November
25 Cents
Canada 30¢

OFFICIAL

Short Wave Listener

HUGO GERNSBACK
EDITOR

MAGAZINE

4,600 SHORT-WAVE STATIONS LISTED IN THIS ISSUE

World Radio at your Fingertips!

LARGEST AND BEST SHORT-WAVE STATION LIST IN PRINT • PHOTOS OF S-W ARTISTS
WHERE TO FIND S-W STATIONS ON YOUR DIAL • WORLD SHORT-WAVE STATION MAP

NEW WORLD GLOBES
for Short Wave Enthusiasts—
at New Low Prices - - -

THESE remarkable, new globes printed in a variety of popular colors are indispensable to short-wave fans. Notable among the many features of these world globes, is that they give life-time service.

Short-wave fans are enabled to determine correct time in various centers of the world with the aid of these globes; distances from city to city can be accurately established.

There is a graduated "Meridian" scale on each globe. Another feature is the movable hour scale found at the north pole—this facilitates determining the hour in any part of the world.

You will be thrilled when you put the globe to actual use—measuring distances from New York to Moscow; from Cape Town to Tokio; from Los Angeles to Rio de Janeiro; etc. A flat map is deceptive for measuring, but take a small string and stretch it across the globe, from city to city, and you have the correct distances.

Each globe contains a listing of several thousand cities in nations all over the world—spellings conform to international geographic standards—all globes are of 1935 production. They contain such important features as—traces of Admiral Byrd's recent voyage to Little America; Lindbergh's Paris flight; the new Japanese Empire; principal railroads; **principal international short-wave radio stations** and call letters; steamship routes; and other equally important data.

The colors on our fine handmade or Library globe maps are refined and delicate. Nevertheless, the two types have an essential characteristic in common—their rich color harmony. In which each color of equal strength blends into a harmonious color unit.

The map surface of all models is protected by a high, glazed, water and scratch proof finish which can easily be kept fresh and new with a damp cloth. This finish will not fade, crack or become yellow with age. The colors are sun proof.

These globes add dignity to home, office, studio or laboratory—they are globes that everyone will be proud to own.

World Globe
No. R-16

De Luxe World Globe No. R-16

This large, de luxe, 16" library globe is designed for those who prefer a globe of real distinction. It is the most comprehensive globe map published. It contains over 9,000 place names, new countries, geographic information, and other useful data. It is extremely easy to read—and can be used for accurate reference. Its distinctive mounting and beautiful coloring harmonize well.

POLITICAL INFORMATION

9,000 name places—Latest political changes (Saar, Manchukuo)—Railroads—Steamship routes with distances—Caravan routes—Ancient ruins (Maya Persepolis)—Important sites (Boulder Dam, National Parks, Little America)—82 Shortwave radio stations and call letters listed—Submarine cable lines—Canals (Suez, Kiel)—Country and state capitals.

PHYSICAL INFORMATION

Mountain ranges—Mountain peaks, volcanos—Plateaus, steppes—Glaciers, shelf ice—Swamps—Deserts, oases—Ocean currents in white—Rivers and river systems—Important lakes—Cataracts (Nile)—Depressions (Death Valley)—Unexplored areas in white.

CONSTRUCTION

The ball is strongly made of three plies of composition board, reinforced within. The map is hand-mounted on a special prepared plaster surface which gives added strength and permits a glass-smooth finish. Water proof and scratch proof lacquer seals the map and preserves its fine colors.

MOUNTING

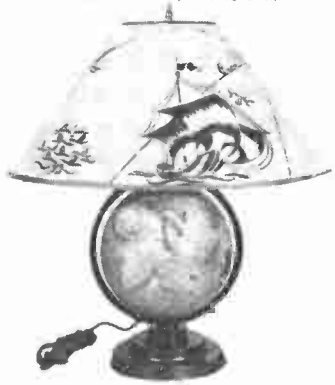
Substantial, completely reversible meridian, antique brass plated with rim, numbers and degree marks brightly burnished. Revolves at a touch on ball bearings in a beautiful, solid walnut floor cradle stand of authentic Duncan Phyfe design. Heavy brass claw feet.

SCALE OF MILES

An inch on this globe's surface is equivalent to 500 miles on the earth's surface. Because of this convenient scale, the 16" globe is specified equipment in the schools of many states.

With this beautiful globe is included the 32-page illustrated booklet entitled, "The Story of the Globe."

The World Globe No. R-16 is moderately priced. Height—39¼". Shipping weight (ball and globe) 30 lbs. PRICE **$31.75**



World Globe No. L-7

This combination globe-lamp, in addition to its decorative value can be used as a reading lamp. The 7" ball, featuring 55 short-wave stations, has a full meridian, and rotates. The 16" diameter shade is parchment, handsomely wrapped in cellophane for protection. Nautical designs in harmonizing colors add to the attractiveness of the lamp shade. The metal parts are antique bronze striped with gold. Complete with plug and cord. Height—19". Shipping weight—5½ lbs. PRICE **$2.60**

World Globe-Atlas No. P-8

This combination world globe and atlas holder adds appearance and dignity to any room—it is very attractive. The globe measures 8" in diameter. It has a full, graduated, movable meridian, finished in statuary bronze and gold. Its stand is richly decorated in a walnut finish. With this world globe is included at no additional cost, a new 221-page world atlas. Height—13¾". Shipping weight—5 lbs. PRICE **$4.25**

Gentlemen:

I received the World Globe and am well pleased with its completeness, appearance and usefulness.

Short-wave listening has become a hobby with me, and this World Globe is a necessary accuracy to any short wave listener or, for that matter, to any home.

P. C. ELLIS, Supt.
Laboratory, 19th and Campbell Sts.
Kansas City, Missouri

World Globe-Atlas No. R-12

This globe-atlas combination is one of the finest pieces that could be placed in any home or office. The 12" library ball, with its brass-plated meridian, fits snugly into the finely constructed solid walnut stand. Provision is made below for the 1935 383-page atlas which accompanies each globe, at no extra charge. 67 Shortwave stations listed. Height—16½". Shipping weight—12 lbs. PRICE **$6.85**

World Globe-Atlas
No. R-12

ORDER YOUR GLOBE TODAY!

SHORT WAVE CRAFT SWL-11-35
99 Hudson Street, New York, N. Y.

Gentlemen: Enclosed you will find my remittance of $..... for which please ship me the following World Globe.

( ) World Globe No. P-8 @ $4.25
( ) World Globe No. R-16 @ $31.75
( ) World Globe No. L-7 @ $2.60
( ) World Globe No. R-12 @ $6.85

Name.....

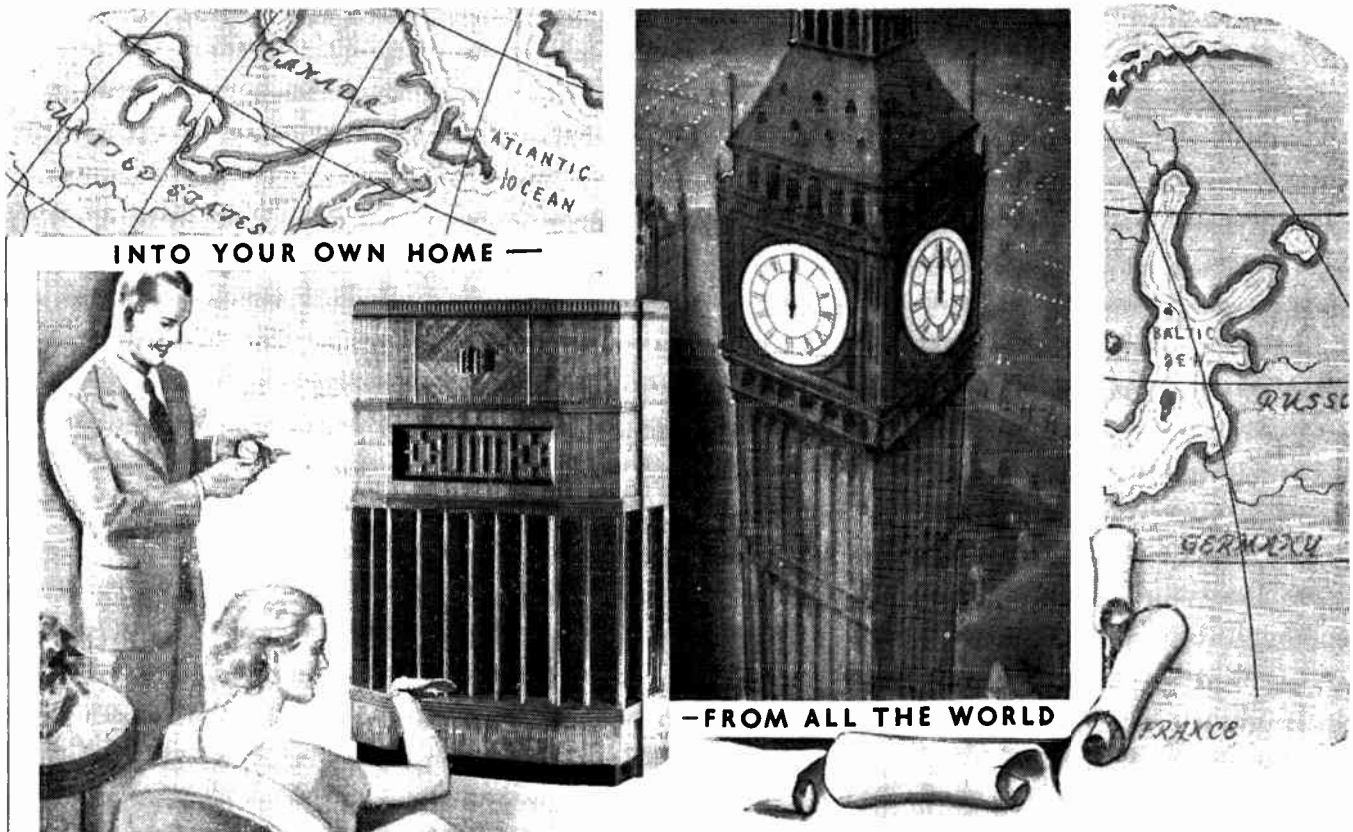
Address.....

City.....State.....

Send remittance in check or money order—register letter if it contains cash, stamps or currency. GLOBES ARE SHIPPED FROM OUR WAREHOUSE IN CHICAGO—F. O. B. FROM THAT CITY.

All globes are carefully packed in original, corrugated protected, cartons, assuring safe delivery. ORDER BY NUMBER. Send check or money order, plus sufficient postage for delivery by parcel post. Globes are shipped from our Chicago warehouse. Register letter if it contains cash, currency or stamps. Specify if shipment is to be sent express collect. ALL ORDERS ARE FILLED PROMPTLY.

SHORT WAVE CRAFT 99 HUDSON STREET, NEW YORK, N. Y.



Only the SCOTT *Full Range Hi-Fidelity* ALL-WAVE *Brings* YOU PARLIAMENT'S MIDNIGHT CHIMES WITH SUCH THRILLING TRUE TONE

London midnight — full of stars and historic towers! And the great chimes of Big Ben booming the hour across the darkness!

And in another quarter of the world: at the same instant—at a touch of the dial of your new SCOTT — you set your own watch to the same thundering measure of these great chimes ringing out over the British Parliament!

THE YARDSTICK FOR ALL DX RECEPTION

A nightly modern miracle — yours with the magnificent new SCOTT! World events—world views—inspiring music from foreign stations you have never heard before, brought in with a power and tonal splendor that stop your breath, so thrilling is the realism of SCOTT *re-creation.*

SCOTT distance records are unchallenged throughout the radio world. London — Paris — Madrid — Geneva — Brussels — Berlin — Rome — all with the clear, enjoyable sparkle possible only with the SCOTT Higher Useable Sensitivity.

Reserve power not even claimed for any other receiver. "Peak" fortissimos of a Beethoven symphony or popular dance arrangement with a brilliance and freedom from distortion that elevates the SCOTT to a class by itself.

DOUBLE THE TONAL RANGE OF ANY RECEIVER

The SCOTT Full Range Hi-Fidelity AllWave is the only receiver today which captures all the dazzling overtones of voice, violin, oboe, and trombone, from the 16,000 cycle high fidelity stations. Regular high fidelity radios with 7,500 cycle limit miss more than half the overtone range.

BULLET DIRECT SELECTIVITY—Piercing the most powerful adjacent wave length stations to bring you more foreign stations than you have ever heard before. 2 to 16 K. C.

HIGHEST USEABLE SENSITIVITY—guaranteeing less noise on distance reception than any receiver today.

PERFECTED AUTOMATIC VOLUME CONTROL—keeps distant world programs at even level.

DISTORTIONLESS PEAK RECEPTION — 35 Watts pure Class "A" output. Six times average power for unwarped tone.

SHORT WAVE STATION LOCATOR—gives clear momentary whistle when you tune in distant stations.

SOUND DIFFUSION—the only radio today with scientifically designed sound diffusers for perfect distribution of all tones.

FULL RANGE HI-FIDELITY — twice the tonal range of any other high fidelity receiver. 25 to 16,000 cycles.

THE RECEIVER THE CELEBRITIES OWN

The unparalleled performance of the SCOTT is backed by a five year guarantee of perfect service on all parts except tubes. Custom-built and sold direct from the laboratories on a thirty day home trial (U. S. A. only). Send TODAY for complete information on the new SCOTT Full Range Hi-Fidelity AllWave — the receiver owned by Toscanini, Jeritza, Rudy Vallee, Guy Lombardo, Walter Winchell, and many other celebrities.

E. H. SCOTT RADIO LABORATORIES, INC.
4464 RAVENSWOOD AVE., DEPT. 34T5, CHICAGO, ILL.

SEND THIS COUPON *TODAY*—DETAILS FREE

E. H. SCOTT RADIO LABORATORIES, INC.
4464 Ravenswood Ave., Dept. 34T5, Chicago, Ill.

Send me complete details of the new SCOTT Full Range Hi-Fidelity AllWave, "94 PROOFS" of its superior tone and DX performance, and particulars of your 30 day trial offer.

Name _____

Street _____

City _____ State _____

Fans, Take Notice!

CONTINUOUS BANDSPREAD

on all bands

THE OFFICIAL

DOERLE BANDSPREAD

NATION-WIDE *TESTIMONIALS* PRAISE THIS SET

Dear Sir:
I want to tell you that the radio which I bought from you recently is working fine. I have received California on long-waves, and on short-waves have logged about 93 stations. Three from the greatest distance are VK3LR, VK2ME and VK3ML, all located in Australia. And I get them consistently, not just once in a great while, at great volume, on a small window-sill aerial.
The set certainly has some "kick" to it.
Ernest J. Orishek, 118 White St., Westfield, Mass.

Dear Sirs:
Just a line or so to give you an idea of what my Doerle A. C. 5 hauled in during a 2 weeks listening test. All the G and D stations were received also TIEP, W9XF, PRADO, HJ4ABE, W8XAL, W2XE, W8XK, CJRO, YU2RC, CJRX, COC, HJ4ABB, HJ1ABB, YU5RMO, YP3RC, WCRCT, CT1AA, W1XAL, W9XAA, W1XAZ, EAQ, WE9GW, HC2RL, HJ3ABD, KEJ, HJB, HP5B, HJ1ABD, WNB, YU1RC, HIZ, JYK, FYA, YU4RC, OA4AD, RNE, PHI, RK,1 WNC, YNA, COH, PRF5, WON, XEBT, W2XAF, LSL, I2RO, IRM, JYS, UK3LR. All stations come in with strong carriers with a QSA4-5—R9 plus. "Hams" in 48 states and foreign countries besides practically all Police Radio Stations were received.
Frances Kmetz, 213 Linden St., Allentown, Pa.

Gentlemen:
The Doerle "AC-5" arrived all O.K. Had it going in about ten minutes after unpacking. It sure seems to be fine, we enjoy it very much. I am new at short-wave tuning but the bandspread dial makes tuning a real pleasure. I only have a short wire aerial so cannot give you any long list of stations received, but have received many foreign stations. I think Rio De Janeiro about the best distance at about R8 volume.
Ralph C. Rathbun, 9 Seward Ave., Bradford, Pa.

Gentlemen:
Here is a list of Short-Wave stations I have received in a short time with my "DOERLE AC5", with a very poor aerial for short-wave work. EAQ—Madrid, Spain; WIXAZ—Springfield, Mass.; W3XAF—Schenectady, N.Y.; COH—Havana, Cuba; COC—Havana, Cuba; VE9GW—Bowmanville, Ontario, Canada; CT1AA—Lisbon, Portugal; PRF5—Rio De Janeiro, Brazil; HJ1ABE—Barranquilla, Col., S. A.; PRADO—Riobamba, Ecuador, S.A.; DJC—Berlin, Germany; XEBT—Mexico City, Mexico; YV5RMO—Maracaibo, Venezuela, S. A.; CRJO—Winnipeg, Canada; W2XE—New York, N. Y.; W2XK—Pittsburgh, Pa.; HP5B—Panama City, Panama; FYA—Paris, France; G8C & G8L—Daventry, England.
EAQ—Madrid, Spain and COD—Havana, Cuba come in every night on the loud speaker regardless of weather conditions. This is the third and best receiver I have owned in the short time I have been interested in Short Waves.
Emerald H. Oelbrugge, Rose-Mary Oahlia Gardens, Martins Ferry, Ohio.
Original letters plus others may be seen at our office.

5-TUBE DE-LUXE A. C. SHORT-WAVE RECEIVER

Complete Price
$27.57 WITH TUBES
READY TO PLUG INTO 110 VOLT 60 CYCLE A.C. OUTLET

- Doublet Antenna Input or Standard Antenna Input
- 8-Low Loss Bakelite Plug-in Coils
- 15-200 Meters
- Fully Shielded
- Bandspread Dial
- Dynamic Speaker
- Headset Jack
- Beautiful Cabinet

BEFORE you buy any other Short-Wave Receiver, be sure to take advantage of our FREE five day trial offer explained below. Satisfy yourself, in your own home and at your leisure that this IS one of the greatest values in radio, and that it DOES have features which are found in more expensive receivers.

A powerful 5-tube "rig" complete with its self-contained hum-free power pack and dynamic speaker; all mounted on a single chassis and contained in a large handsomely finished black crackle cabinet with patterned screen speaker grill.

Two tuned stages—regenerative detector, 3AF stages with powerful 41 pentode output and perfectly matched dynamic speaker; all these features contribute to the great power and fine performance of this Doerle short wave receiver.

CONTINUOUS BANDSPREAD ON ALL BANDS. A special double-pointer, double-scale, airplane dial having a tuning ratio of 125 to 1 is employed.

Many fine features that you would expect to find in more expensive receivers are incorporated in this "ACE TOPNOTCHER" of the entire Doerle line.

Either a short-wave doublet or standard antenna may be used. A new antenna-adjusting scheme permits perfect alignment of both tuned circuits without appreciably affecting the setting of the tuning dial. Provisions are made to use headphones if desired, with a switch to cut out the dynamic speaker.

LOOK AT THIS DX-QSL LIST!

During its initial test, in New York City, this receiver pulled in on its loud speaker, at good room volume, the following enviable log: W1XAL, W1AZ, Boston; W3XAL, Boundbrook, N. J.; W8XAL, Cincinnati; W9XAA and W9XF, Chicago; G8C, G8O, G8E, G8F, Daventry, England; DJA, DJB, DJC, DJD, Zeesen, Germany; HBL, HBP, Geneva; VE9GW Ontario; V9DN Quebec; GE9DR Montreal; VE9HX Halifax; XETE Mexico City; YU1BC,YV3BC Caracas; CP5 Bolivia; LSN Buenos Aires; COC Havana; EAQ Madrid; WQO and WEF, testing with the Byrd Expedition and a whole flock of amateurs in practically every radio district of the United States. After that, we could no longer keep our eyes open so we "signed off" to bed.

The testimonials printed on this page testify that, in actual use, our customers are attaining even greater success. Uses a simple regenerative circuit—so simple as to be entirely reliable. Tubes: 1—6D6, 1—6F7 (actually two tubes in one), 1—37, 1—41 power output tube and 1—80 full-wave rectifier. Two gang tuning condenser; single dial control; FULL-VISION ILLUMINATED BAND SPREAD AIRPLANE DIAL. Ship. wt., 25 lbs. No. 5000. "DOERLE AC-5" Short-Wave Receiver. Complete with Tubes, Speaker and 8 coils 15 to 200 meters. Completely wired and tested. (NOT SOLD IN KIT FORM) YOUR PRICE **$27.57**

List Price $46.75 Set of 2 Broadcast coils $1.75 additional

7 PAGES of Instructions and Diagrams Included with each SET

USE THIS COUPON for—

FREE 5 DAY TRIAL

RADIO TRADING CO., 103A HUDSON ST., NEW YORK

Gentlemen: RL-11-35

I enclose.....dollars.....cents, for your new Doerle 5-Tube De-Luxe Short-Wave receiver on a five day free trial basis. I am to prove to my own satisfaction that it will give me world-wide reception and that your guarantee means exactly what it says. If, at the end of five days after receipt of radio, I am not perfectly satisfied, I will write you accordingly, whereupon, you will send shipping instructions. Upon receipt of the radio, you will refund me the full purchase price. I agree to pay express charges one way, and you the other.

C.O.D. SHIPMENT. I enclose.....dollars.....cents deposit balance of .....dollars.....cents C.O.D.

PRINT Name _____

Address _____

Town _____ State.....

FREE

IMPORTANT BUYING GUIDE FOR RADIO DEALERS, SERVICE MEN, EXPERIMENTERS AND SHORT-WAVE FANS

32 Pages. Two Colors. Profusely Illustrated.

Up-to-the-minute catalog containing low prices which save you money. Contains radio sets, parts, public address equipment, short-wave receivers, etc., etc.

Name the item—it's in the catalog

Send postcard or letter. Book sent by return mail. See page 191 for more details.

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Editor
HUGO GERNSBACK

Managing Editor
H. WINFIELD SECOR

Associate Editor
GEORGE W. SHUART, W2AMN.

OFFICIAL
SHORT-WAVE
LISTENER
MAGAZINE
Combined with
OFFICIAL SHORT-WAVE
LOG AND CALL MAGAZINE

OCTOBER - NOVEMBER, 1935

VOLUME II, No. 2

WILL YOU COOPERATE?

● *We are pleased to report to you that the Short Wave Listener magazine seems to be increasing in popularity among listeners everywhere and that the sale of the magazine is climbing constantly. We have been urged by hundreds of letters which reach us every month to make the magazine a monthly. So far, we have not been able to accede to this request, due to the fact that the sale of the magazine has, as yet, not reached a sufficient volume to make this move feasible. If, however, you are one of those who wish to see the magazine come out monthly you can help us towards this goal by telling others about the magazine.*

If the enthusiastic letters which reach us right along are a criterion, it would seem that other listeners would be benefited as much as yourself, if they only knew about the magazine. If every reader of the Short Wave Listener would take the trouble to inform a friend who has a regulation SHORT-WAVE set or an ALL-WAVE set, that here is a magazine which he should know about, your friend no doubt would appreciate it, and it will not take long before the magazine would be issued monthly.

Won't you, therefore, cooperate with us by giving us the names of your friends who now own all wave sets, using the blank printed on page 232 of this issue. Just paste this blank on a postal card or send it by letter as you wish, and we will send your friend or friends a free sample copy of the magazine immediately.

HUGO GERNSBACK,
Editor.

Popular Book Corporation
Editorial and General Offices
99-101 Hudson St., New York, N. Y.

Contents...

This magazine is published every other month.

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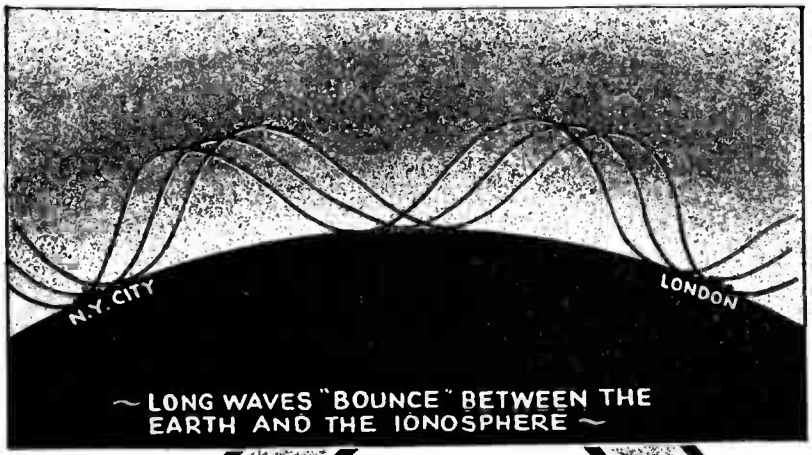
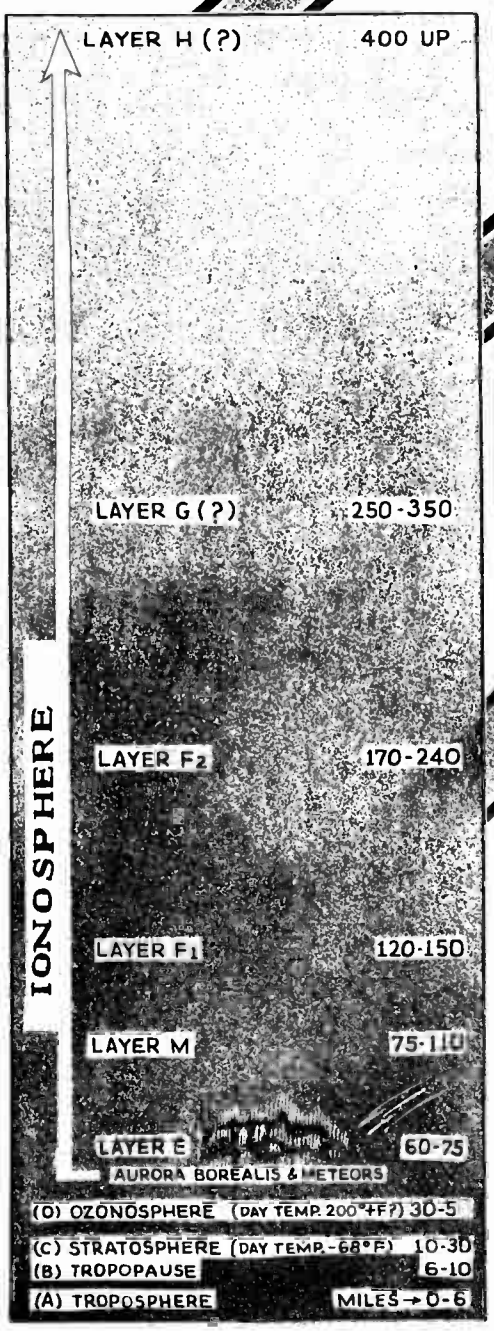
Make all subscription checks payable to Popular Book Corporation.

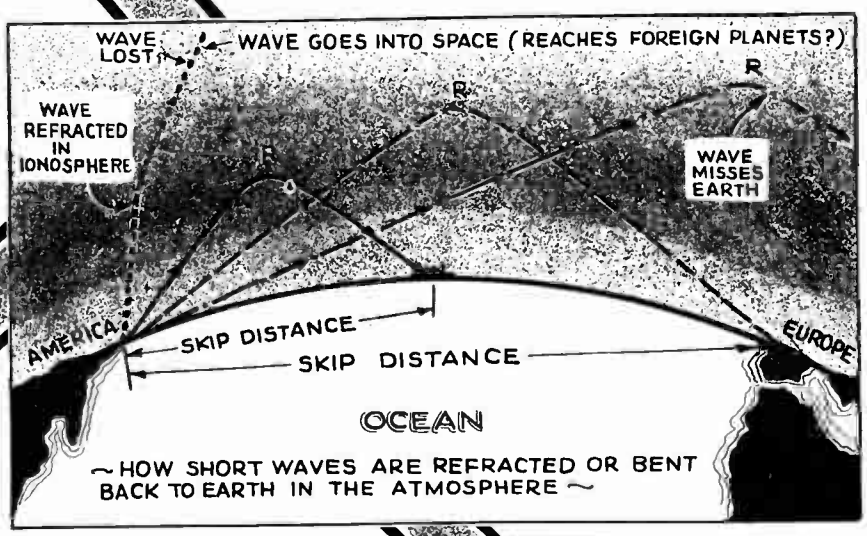
How Short Waves are Propagated and the Ranges for Different Wave Lengths

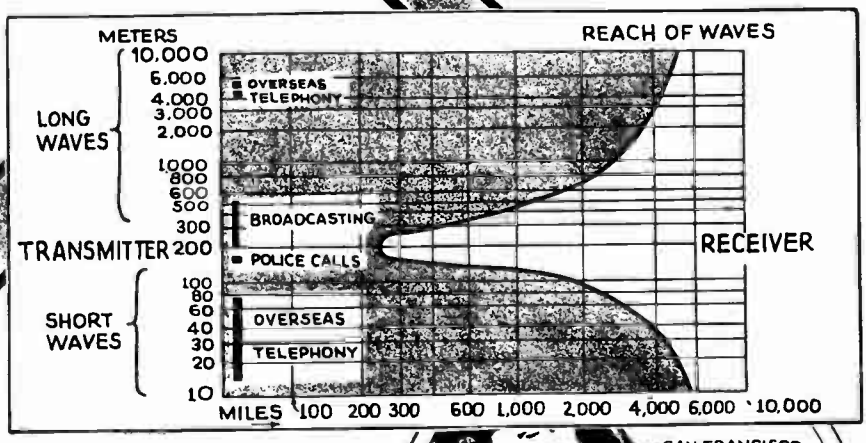
Long waves are transmitted over great distances, such as between New York City and London, by being constantly reflected back and forth between the surface of the earth and the highly ionized upper atmosphere.

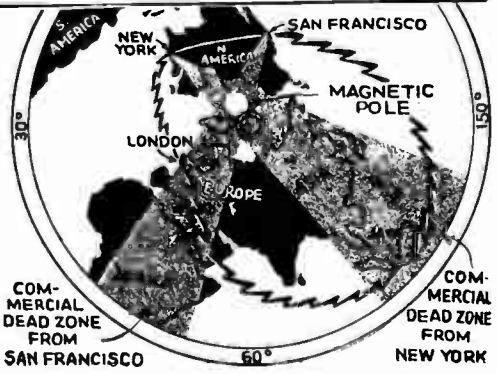
Short waves are also reflected from the highly ionized layers of the upper atmosphere as shown below, and are subject to the peculiar phenomenon known as the "skip distance." A receiving station located in this "skip distance" area will not hear the station ordinarily.











Left—A scientist's picture of the atmosphere showing the various ionized layers and the names of the various layers with their heights above the earth's surface.

Above—Chart which shows the theoretical distance covered with typical wave lengths, and with a given amount of power radiated at the transmitter. This chart is for daytime transmission; wave lengths below 10 meters are not efficient for terrestrial long distances.

Right—This chart shows a view of the earth looking down on the North Pole and, how because of the earth's magnetic effects, there is a large zone for both of the Bell System radio stations in the region of New York and San Francisco, where commercial service cannot be given directly.

How SHORT WAVES Are • PROPAGATED •

● WE are accustomed to marvel at the elaborate technical equipment used in the overseas radio telephone service. We follow its development and shake our heads in wonder over its accomplishments. Yet it would be impossible to telephone abroad were it not for a vast mechanism supplied by nature. This consists of a region of electrified particles in the upper atmosphere which scientists now call the *Ionosphere.*

Without the help of this agency, which is both a barrier and a benefactor, your voice would never get overseas. For the radio impulses carrying your words would leave the transmitter, shoot beyond the curving surface of the earth far out into space, and never arrive in the country you desired. Thanks to the Ionosphere, however, the radio waves bounce back to earth somewhat as billiard balls carom off rubber cushions and green felt. This bouncing process repeats and, by choosing radio waves of the right length, technicians are enabled to direct your conversation to its proper destination.

It was not until after the early years of this century, when Marconi first announced that he had successfully transmitted radio waves across the North Atlantic, that the effect of the Ionosphere was suspected. His report that the Atlantic had been so spanned occasioned considerable surprise, because even then it was known that radio waves were gigantically long light waves. And these waves, as was the case with light, were believed to travel in practically straight lines from their source. It was evident from Marconi's results, therefore, that some influence must be guiding these impulses back to earth, and preventing them from flying off the curved surface of our globe to be lost in outer space.

Ultimately scientists settled upon the atmosphere as this important factor and since then they have been studying it until today, like the New Deal, it is full of alphabetical designations. The envelope of gases about the earth is now neatly divided into regions as neatly labeled with letters. We live and breathe and fly our airplanes in the lower atmosphere which extends upward about six miles—the Troposphere or Layer A. Layers A to C are chiefly characterized by changes in temperature; Layer D by the presence of ozone; and, beyond that, it is a question of the density of the electrified particles floating about in the atmosphere.

As we go up, Layer A changes from warm to bitter cold; the drop in temperature is about seventeen degrees per mile. Layer B (the Tropopause, which introduces us to the upper atmosphere) is still colder, although the rate of change is not quite so rapid. Layer C (the Stratosphere—now a familiar scientific term) is just a bit colder, but as we go higher it maintains about the same temperature. Finally, because it absorbs much of the ultra violet light coming from the sun, Layer D (the Ozonosphere) becomes warmer.

Our next move upward—we are now some fifty miles above the earth—takes us into the Ionosphere which has so much to do with radio telephone service. This is divided into Layers E and F (about which a good deal of information has been gathered) and still higher regions—assumed to be Layers G and H—now being explored. (There is another region also receiving attention—an area discovered by the Bell Telephone Laboratories between Layers E and F_1 referred to as Layer M.) These divisions appear on the diagram.

What is the ionosphere? How are short waves propagated through space? How does the sun affect the transmission of short waves? What is the nature of the atmosphere so far as short waves are concerned? This clearly written article explains what happens to short waves in the atmosphere.

As the action of the Ionosphere discloses, solar influences are of predominate importance in their effect on radio transmission. The electrical particles found in the Ionosphere are produced for the most part by radiations coming from the sun. In addition, cosmic rays, ultra violet light from the stars, impacts from meteors, and thunderstorms also contribute to electrifying the upper atmosphere.

The number of electrified particles created depends chiefly on the intensity of sunlight and the density of the gases in the atmosphere. Ultra violet rays from the sun and elsewhere knock off electrons from the gaseous particles forming the atmosphere, and cause them to take on an electrical character. Since some of these particles have a positive charge and others a negative, they are constantly seeking partners of the opposite charge. Once a partner is found, the atom becomes neutralized and loses its active electrical character. Near the earth where there is more gas in the atmosphere, and thus more particles swimming about, the possibilities of making such re-combinations are greatest.

However, in Layer E and beyond, where there is less gas and consequently greater space between these particles, the possibility of finding a partner is enormously lessened. Hence, at these levels a greater number of particles remain in an electrified state. Here, then, is the Ionosphere, the dense region of electrified particles which reflects most radio waves back to the surface of the earth. Although in the form of layers, these particles are distributed somewhat irregularly; on going higher, incidentally, they usually are found to be more numerous.

Long and short waves meet a somewhat different reception when they travel upward from the transmitter and arrive in the Ionosphere. The longer the radio wave, the easier it is to bend it back on its path and reflect it down to earth. On the other hand, the shorter a radio wave, the less susceptible it is to this bending process; short waves, consequently, penetrate deeper into the upper atmosphere. Here, however, the electrified particles are more numerous and can bend the waves until they finally turn earthward. *Very short radio waves (which behave much like light waves) are so little affected by the action of the Ionosphere that they are not refracted back to earth, but penetrate this barrier and go on beyond into inter-stellar space.*

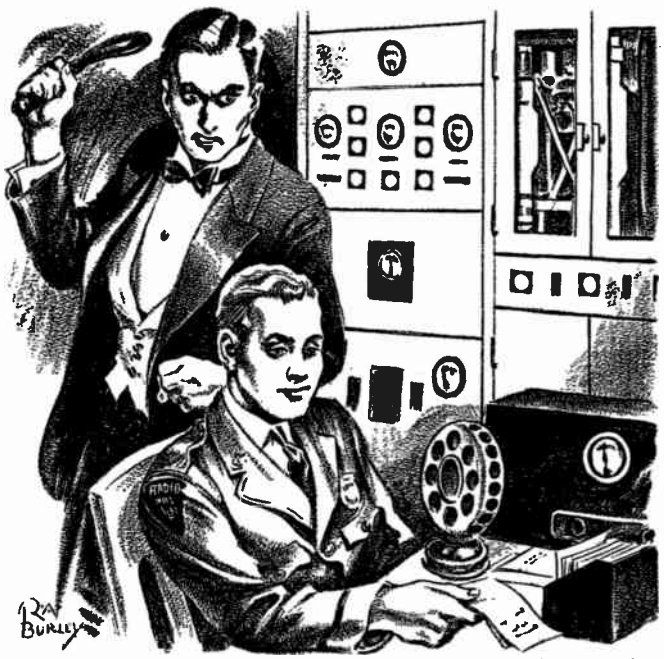
Now it happens that our atmospheric medium absorbs the energy of waves in the vicinity of 200 meters more than those of other lengths. (These waves, incidentally, are near the bands assigned to most of our broadcasting stations and this probably explains why such stations are not always heard well over long distances.) It is customary to use this region as a dividing line in talking about long and short waves—thus, those less than 200 meters in length are called *short waves* while those longer than that figure are ordinarily known as *long waves.* A diagram on the opposite page illustrates this point.

The least number of electrically active particles in the atmosphere is found just before dawn; on the arrival of sunlight with its ultra violet rays the number increases. Thus, in the daytime—especially around noon—a particularly dense region of electrified particles is created, a condition which affects the height at which long and short radio waves are reflected from the upper atmosphere. Such a change in *ceiling height,* so to speak, governs the

(*Continued on page* 232)

The Forgotten Time Signal

By FRANK CLINTON



Sandy was too occupied with his thoughts to notice any noise . . . A well-dressed man in evening clothes stealthily crept in the door . . .

● TWO A.M. on a clear starlight morning in mid September. Sandy Roberts, night relief announcer of Police Radio station WPCX, of Redwood Villa, stifeled a hearty yawn with the back of his left hand. In the early morning hours, a small mid-western town of 35,000 souls was certainly dead, at least as far as the police were concerned, he mused. It had been over two hours since the last call when he had sent one of Redwood Villa's three radio cars to investigate a noisy dog that was keeping a sleepy neighborhood awake.

He reached over and flipped a switch, turning on the 100 watt transmitter and said, "Calling All Cars—All Cars—2:15 A.M. time signal. That's all."

Certainly a nuisance this giving time signals every fifteen minutes. It was one of the old man's ideas. Supposed to let the boys in the prowler cars know if their radios were operating correctly.

Well—it was certainly much softer here in the warm confines of the Police Department's Radio Room containing the transmitter, microphone and dispatching map of the city, showing the exact location of each of the cars, than pounding some lonely beat. Sandy was elated to think that he was assured of this assignment for some time. His steel-blue eyes flashed as he remembered Chief Burke's remark that he was still looking for the man to fill the shoes to old Tim Healy, former Captain of the department who had recently resigned. Sandy secretly hoped the Chief was looking him over, preparatory to announcing the appointment of the new Captain. Of course, he wasn't any too sure of getting the appointment, for after all, he argued to himself, he was only 29 years old, and on the force five years. Lots of the fellows in the department had been there longer—but the Chief was still undecided.

Sandy was too occupied with his thoughts to notice any noise in back of him as the door slowly opened. A well dressed man in evening clothes stealthily crept in the now wide opened door. He cautiously pulled a small, but ugly blackjack out of his trouser pocket. Sandy, startled at the sound of footsteps in back of him started to rise—then there was a quick flash of pain in his head—and then utter blackness.

When he aroused himself, he was lying, securely tied and gagged, on his back. He was shocked to see the tubes of the transmitter lit up—and more shocked to hear a strangely familiar voice commanding—

"Calling Car Two—Car Two. Go to 24 East 34th Street and investigate a prowler. Watch your step boys! This man may be dangerous. Calling Car One—Car One. At 167 W. 39th Street the neighbors are complaining of a wild party. Calling Car Three—Car Number Three at" . . .

It flashed through Sandy's mind that this man's voice was almost exactly like his—the man even had that New England twang in his voice, so similar to Sandy's. He realized this debonnair fellow was sending every available car to the south side of the city. The gleam of the filaments in the transmitter died down. The well groomed intruder had finished his announcements.

Being gagged, there was little Sandy could do except to glare at the man.

"What's the matter, copper? Don't you like being gagged and tied not being able to use your radio station? I suppose you're wondering what this is all about."

He paused for a moment to light a cigarette, and then continued.

"Well, since you are going to be trussed up here for the next three and one half hours, until your relief man comes on at 6, I'll let you in on the secret. You'll no doubt recall the First National Bank has just taken in $100,000 for the payrolls at the factories in Badenville. My playmates and myself have burrowed under the vaults of the bank and have been awaiting our chance to break into the vaults. Just in case anything goes wrong and the burglar alarms go off, we don't want any snooping radio patrol cars around."

The crook seemed to sense the amazement that had entered into Sandy's eyes. He inhaled deeply on the cigarette, and let the smoke drift luxuriously out of his mouth. He smiled at his captive and continued his narrative.

"For many weeks now, I have listened to your voice on my short wave set at home. I have practised during that time, so that I could perfectly imitate your announcing voice. In that way, I could be sure none of the listening cops would get suspicious."

The cleverest crooks always leave some stone unturned, the old saw has it, and the bank robbers in the present tale slipped a cog too!

He paused a few minutes, looking at the ceiling, dreaming of the $100,000 that he soon would share with his two accomplices.

Desperately, Sandy realized what the crook had related was true. The $100,000 payroll for the big industrial plants in Badenville, four miles east of Redwood Villa, had arrived that night from the Chicago banks. From his awkward position on the floor, it was difficult to see the large electric clock on the desk, but by straining his neck, he could see the big black hands had crawled slowly around to 2:29 A.M. If this man would only continue talking for a few minutes longer!

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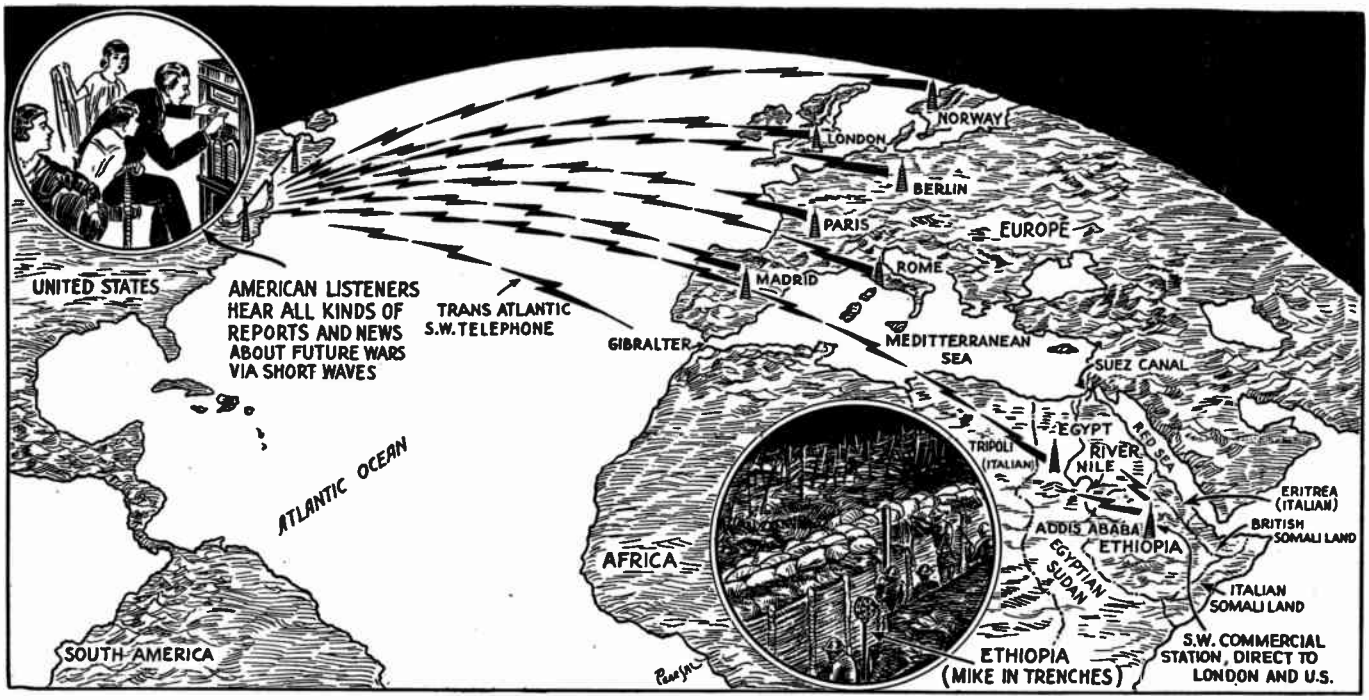


Thanks to short waves, those equipped with a short or dual wave receiver will hear many thrilling as well as interesting reports on the next war, direct from experts in close touch with the seat of war. For example, the Italo-Ethiopian situation will be covered by short-wave reports emanating from the principal short-wave transmitters of Europe and, unlike the World War, "hot" news will be dished up to the short-wave listening public everyday.

Short Waves in the Next War

● THE next war, whether it be in Ethiopia or elsewhere, will surely be covered in a brand new fashion by *short waves*.

Those of us who have listened in daily to the reports from foreign short-wave stations, such as those located in England, Germany, and other countries have had a sample of this already, and the opinions given by some of the leading European experts have been much "snappier" than anything published in the newspapers. We can well imagine that if Italy and Ethiopia, for example, should be engaged in a war, that we would hear some very interesting and unusual reports and opinions from the other national S-W stations, such as those located in London, Berlin, etc.

Not only will this next war be covered as never before, thanks to *short waves*, but it will be entirely unlike the conditions during the World War, in that no *radio broadcasting* whatsoever was available and we could only read the "censored" reports in the public press.

Furthermore, it is quite likely that the Italian short-wave stations will be used to broadcast daily bulletins and opinions of Italian experts in the form of propaganda, in an endeavor to influence listeners in other countries and present their side of the conflict. It is also quite probable that Ethiopia might erect a short-wave broadcasting station to "tell the world" *their side of the story!*

Another radically new angle created by short-wave broadcasting across the ocean will quite possibly be broadcasts of the sounds of actual battle, direct from the trenches or from the decks of warships. This is not an idle dream, the idea having been mentioned seriously in recent reports from abroad. The trans-oceanic commercial telephone services such as that operated by the A. T. & T. Co., by *short waves* will also bring a brand new service of vast importance to diplomats and others engaged officially or otherwise in any future wars.

Not only will short waves bring to the American public the very latest news bulletins, as well as opinions of diplomats and military experts, on any future wars, but they will also serve an important role in transmitting official messages across the oceans between diplomats and others vitally interested in the affairs of the nations concerned.

Entertainment is still another new slant that was missed in the World War and unless the commanding officers absolutely prohibit the reception of music by radio for entertaining the soldiers and sailors at war, it is quite conceivable that the short waves may supply entertaining music and song for the men under arms. It might be that an official order would prohibit the use of loudspeakers, as music or talk coming from them might give away the location of some of the front line troops, but in this case by demanding the use of *headphones* only, it would seem that the men could be royally entertained.

Short waves will find dozens of new uses in the war of tomorrow, and for one thing, the facsimile transmission and reception of maps, photos, etc. will undoubtedly be extensively employed.

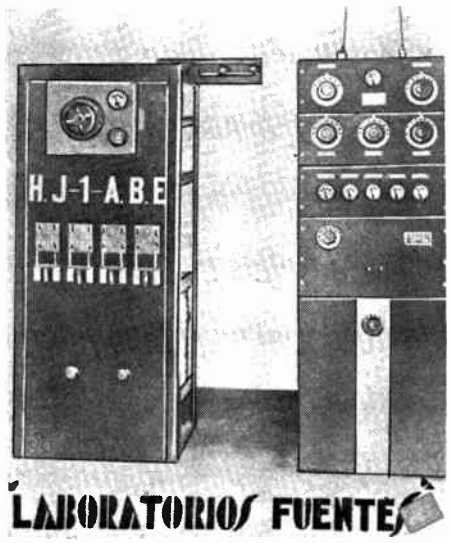
It is quite probable also that *television* may enter into the picture of tomorrow's war and either of these systems of transmitting an image or depicting a scene will be used between an airplane or Zeppelin and the earth, or from a ship to shore, and so forth. Directed beam transmission will undoubtedly be used extensively for military work, and for ranges of a mile or so transmitters operating on waves at 1/10th of a meter or less will quite likely be employed.

One advantage of micro-wave communication is that the beams can be directed quite sharply and the chances of the enemy radio listening devices picking up such waves is rendered very remote.

Short waves are already carrying many brilliant news reports from across the ocean to thousands of American short-wave listeners, which would seem to point to the fact that our reporters in the "Theatre of War" tomorrow will undoubtedly be giving us very elaborate "word pictures" of a battle scene the same day it is reported. It does not seem too great a stretch of the imag-

(*Continued on page* 239)

New Stations In LATIN AMERICA



HJ1ABE "Laboratorios Fuentes", Cartagena: Above—the new transmitter recently installed in Cartagena and now working on 6115 kc. or 49.05 meters, under the title "The Voice of the Fuentes Laboratories." The station is rated at 160-180 watts power, and provides reception throughout the world. The special "DX" tests, transmitted each Monday, from 10:30-11:30 p.m., E.S.T., are most familiar to American short wave "fans."

By H. S. BRADLEY

The South American as well as the Central American stations are now coming in strong. Here's the latest data on these popular stations to aid the Listener in finding them: wavelength, frequencies, and time on the air.

● DESPITE the presence of heavy summer static, new stations from Latin America are constantly presenting themselves to those North American listeners who take the trouble to cover the 40-50 metre wave-range with a bit of care, in the evenings. The results of an increase in power, and an improvement in quality of the average Latin American station are reflected in the daily, year-around reception which these stations provide; in past years, the reception of such unstable and poorly-modulated signals as were placed on the air in various Latin American nations, was limited almost entirely to the static-free winter seasons. No longer is such the case!

Among the best of the newcomers is station COCD, "La Voz del Aire, S.A." of Havana, which operates daily on 6130 kc., relaying the programs of long-wave station CMCD (960 kc.) from about 8-11 p.m. The station is situated at 25 y G, Vedado, Habana, but reports may be addressed to the station director, Sr. J. Benitez, at Box 2.294 in that city.

Haiti has at length taken to the air on short-waves, and the new station, situated in Port au Prince is at present operating on an irregular schedule, on varying wavelengths. A letter from Armand Mallebranche of the Societe Haitienne d'Automobiles, the firm which owns the station, lists for us the following call-letters and wavelengths now in use:

HH2R	31.44m	9545 kc.
HH2S	49.41m	6070 kc.
HH2T	25.93m	11570 kc.

Reception has been effected on the first two waves, generally late in the evenings, from 10-11 p.m., but at irregular intervals.

A brief mention of a special program from station HIH of San Pedro de Macoris, Dominican Republic seems to be in order, as it may enable fans who are otherwise unable to do so, on account of telegraph interference in the evenings, to make this low-powered catch. A special test is conducted each Sunday morning, from approximately 3-4.15 a.m., EST, on an announced wavelength of "exactly 44 metres."

Shifting the scene of our observations to Central America, we record excellent reception from two new Costa Ricans. The first, TIRCC, is owned by the Catholic church in San Jose, and is operated by Sr. Amando Cespedes M., the former operator of the world-famous TI4NRH of Heredia. Sr. Cespedes is at present announcing at TIRCC, and devoting other efforts to the construction of a new station to be operated on long-waves by the same organization. TIRCC works on a frequency of 6550 kc., or 45.8 metres, generally from 8-10 p.m. Reports addressed to the station at Apartado 1064, San Jose, bring a novel verification card in return.

The second new San Jose station, namely TI2PG, "La Voz de la Victor," has a power of 1000 watts, and works on an irregular schedule, although it may be heard most any evening, around 10 p.m., testing with near-by stations. TI2PG first used the same frequency as that used by TIRCC, but changed to 6380 kc. in order to avoid interference. Sr. Perry Girton, the owner, states that as soon as a new crystal on 6410 kc. arrives, regular programs will be transmitted, and the station will remain permanently on this latter frequency.

A verification card received from "La Voz de Sincelejo," the new station in Sincelejo, Bolivar (a bit to the south of Cartagena) confirms the writer's observation that two Colombians are using the same call-letters, HJ1ABE. When the more famous Fuentes station in Cartagena purchased their new transmitter, the old rig was transferred to Sincelejo. Although it hardly seems likely that the call assignment went with the transmitter, it is believed that the Colombian government has neglected to assign a definite call to the Sincelejo station. At any rate, Sincelejo is on the air with regular broadcasts daily, from 6.30-8 p.m., EST. on 7100 kc., or 42.24 metres, according to Sr.

HJ1ABH—"La Voz de Cienaga." From Sergio Aparicio Jr., the owner of station HJ1ABH of Cienaga, Magdalena, Colombia, comes this view of his station, together with the warning that we should not be too greatly impressed by the panels, for, as he says, "there is not much behind them." The station's power is only 50 watts, and it works on approximately 48 meters, transmitting scheduled broadcasts on Tuesday and Thursday, from 7:50-10 p.m., E.S.T.

Eugenio Quintero A., the station manager.

The anticipated power-increase has been effected at "La Voz de la Victor," HJ3ABH in Bogota, and this station is now operating with a power of 1200 watts in the aerial on alternate frequencies of 5970 and 6012 kc. A recent verification lists the following schedule: Daily except Sunday, 11.30 a.m.-2 p.m. and 6-11 p.m. E.S.T. On Sunday, operation is scheduled from 12-2 and 4-9 p.m.

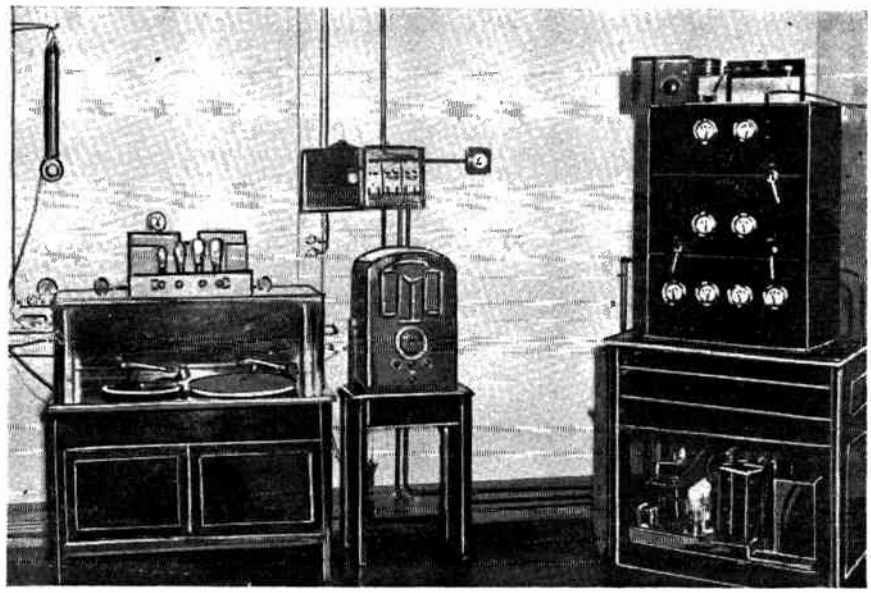
For those fans who do not yet have a QSL-card from HJ4ABA, "Ecos de la Montana" of Medellin, we list the following data which will aid them to hear, and obtain verification from this station. The schedule is from 11.30 a.m.-1 p.m., and 6.30-10.30 p.m., on 11710 kc., or 25.6 metres. Reports should be directed to Sr. F. Cuartas the station manager.

During the past year, station HJ4ABC, "La Voz de Pereira", located in the city of Pereira, Caldas (near Manizales) has provided American listeners with a "catch" difficult of reception. However, a new crytsal-controlled transmitter shown in the accompanying view, has recently replaced the former 50-watt rig, and a new frequency of 6135 kc. is used; reception from this station should prove much better than in previous months, barring interference from other signals. Cesar and Mario Arango M., the station owners, appreciate reports, and answer with an attractive QSL card.

The fifth Colombian district offers a new station, HJ5ABE, "Radiodifusora Colombiana" which operates daily from about 4.30-11 p.m., on a frequency of 14110 kc. Protests made by amateur operators are expected to cause the removal of this commercial broadcaster from within the limits of the 20 metre amateur band, and we may look for HJ5ABE on a new wavelength in the near future. Meanwhile, reports are to be sent to Sr. J. T. Calderon N., at Box 50, in Cali.

A new Venezuelan, YV8RV of Barquisemeto has recently been heard testing on about 51 metres, preparatory to starting regular broadcasts. Best reception has been noted after 11 p.m., but, as no cerification has yet arrived from this station, no official data can be offered at the moment.

We conclude our review of Latin American news with mention of the new broadcaster, VP3MR, "The Voice of Guiana" of Georgetown, British Guiana. Altho this is not truly "Latin American," it is at least South American and will therefore be of interest to U.S.A. fans, particularly so, in as much as it will offer many a chance to log a new country on phone! A recent veri-card lists the station frequency as 7080 kc., and the schedule as follows: Monday, 3.45-4.45 and 6.45-7.45 p.m.; Wednesday, 6.45-7.45 p.m.; Thursday, 5-6.45 p.m.; Sat., 6.45-7.45 p.m., and Sun., 7.45-10.15 a.m., EST.



STATION TIEP—"LA VOZ DEL TROPICO"

Above—the transmitting equipment of station TIEP "The Voice of the Tropics", San Jose, Costa Rica. This station works daily on about 6700 kc, (although listed as "6710") relaying the programs carried by the "long-wave" station on 850 kc. TIEP is a member-station of the Cadena Indo Latina de Estaciones Radiodifusoras, an association of Latin-American broadcasting stations. Eduardo Pinto H., the station owner, often changes the frequency of the transmitter into the 40 meter "amateur band", after the scheduled broadcasts are concluded. The call used on this wavelength (7238 kc.) is TI2EP.

Another interesting Latin-American s-w broadcasting station, with view of the studio.

ENGINEER USES RADIO TO CALL DAUGHTER FROM PLAYGROUNDS

● JEAN DARLINGTON, five-year old daughter of a General Electric engineer, who has been identified with acoustical equipment since her earliest days when her daddy built in her bedroom a system which automatically turned on a phonograph to quiet her on waking moment, now uses a small portable *short-wave* radio to keep in touch with her father when she is away from home.

Like Mary with her lamb, no matter where little Jean wanders the radio is sure to go. She trails it behind her in a small cart. When the engineer desires to call her from play in the neighborhood of Scotia, N. Y., he puts through a call with his amateur transmitter. The receiver is permanently tuned to his station and is in constant operation so that his daughter hears him as soon as he begins talking. Being an obedient little girl, she returns home.

"Policemen in Scotia never worry about Jean getting lost when she has her radio receiver with her," Mr. Darlington says. "This radio system might prove helpful to worried mothers in sending out a general call for their tardy children to hasten home." Soon he expects his radio to send Jean on errands without first calling her home.

This receiving station owned and operated by Mr. A. J. Webb of England, consists of a 6-tube Pilot super-het and an English HMV 5-tube super-het. By careful tuning a total of 32 "DX" stations were received by Mr. Webb.

TUNING IN THOSE "DX" STATIONS

By G. W. SHUART, W2AMN

The proper operation of a short-wave receiver is the determining factor in pulling in weak and distant stations. Read this article carefully and improve your DX'-ing.

● EVERY day our mail reveals a number of letters from readers asking the same question, *"Why can I not receive the distant stations that other fellows are receiving?"* In other words, a good many readers find it impossible to pull in those weak "hard-to-get" DX stations, while others are just blessed with stations from Japan, China, Africa, and other far distant countries.

In the past the first answer has always been—"Your location is not as good as their's." However, experience has proven that there are very few really *poor* locations, that is, locations where it is impossible to pull in very many short-wave stations. Of course, the location can be either a noisy or a quiet one. If you are bothered with a tremendous amount of man-made interference, such as that coming from electric devices, power lines, and what not, you are really in a tough spot so to speak.

True, modern engineering has devised antenna systems which go a long way toward reducing man-made interference, but it cannot be entirely eliminated if the source of the noise originates at some point quite remote from your set. Probably the most truthful answer to the question in the opening paragraph is—*"You are not carefully tuning your receiver"*—considering, of course, that the receiver is one of efficient and modern design.

The writer recently spent several hours tuning across the various short-wave broadcast bands and, after listening for about fifteen minutes, was just about ready to give up and call the band "dead" for the evening. However upon turning up the volume control and tuning *carefully* across the band, several weak carriers were heard.

Spending about one minute with each station, it was possible to bring them in with full speaker volume and really an enjoyable program could be heard, and the above experience is what prompted us to write this story.

If you own a modern super-heterodyne receiver, you are probably more apt to pass over more stations than with the simpler regenerative receivers. The superheterodyne tunes *extremely sharp* and as the dial is rotated rather swiftly, a station will bring forth nothing more than a mere click from the speaker when you pass over it. With the regenerative receiver, however, usually the set is oscillating and a squealing sound will be heard as each station is passed. A good many of the new superheterodyne receivers are equipped with what is known as *beat oscillators*, which also produces a whistling sound as the stations are tuned in, much the same as that heard on the regenerative receiver. This, needless to say, is a tremendous aid in tuning in the weak stations.

There are commercially available at the present time, *beat oscillator* units which can be attached to super-hets which are not already equipped with one, designed especially to aid the short-wave "Fan" in his etheral journeys.

Commercially available beat oscillator which can be used in conjunction with any super-het as explained in this article.

If you are operating a regenerative receiver, adjust the generation control until a squealing sound is heard on each short-wave station; then tune across the dial and if a station appears on the dial, the regeneration control should be *backed off* or retarded slightly until the whistling or squealing sound disappears. The main tuning dial should then be readjusted slightly in order to clear up the speech or music, whichever the case may be.

There is really no more in the tuning of the regenerative receiver. Some of them have what is termed an *antenna trimming* condenser. In this case, of course, an adjustment can be made to increase the antenna coupling and consequently increase the signal strength. This also requires a readjustment of the main tuning dial, however, the antenna condenser should not be adjusted to the point where the receiver becomes very *broad*, because considerable interference from stations operating in an adjacent channel will be experienced.

The superheterodyne provides "real comfort" one might say in short-wave reception, because on it we may have gain controls, that is, sensitivity controls manually operated or automatically operated. Tuning controls and, as previously mentioned, a *beat-oscillator* to provide an audible sound when tuning in a station with no modulation. In adjusting the "super-het" the volume control should be turned on just enough to allow a general rushing sound caused by atmospheric disturbances or other electrical discharges and tube noises in the set to come through. If these noises are too harsh to allow sufficient pick-up, the *tune control* may be adjusted to attenuate or decrease the high-pitched noises and in most cases will cut down the back-ground hissing and crackling noises at least 50%. The main dial should be rotated *very, very slowly* because of the very selective qualities of the "super-het."

A station *may easily be passed* and

(*Continued on page* 239)

UNUSUAL Short-Wave Experiences

By PAUL B. SILVER

● ONE night when the German Leviathan of the seas, the steamship *Bremen*, was making one of her trans-Atlantic crossings, a radio call came for help from an English freighter in distress. It was this S.O.S. which the *Bremen's* master answered. I heard the giant *Bremen* answer and subsequently obtained a verification from her, and have it framed among the other verifications I have received. It is one of my most prized verifications. The powerful radio-telephone transmitter of the *Bremen* enables it to work with Ocean Gate-WOO, Rugby, England-GBC, and Norddeich, Germany-DAF, during the entire trip. Her call is DOAH.

The Pan-American Clipper: On April 16th, at 6:50 P.M., E.S.T., the Pan-American Clipper roared over the Golden Gate, San Francisco, on the first flight to Hawaii. It was a long

Here's Paul Silver's Short-Wave Listening Station, located in a New Jersey town not far from New York City. Several short-wave receivers are used at this station, and Mr. Silver has verifications galore from practically every country on the globe.

flight, with 2,301 miles of weary flying ahead for the six officers. They were Edwin C. Musick, Captain of the Pan-American Clipper; R. O. D. Sullivan, First Officer; Fred J. Noonan, Navigation Officer; V. A. Wright, Engineering Officer; Harry R. Canaday, Junior Flight Officer, and W. T. Jarboe, Jr., Radio Officer. The Clipper was flying along at 126 miles per hour. A thrill ran up my spine you can bet as someone said—"This is the Pan-American Clipper"! After 17:54 hours the Clipper came to rest in Hawaii. A record for flying and I believe a record for short-wave reception. I received a letter of verification and also a picture of the ship and each one of her officers.

The Nairobi, Kenya Colony Station: The right name of the station is Cable and Wireless, Limited, Nairobi, Kenya, Colony, Africa. The call is VQ7LO. I have heard this station several times and here are the transmission times, expressed in E.S.T.

Monday 5:45 A.M.-6:15 A.M.; 11:30 A.M.-2:30 P.M.

Tuesday 5:45 A.M.-6:15 A.M.; 8:30 to 9:30 A.M.; 11:30 A.M.-2:30 P.M.

Wednesday 5:45 A.M.-6:15 A.M.; 11:30 A.M.-2:30 P.M.

Thursday 5:45 A.M.-6:15 A.M.; 8:30 to 9:30 A.M.; 11:30 A.M.-2:30 P.M.

Friday 5:45 A.M.-6:15 A.M.; 11:30 A.M.-2:30 P.M.

Saturday 11:30 A.M.-3:30 P.M.

Sunday 11:00 A.M.-2:00 P.M.

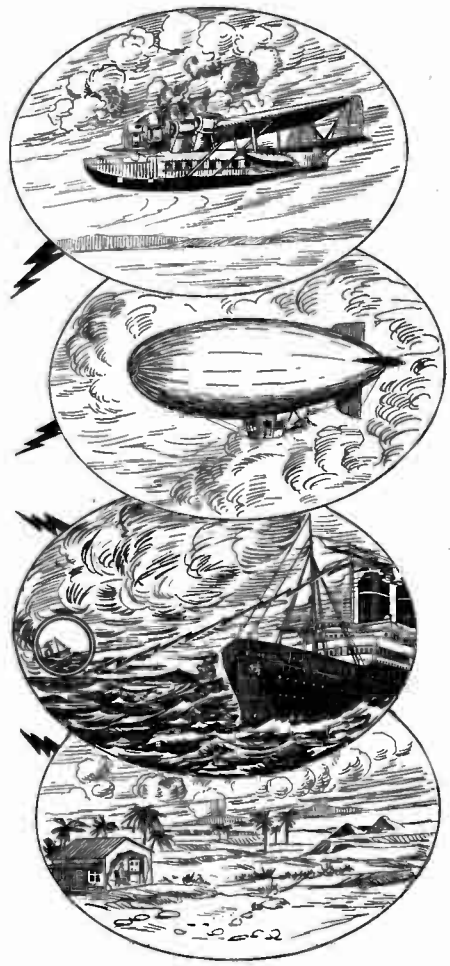
It is on 49.5 meters or 6060 kc. As it is situated only a few degrees from the Equator, that is really an unusual short-wave verification for summer-time transmission.

Another thrill via Short Waves was the reception from a Goodyear airship flying over Washington, D. C. The airship was the "*Enterprise*," a non-rigid blimp. Power for the transmitters on the airship is furnished by two dynamotors, battery driven from a 12 volt battery.

A quite unusual short-wave listening experience occurred a few weeks ago when the Empress Menen of Ethiopia, broadcast a speech on peace to American listeners by short wave. The speech of the Empress was translated into English by her daughter. A recent talk enjoyed on short waves came from Geneva and a short-wave talk heard by many and ante dating the Empress's talk emanated in Ethiopia. Also on Sept. 13 two short wave transmissions from Ethiopia took place, one of them from the King.

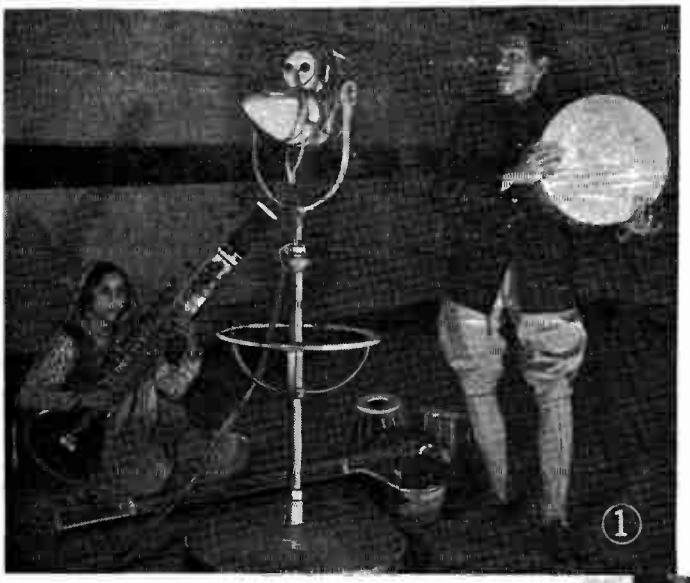
What is the greatest thrill you ever experienced on short waves? If we receive a sufficient number of exciting "short-wave thrills" in time for the next number, we shall be very glad to start a new department just for these "thrills" alone. All articles accepted and published will be paid for at regular space rates. Undoubtedly, you have had at least one good thrill while listening to short-wave stations, so sit down and write the Editor, and tell him about it. If your letter contains an unusual thrill, and it need not require a lengthy description, send it to the Editor—"Short Wave Thrills," in care of this publication.

Hints on Efficient Reception: I have tried to give you some of the unusual happenings that one receives on short-waves. The short-wave receiver is a queer instrument. First of all remember you can't pull in short-wave stations reliably on "any old aerial"! The



thing to do is get the aerial that "matches your set." If you use an RCA set, use the RCA aerial; or if it is a Philco set, use a Philco aerial. The average "DX'er" does not know more about his set than the manufacturer of the set, so why not use that which research has proved to be the best that is, a set and aerial that "exactly match."?

The FOREIGN SHORT-WAVE STATIONS PRESENT



Surya Sena and Nelun Devi, his wife, famous Singalese artists, broadcast recently from the B. B. C. short-wave stations. Note the unusual instruments these artists use, which resemble "over-grown" guitars.

Below—U. S. S. R. short-wave artists of the State Theatre at the microphone. Drama and comedy are thoroughly enjoyed in the land of the Soviet, as well as the many musical programs which are broadcast.

Radio dramatics seem to be on the increase in the U. S. S. R. and reports from listeners indicate that more people are daily picking up the short-wave stations operated by the Soviet Government. The photo below shows members of the Dramatic Theatre named after Vakhtangov, and the artists before the microphone are Derjavin, Schuken, Manssurova.

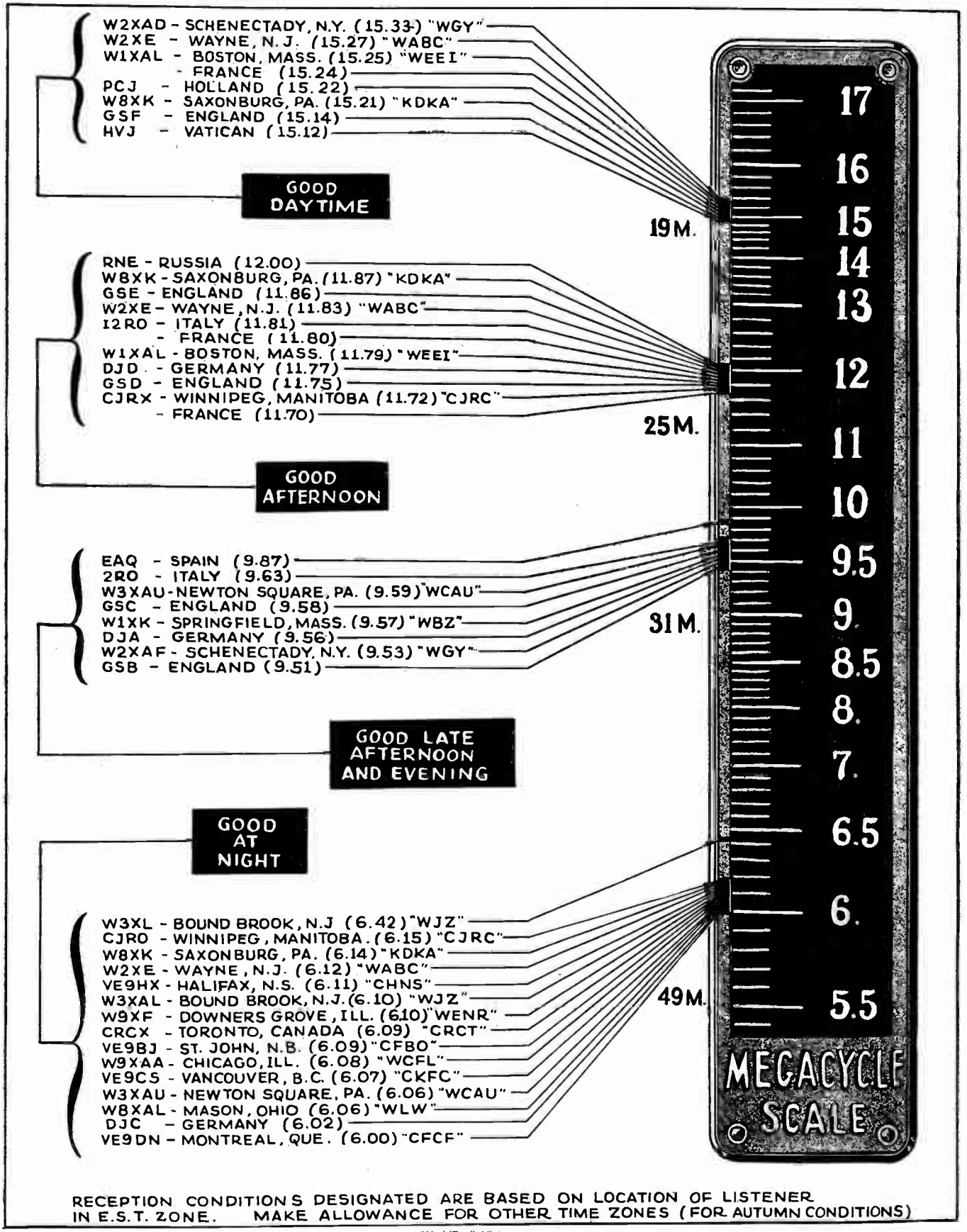
Right—Miss Lily Filotas, one of the charming lady announcers heard by American listeners who tune into the Hungarian short-wave stations. It seems that in Hungary lady announcers are very popular.

Below—Ben Williams, the Welsh operatic tenor, whose recitals are heard over the station 3LR, located at Lyndhurst, Victoria, Australia. As reported in the last issue of this magazine, quite elaborate musical programs have been arranged by the Australian short-wave stations.

Fig. 3 above — Jim Davidson, conductor of the Australian Broadcast Commission's dance band, which broadcast frequently over station 3LR.

Fig. 5 above — Ella Némethy, popular opera singer, who broadcasts over short-wave Hungarian stations.

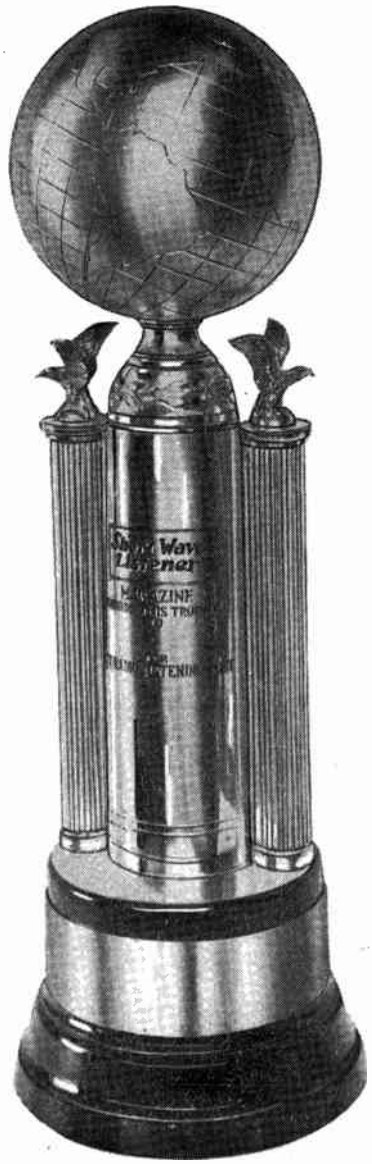
Where S-W Stations Appear on Your Dial



Win This Silver Trophy

Fourth Trophy Award to Joe Ficere, Long Beach, Calif.

The handsome Silver Trophy, illustrated here, will be awarded to the person sending in what appears to be to the judges the most interesting photograph of their short-wave listening post. The rules for this contest provide that the Trophy shall be awarded only for the BEST photo of listening post apparatus or set-up, and is not concerned with amateur TRANSMITTING stations. Those owning transmitting stations may enter such photos in the monthly contest sponsored by SHORT WAVE CRAFT magazine. This Trophy is a handsome specimen of the silversmith's art and was designed by a leading New York Trophy Manufacturer. This beautiful silver trophy stands 19½ inches high and is symbolic of the art of short-wave listening.



Here is the new design of Silver Trophy which the Editors will award for the best "Listening Post" photo. Isn't it a beauty! This new contest will cost you practically nothing to enter and you have a very fine chance of winning this handsome Silver Trophy. The editors will award one of these Silver Trophies for the best "Listening Post" photo submitted by the readers of the OFFICIAL SHORT WAVE LISTENER magazine.

For the Best "Listening Post Photo"

Rules For Short Wave "Listening Post" Trophy Contest

● THE editors of the OFFICIAL SHORT WAVE LISTENER magazine feel sure that our readers will be greatly pleased with this announcement of a brand new "Trophy Cup" Contest, in which the handsome silver trophy here illustrated, will be awarded to that Short Wave Listener who submits the best "Listening Post" photo.

Here are some of the points on which the "Listening Post" photos will be judged by the editorial staff: The photo must be clear and preferably not smaller than 5 x 7 inches, although 4 x 5 inches will do if the photo is particularly clear.

If possible try to have the photo show the owner or operator of the "Listening Post" appear in the same picture with the receiving apparatus, although a separate photo of yourself will do, of course.

Not only will the photo be judged for the quality of the photograph itself, but also for the ingenuity shown by the owner of the station in a neat and orderly arrangement of the receiving apparatus.

Do not write descriptions on the back of the photo, but simply place your name and address on the back of it or on the photo mounting.

All descriptions of Short-Wave "Listening Posts" should be typewritten or else writtin in ink, well spaced so that the editors can read them quickly. Do not send "pencil-written" descriptions and moreover keep the description of the station and the results you have obtained as brief as possible; usually 300 words is plenty.

Describe your aerial briefly with its dimensions, and particularly tell in what geographic direction it points, north, south, etc. Also mention where it is located such as above any roofs, trees, or other objects, and what form of lead-in you employ.

The announcement of the fourth Trophy Award for the best Short-Wave "Listening Post" photo appears on the opposite page. Entries for the next contest will be accepted up until November 15th, 1935.

The editors will not be responsible for any photographs or descriptions of "Listening Posts" which may be lost in the mail or otherwise, and return postage should be included with the photos if they are to be returned.

All members of the OFFICIAL SHORT WAVE LISTENER MAGAZINE'S editorial and business staff are excluded from this contest, as well as any members of their families.

In the event of a "tie" between two or more contestants, the judges will award a similar trophy to each contestant so tying. Please remember that this contest for the best Short-Wave "Listening Post" photo is purely an amateur or experimenter's proposition, and all commercial short-wave receiving stations are excluded.

The best "Listening Post" photo will also be judged not because of the fact that a handsome array of expensive short-wave receiving apparatus has been assembled for the picture, but the "pedigree" or "DX" reception results will also be carefully scrutinized by the judges. The board of judges for this contest will be the Editors of the Official SHORT WAVE LISTENER magazine.

Address all entries to this contest to: LISTENING POST CONTEST, care of OFFICIAL SHORT WAVE LISTENER MAGAZINE, 99-101 Hudson Street, New York.

Fourth Trophy Award to Joe Ficere

Editor, SHORT WAVE CRAFT:

● I am enclosing a picture of my S.W. Listening Post. The set in the picture is a Breting 12, which has a frequency range of 32,000 kc. to 550 kc. in five bands. It has a beat oscillator, crystal filter, "R" meter, Voltmeter, and band-spread. There is also a communication switch, which disconnects the audio amplifier from the set, and connects it to tip-jacks in the rear and can be used for transmitting. The speaker is a 12" one, mounted on a 2 x 2 ft. celotex board. Phones, when used, cut out the speaker.

As you can see by the photo, I constructed the antenna tuner described by George Shuart in the April issue of *Short Wave Craft*. I am using the 76 ft. doublet with 50 ft. transposed feeders, antenna running N. and S. I want to say here and now, that anyone who thinks this "rig" doesn't work F.B. (Fine Business) is very, very wrong. I have done wonders with it, and the switches on the board below it, allow me to by-pass it at will, and when I do, I get static and the station comes in very badly.

But, when I cut the tuner back in—Oh, boy! I also have another antenna, an R.C.A. running E. and W., and I find that when I figure out a station's direction I can get fine results from either. But the *tuned antenna* gets them from anywhere!

I have only had this set ten weeks, and it sure is fine for DX (Distance) in conjunction with the Shuart tuned antenna circuit. The cards and letters of veris I have now were obtained with an eight tube set last year, but in two weeks, I have received, JVM, N-H-JYS, French, Englisn, and German stations, Java, Australia, Fiji Islands, Siberia, Cuba, and practically every country in South America. I also had ZHJ, Penang, Malaya. FZR also comes in here, Phoenix, Ariz., and Paris, France, in the early morning.

The veris I have now include Japan, England, France, Spain, Cuba, all Australians, Canada, Panama, Costa Rica, Peru, Ecuador, Brazil, Venezuela, some Colombia, and United States.

I have been reading *Short Wave Craft* since last September, and won't be without one. I get tired of waiting for the newsstands to get them, so I subscribed. It is the best short-wave magazine on the market, and more than once have I found valuable information in it, that helped me out of a fix. More power to *Short-Wave Craft!*

The short-wave Listening Post of Joe Ficere, Long Beach, Calif.

I am studying for a "Ham" (transmitting amateur license) ticket and am looking over your Xmitter hook-ups,

(*Continued on page* 239)

From "The Valley of Wild Ducks"

● HERE is the photo of my "Listening Post." I have read *Short Wave Craft* for the past 1½ years and enjoy reading it very much. Sure can get lots of good information out of it. I never missed a single copy of it.

I use a Sargeant 8-34 Super-het (all-wave) which works very well on the 20 meter phones—Hi, Hi. I have listed about 1178 amateurs and DX stations. I am a member of the *Short Wave League, International Broadcasting Club* (London) and R9LL. I'm also acting as an Official Short Wave Observer for California (for *Short Wave Craft* and *Radio News* magazines.)

I have about 51 pen pals in U. S. A. and 10 abroad. I have exchanged cards with many foreign SWL's and "Hams." My famous "Duck" card is just above the alarm clock.

'California Duck" (that's me) is 24 years old, 5 feet 7½ inches tall and weighs 140 pounds, have black hair, American born Japanese, graduate of

(*Continued on page* 239)

Here is the Short-Wave Listening Post of Oriente I. Noda, from "The Valley of the Wild Ducks", Santa Clara, Calif.

SG'T. DENT, INDIA, A "REAL" LISTENER

Editor, SHORT WAVE LISTENER:

I am sending a photograph for your "Listener's Shack" Competition, and hope it will be O.K. Here are a few details of the shack:—It is situated on the rear verandah of the Police Quarters, and the set used is a Philco 16B, in a cabinet designed by myself to stand the moving about that it has to be subjected to, due to my transfers to other stations. I have made the whole affair, with a space at the bottom for records, etc., but being so interested in Radio, I rarely use the built-in phonograph.

All reception is on a loud-speaker, and the set is now 18 months old. I am sit-

(*Continued on page* 239)

All the Way from India

From far-away India—Sergeant H. J. Dent and his short-wave listening post. He has heard 40 countries!

Two New Aerials

To Help Catch Those "DX" Signals

Two of the newer short-wave receiving aerials which are of particular interest to short-wave "Fans" intent upon hearing the foreign stations are those described and illustrated here. A considerable gain in signal strength is obtainable with either of these aerials and the choice will depend a great deal upon the location.

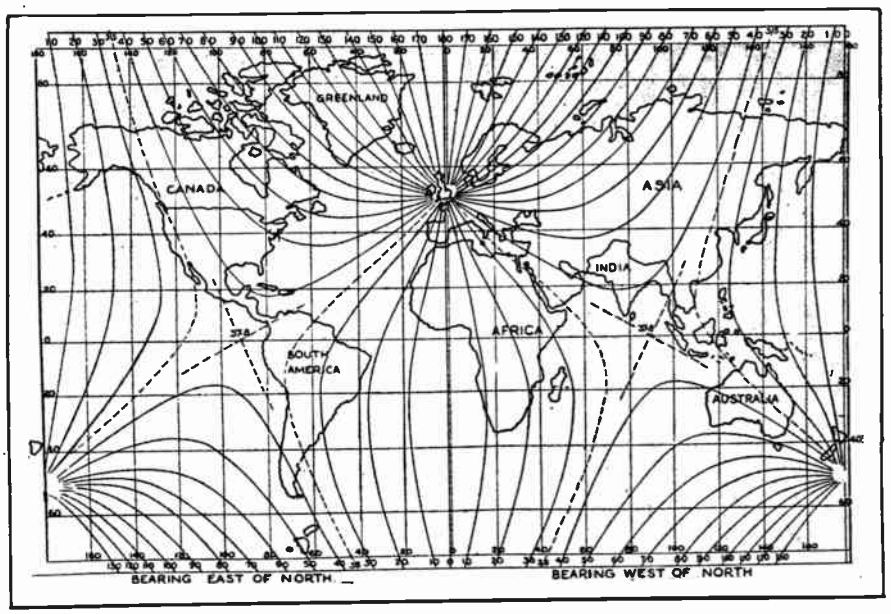
● ONE of the newest type receiving aerials is known as the Rhombic or horizontal diamond and it is shown in one of the accompanying illustrations. With this type of aerial the most important factors are: its height above the ground "H", the angle "A" between the two legs composing each side, and the length of each of the four legs of the antenna and designated by the letter "L".

The direction of maximum reception with this type aerial is indicated by the arrow on the diagram and it is opposite to the end from which the twisted pair lead-in is taken. As pointed out in a recent article by James S. Carver in the New York SUN, (see also original article on the Rhombic and Bruce antennas in the October 1932 issue of *Short Wave Craft*). The table of dimensions given for the Rhombic antenna will enable the reader to judge which size of antenna he can erect in his particular location. It will be noted from the table of dimensions that when the length of the one of the four sides, "L", is made small, the height above the ground "H" also becomes smaller, for a given wavelength.

The dimension "H" is the average height of the horizontal wire above the effective ground. What is known as the *tilt* angle "A" is shown in the diagram, and this factor determines the vertical directivity of the aerial. The front end of the Rhombic antenna ends in a non-inductive resistance as shown in the detail drawing.

The directivity of the aerial must be arranged so that its front end is pointed geographically toward the station which one desires to receive. London lies north 50 degrees and 10 minutes east from New York and the axis of the antenna (X-XI) should lie in that direction, facing London. The accompanying map will also aid in properly locating and pointing the antenna toward the Daventry station. The direction for other stations can be determined by use of a large globe.

The larger and higher the antenna the more effective the results, but an aerial selected for reception on the 25.5 meter wavelength would also prove very favorable for other wavelengths, such as the 19.6 or the 16.7 meters. For the Rhombic antenna the tilt angle "A" should be 72 degrees and the lead-in to the short-wave receiver from one end of the Rhombic or horizontal diamond antenna may be a twisted pair of insulated wires or Lynch *giant killer* cable.



A map of the world, the curved lines on which show the bearing or the direction of the Daventry (England) short-wave broadcasting station from any point.

A transposed lead-in line is best employed for the vertical diamond (inverted "V") antenna shown in the second illustration. A table of figures or dimensions is also given in connection with the vertical antenna for different wavelengths.

The measured performance of the inverted V antenna, when designed for 17 meters and using a mast 42 feet high, was determined to be approximately five times that obtained with an ordinary antenna on 17 meters! A gain in signal strength of about three times was obtained on 20 meters, and on 25 and 30 meters a gain of from 2 to 1½ times in favor of the inverted V aerial was found. Note that when using the inverted V antenna that the end most remote from the receiver is terminated through non-inductive resistance of about 400 ohms, which is connected to ground (a pipe driven in the ground, for example).

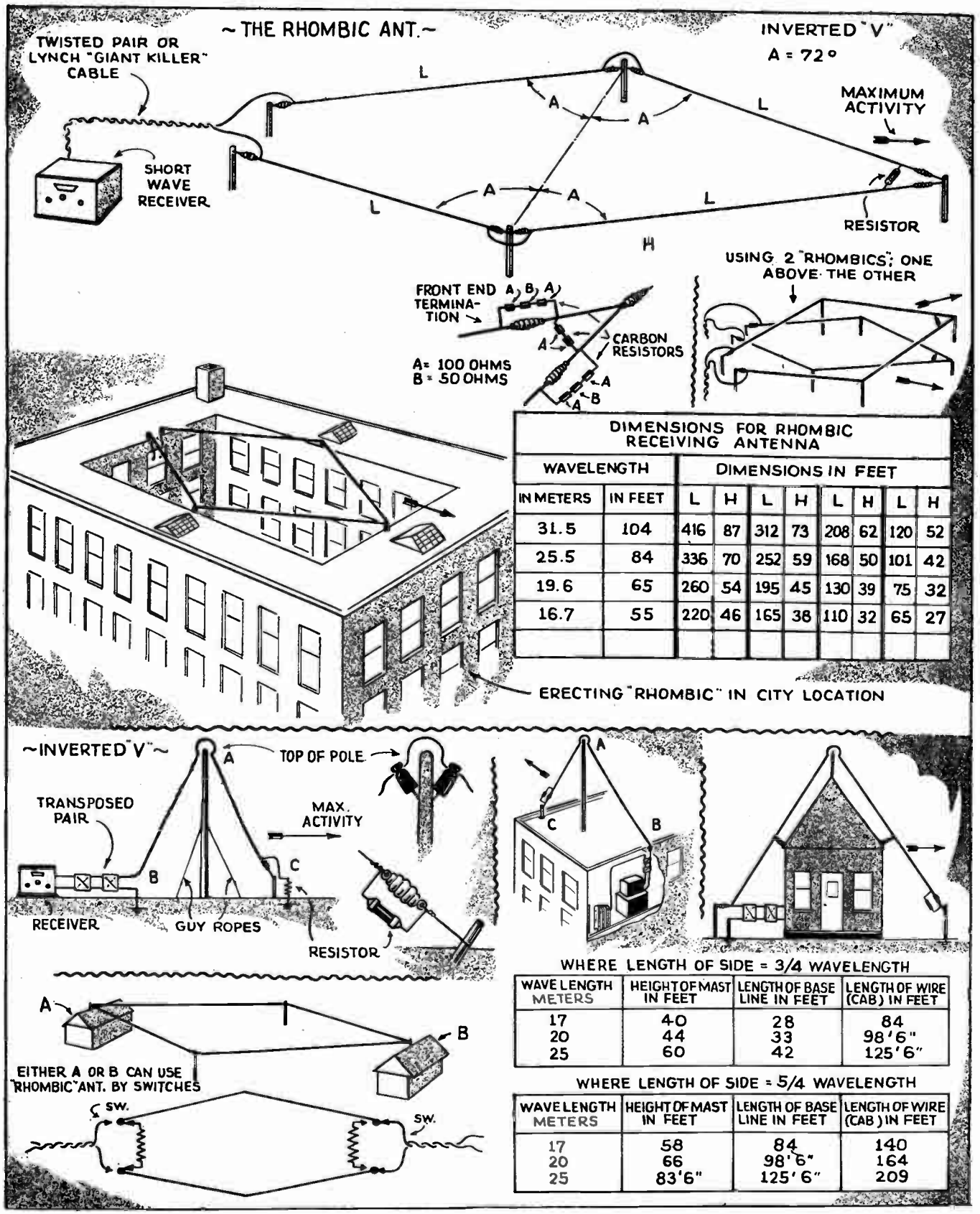
At the end of the transposed feeder line a suitable coupling transformer may be employed or else the two connections may be made to the aerial and ground post on the receiver, where the set is designed for use with a *doublet* antenna. When the inverted V aerial is properly arranged, it is *directional* and stations are received best which lie in a line with the plane of the aerial and the signals from which first strike that end of the aerial where the 400 ohm resistor is located.

Referring to the special chart showing the direction in which an inverted V aerial, for example, should be pointed in order to be most receptive for the British Broadcasting station in Daventry, or stations in that general vicinity, (including Berlin) this chart has been especially drawn by engineers of the B. B. C. to show the lines bearing on Daventry.

Lines have been drawn for every 10 degrees of bearing. Additional lines for a bearing of 35 degrees are shown to fill in a region in which the lines are otherwise somewhat wide apart, and the 37.8 degree bearing line is also drawn, as this line follows a peculiar path.

While the above lead-ins and those shown in the drawings are undoubtedly the most simple to construct, a better match between the lead-ins and antenna will be obtained by using a pair of No. 14 wires with a spacing of about 1¼" between them, (wooden or isolantite spreaders may be used). The wood ones should be boiled and paraffined to make them weather-proof.

Have You Tried the Rhombic or Inverted "V" ?



DIMENSIONS FOR RHOMBIC RECEIVING ANTENNA

WAVELENGTH		DIMENSIONS IN FEET							
IN METERS	IN FEET	L	H	L	H	L	H	L	H
31.5	104	416	87	312	73	208	62	120	52
25.5	84	336	70	252	59	168	50	101	42
19.6	65	260	54	195	45	130	39	75	32
16.7	55	220	46	165	38	110	32	65	27

WHERE LENGTH OF SIDE = 3/4 WAVELENGTH

WAVE LENGTH METERS	HEIGHT OF MAST IN FEET	LENGTH OF BASE LINE IN FEET	LENGTH OF WIRE (CAB.) IN FEET
17	40	28	84
20	44	33	98'6"
25	60	42	125'6"

WHERE LENGTH OF SIDE = 5/4 WAVELENGTH

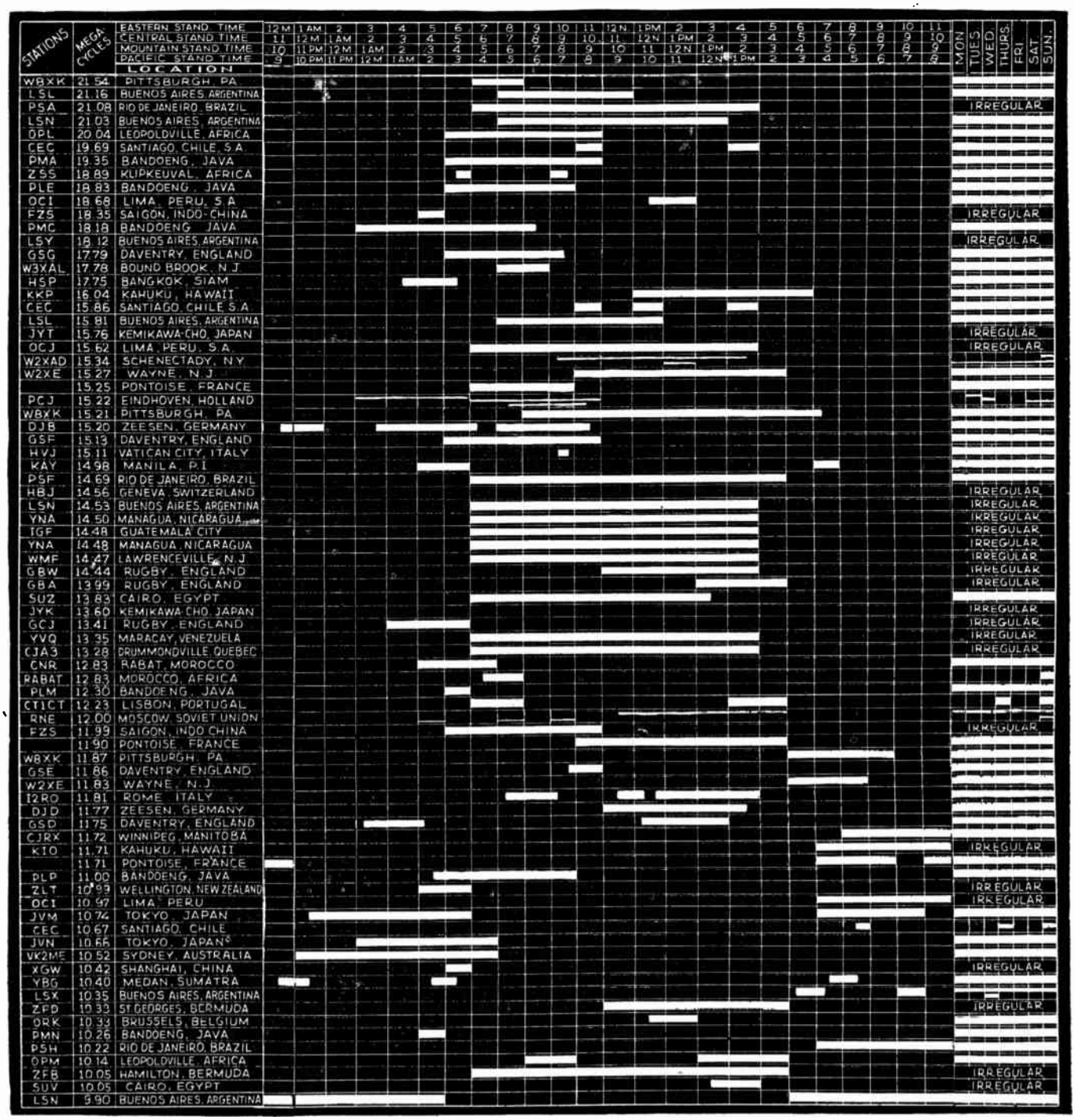
WAVE LENGTH METERS	HEIGHT OF MAST IN FEET	LENGTH OF BASE LINE IN FEET	LENGTH OF WIRE (CAB.) IN FEET
17	58	84	140
20	66	98'6"	164
25	83'6"	125'6"	209

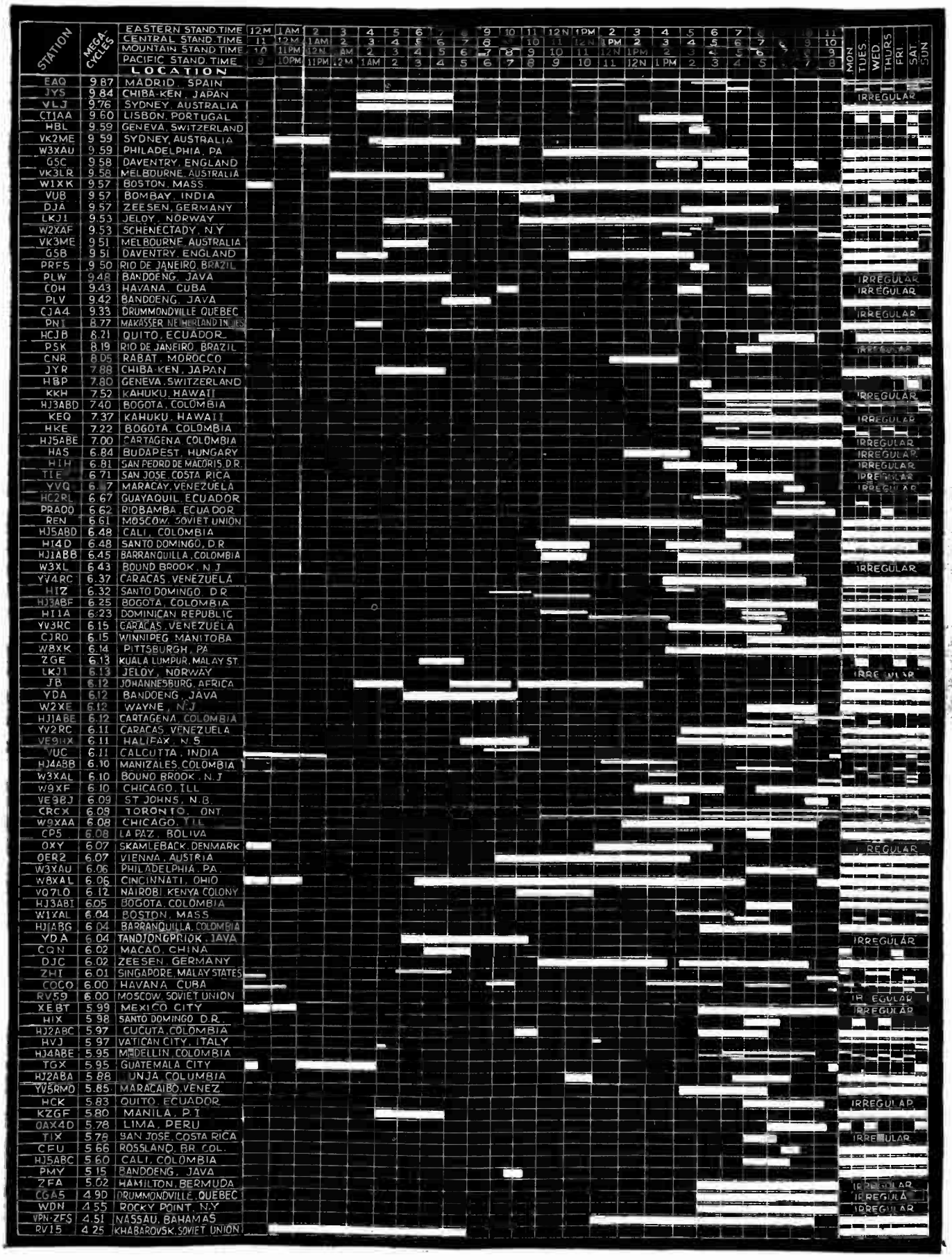
S. W. Station Time Graph

(1) Each square under the hours represents one hour. For example: A line drawn through all the squares from 7 A.M. to 5 P.M. means that the station broadcasts from 7 A.M. to 5 P.M. Note the indication of time on the air opposite Station OCJ, 15.62 megacycles, Lima, Peru, S. A. Under the days of the week at the right of the graph, there appears the word "Irregular"; in some cases a line indicates what days of the week the station is on the air.

(2) If a station broadcast on different hours of the day on the same day, note how this is indicated for Station CEC, 19.69 MC, San Diego, Chile, S. A., this station being on the air for one hour between 11 A.M. to 12 noon, and from 4 to 5 P.M.; and the station broadcasts every day in the week.

(3) This chart is based on Eastern Standard Time; Central, Mountain and Pacific Time is given below the Eastern Standard Time. By blocking out all of the time lines except the one for your location, the chart will then be correct for your station.





STATION	MEGA-CYCLES	LOCATION
EAQ	9.87	MADRID, SPAIN
JYS	9.84	CHIBA-KEN, JAPAN
VLJ	9.76	SYDNEY, AUSTRALIA
CT1AA	9.60	LISBON, PORTUGAL
HBL	9.59	GENEVA, SWITZERLAND
VK2ME	9.59	SYDNEY, AUSTRALIA
W3XAU	9.59	PHILADELPHIA, PA.
G5C	9.58	DAVENTRY, ENGLAND
VK3LR	9.58	MELBOURNE, AUSTRALIA
W1XK	9.57	BOSTON, MASS.
VUB	9.57	BOMBAY, INDIA
DJA	9.57	ZEESEN, GERMANY
LKJ1	9.53	JELOY, NORWAY
W2XAF	9.53	SCHENECTADY, N.Y.
VK3ME	9.51	MELBOURNE, AUSTRALIA
G5B	9.51	DAVENTRY, ENGLAND
PRF5	9.50	RIO DE JANEIRO, BRAZIL
PLW	9.48	BANDOENG, JAVA
COH	9.43	HAVANA, CUBA
PLV	9.42	BANDOENG, JAVA
CJA4	9.33	DRUMMONDVILLE, QUEBEC
PNI	8.77	MAKASSER, NETHERLAND INDIES
HCJB	8.21	QUITO, ECUADOR
PSK	8.19	RIO DE JANEIRO, BRAZIL
CNR	8.05	RABAT, MOROCCO
JYR	7.88	CHIBA-KEN, JAPAN
HBP	7.80	GENEVA, SWITZERLAND
KKH	7.52	KAHUKU, HAWAII
HJ3ABD	7.40	BOGOTA, COLOMBIA
KEQ	7.37	KAHUKU, HAWAII
HKE	7.22	BOGOTA, COLOMBIA
HJ5ABE	7.00	CARTAGENA, COLOMBIA
HAS	6.84	BUDAPEST, HUNGARY
HIH	6.81	SAN PEDRO DE MACORIS, D.R.
TIE	6.71	SAN JOSE, COSTA RICA
YVQ	6.67	MARACAY, VENEZUELA
HC2RL	6.67	GUAYAQUIL, ECUADOR
PRA00	6.62	RIOBAMBA, ECUADOR
REN	6.61	MOSCOW, SOVIET UNION
HJ5ABD	6.48	CALI, COLOMBIA
HI4D	6.48	SANTO DOMINGO, D.R.
HJ1ABB	6.45	BARRANQUILLA, COLOMBIA
W3XL	6.43	BOUND BROOK, N.J.
YV4RC	6.37	CARACAS, VENEZUELA
HIZ	6.32	SANTO DOMINGO, D.R.
HJ3ABF	6.25	BOGOTA, COLOMBIA
HI1A	6.23	DOMINICAN REPUBLIC
YV3RC	6.15	CARACAS, VENEZUELA
CJRO	6.15	WINNIPEG, MANITOBA
W8XK	6.14	PITTSBURGH, PA.
ZGE	6.13	KUALA LUMPUR, MALAY ST.
LKJ1	6.13	JELOY, NORWAY
JB	6.12	JOHANNESBURG, AFRICA
YDA	6.12	BANDOENG, JAVA
W2XE	6.12	WAYNE, N.J.
HJ1ABE	6.12	CARTAGENA, COLOMBIA
YV2RC	6.11	CARACAS, VENEZUELA
VE9HX	6.11	HALIFAX, N.S.
VUC	6.11	CALCUTTA, INDIA
HJ4ABB	6.10	MANIZALES, COLOMBIA
W3XAL	6.10	BOUND BROOK, N.J.
W9XF	6.10	CHICAGO, ILL.
VE9BJ	6.09	ST JOHNS, N.B.
CRCX	6.09	TORONTO, ONT.
W9XAA	6.08	CHICAGO, ILL.
CP5	6.08	LA PAZ, BOLIVIA
OXY	6.07	SKAMLEBACK, DENMARK
OER2	6.07	VIENNA, AUSTRIA
W3XAU	6.06	PHILADELPHIA, PA.
W8XAL	6.06	CINCINNATI, OHIO
VQ7LO	6.12	NAIROBI, KENYA COLONY
HJ3ABI	6.05	BOGOTA, COLOMBIA
W1XAL	6.04	BOSTON, MASS.
HJ1ABG	6.04	BARRANQUILLA, COLOMBIA
YDA	6.04	TANDJONGPRIOK, JAVA
CQN	6.02	MACAO, CHINA
DJC	6.02	ZEESEN, GERMANY
ZHI	6.01	SINGAPORE, MALAY STATES
COCO	6.00	HAVANA, CUBA
RV59	6.00	MOSCOW, SOVIET UNION
XEBT	5.99	MEXICO CITY
HIX	5.98	SANTO DOMINGO, D.R.
HJ2ABC	5.97	CUCUTA, COLOMBIA
HVJ	5.97	VATICAN CITY, ITALY
HJ4ABE	5.95	MEDELLIN, COLOMBIA
TGX	5.95	GUATEMALA CITY
HJ2ABA	5.88	UNJA, COLUMBIA
YV5RMO	5.85	MARACAIBO, VENEZ.
HCK	5.83	QUITO, ECUADOR
KZGF	5.80	MANILA, P.I.
OAX4D	5.78	LIMA, PERU
TIX	5.78	SAN JOSE, COSTA RICA
CFU	5.66	ROSSLAND, BR. COL.
HJ5ABC	5.60	CALI, COLOMBIA
PMY	5.15	BANDOENG, JAVA
ZFA	5.02	HAMILTON, BERMUDA
CGA5	4.90	DRUMMONDVILLE, QUEBEC
WDN	4.55	ROCKY POINT, N.Y.
VPN-ZFS	4.51	NASSAU, BAHAMAS
RV15	4.25	KHABAROVSK, SOVIET UNION

The Listener Speaks

● In this department we will print in each issue letters from short-wave listeners of value to all readers. We are particularly interested in those that have constructive criticisms and information that may be of value and help to other short-wave listeners. Only those letters which are deemed of sufficient importance will be printed here. It makes no difference whether your letter is laudatory or whether it contains a "brickbat," it will be published just the same, as long as the information is deemed worthy.

Address all communications to THE LISTENER SPEAKS, care of THE SHORT-WAVE LISTENER, 99-101 Hudson Street, New York City.

Who Said "Code Hogs"!

Editor, SHORT WAVE LISTENER:

In your department, *Our Readers Ideas*, I have just read a letter in which the writer voices his thorough disgust of short waves; due to what he calls "Code Hogs", the code stations that he claims blanket the broadcasting stations. I was pleased to see that you came to the fore and defended short-wave broadcasting from such a silly condemnation. By tuning in numerous "foreign" broadcasting stations on a simple two-tube short-wave receiver, *I have proved to my own satisfaction that his accusations are wholly false!* Furthermore, he is wrong in stating that there is no international authority controlling the frequency assignments of stations. There is such an authority which assigns various portions of the short wave spectrum to various services, such as: broadcasting, amateur, mobile, and radiotelephone. When one considers the vast services performed by the code stations, he would not begrudge them the occasional interference that they might cause. The condition that the aforementioned writer claims exists on the short waves is an extremely exaggerated one, and so misleading to the novice, *that it should never have been written!*

ROBERT CURTIS,
181 Washinton Street,
Barre, Vermont.

(*Experience seems to prove that you are correct.—Editor*).

Capt. Jernigan Speaks His Mind!

Editor, SHORT WAVE LISTENER:

As I understand the Listener is OUR paper and in addition I am a subscriber to the *Short Wave Craft*. I crave your indulgence long enough to concur in the "Constructive criticism" by Jack Wasley Polick in the June-July issue where he recommends a "Ham" exchange classified page at reasonable rates and the changes from meters to megs., my amendment being that *both* meters and megs be quoted as many of us are not apt mathematicians and our short-wave or all-wave radios are not marked for anything excepts megs and kilocycles.

Now just a few words about aerials or antennas. I live on U. S. route 23 where from one to a dozen cars and trucks pass every 30 seconds by the watch. My radios and residence location is about 75 feet west of this thorofare and as I am quite a S.W. fan I am bothered often to a point of desperation and for the past two years have spent a "fortune" on the many kinds of popular makes of radios and noise-killing antennas and have about come to the conclusion that it is all "Hooey" and that one is about as good as the other as far as man made static is concerned. If your machine is properly aligned, balanced, tubes good and tone control properly adjusted you'll get just as good reception from one, with the exception of possibly a directional difference, as with the other and I have tried conventionals of all lengths, heights and direction, doublets, double-doublets, Tees, Ells, V's, cages of all lengths, verticals and diagonals, together with static filters and everything I have been able to get my hands on, to try to stop this nerve-racking auto noise, in which I have graduated to such a point that I can tell you just what kind of a car is coming, whether it is a four, six or eight cylinder or a truck. At times the radio just has to be shut off and to say the least I have found nothing that will stop or filter this noise satisfactorily; what little relief I do get costs so much more "volume" that the game is hardly worth the candle.

For the sake of others that may be in a like position, I will state what I have worked out and which is giving me better reception than I have ever had before. First I set my line on the back of my orchard nearly 200 feet from the road, with masts on the hillside that will level 55 feet high at my residence. From the top of the north pole, I ran a heavy insulated wire broken up by glass insulators every 8 feet, on which I attached a conventional antenna, running it through an insulated ring on top a 55 foot mast and direct to a lightning arrester, then through the wall to a double-throw knife switch. I then extended the heavy wire and insulators 20 feet and attached a double-doublet with 19 foot short-wave end and 46 foot broadcast end fastened to an insulator and coming down in a V through a condenser coupler with twisted pair (one red and the other black wire) both conventional and doublet antennas running 125 feet to the radio the conventional going east and west direct. The doublet runs north and south with 125 feet twisted pair and connects through a regular S.W. lightning arrester to the condenser coupler that has a short-wave and B.C. switch to which the radio is connected and is in turn connected to the double-throw knife-switch, by which means either wire may be used independently, or both of them together.

A test showed some of this noise was coming in on the power line or lighting system on which a grounded filter was attached, along with a voltage control. I forgot to state that the 125 foot lead-in runs 25 feet lower than the conventional wire does.

The advantage of this layout of antenna is that the directional feature is overcome when both wires are used, and in acting singly one can at times get better reception in this manner, but my tests show that one wire is just as good as the other, when used singly as may be shown by the throw of the knife switch. However there is often an improvement when both are used simultaneously, but at times one of them gives just as good reception as both, but one is no better than the other, so again I say I have about come to the conclusion that this killing of man-made static is all "Hooey".

The best thing of all is a good ground. If I had to take my choice between a good antenna and a poor ground, or a good ground and a poor antenna, I'd choose the latter.

In the June-July *Listener* there is an article on OXY in Denmark, which station I have never been able to get in my life on any radio, and in all the reports of the listening posts, I have never seen any record of their having received it.

What's wrong with London (Daventry) and Germany in the forenoons? For the past 30 days I have not been able to get them before 2.00 P.M. and that was Germany on special broadcast. I haven't heard "Big Ben" in the morning in so long that I have about decided he is dead.

By the way, that is rather a nifty dial on the European all-wave receiver. Why can't we have something like it?

That "Locating stations in a jiffy" is one of the best things that has ever been printed in either the *Listener* or the *Craft* and by the way, to those making reports from listening posts, let me suggest that when you report stations, why not state the *time* you received them? Gracias Senores. Adios Amigos.

CAPT. F. A. X. JERNIGAN,
Commander, U. S. W. V. No. 22,

(*Thanks for your ideas, Captain, and we intend to discuss the "ham" exchange classified "ad" idea with our Advertising Department.—Editor.*)

OUR

A "Bouquet" and a "Brickbat"

Editor, SHORT WAVE LISTENER:

"In response to your request for helpful criticism, as voiced in the June "*Short Wave Listener*", I am pleased to forward to you through this letter my impressions upon and criticisms of the "*Short Wave Listener*".

I was unusually impressed upon the neatness and clear-cut appearance of the magazine. The illustrations are numerous and attractive, and they are well balanced to assure the pleasing touch to the reader's eye.

The grand list of short wave stations was helpful, especially the list of stations alphabetically arranged. I believe that this is the first time I have ever seen short wave stations arranged in this manner, and it is very helpful to the average short wave listener.

The photographs of "BBC" artists and descriptions of various foreign short-wave stations were interesting, and provided reading that is not available in other magazines of this type.

I do think you should be more careful in editing stories submitted to you. For instance in the June number, page 95, in "Why I Couldn't Do Without Short Waves", the writer says, "When the Australian stations open . . . with a few bars of "God Save The King," I am always reminded of the nearness of our relationship, realizing that the refrain is the same as our National Anthem." Any school boy can tell you that "The Star Spangled Banner" is our National Anthem, and not "America", the Americanized version of "God Save the King." This may seem a small point to the Editor, but little slips like this loom large in the reader's mind. (*Thanks—Editor.*)

Call letters and locations of radio police stations also should be included in the lists. I spend much time listening to these thrilling stations, and I feel that most any short-wave "fan," like myself, would appreciate seeing an accurate and up-to-date list of these stations included in the next issue of "*Short Wave Listener.*"

I hope that my few suggestions and comments have been of help to you in improving upon your magazine, although, other than the few points I have outlined, there is little room for improvement in a magazine such as yours, which has gained such an enviable reputation in radio circles.

JACK WATROUS,
(Member of the Short Wave League)
La Cavoda Road,
San Mateo, Calif.

(*Thanks a million, Jack, for the orchids, and we also appreciate your criticism. As there are about* 50,000 *words in an average issue of the magazine, much of which is proof-read under pressure, errors will creep in. Thanks again for your interest.—Editor.*)

He Wants Swappers! Do You?

Editor, SHORT WAVE LISTENER:

I have just made the Doerle A.C. receiver using a 57 and a 56 and I have received GSV in Daventry, England; GSG, Daventry, England; PHI, Huizen, Holland; HAS3, Budapest, Hungary; FYA, Paris, France; RNE, Moscow, Russia; 2RO, Rome, Italy; CT1AA, Lisbon, Portugal; VK3ME, Melbourne, Australia; and VK2ME, Sydney, Australia. I also have the Globe Trotter, DXer, and a "five meter" set.

I wish you would print more articles on "Fitting up a Short-Wave Listening Den" such as the one on page 60 in the April-May issue and also I would like to see a "swapper list" in this magazine, as well as in the *Short Wave Craft*. But, if you do, please keep it up and not have any person there who doesn't want to write.

I enjoy your magazine very much, and more power to you and *Short Wave Listener*.

I would be pleased to correspond with any *Short Wave Craft* reader or what have you.

EDDIE FAWSETT,
1275 Singletary Ave.,
San Jose, Calif.

READERS

(*We like your idea suggesting a "Swapper List" in this magazine, and we are taking this opportunity to ask that every reader interested in exchanging cards with another short-wave listener, send in his or her name to us on a postcard, marked "Swapper Editor", c/o this magazine. Let's go! —Editor*).

Who Threw That Wrench?

Editor, SHORT WAVE LISTENER:

I noticed in your last issue of O. S. W. L. Magazine that you wanted constructive criticism. Well here it is.

First of all your magazine is not published often enough to be able to bring the up-to-the-minute news to the reader.

I would suggest that you put out a new issue twice a month or at least every month. Also the news printed in one issue should not be older than the date of type setting of the preceding issue. That is to say that if type were set on the first and the fifteenth of the month, the news contained in the copy put out after the fifteenth should not date back further than the first of the month. This is being done now on a monthly basis by a great many magazines, so why can't we go a step further and make a bi-monthly of O.S.W.L. and get ahead of the rest of the magazines. If need be, reduce the magazine to about ¼ the size and devote most of it to S.W. station lists and reports from readers.

There are altogether too many articles describing S.W. stations in one issue. One should be sufficient each month. Or better in one issue describe a S.W. station and in the following issue give us a "fiction" story. When we continue to read the same rot all the time we loose interest. "Variety is the spice of life," you know. I think most of the readers will agree with me on this point.

Secondly your station list should be entirely revised. Organize a chain of S.W. listening posts all over the world. Condense the information supplied to you by these and readers.

The harder "catches" that are not reported, may be put on a separate page along with the schedule obtained from the station.

In your present station list I have noticed many stations that do not exist, have changed frequency and the like but I can not find any information about some stations that I hear most every night; showing how inaccurate your list is.

The "Listening Post Photo" department is the best part of the magazine at present in my opinion.

Someone should be hired to write some articles on how to obtain verifications, give the address of the short wave stations, their identification signals and their relative signal strength.

There also should be more said about the "foreign amateurs" that may be heard on 20 and 40 meter fone.

I would be very glad to help you in any way I am able along these lines.

PIERRE A. PORTMANN,
47-20 48th Street,
Woodside, N. Y.

(*Well, Pierre, we would like to do all of the things that you suggest but at present, as it seems impossible to bring out this magazine monthly, we will have to do the best we can as far as the short-wave station lists are concerned. True, there are many stations appearing on this list that may not be in operation just at the moment, but some of these have a habit of coming back on the air at the most unexpected time, as we have learned in many instances. And then—on our S. W. L. list, you find it!—Editor*).

He Suggest Two Trophies!

Editor, SHORT WAVE LISTENER:

I have read the last two copies of the *Short Wave Listener*," and think it is a fine constructive issue. It has some very valuable, and interesting information.

The "Listening Post Trophy" section is also very interesting, but feel that the listeners on "West Coast" do not have a fair chance at it. It is true

IDEAS

we have the "Orientals" and "Mexicans," but what are their number compared to England, France, Germany, Italy, etc. Usually only the most powerful of these can be heard out West. So why not have an "East Coast" and a "West Coast" Trophy?

JAMES E. MOORE, JR.,
1504 McAllister St.,
San Francisco, Cal.

(*Two trophies! Not a bad idea.*)

A Word from Trophy Winner, Juan Storer

Editor, SHORT WAVE LISTENER:

I feel very glad sending you my photo with the trophy recently won in your "contest" for the *Best Station Photo*, so please find it enclosed with my most sincere wishes for success to this very good magazine, which I shall buy for all the time it will be published, as I read all and every page of its information.

I have received with great pleasure some letters and S.W.L. cards, which I appreciate very much from radio "fans" congratulating me on winning the trophy. Please mention in your magazine that I will be very pleased to receive and answer all letters written to me, and besides that I will accompany my letters with views of Puerto Rico and photos of my Listening Post.

JUAN C. STORER,
Jose de Diego St. No. 1,
P. O. Box 194,
Arechibo, Porto Rico.

JUAN CLOQUELL STORER
Winner of the handsome Silver Trophy for the best S-W Listening Post—See photo of his station in the June-July issue, page 117.

Tried Our "Aerial Hint" Successfully!

Editor,
SHORT WAVE LISTENER:

Since I am a short wave listener and have been looking for new ideas to improve my reception, I have been trying some of the hints that have been published in *Short Wave Listener*. One of these that I tried was the *bed spring aerial* as described in April-May issue. This aerial compared favorably with my "outside" wire aerial. The "bed spring" aerial "brought in" Daventry with a rating of R9 plus, *on a loud-speaker*.

My set consists of a 2-tube Stewart-Warner short wave converter, attached to a 5-tube Crosley broadcast receiver. A loud-speaker is always used!

The size of the bed spring is about 5½ feet by 2 feet (the "day bed" variety), and its direction is East-West.

Why don't short-wave experimental stations give their call letters after they have sent or relayed a feature program? Twice I have heard special features from other countries being sent over short waves, and then picked up by the broadcast stations, and when the program was finished, the short-wave stations would go off the air without signing off, or they would go to the "chopped up' (scrambled) variety of phone conversation. Both times that this happened to me, they were NBC presentations. One of these was from Hawaii, and the other "feature" was from France.

Y. OSCAR JOHNSON,
638 Edel Avenue,
Maywood, New Jersey.

Wants "Ham" Data Published in S.W.L.

Editor, SHORT WAVE LISTENER:

Having just finished my second issue of the best magazine ever published, the *Short Wave Listener*, I would like to have a few pros and cons with you.

In your "How to Get Best Results' department, you spoke about cutting loose the aerial to find the noise. Well, it doesn't work on my set (it is a 6-tube super-het colonial model made by the Graybar Electric Co.). I get more noise than ever.

How about putting a department in the *Listener* for some dope for the beginner who would like to become a "Ham"? Can you publish the requirements to become a licensed "Ham"? Better still, how about making it "The Ham Beginners"—giving all the dope tbe readers write in?

What is the best aerial for an apartment, where you can't use a doublet, etc.?

Why not publish the *Listener* every month. I have run the newsstands "ragged" for the "S.W.L."! Now every time I go near the stands, all I hear is "not yet".

I think your *Grand Short Wave Station List* is just the berries! For a beginner, I sure can find the short wave stations easily. I don't have any aerial, but I get England, Spain and Germany, mostly every night when I come home from work.

Hope to see the *Listener every month.*

A Would-Be "Ham",
WILBUR BLAIR,
1232 Penn St.,
Kansas City, Mo.

(In nearly every case in our experience we have found that when an antenna was disconnected from the receiver, the noise would diminish almost to zero; that is, if the noise was coming from a source outside of the receiver, and not through the power line. If the noise still persisted it could usually be found originating directly in the radio set tself.

For any information regarding amateur or "Ham" apparatus, we refer you to "Short Wave Craft" magazine. You will undoubtedly be interested in knowing that "Short Wave Craft" is now running a series of lessons for the amateur ("Ham"). This will be found under the heading of "Radio Amateur Course"; also some very valuable antenna data is appearing in the current and next few issues.—Editor.)

Free Diagrams!

Editor,
SHORT WAVE LISTENER:

I have just receievd my first copy of *Official Short Wave Listener.*

And enjoy it very much.

It's the magazine we listeners need! It is a great help to us. I have been reading another magazine for the past two years, but it cannot compare with this one.

What we need is a club among the listeners to exchange thoughts, blue-prints, etc. I would like to hear from any listener who has any trouble with his set, and would be glad to give him any information he needs. I will send any one the blueprint of a two tube short wave set, good for two thousand miles, which gives good results

DEAN SHANOFELT,
Box 104, Corsica, Pa.

International Call Letters

Editor, SHORT WAVE LISTENER:

I have just started in short waves, but your "mag." favors both the beginner and the dyed-in-the-wool short wave "fan".

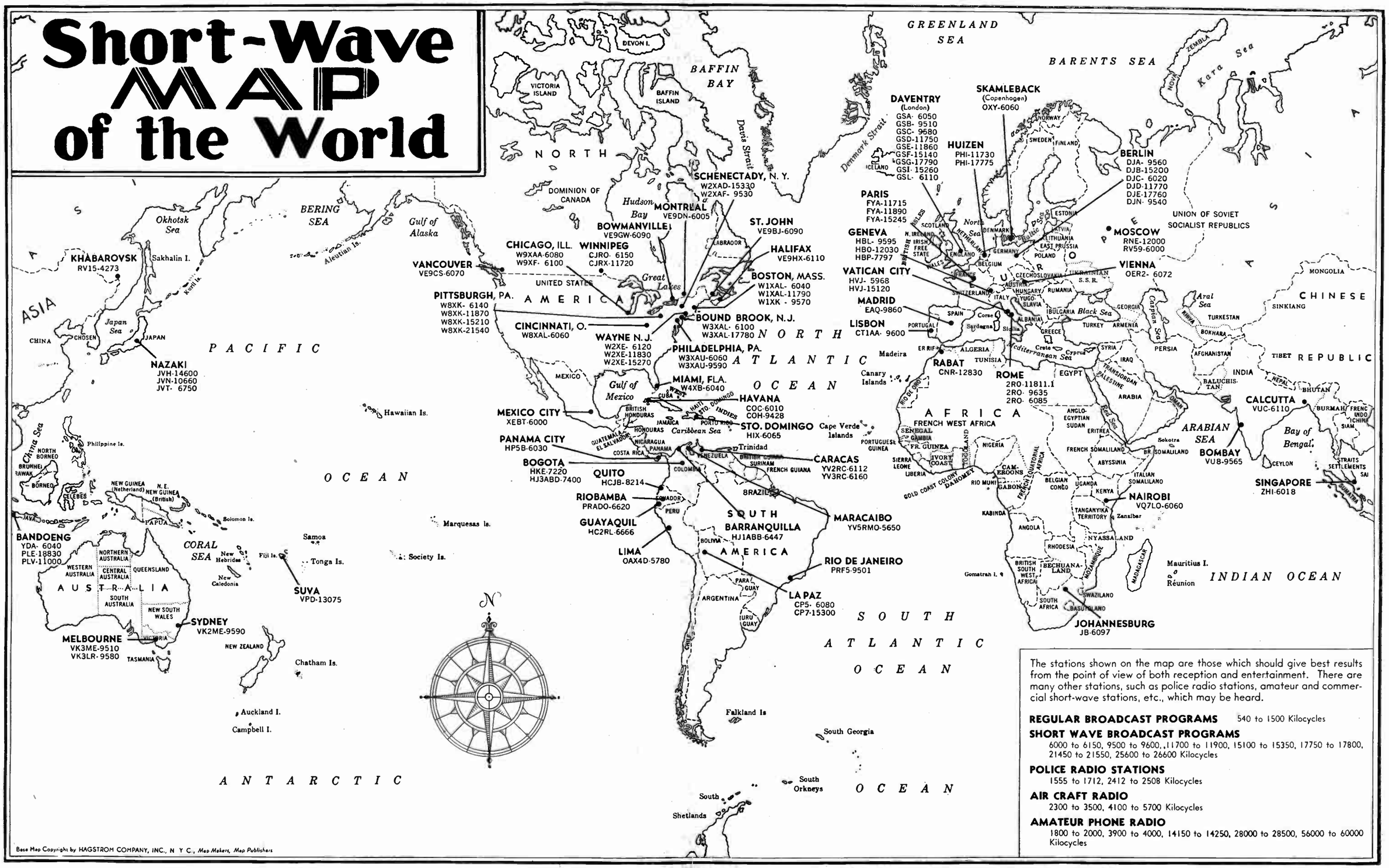
The whole "mag" between the two covers is packed full of interesting data valuable to any short-wave "fan".

There is one thing the "mag" lacks, that would bring great favor to the average short wave listener. This is *International Call Letter Assignments.*

I am wishing you such great success that this "mag" will even surpass the high qualities of its sister—*Short Wave Craft.*

JOSEPH QUICKEL,
740 Prospect Street,
York, Penna.

Short-Wave MAP of the World



The stations shown on the map are those which should give best results from the point of view of both reception and entertainment. There are many other stations, such as police radio stations, amateur and commercial short-wave stations, etc., which may be heard.

REGULAR BROADCAST PROGRAMS 540 to 1500 Kilocycles

SHORT WAVE BROADCAST PROGRAMS
6000 to 6150, 9500 to 9600, 11700 to 11900, 15100 to 15350, 17750 to 17800, 21450 to 21550, 25600 to 26600 Kilocycles

POLICE RADIO STATIONS
1555 to 1712, 2412 to 2508 Kilocycles

AIR CRAFT RADIO
2300 to 3500, 4100 to 5700 Kilocycles

AMATEUR PHONE RADIO
1800 to 2000, 3900 to 4000, 14150 to 14250, 28000 to 28500, 56000 to 60000 Kilocycles

Best Short Wave Stations

This list of short-wave relay broadcasting, commercial and experimental stations is the result of several years of work. Names and addresses included wherever possible so that you may know where to write. The blank spaces are for the dial settings of your own set.

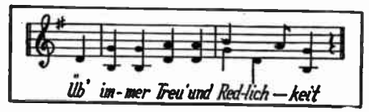
★ Stars designate the most active and best heard stations. Times are Eastern Standard
C—Commercial phone. B—Broadcast service. X—Experimental service.

Station	Dial
21540 kc. W8XK -B- 13.93 meters WESTINGHOUSE ELECTRIC PITTSBURGH, PA. 7-9 a.m.; relays KDKA	
20700 kc. LSY -C- 14.49 meters MONTE GRANDE ARGENTNIA Test irregularly	
18830 kc. ★PLE -C- 15.93 meters BANDOENG, JAVA Calls Holland, early a.m. Broadcasts Tues., Thurs., Sat. 10-10:30 a.m.	
18620 kc. GAU -C- 16.11 meters RUGBY, ENGLAND Calls N. Y., daytime	
18345 kc. FZS -C- 16.35 meters SAIGON, INDO-CHINA Phones Paris, early morning	
18340 kc. WLA -C- 16.36 meters LAWRENCEVILLE, N. J. Calls England, daytime	
18135 kc. PMC -C- 16.54 meters BANDOENG, JAVA Phones Holland, early a. m.	
17810 kc. PCV -C- 16.84 meters KOOTWIJK, HOLLAND Calls Java, 6-9 a.m.	
17790 kc. ★GSG -B- 16.86 meters DAVENTRY, ENGLAND B.B.C., BROADCASTING HOUSE, LONDON, ENGLAND	
17780 kc. ★W3XAL -B- 16.87 meters NATIONAL BROAD. CO. BOUND BROOK, N. J. Relays WJZ, Daily exc. Sun. 9-11 a.m.	
17775 kc. ★PHI -B- 16.88 meters HUIZEN, HOLLAND Daily exc. Tues. and Wed. 10:30 a.m., Sun. till 11:30	
17760 kc. ★DJE -B- 16.89 meters BROADCASTING HOUSE BERLIN, GERMANY 8-11:30 a.m.	
17310 kc. W3XL -X- 17.33 meters NATIONAL BROAD. CO. BOUND BROOK, N. J. Tests irregularly	
17080 kc. GBC -C- 17.56 meters RUGBY, ENGLAND Calls ships	
16233 kc. FZR3 -C- 18.48 meters SAIGON, INDO-CHINA Calls Paris and Pacific Isles	
15660 kc. JVE -C- 19.16 meters NAZAKI, JAPAN Phones Java 3-5 a.m.	
15620 kc. JVF -C- 19.2 meters NAZAKI, JAPAN Phones U. S., 5 a.m. & 4 p.m.	
15415 kc. KWO C- 19.46 meters DIXON, CAL. Phones Hawaii 2-7 p.m.	
15370 kc. ★HAS3 -B- 19.52 meters BUDAPEST, HUNGARY Broadcasts Sundays, 9-10 a.m.	
15355 kc. KWU C- 19.53 meters DIXON, CAL. Phones Pacific Isles and Japan	
15330 kc. ★W2XAD -B- 19.56 meters GENERAL ELECTRIC CO. SCHENECTADY, N. Y. Relays WGY daily, 2-3 p.m. Sun. 10:30 a.m.-4 p.m.	
15280 kc. DJQ B- 19.63 meters BROADCASTING HOUSE BERLIN, GERMANY 8-11:30 a.m.	
15270 kc. ★W2XE -B- 19.65 meters ATLANTIC BROADCASTING CORP. 486 Madison Av., N.Y.C. Relays WABC daily, 11 a.m.-3 p.m.	
15260 kc. GSI B- 19.66 meters DAVENTRY, ENGLAND B.B.C., BROADCASTING HOUSE, LONDON, ENGLAND	
15250 kc. W1XAL -B- 19.67 meters BOSTON, MASS. Irregular, in morning	
15245 kc. -B- 19.66 meters "RADIO COLONIAL" PARIS, FRANCE Service de la Radiodiffusion 103 Rue de Grenelle, Paris 7-11 a.m.	
15220 kc. ★PCJ -B- 19.71 meters N.V. PHILIPS' RADIO EINDHOVEN, HOLLAND Broadcast relaying PHI Sat. and Sun. 8:30-11:30 a.m. Also tests Tues. 3-6 a.m., Wed. 7-11 a.m.	
15210 kc. ★W8XK B- 19.72 meters WESTINGHOUSE ELECTRIC & MFG. CO. PITTSBURGH, PA. 9 a.m. - 7 p.m. Relays KDKA	
15200 kc. ★DJB -B- 19.73 meters BROADCASTING HOUSE BERLIN, GERMANY 3:45-7:15 a.m., 8-11:30 a.m.	
15140 kc. ★GSF -B- 19.82 meters DAVENTRY, ENGLAND B.B.C., BROADCASTING HOUSE, LONDON, ENGLAND	
15120 kc. ★HVJ -B- 19.83 meters VATICAN CITY ROME, ITALY 10:30 to 10:45 a.m., except Sunday	
15090 kc. RKI -C- 19.88 meters MOSCOW, U.S.S.R. Phones Tashkent near 7 a.m. and relays RNE on Sundays irregularly	
15055 kc. WNC -C- 19.92 meters HIALEAH, FLORIDA Calls Central America, daytime	
14980 kc. KAY -C- 20.03 meters MANILA, P. I. Phones Pacific Isles	
14950 kc. HJB -C- 20.07 meters BOGOTA, COL. Calls WNC, daytime	
14600 kc. JVH -B,C- 20.55 meters NAZAKI, JAPAN Broadcasts 4-5 p.m., 12 m.-1 a.m.	
14590 kc. WMN -C- 20.56 meters LAWRENCEVILLE, N. J. Phones England morning and afternoon	
14500 kc. LSM2 -C- 20.69 meters HURLINGHAM, ARGENTINA Calls U. S., evening	
14485 kc. TIR -C- 20.71 meters CARTAGO, COSTA RICA Phones Cen. Amer. & U.S.A. Daytime	
14485 kc. HPF -C- 20.71 meters PANAMA CITY, PAN. Phones WNC daytime	
14485 kc. TGF -C- 20.71 meters GUATEMALA CITY, GUAT. Phones WNC daytime	
14485 kc. YNA -C- 20.71 meters MANAGUA, NICARAGUA Phones WNC daytime	
14000 kc. HJ5ABE -B- 41.43 meters CALI, COLOMBIA Irregular 7 p.m.-12 m.	
13610 kc. JYK -C- 22.04 meters KEMIKAWA-CHO, CHIBA- KEN, JAPAN Phones California till 11 p. m.	
13585 kc. GBB -C- 22.06 meters RUGBY, ENGLAND Calls Egypt & Canada, afternoons	
13075 kc. VPD -X- 22.94 meters SUVA, FIJI ISLANDS Daily exc. Sun. 12:30-1:30 a.m.	
12840 kc. WOO -C- 23.36 meters OCEAN GATE, N. J. Calls ships	
12825 kc. CNR -B, C- 23.39 meters DIRECTOR GENERAL Telegraph and Telephone Stations, Rabat, Morocco Broadcasts, Sunday, 7:30-9 a.m.	
12800 kc. IAC -C- 23.45 meters COLTANO, ITALY Calls Italian ships, mornings	
12396 kc. CT1GO B- 24.2 meters PAREDE, PORTUGAL Sun. 10-11:30 a.m., Tues., Thur., Fri. 1:00-2:15 p.m.	
12235 kc. TFJ -C- 24.52 meters REYKJAVIK, ICELAND Phones England mornings, Broadcasts irregularly	
12150 kc. GBS -C- 24.69 meters RUGBY, ENGLAND Calls N.Y.C., afternoon	
12000 kc. ★RNE -B- 25 meters MOSCOW, U. S. S. R. Sun. 6-9 10-11 a.m., 1-6 p.m. Mon., Wed., Fri. 3-6 p.m., Wed. also 5-6 a.m.	
11991 kc. FZS2 -C- 25.02 meters SAIGON, INDO-CHINA Phones Paris, morning	
11950 kc. KKQ -X- 25.10 meters BOLINAS, CALIF. Tests, irregularly, evenings	
11940 kc. FTA -C- 25.13 meters STE. ASSISE, FRANCE Phones CNR morning Hurlingham, Arge., nights	
11890 kc. -B- 25.23 meters "RADIO COLONIAL" PARIS, FRANCE 11:30 a.m. - 6 p.m.	

Identifying Short-Wave Stations *By Their* MUSICAL SIGNATURES

AUSTRALIA

A great many of the foreign as well as the domestic short-wave broadcast stations can be identified by their musical or other signatures which they use in opening and closing the programs, and also use them at frequent intervals while they are on the air. For instance, practically every real short-wave "fan" has either heard or knows about the



Notes of old German folk song, identifying signature of "DJ" stations. Translation—"Practice Faithfulness and Honesty." Also two National anthems are played—one, the Nazi Hymn, the other the German National Anthem.

famous Kookaburra bird or "laughing jackass," the sound of which is heard over the Sydney, Australia, Station VK2ME. This Australian station is heard best in the eastern part of the United States by short wave listeners in the early morning hours usually, or up to about 9:00 o'clock in the morning. VK3ME, at Melbourne, open their program with clock chimes.

GERMANY

Another famous musical signature well known to short-wave fans is the German folk song played on a chime over the German short wave broadcast stations. The German announcers make a very clear statement over the air in both German and English, and you will have no difficulty in recognizing the powerful "DJ" Stations. Before the station goes on the air, they play an old German folk song of nine notes, which is played over and over again, and the writer has often heard it being played as long as twenty minutes before the station came on the air. The notes corresponding to this German folk song are here reproduced, and it gives one a very fine opportunity to tune in the station and be all set for the first spoken announcement which runs like this — "Here is Deutschlandsender, DJA, Hallo Nord America. The Reichs—Rundfunk—Gesellschaft, Berlin, presents to you today" . . . . The announcement is then repeated in German—"Die Reichs — Rundfunk—Gesellschaft Berlin sendet ihnen heute.'

ENGLAND

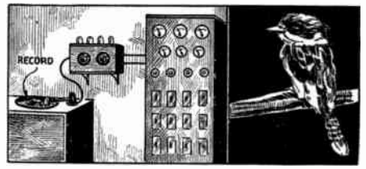
The next popular identifying signature is probably that of the chimes of "Big Ben", which are heard on the English short-wave stations. These stations are scheduled to sound the chimes of "Big Ben" on the quarter hours, and the announcer follows this with—"London calling on—(stations and wavelengths)." The English stations begin and end transmissions by playing "God save The King." This song has the same tune as our "America." London also uses the "Bow bells" for interval signals—the sound of the bells being reproduced from a record previously made.

HOLLAND

Station PHI, Huizen, Holland, may be identified by the announcement — "This is Huizen." The sound of the metronome is used.

FRANCE

The French station at Pontoise, opens and closes its transmissions by playing the "Marseillaise."



VK2ME is famous for its unique signature—the voice of the Kookaburra bird (laughing jackass). It is a large bird, growing to a size of 9 inches frequently. Its voice is usually broadcast from a record.

BELGIUM

Station ORK at Brussels, Belgium, plays the Belgium national hymn at the close of their programs.

SPAIN

EAQ, the well known station, located at Madrid, Spain, and which comes in loud and clear on American short wave receivers, announces the call of their station first in Spanish—"Ay-ah-coo, transradio Madrid." As a matter of fact, this station announces its call in Spanish as just mentioned, but our experience has been that the operator usually says—"Radio Madrid." and in some cases "Radio Espanol". Also, it is interesting to note that an English announcer makes announcements following those in Spanish, and numerous programs given in English have been heard over this excellent station.

PORTUGAL

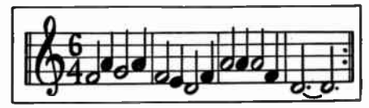
Station CT1AA at Lisbon, uses the sound of the cookoo call between selections.

U. S. S. R.

RV59, the well known Soviet station of Moscow, which has been heard by thousands of American short-wave fans, plays the "Internationale" at the beginning and end of their programs, and announcements are made in English as well as in Russian. The U. S. S. R. stations broadcast quite a few features in English, and also features especially intended for America.

ITALY

The famous station, I2RO at Rome,



Notes of musical signature identifying the short-wave station at Copenhagen.

familiar to all American short-wave listeners, features a woman announcer in the daytime, and one of the usual salutations heard from this station is —"Radio Roma Napoli." Announcements in English are interspersed with those in Italian, and this station can easily be identified, therefore. Station IAC at Piza, Italy, calls "Pronto, pronto—(name of ship)."

HVJ, Vatican City—Hear a constant tick of the studio clock as a background to the speech. Also broadcasts the bells of Saint Peter's starting each broadcast.

MOROCCO

The short wave broadcast station, CNR at Rabat, makes this announcement usually—"Radio Rabat dans Maroc." They also use broadcast sound of a metronome between selections.

ETHIOPIA

The new short-wave transmitting station, ETA in Ethiopia, located at Adis Ababa, has been transmitting special talks in French and also in English, on a wavelength of approximately 17.3 meters or 17.33 megacycles. (Another report has it 7.5 mc.) No identifying signature has been adopted as far as we know as yet nor is it classified as a "Broadcasting" station. ETA has been in operation for quite a long time, and is classified as a *point-to-point* radio telegraph station. The programs which have been broadcast during September from this station have been picked up by the RCA short-wave receiving stations in this country and re-broadcast over the NBC network, the New York "key" station being WEAF or WJZ. It is reliably reported that in the event of hostility between Ethiopia and Italy that short-wave announcements, including "broadcasts from the trenches and

(*Continued on page* 237)

Station	Dial
11870 kc. *W8XK -B- 25.26 meters WESTINGHOUSE ELECTRIC & MFG. CO. PITTSBURGH, PA. 5-9 p.m. Fri. till 12 m. Relays KDKA	
11860 kc. GSE -B- 25.29 meters DAVENTRY, ENGLAND B.B.C., BROADCASTING HOUSE, LONDON, ENGLAND	
11830 kc. *W2XE -B- 25.36 meters ATLANTIC BROADCASTING CORP. 485 MADISON AVE., N. Y. C.	
11810 kc. *2RO -B- 25.4 meters E.I.A.R. Via Montello 5 ROME, ITALY 8:15-9 a.m., 9:15-10:15 a.m., 2:30-5 p.m.	
11800 kc. CO9WR -X- 25.42 meters P. O. Box 85 SANCTI SPIRITUS, CUBA Testing in early evening	
11790 kc. W1XAL -B- 25.45 meters BOSTON, MASS. Irregularly in the afternoon	
11770 kc. DJD -B- 25.49 meters BROADCASTING HOUSE, BERLIN, GERMANY 12-4:30	
11750 kc. *GSD -B- 25.53 meters BRITISH BROAD. CORP. DAVENTRY, ENGLAND	
11730 kc. PHI -B- 25.57 meters HUIZEN, HOLLAND Daily exc. Tues. and Wed. 8:30-10:30 a.m., Sun. 8:30-11:30 a.m.	
11720 kc. *CJRX -B- 25.6 meters WINNIPEG, CANADA Daily, 8 p.m.-12 m.	
11715 kc. -B- 25.61 meters "RADIO COLONIAL" PARIS, FRANCE 7-10 p.m. 11 p.m.-1 a.m.	
11710 kc. *HJ4ABA -B- 25.63 meters P. O. BOX 50, MEDELLIN, COLOMBIA 11:30 a.m.-1 p.m., 6:30-10:30 p.m.	
11680 kc. KIO -X- 25.68 meters KAHUKU, HAWAII Tests in the evening	
11500 kc. VIZ3 -X- 26.09 meters AMALGAMATED WIRELESS OF AUSTRALASIA MELBOURNE, AUSTRALIA Calls Canada evening and early a.m.	
11000 kc. PLP -B-C- 27.27 meters BANDDOENG, JAVA Relays NIROM programs 5:30-11 a.m. daily	
10990 kc. ZLT -C- 27.3 meters Phones Australia and England early a.m. Also broadcasts irregularly on Sunday, 9-10 a.m.	
10740 kc. *JVM -C- 27.93 meters NAZAKI, JAPAN Broadcasts 2-7:45 a.m.	

Station	Dial
10675 kc. WNB -C- 28.1 meters LAWRENCEVILLE, N. J. Calls Bermuda, daytime	
10670 kc. *CEC -C- 28.12 meters SANTIAGO, CHILE Broadcasts Tues., Thurs., Sun. 8-9 p.m.	
10660 kc. *JVN -C- 28.14 meters NAZAKI, JAPAN	
10520 kc. VLK -C- 28.51 meters SYDNEY, AUSTRALIA Calls Rugby, early a.m.	
10430 kc. YBG -C- 28.76 meters MEDAN, SUMATRA 5:30-8:30 a.m., 7:30-8:30 p.m.	
10410 kc. PDK -C- 28.80 meters KOOTWIJK, HOLLAND Calls Java 7:30-9:40 a.m.	
10410 kc. KES -X- 28.80 meters BOLINAS, CALIF. Tests evenings	
10350 kc. LSX -C- 28.98 meters MONTE GRANDE, ARGENTINA Tests irregularly 8 p.m.-12 midnight	
10330 kc. ORK -B, C- 29.04 meters RUYSSELEDE, BELGIUM Broadcasts 1:30-3 p.m.	
10290 kc. DIQ -X- 29.16 meters KONIGSWUSTERHAUSEN, GERMANY Broadcasts irregularly	
10260 kc. PMN -C- 29.24 meters BANDOENG, JAVA Calls Australia 5 a.m.	
10250 kc. LSK3 -C- 29.27 meters HURLINGHAM, ARGENTINA Calls Europe and U. S., afternoon and evening	
10140 kc. OPM -C- 29.59 meters LEOPOLDVILLE, BELGIAN CONGO Phones around 3 a.m.	
10055 kc. ZFB -C- 29.84 meters HAMILTON, BERMUDA Phones N. Y. C. daytime	
9860 kc. *EAQ -B- 30.43 meters P. O. Box 951 MADRID, SPAIN Daily 5:15-7:30 p.m.; Saturday also 12 n.-2 p.m.	
9800 kc. LSE -C- 30.61 meters MONTE GRANDE, ARGENTINA Tests irregularly	
9790 kc. GCW -C- 30.64 meters RUGBY, ENGLAND Calls N.Y.C., evening	
9760 kc. VLJ-VLZ2 -C- 30.74 meters AMALGAMATED WIRELESS OF AUSTRALIA SYDNEY, AUSTRALIA Phones Java and N. Zealand early a.m.	

Station	Dial
9750 kc. WOF -C- 30.77 meters LAWRENCEVILLE, N. J. Phones England, evening	
9635 kc. *2RO -B- 31.13 meters E.I.A.R., ROME, ITALY Mon., Wed., Fri. 6-7:30, 7:45-9:15 p.m.	
9600 kc. *CT1AA -B- 31.25 meters LISBON, PORTUGAL Tues., Thurs., Sat. 3:30-6 p.m.	
9595 kc. *HBL -B- 31.27 meters LEAGUE OF NATIONS GENEVA, SWITZERLAND Saturdays, 5:30-6:15 p.m. Mon. at 1.45 a.m.	
9590 kc. *VK2ME -B- 31.28 meters AMALGAMATED WIRELESS LTD., 47 YORK ST. SYDNEY, AUSTRALIA 1-3, 4:30-8:30, 9-11 a.m.	
9590 kc. HP5J -B- 31.28 meters J Street PANAMA CITY, PANAMA 7:30-10 p.m.	
9590 kc. W3XAU -B- 31.28 meters NEWTOWN SQUARE, PA. Relays WCAU 12 n.-7:50 p.m.	
9580 kc. *GSC B- 31.32 meters BRITISH BROAD. CORP. DAVENTRY, ENGLAND	
9580 kc. *VK3LR -B- 31.32 meters Research Section Postmaster Gen'ls. Dept. 61 Little Collins St., MELBOURNE, AUSTRALIA 4-8:30 a.m., except Sun. Also Fri., 10:30 p.m.-2 a.m.	
9572 kc. LKJ1 -B- 31.34 meters JELOY, NORWAY Relays Oslo 5-8 a.m. 11 a.m. - 6 p.m.	
9570 kc. *W1XK -B- 31.35 meters WESTINGHOUSE ELECTRIC & MFG. CO. SPRINGFIELD, MASS. Relays WBZ, 7 a.m.-1 a.m.	
9565 kc. VUB -B- 31.38 meters BOMBAY, INDIA 11 a.m.-12:30 p.m., Wed., Sat. Sun. 7:30-8:30 a.m.	
9560 kc. *DJA -B- 31.38 meters BROADCASTING HOUSE, BERLIN 5:05-9:15 p.m. 12:30-2, 8-11:30 a.m.	
9540 kc. *DJN -B- 31.45 meters BROADCASTING HOUSE BERLIN, GERMANY 12:30-2 a.m. 3:45-7:15 a.m. 5:05-10:45 p.m.	
9530 kc. *W2XAF -B- 31.48 meters GENERAL ELECTRIC CO. SCHENECTADY, N. Y. Relays WGY 6:25 p.m.-12 m. Sun. 4:15 p.m.-12 m.	
9518 kc. *VK3ME -B- 31.54 meters AMALGAMATED WIRELESS, Ltd. G. P. O. Box 1272L, MELBOURNE, AUSTRALIA Daily except Sun. 5:00-7:00 a.m.	

Station	Dial
9510 kc. *GSB -B- 31.55 meters BRITISH BROAD. CORP. DAVENTRY, ENGLAND	
9500 kc. *PRF5 -B- 31.58 meters RIO DE JANEIRO, BRAZIL Daily except Sun. 5:30-6:15 p.m.	
9428 kc. *COH -B- 31.8 meters 2 B ST., VEDADO, HAVANA, CUBA 10 a.m.-12 n., 4-6:30, 8-10 p.m. also 11 a.m.-12 n. Thurs.	
9415 kc. PLV -C- 31.87 meters BANDOENG, JAVA Phones Holland around 9:45 a.m.	
9125 kc. HAT4 -B- 32.88 meters "RADIOLABOR" GYALI-uT. 22 BUDAPEST, HUNGARY Sunday 8-7 p.m.	
9060 kc. TFK -C- 33.11 meters REYJAVIK, ICELAND Phones London afternoons. Broadcasts irregularly.	
9010 kc. KEJ -C- 33.3 meters BOLINAS, CAL. Relays NBC & CBS Programs in evening irregularly	
8795 kc. HKV -B- 34.09 meters BOGOTA, COLOMBIA Irregular; 6:30 p.m.-12 m.	
8750 kc. ZEK -B- 34.29 meters HONGKONG, CHINA Relays ZBW	
8220 kc. ZP10 -B- 36.4 meters ASUNCION, PARAGUAY 7-9 p.m.	
8214 kc. HCJB -B- 36.5 meters QUITO, ECUADOR 7-11 p.m., except Monday Sun. 4-10 p.m.	
8185 kc. PSK -C- 36.65 meters RIO DE JANEIRO, BRAZIL Irregularly	
8036 kc. CNR -B- 37.33 meters RABAT, MOROCCO Sunday, 2:30-5 p.m.	
7880 kc. JYR -B- 38.07 meters KEMIKAWA-CHO, CHIBA-KEN, JAPAN 4-7:40 a.m. Sun. 4:14-10:44 p.m.	
7860 kc. HC2JSB -B- 38.17 meters GUAYAQUIL, ECUADOR 8:15 p.m.-11:15 p.m.	
7799 kc. *HBP -B- 38.47 meters LEAGUE OF NATIONS, GENEVA, SWITZERLAND 5:30-6:15 p.m., Saturday	
7630 kc. ZHJ -B- 39.32 meters PENANG, MALAYA Daily 7-9 a.m. also Sat. 11 p.m.-1 a.m. (Sun.)	
7400 kc. HJ3ABD -B- 40.54 meters P. O. Box 509 BOGOTA, COLOMBIA Daily 12-2 p. m.; 7-11p.m. Sunday, 5-9 p.m.	

Station	Dial
7380 kc. XECR -B- 40.85 meters FOREIGN OFFICE, MEXICO CITY, MEX. Sun. 8-7 p.m.	
7310 kc. HJ1ABD -B- 41.04 meters CARTAGENA, COLO. Irregularly, evenings	
7100 kc. HKE -B- 42.25 meters BOGOTA, COL., S. A. Tue. and Sat. 8-9 p.m.; Mon. & Thurs. 6:30-7 p.m.	
7030 kc. HRP1 -B- 42.67 meters SAN PEDRO SULA, HONDURAS Reported on this and other waves irregular in evening	
7000 kc. HJ5ABE -B- 42.86 meters CALI, COLUMBIA Irregular in evening	
6860 kc. KEL -X- 43.70 meters BOLINAS, CALIF. Tests irregularly 11 a.m.-12 n.; 6-9 p.m.	
6800 kc. HIH -B- 44.12 meters SAN PEDRO de MACORIS DOMINICAN REP. 12:10-1:40 p.m., 6:40-7:40 p.m., Sun. 3-4 a.m., 12:10-1:40 p.m., 2:20-4:40 p.m.	
6750 kc. JVT -X- 44.44 meters NAZAKI, JAPAN KOKUSAI-DENWA KAISHA, LTD., TOKIO	
6710 kc. *TIEP -B- 44.71 meters LA-VOZ DEL TROPICO SAN JOSE, COSTA RICA APARTADO 257, Daily 7-10 p.m.	
6672 kc. YVQ -C- 44.95 meters MARACAY, VENEZUELA Broadcasts Sa. 8-9 p.m.	
6650 kc. *HC2RL -B- 45.06 meters P. O. BOX 759, GUAYAQUIL, ECUADOR, S. A. Sunday, 5:45-7:45 p. m. Tues., 9:15-11:15 p. m.	
6620 kc. *PRADO -B- 45.30 meters RIOBAMBA, ECUADOR Thurs. 9-11:45 p.m.	
6611 kc. RV72 -B- 45.36 meters MOSCOW, U. S. S. R. 1-8 p. m.	
6610 kc. H14D -B- 45.39 meters SANTO DOMINGO, DOMINICAN REPUBLIC Except Sun. 11:55 a.m.-1:40 p.m.; 4:40-7:40 p.m.	
6550 kc. TIRCC -B- 45.77 meters RADIOEMISORA CATOLICA COSTARRICENSE SAN JOSE, COSTA RICA Irregularly 12 n.-2 p.m. and 5-7 p.m.	
6550 kc. TI2PG -B- 45.77 meters APARTADO 225, SAN JOSE, COSTA RICA "Costa Rica Broadcasting" 9-10 p.m.	
6528 kc. HIL -B- 45.95 meters SANTO DOMINGO, D. R. Sat., 8-10 p.m.	
6520 kc. *YV6RV -B- 46.01 meters VALENCIA, VENEZUELA 5-7, 9-11 p.m., irregular	
6500 kc. HJ5ABD -B- 46.15 meters MANIZALES, COL. 12-1:30 p.m., 7-10 p.m.	
6447 kc. HJ1ABB -B- 46.53 meters BARRANQUILLA, COL., S. A. P. O. BOX 715, 11:30 a.m.-1 p.m.; 5-10 p.m.	
6425 kc. W3XL -X- 46.70 meters NATIONAL BROADCASTING CO. BOUND BROOK, N. J. Tests irregularly	
6425 kc. VE9AS -X- 46.7 meters FREDERICTON, N. B. CANADA Operates irregularly	
6385 kc. YN1GG -B- 46.99 meters "LA VOZ de LOS LAGOS," MANAGUA, NICARAGUA Irregular in evening	
6375 kc. YV4RC -B- 47.06 meters CARACAS, VENEZUELA 4:30-10:30 p.m.	
6316 kc. HIZ -B- 47.5 meters SANTO DOMINGO DOMINICAN REPUBLIC Daily except Sat. and Sun. 4:40-5:40 p.m.; Sat., 9:40-11:40 p.m.; Sun., 11:40 a.m.-1:40 p.m.	
6250 kc. HJ4ABC -B- 48 meters PERIERA, COL. 9:30-11:30 a.m., 7-8 or 9 p.m.	
6230 kc. OAX4G -B- 48 meters Apartado 1242 LIMA, PERU Wed. & Sun. 7-10 p.m.	
6198 kc. CT1GO -B- 48.4 meters Portuguese Radio Club, PAREDE, PORTUGAL Sun. 11:30 a.m.-1 p.m. Daily exc. Tues. 7:20-8:30 p.m.	
6185 kc. HI1A -B- 48.5 meters P. O. BOX 423, SANTIAGO, DOMINICAN REP. 11:40 a.m.-1:40 p.m. 7:40-9:40 p.m.	
6175 kc. HJ2ABA -B- 48.58 meters TUNJA, COLOMBIA 1-2; 7:30-9:30 p.m.	
6170 kc. HJ3ABF -B- 48.62 meters BOGOTA, COLOMBIA 6-11 p.m.	
6160 kc. *YV3RC -B- 48.7 meters CARACAS, VENEZUELA Generally 4:00-10:00 p.m.	
6155 kc. CO9GC -B- 48.74 meters GRAU & CAMENEROS LABS. BOX 137, SANTIAGO, CUBA 9-10 a.m., 11:30 a.m.-1:30 p.m., 3-4:30 p.m. and 10-11 p.m., 12 m. - 2 a.m.	
6150 kc. CSL -B- 48.78 meters LISBON, PORTUGAL 7-8:30 a.m., 2-7 p.m.	
6150 kc. *CJRO -B- 48.78 meters WINNIPEG, MAN., CANADA 8 p.m.-12 m. Sun. 3-10:30 p.m.	
6140 kc. *W8XK -B- 48.86 meters WESTINGHOUSE ELECTRIC & MFG. CO. PITTSBURGH, PA. Relays KDKA 9 p.m.-1 a.m.	
6130 kc. HJ1ABE -B- 48.92 meters CARTAGENA, COL. P. O. BOX 31 Daily 11:15 a.m.-1 p.m.; Sun. 9-11 a.m.; Mon. 10 p.m.-12 m. Wed. 8-11 p.m.	
6130 kc. ZGE -B- 48.92 meters KUALA LUMPUR, FED. MALAY STATES Sun., Tue., and Fri., 6:40-8:40 a.m.	
6130 kc. COCD -B- 48.92 meters "La Voz del Aire" CALLE G y 25, VEDADO, HAVANA, CUBA Relays CMLD 6 p.m.-12 m.	
6128 kc. LKJ1 -B- 48.94 meters JELOY, NORWAY Relays Oslo. 10 a.m.-6 p.m.	
6120 kc. VQ7LO -B- 49.02 meters NAIROBI, KENYA, AFRICA Mon.-Fri. 5:45-6:15 a.m., 11:30 a.m.-2:30 p.m. Also 8:30-9:30 a.m. on Tues. and Thurs. Sat. 11:30 a.m.-3:30 p.m. Sun. 11 a.m.-2 p.m.	
6120 kc. *YDA -B- 49.02 meters N.I.R.O.M. BANDOENG, JAVA 10:40 p.m.-1:40 a.m., 5-9:40 a.m.	
6120 kc. *W2XE -B- 49.02 meters ATLANTIC BROADCASTING CORP. 185 MADISON AVE., N. Y. C. Relays WABC, 5-10 p.m.	
6112 kc. YV2RC -B- 49.08 meters CARACAS, VENEZUELA Sun. 8:30 a.m.-10:30 p.m., Daily except Sun. 11 a.m.-1:30 p.m., 4-9:30 p.m.	
6110 kc. *GSL -B- 49.10 meters British Broadcasting Corp. Daventry, England 2:15-4, 6-8, 10-11 p.m.	
6110 kc. VUC -B- 49.1 meters CALCUTTA, INDIA Daily except Sat., 3-5:30 a.m., 9:30 a.m.-noon; Sat. 11:45 a.m.-3 p.m.	
5105 kc. HJ4ABB -B- 49.14 meters MANIZALES, COL., S. A. P. O. Box 175 Mon. to Fri. 12:15-1 p.m.; Tues. & Fri. 7:30-10 p.m.; Sun. 2:30-5 p.m.	
6100 kc. *W3XAL -B- 49.18 meters NATIONAL BROADCASTING CO. BOUND BROOK, N. J. Relays WJZ Monday, Wednesday, Saturday, 6 p.m.-12 m.	
6100 kc. *W9XF -B- 49.18 meters DOWNERS GROVE, ILL. Relays WENR, Chicago	
6097 kc. JB -B- 49.2 meters AFRICAN BROADCASTING CO. JOHANNESBURG, SOUTH AFRICA Sun.-Fri. 11:45 p.m.-12:30 a.m. (next day) Mon.-Sat. 3:30-7 a.m. 9 a.m.-4 p.m. Sun. 8-10:15 a.m.; 12:30-3 p.m.	
6090 kc. CRCX -B- 49.26 meters TORONTO, ONTARIO CANADA Daily 6 p.m.-12 m. Sunday, 12 n.-12 m.	
6090 kc. VE9BJ -B- 49.26 meters SAINT JOHN, N. B., CAN. 7-8:30 p.m.	
5080 kc. CP5 -B- 49.34 meters LAPAZ, BOLIVIA 7-10:30 p.m.	
5080 kc. W9XAA -B- 49.34 meters CHICAGO FEDERATION OF LABOR CHICAGO, ILL. Relays WCFL Sunday 11:30 a.m.-9 p.m. and Tues., Thurs., Sat., 4 p.m.-12 m.	
6072 kc. OER2 -B- 49.41 meters VIENNA, AUSTRIA 9 a.m.-5 p.m., 7-10 p.m.	
6070 kc. HP5H -B- 49.42 meters COLON, PANAMA Testing in evening.	
6070 kc. VE9CS -B- 49.42 meters VANCOUVER, B. C., CANADA Sun. 1:45-9 p.m., 10:30 p.m.-1 a.m.; Tues. 6-7:30 p.m., 11:30 p.m.-1:30 a.m. Daily 6-7:30 p.m.	
6065 kc. HJ4ABL -B- 49.46 meters MANIZALES, COL. Daily 5:30-7:30 p.m., Sat. 10:30-11:30 p.m.	
6060 kc. OXY -B- 49.50 meters SKAMLEBOAEK, DENMARK 1-6:30 p.m.; also 11 a.m.-12 n. Sunday	
6060 kc. *W8XAL -B- 49.50 meters CROSLEY RADIO CORP. CINCINNATI, OHIO 6:30 a.m.-8 p.m.; 11 p.m.-1 a.m. Relays WLW	
6060 kc. W3XAU -B- 49.50 meters NEWTON SQUARE, PA. Relays WCAU, Philadelphia 6 p.m.-11 p.m.	
6050 kc. GSA -B- 49.59 meters DAVENTRY, B.B.C., BROADCASTING HOUSE, LONDON, ENGLAND	
6045 kc. HJ3ABI B- 49.63 meters BOGOTA, COLO. Irregular in evening	
5042 kc. HJ1ABG -B- 49.85 meters BARRANQUILLA, COLO. 12 n.-1 p.m., 6-10 p.m. Sun. 1-8 p.m.	
6040 kc. PRA8 -B- 49.67 meters RADIO CLUB OF PERNAMBUCO PERNAMBUCO, BRAZIL 3:00-3:30 p.m. and from about 4-7 p.m. daily	

(Continued on Page 236)

Police Radio Alarm Stations

CGZ	Vancouver, B.C.	2242 kc.
CJW	St. Johns, N.B.	2390 kc.
CJZ	Verdeen, Que.	2390 kc.
KGHA	Portable-Mobile In State of Wash.	2490 kc.
KGHB		
KGHC		
KGHD		
KGHE		
KGHG	Las Vegas, Nev.	2474 kc.
KGHK	Palo Alto, Cal.	1674 kc.
KGHM	Reno, Nev.	2474 kc.
KGHN	Hutchinson, Kans.	2450 kc.
KGHO	Des Moines, Iowa	1682 kc.
KGHP	Lakton, Okla.	2466 kc.
KGHQ	Chinook Pass, W.	2490 kc.
KGHR	(Mobile) in Wash.	2490 kc.
KGHS	Spokane, Wash.	2414 kc.
KGHT	Brownsville, Tex.	2382 kc.
KGHU	Austin, Tex	2482 kc.
KGHV	Corpus Christi, Tex.	2382 kc.
KGHW	Centralia, Wash.	2414 kc.
KGHX	Santa Ana, Cal.	2490 kc.
KGHY	Whittier. Cal.	1712 kc.
KGHZ	Little Rock. Ark.	2406 kc.
KGJX	Pasadena, Cal.	1712 kc
KGLX	Albuquerque, N.M.	2414 kc.
KGOZ	Cedar Rapids, Iowa	2466 kc.
KGPA	Seattle, Wash.	2414 kc.
KGPB	Minneapolis, Minn.	2430 kc.
KGPC	St. Louis, Mo.	1706 kc.
KGPD	San Francisco, Cal.	2474 kc
KGPE	Kansas City, Mo.	2422 kc.
KGPF	Sante Fe, N. Mex.	2414 kc.
KGPG	Vallejo, Cal.	2422 kc.
KGPH	Oklahoma City, Okla.	2450 kc.
KGPI	Omaha, Neb	2466 kc.
KGPJ	Beaumont, Tex.	1712 kc.
KGPK	Sioux City, Iowa	2466 kc.
KGPL	Los Angeles, Cal.	1712 kc.
KGPM	San Jose, Cal.	2466 kc.
KGPN	Davenport, Iowa	2466 kc.
KGPO	Tulsa, Okla.	2450 kc.
KGPP	Portland, Ore.	2442 kc.
KGPQ	Honolulu, T.H.	1712 kc.
KGPR	Minneapolis, Minn.	2430 kc.
KGPS	Bakersfield, Cal.	2414 kc.
KGPW	Salt Lake City, Utah	2406 kc.
KGPX	Denver, Colo.	2442 kc.
KGPY	Baton Rouge, La.	1574 kc.
KGPZ	Wichita, Kans.	2450 kc.
KGZA	Fresno, Calif.	2414 kc.
KGZB	Houston, Tex.	1712 kc.
KGZC	Topeka, Kans.	2422 kc.
KGZD	San Diego, Cal.	2490 kc.
KGZE	San Antonio, Tex.	2482 kc.
KGZF	Chanute, Kans.	2450 kc.
KGZG	Des Moines, Iowa	2466 kc.
KGZH	Klamath Falls, Ore.	2382 kc.
KGZI	Wichita Falls, Tex.	2458 kc.
KGZJ	Phoenix, Ariz.	2430 kc.
KGZL	Shreveport, La.	1712 kc.
KGZM	El Paso, Tex.	2414 kc.
KGZN	Tacoma, Wash.	2414 kc.
KGZO	Santa Barbara, Cal.	2414 kc.
KGZP	Coffeyville, Kans.	2450 kc.
KGZQ	Waco, Tex.	1712 kc.
KGZR	Salem, Ore.	2442 kc
KGZS	McAlester, Okla.	2458 kc.
KGZT	Santa Cruz, Cal.	1674 kc.
KGZU	Lincoln, Neb.	2490 kc.
KGZV	Aberdeen, Wash.	2414 kc.
KGZW	Lubbock, Tex.	2458 kc.
KGZX	Albuquerque, N. Mex.	2414 kc.
KGZY	San Bernardino, Cal.	1712 kc.
KIUK	Jefferson City, Mo.	1674 kc.
KNFA	Clovis, N. Mex.	2414 kc.
KNFB	Idaho Falls, Idaho	2414 kc.
KNFC	SS Gov. Stevens, (Wash.)	2490 kc.
KNFD	SS Gov. J. Rogers, (Wash.)	2490 kc.
KNFE	Duluth, Minn.	2382 kc.
KNFF	Leavenworth, Kans.	2422 kc.
KNFG	Olympia, Wash.	2490 kc.
KNFH	Garden City, Kans.	2474 kc.
KNFI	Mt. Vernon, Wash.	2414 kc.
KNFJ	Pomona, Cal.	1712 kc.
KNFK	Bellingham, Wash.	2490 kc.
KNFL	Shuksan, Wash.	2490 kc.
KNFM	Compton, Cal.	2490 kc.
KNFN	Waterloo, Ia.	1682 kc.
KNFO	Storm Lake, Ia.	1682 kc.
KNFP	Everett, Wash.	2414 kc.
KNFQ	Skykomish, Wash.	2490 kc.
KNGE	Cleburne, Tex.	1712 kc.
KNGF	Sacramento, Cal.	2422 kc.
KNGG	Phoenix, Ariz.	1698 kc.
KNGH	Dodge City, Kans.	2474 kc.
KNGJ	El Centro, Cal.	2490 kc.
KNGK	Duncan, Okla.	2450 kc.
KNGL	Galveston, Tex.	1712 kc.
KSNE	Duluth, Minn.	2382 kc.
KSW	Berkeley, Cal.	1658 kc.
KVP	Dallas, Tex.	1712 kc.
VDM	Halifax, N.S.	1690 kc.
VYR	Montreal, Can.	1706 kc.
VYW	Winnipeg, Man.	2396 kc.
WCK	Belle Island, Mich.	2414 kc.
WEY	Boston, Mass.	1630 kc.
WKDT	Detroit, Mich.	1630 kc.
WKDU	Cincinnati, Ohio	1706 kc.
WMDZ	Indianapolis, Ind.	2442 kc.
WMJ	Buffalo, N. Y.	2422 kc.
WMO	Highland Park, Mich.	2414 kc.
WMP	Framingham, Mass.	1666 kc.
WNFP	Niagara Falls, N. Y.	2422 kc.
WPDA	Tulare, Cal.	2414 kc.
WPDB	Chicago, Ill.	1712 kc.
WPDC	Chicago, Ill.	1712 kc.
WPDD	Chicago, Ill.	1712 kc.
WPDE	Louisville, Ky.	2442 kc.
WPDF	Flint, Mich.	2466 kc.
WPDG	Youngstown, Ohio	2458 kc.
WPDH	Richmond, Ind.	2442 kc.
WPDI	Columbus, Ohio	2430 kc.
WPDK	Milwaukee, Wis.	2450 kc.
WPDL	Lansing, Mich.	2442 kc.
WPDM	Dayton, Ohio	2430 kc.
WPDN	Auburn, N. Y.	2382 kc.
WPDO	Akron, Ohio	2458 kc.
WPDP	Philadelphia, Pa.	2474 kc.
WPDR	Rochester, N. Y.	2422 kc.
WPDS	St. Paul, Minn.	2430 kc.
WPDT	Kokomo, Ind.	2490 kc.
WPDU	Pittsburgh, Pa.	1712 kc.
WPDV	Charlotte, N. C.	2458 kc.
WPDW	Washington, D. C.	2422 kc.
WPDX	Detroit, Mich.	2414 kc.
WPDY	Atlanta, Ga.	2414 kc.
WPDZ	Fort Wayne, Ind.	2490 kc.
WPEA	Syracuse, N. Y.	2382 kc.
WPEB	Grand Rapids, Mich.	2442 kc.
WPEC	Memphis, Tenn.	2466 kc.
WPED	Arlington, Mass.	1712 kc.
WPEE	New York, N. Y.	2450 kc.
WPEF	New York, N. Y.	2450 kc.
WPEG	New York, N. Y.	2450 kc.
WPEH	Somerville, Mass.	1712 kc.
WPEI	E. Providence, R. I.	1712 kc.
WPEK	New Orleans, La.	2430 kc.
WPEL	W. Bridgewater, Mass.	1666 kc.
WPEM	Woonsocket, R. I.	2466 kc.
WPEP	Kenosha, Wis.	2450 kc.
WPES	Saginaw, Mich.	2442 kc.
WPET	Lexington, Ky.	1706 kc.
WPEV	Portable (in Mass.)	1666 kc.
WPEW	Northampton, Mass.	1666 kc.
WPFA	Newton, Mass.	1712 kc.
WPFC	Muskegon, Mich.	2442 kc.
WPFE	Reading, Pa.	2442 kc.
WPFG	Jacksonville, Fla.	2442 kc.
WPFH	Baltimore, Md.	2414 kc.
WPFI	Columbus, Ga.	2414 kc.
WPFJ	Hammond, Ind.	1712 kc.
WPFK	Hackensack, N. J.	2430 kc.
WPFL	Gary, Ind.	2470 kc.
WPFM	Birmingham, Ala.	2382 kc.
WPFN	Fairhaven, Mass.	1712 kc.
WPFO	Knoxville, Ten.	2474 kc.
WPFP	Clarksburg, W. Va.	2490 kc.
WPFQ	Swathmore, Pa.	2474 kc.
WPFR	Johnson City, Tenn.	2470 kc.
WPFS	Asheville, N. C.	2474 kc.
WPFT	Lakeland, Fla.	2442 kc.
WPFU	Portland, Me.	2422 kc.
WPFV	Pawtucket, R. I.	2466 kc.
WPFW	Bridgeport. Conn.	2466 kc.
WPFX	Palm Beach, Fla.	2442 kc.
WPFY	Yonkers, N. Y.	2442 kc.
WPFZ	Miami, Fla.	2442 kc.
WPGA	Bay City, Mich.	2466 kc.
WPGB	Port Huron, Mich.	2466 kc.
WPGC	S. Schenectady, N. Y.	1658 kc.
WPGD	Rockford, Ill.	2458 kc.
WPGF	Providence, R. I.	1712 kc.
WPGG	Findlay, Ohio	1596 kc.
WPGH	Albany, N. Y.	2414 kc.
WPGI	Portsmouth, Ohio	2430 kc.
WPGJ	Utica, N. Y.	2414 kc.
WPGK	Cranston, R. I.	2466 kc.
WPGL	Binghamton, N. Y.	2442 kc.
WPGN	South Bend, Ind.	2490 kc.
WPGO	Huntington, N. Y.	2490 kc.
WPGP	Muncie, Ind.	2442 kc.
WPGQ	Columbus, Ohio	1596 kc.
WPGS	Mineola, N. Y.	2490 kc.
WPGT	New Castle, Pa.	2482 kc.
WPGU	Cohasset, Mass.	1712 kc.
WPGV	Boston, Mass.	1712 kc.
WPGW	Mobile, Ala.	2382 kc.
WPGX	Worcester. Mass.	2466 kc.
WPGZ	Johnson City. Tenn.	2474 kc.
WPHA	Fitchburg, Mass.	2406 kc.
WPHB	Nashua. N. H.	2422 kc.
WPHC	Massillon, O.	1682 kc.
WPHD	Steubenville, O.	2458 kc.
WPHE	Marion Co., Ind.	1634 kc.
WPHF	Richmond, Va.	2450 kc.
WPHG	Medford, Mass.	1712 kc.
WPHI	Charleston, W. Va.	2490 kc.
WPHJ	Fairmont, W. Va.	2490 kc.
WPHK	Wilmington, O.	1596 kc.
WPHL	Portable in Ohio	1682 kc.
WPHM	Orlando, Fla.	2442 kc.
WPHN	Tampa, Fla.	2466 kc.
WPHO	Zanesville, Ohio	2430 kc.
WPHP	Jackson, Mich.	2466 kc.
WPHQ	Parkersburg, W. Va.	2490 kc.
WPHS	Culver, Ind.	1634 kc.
WPHT	Cambridge, Ohio	1682 kc.
WPHV	Bristol, Va.	2450 kc.
WPHY	Elizabethton, Tenn.	2474 kc.
WPSP	Harrisburg, Pa.	1674 kc.
WQFA	New Haven, Conn.	2466 kc.
WQFE	Seymour, Ind.	1634 kc.
WRBH	Cleveland, Ohio	2458 kc.
WRDQ	Toledo, Ohio	2474 kc.
WRDR	Grosse Pt. Village, Mich.	2414 kc.
WRDS	E. Lansing, Mich.	1666 kc.
W1XAO	Boston, Mass.	1712 kc.

Television Stations

2000-2100 kc.

VE9AU—London, Ont., Can.
VE9DS—Montreal, Que.
W2XDR—Long Island City, N. Y.
W8XAN—Jackson, Mich.
W9XK—Iowa City, Ia.
W9XAK—Manhattan, Kans.
W9XAO—Chicago, Ill.
W6XAH—Bakersfield, Calif.

2750-2850 kc.

W3XAK—Portable
W9XAP—Chicago, Ill.
W2XBS—Bellmore, N. Y.
W9XAL—Kansas City, Mo.
W9XG—W. Lafayette, Ind.
W2XAB—New York, N. Y.
VE9AR—Saskatoon, Sask., Can.
VE9ED—Mt. Joli, Que., Can.

42000-56000, 60000-86000 kc.

W2XAX—New York, N. Y.
W6XAO—Los Angeles, Calif.
W9XD—Milwaukee, Wis.
W2XBT—Portable
W2XF—New York, N. Y.
W3XE—Philadelphia, Pa.
W3XAD—Camden, N. J.
W10XX—Portable & Mobile (Vicinity of Camden)
W2XDR—Long City, N. Y.
W8XAN—Jackson, Mich.
W9XAT—Portable
W2XD—New York, N. Y.
W2XAG—Portable
W1XG—Boston, Mass.
W9XK—Iowa City, Ia.
VE9BZ—Vancouver, B.C., Can.
VE9DS—Montreal, Que., Can.
VE9AU—London, Ont., Can.
VE9RC—Quebec, Que., Can.

Grand Short-Wave Station List

● ***This Grand List of Short-Wave Stations of the World is a carefully edited one, and especially compiled by the editors. Only those short-wave stations which the average listener is likely to hear have been included in this list. A special "Quick Reference" list appears elsewhere in the magazine, giving the "Star" short-wave broadcasting stations, while another specially edited list contains the "Television" and "Police" station call letters.***

The editors will be glad at all times to receive corrections from our readers, and particularly any additional information on new stations not found in this list. In giving this information, please write such data on a separate sheet if the letter contains references to any other subject, so that these corrections can be handed directly to the editor of this department. A postcard will frequently serve the purpose for sending us such information.

Short Wave Phone Stations By Order of Frequency in Megacycles

Freq. Mc.	CALL	LOCATION
		199 TO 180 METERS
1.510	VAF	Alert Bay, Can.
1.510	CJD	Campbell River, B.C., Can.
1.510	VAC	Cape Lazo, Can.
1.510	CJN	Cardero Channel, B.C., Can.
1.510	CJE	Ceepeecee, B.C., Can.
1.510	CJK	Knight Inlet, B.C., Can.
1.510	VCU	Merry Island, Can.
1.510	CFV	Namu, B.C., Can.
1.510	CKQ	Powell River, B.C., Can.
1.510	YLZ	Riga, Latvia (X)
1.510	CJT	Theodosia Arm, B.C., Can.
1.510	CYG	Thurston Bay, B.C., Can.
1.510	VAI	Vancouver, B.C., Can.
1.510	CJH	Viner Sound, B.C., Can.
1.510	CJR	Wakeman Sound, B.C., Can..
1.520	VIA	Adelaide, Australia
1.520	VKO	Sydney, Australia
1.523	GUF	Alderney, United Kingdom
1.523	GUG	Guernsey, United Kingdom
1.523	GUB	Lochboisdale, United Kingdom
1.523	GUA	Tobermory, United Kingdom
1.530	W9XBY	Kansas City, Missouri, USA (BX)
1.530	W1XBS	Prospect Twp., Conn.,USA (BX)
1.530	SCJ	Karlskrona, Sweden (B)
1.532	CFC	Cub Lake, Sask., Can.
1.532	CGV	Emma Lake, Sask., Can.
1.532	CZJ	Ile-a-la-Crosse, Sask., Can.
1.532	CGQ	Lac la Ronge, Sask., Can.
1.532	CJC	Thunder Mountain, Sask., Can.
1.538	OSW	Antwerp, Belgium
1.538	OYM	Christianso, Denmark
1.538	OXJ	Thorshavn, Denmark
1.538	OZK	Thorshavn, Denmark
1.538	TFO	Malmey, Iceland
1.538	TFS	Stykkisholmur, Iceland
1.540	VBY	Lunenburg, N.S., Can.
1.540	VK3EJ	Melbourne, Australia (Fire)
1.540	CJD	Campbell River, B.C., Can.
1.540	CJD	Thurston Bay, B.C., Can.
1.550	W6XAI	Bakersfield, Calif. (BX)
1.550	W2XR	Long Island City, N.Y., USA (BX)
1.550	YDA4	Soekaboemi, Neth. India (B)
1.550	----	Naval stations, United Kingdom
1.560	CZA	Drummondville, P.Q., Can.
1.560	VBQ	Halifax, N.S., Can.
1.570	YDB6	Malang, Netherland India
1.579	VLA	Cape Bruny, Australia
1.579	VLB	Maatsuyker Isl., Australia
1.579	VLC	Tasman Isl., Australia
1.579	DCA	Adlergrund Lightship, Germany
1.579	DCV	Bremen Lightship, Germany
1.579	DCK	Elbe Lightship No. 2, Germany
1.579	DCG	Elbe Lightship No. 3, Germany
1.579	DCI	Elbe Lightship No. 4, Germany
1.579	DCU	Robbenplate Lighthouse, Germ.
1.579	----	Ship Stations, Germany
1.579	OYQ	Jakobshavn, Greenland
1.580	CJM	Borden, P.E.I., Canada
1.582	YDD3	Batavia, Netherland India (B)
1.585	PCC	Noordhinder Lightship, Neth.
1.585	PID	Vlissingen Canal Watch, Neth.
1.595	OZP	Lyngby, Denmark (B)
1.595	YDB5	Solo, Netherland India (B)
1.596	----	Experimental, USA
1.596	CFC	Cub Lake, Sask., Canada
1.596	CGV	Emma Lake, Sask., Canada
1.596	CZJ	Ile-la-Cross, Sask., Canada
1.596	CGQ	Lac la Ronge, Sask,. Canada
1.596	CJC	Thunder Mountain, Sask., Can.
1.596	TFZ	Isafjordur, Iceland
1.596	TFA	Reykjavik, Iceland
1.596	TFX	Siglufjordur, Iceland
1.596	TFV	Vestmannaeyjar, Iceland
1.600	PIE	Hoek van Holland, Netherlands
1.600	PCB	Maas Lightship, Netherlands
1.600	PIC	Scheveningen Lighthouse Dep. Netherlands
1.615	PIB	Brandaris Lighthouse, Neth.
1.615	PCD	Haaks Lightship, Netherlands
1.615	PIA	Kykduin Semaphore, Neth.
1.615	PCE	Terschellingerbank Lightship, Netherlands
1.615	YDB4	Tjepoe, Netherland India (B)
1.620	CZB	Bellevue, P.Q., Canada
1.620	CFC	Cub Lake, Sask., Canada
1.620	CGV	Emma Lake, Sask., Canada
1.620	CZJ	Ile-a-la-Crosse, Sask., Canada
1.620	CFD	Kenora, Ont., Canada
1.620	CGQ	Lac la Ronge, Sask., Canada
1.620	CMF	Manicouagan River, P.Q., Can.
1.620	CZY	Riviere du Chef, P.Q., Canada
1.620	CZZ	St. Felicien, P. Q., Canada
1.620	CFL	Tabouret, P. Q., Canada
1.620	CJC	Thunder Mt., Sask., Canada
1.620	----	Experimental, Canada
1.622	VKA	Bogolara, Australia
1.622	VJE	Burrinjuck, Australia
1.622	VJF	Cootamundra, Australia
1.622	VJH	Gundagai, Australia
1.622	VJO	Koorawatha, Australia
1.622	VKJ	Lithgow, Australia
1.622	VJG	Murrumburrah, Australia
1.622	VKB	Yass, Australia
1.622	----	Portable, Burrinjuck, Australia
1.622	----	Portable, Lithgow, Australia
1.622	OXB	Blaavand, Denmark, 2B
1.622	OUY	Vyl Lightship, Denmark
1.629	ESS	Osmussaar, Estonia
1.630	YDD2	Bandoeng, Netherland India
1.640	YDA3	Buitenzorg, Netherl. India, B
1.648	TFA	Reykjavik, Iceland
1.648	TFX	Siglufjordur, Iceland
1.648	TFV	Vestmannaeyjar, Iceland
1.660	YDB3	Djokjakarta Netherl. Ind., (B)
		180 TO 160 METERS
1.690	----	Burnham, United Kingdom
1.712	CZG	Prince Rupert, B. C., Canada
1.712	CZF	Vancouver, B. C., Canada
1.712	CZE	Victoria, B. C., Canada
1.714	ESG	Tallinn-Ulemiste, Etonia
1.715	----	Amateurs, Argentina
1.715	----	Amateurs, Canada
1.715	----	Amateurs, Ecuador
1.715	----	Amateurs, Estonia
1.715	----	Amateurs, Union of So. Africa
1.716	----	
to		Amateurs, USA
2.000		
1.720	DAL	Bremerhaven Lloydhalle, Ger.
1.730	YLY	Liepaja, Latvia, (X)
1.735	RFAU	Bykovo (Moskow Obl.) Russia
1.754	OYE	Ronne, Denmark
1.760	GMH	Main Head, Irish Free State
1.760	GCK	Valentia Irish Free State
1.760	----	Burnham, United Kingdom
1.760	----	Cullercoats, United Kingdom
1.760	----	Fishguard, United Kingdom
1.760	----	Humber, United Kingdom
1.760	----	Lands End, United Kingdom
1.760	----	Niton, United Kingdom
1.760	----	North Foreland, United King.
1.760	----	Portpatrick, United Kingdom
1.760	----	Seaforth, United Kingdom
1.760	----	Wick, United Kingdom
1.764	EAI	Teneriffe, Canary Islands
1.764	DCS	Tonning, Germany
1.765	TFF	Flatey a Skjalfanda, Iceland
1.775	RHBD	Leningrad, Russia
1.775	ESR	Ruhnu, Estonia
1.775	----	Ship Stations, Germany
1.818	OUY	Vyl Lightship, Denmark
1.818	PDN	Scheveningen, Netherlands
1.818	RHBD	Leningrad, Russia
1.819	OXC	Ringsted, Denmark
1.840	YDJ4	Cheribon, Netherl. Indie, (B)
1.860	YDK6	Semarang, Netherl. India, (B)
		160 TO 120 METERS
1.875	EAU	San Lorenzo, Canary Islands
1.875	DCA	Adlergrund Lightship, Germany
1.875	DCV	Bremen Lightship, Germany
1.875	DCK	Elbe Lightship No. 2, Germany
1.875	DCG	Elbe Lightship No. 3, Germany
1.875	DCI	Elbe Lightship No. 4, Germany
1.875	DAC	Elbe-Weser, Germany
1.875	DCU	Robbinplate Lighthouse, Ger.
1.875	DAS	Rugen, Germany
1.875	----	Naval Stations, Germany
1.875	TFH	Husavik, Iceland
1.875	RFAW	Moscow, Russia
1.875	RLXS	Saratov, Russia
1.880	YDO9	Soerabaja, Netherl. India, (B)
1.898	ESP	Parnu, Estonia
1.900	YDG6	Batavia, Netherl. India, (B)
1.900	RW69	Odessa, Russia, (T)
1.910	----	Ship Stations, Germany
1.920	YDH9	Buitenzorg, Netherl. India, (B)
1.940	OHN	Hango, Finland
1.940	YDN3	Kediri, Netherland India, (B)
1.960	----	Ship Stations, Germany
2.000	OXK	Tveraa, Denmark
2.000	TFG	Grimsey, Iceland
2.020	RIAD	Nijni-Chkaft, Russia
2.020	----	Portable, Australia
2.050	VJI	Cloncurry, Australia
2.090	DAS	Rugen, Germany
2.098	----	Kronborg Light, Denmark
2.110	----	Ship-to-Shore radiophone, USA
2.110	YDI2	Soekaboemi, Netherl. India, (B)
2.126	----	Ship-to-Shore, USA
2.140	DAC	Elbe-Weser, Germany
2.140	VHO	Melbourne, Australia
2.174	----	Ship-to-Shore, USA
2.198	----	Ship-to-Shore, USA
2.206	VYV	Port Menier, P. Q., Canada
2.212	VYZ	High Falls, P. Q., Canada
2.230	RT7	Azov-on-le-Don, Russia
2.252	KIUG	Portable, USA
2.252	KIUF	Portable, USA
2.252	KIUE	Portable, USA
2.252	KIUD	Portable, USA
2.252	KIUC	Portable, USA
2.252	KIUB	Portable, USA
2.255	DAC	Elbe-Weser, Germany
2.284	CKO	Crane Island, P. Q., Canada
2.284	CFI	Flaggs Cove, N. B., Canada
2.284	CFT	Leamington, Ont., Canada
2.284	CKP	Montmagny, P. Q., Canada
2.284	CFX	Pelee Island, Ont., Canada
2.284	CKB	Pictou, N. S., Canada
2.284	CKU	Pictou Island, P. Q., Canada
2.284	CFZ	Welchpool, N. B., Canada
2.290	CFW	Bones Bay, B. C., Canada
2.290	CJE	Ceepeecee, B. C., Canada
2.290	VFJ	Homalko, B. C., Canada
2.290	CZL	Humpback Bay, B. C., Canada
2.290	CJY	Jackson Bay, B. C., Canada
2.290	CFV	Namu, B. C., Canada
2.290	CJL	Selwyn Inlet, B. C., Canada
2.290	CJR	Wakeman Sound, B. C., Canada
2.300	RHHA	Armavir, Russia
2.300	RKPU	Loubny, Russia
2.343	RFCQ	Moscow, Russia
2.350	VBQ	Halifax, N. S., Canada
2.355	----	Burnham, United Kingdom
2.355	----	Cullercoats, United Kingdom
2.355	----	Fishguard, United Kingdom
2.355	----	Humber, United Kingdom
2.355	----	Lands End, United Kingdom
2.355	----	Malin Head, United Kingdom
2.355	----	Niton Radio, United Kingdom
2.355	----	North Foreland, United King.

*=Broadcasting; X=Experimental.

Freq. Mc.	CALL	LOCATION
2.355	----	Portpatrick, United Kingdom
2.355	----	Seaforth, United Kingdom
2.355	----	Valentia, United Kingdom
2.355	----	Wick, United Kingdom
2.357	EDP	Palma de Mallorca, Spain
2.357	EDR4	Palma de Mallorca, Spain
2.366	----	Naval Stations, United King.
2.385	YDA2	Batavia, Netherl India, (B)
2.398	----	Experimental, USA
2.400	EST	Tallinn-Sadam, Estonia
2.400	DAF	Norddeich, Germany
2.400	OYR	Egedesminde, Greenland
2.415	YDE4	Soerabaja, Netherl. India, (B)
2.416	CZG	Prince Rupert, B. C., Canada
2.416	CJW	St. John, N. B., Canada
2.416	CZF	Vancouver, B. C., Canada
2.416	CZE	Victoria, B. C., Canada
2.416	VYW	Winnipeg, Man., Canada
2.450	YDB2	Semarang, Netherl. India, (B)
2.452	CQZ	Vancouver, B. C., Canada
2.452	CJZ	Verdun, P. Q., Canada
		120 TO 100 METERS
2.500	DAS	Rugen, Germany
2.500	TFQ	Djopivogur, Iceland
2.517	EDO	Madrid, Spain
2.517	EDR2	Madrid, Spain
2.517	EDS	Madrid, Spain
2.550	RHJS	Oust-Labinskaia, Russia
2.604	WZAS	Gasconade, Mo., USA
2.604	WXA	Juneau, Alaska
2.604	WXH	Ketchekan, Alaska
2.604	WYBF	Napoleon, Mo., USA
2.604	WXY	Nome, Alaska
2.604	----	Transports, USA
2.610	RELB	Boukhta Bertys, Russia
2.610	RELD	Boukhta Bertys, Russia
2.610	RELO	Boukhta Bertys, Russia
2.610	RELZ	Spasskyi Zavod, Russia
2.640	----	Airways, USA
2.644	----	Airways, USA
2.670	NOX	Biloxi, Miss., USA
2.670	NOB	Buffalo, N. Y., USA
2.670	NOV	Cape May, N. J., USA
2.670	NMD	Cleveland, Ohio, USA
2.670	NOL	Ft. Lauderdale, Fla., USA
2.670	NOY	Galveston, Texas, USA
2.670	NMW	Grays Harbor, Wash., USA
2.670	NMV	Jacksonville, Fla., USA
2.670	NOM	Miami, Fla., USA
2.670	NMG	Mobile, Ala., USA
2.670	NOU	New London, Conn., USA
2.670	NMC	Point Bonita, Calif., USA
2.670	NOJ	Point Vicente, Calif., USA
2.670	NOW	Port Angeles, Wash., USA
2.670	NOZ	Port Tounsend, Wash., USA
2.670	NMN	Princess Anne, Va., USA
2.670	NMY	Rockaway Point, N. Y., USA
2.670	NOF	St. Petersburg, Fla., USA
2.670	NOS	Salem, Mass., USA
2.670	NMP	Wilmette, Ill., USA
2.670	NMF	Winthrop, Mass., USA
2.672	EDO	Madrid, Spain
2.672	EDR2	Madrid, Spain
2.673	EDS	Madrid, Spain
2.698	NOX	Biloxi, Miss., USA
2.698	NOB	Buffalo, N. Y., USA
2.698	NMD	Cleveland, Ohio, USA
2.698	NOW	Port Angeles, Wash., USA
2.698	NOS	Salem, Mass., USA
2.698	NMP	Wilmette, Ill., USA
2.710	YDK5	Semarang, Netherl. India, (B)
2.730	KZGF	Manila, Philippine Islands
2.730	----	North Foreland, United Kingdom
2.738	WKDX	New York, N. Y., USA
2.740	CFD	Kenora, Ont., Canada
2.740	----	Experimental, Canada
2.750	----	Experimental, tel., USA, (T)
2.750	----	Experimental, tel., Can., (T)
2.750	YDL6	Djokjakarta, Nethrl. India, (B)
2.758	----	Experimental, Can.
2.760	YZGH	Iloilo, Philippine Islands
2.770	VK3LR	Lyndhurst, Vic., Australia
2.770	VK3XX	Lyndhurst, Vic., Australia
2.770	YDO6	Soerabaja, Netherl. India, (B)
2.790	YDN2	Madioen, Netherl. India, (B)
2.800	----	Aeronautical, Europe
2.810	YDQ6	Malang, Netherland India (B)
2.810	RHBD	Leningrad, Russia
2.815	----	Aeronautical, Europe
2.820	VK3LR	Lyndhurst, Vic., Australia, (B)
2.820	VK3XX	Lyndhurst, Vic., Australia
2.820	RIAD	Nijni-Chkaft, Russia
2.830	KZGG	Cebu, Philippine Islands
2.830	YDU4	Medan, Netherland Indies (B)
2.830	----	Aeronautical, Europe
2.835	----	Rome, Italy
2.845	OHG	Helsingfors, Finland
2.845	VLT	Bulolo, New Guinea
2.870	YDJ3	Tegal, Netherland India, (B)
2.870	RFCQ	Moscow, Russia
2.875	EDR4	Palma de Mallorca, Spain
2.890	YDJ2	Pekalongou, Netherl. India, (B)
2.910	YDE3	Semarang, Netherl. India, (B)
2.920	REKD	Alma-Ata, Russia
2.930	YDO5	Soerabaja, Netherl. India, (B)
2.950	YDQ5	Malang, Netherland India, (B)
2.980	CZA	Drummondville, P. Q., Canada
		100 TO 85 METERS
2.990	RHBB	Novorjev, Russia
3.000	SQB	Bialystok, Poland
3.000	SQA	Lwow, Poland
3.000	SWZ	Warsaw, Poland
3.040	YDA	Tandjongpriok, Neth. Ind. (B)
3.040	CGE	Calgary, Alta., Canada
3.040	CKS	Calgary, Alta., Canada
3.040	RKDM	Medvejia Gora, Russia
3.040	RKOO	Odessa, Russia
3.040	RKDO	Parandovo, Russia
3.048	KIOG	Portable, USA
3.048	KIUF	Portable, USA
3.048	KIUE	Portable, USA
3.048	KIUD	Portable, USA
3.048	KIUC	Portable, USA
3.048	KIUB	Portable, USA
3.050	RUF	Moscow, Russia
3.050	----	Portable, Wyndham Meatsworks, Australia
3.058	VYY	Masson, P. Q., Canada
3.060	RKNK	Kharkov, Russia
3.060	RUF	Moscow, Russia
3.080	PVV5	Tarauaca, Brazil
3.080	RHIK	Rostov on Don, Russia
3.080	REBB	Vladimir, Russia
3.088	----	Airplanes, USA
3.090	RBX	Moscow, Russia
3.095	W7XA	Portable, USA
3.095	W7XAQ	Portable, USA
3.105	----	Airplanes, USA
3.125	RPF	Moscow, Russia
3.130	YDH6	Bandoeng, Netherl. India, (B)
3.135	RKOP	Kiev, Russia
3.140	RMDU	Ouroulga, Russia
3.150	YDG3	Batavia, Netherl. India, (B)
3.150	REIX	Akmolinsk, Russia
3.150	RLEE	Bouchoulei, Russia
3.150	RMDK	Ksenievskaia, Russia
3.152	CGM	Montreal, P. Q., Canada
3.152	CGY	Yamachichi P. Q., Canada
3.155	W7XAQ	Portable station, USA
3.158	OYN	Upernivik, Greenland
3.160	CGM	Montreal, P. Q., Canada
3.160	CGY	Yamachichi, P. Q., Canada
3.160	RLEZ	Zilovo, Russia
3.170	YDO4	Soerabaja, Netherl. India, (B)
3.170	RLEC	Tehita, Russia
3.180	RMDG	Bolchoi Never, Russia
3.180	RHJD	Chakhty, Russia
3.180	RLED	Chulka, Russia
3.180	RMWA	Tashkent, Russia
3.180	RMDF	Zeia, Russia
3.190	YDK2	Semarang, Netherl. India, (B)
3.190	RMDQ	Amazar, Russia
3.190	RENI	Tehimkent, Russia
3.195	W7XAQ	Portable, USA
3.200	RMDM	Mogotcha, Russia
3.210	YDL5	Djokjakarta, Nethrl. India, (B)
3.230	YDQ4	Malang, Netherland India, (B)
3,235	W7XAQ	Portable, USA
3.240	RMAY	Troitse Zaroubino, Russia
3.240	EDP	Palma de Mallorca, Spain
3.240	EDO	Madrid, Spain
3.240	EDR2	Madrid, Spain
3.250	YDH5	Garoet, Netherland India, (B)
3.256	----	Experimental, Canada
3.265	W7XAQ	Portable, USA
3.270	YDK4	Mageland, Netherl. India, (B)
3.275	RMAS	Tafouin, Russia
3.295	W7XAQ	Portable, USA
3.310	YDH4	Bandoeng, Netherl. India, (B)
3.310	RIAC	Penza, Russia
3.330	LPG	General Pacheco, Argentina
3.330	YDV2	Bandjermasin, Neth. India, (B)
3.330	RRRR	Tashkent, Russia
3.332	CFD	Kenora, Ont., Canada
3.333	OGH	Elmholm, Finland
3.333	OGF	Fagerholm, Finland
3.333	OFL	Haapasaari, Finland
3.333	OHN	Hango, Finland
3.333	OGE	Helsingfors, Finland
3.333	OHG	Helsingfors, Finland
3.333	OHH	Koivisto Finland
3.333	OFM	Kotka, Finland
3.333	OFQ	Lavansaari, Finland
3.333	OFY	Mariehanin, Finland
3.333	OFW	Pirttisaari, Finland
3.333	OFX	Porkkala, Kallbada, Finland
3.333	OFV	Porkkala, Ronnskar, Finland
3.333	OGI	Saggo, Finland
3.333	OFS	Seiskari, Finland
3.333	OFN	Suursaari, Finland
3.333	OFI	Tanimio, Finland
3.333	OFO	Tytarsaari, Finland
3.333	OHT	Uto, Finland
3.333	OGJ	Vaasa, Finland
3.333	OFU	Vatskar, Finland
3.333	OHP	Viipuri, Finland
3.340	CGD	Drummondville, P. Q., Canada
3.340	CGM	Montreal, P. Q., Canada
3.345	W7XA	Portable, USA
3.350	----	Naval Stations, Germany
3.350	YDQ3	Malang, Netherland India, (B)
3.370	YDU2	Medan, Netherland India, (B)
3.370	RIAY	Tchernoretchenskoe, Russia
3.380	RGJV	Iochkar-Ola, Russia
3.380	RENJ	Karsakpai, Russia
3.385	KIIU	Marshall, Alaska
3.385	W7XAP	Portable, USA
3.390	RENG	Atchi-Sai, Russia
3.390	YDQ2	Djember, Netherland India, (B)
3.410	WWG	Cheboygan Range Light Station, Mich., USA
3.410	WWEC	Delaware Breakwater Light, Del., USA
3.410	WWR	Detroit, L.H. Depot, Mich., USA
3.410	WWN	Detroit River Light Station, Mich., USA
3.410	WST	Dry Tortugas Lgt. Sta., USA
3.410	WWDI	Edgemoor Depot, Del.
3.410	WWDW	Fourteen Foot Bank Light, Del., USA
3.410	WWZ	Key West L.H. Dep. Fla., USA
3.410	WWAJ	Manitou Lgt. Sta., Mich, USA
3.410	WWM	Marquette Lgt. Sta., Wis., USA
3.410	WWAL	Passage Isl. Lgt. Sta., USA
3.410	WRL	Poe Reef Lgt. Sta., Mich., USA
3.410	WWAM	Rock of Ages Lgt., Mich., USA
3.410	WWH	Standard Rock Lgt., Mich., USA
3.410	YDL4	Djokjakarta, Nethrl. India, (B)
3.410	RGAZ	Kotelnitch, Russia
3.410	RJBD	Soerdlovsk, Russia
3.420	RFAU	Bykovo, Russia
3.435	OEHI	Vienna, Austria
3.430	YDO2	Soerabaja, Netherl. India, (B)
3.440	RFAX	Moscow, Russia
3.440	RKF	Moscow, Russia
3.445	W7XAQ	Portable, USA
3.450	YDL2	Solo, Netherland India, (B)
3.450	RKNZ	Kharkov, Russia
3.450	RFAG	Moscow, Russia
3.450	RFBL	Moscow, Russia
3.460	CFD	Kenora, Ont., Canada
3.460	CZG	Prince Rupert, B. C., Canada
3.460	CZF	Vancouver, B. C., Canada
3.460	CZE	Victoria, B. C., Canada
3.470	RFAJ	Moscow, Russia
3.480	VLT	Bulolo, New Guinea
3.485	SQB	Bialystok, Poland
3.490	YDH3	Bandoeng, Java, (B)
3.490	HAP	Budapest, Hungary
3.490	SQZ	Warsaw, Poland
		85 TO 80 METERS
3.495	SQA	Lwow, Poland
3.495	----	Airway Stations Russia
3.495	RLXS	Saratov, Russia
3.500 to 4.000	----	Amateurs,
3.505	RHCU	Leningrad, Russia
3.510	RKNX	Debaltsevo, Russia
3.510	RKLA	Kramatorsk, Russia
3.515	RTU	Dolgoproudnaia, Russia
3.520	RFAO	Moscow, Russia
3.520	SQZ	Warsaw, Poland
3.530	TFR	Flatey a Breidafirdi, Iceland
3.530	TFP	Papey, Iceland
3.540	----	Airways Stations, Russia
3.543	CR7AA	Lourenco Marques, Mozambique, (B)
3.550	REIB	Alma-Ata, Russia
3.550	RFAW	Moscow, Russia
3.550	REJB	Sergiopol, Russia
3.550	REJA	Taldy-Kourgon, Russia
3.555	RRT	Vitebsk, Russia
3.560	RPOK	Korosten, Russia
3.565	RRT	Vitebsk, Russia
3.570	RGAP	Gorki, Russia
3.570	RGLG	Mezen, Russia
3.570	RCRI	Nakhitchevan, Russia
3.570	RRT	Vitebsk, Russia
3.580	RLW	Artemovsk, Russia
3.580	RMPB	Madrouchkent, Russia
3.580	RIU	Verkholansk, Russia
3.585	RHCC	Khibinigorsk, Russia
3.590	REX	Indigo-Boukhta, Russia
3.590	RUY	Pervomaisk, Russia
3.600	RPG2	Groumont Siti, Russia
3.600	RKNE	Kharkov, Russia
3.600	RCND	Neval, Russia
3.600	RJCZ	Soerdlovsk, Russia
3.610	RJRV	Kozlov, Russia
3.610	RKLW	Kramatorsk, Russia
3.620	DOA	Doeberitz, Germany
3.620	RCAD	Minsk, Russia
3.620	RGX	Minsk, Russia
3.620	RIAU	Samara, Russia

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL	LOCATION
3.630	RFF	Kharkov, Russia
3.630	RENC	Temir, Russia
3.630	RGFW	Viatka, Russia
3.640	RKOV	Grichino, Russia
3.640	RKME	Kharkov, Russia
3.640	RCTS	Mamadych, Russia
3.640	RIBC	Penza, Russia
3.650	RENT	Gouriev, Russia
3.650	RKPA	Nikolaev, Russia
3.650	RMWA	Tashkent, Russia
3.658	RFAJ	Moscow, Russia
3.660	RKOB	Bobrinskaia, Russia
3.660	----	Konigs Wusterhausen, Ger.
3.670	RKNK	Kharkov, Russia
3.670	RHIY	Tatsinskaia, Russia
3.680	RJAJ	Moscow, Russia
3.685	RAJ	Sovgavan, Russia
3.690	REAS	Chouia, Russia
3.690	RKNC	Kharkov, Russia
3.690	RCRJ	Lenkoran, Russia
3.700	VK3LR	Lyndhurst, Victora, Australia, (B)
3.700	VK3XX	Lyndhurst, Victoria, Australia,
3.700	JPY	Tobata, Japan
3.710	RIBB	Abdoulinskoe, Russia
3.710	RIAZ	Andreeoskoe, Russia
3.710	RGAQ	Ijevsk, Russia
3.710	RFCJ	Kachira, Russia
3.710	RKND	Kharkov, Russia
3.720	RCNQ	Novosokolniki, Russia
3.720	RHJS	Orist Labinskaia, Russia
3.720	RIBE	Samara, Russia
3.730	RKNB	Kharkov, Russia
3.730	RCQA	Koutais, Russia
3.740	RKOU	Kharkov, Russia
3.740	RJEJ	Sverdloosk, Russia
		80 TO 70 METERS
3.750	F8KR	Constantine, Algeria, (B)
3.750	VK3LR	Lyndhurst, Victoria, Australia, (B)
3.750	VK3XX	Lyndhurst, Victoria, Australia
3.750	2RO	Rome, Italy, (B)
3.750	RENY	Dozzor, Russia
3.750	REJQ	Ganiouchkino, Russia
3.750	REBO	Iavnovo, Russia
3.750	RFCV	Kalinin, Russia
3.750	CT1CT	Lisbon, Portugal, (B)
3.760	RENU	Aktinbinsk, Russia
3.760	----	Konigs Wusterhausen, Germany
3.760	RMWP	Samarkand, Russia
3.760	RKOH	Znamenka, Russia
3.769	ZEZ	Broken Hill, Northern Rhodesia
3.769	ZDH	Sameson, Northern Rhodesia
3.769	ZDA	Livingston, Northern Rhodesia
3.769	ZDI	Mongu-Lealui, Northr. Rhodesia
3.769	ZFF	Mpika, Northern Rhodesia
3.770	RRR	Briansk, Russia
3.780	RLW	Artemovsk, Russia
3.780	RLX	Artemovsk, Russia
3.780	RELO	Boukhta Bertys, Russia
3.790	RPNA	Kharkov, Russia
3.800	RKOL	Krementchoug, Russia
3.800	RMPH	Stalinabad, Russia
3.810	RKPP	Ouman, Russia
3.820	RMSE	Karabougaz, Russia
3.830	----	Bykovo, Russia
3.830	RHAB	Leningrad, Russia
3.830	RIAL	Syzran, Russia
3.830	RCQY	Tiflis, Russia
3.840	RKOD	Kazatin, Russia
3.850	RKMC	Odessa, Russia
3.850	RGLC	Syktykvar, Russia
3.860	RKLO	Sorokino, Russia
3.860	RKPO	Vorochilovsk, Russia
3.870	RW77	Moscow, Russia
3.880	RIBA	Bouzoulousk, Russia
3.880	RKLQ	Dnepropetrovsk, Russia
3.880	RCBA	Jlobin, Russia
3.880	RENV	Karaton, Russia
3.885	RCRH	Batoum, Russia
3.890	RLY	Kharkov, Russia
3.900	RFAX	Moscow, Russia
3.910	RLEQ	Tchita, Russia
3.910	RLEV	Verkhne Oudinsk, Russia
3.910	RMCC	Roukhlovo, Russia
3.920	RKLA	Kramatorsk, Russia
3.920	RFAO	Moscow, Russia
3.950	RHAX	Leningrad, Russia
3.998	HCJB	Quito, Ecuador, (B)
4.000	ZGE	Kuala Lumpur, Federated Malay States, (B)
4.000	REJM	Karaganda, Russia
4.002	CT2AJ	Ponta Delgada, Sao Miguel, Azores, (B)
4.010	RFAU	Bykovo, Russia
4.030	RFAW	Moscow, Russia
4.050	DAS	Rugen, Germany
4.054	CNW	Tangier, Morocco
4.060	RGKX	Archangel, Russia
4.080	RFAO	Moscow, Russia
4.097	WND	Hialeah, Fla., USA
4.100	LCL	Jeloy. Norway, (X)
4.110	HCJB	Quito, Ecuador, (B)
4.110	RELO	Boukhta, Bertys, Russia
4.110	RENA	Bourondal, Russia
4.110	RKNX	Debaltsevo, Russia
4.110	RISQ	Novosibirsk, Russia
4.130	RTU	Dolgoproudnaia, Russia
4.130	DAF	Norddeich, Germany
4.135	W7XAQ	Portable, USA
4.140	RELW	Karalinsk. Russia
4.140	RELX	Djarkent, Russia
4.140	RJCU	Magnetigorsk, Russia
4.150	SQZ	Warsaw, Poland
4.150	REIB	Alma Ata, Russia
4.150	RLEN	Nijne Oudinsk, Russia
4.150	RMCC	Roukhlovo, Russia
4.150	REJB	Sergiopol, Russia
4.150	REJA	Tandy-Kourgan, Russia
4.150	RLEQ	Tchita, Russia
4.150	RLEV	Verkneoudinsk, Russia
4.160	SQB	Bialystok, Poland
4.165	LOB	Puerto Aguirre, Argentine
4.165	SQZ	Warsaw, Poland
4.170	SQA	Lwow, Poland
4.174	----	British ships
4.177	----	Ship telephone
4.190	RJXC	Makhatch-Kala, Russia
4.190	RMAT	Vladivostok, Russia
4.272	WOY	Lawrenceville, N. J., USA
4.272	WOO	Ocean Gate, N. J., USA
4.273	RV15	Khabarovsk, Russia, (B)
4.280	RFAK	Koutchino, Russia
		70 TO 60 METERS
4.283	----	Ship telephone
4.286	RKMF	Jitomir, Russia
4.286	RKPL	Jitomir, Russia
4.286	RCNF	Smolensk, Russia
4.295	WTDW	St. Croix, Virgin Islands
4.295	WTDX	St. John, Virgin Islands
4.295	WTDV	St. Thomas, Virgin Islands
4.300	----	Aeronautical, Europe
4.300	RKPE	Liman, Russia
4.300	RKDM	Medvejia Gora, Russia
4.300	RKDO	Parandoyo, Russia
4.300	RHIK	Rostov on Don, Russia
4.305	RGFK	Kanavino, Russia
4.305	RKOG	Vapniarka, Russia
4.310	RMDP	Erofei Pavlovitch, Russia
4.310	RMDT	Staibo, Russia
4.310	RLEC	Tshita, Russia
4.315	RGFK	Kanavino, Russia
4.315	RKOG	Vapniarka, Russia
4.320	G6RX	Hillmorton, United King., (X)
4.320	GDB	Rugby, United Kingdom, (B)
4.330	RKLP	Rovenki, Russia
4.355	IAC	Coltano, Italy, (X)
4.350	RKOP	Kiev, Russia
4.350	PROF	Proskurov, Russia
4.350	RIMK	Topki, Russia
4.360	RMDV	Ekimtchan, Russia
4.360	RMDU	Ouroulga, Russia
4.375	RUF	Moscow, Russia
4.380	RMDW	Dambouki, Russia
4.380	RUF	Moscow, Russia
4.385		
4.390	RENG	Atchi Sai, Russia
4.400	RMDX	Komsomolsk, Russia
4.400	DAF	Norddeich, Germany
4.410	RFAY	Moscow, Russia
4.410	REIK	Petropavlovsk, Russia
4.412	ZGC	Kuala Lumpur, Federated Malay States
4.412	CNR	Rabat, Morocco
4.412	RFAJ	Moscow, Russia
4.420	RKLS	Tchistiakovo, Russia
4.430	RLED	Chilka, Russia
4.430	DOA	Doeberitz, Germany
4.430	RMDH	Ouroucha, Russia
4.430	RMDI	Svobodnyi, Russia
4.430	RMDJ	Tynda, Russia
4.430	RLEZ	Zilovo, Russia
4.430	GBC	Rugby, United Kingdom
4.440	RBX	Moscow, Russia
4.440	RMXC	Tchimion, Russia
4.445	WUM	Tucson, Ariz., USA
4.450	RRY	Moscow, Russia
4.450	RKOS	Routchenkovo, Russia
4.455	RRY	Moscow, Russia
4.460	RKOT	Dnepropetrovsk, Russia
4.460	RKOW	Kharkov, Russia
4.460	RKOI	Kiev, Russia
4.460	RKOE	Odessa, Russia
4.460	RKOJ	Stalino, Russia
4.460	RHIZ	Taganrog, Russia
4.460	RKOC	Vinnitsa, Russia
4.465	CGA4	Drummondville, P. Q., Canada
4.470	YID	Baghdad, Iraq, (B)
4.470	YDB	Soerabaya, Netherl. India, (B)
4.470	RBT	Samarov, Russia
4.475	RRKNK	Kharkov, Russia
4.477	RMGI	Khabarovsk, Russia
4.480	RKMB	Gorlovka, Russia
4.490	RMXA	Kim, Russia
4.490	RLBY	Kirensk, Russia
4.490	RKOR	Krasnyi Loutch, Russia
4.490	RENC	Temir, Russia
4.500	RELB	Boukhta Bertys, Russia
4.500	RELO	Boukhta Bertys, Russia
4.500	----	Naval Stations, Germany
4.505	CZP	Claydon Bay, B. C., Canada
4.505	CGO	Ocean Falls, B. C., Canada
4.505	CZO	Prince George, B. C., Canada
4.510	VPN	Nassau, Bahamas
4.510	RKOA	Berditchev, Russia
4.512	ZFS	Nassau, Bahamas
4.520	RCNO	Briansk, Russia
4.535	WDG	Rocky Point, N. Y., USA
4.540	WIR	Rocky Point, N. Y., USA
4.540	RMXB	Kokand, Russia
4.545	RFAJ	Moscow, Russia
4.545	WDW	New Brunswick, N. J., USA
4.550	KIKC	Bolinas, Calif., USA
4.550	WAD	Rocky Point, N. Y., USA
4.555	WDN	Rocky Point, N. Y., USA
4.570	RIBJ	Kachirinsk, Russia
4.570	RKOQ	Kadrevka, Russia
4.600	HC2ET	Apartado 249, Guayaquil, Ecuador, (B)
4.600	RKON	Gorlovka, Russia
4.615	RLXI	Stalingrad, Russia
4.615	RJRS	Voronei, Russia
4.625	ZGF	Kuantan, Federtd. Malay States
4.670	RIBK	Rouzaevka, Russia
4.687	RFCO	Moscow, Russia
4.700	RCRB	Erivan, Russia
4.710	RIAL	Syzran, Russia
4.710	RENI	Tchmekent, Russia
4.710	RKLM	Zaporojie, Russia
4.715	EDP	Palma de Mallorca, Spain
4.720	RFAJ	Moscow, Russia
4.730	RKMD	Chepetovka, Russia
4.740	RCNP	Smolensk, Russia
4.740	RIBF	Syzran, Russia
4.750	RLGL	Kabansk, Russia
4.753	WOY	Lawrenceville, N. J., USA
4.753	WOO	Ocean Gate, N. J., USA
4.761	RMFN	Grodekovo, Russia
4.775	CFD	Kenora, Ont., Canada
4.785	CZA	Drummondville, P. Q., Canada
4.790	RKMI	Krivoi Rog, Russia
4.795	VE9BY	London, Ont., Canada (X)
4.795	VE9BK	Vancouver, B. C. (X)
4.800	RKMH	Khristinovka, Russia
4.800	RCNQ	Novosokolniki, Russia
4.810	CGP	Prince Rupert, B. C., Canada
4.810	YDE2	Solo, Netherland India, (B)
4.810	RKMG	Vinnitsa, Russia
4.820	PRO	Olinda, Brazil
4.820	REJK	Karsakpai, Russia
4.820	GDW	Rugby, United Kingdom
4.838	RJRV	Kozlov, Russia
4.839	RNZ	Petropavlovsk, Russia
4.840	GDW	Rugby, United Kingdom
4.850	RELO	Boukhta Bertys, Russia
4.850	RKMF	Jitomir, Russia
4.860	CGT	Campbell River, B. C., Canada
4.860	RKMM	Konstantinovka, Russia
4.860	RKF	Moscow, Russia
4.860	RJCZ	Sevrdlosk, Russia
4.875	RKF	Moscow, Russia
4.880	RKME	Kharkov, Russia
4.895	CEC	La Granja, Chile
4.900	RKMN	Sorokino, Russia
4.910	RENJ	Korsakpai, Russia
4.920	LCL	Jeloy, Norway, (X)
4.930	RFAJ	Moscow, Russia
4.930	RIBE	Samara, Russia
4.930	RKMK	Zouevka, Russia
4.940	REIL	Koounrad, Russia
4.950	RKMJ	Zaporojie, Russia
4.960	RHIE	Elizavetopolskaia, Russia
4.960	RCND	Nevel, Russia
4.970	RLY	Kharkov, Russia
4.975	GBC	Rugby, United Kingdom
4.980	RMWP	Samarkand, Russia
4.988	----	Airplanes, USA
		60 TO 50 METERS
5.000	FY3	Lyon, T.S.F., France
5.000	FHH3	Pointe-Noire, French Equatorial Africa
5.000	RCRI	Nakhitchevan, Arakse, Russia
5.000	RLXI	Stalingrad, Russia
5.000	RCNA	Viazma, Russia
5.000	RJRS	Voronej, Russia
5.000	TFL	Reykjavik, Iceland
5.015	KUF	Manila, Philippine Is.
5.023	ICQ	Naples, Italy
5.025	ZFA	Hamilton, Bermuda
5.030	REJJ	Koustanai, Russia
5.040	RIR	Tiflis, Russia
5.050	VRT	Hamilton, Bermuda
5.050	RMLD	Mouinak, Russia
5.058	TFI	Reykjavik, Iceland
5.060	EDO	Madrid, Spain
5.060	EDR2	Madrid, Spain

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL	and LOCATION
5.060	EDS	Madrid, Spain
5.070	RMLC	Tourtkoul, Russia
5.077	WCN	Lawrenceville, N. J., USA
5.085	RIO	Pakou, Russia
5.085	RMBK	Oust Bolcheretsk, Russia
5.090	REJV	Semipalatinsk, Russia
5.100	RCTQ	Kazan, Russia
5.105	KEC	Bolinas, Calif., USA
5.120	REIQ	Pribalkhachstroi, Russia
5.130	ZGD	Kuantan, Federatd. Malay States
5.140	EDR3	El Tablero, Canary Is.
5.140	PMY	Bandoeng, Netherl. India, (B)
5.140	PJEJ	Sverdlosk, Russia
5.145	OKIMPT	Prague, Czechoslovakia, (X)
5.200	RKLW	Kramatorsk, Russia
5.210	REIP	Vozrojdenic Ostrov, Russia
5.215	RCTP	Tchistopol, Russia
5.220	ZFC	Hamilton, Bermuda
5.220	RELO	Boukhta Bertys, Russia
5.222	ZEZ	Broken Hill, Northern Rhodesia
5.222	ZDH	Fort Jameson, Northn. Rhodesia
5.222	ZDA	Livingstone, Northern Rhodesia
5.222	ZDI	Mongu-Lealui, Northn. Rhodesia
5.222	ZFF	Mpika, Northern Rhodesia
5.250	RIBC	Penza, Russia
5.255	DJB	Zeesen, Germany, (B)
5.260	WQN	Rocky Point. N. Y., USA
5.263	RMFN	Grodekovo, Russia
5.265	CEC	La Granja, Chile
5.280	PWO	Nictheroy, Armacao, Brazil
5.280	RGAP	Gorkyi, Russia
5.290	RUY	Pervomaisk, Russia
5.300	ZFO	Cat Cay, Bahamas
5.310	RIAC	Penza, Russia
5.345	EDR4	Palma de Mallorca, Spain
5.350	RELT	Bouli-Tiube, Russia
5.350	RKOK	Korosten, Russia
5.357	ZGF	Kuantan, Federatd Malay States
5.357	RMPB	Madrouchkent, Russia
5.357	RMPH	Stalinabad, Russia
5.370	RLW	Artemovsk, Russia
5.370	RLX	Artemovsk, Russia
5.375	RSB	Stalinsk, Russia
5.380	LPG2	General Pacheco, Argentina
5.390	RKOU	Kharkov, Russia
5.400	HAT	Szekesfehervar, Hungary
5.400	RFAG	Moscow, Russia
5.405	CGT	Campbell River, B. C., Canada
5.410	----	Coast Stations, Japan
5.410	RKLO	Sorokino, Russia
5.415	IAF	Fiumicino, Italy
5.420	CGE	Calgary, Alta., Canada
5.420	JPY	Tobata, Japan
5.440	RSN	Sverdlovsk, Russia
5.450	ZGC	Kuala Lumpur, Federated Malay States
5.450	RKLQ	Dnepropetrovsk, Russia
5.454	RHJD	Chakhty, Russia
5.455	VQR	Nairobi, Kenya
5.455	RLXI	Stalingrad, Russia
5.460	VIX	Wyndham Meatworks, Australia
5.460	RKPL	Jitomir, Russia
5.460	RCNF	Smolensk, Russia
5.460	ZFU	Arua, Uganda
5.470	RKOV	Grichino, Russia
5.490	RPOB	Bobrinskaia, Russia
5.490	ROI	Sverdlovsk, Russia
5.495	ZGD	Kuantan, Fed. Malay States
5.505	RKNK	Kharkov, Russia
5.510	----	Airplanes, USA
5.515	SPV	Warsaw, Poland
5.520	PRP	Olinda, Brazil
5.520	RMAT	Vladivostok, Russia
5.530	RINA	Novosibirsk, Russia
5.540	CFD	Kenora, Ont., Canada
5.542	RUU	Detskoe Selo, Russia
5.547	RUU	Detskoe Selo, Russia
5.552	RUU	Detskoe Selo. Russia
5.555	RUU	Detskoe Selo. Russia
5.555	LPD	General Pacheco, Argentina
5.555	LPG3	General Pacheco, Argentina
5.555	2RO	Rome, Italy. (B)
5.556	OXM	Scoresbysund, Greenland
5.556	OYI	Scoresbysund. Greenland
5.560	RKOH	Znamenka, Russia
5.570	----	Airplanes, USA
5.570	OQP	Astrida, Belgian Congo
5.580	RKOL	Krementchoug, Russia
5.600	----	Aeronautical, Europe
5.603	----	Airplanes, USA
5.610	FFK	St. Nazaire, France
5.610	2RO	Rome, Italy
5.610	RELO	Boukhta Bertys, Russia
5.615	OQY	Niangara, Belgian Congo
5.620	RKOD	Kazatin, Russia
5.630	RGFW	Viatka, Russia
5.635	DAS	Rugen, Germany
5.640	RGFK	Kanavino, Russia
5.640	RKOG	Vapniarka, Russia
5.650	OQM	Lusambo, Belgian Congo
5.650	YV5RMO	Maracaibo, Venezuela
5.653	WNEY	Baltimore, Md., USA
5.660	----	Airplanes, USA
5.660	CFD	Kenora, Ont., Canada
5.660	XQAJ	Shanghai, China
5.660	OZZ	Thule, Greenland
5.660	HJ5ABC	Cali, Colombia, (B)
5.660	2RO	Rome, Italy
5.660	VQR	Nairobi, Kenya
5.660	RKLP	Rovenki, Russia
5.670	RKON	Gorlovka, Russia
5.680	RKOF	Proskourov, Russia
5.692	FIQA	Tananarive, Madagascar
5.700	OSG	Luluabourg, Belgian Congo
5.700	RKLR	Lisitchansk, Russia
5.705	ZC2PC	Haifa, Palestine
5.705	ZC3PC	Mafrak, Transj., Palestine
5.705	ZC4PC	Pump Station H4, Transj., Pal.
5.710	JDZ	Dairen, Manchuria
5.713	TGS	Guatemala City, Guat. (B)
5.714	ZGA	Kuala Lumpur, Fed. Malay States
5.715	GIR	Dollis Hill, United Kingdom
5.725	OXL	Skamlebak, Denmark
5.725	2RO	Rome, Italy, (B)
5.730	JVV	Tokyo, Japan
5.740	RKLS	Tchistiakovo, Russia
5.750	RGAQ	Ijevsk, Russia
5.750	EDR2	Madrid, Spain
5.750	EDS	Madrid, Spain
5.760	RLX	Artemovsk, Russia
5.760	OQQ	Libenge, Belgian Congo
5.766	CFU	Rossland, B. C., Canada
5.766	XAM	Merida, Yucatan, Mexico
5.769	RELB	Boukhta Bertys, Russia
5.769	RELD	Boukhta Bertys, Russia
5.769	RMSX	Merv, Russia
5.769	RELZ	Spasskyi Zavod, Russia
5.780	OAX4D	P.O. Box 853, Lima, Peru, (B)
5.780	RKOS	Routchenkovo, Russia
5.780	HI1J	San Pedro de Macoris, Dom. Rep. (B)
5.790	RV50	Moscow, Russia, (B)
5.790	JVU	Tokyo, Japan
5.800	VK3XX	Lyndhurst, Vic., Australia
5.800	VK3LR	Lyndhurst, Vic., Australia, (B)
5.800	RKMK	Zouevka, Russia
5.805	OSE	Kanda Kanda, Belgian Congo
5.805	CSN	Rossland, B. C., Canada
5.810	RKOR	Krasnyi-Loutch, Russia
5.810	CGI	Isle Maligne, P. Q., Canada
5.810	RFAN	Moscow, Russia
5.810	CGR	Quebec, P. Q., Canada
5.813	FZN6	Noumea, New Caledonia
5.820	CEC	La Granja, Chile
5.820	RKML	Krinditchovka, Russia
5.825	TIGPH	San Jose, Costa Rica, (B)
5.830	JMP	Shinkyo, Japan
5.830	RPG	Borentsburg, Russia
5.830	CWD	Cerrito, Uruguay
5.840	REKD	Alma-Ata, Russia
5.840	RKMM	Konstantinovka, Russia
5.840	RHIF	Grozni, Russia
5.840	RHII	Novo Kresitanovskoe, Russia
5.840	RHIH	Sterkertitchka, Ruasia
5.842	FZP4	Papeete, Tahiti
5.845	KRO	Kahuku, Hawaai
5.850	VK3LR	Lyndhurst, Vic., Australia, (B)
5.850	RKOQ	Kadievka, Russia
5.850	RFAL	Moscow, Koutchino, Russia
5.853	WOB	Lawrenceville, N. J.
5.855	OQZ	Kamina, Belgan Congo
5.855	EDR3	El Tablero, Teneriffe, Canary Island
5.857	XDA	Chapultepec, Mexico
5.860	XDA	Chapultepec, Mexico
5.860	RPMN	Sorokini, Russia
5.870	RKMB	Gorlovka, Russia
5.870	RRRR	Tashkent, Russia
5.880	REKD	Alma-Ata, Russia
5.880	RKNY	Kharkov, Russia
5.880	RKMO	Verkhne, Oudinsk, Russia
5.890	JIC	Taihoku, Tauvan, Japan
5.890	RIKW	Osmk, Russia
5.890	RRRZ	Sverdlovsk, Russia
5.892		
5.895		
5.900	OQX	Kabinda, Belgian Congo
5.900	CMBI	Habana, Cuba, (B)
5.900	RMWA	Tashkent, Russia
5.915	VRR	Stony Hill, Jamaica
5.930	HJ4ABE	Medellin, Colombia
5.940	----	Airplanes, USA
5.950	HJ1ABJ	Santa Marta, Colo., (B)
5.950	OSI	Gule, Belgian Congo
5.950	TGX	Guatemala City, Guat., (B)
5.952	FZF6	Fort de France Martinique
5.953	HIX	Santo Domingo, Dom. Rep., (B)
5.955	RRRZ	Sverdlovsk, Russia
5.969	HVJ	Vatican City, (B)
5.970	HJ3ABH	Bogota, Colo., AparTado 565. (B)
5.975	HJ2ABC	Cucuta. Colombia. (B)
5.980	HIX	Santo Domingo, Dominican Rep. (B)
5.980	XECW	Calle del Bajio 120, Mexico City, Mex., (B)
5.990	FZK6	Dakar, Senegal
5.990	XEBT	Mexico City, Mex., P. O. Box 79-44, (B)

50 TO 45 METERS

Freq. Mc.	CALL	and LOCATION
5.995	WXE	Anchorage, Alaska
5.995	WXH	Ketchikan, Alaska
5.995	RPT	Tashkent, Russia
6.000	OSF	Panu, Belgian Congo
6.000	XGOX	Nanking, China
6.000	VSZAB	Kuala Lumpur, Fed. Malay States
6.000		Tananarive, Madagascar
6.000	TGW	Guatemala City, Guat. (B)
6.000	----	St. Denis, Reunion
6.000	----	Buchorest, Rumania
6.000	RPDM	Medvejia Gora, Russia
6.000	RV59	Moscow, Russia
6.000	RKDO	Parandovo, Russia
6.000	RKDN	Segja, Russia
6.000	EAJ25	Barcelona, Spain
6.005	VE9DN	Drummondville, P. Q., Canada
6.005	VE9DR	Drummondville, P. Q., Canada
6.005	HJ3ABH	Bogota, Colombia
6.005	CMCI	Habana, Cuba
6.006	HJ1ABF	Santa Marta, Colombia
6.010	COC	Habana, Cuba, (B)
6.010	----	Cairo, Egypt, (B)
6.010	XEBT	Mexico City, Mexico, (B)
6.018	ZHI	Singapore, Straits Settlements, (B)
6.020	CQN	Macao, China
6.020	DJC	Zeesen, Germany, (B)
6.020	PGD	Kootwijk, Netherlands, (B)
6.023	XEW	Mexico City, Mexico, (B)
6.025	PGD	Kootwijk, Netherlands, (B)
6.030	VE9CA	Calgary, Alta., Canada, (B)
6.030	OQT	Buta, Belgian Congo, (B)
6.030	PGD	Kootwijk, Netherlands, (B)
6.030	HP5B	Panama, Panama
6.035	HJ4ABI	Medellin, Colombia, (X)
6.035	YNA	Managua, Nicaragua, (B)
6.040	W1XAL	Boston, Mass., USA, (B)
6.040	W4XB	Miami Beach, Fla., USA, (B)
6.040	PRA8	Pernambuco, Brazil (B)
6.040	CMCI	Habana, Cuba, (B)
6.040	RILD	Omsk, Russia
6.040	RLEC	Tchita, Russia
6.042	HJ1ABG	Barranquilla, Colombia, (B)
6.045	HJ3ABI	Bogota, Colo., (B)
6.045	EAQ	Aranjuez, Spain, (B)
6.050	VE9CF	Halifax, N. S., Canada, (B)
6.050	RIMK	Topki, Russia
6.050	GSA	Daventry, United Kingdom, (B)
6.060	W8XAL	Mason, Ohio, USA, (B)
6.060	W3XAU	Newton Sq., Pa., USA, (B)
6.060	OSC	Boende, Belgian Congo
6.060	CMCI	Habana, Cuba, (B)
6.060	OXY	Skamlebak, Denmark, (B)
6.060	HIX	Santo Domingo, Dom. Rep., (B)
6.065	I2RO	Rome, Italy, (B)
6.060	VQ7LO	Nairobi, Kenya, (B)
6.060	RLEE	Bouchoulei, Russia
6.065	HJ4ABL	Manizales, Colombia, (B)
6.070	VE9CS	Vancouver, B. C., Canada, (B)
6.070	OXY	Skamlebak, Denmark, (B)
6.070	RGFN	Charia, Russia
6.070	EAQ	Aranjuez, Spain, (B)
6.072	ZHJ	Penang, Malaya, (B)
6.072	OER2	Vienna, Austria, (B)
6.074	HJ1ABF	Barranquilla, Colombia, (X)
6.079	DJM	Zeesen, Germany, (B)
6.080	W9XAA	Chicago, Ill., USA
6.080	CP5	LaPaz, Bolivia, (B)
6.080	TIRA	Cartago, Costa Rica, (B)
6.080	VE9EH	Charlottetown, P.E.I., (B)
6.080	RFCK	Moscow, Russia
6.085	2RO	Rome, Italy, (B)
6.090	VE9BJ	St. John, N.B., Canada, (B)
6.090	HJ4ABC	Pereira, Colombia, (B)
6.095	VE9GW	Bowmanville, Ont., Canada, (B)
6.097	JB	Johannesburg, Un. of S. A., (B)
6.098	HJ1ABD	Cartagena, Colombia, (B)
6.100	W3XAL	Bound Brook, N. J., USA, (B)
6.100	W9XF	Downers Grove, Ill., USA, (B)
6.100	RMDQ	Amazar, Russia
6.100	RMDK	Ksenievskaia, Russia
6.100	RFCI	Riazan, Russia
6.105	HJ4ABB	Manizales, Colombia, (B)
6.110	VE9CG	Calgary, Alta., Canada
6.110	GSL	Daventry, England. B. B. C., Broadcast. Hse., Lon., E., (B)
6.110	VE9HX	Halifax, N. S., Canada, (B)
6.110	HJ4ABB	Medellin, Colombia, (X)
6.110	VUC	Calcutta, India, (B)
6.110	EAQ	Aranjuez, Spain, (B)
6.112	YV2RC	Caracas, Venezuela
6.115	----	Warsaw, Poland, (B)
6.120	VQ7LO	Nairobi, Kenya (B)

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL and LOCATION
6.116	HJ1ABE Cartagena, Colombia, (B)
6.120	NAA Washington, D. C., USA, (B)
6.120	W2XE Wayne, N. J., USA, (B)
6.120	OQU Basankusu, Belgian Congo, (B)
6.120	YDA Bandoeng, Netherl. India, (B)
6.120	RKOM Dnepropetrovsk, Russia
6.128	HJ1ABH Cienaga, Colombia, (X)
6.128	YV11RMO Maracaibo, Venezuela
6.128	LKJ1 Jeloy, Norway, (B)
6.130	VE9BA Montreal, P. Q., Canada, (B)
6.130	COCD Havana, Cuba (B)
6.135	HJ1ABC Quibdo, Colombia, (X)
6.135	ZGE Kuala Lumpur, Fed. Malay Sts., (B)
6.135	YID Baghdad, Iraq, (B)
6.135	RKK Moscow, Russia
6.140	W8XK Saxonburg, Pa., USA, (B)
6.140	VK3LR Lyndhurst, Vic., Australia, (B)
6.140	KZRM Manila, P. I., (B)
6.145	--- Pontoise, France
6.150	CJRO Winnipeg, Manitoba, Can., (B)
6.150	HJ5ABC Cali, Colombia, (B)
6.150	HJ2ABA Tunja, Colombia, (B)
6.150	RKOO Odessa, Russia
6.150	CSL Lisbon, Portugal, (B)
6.150	YV3RC Caracas, Venezuela
6.155	CO9GC Grau & Cameneros Labs., Box 137, Santiago, Cuba, (B)
6.160	I2RO Rome, Italy
6.170	CFD Kenora, Ont., Canada
6.170	CFG Pickle Lake, Ont., Canada
6.170	CFJ Red Lake, Ont., Canada
6.170	CFB Sioux Lookout, Ont., Canada
6.175	OND Banana, Belgian Congo
6.175	FTX St. Assise, France
6.180	HJ3ABF Bogota, Colombia, (B)
6.180	TGW Guatemala City, Guatemala, (B)
6.180	RKOP Kiev, Russia
6.180	REIK Petropavlovsk, Russia
6.185	HI1A P.O. Box 423, Santiago, Dominican Rep., (B)
6.190	RIPV Barnaoul, Russia
6.190	RRRR Tashkent, Russia
6.198	CT1GO Portuguese Radio Club, Parede, Portugal, (B)
6.200	RMDP Erofei Pavlovitch, Russia
6.200	RMDM Mogotcha, Russia
6.200	RMWW Tashkent, Russia
6.210	HJN Bogota, Colombia, (B)
6.230	OAX4B Apartado 1242, Lima, Peru, (B)
6.235	OCN Lima, Peru, (B)
6.240	RMAS Tafouin, Russia
6.240	RMAY Troitse Zaroubino, Russia
6.245	OQE Costermansville Belgian Congo
6.250	---- Airways, Germany
6.250	OCI Lima, Peru
6.250	REIX Akmolinsk, Russia
6.250	RGAZ Kotelnich, Russia
6.250	RFAQ Moscow, Russia
6.250	REIA Ouialy, Russia
6.250	REIM Ouzounkair, Russia
6.250	HJ4ABC Periera, Col., (B)
6.260	PBB Den Helder, Netherlands
6.280	HI1A Santo Domingo, Dom. Rep., (B)
6.285	CZA Drummondville, P. Q., Canada
6.300	RCE Leningrad, Russia
6.300	RMBA Prcobrajenia, Russia
6.320	CFD Kenora, Ont., Canada
6.320	HIZ Santo Domingo, Dominican Rep., (B)
6.320	OQA Kigoma, Tanganyika
6.330	---- Tokyo, Japan
6.335	VE9AP Drummondville, P. Q., Canada, (B)
6.345	OSD Kigali, Belgian Congo, (B)
6.375	YV4RC Caracas, Venezuela
6.375	OQR Usumbura, Belgian Congo
6.380	HC1DR Quito, Ecuador, (B)
6.383	RNZ Petropavlovsk, Russia
6.385	YN1GG Managua, Nicaragua
6.405	OQJ Inongo, Belgian Congo
6.420	RGX Minsk, Russia
6.425	VE9AS Fredericton, N. B., Canada, (X)
6.425	W3XL Bound Brook, N. J., USA, (B)
6.425	CZE Victoria, B. C., Canada
6.425	CZF Vancouver, B. C., Canada
6.425	CZG Prince Rupert, B. C., Canada
6.425	VE9BY London, Ont., Canada, (B)
6.430	OQF Port Franqui, Belgian Congo
6.440	RTA Novosibirsk, Russia
6.450	OTO Leopoldville, Belgian Congo
6.450	HJ1ABB Barranquilla, Colombia, (B)
6.460	RHCC Khibinogorsk, Russia
6.465	OQO Basoko, Belgian Congo
6.470	RCAD Minsk, Russia
6.480	EDR4 Palma de Mallorca
6.495	OTH Elizabethville, Belgian Congo
6.500	HJ5ABD Manizales, Col.. (B)
6.520	RELT Bourli-Tiube, Russia
6.520	YV6RV Valencia, Venezuela, (B)
6.528	HIL Santo Domingo, D.R.. (B)
6.535	OSB Kikwit, Belgian Congo
6.550	TI2PG San Jose, Costa Rica, (B)
6.550	TIRCC San Jose, Costa Rica (B)
6.550	RKLM Zaporojie, Russia
6.570	OQV Albertville, Belgian Congo
6.580	HJ1ABB Barranquilla, Colombia, (B)
6.590	VQR Nairobi, Kenya
6.593	ZDG Mpika, Northern Rhodesia
6.593	ZEB Bulawayo, Southern Rhodesia
6.593	ZEA Salisbury, Southern Rhodesia
6.593	ZTG Germiston, Union of S. A.
6.600	RJTL Dmitriev-Igovsky, Russia
6.600	RKLX Odessa, Russia
6.605	OQW Banningville, Belian Congo
6.610	HI4D Santo Domingo, Dominican Rep., (B)
6.610	RV72 Moscow, Russia, (B)
6.610	CWE Cerrito, Montevideo, Urugauy
6.620	PRADO Riobamba, Ecuador, (B)
6.630	---- Moscow, Russia, (B)
6.635	OTC Coquilhatville, Belgian Congo
6.650	IAC Coltano, Italy, (X)
6.650	---- Naval Stations, Japan
6.650	XFD Mexico City, Mexico, (B)
6.650	HC2RL P.O. Box 759, Guayaquil, Ecuador, S.A., (B)
6.660	TGW Guatemala City, Guatemala, (B)
6.660	TIEP La-Voz Del Tropico, San Jose, Costa Rica, (B)

45 TO 40 METERS

6.664	YNCRG Granada, Nicaragua, (B)
6.665	LPG4 General Pacheco, Argentina
6.672	YVQ Maracay, Venezuela
6.674	IRT Rome, Italy
6.675	HBQ Prangins, Switzerland
6.677	FZ14 Brazzaville, Fr. Equa., Africa
6.680	DGP Nauen, Germany, (X)
6 685	OZS Skamlebak, Denmark
6.685	ZGA Kuala Lumpur, Fed. Malay States
6.685	YNLF Managua, Nicaragua, (B)
6.690	CFA Drummondville, P. Q., Canada
6.690	VQR Nairobi, Kenya
6.690	ZDB Broken Hill, Northern Rhodesia
6.690	ZDG Mpika, Northern Rhodesia
6.690	ZEB Bulawayo, Southern Rhodesia
6.690	ZEA Salisbury, Southern Rhodesia
6.690	ZTG Germiston, Union of So. Africa
6.690	ZTF Maitland Cape, Un. of S. Africa
6.695	OQI Lisala, Belgian Congo
6.700	RIBF Syzran, Russia
6.703	TIK Cartago, Costa Rica
6.707	YNCRG Granada, Nicaragua, (B)
6.718	WDB Rocky Point, N. Y., USA
6.718	KBK Manila, P. I.
6.733	WDA Rocky Point, N. Y., USA
6.738	TIGP San Jose, Costa Rica, (B)
6.745	OQB Bumba, Belgian Congo
6.750	JVT Tokyo, Japan
6.750	RMSE Karabougaz, Russia
6.755	WOA Lawrenceville, N. J., USA
6.755	KZGF Manila, Philippine Islands
6.760	CFA2 Drummondville, P. Q., Canada
6.760	RENJ Karsakpai, Russia
6.770	KZGF Manila, Philippine Islands
6.775	OQK Aketi, Belgian Congo
6.780	RENT Gouriev, Russia
6.780	EAH Madrid, Spain
6.785	OQD Kindu, Belgian Congo
6.790	SQB Bialystok, Poland
6.790	RIBO Kvarkeno, Russia
6.792	HAP3 Budapest, Hungary
6.792	SQZ Warsaw, Poland
6.795	---- Rugby, United Kingdom
6.800	EDR3 Tablero, Canary Islands
6.800	SQA Lwow, Poland
6.800	HIH San Pedro de Macoris, Dominican Rep., (B)
6.810	OSK Kitega, Belgian Congo
6.810	RENG Atch-Sai, Russia
6.818	RELZ Spasskyi Zavod, Russia
6.840	OQG Kongolo, Belgian Congo
6.840	CFA Drummondville, P. Q., Canada
6.840	HAS Szekesvehervar, Hungary,
6.840	HAT2 Szekesvehervar, Hungary
6.840	RKNP Kharkov, Russia
6.850	LPG5 General Pacheo, Argentina
6.850	VPE Labasa, Fiji Islands, (X)
6.850	VQL Savu-Savu, Fiji Islands, (X)
6.850	VRO Suva, Fiji Islands, (X)
6.850	VPF Taveuni, Fiji Islands, (X)
6.850	RKF Moscow, Russia
6.860	KEL Bolinas, Calif., (X)
6.860	OTL Leopoldville, Belgian Congo
6.870	EAK San Lorenzo, Canary Islands
6.870	RFK Moscow, Russia
6.880	OQN Irumu, Belgian Congo
6.880	CFA4 Drummondville, P. Q., Canada
6.880	RKF Moscow, Russia
6.880	RINY Oirat-Toura, Russia
6.890	RLGL Kabansk, Russia
6.895	EDK San Lorenzo, Canary Islands
6.895	EDT San Lorenzo, Canary Islands
6.900	RKF Moscow, Russia
6.905	GDS ---Rugby, United Kingdom
6.910	ZEZ Broken Hill, Northern Rhodesia
6.910	ZDH Fort Jameson, Northrn Rhodesia
6.910	ZDA Livingstone, Northern Rhodesia
6.910	ZDI Mongu-Lealui, Northn. Rhodesia
6.910	ZFF Mpika, Northern Rhodesia
6.910	RJBD Sverdlovsk, Russia
6.915	ZCI Cape D'Aguilar, Hong Kong
6.920	RFAX Moscow, Russia
6.930	RENU Aktubinsk, Russia
6.930	RGKX Archangel, Russia
6.930	RLEV Verkhne-Oudinsk, Russia
6.940	RFAU Bykovo, Russia
6.950	RLXS Saratov, Russia
6.958	WEO New Brunswick, N. J., USA
6.960	OTS Stanleyville, Belgian Congo
6.965	KZGG Cebu, Philippine Islands
6.966	EDO Madrid, Spain
6.970	EDR2 Madrid, Spain
6.976	EA4AQ Madrid, Spain, (B)
6.977	---- Aeronautical, Europe
6.977	RNZ Petropavlovsk, Russia
6.980	2RO Rome, Italy
6.980	VQR Nairobi, Kenya
6.980	KZGH Iloilo, Philippine Islands
6.980	RKNZ Kharkov, Russia
6.980	RFAO Moscow, Russia
6.980	EAR110 Madrid, Spain, (B)
6.990	JVS Tokyo, Japan
6.990	LCL Jeloy, Norway
7.000	HJ5ABE Cali, Columbia, (B)
7.000 to 7.300	Amateurs,
7.010	RHCU Leningrad, Russia
7.020	RFBL Moscow, Russia
7.020	EAR125 Madrid, Spain, (B)
7.030	HRP1 San Pedro Sula, Honduras, (B)
7.050	---- Experimental Sta.. Japan (X)
7.050	RGFO Arzamas, Russia
7.050	RFBO Mojaisk, Russia
7.060	RENB Boukhta Bertys, Russia
7.060	RENA Bouroundal, Russia
7.070	RHAX Leningrad, Russia
7.080	LU5CZ Buenos Aires, Argentina, (B)
7.080	RTU Dolgoproudnaia, Russia
7.100	HKE Bogota, Colombia, (B)
7.100	---- Experimental and Amateurs, Japan, (X)
7.160	OA4B Lima, Peru, (B)
7.170	RELD Boukhta Bertys, Russia
7.170	RELO Boukhta Bertys, Russia
7.177	CR6AA Lobito, Angola, (B)
7.211	EA8AB Teneriffe, Canary Islands, (B)
7.220	---- Experimental, Japan, (X)
7.225	RPK Moscow, Russia
7.230	DOA Doberitz, Germany
7.250	---- Rome, Italy
7.260	RFF Kharkov, Russia
7.260	VS1AB Singapore, S. S., (B)
7.275	RTZ Irkutsk, Russia
7.300	---- Rome, Italy
7.310	RFBY Moscow, Russia
7.310	RMWP Samarkand, Russia
7.310	HJ1ABD Cartagena, Colo., (B)
7.320	HJ5ABD Cali, Colombia, (B)
7.320	ZTJ Johannesburg, Un. of S. Africa
7.330	RKMI Krivoi Rog, Russia (B)
7.333	DFH Nauen, Germany
7.340	RGLC Syktyvkar, Russia
7.345	GDL Rugby, United Kingdom
7.360	ZEZ Broken Hill, Northern Rhodesia
7.360	ZDH Ft. Jameson, Northern Rhodesia
7.360	ZDA Livingstone, Northern Rhodesia
7.360	ZFF Mpika, Northern Rhodesia
7.360	ZDI Mongu-Lealui, Northr. Rhodesia
7.370	RFBX Moscow, Russia
7.370	RKLX Odessa, Russia
7.380	XECR Foreign Office, Mexico City, Mex., (B)
7.390	JVR Tokyo, Japan
7.390	ZLT Wellington, N. Z.
7.390	RKNE Kharkov, Russia
7.400	WEM Rocky Point, N. Y., USA
7.400	HJ3ABD Bogota, Colombia, (B)
7.400	RRRH Khabarovsk, Russia
7.407	WEN New Brunswick, N. J., USA
7.408	RFAJ Moscow, Russia
7.410	XGV Shanghai. China
7.410	VQR Nairobi, Kenya
7.415	WEG Rocky Point, N. Y., USA
7.430	RKMJ Zaporojie, Russia
7.440	RKMH Khristinovka, Russia
7.444	HBQ Prangins, Switzerland. (B)
7.450	RUK Stalinabad. Russia
7.460	CZG Prince Rupert, B. C., Canada
7.460	CZF Vancouver. B. C., Canada
7.460	CZE Victoria, B. C., Canada
7.460	RKMF Jitomir, Russia
7.470	JVQ Tokyo, Japan
7.470	RKME Kharkov, Russia

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL and LOCATION	
	40 TO 35 METERS	
7.500	LPG6	General Pacheco, Argentina
7.500	ZGB	Kuala Lumpur, Fed. Malay States
7.500	JVP	Tokyo, Japan
7.500	RKI	Moscow, Russia
7.510	JVP	Nazaki, Japan
7.510	REJK	Karsapkai, Russia
7.510	RKND	Kharkov, Russia
7.518	IRV	Rome, Italy
7.520	KKH	Kahuku, Hawaii
7.520	RKI	Moscow, Russia
7.545	RKI	Moscow, Russia
7.565	KWY	Dixon, Calif., USA
7.580	RKNC	Kharkov, Russia
7.610	KWX	Dixon, Calif., USA
7.610	----	Konigs Wusterhausen, Germany
7.620	RKPO	Vorochilovsk, Russia
7.626	RIM	Irkutsk, Russia
7.626	RIM	Tashkent, Russia
7.630	ZHJ	Penang, Malaya (B)
7.632	OEJ	Vienna, Austria
7.650	REAJ	Moscow, Russia
7.660	FTL	Ste. Assise, France
7.660	----	Taihoku, Japan
7.685	TIO	Cartago, Costa Rica
7.688	TYC3	Paris, France
7.700	ONE	Banana, Belgian Congo
7.700	TYC2	Paris, France
7.700	RKNB	Kharkov, Russia
7.715	KEE	Bolinas, Calif., (X)
7.725	----	Radom, Poland
7.730	WEV	New Brunswick, N. J., USA
7.730	PDL	Kootwijk, Netherlands
7.735		
7.740	CEC	La Granja, Chile
7.755	OQA1	Kigoma, Tanganyika
7.760	PCK	Kootwijk, Netherlands
7.760	PDM	Kootwijk, Netherlands
7.765	PDM	Kootwijk, Netherlands
7.770	FTF	Ste. Assise, France
7.770	PDM	Kootwijk, Netherlands
7.780	PSZ	Sepetiba, Brazil
7.785	TIR	Cartago, Costa Rica
7.790	HBP	Prangins, Switzerland, (B)
7.795	LPZ	Buenos Aires, Argentina, (P)
7.800	RKNA	Kharkov, Russia
7.805	KZGF	Manila, Philippine Islands
7.810	VRR	Stony Hill, Jamaica
7.813	DFT	Nauen, Germany
7.815	LPZ	Buenos Aires, Argentina, (P)
7.820	OCO	Lima, Peru
7.830	PGA	Kootwijk, Netherlands
7.830	PZGG	Cebu, Philippine Islands
7.835	PDV	Kootwijk, Netherlands
7.835	LCN	Jeloy, Norway, (B)
7.840	PGA	Kootwijk, Netherlands
7.851	SUX	Abou Zabal, Egypt
7.853		
7.855	PZGH	Iloilo, Philippine Islands
7.860	HC2JSB	Guayaquil, Ecuador, (B)
7.860	SUX	Abou Zabal, Egypt
7.867		
7.869		
7.870	RXC	Panama City, Panama
7.877	SUX	Abou Zabal, Egypt
7.880	JYR	Chiba, Japan, (X)
7.890	VPD	Suva, Fiji Islands
7.895	RMGI	Khabarovsk, Russia
7.901	LSL	Hurlingham, Argentina, (X)
7.905	OSKI	Kitega, Belgian Congo
7.910	REJV	Semipalatinsk, Russia
7.920	RCKJ	Lenkoran, Russia
7.920	GCP	Rugby, United Kingdom
7.930	DOA	Doberitz, Germany
7.935	PSL	Marapicu, Brazil
7.935	KZGF	Manila, Philippine Islands
7.945	VK2ME	Sydney, Australia
7.960	VLZ	Sydney, Australia
7.965	OQP1	Astrida, Belgian Congo
7.968	HSP	Bangkok, Siam
7.980	VLJ	Sydney, Australia
7.980	VLZ4	Sydney, Australia
7.980	HSJ	Bangkok, Siam
7.990	OQM1	Lusambo, Belgian Congo
7.995	HC2JSB	Guayaquil, Ecudaor, (B)
8.020	HSJ	Bangkok, Siam
8.035	OQB1	Bumba, Belgian Congo
8.035	CNR	Rabat, Morocco, (B)
8.050	RCNV	Smolensk, Russia
8.055	OQW1	Banningville, Belgian Congo
8.065	LPZ	Buenos Aires, Argentina, (P)
8.068	----	Konigs Wusterhausen, Germany
8.075	WEZ	Rocky Point, N. Y., USA
8.075	TYB2	Paris, T.S.F., France
8.085	OQS	Stanleyville, Belgian Congo
8.095	VLK3	Sydney, Australia, (B)
8.100	EATH	Vienna, Austria
8.100	J1AA	Tokyo, Japan
8.103	HCJB	Quito, Ecudaor, (B)
8.110	RELB	Boukhta Bertys, Russia
8.110	RELO	Boukhta Bertys, Russia
8.120	KAZ	Manila Philippine Islands
8.120	KTP	Manila Philippine Islands
8.130	OSF1	Panu, Belgian Congo
8.135	VIG	Baghdad, Iraq.
8.140	FRS9	Saigon, Indo China
8.155	PGB	Kootwijk, Netherlands
8.160	OSE1	Kanda-Kanda, Belgian Congo
8.170	RV5O	Moscow, Russia, (B)
8.185	PSK	Rio de Janeiro, Brazil, (B)
8.195	OQL	Leopoldville, Belgian Congo
8.200	LPG7	General Pacheco, Argentina
8.205	EDR2	Madrid, Spain
8.205	EDS	Madrid, Spain
8.214	HCJB	Quito, Ecuador, (B)
8.215	HJ5ABF	Popayan, Colombia, (X)
8.220	ZP10	Asuncion, Paraguay (B)
8.220	ZSV	Walvis Bay, Un. of So. Africa
8.225	RRD	Moscow, Russia
8.230	EAP	S. Lorenzo, Canary Islands
8.235	OOC	Coquilhatville, Belgian Congo
8.250	RKNK	Kharkov, Russia
8.270	OQDI	Kindu, Belgian Congo
8.290	RIKW	Omsk, Russia
8.305	OQEI	Costermansville, Belgian Congo
8.328	----	Ship telephone
8.333	YQI	Constanta, Rumania
8.333	LPD	General Pacheco, Argentina
8.333	LOB	Puerto Aguirre, Argentina
8.333	OXM	Scoresbysund, Greenland
8.333	RMAT	Vladivostok, U.S.S.R.
8.340	OQF1	Port-Francqui, Belgian Congo
8.345	FFK	St. Nazaire, France
8.380	IAC	Coltano, Italy, (X)
8.380	RJXC	Makhatch Kala, Russia
8.396	HSP	Bangkok, Siam
8.400	----	Aeronautical, Europe
8.420	EAK	San Lorenzo, Canary Islands
8.430	EAK	San Lorenzo, Canary Islands
8.440	SPU	Warsaw, Poland
8.445	OSB1	Kikwit, Belgian Congo
8.450	PRAG	Porto Alere, Brazil, (B)
8.455	CWF	Cerrito, Montevideo, Uruguay
8.460	FFK	St. Nazaire, France
8.470	DAF	Norddcrch, Germany
8.485	OQI1	Lisala, Belgian Congo
8.510	RILD	Omsk, Russia
8.515	CZA	Drummondville, P. Q., Canada
8.515	IAC	Coltano, Italy, (X)
8.525	OQJ1	Inongo, Belgian Congo
8.540	EAK	San Lorenzo, Canary Islands
8.540	DAS	Rugen, Germany
8.540	RLEC	Tchita, Russia
8.550	HSG	Bangkok, Siam
8.555	OQK1	Aketi, Belgian Congo
8.560	WOY	Lawrenceville, N. J., USA
8.560	WOO	Ocean Gate, N. J., USA
8.565	HAT3	Szekesfehervar, Hungary
8.566	----	Ship Telephone
8.570	RRRQ	Novosibirsk, Russia
	35 TO 30 METERS	
8.580	RKOM	Dnepropetrovsk, Russia
8.585	OQX1	Kabinda, Belgian Congo
8.595	OXU	Skamlebak, Denmark
8.600	----	Aeronautical, Europe
8.600	RIPV	Barnaoul, Russia
8.610	TYD2	Paris, T.S.F., France
8.630	VJI	Cloncurry, Australia
8.630	PBB	Den Helder, Netherlands
8.635	OXC1	Poenda, Belgian Congo
8.650	VE9BY	London, Ontario, Canada, (X)
8.650	HAS	Szekesfehervar, Hunagry, (B)
8.680	GBC	Rugby, United Kingdom
8.691	VWZ	Kirkee, India
8.693		
8.700	VWZ	Kirkee, India
8.700	RKLX	Odessa, Russia
8.707	VWZ	Kirkee, India
8.709		
8.710	CEC	La Granja, Chile
8.715	OSD1	Kigali, Belgian Congo
8.730	GCI	Rugby, United Kingdom
8.750	ZEK	Hongkong, China, (B)
8.760	GCQ	Rugby, United Kingdom
8.765	----	Naval Stations, Germany
8.770	RSZ	Irkutsk, Russia
8.775	PNI	Makassar, Netherland Indies
8.790	OQQ1	Libenge, Belgian Congo
8.790	TIN	Cartago, Costa Rica
8.790	TIR	Cartago, Costa Rica
8.793	CNP	Casablanca, Morocco
8.795	HKV	Bogota, Colombia, (X)
8.830	----	Portable-Interior Commission, Australia
8.830	----	Ship Telephone
8.850	OQO1	Basoko, Belgian Congo
8.870	NPO	Cavite, P. I., (Time)
8.875	CWK	Cerrito, Montevideo, Uruguay
8.880	----	Naval Stations, Japan
8.890	WYL	Barksdale Field, La., USA
8.890	WUK	Chapman Field, Fla., USA
8.890	WYS	Clark Field, Philippine Isl.
8.890	WYY	Dryden, Tex., USA
8.890	WZO	Ft. Bliss, Tex., USA
8.890	WZG	Ft. Bragg, N. C., USA
8.890	WZB	Ft. Clark, Tex., USA
8.890	WVR	Ft. McPherson, Ga., USA
8.890	WZI	Ft. Ringgold, Tex., USA
8.890	WVB	Ft. Sam Houston, Tex., USA
8.890	WYN	Hatbox Field, Okla., USA
8.890	WYO	Hensley Field, Tex., USA
8.890	WXA	Juneau, Alaska
8.890	WYG	Kelly Field, Tex., USA
8.890	WYR	Kingley Field, Philippine Is.
8.890	WYZ	Lordsburg, New Mexico, USA
8.890	WUG	Marfa, Texas, USA
8.890	WYT	Nichols Field, Philippine Is.
8.890	WUM	Tucson, Ariz., USA
8.900	ZLS	Wellington, New Zealand
8.900	ZLT	Wellington, New Zealand
8.902	RKN	Moscow, Russia
8.920	GCX	Rugby, United Kingdom
8.925	OQH	Elisabethville, Belgian Congo
8.935	CNR	Rabat, Morocco, (B)
8.940	KZGG	Cebu, Philippine Islands
8.950	TGX	Guatemala City, Guatemala, (B)
8.955	ZGB	Kuala Lumpur, Fed. Malay St.
8.960	----	Algiers-Eucalyptus, Algeria
8.965	OQC	Coquilhatville, Belgian Congo
8.975	VWY	Kirkee, India
9.005	OQN1	Irumu, Belgian Congo
9.010	KEJ	Bolinas, Calif., USA
9.020	GCS	Rugby, United Kingdom
9.037	TYA2	Paris, T.S.F., France
9.050	OQR1	Usumbura, Belgian Congo
9.060	TFK	Reykjavik, Iceland
9.091	XDA	Chapultepec, Mexico
9.091	XFD	Mexico City, Mexico, (B)
9.104	LST	Olivos, Argentina
9.110	KUW	Manila, Philippine Islands
9.110	EAH	Madrid, Spain
9.120	CP5	La Paz, Bolivia, (B)
9.125	OSI1	Gule, Belgian Congo
9.125	HAT4	Szekesfehervar, Hungary
9.150	YVR	Maracay, Venezuela
9.170	WNA	Lawrenceville, N. J., USA
9.170	KZGF	Manila, Philippine Islands
9.180	ZSR	Klipheuvel, Un. of So. Africa
9.195	OQZ1	Kamina, Belgian, Congo
9.200	GBS	Rugby, United Kingdom
9.230	FLJ	Paris, France
9.235	PDP	Kootwijk, Netherlands
9.240	PDP	Kootwijk, Netherlands
9.250	GBK	Bodmin, United Kingdom
9.275	GCS	Ongar, United Kingdom
9.280	GCB	Rugby, United Kingdom
9.300	CNR	Rabat, Morocco, (B)
9.310	GBC	Rugby, United Kingdom
9.315	OQT1	Buta, Belgian Congo
9.330	VLJ4	Sydney, Australia
9.332	CJA2	Drummondville, P. Q., Canada
9.350	CEC	La Granja, Chile
9.355	OQU1	Basankusu, Belgian Congo
9.370	VQR	Nairobi, Kenya
9.370	PGC	Kootwijk, Netherlands
9.375	XDA	Chapultepec, Mexico
9.375	PGC	Kootwijk, Netherlands
9.375	RFCQ	Moscow, Russia
9.380	----	Aeronautical, Japan
9.400	XDC	Mexico City, Mexico, (X)
9.415	PLV	Bandoeng, Java
9.428	COH	Habana, Cuba, (B)
9.435	LPZ	Buenos Aires, Argentina, (P)
9.445	OQV1	Albertville, Belgian Congo
9.450	WES	Rocky Point, N. Y., USA
9.470	WET	Rocky Point, N. Y., USA
9.470	RRRN	Irkutsk, Russia
9.480	KET	Bolinas, Calif., USA
9.480	LPR5	General Pacheco, Argentina
9.480	EAH	Madrid-Vallecas, Spain
9.490	KEI	Bolinas, Calif., USA
9.490	KZGH	Iloilo, Philippine Islands
9.493	SRI	Posen, Poland, (B)
9.495	OXY	Skamlebak, Denmark, (B)
9.500	XGOX	Nanking, China, (B)
9.500	RFAJ	Moscow, Russia
9.500	HSP2	Bangkok, Siam, (B)
9.501	PRF5	Rio de Janeiro, Brazil (B)
9.510	GSB	Daventry, United Kingdom, (B)
9.510	YV3RC	Caracas, Venezuela
9.518	VK3ME	Melbourne, Australia, (B)
9.520	OXY	Skamlebak, Denmark, (B)
9.525	OSG1	Luluabourg, Belgian Congo
9.530	W2XAF	Schenectady, N. Y., USA, (B)
9.530	YNA	Managua, Nicaragua
9.540	DJN	Zeesen, Germany, (B)
9.540	----	Batavia, Netherland India, (B)
9.545	EAQ	Aranjuez, Spain, (B)
9.550	NAA	Washington, D. C., USA (B)
9.560	DJA	Zeesen, Germany, (B)
9.560	----	Japan, (B)
9.565	VUB	Bombay, India, (B)
9.570	W1XK	Westinghouse Elec. & Mfg. Co., Springfield, Mass., (B)
9.570	W8XK	Saxonburg, Pa., USA
9.570	SUV	Abou Zaabal, Egypt, (B)

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL	Location
9.570	KZRM	Manila, Philippine Islands, (B)
9.572	LKJ1	Jeloy, Norway, (B)
9.575	VUC	Calcutta, India, (B)
9.579	XGBD	Shanghai, China, (B)
9.580	VK3LR	Lindhurst, Vic., Australia, (B)
9.580	VE9DR	Drummondville, P.Q., Can., (B)
9.580	HBL	Prangins, Switzerland, (B)
9.580	GSC	Daventry, United Kingdom, (B)
9.585	----	Pontoise, France, (B)
9.590	W3XAU	Newton Square, Pa., USA, (B)
9.590	VK2ME	Sydney, Australia, (B)
9.590	HP5J	J St., Panama City, Panama, (B)
9.590	TIRA	Cartago, Costa Rica, (B)
9.590	PCJ	Eindhoven, Netherlands, (B)
9.595	HBL	Prangins, Switzerland, (B)
9.600	2RO	Rome, Italy, (B)
9.600	XETE	Mexico City, Mexico, (B)
9.600	LGN	Bergen, Norway
9.600	CT1AA	Lisbon, Portugal, (B)
9.616	VQ7LO	Nairobi, Kenya, (B)
9.620	FZR2	Saigon, French Indo-China
9.620	DGU	Nauen, Germany, (X)
9.635	2RO	Rome, Italy, (B)
9.640	HSP2	Bangkok, Siam
9.655	OQY1	Niangara, Belgian Congo
9.660	PSJ	Marapicu, Brazil
9.700	LQA	Buenos Aires, Argentina
9,710	GCA	Rugby, United Kingdom
9.750	WOF	Lawrenceville, N. J., USA
9.750	RKF	Moscow, Russia
9.760	VK2ME	Sydney, Australia, (B)
9.760	VIJ	Sydney, Australia
9.760	VLZ2	Sydney, Australia
9.772	EAM	Madrid, Spain, (B)
9.780	2RO	Rome, Italy
9.790	GBW	Rugby, United Kingdom
9.800	LSE	Monte Grande, Argentina
9.800	GCW	Rugby, United Kingdom
9.820	EAK	San Lorenzo, Canary Islands
9.824	LSI	Buenos Aires, Argentina
9.830	IRF	Rome, Italy
9.830	IRM	Rome, Italy, (B)
9.830	IRU	Rome, Italy
9.840	FTI	St. Assise, France
9.840	FYC2	Paris, France
9.840	JYS	Chiba, Japan, (B)
9.860	EAQ	Aranjuez, Spain, (B)
9.863	FZT5	Tananarive Madagascar
9 870	WON	Lawrenceville, N. J., USA
9.875	LPZ	Buenos Aires, Argentina, (P)
9.890	LSA	Buenos Aires, Argentina
9.890	LSN	Hurlinghan, Argentina
9.895	FZV2	Tananarive, Madaascar
9.900	LSN	Buenos Aires, Argentina, (B)
9.905	CGA5	Drummondville, P. Q., Canada
9.925	JDY	Dairen, Manchuria
9.928	RRLY	Moscow, Russia
9.950	GCU	Rugby, United Kingdom
9.964	LSL	Buenos Aires, Argentina
9.966	IRS	Rome, Italy
9.990	LSN	Buenos Aires, Argentina, (B)
9.990	KAZ	Manila, Philippine Islands

30 TO 25 METERS

10.000	FHH4	Pointe-Noire, French Equatorial Africa
10.000	EAQ	Aranjuez, Spain
10.000	----	Belgrade, Yugoslavia, (B)
10.055	ZFB	Hamilton, Bermuda
10.055	SUV	Abou Zaabal, Egypt, (B)
10.065	JMP2	Shinkyo, Japan
10.070	EDM	Madrid, Spain
10.070	EDR2	Madrid, Spain
10.070	EDS	Madrid, Spain
10.070	EHY	Madrid, Spain
10.090	EDR3	Tablero, Teneriffe, Canary Is.
10.100	EHY	Madrid. Spain
10.105	REX	Indigo Boukhta, Russia
10.120	PSI	Marapicu, Brazil
10.140	OPM	Leopoldville, Belgian Congo
10.163	----	Ship telephone
10.169	HSJ	Bangkok, Siam
10.220	PSH	Marapicu, Brazil
10.230	CEC	Santiago, Chile
10.250	LSK3	Hurlinghan, Argentina
10.260	PMN	Bandoeng, Netherland Indies
10.260	RRRO	Irkoutsk, Russia
10.290	DIQ	Nauen, Germany
10.290	HPC	Panama City, Panama
10.300	LSL2	Hurlinghan, Argentina
10.330	ORK	Ruysselede, Belgium, (B)
10.335	ZFD	Hamilton, Bermuda
10.350	LSX	Monte Grande, Argentina, (B)
10.370	EDR3	El Tablero, Canary Islands
10.370	EHZ	El Tablero, Canary Islands
10.375	JVO	Tokyo, Japan
10.380	WCG	Rocky Point, N. Y., USA
10.390	KER	Bolinas, Calif., USA
10.390	GBX	Rugby, United Kingdom
10.400	KEZ	Bolinas, Calif., USA
10.410	KES	Bolinas, Calif., USA
10.410	PDK	Kootwijk, Netherlands
10.410	LSY	Monte Grande, Argentina
10.415	PDK	Kootwijk, Netherlands
10.420	XGW	Shanghai, China
10.420	PDK	Kootwijk, Netherlands
10.430	YBG	Medan, Sumatra
10.440	DGH	Nauen, Germany
10.515	FZT2	Tananarive, Madagascar
10.520	CJA4	Drummondville, P. Q., Canada
10.520	VLK	Sydney, Australia, (B)
10.526	FZT2	Tananarive, Madagascar
10.530	GBX	Rugby, United Kingdom
10.535	JIB	Taihoku, Taiwan, Japan
10.550	WOK	Lawrenceville, N. J., USA
10.578	FYB	Paris, France, (B)
10.610	WEA	Rocky Point, N. Y., USA
10.620	WEF	RockyPoint, N. Y., USA
10.620	EDN	Madrid, Spain
10.620	EDS	Madrid, Spain
10.620	EDR2	Madrid, Spain
10.620	EHX	Madrid, Spain
10.630	WED	Rocky Point, N. Y., USA
10.640	WQW	Rocky Point, N. Y., USA
10.640	OZT	Skamlebak, Denmark
10.660	JVN	Tokyo, Japan
10.670	CEC	Santiago, Chile
10.675	WNB	Lawrenceville, N. J., USA
10.714	RNZ	Petropavlovsk, Russia
10.740	JVM	Tokyo, Japan
10.760	PSG	Marapicu, Brazil
10.770	GBP	Rugby, United Kingdom
10.840	KWV	Dixon, Calif., USA
10.850	DFL	Nauen, Germany
10.860	RQT	Irkutsk, Russia
10.870	GIQ	Dollis Hill, United Kingdom
10.910	KTR	Manila, Philippine Islands
10.940	FTH	St. Assise, France
10.950	VLK4	Sydney, Australia
10.975	OCI	Lima, Peru
10.975	GCL	Rugby, United Kingdom
10.990	ZLT	Wellington, N. Z.
11.000	PLP	Bandoeng, Java
11.110	RUU	Detskoe Selo, Russia
11.110	LPD	General Pacheco, Argentina
11.110	----	Aeronautical, Japan
11.111	XFD	Mexico City, Mexico, (B)
11.140	XGB	Shanghai, China
11.140	----	Naval Stations, Germany
11.187	XAM	Merida, Yuc., Mexico
11.200	----	Aeronautical, Europe
11.210	SPT	Warsaw, Poland
11.260	----	Aeronautical, Europe
11.340	DAN	Norden, Germany
11.370	CWG	Cerrito, Montevideo, Uruguay
11.425	OQK2	Aketi, Belgian Congo
11.435	DHC	Nauen, Germany
11.465	OQV2	Albertville, Belgian Congo
11.470	IBDK	S. S. Elettra (G. Marconi's Yacht) (X)
11.490	EAH	Madrid, Spain
11.490	GBK	Bodmin, United Kingdom
11.500	VIZ3	Melbourne, Australia
11.500	VQR	Nairobi, Kenya
11.500	RPT	Tashkent, Russia
11.505	OSH	Elisabethville, Belgian Congo
11.530	LSN	Buenos Aires, Arentina, (B)
11.530	CGA	Drummondville, P. Q.
11.538	----	Rome, Italy
11.540	XGR	Shanghai, China
11.565	OQP2	Astrida, Belgian Congo
11.570	GNS	Ongar, United Kingdom
11.620	EAH	Madrid, Spain
11.660	PPQ	Sepetiba, Brazil, (X)
11.660	----	Aeronautical, Europe
11.660	JVL	Tokyo, Japan
11.660	RPG	Barentsbourg, Russia
11.670	----	Rome, Italy
11.675	OQM2	Lusambo, Belgian Congo
11.680	LPG8	General Pacheco, Argentina
11.680	KIO	Kahuku, Hawaii
11.695	YV2RC	Caracas, Venezuela
11.710	HJ4ABA	P.O. Box 50, Medellin, Colombia, (B)
11.710	OQW2	Banningville, Belgian Congo
11.715		Pontoise, France, (B)
11.720	CJRX	Winnipeg, Man., Canada, (B)
11.730	PHI	Huizen, Netherlands, (B)
11.730	NAA	Washington, D. C., USA, (B)
11.740	RKF	Moscow, Russia
11.740	RRRR	Tashkent, Russia, (B)
11.750	GSD	Daventry, United King.. (B)
11.760	XDA	Chapultepec, Mexico, (B)
11.770	DID	Zeesen, Germany, (B)
11.780	VE9DN	Drummondville, P.Q., Can., (B)
11.780	VE9DR	Drummondville, P.Q., Can., (B)
11.780	----	Cairo, Egypt
11.790	W1XAL	Boston, Mass., USA, (B)
11.790	TITR	San Jose, Costa Rica, (B)
11.795	DJO	Zeesen, Germany, (B)
11.800	----	Japan, (B)
11.800	CO9WR	P.O. Box 85, Sancti Spiritus, Cuba, (X)
11.801	OER3	Vienna, Austria, (B)
11.801	XGBC	Shanghai, China, (B)
11.810	VE9GW	Bowmanville, Ont., Can., (B)
11.810	2RO	Rome, Italy, (B)
11.810	EAQ	Aranjuez, Spain, (B)
11.830	W9XAA	Chicago, Ill., USA
11.830	W2XE	Wayne, N. J., USA, (B)
11.835	VE9HX	Halifax, N. S., Canada, (B)
11.840	KZRM	Manila, Philippine Islands
11.845	----	Pontoise, France, (B)
11.855	DJP	Zeesen, Germany
11.860	VE9CA	Calgary, Alta., Canada, (B)
11.860	GSE	Daventry, United Kingdom, (B)
11.870	W8XK	Saxonburg, Pa., USA, (B)
11.870	VUC	Calcutta, India, (B)
11.875		"Radio Colonial," Paris, France, (B)
11.880	VK3LR	Lyndhurst, Vic., Australia
11.880	----	Pontoise, France, (B)
11.880	RSN	Everdlovsk, Russia
11.885	----	Pontoise, France
11.890	YNA	Managua, Nicaragua, (B)
11.895	OSL	Leopoldville, Belgian Congo
11.900	XGOX	Nanking, China, (B)
11.910	RRRZ	Sverdlovsk, Russia
11.920	RRRQ	Novosibirsk, Russia
11.940	FTA	St. Assise, France
11.950	FTA	St. Assise, France
11.950	KKQ	Bolinas, Calif., (X)
11.960	OQU2	Basankusu, Belgian Congo
11.970	HSJ	Bangkok, Siam
11.980	FZS	Saigon, French Indo-China
11.985	OQO2	Basoko, Belgian Congo
11.991	FZS2	Saigon, French Indo-China

25 TO 20 METERS

12.000	FZG	Saigon, French Indo-China
12.000	VQR	Nairobi, Kenya
12.000	RNE	Moscow, Russia, (B)
12.015	OSC2	Boende, Belgian Congo
12.028	CT1CT	Lisbon, Portugal, (B)
12.030	HBO	Prangins, Switzerland, (B)
12.035	DJK	Nauen, Germany
12.050	VRR	Stony Hill, Jamaica
12.050	PDV	Kootwijk, Netherlands
12.055		
12.060	PDV	Kootwijk, Netherlands
12.082	CT1CT	Lisbon, Portugal, (B)
12.085	OQB2	Bumba, Belgian Congo
12.100	CJA6	Drummondville, P. Q., Canada
12.100	TIR6	Cartago, Costa Rica
12.120	----	Algiers, Algeria
12.145	OQN2 FQO-	Urumu, Belgian Congo
12.150	FQE	St. Assise, France
12.150	GBS	Rugby, United Kingdom
12.180	OQT2	Buta, Belgian Congo
12.185	FRSS	Saigon, French Indo-China
12.185	----	Radom, Poland
12.215	TYA	Paris, T.S.F., France
12.229	CT1CT	Lisbon, Portugal, (B)
12.235	TFJ	Reykjavik, Iceland
12.240	OQE2	Costermansville, Belgian Congo
12.244	LPD	General Pacheco, Argentina
12.250	FTN	Ste. Assise, France
12.250	TYB	Paris, France
12.250	RFBY	Moscow, Russia
12.250	GBS	Rugby, United Kingdom
12.260	FTN	Ste. Assise, France
12.270	RKK	Moscow, Russia
12.275	FZT3	Tananarive, Madagascar
12.280	KUV	Manila, Philippine Islands
12.290	GBU	Rugby, United Kingdom
12.295	ZLT	Wellington, New Zealand
12.295	ZLU	Wellington, New Zealand
12.300	ONC	Coquilhatville, Belian Congo
12.300	ZLW	Wellington, New Zealand
12.325	DAF	Norddeich, Germany
12.360	OSF2	Panu, Belgian Congo
12.394	DAF	Norddeich, Germany
12.396	CT1GO	Parede, Portugal, (B)
12.425	OSI2	Gule, Belgian, Congo
12.450	RLGL	Kabansk, Russia
12.470	OQJ2	Inongo, Belgian Congo
12.485	CNP	Casablanca, Morocco
12.500	PBB	Den Helder, Netherlands
12.500	SPN	Warsaw, Poland
12.500	YQI	Constanta, Rumania
12.500	RKF	Moscow, Russia
12.500	ZSV	Walvis Bay, Un. of So. Africa
12.550	----	Aeronautical, Europe
12.565	OQX2	Kabinda, Belgian Congo
12.570	FFK	St. Nazaire, France
12.640	OQZ2	Kanuna, Belgian Congo
12.660	CZA	Drummondville, P. Q., Canada
12.705	FFK	St. Nazaire, France
12.740	OSE2	Kanda-Kanda, Belgian Congo
12.745	DAF	Norddeich, Germany
12.750	----	Aeronautical, Europe
12.780	GBC	Rugby, United Kingdom
12.800	IAC	Coltano, Italy, (X)
12.800	OSD2	Kigali, Belgian Congo

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL	LOCATION
12.825	CNR	Rabat, Morocco, (B)
12.840	WOY	Lawrenceville, N. J., USA
12.840	WOO	Ocean Gate, N. J., USA
12.860	OQD2	Kindu, Belgian Congo
12.865	IAC	Coltano, Italy, (X)
12.910	OSK2	Kitega, Belgian Congo
12.910	OXR	Skamlebak, Denmark
12.960	OQG2	Kongolo, Belgian Congo
13.000	TYC	Paris T.S.F., France
13.025	OQQ2	Libenge, Belgian Congo
13.040	----	Ship Telephone
13.074	JYK	Tokyo, Japan
13.075	VPD	Suva, Fiji Islands, (X)
13.085	OQI2	Lisala, Belgian Congo
13.100	----	Naval Stations, Germany
13.105	IRJ	Rome, Italy
13.140	CWH	Cerrito, Montevideo, Uruguay
13.150	OSG2	Luluabuorg, Belgian Congo
13.180	DGG	Nauen, Germany
13.200	----	Ship Telephone
13.205	ONF	Banana, Belgian Congo
13.215	----	Ship Telephone
13.220	----	Ship Telephone
13.240	KBJ	Manila, Philippine Islands
13.245	OSV	Stanleyville, Belgian Congo
13.260	IRR	Rome, Italy
13.285	CJA7	Drummondville, P. Q., Canada
13.300	----	Aeronautical, Europe
13.300	----	Naval Stations, Japan
13.315	OQY2	Niangara, Belgian Congo
13.335	WYS	Clark Field, Philippine Isl.
13.335	WYY	Oryden, Texas, USA
13.335	WYM	Ft. Leavenworth, Kans., USA
13.335	WYN	Hatbox Field, Okla., USA
13.335	WYO	Hensley Field, Texas, USA
13.335	WYG	Kelly Field, Texas, USA
13.335	WYR	Kindley Field, Philippine Isl.
13.335	WUG	Marfa, Texas, USA
13.335	WYT	Nichols Field, Philippine Isl.
13.335	WUM	Tucson, Ariz., USA
13.340	VLJ2	Sydney, Australia
13.340	VLZ3	Sydney, Australia
13.340	CGA	Drummondville, P. Q., Canada
13.345	YVQ	Maracay, Venezuela
13.360	OQF2	Port-Francqui, Belgian Congo
13.390	WMA	Lawrenceville, N. J., USA
13.405	GBJ	Bodmin, United Kingdom
13.410	YID	Baghdad, Iraq, (B)
13.415	OQR2	Usumbura, Belgian Congo
13.415	GCJ	Rugby, United Kingdom
13.460	LPR6	General Pacheco, Argentina
13.510	OSB2	Kikwit, Belgian Congo
13.540	GMS	Ongar, United Kingdom
13.560	JVI	Tokyo, Japan
13.585	GBB	Rugby, United Kingdom
13.591	GBC	Rugby, United Kingdom
13.605	OQA2	Kigoma, Belgian Congo
13.610	JYK	Tokyo, Japan, (XB)
13.635	SPW	Warsaw, Poland
13.685	HAT	Szekesfehervar, Hungary
13.740	CGA	Drummondville, P. Q., Canada
13.790	EAK	San Lorenzo, Canary Islands
13.800	VLK5	Sydney, Australia
13.811	SUZ	Abou Zaabal, Egypt
13.813		
13.820		
13.827	SUZ	Abou Zaabal, Egypt
13.829		
13.880	RELO	Boukhta Bertys, Russia
13.885	WQT	RockyPoint, N. Y.. USA
13.890	LPG9	General Pacheco Argentina
13.950	----	Aeronautical, Europe
13.950	YO1	Bucharest Rumania, (B)
13.965	TFL	Reykjavik, Iceland
13.980	LCO	Jeloy, Norway, (B)
13.990	GBA	Rugby, England
14.000	RFBD	Mojaisk, Russia
14.000 to 14.005	HJ5ABE	Cali, Colombia
14.005 to 14.395		Amateurs,
14.151	HSJ	Bangkok, Siam
14.250	RPK	Moscow, Russia
14.285	LPR2	General Pacheco, Argentina
14.286	RMNK	Kharkov, Russia
14.286	RKV	Moscow, Russia
14.410	DIP	Zeesen, Germany
14.420	VPD	Suva, Fiji
14.435	LSJ2	Hurlingham, Argentina
14.440	GBW	Rugby, United Kingdom
14.450	RPK	Moscow, Russia
14.470	WMF	Lawrenceville, N. J., USA
14.479	HSJ	Bangkok, Siam
14.480	LSN	Buenos Aires, Argentina, (B)
14.480	GBW	Rugby, United Kingdom
14.485	TGF	Guatemala City, Guat.
14.485	HPF	Panama, Panama
14.485	YNA	Managua, Nicaragua
14.485	TIR	Cartago, Costa Rira
14.500	LSM2	Hurlingham, Argentina
14.500	RRRF	Moscow, Russia
14.510	RRRF	Moscow, Russia
14.515		Panama City, Panama

Freq. Mc.	CALL	LOCATION
14.525	XDA	Chapultepec, Mexico
14.530	LSA	Buenos Aires, Argentina
14.530	LSN	Buenos Aires, Argentina, (B)
14.535	HBJ	Prangins, Switzerland
14.540	----	Tokyo, Japan
14.545	RTZ	Irkutsk, Russia
14.550	RTZ	Irkutsk, Russia
14.550	HBJ	Prangins, Switzerland
14.560	RTZ	Irkutsk, Russia
14.570	RTZ	Irkutsk, Russia
14.590	WMN	Lawrenceville, N. J., USA
14.600	JVH	Tokyo, Japan
14.605	DGZ	Nauen, Germany
14.620	XDA	Chapultepec, Mexico
14.620	EDM	Madrid, Spain
14.620	EDN	Madrid, Spain
14.620	EDR2	Madrid, Spain
14.620	EDS	Madrid, Spain
14.620	EHY	Madrid, Spain
14.635	RELB	Boukhta Bertys, Russia
14.635	RELO	Boukhta Bertys, Russia
14.653	GBL	Rugby, United Kingdom
14.665	DFD	Nauen, Germany
14.690	PSS	Rio de Janeiro, Brazil
14.705	OZW	Skamlebak, Denmark
14.710	VLZ5	Sydney, Australia
14.750	FZV	Tananarive, Madagascar
14.770	WEB	Rocky Point, N. Y., USA
14.800	WQV	Rocky Point, N. Y., USA
14.815	WQL	New Brunswick, N. J., USA
14.820	EAK	San Lorenzo, Canary Islands
14.830	WKU	Rocky Point, N. Y., USA
14.830	RRRW	Moscow, Russia
14.840	RRRW	Moscow, Russia
14.910	JVG	Tokyo, Japan
14.920	KQH	Kahuku, Hawaii
14.935	PSE	Marapicu, Brazil
14.940	EAK	San Lorenzo, Canary Islands
14.950	HJB	Bogota, Col.
14.965	EAK	San Lorenzo, Canary Islands
14.980	KAY	Manila, Philippine Islands
14.985	EFR2	Madrid, Spain
14.985	EDS	Madrid, Spain

20 TO 17 METERS

15.000	CM6XJ	Central Tuinucu, Cuba
15.040	WQG	Rocky Point, N. Y., USA
15.040	RKI	Moscow, Russia
15.055	WNC	Hialeah, Fla., USA
15.065	EAK	San Lorenzo, Canary Islands
15.070	PSD	Marapicu, Brazil
15.075	TI4NRH	Heredia, Costa Rica, (B)
15.090	RKI	Moscow, Russia
15.104	RAU	Tashkent, Russia, (B)
15.110	DJL	Zeesen, Germany, (B)
15.120	J1AA	Tokyo, Japan, (B)
15.120	HVJ	Vatican City, (B)
15.123	HVJ	Vatican City, (B)
15.130	NAA	Washington, D. C., USA, (B)
15.130	VE9DN	Drummondville, P.Q., Can., (B)
15.140	GSF	Daventry, United Kingdom, (B)
15.190	VE9BA	Montreal, P. Q., Canada, (X)
15.200	DJB	Zeesen, Germany, (B)
15.210	W8XK	Saxonburg, Pa., USA
15.220	PCJ	Eindhoven Netherlands, (B)
15.230	VK3LR	Lyndhurst, Vic., Aus., (B)
15.230	2RO	Rome, Italy (B)
15.243		Pontoise, France (B)
15.250	W1XAL	Boston, Mass., USA, (B)
15.252	RIM	Rachkent, Russia
15.260	GSI	Daventry, United Kingdom, (B)
15.265	EAQ	Aranjuez, Spain, (B)
15.270	W2XE	Wayne, N. J., USA, (B)
15.275	----	Warsaw, Poland, (B)
15.280	DJQ	Zeesen, Germany, (B)
15.290	2RO	Rome, Italy (B)
15.295	CP5	La Paz, Bolivia, (B)
15.295		Pontoise, France, (B)
15.300	OXY	Skamlebak, Denmark, (B)
15.320	----	Taihoku, Japan
15.330	W2XAD	Schenectady N. Y., USA, (B)
15.340	DJR	Zeesen, Germany, (B)
15.350	CT1AA	Lisbon, Portugal, (BX)
15.355	KWU	Dixon, Calif., USA
15.370	TIR	Cartago, Costa Rica
15.370	HAS3	Szekesfchervar, Hungary, (B)
15.410	PRADO	Riobamba, Ecuador, (B)
15.415	KWO	Dixon, Calif., USA
15.430	KWE	Bolinas, Calif., USA
15.445	WQZ	San Juan, Puerto Rico
15.460	KRR	Bolinas, Calif., USA
15.475	KKL	Bolinas, Calif., USA
15.490	KEM	Bolinas, Calif., USA
15.510	JDX	Dairen, Manchuria
15.530	HSG	Bangkok, Siam
15.560	PYR	Sopetiba, Brazil
15.620	JVF	Tokyo, Japan
15.625	OCJ	Lima, Peru
15.660	JVE	Tokyo, Japan
15.670	LCQ	Jeloy, Norway
15.680	JZA	Shinkyo, Japan

Freq. Mc.	CALL	LOCATION
15.740	TFM	Reykjavik, Iceland
15.740	JIA	Taihoku, Taiwan, Japan
15.760	JYT	Tokyo (Kemikawa) Jap., (BX)
15.810	LSL	Hurlingham, Argentina
15.860	FTK	St. Assise, France
15.860	JVD	Tokyo, Japan
15.865	CEC	La Granja, Chile
15.880	FTK	St. Assise, France
15.930	FYC	Paris, France
15.935		
15.970	RRRI	Khabarovsk, Russia
15.985	WAZ	New Brunswick, N. J., USA
16.000	WKQ	Rocky Point N. Y., USA
16.000	RFAJ	Moscow, Russia
16.015	WQR	New Brunswick, N. J., USA
16.030	KKP	Kahuku, Hawaii
16.050	JVC	Tokyo, Japan
16.070	RRRI	Khabarovsk, Russia
16.090	EDR2	Madrid, Spain
16.090	EDS	Madrid, Spain
16.120	IRY	Rome, Italy
16.140	----	Rugby, United Kingdom
16.150	GBX	Rugby, United Kingdom
16.162	PSA	Maripicu, Brazil
16.200	FZR	Saigon, French Indo-China
16.214	FZR3	Saigon, French Indo-China
16.233	FZR3	Saigon, French Indo-China
16.240	KTO	Manilla, Philippine Islands
16.270	WLK	Lawrenceville, N. J., USA
16.270	WOG	Ocean Gate, N. J., USA
16.300	EDR3	El Tablero, Canary Islands
16.305	PCL	Kootwijk, Nehterlands
16.330	VLJ3	Sydney, Australia
16.330	VLK	Sydney, Australia, (B)
16.330	VLZ	Sydney, Australia
16.430	----	Naval Stations, Germany
16.440	----	Aeronautical, Europe
16.665	LPD	General Pacheco, Argentina
16.665	DAN	Norden, Germany
16.666	LOB	Puerto Aguirre, Argentina
16.800	----	Aeronautical, Europe
16.854	ZSV	Walvis Bay, Un. of So. Africa
16.870	FFK	St. Nazaire, France
17.080	GBC	Rugby, United Kingdom
17.120	WOY	Lawrenceville, N. J., USA
17.120	WOO	Ocean Gate. N. J., USA
17.130	HAS5	Szekesfehervar, Hungary, (B)
17.143	----	Shanghai, China
17.150	OPC	Coquilhatville, Belgian Congo
17.190	OXV	Skamlebak, Denmark
17.200	----	Aeronautical, Europe
17.200	CWI	Cerrito, Montevideo, Uruguay
17.260	DAF	Norddcitch. Germany
17.260	PBB	Den Helder, Netherlands
17.300	VE9BY	London, Ont., Canada, (B)
17.310	W3XL	Bound Brook, N. J., USA, (B)
17.310	CZA	Drummondville, P. Q., Canada
17.341	DIM	Nauen, Germany
17.400	J1AA	Tokyo, Japan, (B)
17.430	CWM	Cerrito, Montevidco, Uruguay
17.470	TYD	Paris, T.S.F., France
17.480	VWY	Kirkee, India
17.510	VWY2	Kirkee, India
17.512	DFB	Nauen, Germany
17.520	DEB	Nauen, Germany
17.600	----	Ship Telephone
17.600	GBC	Rugby, United Kingdom
17.620	----	Ship Telephone
17.630	VLJ5	Sydney, Australia
17.630	RRRU	Khabarovsk, Russia
17.640	RRRU	Khabarovsk, Russia
17.640	----	Ship Telephone

17 TO 15 METERS

17.650	XGM	Shanghai, China
17.650	RRRU	Khabarovsk, Russia
17.660	RRRV	Khabarovsk, Russia
17.670	RRRV	Khabarovsk, Russia
17.680	RRRV	Khabarovsk, Russia
17.690	LQB2	Monte Grande, Argentina
17.699	IAC	Coltano, Italy (X)
17.700	----	Naval Stations, Japan
17.710	CJA9	Drummondville, P. Q., Canada
17.710	RRRV	Khabarovsk, Russia
17.719	HSP	Bangkok, Siam
17.720	RRRV	Khabarovsk, Russia
17.725	CNP	Casablanca, Morocco
17.730	RRRV	Khabarovsk, Russia
17.735		
17.740	HSP	Bangkok, Siam
17.750	IAC	Coltano, Italy. (X)
17.760	DJE	Zeesen, Germany, (B)
17.765		Pontoise, France, (B)
17.770	2RO	Rome, Italy (B)
17.775	PHI	Huizen, Netherland, (B)
17.780	W3XAL	Bound Br., N. J., USA, (B)
17.780	W9XAA	Chicago, Ill., USA, (B)
17.780	W9XF	Downer's Grove, Ill., USA, (B)
17.780	W8XK	Saxonburg, Pa., (B)
17.780	----	Warsaw, Poland, (B)
17.790	RRRV	Khabarovsk, Russia
17.790	GSG	Daventry, United Kingdom (B)
17.794	XGBB	Shanghai, China

B=Broadcasting; X=Experimental.

Freq. Mc.	CALL	LOCATION
17.795	PCV	Kootwijk, Netherlands
17.800	XGOX	Nanking, China, (B)
17.800	PCV	Kootwijk, Netherlands
17.800	RRRV	Khabarovsk, Russia
17.800	HSC	Bangkok, Siam
17.805	PCV	Kootwijk, Netherlands
17.810	PCV	Kootwijk, Netherlands
17.810	RRRV	Khabarovsk, Russia
17.820	RRRV	Khabarovsk, Russia
17.830	PCV	Kootwijk, Netherlands
17.830	RRRV	Khabarovsk, Russia
17.850	LSN	Buenos Aires, Argentina, (B)
17.850	RRRV	Khabarovsk, Russia
17.860	WQC	Rocky Point, N. Y., USA
17.860	RRRV	Khabarovsk, Russia
17.870	RRRV	Khabarovsk, Russia
17.880	WQI	New Brunswick, N. J., USA
17.890	TFN	Reykjavik, Iceland
17.890	FZT	Tananarive, Madagascar
17.900	WLL	Rocky Point, N. Y., USA
17.900	FZT	Tananarive, Madagascar
17.910	CWO	Cerrito, Montevideo, Uruguay
17.910	RRRV	Khabarovsk, Russia
17.920	WQF	Rocky Point, N. Y., USA
17.920	RRRV	Khabarovsk, Russia
17.930	RRH	Tashkent, Russia
17.940	WQB	Rocky Point, N. Y., USA
17.980	KQZ	Bolinas, Calif., USA
18.030	RRI	Novosibirsk, Russia
18.040	GAB	Rugby, United Kingdom
18.050	RRRX	Khabarovsk, Russia
18.060	KUN	Bolinas, Calif., USA
18.060	RRRX	Khabarovsk, Russia
18.070	RRRX	Khabarovsk, Russia
18.080	----	Camaguey, Cuba
18.080	RRRX	Khabarovsk, Russia
18.100	RRRX	Khabarovsk, Russia
18.110	RRRX	Khabarovsk, Russia
18.115	LSY3	Monte Grande, Argentina
18.120	RRRX	Khabarovsk, Russia
18.135	PMC	Bandoeng, Java
18.150	----	Camaguey, Cuba
18.150	RRRX	Khabarovsk, Russia
18.160	RRRX	Khabarovsk, Russia
18.170	CGA	Drummondville, P. Q., Canada
18.170	RRRX	Khabarovsk, Russia
18.190	JVB	Tokyo, Japan
18.200	GAW	Rugby, United Kingdom
18.220	KUS	Manila, Philippine Islands
18.230	EAH	Madrid, Spain
18.240	FRE	St. Assise, France
18.240	JVB	Tokyo, Japan
18.250	FTO	St. Assise, France
18.295	YVR	Maracay, Venezuela
18.310	FZS	Saigon, Indo China
18.310	GBS	Rugby, United Kingdom
18.340	WLA	Lawrenceville, N. J., USA
18.340	ZLW	Wellington, N. Z.
18.345	FZS3	Saigon, French Indo-China
18.390	----	Warsaw, Poland
18.400	PCK	Kootwijk, Netherlands
18.405		
18.410	PCK	Kootwijk, Netherlands
18.411	VWZ	Kirkee, India
18.413		
18.420	VWZ	Kirkee, India
18.427		
18.429		
18.480	HBH	Prangins, Switzerland
18.535	PCM	Kootwijk, Netherlands
18.535	----	Warsaw, Poland
18.540	PCM	Kootwijk, Netherlands
18.545	PCM	Kootwijk, Netherlands
18.595	GLS	Ongar, United Kingdom
18.600	PDM	Kootwijk, Netherlands
18.610	RRK	Tiflis, Russia
18.620	GBJ	Bodmin, United Kingdom
18.620	GAU	Rugby, United Kingdom
18.630	IRZ	Rome, Italy
18.640	PSC	Marapicu, Brazil
18.680	OCI	Lima, Peru
18.680	GAX	Rugby, United Kingdom
18.700	DFQ	Nauen, Germany
18.770	TYD3	Paris, T.S.F., France
18.830	PLE	Bandoeng, Java, (C)
18.860	WKM	Rocky Point, N. Y., USA
18.890	ZSS	Klipheuvel, Un. of So. Africa
18.910	JVA	Tokyo, Japan
18.950	HBF	Prangins, Switzerland
18.960	LSR	Buenos Aires, Argentina
18.960	EAH	Madrid, Spain
18.970	GAQ	Rugby, United Kingdom
18.980	WFX	Rocky Point, N. Y. USA
19.000	HSJ	Bangkok, Siam
19.010	PSB	Marapicu, Brazil
19.030	EDM	Madrid, Spain
19.030	EDR2	Madrid, Spain
19.030	EDS	Madrid, Spain
19.030	EHY	Madrid, Spain
19.160	GAP	Rugby, United Kingdom
19.200	ORG	Ruysselede, Belgium
19.220	WKF	Lawrenceville, N. J. USA
19.240	DFA	Nauen, Germany
19.250	FZV3	Tananarive, Madagascar
19.260	PPU	Sepetiba, Brazil
19.300	VLK2	Sydney, Australia
19.355	FTM	St. Assise, France
19.380	WOP	Ocean Gate, N. J., USA
19.400	LQD	Monte Grande, Argentina
19.400	FRE	St. Assise France
19.430	ORH	Elisabethville, Belgian Congo
19.435	EDR2	Madrid, Spain
19.435	EDS	Madrid, Spain
19.460	DFM	Nauen, Germany
19.500	LSQ	Buenos Aires, Argentina, (B)
19.520	IRW	Rome, Italy
19.530	EDR2	Madrid, Spain
19.530	EDS	Madrid, Spain
19.600	LSF	Monte Grande, Argentina
19.650	LSN5	Hurlinghan, Argentina
19.656	IRL	Rome, Italy
19.680	CEC	La Granja, Chile
19.700	DFJ	Nauen, Germany
19.720	EAQ	Aranjuez, Spain, (B)
19.800	----	Tokyo, Japan
19.820	WKN	Lawrenceville, N. J., USA
19.840	FTD	St. Assise, France
19.900	LSG	Monte Grande, Argentina
19.920	HSJ	Bangkok, Siam
19.947	DIH	Nauen, Germany
19.980	KAX	Manila, Philippine Islands

15 TO 6 METERS

Freq. Mc.	CALL	LOCATION
20.020	DHO	Nauen, Germany
20.040	OPL	Leopoldville, Belgian Congo
20.140	DGW	Nauen, Germany
20.140	DWG	Nauen, Germany
20.165	----	Warsaw, Poland
20.180	WQX	Rocky Point, N. Y., USA
20.260	WQQ	Rocky Point, N. Y., USA
20.310	RFAJ	Moscow, Russia
20.360	EAH	Madrid, Spain
20.380	GAA	Rugby, United Kingdom
20.400	VLK7	Sydney, Australia
20.430	IRK	Rome, Italy
20.500	DGQ	Nauen, Germany
20.570	EDR2	Madrid, Spain
20.570	EDS	Madrid, Spain
20.570	EHX	Madrid, Spain
20.585	ORS	Stanleyville, Belgian Congo
20.595	ORL	Leopoldville, Belgian Congo
20.610	EAH	Madrid, Spain
20.620	CEC	La Granja, Chile
20.640	FSR	Paris France
20.670	EHX	Madrid, Spain
20.680	LSN	Buenos Aires, Argentina, (B)
20.680	LSX	Monte Grande, Argentina, (B)
20.730	LSY	Monte Grande, Argentina
20.740	DGP	Nauen, Germany
20.780	KMM	Bolinas, Calif., USA
20.820	KSS	Bolinas, Calif., USA
20.825	PFF	Kootwijk, Netherlands
20.830	PFF	Kootwijk, Netherlands
20.835		
20.860	EDM	Madrid, Spain
20.860	EDR2	Madrid, Spain
20.860	EDS	Madrid, Spain
20.860	EHY	Madrid, Spain
20.960	EAH	Madrid, Spain
21.000	OKI	Podebrady, Czechoslovakia
21.020	LSN	Buenos Aires, Argentina, (B)
21.060	KWN	Dixon, Calif., USA
21.060	WKA	Lawrenceville, N. J., USA
21.080	PSA	Marapicu, Brazil
21.110	CEC	La Granja, Chile
21.130	LSM	Buenos Aires, Argentina (B)
21.140	KBI	Manila, Philippine Islands
21.150	HAS4	Szekesfehervar, Hungary (B)
21.160	LSL	Buenos Aires, Argentina
21.180	DGN	Nauen, Germany
21.220	WQA	Rocky Point, N. Y., USA
21.240	WQJ	Rocky Point, N. Y., USA
21.260	WBU	Rocky Point, N. Y., USA
21.340	DGM	Nauen, Germany
21.420	WKK	Lawrenceville, N. J. USA
21.460	W1XAL	Boston, Mass., USA, (B)
21.470	GSH	Daventry, United Kingdom, (B)
21.480	----	Warsaw, Poland, (B)
21.490		Pontoise, France, (B)
21.500	NAA	Washington, D. C., USA
21.510	2RO	Rome, Italy (B)
21.530	GSJ	Daventry, United Kingdom, (B)
21.540	W8XK	Pittsburgh, Pa., USA
21.540	VK3LR	Lyndhurst, Vic., Aus., (B)
21.550	XGBA	Shanghai, China, (B)
21.600	CGG	Drummondville, P. Q., Canada
22.300	GBU	Rugby, United Kingdom
22.460	EDS	Madrid, Spain
22.520	DGE	Nauen, Germany
22.600	DGF	Nauen, Germany
22.760	EDR2	Madrid Spain
22.820	CEC	La Granja, Chile
23.240	HSJ	Bangkok, Siam
25.650	2RO	Rome, Italy (B)
26.100	GSK	Daventry, United Kingdom (B)
28.000 to 30.000		Amateurs,
29.817	IAF	Fiumicino, Italy
30.604	IAG	Golfo Aranci, Italy
36.144	TYZ	Calenzana, France
36.300	KGXM	Waikiki, Hawaii
36.800	----	Amateur and Experimental, Japan, (X)
37.400	KGXC	Manawahua, Hawaii
39.473	TY4	La Turbie, France
39.600	KGXA	Manawahua, Hawaii
40.700	KGXJ	Ulupalakua, Hawaii
41.040	LQL	Monte Grande, Argentina
41.400	LQK	Monte Grande, Argentina
46.200	KGXO	Kalepa, Hawaii
47.300	KGXB	Manawahua, Hawaii
48.400	KGXH	Ulupalakua, Hawaii
49.500	KGXK	Waikiki, Hawaii
56.000 to 60.000		Amateurs, USA
400.000 to 401.000		Amateurs, USA

B=Broadcasting; X=Experimental.

How To "Log" S-W Stations and Calibrate Receivers

This article explains just how to "log" stations and also how to approximate just where they can be heard on your dial. Extreme care is really the secret of successful short-wave reception. An "accurate log" is, of course, essential.

● THE secret of successful short-wave DXing undoubtedly lies in accurate *logging* on the part of the operator and the accuracy of the receiver calibration. Tuning across the short-wave bands we have come upon several weak stations and have listened to some of them for hours at a time without hearing a single announcement as to the call letters and location. This means that if one wishes to gather enough information to obtain a verification card from the station, he would have to spend four or five hours of constant listening to that particular one.

But, if the station is *logged* by dial number and the receiver accurately calibrated, you can tune to other stations and return to the unknown station from time to time in hopes that you will strike an announcement of call letters.

Many types of log books and log sheets have been prepared and sold by different companies, and we do not intend to specify any particular type, however, a good "log" has columns for each of the following:

Call letters of the station, frequency of the station, dial setting, the date, time of day, and any other remarks which the listener may wish to note.

For instance, coming upon one of these stations that you cannot identify, mark down the approximate frequency, the exact dial setting, and the type of program heard, and possibly the language spoken, if any is heard, and also the exact time and date. At some later moment you may return to this station, obtain its call letters, and fill in the blank columns. Most of the present day up-to-date receivers are fairly accurately calibrated, that is, the dials are marked off in wavelength, kilocycles, or megacycles, and a good many times when complete instructions are not furnished with the receiver, the dial readings present as great a problem as operation.

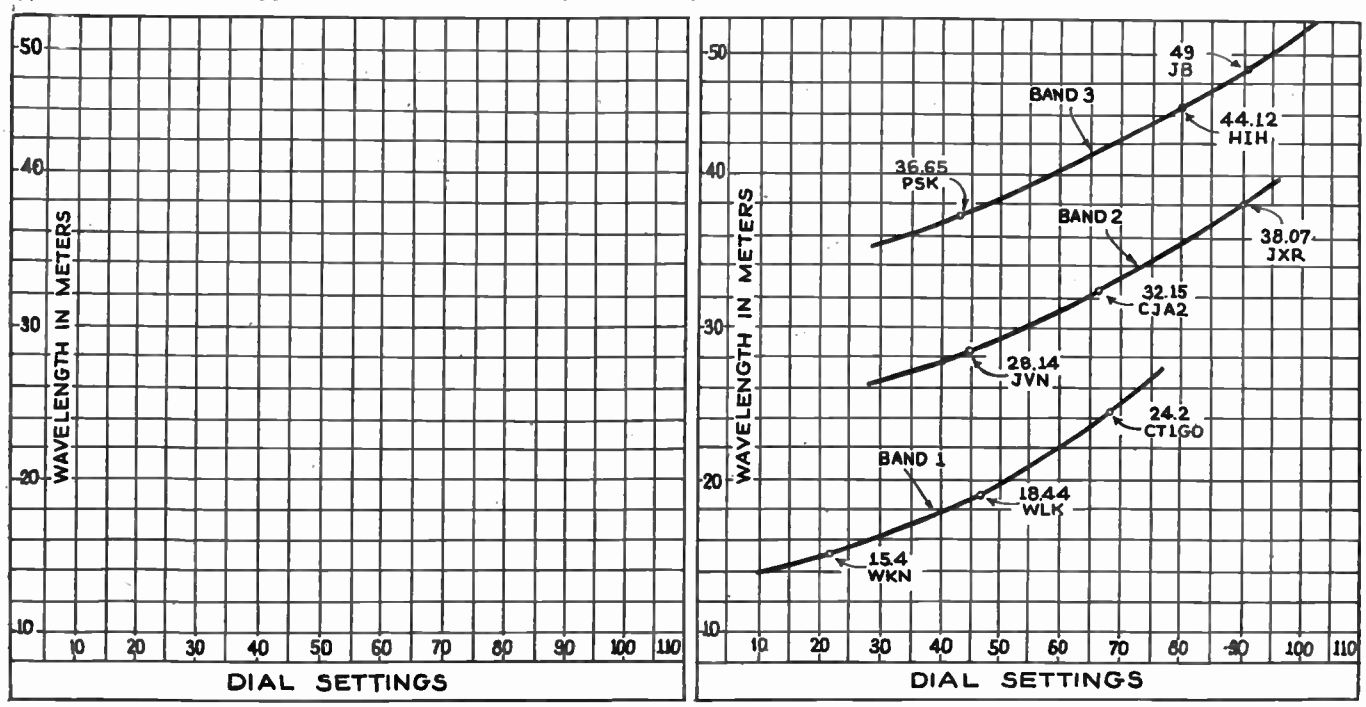
STATION	COUNTRY	FREQ.	TIME	DATE	DIAL	REMARKS
VK2ME	AUSTRALIA	9590	12.30AM	1/3/35	48	VERY STEADY

Sample "Log" showing how a station should be entered on the record.

For instance, in the station lists provided in this magazine, the wavelength and frequency are given, if your dial is marked in megacycles such as from 1.5 to say 15, it is a simple matter to follow the kilocycle designations given in our list; 9.5 megacycles is 9500 kilocycles; 1.5 megacycles is 1500 kilocycles.

At the bottom of this page you will find a graph which will aid you in calibrating your receiver if it is not marked off in megacycles. The various dial settings are plotted against the known frequencies of the stations received and later a smooth curved line is drawn between all of these marks, and the result is that you will be able to find the approximate dial setting or frequencies not indicated by the connecting line, by following the line through to the proper kilocycle column.

As shown in this graph, a separate line or curve which is really the tuning curve of your receiver, is used for each wave band. While three are shown you should incorporate as many curves as you have wave bands on your receiver. If your receiver has 4 or 5 short-wave bands then plot a corresponding number of tuning curves.



Calibration curves plotted on a cross-section paper enable you to quickly find stations when only their frequency is known.

selection of the length of radio waves used for service at various hours.

For distances over a thousand miles the shorter of the commercially useful short waves (14 to 35 meters) are generally relied on during the day, because at that time the density of the Ionosphere is greatest and the electrified particles are present in sufficient numbers to turn these waves back to earth. On the other hand, radio waves longer than 30 meter (roughtly, 100 feet) are received stronger at night than they are in the daytime.

For consistent long distance work, short waves from about 15 to 80 meters in length and waves longer than 1,000 meters are found to be more economical. This last point—economy—has an important bearing on the selection of wave lengths. Because their antenna systems are easier to construct and they do not have to cover so great a space, and because they also are easier to radiate, short waves are more economical than long waves for transmission. Where nearly 550 kilowatts of power is used to send long waves on our New York-London channel, virtually the same thing is accomplished under normal conditions by short waves and their more directive antenna systems with about 105 kilowatts.

Since they are reflected from higher regions in the Ionosphere, short waves make a longer hop than long waves in going from the earth to the upper atmosphere and back again to earth. On two of the diagrams are indicated the paths of a number of typical radio waves. As can be seen, the progress of long waves around the globe takes the form of a series of bounces. The routes of several short waves are also illustrated.

Again, with this chart in view, the phenomenon spoken of as "skip distance" is easily comprehended. As they skim along the ground, short waves diminish in strength much faster than long waves. In the case of the shorter of the commercially useful short waves, little or no signal strength is received from the point where the radio waves die out on the ground and the point where the waves return to the earth from the sky. Obviously, the receiver at the other end of the circuit must not be allowed to be in one of these dead areas. Radio engineers therefore choose short wave lengths which will bounce the conversation down into the region desired by the telephone user.

Take the New York-London circuits and those on the ship-to-shore service, for example. During the day, short waves from 16 to 24 meters in length are ordinarily used between the two cities. At this time, short waves around 18 and 25 meters in length are employed when a ship is more than a quarter of the way across the Atlantic; about 35 meters long when it is between one-quarter and one-tenth the way over; and about 72 meters when it is less than one-tenth the way out. At night, 24 meter waves and longer are generally used on the New York-London service and the range of the 35 and 72 meter waves is considerably extended for the ship to-shore service.

How Short Waves Are Propagated

(*Continued from page* 197)

Of course, there are *seasonal changes* which also affect the choice of wave length for commercial operations. The most pronounced are caused by the shifting intensity of sunlight, the changing length of day and night, or the extent to which the upper atmosphere is exposed to the rays of the sun. The shorter of the available short waves are used more in summer than in winter while the longer of these short waves are relied on during winter nights.

So much for the length of radio waves. What of changes in their strength? Here we come upon two factors: *dispersion* and *absorption*. The first is comparatively simple—as the radio waves go toward their destination, some of their energy is spent by merely being spread out into a larger and larger area. Absorption, however, is a more difficult matter. Its causes are highly technical and it indirectly involves the activity of the sun as well. Briefly, the phenomenon can be summarized as follows:

As they journey into space, radio waves transfer a good portion of their energy into another form by setting up motions of the electrified particles in the Ionosphere. In turn, these particles set up radio waves of the same pattern as those which put them into motion. In the course of such movement the electrified particles may collide with neutral particles, such as those of oxygen and nitrogen, and deflect or arrest this motion. As a result, radio energy is either scattered or lost; absorbed, in other words.

Further, there are more neutral or atmospheric particles at low levels. During the day, as we have learned, there are also more electrified particles at such low levels of the atmosphere. Hence, more collisions take place at this time and more radio energy is lost. At night, however, radio waves climb to loftier heights before meeting sufficient electrified particles to bend them back to earth. And at this level there are fewer neutral or atmospheric particles. Consequently, fewer collisions take place then, a condition which results in less absorption.

Variations in the amount of absorption are responsible for a familiar difficulty in radio reception—fading, described as "a kind of nervousness" in which the signal strength fluctuates and affects the intelligibility of speech. Wave interference is still another reason. On their journey into the Ionosphere, radio waves follow more than one path before being directed back to the earth's surface. These paths are constantly changing in length because of variations in the creation of electrified particles. Thus, as they arrive at the receiver, the waves following these various paths fall in and out of phase with each other in a random sort of way, causing the intensity of the signal to be weakened and strengthened in an equally unpredictable manner.

Since something like 1,800 *electrical storms* (thunder-storms) are going on every moment all round the world, it is not hard to label noise or static as another enemy of clear radio reception. These disturbances produce about 100 lightning flashes every second. While most discharges are between clouds, about one out of every ten is between a cloud and the earth. It is these last discharges which are most disturbing to radio reception.

Curiously enough, this ultra modern scientific observation has an ancient parallel. Long ago it was a tenet of religion—as it is now of superstition—that the action of heavenly bodies affected affairs on earth. — *Courtesy Long Lines."—A. T. & T. Co.*

$3.00 for Best S-W Hint

Each month we are awarding $3.00 for the best short-wave hint. Those presented on this page will give the reader an idea of the type of material that we are looking for. All hints printed other than the prize winner will be awarded a six months' subscription to this magazine.

PRIZE HINT

Two Dials Aid in Tuning

Here is a hint which I believe is valuable. Very often it is most difficult to write down the exact setting of a station on the dial.

Most airplane-type dials are not calibrated to such a fine degree as one would like them to be. The illustrated hint helps a great deal in logging stations. When the station is tuned in at the exact point of resonance, the readings of both dials are taken down.

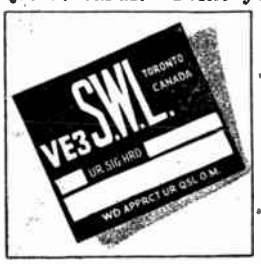
Two dials mounted in this fashion aid in tuning.

For example, thus: 7-2; 53; which means the airplane dial points on 7200 kc. set first, and then the small dial turned to exactly 53. This gives the effect of band-spread tuning on receivers that are not so equipped. The 3-inch dial allows for a much firmer grasp to be had than with a small knob, and thereby permits slow tuning.—Ernest J. Orishek.

SWL Cards

I submit a kink for consideration in your column—print your own S. W.L.'s and Q.S.L.'s.

Here is a novel and inexpensive way to print your own S.W.L. and Q.S.L. cards. Print your call letters, etc., in India Ink on a sheet of white writing paper about 3¼" x 4¼". Place this sheet (printed side down) in a small printing frame. On this place a sheet of sensitized photograph printing paper, preferably that of the post card type. Then expose to white light, remove the sensitized paper placing it in developer, then fixer, following the procedure of printing from a negative. The printing will come out in white against a black background.—A. McCall.

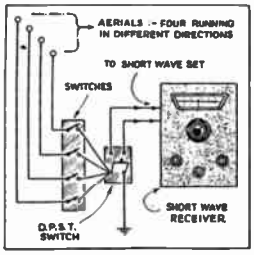


S. W. L. cards may be printed by the short wave "fan" himself.

Diversity Antenna for the "Fan"

I have just recently started reading your *Short Wave Listener* magazine and I want to take this opportunity to tell you that it is one of the best, if not the best short-wave magazine on the market. It sure has helped me with several of my problems in radio.

I am enclosing a diagram which I would like to enter in your magazine, "$3.00 for the Best S-W Hint." I have installed this about three years ago and have used it with great success. I have four different aerials running in different directions and each lead-in is connected to a switch. When I listen in on my short-wave set, I try out each of the four aerials for the best results. I can use one, two, three, or four aerials, just by throwing the switches. In this way you can receive stations that you never dreamed of hearing.

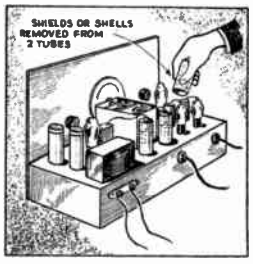


Several antennas aid in bringing in those "weak" stations.

I have "logged" stations all over the world, including amateurs on phone from the Hawaiian Islands and the Philippine Islands, also Cuba, Denmark, England, Germany, Mexico, India, Panama, Switzerland, Spain, France, South America, Australia, and many other countries. — Frank J. Schrameyer.

Increasing Sensitivity

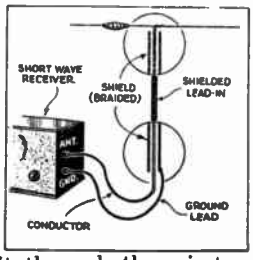
I have a S-W hint that I think might be of benefit to other fans. Removing the shields from screen grid tubes will give your set more qualities of a regenerative set and make tuning sharper and the set more sensitive. This will enable you to bring in greater DX, (distance).—Bud Toohey.



Removing one or two tube shields makes set more sensitive.

Shielded Lead-Ins

I live in the down-town part of the city in a flat and have had lots of trouble trying to eliminate interference. I now use shielded lead-in wire from the aerial down to the receiver. It is stranded copper wire, with rubber insulation and a flexible metal braid on the outside. I soldered the connection at the aerial on the roof and used stand-off insulators down the side of the building and then brought it through the window by installing a porcelain tube, and then connecting the copper core to the aerial post of the set and stripping enough of the flexible braid to reach the ground post of the set.



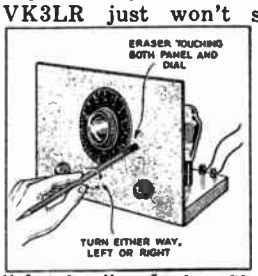
Shielded lead-in in many cases reduces man-made interference.

I was very much surprised at the results because before I could hear vacuum sweepers and automobiles, and now it works very well on both broadcast and short waves. I have an Airline 7-tube All-Wave radio and have got nine South American, three Cuban, two German, three English, one Spain, one Hawaiian, three Canadina, besides most of the United States stations.

I hope that this may be useful to others that have trouble with their lead-in picking up noise.—Kenneth McGovern.

Novel Vernier

At some time or other when VK3LR just won't slide into the "clutches" of the Short Wave Listener, as it has been for myself many and many a time, by acquiring a pencil with a good eraser on the end one can (as I have) overcome this hair-graying obstacle.



The pencil eraser may be employed as a vernier adjuster.

Simply place the pencil (eraser foremost) to the panel up against the dial so that the eraser touches the dial and panel simultaneously. Then slowly turn the pencil between your fingers always keeping the pencil firmly against the panel and dial. The result—the dial slowly moves and in slides the VK3LR (or what have you). It's just another simple method of band-spreading ,but it always is the simple idea that usually works for the average listener—and not the complicated.—Stephen Scibal.

THE LISTENER

Too many stations operating in the 49 meter band cause a great amount of interference.

TOO MANY STATIONS IN ONE BAND

John Underhill, St. Paul, Minn.

(Q) I have just purchased my first short-wave receiver, and I am very much disappointed in the results I am obtaining. It seems that this receiver does not tune sharply enough or it tunes improperly in some manner because I notice that within 5 or 10 divisions on the dial I can hear 10 or 15 stations, while I can go over the entire remainder of the dial and hear but two or three stations. It would seem to me that there is something wrong with the tuning of this receiver, that the stations should be bunched together in a few divisions.

(A) We are inclined to think that your receiver is working properly. You will find that the short-wave stations are grouped together on all receivers just the same as you are finding them on your dial. For instance, you will find 25 or 30 short-wave broadcast stations right in the vicinity of 49 meters, while you will only find two or three stations between 49 and 31 meters. This is because the stations are grouped in that manner by international regulations and there is nothing that you can do to remedy the situation.

OPERATE TRANSCEIVER WITHOUT LICENSE?

Joe Greene, Houston, Tex.

(Q) I have been informed that it is lawful to operate a transceiver without a license providing it does not transmit signals outside of the state. Is this correct?

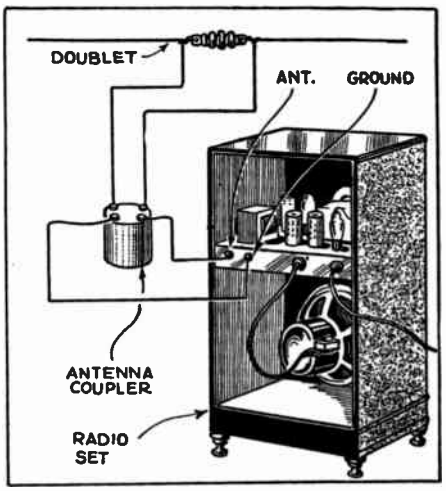
(A) Section 301 of the Communications Act of 1934 requires that a station must be licensed where the signals of that station may transcend state lines or where the signals of that station may interfere with interstate messages. Now this would seem to allow transmission without a license under the above conditions, however, our courts in all cases have held that regardless of how small the power of a transmitter, it radiates signals across the state border. In other words, all transmitters, regardless of their size are theoretically capable of transmitting signals across the state border and, for this reason, it is absolutely necessary to have a license when operating a transceiver.

USES GROUND AS AERIAL

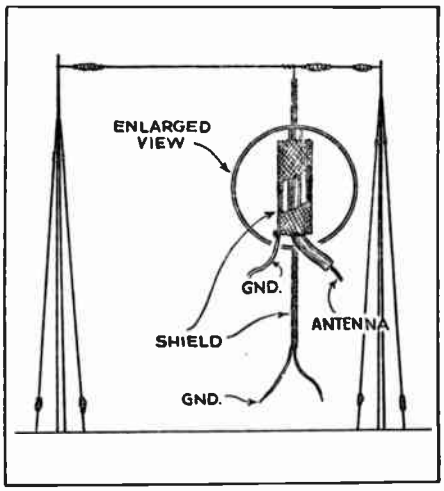
Oscar Ahrens, Tampa, Fla.

(Q) Recently my antenna became disconnected from the receiver, and a member of the family trying to right the condition, connected the ground wire on the antenna post and the antenna on the ground post. From that time on, I was able to pull in stations on my short-wave receiver that I had never before heard. I would like to know if it is due to the peculiar antenna and ground connections and just why this has not been done before as it works out so well.

(A) We hesitate to say that the improved results that you experienced are entirely due to the fact that the ground is connected on the antenna post. If they are, then we can only say that you must have a very very poor antenna system. We suggest you try turning the connections around sometime, especially when you are listening to a very weak station. This will prove whether or not the increase in sensitivity was due to the change in the antenna connection. It is quite possible that conditions have become quite a bit improved since the change was made and that you are blaming it on the change rather than general improved receiving conditions.



The doublet antenna can be connected to any set, providing the proper transformer or coupler is used.



In many cases a shielded lead-in has successfully reduced "man-made static" interference.

SHIELDED LEAD-IN

Adolph Hanson, Springfield, Mass.

(Q) I have read in numerous radio publications and catalogs that man-made static interference can be eliminated through the use of a shielded lead-in. I would like to know if this is true or not because I am contemplating putting up a new antenna and do not want to waste any time nor money in antennas which will not give proper results. A good many of my friends have told me that these antennas reduce signal strength considerably. Is this true?

(A) We have had considerable experience with shielded lead-ins of the ordinary type where a copper braid has been used on the outside of rubber covering stranded wire. While the noise has been known to decrease, some 30 or 40 per cent, with a lead in of this type, the signal usually decreases nearly as much; probably with a really sensitive receiver the lower signal level could be tolerated, in view of the reduction of back-ground noises. We have known of some cases where the signal strength has not been decreased any appreciable amount and the background noise entirely eliminated, although this cannot be guaranteed to hold true in any particular case. The type of noise you are experiencing and the sensitivity of your receiver will play a very important part in the use of shielded lead-ins.

CONNECTING DOUBLET

Henry Stages, Paterson, N. J.

(Q) My short-wave receiver is not of the newer type and I only have the standard antenna and ground binding posts. I would like to know if it is possible to connect a doublet to my receiver and still maintain the noise

ASKS

Only questions of general "Listener" interest will be answered here. No queries can be answered by mail. No diagrams of a technical or involved nature will be given here—only those which the Editors feel will be of value to the average nontechnical "Short-Wave Listener."

reducing qualities of the antenna and its lead-in. Would a special transformer be necessary or can the doublet wires be connected directly to the two posts of my receiver?

(A) The two lead-in wires from the doublet antenna can be connected to the two posts of your receiver, however, best results would be obtained with the use of a regular doublet coupling transformer sometimes called impedance matching transformer. These are available in any radio store, however, when purchasing one, provide the dealer with information as to the type of lead-in used, whether twisted or spaced pair, and also the type of receiver. Different types of lead-ins and receivers require different couplers.

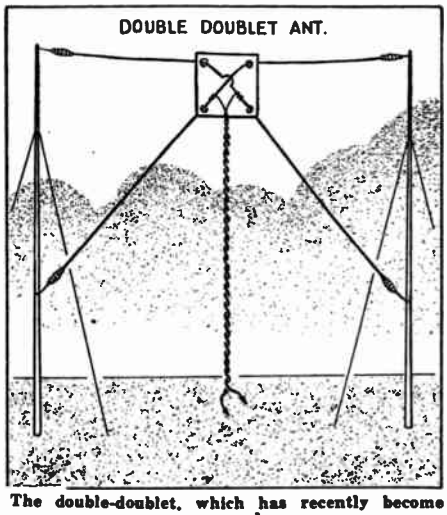
SHORT WAVES MORE NOISY THAN B.C. BAND

Robert Muller, Los Angeles, Calif.

(Q) I have a new all-wave receiver which is reputed to be one of the best on the market. It shows signs of being extremely sensitive and very selective and the tone quality is fine and I have received many foreign stations. My complaint though is that on the short wave bands I experience considerable noise which interferes with the weaker stations. I do not encounter any noise whatsoever on the broadcast band, that is above 200 meters and I am wondering if there isn't something wrong with my receiver, that might cause the short-wave bands to be noisy. Your answer in the LISTENER magazine would be appreciated.

(A) Undoubtedly if you were to turn the volume of your receiver all the way up and set the dial on the point on your receiver where no stations are received, you would find that the noise would be as great as on the short-wave band. On modern receivers having automatic volume control, the tremendous strength of the stations on the regular broadcast band is able to overcome and override the back-ground noise, but on the short-wave bands the amount of signal reaching the receiver is considerably less and, therefore, cannot compete with the general back-ground noise. If you take particular notice, you will find that on the strong short-wave stations the noise is somewhat less bothersome.

Keeping an accurate "log" enables you to return to a station at any time.



The double-doublet, which has recently become very popular.

CALIBRATING RECEIVER

Everett Gray, Hewlett, L. I.

(Q) The dial on my radio receiver is marked in figures from zero to 100. I understand the newer models are equipped with dials marked off in either kilocycles or wavelength and sometimes megacycles. Kindly let me know if it is possible to calibrate my dial in this fashion. I have considerable difficulty in locating some of the stations because, as you know, most call lists give the wavelength or frequency of the station and I have no reference marks to go by.

(A) Calibrating a short-wave receiver is quite a simple matter, however, by calibrating it we do not mean that the calibration is to be accurate within a half kilocycle or so, although it should be accurate enough to provide a convenient guide in searching for a station whose frequency is known.

First, of course, it is necessary that you keep an accurate list of the dial settings for stations that you have already received, and also the exact frequency either in kilocycles or megacycles. Then, by employing a piece of cross section paper and plotting the dial settings against the frequency of the stations, you will get a curve known as the tuning curve of your receiver. Then, anywhere along this curve the various stations can be located. In another section of this magazine, we have complete details showing just how to calibrate the receiver.

DOUBLET VERSUS DOUBLE DOUBLET

Arthur Hemerson, Detroit, Mich.

(Q) I would like to know whether or not a double doublet will improve reception and just how much better results I can expect.

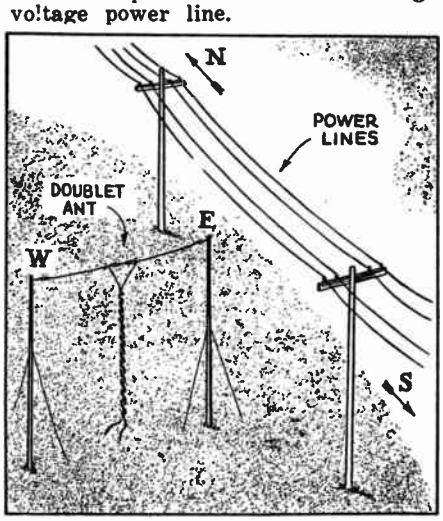
(A) Theoretically the double doublet is the more effective over a wide range of frequencies than a single doublet antenna, however, a direct comparison cannot be made on any particular frequency because the single doublet can be designed to work very efficiently on one wave band and will give very poor results on another band. So, unless we knew just what type of doublet you are using now, that is the length of it, its height above ground, etc., it is impossible to say whether or not you would obtain better results with the double doublet.

BEST POSITION OF DOUBLET

Fred Ickes, Philadelphia, Pa.

(Q) I live right near a high-voltage transmission line and would like to know just how I should use the doublet antenna in order to reduce the noise from the power line as much as possible. Some of my friends say that it should be at right angles with the power line and others say it should be parallel. Please advise through your LISTENER Question Box.

(A) The drawing below clearly shows just how the doublet antenna should be placed relative to the high voltage power line.

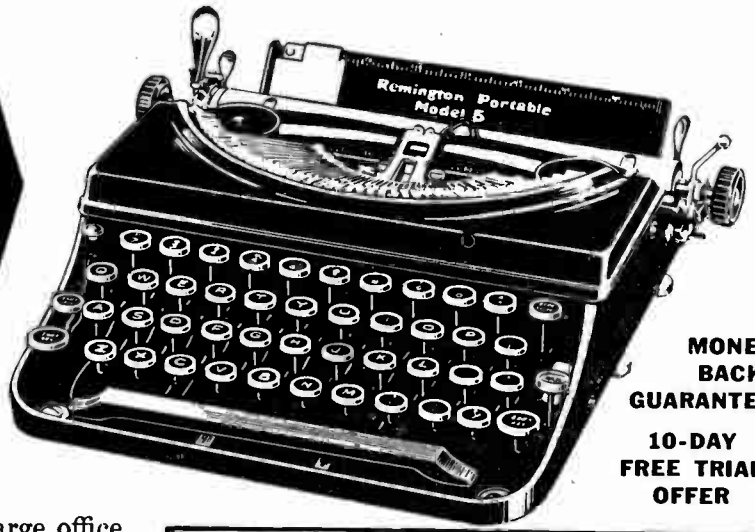


The doublet should be at right angles with power lines.

FACTORY TO YOU

LATEST MODEL REMINGTON TYPEWRITERS

10¢ A DAY



MONEY BACK GUARANTEE

10-DAY FREE TRIAL OFFER

● Brand new, latest model Remington for only 10¢ a day! Here is your opportunity to get a perfect writing machine at an amazingly low price direct from the factory. Every essential feature of large office typewriters—standard 4-row keyboard, standard width carriage, margin release, back spacer, automatic ribbon reverse. Act now, while this special opportunity holds good. Send coupon TODAY for details.

YOU DON'T RISK A PENNY

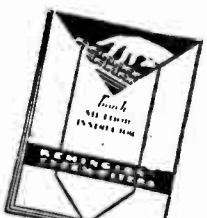
We send you the Remington Portable, Model 5, direct from the factory with 10 days' free trial. If you are not satisfied, send it back. We pay shipping charges both ways.

EVERY ESSENTIAL FEATURE found in standard machines

When you buy a typewriter, be sure you get one of the new, latest models, not a used or rebuilt machine. For you want a machine that has only the latest conveniences and devices. The Remington Model 5 you can get for 10c a day has every essential feature of big office machines. It is a complete writing machine—the most compact and durable portable ever built, one that will give you years and years of hard service. This beautiful machine offers unequalled economy in first cost, unequalled economy in service. Buy now. It is a real bargain.

SPECIFICATIONS. Standard 4-row keyboard. Complete visibility. Standard width carriage for long envelopes. Carriage return lever designed for easy and rapid operation. Margin release on keyboard. Automatic ribbon reverse. Back spacer. Two-color ribbon shift. Variable line spacer. Adjustable margin stops. Autoset paragraph key (one of the most useful features found on any typewriter.) Weight, 11 lbs. 13 oz. Furnished with Pica or Elite type.

FREE → TYPING COURSE



With your new Remington we will send you — absolutely FREE — a 19-page course in typing. It teaches the Touch System, used by all expert typists. It is simply written and completely illustrated. Instructions are as simple as A, B, C. Even a child can easily understand this method. A little study and the average person, child or adult, becomes fascinated Follow this course during the 10-Day Trial Period we give you with your typewriter and you will wonder why you ever took the trouble to write letters by hand.

MONEY-MAKING OPPORTUNITIES OPEN. Hundreds of jobs are waiting for people who can type. A typewriter helps you put your ideas on paper in logical, impressive form...helps you write clear, understandable sales reports, letters, articles, stories A Remington Portable has started many a young man and woman on the road to success.

FREE → CARRYING CASE

Also under this new Purchase Plan we will send you FREE with every Remington Model 5 a special carrying case sturdily built of 3-ply wood This handsome case is covered with heavy du Pont fabric The top is removed by one motion, leaving the machine firmly attached to the base. This makes it easy to use your Remington anywhere—on knees, in chairs, on trains. Don't delay . . send in the coupon for complete details!

A GIFT FOR ALL THE FAMILY. If you want a gift for birthday, Christmas or Graduation . . . one Father, Mother, Sister or Brother will use and appreciate for years to come . . . give a Remington Portable. We will send a Remington Model 5 to anyone you name, and you can still pay for it at only 10c a day Few gifts are so universally pleasing as a new Remington Portable. Write today.

SEND COUPON WHILE LOW PRICES HOLD

CLIP COUPON NOW . . .

Remington Rand, Inc., Dept 305-11
205 E 42nd Street, New York, N. Y

Please tell me how I can get a new Remington Portable typewriter, plus FREE Typing Course and carrying case, for only 10c a day. Also send me new illustrated catalogue.

Name_____

Address_____

City_____ State_____

Musical Signatures

(*Continued from page* 215)

battlefields" will be sent out from the station at Addis Ababa. Many readers have no doubt heard this station direct .

SWITZERLAND

The station HBP at Geneva makes its announcement in several languages, including English. One of their schedule announcements is—"Hillo, hillo, Radio Nations."

DENMARK

OXY located at Skamleback sounds the midnight chimes at 6:00 P.M. Eastern Standard Time.

SOUTH AMERICA

Station HJ1ABB, Barranquilla, Columbia, announces "Achay-hota-uno-ah-bay-bay."

Station HJ5ABD, Cali, Colombia, announces — "Achay-hota-thinko-ah-bay-bay."

Station HCJB, Quito, Ecuador, sounds a two-tone chime for announcements.

Station YV5RMO, Maracaibo, Venezuela, strikes a gong before announcing.

Station YV2RC, Caracas, Venezuela, announces "Ee-vay-dos-erray-say", and sounds four strokes on chimes every fifteen minutes.

Station YV3RC, Caracas, announces "Ee-vay-trays-erray-say", and plays bells on the hour.

PRADO, Riobomba, Ecuador, announces "Estacion el Prado, Riobomba, Ecuador."

Station HC2RL, Guayaquil, Ecuador, plays the Ecuadorian National Anthem at beginning and end of transmissions.

Station PSK (PRA3) at Rio de Janeiro, Brazil, plays chimes similar to the NBC chimes when signing off.

CENTRAL AMERICA

Station TGX at Guatemala City, uses a two-tone high frequency sound as their identification signal.

Station HI1A, Santo Domingo, plays "Anchors Aweigh" at the opening and closing of programs.

JAVA

Bandoeng, PMC or PLF; previous to speech you hear the sound of notes similar to a motor horn (F-D-C-).

Best Short Wave Stations

(*Continued from page* 220)

Station

6040 kc. W4XB
-B- 49.67 meters
MIAMI, FLORIDA
12 n.-2 p.m.; 5:30 p.m.-12 m.

6040 kc. *W1XAL
-B- 49.67 meters
BOSTON, MASS.

6030 kc. *HP5B
-B- 49.75 meters
P. O. BOX 910
PANAMA CITY, PAN.
12 N.-1 p.m., 8-10:30 p.m.

6030 kc. VE9CA
-B- 49.75 meters
CALGARY, ALBERTA, CAN.
Thurs. 9 a.m.-2 a.m. (Fri.)
Sun. 12 n.-12 m.
Irregularly other days 9 a.m.-12 m.

6020 kc. CQN
-B- 49.83 meters
MACAO, CHINA
Mon. and Fri. 3-5 a.m.

6020 kc. *DJC
B- 49.83 meters
BROADCASTING HOUSE,
BERLIN
12 n.-4:30 p.m., 5:05-10:45 p.m.

6020 kc. HJ3ABH
-B- 49.83 meters
BOGOTA, COLO
APARTADO 585
7-11 p.m.

6018 kc. ZHI
-B- 49.9 meters
RADIO SERVICE CO.,
20 ORCHARD RO.,
SINGAPORE, MALAYA
Mon., Wed. and Thurs. 5:40-8:10 a.m. Sat. 10:40 p.m.-1:10 a.m. (Sun.) Every other Sunday 5:10-6:40 a.m.

6010 kc. *COCO
-B- 49.92 meters
P. O. BOX 98
HAVANA, CUBA
Daily 9:30-11 a.m., 4-7 p.m. and 8-10 p.m.
Sat. also at 11:30 p.m.

6005 kc. VE9DN
MONTREAL, CAN.,
49.96 meters
Saturday 11:30 p.m.-12:30 a.m.

Station

6000 kc. TGW
-B- 50 meters
GUATEMALA CITY, GUAT.
12 n.-2 p.m., 7:30-8:30 p.m., 10 p.m.-12 m. Sat. also from 12 m.-6 a.m. (Sun.)

6000 kc. RV59
-B- 50 meters
MOSCOW, U. S. S. R.

5990 kc. *XEBT
-B- 50.08 meters
MEXICO CITY, MEX.
P. O. Box 79-44
7 p.m.-1 a.m.

5980 kc. XECW
-B- 50.17 meters
CALLE del BAJIO 120
MEXICO CITY, MEX.
1-4:30 p.m., 10:30 p.m., 12 m.

5980 kc. HIX
-B- 50.17 meters
SANTO DOMINGO, DOMINICAN REP.
Tues. and Fri. at 8:10 p.m.
Sun. at 7:40 a.m., Irreg. Tues. and Thurs.

5970 kc. HJ3ABH
B- 50.25 meters
BOGOTA, COLO.
APARTADO 585
7-11 p.m.

5968kc. HVJ
-B- 50.27 meters
VATICAN CITY (ROME)
2-2:15 p.m., daily. Sun. 5-5:30 a. m.

5950 kc. HJ1ABJ
-B- 50.42 meters
SANTA MARTA, COLO.
11 a.m.-1 p.m., 7-9 p.m.

5950 kc. HJ4ABE
-B- 50.42 meters
MEDELLIN, COLO.
Mon. 7-11 p.m., Tues., Thurs., Sat. 6:30-8 p.m., Wed. and Fri. 7:30-11 p.m.

5940 kc. TG2X
-B- 50.5 meters
GUATEMALA CITY, GUAT.
4-6, 9-10 p.m.

5890 kc. HJ2ABC
-B- 50.97 meters
CUCUTA, COL.

Station

5780 kc. OAX4D
-B- 51.9 meters
P.O. Box 853
LIMA, PERU
Mon., Wed. & Sat. 9-11:30 a.m.

5780 kc. HI1J
-B- 51.9 meters
SAN PEDRO de MACORIS.
DOM. REP.
7-9:30 p.m.

5713 kc. TGS
-B- 52.51 meters
GAUTEMALA CITY, GUAT.
Tues., Thurs., and Sun. 6-8 p.m.

5660 kc. HJ5ABC
-B- 53 meters
CALI, COLOMBIA
11 a.m.-12 n.
Tues. and Thurs. 8-10 p.m.
Sun. 12 n.-1 p.m.

5000 kc. TFL
-C- 60 meters
REYKJAVIK, ICELAND
Calls London at night.
Also broadcasts irregularly.

5825 kc. TIGPH
-B- 51.5 meters
SAN JOSE, COSTA RICA
6:15-11 p.m.

5650 kc. *YV5RMO
-B- 53.1 meters
MARACAIBO, VENEZUELA
5:30-10 p.m.

4600 kc. HC2ET
-B- 65.22 meters
Apartado 249
GUAYAQUIL, ECUADOR
Reported Wed., Sat. 9-11:30 p.m

4470 kc. YDB
-B- 67.11 meters
N.I.R.O.M.
SOERABAJA, JAVA
10:30 p.m.-1:30 a.m., 5:30-11 a.m., 5:45-8:45 p.m.

4273 kc. RV15
-B- 70.20 meters
KHABAROVSK SIBERIA.
U. S. S. R.
Daily, 3-9 a.m

The Forgotten Time Signal

(*Continued from page* 198)

"Perhaps," continued the man, who by this time Sandy had recognized as being Charley Graham, wanted in several states on robbery charges, "you are wondering why I'm dressed in these evening clothes. We figured your cops wouldn't see anything wrong with three gentlemen dressed in evening clothes, on the streets at 2 A.M. The boys should be finished with the job soon—and then for parts unknown with $100,000 as the booty!"

Slowly but relentlessly the clock reached the hour of 2:34.

Graham suddenly felt the cold steel of a Police Special prodded into his back, and heard the command:

"All right, fellow; Stick 'em up!"

Amazed, Graham slowly turned and as he did so he slowly raised his hands skyward. The cold blue eyes of Radio Patrolman Ralphs, of Car number Two bored into his, and lowering his gaze he found himself looking into the steel barrel of a .38 police special.

Almost every citizen in the city of Redwood Villa read in the newspaper extras that morning of the red handed capture, by Officers Roberts and Ralphs, of two bandits engaged in taking $100,000 in crisp, new bills from the vaults of the First National Bank.

But Graham had neglected to give a time signal at 2:30 A.M. thus automatically recalling all the cars to the police station.

Very few readers of this first page thriller noticed this small item in the Redwood Villa "Courier", which read,

REDWOOD VILLA, Sept. 16—Police Chief R. S. Burke announced early this morning the appointment of Sanford Roberts to the position of Captain of Police, succeeding the resigned former Captain, Timothy Healy. Chief Burke also announced the appointment of Patrolman James S. Ralphs to the position of Chief Radio Announcer, the position left vacant as the result of Captain Robert's appointment.

Tuning In Those "DX" Stations

(*Continued from page* 202)

in most cases, it may be just that station which you are looking for! If you are using a beat oscillator, this of course should be turned on when in search of the station, but after one has been located and tuned in, the beat oscillator should be turned off, because it is liable to interfere with the quality of reproduction.

Short Waves in the Next War

(*Continued from page* 199)

ination to think for a moment that we may even have television pictures of a battle projected on the screens of our theatres. One way in which this could be done would be for the official news photographers on the battle line to take a picture of the action, in the same way that pictures were taken during the last war for government records. Afterward the "movie film" would be rushed back to the nearest short wave transmitting station, and by scanning each picture on the film with a television scanner the impulses corresponding to the various points of light and shadow in the picture would be transmitted and picked up at a distant short wave receiving station, (relaying the signals through several stations if necessary) until it finally arrived at its destination, possibly several thousand miles from the scene of battle.

Fourth Trophy Award

(*Continued from page* 207)

some very good ones too. I like the Rack and Panel transmitter of George Shuart very much, and may use it for a "starter."

JOE FICERE,
3510 B. East 2nd St.,
Long Beach,
Calif.

From "The Valley of Wild Ducks"

San Jose High School and also High School in Japan ,once a student of famous Waseda University in Tokio, Japan.

ORIENTE I. NODA,
RT. 1, Box 395,
Santa Clara, California

ALL THE WAY FROM INDIA

uated at present in a very bad locality, having 37 mills working near me (Day and night) and also being on a main road, but in spite of this, I have managed to verify all continents (less Australia) eleven times or more each, and have a total of 130 verifications.

Cordially yours,
SERGEANT H. J. DENT,
De Lisle Rd. Police station,
Jacob Crcle, Bombay, India.

Here are the Six BEST SHORT-WAVE RADIO BOOKS!

Without doubt you will have to go along way to buy better books on short waves than you find on this page. Each book is written by a well-known authority on short waves . . . each book has been carefully illustrated with photographs and diagrams to make the study of this field of radio much simpler. The volumes on this page are the finest books on short-waves which are published anywhere today. Order one or two copies today . . . find out for yourself if they are not educational. Prices are postpaid.

How to Get Best Short-Wave Reception

By M. HARVEY GERNSBACK

This book tells you everything you ever wanted to know about short-wave reception.

The author, a professional radio listener and radio fan for many years, gives you his long experience in radio reception and all that goes with it.

Why is one radio listener enabled to pull in stations from all over the globe, even small 100 watters, 10,000 miles away, and why is it that the next fellow, with a much better and more expensive equipment, can only pull in the powerful stations that any child can get without much ado?

The reason is intimate knowledge of short waves and how they behave. Here are the chapters of this new book:

1. What are Short Waves and what can the listener hear on a short-wave receiver or converter?
2. How to tune and when to listen in on the short waves.
3. How to identify short-wave stations.
4. Seasonal changes in short-wave reception.
5. Types of receivers for short-wave reception.
6. Aerial systems for short-wave receivers.
7. Verifications from short-wave stations.

The book makes excellent reading matter. There are many tricks in short-wave reception that even some of the "old-timers" do not know. Be sure to get it.

40 Illustrations, 72 Pages. Stiff, flexible covers **50c**

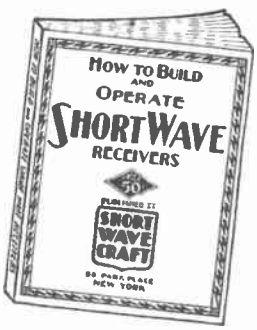
HOW TO BUILD AND OPERATE SHORT-WAVE RECEIVERS

THIS is the best and most up-to-date book on the subject. It is edited and prepared by the editors of SHORT WAVE CRAFT, and contains a wealth of material on the building and operation, not only of typical short-wave receivers, but short-wave converters as well. Dozens of short-waves sets are found in this book, which contains hundreds of illustrations; actual photographs of sets built, hookups and diagrams galore.

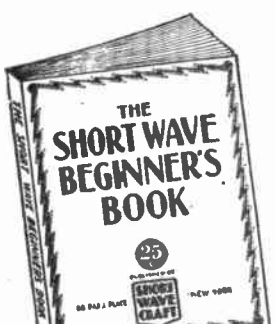
This book is sold only at a ridiculously low price because it is our aim to put this valuable work into the hands of every short-wave enthusiast.

We know that if you are at all interested in short waves you will not wish to do without this book. It is a most important and timely radio publication.

150 Illustrations, 72 Pages. Stiff, flexible covers **50c**



THE SHORT-WAVE BEGINNER'S BOOK



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The Transposed Lead-in for reducing Static.

The Beginner's Short-Wave Receiver—a simple one tube set that anyone can build.

How to Tune the Short-Wave Set—telling the important points to get good results.

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Compiled by the Editors of SHORT WAVE CRAFT

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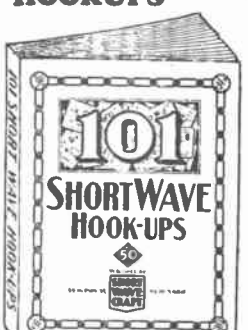

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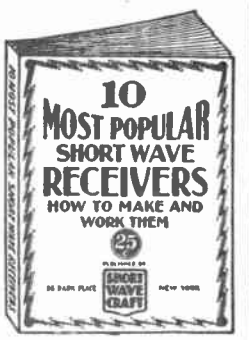

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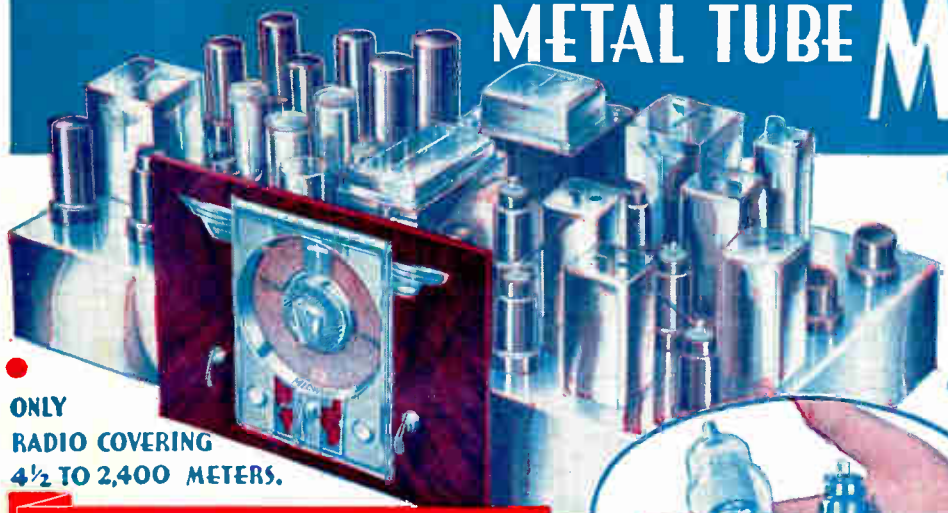

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