on a short-wave receiver. I have this to offer: reverse the secondary connections on the second-stage transformer, and this will stop the whistle when nothing else will.

LOUIS J. LABASH,
Zeigler, Illinois.

I thought some other readers would like to know how I got rid of body-capacity in the "Junk-Box." At first the tuning condenser had seven plates, which caused it to tune very sharp. I removed two of the plates and found that not only did the set tune broad, but I can now place my hand on the coils and the signals do not change.

JAMES FORGEY,
700 Penn Ave., Bristol, Tenn.

The "Junk-Box" caused me a lot of worry and there was nothing but disappointment in my system. I read of the many successes other builders enjoyed, and wondered what ailed my set. However, I had no idea of giving up and, after I had connected a .000015-mf. variable in the aerial circuit (instead of that in the official parts list) the set turned out to be the snappiest thing I have ever had the pleasure of dialing. With the variable in the circuit, it completely stopped body capacity. I have received foreign stations by using a two-wire aerial. Each leg is 50 feet long; they join at the lead-in, which adds about fifteen feet.

E. A. CORREA,
Keswick, Virginia.

(Remembering the story of the doctor who found empirically that sauerkraut is a stimulant for sick Germans, and toxic to Frenchmen, we hesitate to pass on as a panacea any prescription for the ills of a radio set. It is difficult to see how removing a couple of plates from a condenser would cure body capacity, but the connections of stator and rotor plates may have been interchanged during the operation. Reversing connections on windings, both R.F. and A.F., is sometimes needed to correct wrong polarity; but if the windings of two A.F. transformers couple, they should be shielded or otherwise rearranged to correct the fault. The tuning of the aerial circuit on a short-wave set is especially important because of the usual low power of the received signal. The capacity (C3) used in that of the "Junk-Box" is obtained by a home-made device, such as amateurs have been using for years; but a factory-built variable may be easier to adjust with precision.)

CORRESPONDENTS WANTED

I would be glad to receive correspondence on making improvement to a Radiola No. 3A, especially as regards eliminating the four aerial posts on this set.

E. M. RYMER,
Canadian Corps of Signals,
9934 Ninetieth Avenue, Edmonton, Alta., Canada.

I would like to hear from any short-wave fan who has successfully built a two- or three-tube receiver and transmitter.

HARRY CULHANE,
170 Austin Street, Worcester, Mass.

There is knowledge to be gained in arguing, and I will gladly keep up a friendly argument by mail, and exchange ideas, on tubes and reproducers in general.

HERBERT COX,
2017 Pacific Ave., Atlantic City, N. J.

I would like to exchange ideas with any fans interested in S. W. reception.

LEON VINCENT,
Dannemora, New York.

I would be more than pleased if some one in South America, South Africa, or Australia, who is interested in short waves, would correspond with me. I will reply to all letters.

HILAIRE LE PROVOST,
722 Douglas Court, Clinton, Iowa.

I would like to correspond with others interested in short waves.

ERNEST K. WEAVER,
Box 1461, Fairmount, Illinois.

SPANISH PROGRAM FEATURES

Editor, RADIO NEWS:

The station mentioned in your November issue by Mr. John J. Hannigan, Jr., was undoubtedly PCJJ at Eindhoven, Holland, broadcasting a program for Buenos Aires and the rest of South America. This is a regular weekly feature from that station. On October 12, in commemoration of the discovery of America, a program was broadcast by that station for Spain and South America, including a message to the new president of Argentina.

In the same issue of RADIO NEWS I had the pleasure of reading a letter from the Rev. Richard H. Bell, S.J. While teaching in the University of Santa Clara, he made many important experiments and discoveries in the science of radio ("wireless" in those times) and physics. Very little credit

has been given to Father Bell and I hope some day full credit he deserves will be given to him; though I know very well he did everything just for the benefit of others, never seeking personal credit.

I would like to correspond with readers interested in radio. I will answer all letters.

ELIAS J. PELLET,
Calle de Goya, 42do, Madrid 9, Spain.