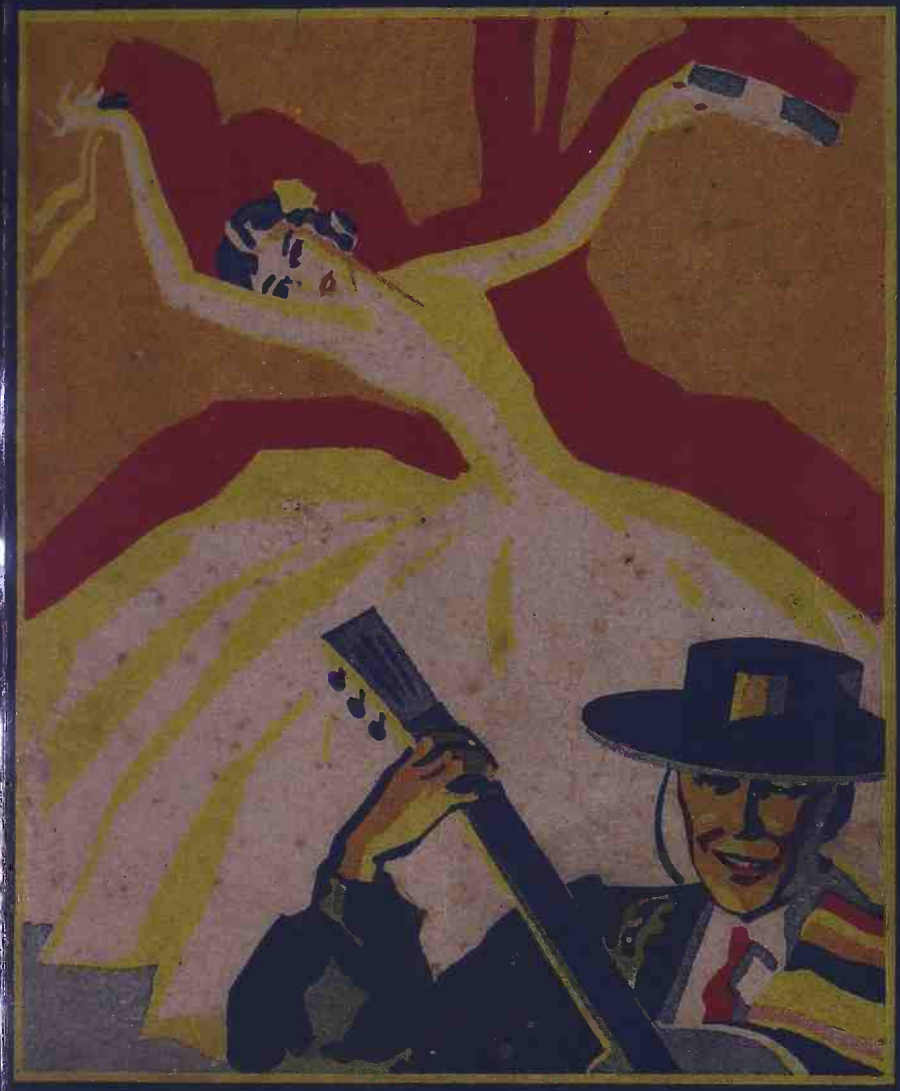


An All-Wave RADIO PRIMER

2 Hebrews 2-10 verse

An All-wave RADIO PRIMER

WRITTEN ESPECIALLY FOR

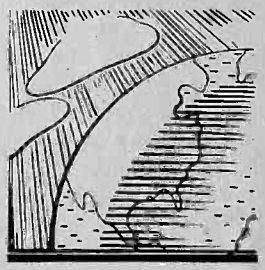
GENERAL ELECTRIC

BY ONE OF THE COUNTRY'S

LEADING AUTHORITIES ON RADIO

AN ALL-WAVE RADIO PRIMER

TO a large number of radio set owners, that glamorous world of Radio by which we hear music, lectures, opera, football games and dramatic happenings of the day, begins at a spot on the dial marked 550 kilocycles and ends on the 1500 kilocycle line. Little do these people realize that above 1500 kilocycles lies a new realm of radio, a vast territory of ethereal space that scientists have developed for the benefit of Man. This new romantic world appeals to every man, woman and child. It is as thrilling in its possibilities as a new microscope to a research worker, or an unknown country to an explorer. Thanks to the skill of engineers, most of the obstacles that formerly hindered the full use of these short waves have been overcome. During the last year or two, more and more stations designed to supply world-wide entertainment have sent out their programs over these new high frequencies,—or short waves, as they are frequently called.



These increased short-wave activities have resulted in the development of a new type of radio set which brings in not only the usual broadcast stations with increased beauty of performance but also makes it possible to hear a large number of other stations in both hemispheres.

Short waves, so called because by actual measurement in meters they are only a fraction of the length of the long radio waves with which you are already familiar, are not actually different in their characteristics from the long

waves. The radio sets we have hitherto known ignored these short waves because up to now it has been impossible to design a commercial receiver capable of receiving them well. But science is always marching along and today General Electric offers sets that receive both long- and short-wave programs so efficiently that both may be heard with pleasure.

Short waves bring you a new type of entertainment. They give you close contact with strange lands, new peoples, different manners and customs. They bring the outposts of the world to your own living room. They supply a passport to the many countries that all of us hope to visit but which we somehow never seem to get to.

The field of short waves is international. Through them we are privileged to hear famous operas from Italy, tingling tangos from the Argentine, native melodies from the South Sea Isles, and reports on international affairs by speakers of world repute. These and many other features were once available only to the globe trotter but now are brought to the homes of thousands of enterprising Americans who have discovered the thrill and glamour of short waves.

Because of the characteristics of short waves, programs coming from great distances are often received with greater clarity and volume than might be expected. Thousands of short-wave enthusiasts listen to the messages sent by radio from Admiral Byrd and his men in snow-bound Little America. Others who own short-wave receivers are able to set their clocks by the strokes of Big Ben in London. Still others, permanently residing in this country, tune by choice to the programs which originate regularly in their home lands. They hear the native songs they know so well and get the news of political developments that affect the daily lives of their relatives back home.

Blood-tingling stunts that are unknown to the owners of standard broadcast receivers are high spots in the memory

of short-wave set owners. At Christmas and New Year's time, for instance, they enjoy the novelty of tuning to one country after another as midnight heralds the coming of the great day. As the difference in longitude shifts the clock ahead hour after hour, from East to West, the dial of a short-wave receiver may pick up as many as nine Merry Christmas or Happy New Year greetings.

In isolated sections of this country where standard radio reception is not so extensive as in the more thickly settled areas, short waves fill the need for continuous entertainment. Often when atmospheric conditions make it unpleasant or impossible to listen on the regular broadcast waves, a simple shift to the lower waves permits the owner of a modern receiver to reach out over hundreds and perhaps thousands of miles for the same program free from annoying disturbances.

Short waves, once a plaything of scientists and experimenters, are now a priceless supplement to the established broadcasting facilities and services . . . a new world of radio enjoyment available to all who have a modern short-wave receiver.

EVERY COUNTRY OFFERS ITS PARTICULAR TYPE OF PROGRAM

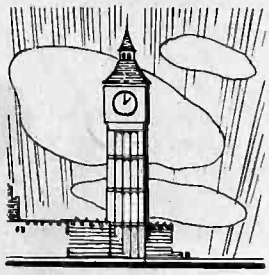
Broadcasting, being an expression of the people of any country, is naturally typical of that country. Our programs here in the United States follow a pattern that is peculiar to our times and our people. As such, they are recognized wherever they are heard. The same can be said of broadcasts originating in European, South American and Asiatic centers. So typical are many of these offerings that listeners, after a few months, can identify the sources of their entertainment long before the stations announce their call letters or give their identifying signals.

ENGLAND

One of the most extensive of all radio systems is the so-called Empire System of world-wide broadcasting formed by Great Britain for the benefit of the British Isles and the

far-flung dominions of the Empire. Over the numerous waves set aside by the British for the transmission of entertainment and information to her colonies goes an almost continuous stream of material, a fair share of which can be picked out of the air in America.

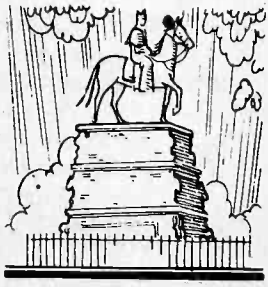
The British excel in talks by outstanding statesmen on topics of international interest. So important are some of these lectures and discussions that the big networks in the United States frequently arrange to rebroadcast them for the benefit of listeners who are not so fortunate as to own short-wave receivers. The man or woman who has a receiver for short as well as for long waves is not limited in the number of these broadcasts, but may enjoy them all.



One bit of "Old England" that is seldom missed by the owners of short-wave sets is the striking of midnight and every hour in London by Big Ben. As the twelve sonorous tones of the mammoth bell ring out, the clocks in New York point to 7 p. m., in Chicago to 6 p. m. and in San Francisco to 4 p. m.

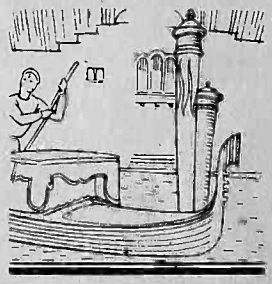
GERMANY

Germany divides her short-wave broadcasting periods about equally between news of the day and the playing of those swinging waltzes that are always associated with the Rhine and the Danube. Here news reports are delivered in several of the most widely-used languages, including, of course, English, and are intended to supply a word picture of national developments in the Reich. With the new Germany playing a highly important part in world affairs these news bulletins are interesting and vital, even though it is generally recognized that they are intended as propaganda.

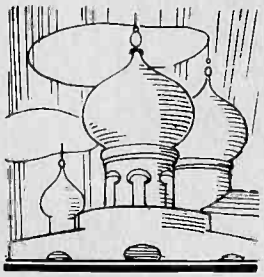


ITALY

Easily identified by the voices of their women announcers, the short-wave stations of Italy take pride in the artistic quality of the programs which they transmit for the world to enjoy. The operas especially, coming as they do from the cradle of many fine operas, are highly regarded by music lovers. Many of the operatic productions at the leading theatres in Rome are caught by the microphone and broadcast on short waves. Unfortunately for the majority of American listeners, most of the talks and addresses from the Italian stations are given only in the native tongue, but the universal language of Music breaks down all such barriers and is free to all radio users who have the proper equipment with which to tune in.



RUSSIA



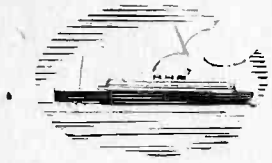
Russia has expanded her radio plans by increasing both the number and power of her stations. American listeners tune to Moscow for the latest news of the Soviet government, which is translated into several languages. Dramatic plays are also a feature of the Russian studios.

OTHER COUNTRIES

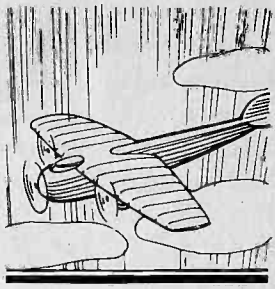
Now that statesmen appreciate the covering power of short waves there is scarcely a country of any size that is not now broadcasting special programs or arranging to do so. In far-off Morocco, on the edge of the Sahara Desert, a radio station produces programs on regular schedule and is heard frequently in this country. In Spain, Switzerland and the Netherlands . . . in Mexico, Central America and South America . . . in Hawaii, the Philippines and New Zealand

. . . from all these countries come radio features that are considered "rare catches" by the ever-growing army of short-wave listeners.

What better comparison could be drawn than one between a short-wave receiver and a world passport? A General Electric receiver may be likened to a world cruise in an easy chair, taken at the convenience of the traveler. As a matter of plain truth, a real world cruise would never touch many of the spots that are brought to our easy chair by the ether waves. In this respect at least, the radio tuner has a decided advantage over the world voyager who must follow a definite route at a definite time, and who cannot detour from the stereotyped trail to enjoy an unexpected thrill from some remote country.



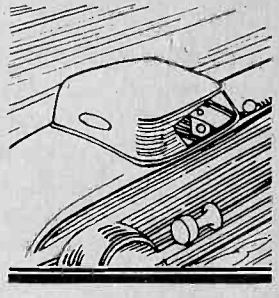
SOME OTHER SHORT-WAVE ATTRACTIONS



For strange radio fare that is never found on the regular broadcast bands it is not necessary to leave the shores of our own country. Beyond 1500 kilocycles there are countless services . . . commercial, governmental and amateur, that offer unusual features.

The aviators that fly the skies over America carry on conversations with their home airports. Occasionally when a pilot finds himself and his plane in difficulties the moments that follow are as full of thrills to the radio listener as the climax of the most exciting radio drama.

Police departments from Maine to the Pacific are equipping their patrol cars with short-wave sets and the orders that go out from headquarters are easily caught on G-E radio sets. Real enthusiasts sometimes spend an entire evening shifting from one police wave to another as warning bell or whistle announces that a patrol car is about to be dispatched to the scene of a crime.



Amateur radio operators . . . there are now over 40,000 of them . . . hold forth at numerous spots on the short-wave dial, sometimes using code but at other times conversing in voice.

And sandwiched between these services are the commercial phone stations. These stations form the transoceanic

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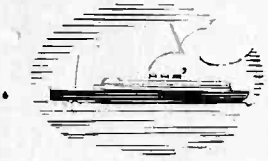

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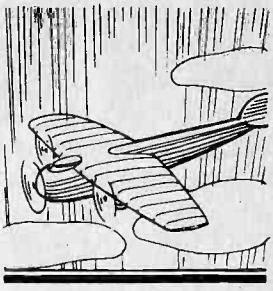

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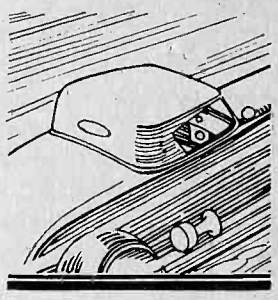

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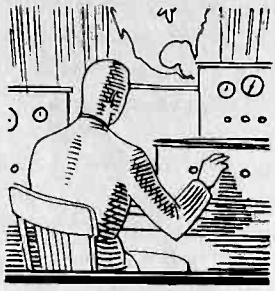
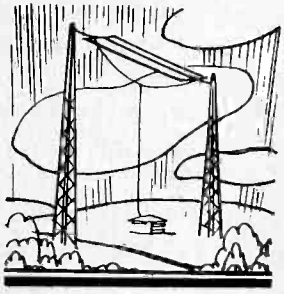


links in two-way conversations between telephone subscribers in this country and in foreign lands. Privacy is sometimes insured by "scrambling" or intentionally distorting the speech, thereby producing a gibberish of noise. While these conversations are absolutely unintelligible to us, they are "unscrambled" at the authorized point of reception and converted back into understandable speech.

SHORT WAVES
WHAT THEY ARE AND HOW THEY ACT



All radio waves travel at the same speed as light . . . 186,000 miles a second. Each complete radio wave is known as a cycle. The number of waves or cycles sent out each second by a station is called its frequency. "Kilo" means a thousand. Therefore, a kilocycle means a thousand waves, or cycles, a second. Station RV59 at Moscow, for example, is authorized to radiate 6,000,000 radio waves a second, or 6,000 kilocycles.

In exploring the mysteries of short waves you will sometimes find stations listed by frequency (kilocycles) and other times by wave-lengths (meters). To convert kilocycles into meters, simply divide 300,000 by the figure you have. Thus, Station RV59, which sends out 6,000 kilocycles per second, uses a wave-length of 50 meters (300,000 ÷ 6,000).

To reduce the size of the numbers used to indicate frequency, sometimes a station in the higher frequencies is listed in megacycles. A megacycle is simply a thousand kilocycles. The Moscow station with a frequency of 6,000 kilocycles may be listed as 6 megacycles (6,000 ÷ 1,000).

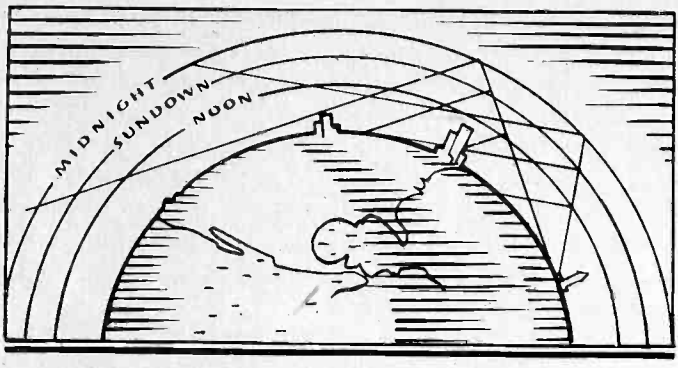
Tuning dials on all General Electric receivers are marked in kilocycles for the lower frequencies and in megacycles for the higher frequencies. To simplify tuning, the important short-wave channels are also indicated on the dial in meters.

There are no definite limits for the short wave but it is generally understood that short waves, as such, are those represented by the frequencies extending from the upper end of the broadcast band (1500 kilocycles) to the 30,000-kilocycle, or 10-meter wave. Frequencies higher than 30,000 kilocycles are commonly known as ultra short waves and are rarely included in the average all-wave receiver.

For all practical purposes, 36,000 kilocycles appears to be the useful limit of long distance broadcasting on short-wave. General Electric offers several all-wave receivers which reach this frequency.

Likewise, at the other end of the scale is an extremely low frequency or long-wave band on which is found a number of European long-wave broadcast stations as well as American stations giving aircraft weather reports. U. S. Coast Guard stations use this band. Reception of these European long-wave broadcast stations is usually more difficult than that of similarly located short-wave stations. This frequency band is also rarely found on average all-wave receivers but is available on several of the General Electric models.

Let us study the general behavior of short waves from the time they are transmitted by the station until they reach the radio receiver. When these waves leave the station antenna they are in two parts. One part, called the ground wave, travels close to the earth and is soon absorbed by buildings, metal deposits and natural screens. The other wave sets off into the air at an angle determined by the design of the antenna and the frequency of the transmitted wave and travels in a straight line until, at a point 75 to 125 miles up in the air, it encounters a region known as the



Heaviside layer, which is thought to be an area of highly charged particles which cannot be penetrated by the short waves. This layer acts like a mirror and turns the wave back toward the earth. As a result, the waves which started away from the ground finally come back to the earth's surface many hundreds of miles from their starting point. The distance between the station and the point of return to the earth is called the "skip distance" and in this area it is not possible to hear the station with any degree of reliability. This explains why a short-wave station of relatively low power is often heard with good volume several thousands of miles away whereas its signal may be completely missing only fifty miles or so from the transmitter.

The height of the Heaviside layer varies with the time of day and the season. Because of this, the signals change in strength as the hours pass from daylight to darkness. To overcome this objection, radio engineers have worked out charts which give the best wave length to use at every hour of the day and these charts are followed closely in selecting the frequency best suited for any particular broadcasting schedule.

For instance, the waves from 15 to 25 meters give best service during daylight hours but are practically useless after sundown. When the sun sets, the stations transfer their activities to the 30- to 50-meter waves and continue there until the sun is about to rise again.

So you see how essential it is to consider the prankishness of nature when dealing with short waves. Actually, Mother

Nature still holds the upper hand and her vagaries must be considered seriously, if the best results from broadcasts in the lower wave regions are to be obtained.

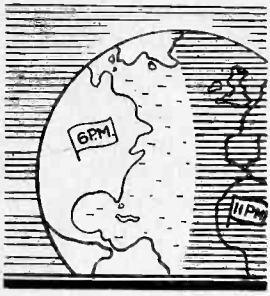
Long before the general public took any interest in short waves, the leading scientists of the world were studying their action. Just outside the city of Schenectady, Dr. E. F. W. Alexanderson of the General Electric Company erected a complete short-wave laboratory with the idea of seeing what happened to short waves after they had been shot into the air. He tried many types of antennas and watched their effect on signals sent into space. One of these antennas, called a "directional antenna," displayed remarkable ability in reaching remote points, and made possible the establishment of continuous contact with the first Byrd expedition to the Antarctic in 1929. These antennas are called "directional" because they aim the signals at the particular spot it is desired to reach instead of spreading them fan-wise in every direction. They are now in world-wide use, and by means of them, Germany and England and many other countries are able to send you fine programs with a volume and fidelity that sometimes equal those of programs from your local stations . . . provided you have a modern receiver, like the General Electric.

These scientists also discovered that those mysterious blemishes on the sun called "sun spots" have a definite effect on radio reception and that the strength of signals can be prophesied many weeks ahead of time by the movement of these spots.

These things indicate how necessary it is to consider the workings of nature as they affect short-wave reception. Except for the static which comes from thunderstorms, standard broadcast programs are seldom ruined by upheavals of nature, but the short-wave listener has learned that he must make due allowances for such things until science finds a way for us to get around them.

THE TRUTH ABOUT SHORT-WAVE RECEPTION

Short-wave radio reception is one of the most fascinating types of home entertainment. However, there are several factors which at times make perfect reception impossible.



A fair appreciation of short-wave reception, with a knowledge of its limitations, only adds to the attractiveness of this newest branch of radio. For let it be said here, short-wave reception is far from perfect. Those who are now utilizing it as a supplement to their regular broadcasting services do so because the lower waves have a carrying power far greater than that of the broadcast waves and are therefore indispensable when reaching out to distant points.

Short-wave broadcasts lose quality as the distance from the transmitter increases. Another drawback is fading.

A fading signal is one that varies in strength from minute to minute. Sometimes fading is scarcely noticeable . . . at other times it makes intelligible reception impossible. Here again weather conditions have a great deal to do with the character of the waves as they reach your ears through the loudspeaker of your short-wave receiver. Infrequently, fading becomes so pronounced that the signals disappear for seconds and even minutes, only to reappear and build up again to their original strength. As one season passes into another the period of fading may lengthen until the station is silent as far as your locality is concerned, although listeners in other parts of the world may be tuning to the same station and reporting unusually satisfactory reception.

The difference in time between various parts of the world serves likewise to complicate short-wave reception. For instance, when it is evening in the eastern part of the United

States, it is midnight or later in Europe. This time difference means that European broadcasters desirous of reaching America must go into action at an hour when their own local listeners are asleep.

For the same reason, Australian stations are heard here in the early morning although it is late the night before in Oceania. By experience, if not by reading, the short-wave fan soon learns the most favorable listening times for the various countries and makes his plans to listen when he has the best chance to reach his objective.

Another factor which may often seriously impair short-wave reception is "man-made static"—the electrical noises caused by motors, generators, passing automobiles, flasher signs and other such apparatus. These noises are far more disturbing to short-wave reception than they are to standard broadcast reception. To offset their effects and assure maximum satisfaction the use of a well-designed short-wave antenna — such as the General Electric All-wave Antenna—is strongly recommended.

Generally speaking, short-wave broadcasters are assigned to one of four main sections of the dial, known as the "19-meter," "25-meter," "31-meter" and "49-meter" bands. On both sides of these bands and filling the space between them are the commercial radiophone and radio-telegraph stations, amateurs who talk by both code and voice, and the airplanes which get their orders and weather reports from headquarters.

There are so many short-wave broadcasters and so few available places for them that the stations necessarily are close together. Exceedingly fine tuning is therefore required in order to select one particular program from the many that cluster about it. Often a movement of the dial so slight as to be scarcely noticeable tunes one station out and another one in. The cleverest users of all-wave receivers eventually develop a knack of slicing the desired station from those adjacent to it. With General Electric receivers, short-wave tuning is made easier through the use of a vernier control with a reduction of 50 to 1, thus making it possible to tune sharply with ease . . . a most important requirement in a short-wave receiver.

HOW TO TUNE

The new owner should look to the "old faithfuls" of the dial for his first introduction to short waves. The best "catches" are found in the vicinity of 19, 25, 31 and 49 meters. The location of these bands is plainly marked on the dials of G-E receivers. After these waves have been exhausted and the user has learned to handle his receiver with reasonable skill, then he can reasonably begin his explorations in the other fertile sections of the ether.

In tuning for short waves, the procedure differs but little from that followed when selecting a standard broadcast station, except that the tuning must be more exact. Haphazard twisting of the tuning control is a waste of time. The successful dialist goes after his prey like a scientist seeking a missing element and does not end the search until he bags his game.

The first move is to make sure that the station sought is actually on the air at the time. Because foreign broadcasters find it necessary occasionally to shift their schedules and wave-lengths, every short-wave fan should subscribe to one of the publications catering to this field. The International Short Wave Club, with headquarters in East Liverpool, Ohio, issues a monthly magazine to its members in which all late changes are noted and new stations announced and identified. With a membership in nearly 100 countries, the International Club is supplied with a continuous stream of accurate news of old and new stations. This club is only one of many.

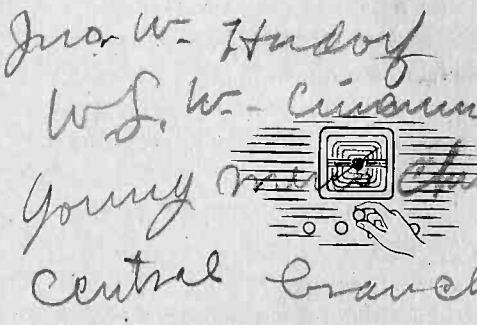
We have now made sure that the station is on the air. The next step is the location of its wave. In the 31-meter band, let us say, there may be several stations. Their separation, therefore, must be reckoned in fractions of a meter. For instance, DJA, Germany, transmits on 31.38 meters while W2XAF, Schenectady, works on 31.48 meters, a trifling separation but ample enough to give perfect recep-

tion when using a General Electric set with its extremely accurate vernier tuning control and its precisely balanced circuit arrangement.

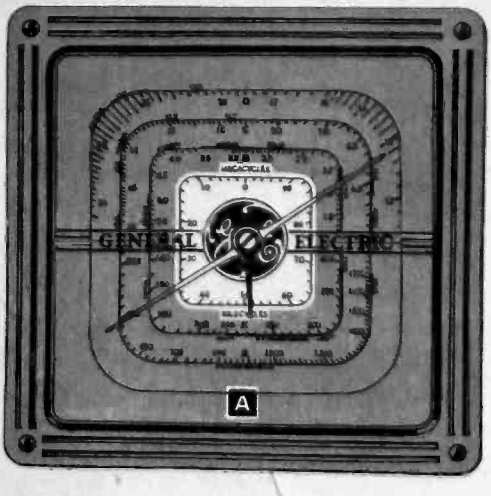
When the approximate dial location is known, the tuning knob must be rotated slightly back and forth and the volume control adjusted until the signal is recognized. Then by closer and still finer tuning the signal is built up to a volume sufficient to identify the station from the call letters and the language used in the announcements.

It is considered good practice to have several such stations in mind so that if the signal of one does not happen to be strong enough at the moment for satisfactory reception, a search may be made for another.

General Electric receivers are equipped with a device called a tone control. This accessory is invaluable when a program from a distant station is accompanied by atmospheric noises. Fortunately, most of these noises are pitched high in the musical scale so that by rotating the tone control, they may be suppressed without affecting the program. The proper adjustment of this control is found by practice and its judicious use sometimes means the difference between success and failure in the search for the best broadcasts on the shorter waves.

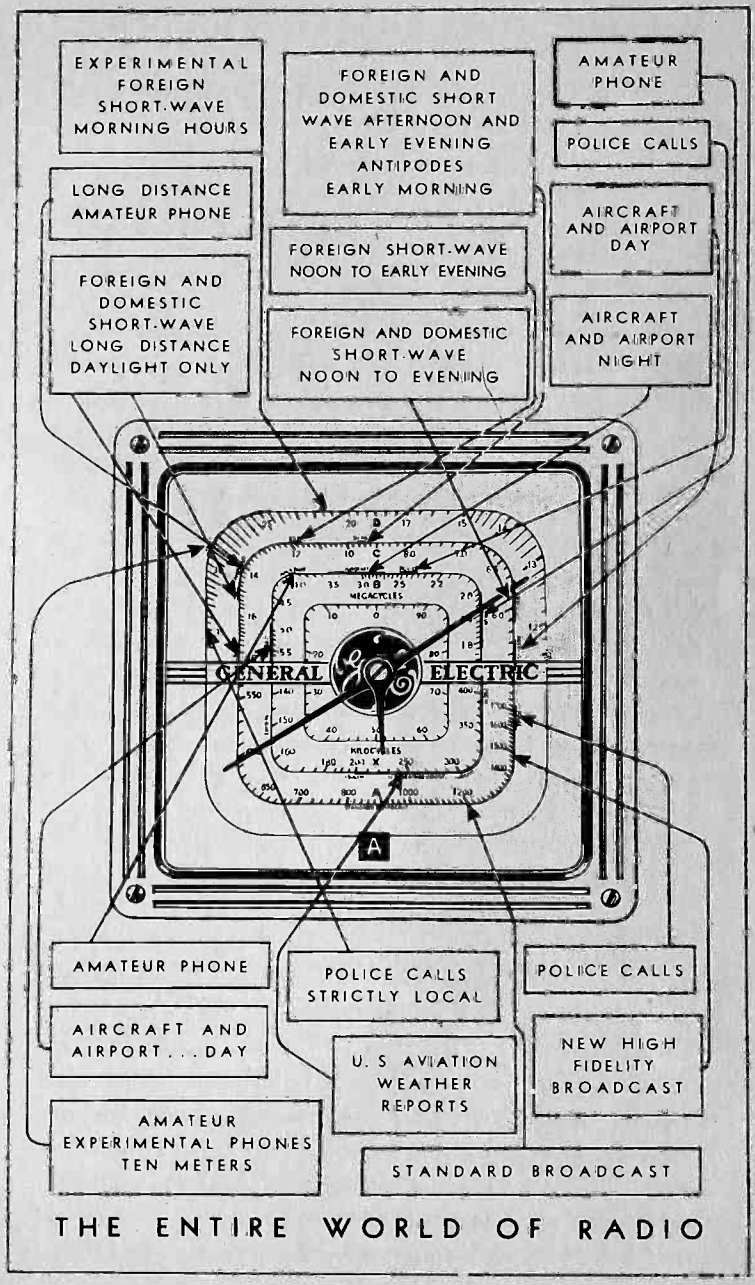


THE MAGIC DIAL



FIVE DIALS IN ONE

One of the many modern and distinctive features of General Electric receivers is the full-range, square, airplane-type, illuminated dial. Not only does this dial add to the appearance of the set but it is important in tuning . . . the G-E set is about the easiest set to tune for short waves that has yet been made. The dial is really five dials in one, as the range of the set has been divided into five bands . . . "A" for standard and experimental broadcasts, "B" for police calls, amateur and aircraft stations . . . "C" and "D" for short-wave broadcasts, and "X" for European long-wave, aircraft weather reports and Coast Guard transmission. A double-pointed tuning needle is used for all five bands while a secondary "band-spread" needle provides micro-accurate tuning and permits positive logging of short-wave stations. A band selector switch is used to switch from one band to another, the band indicator showing at a glance for which band the set is, at the moment, adjusted. By thus spreading the range of the set over five bands it is possible to locate stations with great ease and speed.


EXPERIMENTAL FOREIGN SHORT-WAVE MORNING HOURS
FOREIGN AND DOMESTIC SHORT WAVE AFTERNOON AND EARLY EVENING ANTIPODES EARLY MORNING
AMATEUR PHONE
POLICE CALLS
LONG DISTANCE AMATEUR PHONE
AIRCRAFT AND AIRPORT DAY
FOREIGN SHORT-WAVE NOON TO EARLY EVENING
FOREIGN AND DOMESTIC SHORT-WAVE LONG DISTANCE DAYLIGHT ONLY
AIRCRAFT AND AIRPORT NIGHT
FOREIGN AND DOMESTIC SHORT-WAVE NOON TO EVENING
GENERAL ELECTRIC
AMATEUR PHONE
POLICE CALLS STRICTLY LOCAL
POLICE CALLS
AIRCRAFT AND AIRPORT . . . DAY
U. S AVIATION WEATHER REPORTS
NEW HIGH FIDELITY BROADCAST
AMATEUR EXPERIMENTAL PHONES TEN METERS
STANDARD BROADCAST
THE ENTIRE WORLD OF RADIO

WHAT GENERAL ELECTRIC OFFERS YOU IN A RADIO FOR BOTH STANDARD AND SHORT-WAVE RECEPTION

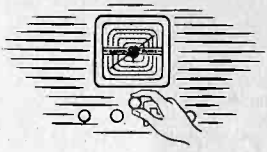
Not all "short-wave" sets are really short-wave. This name has been given erroneously to many standard broadcast receivers that also receive police and aircraft messages. A truly short-wave receiver should be capable of getting both foreign and domestic short-wave broadcasting stations as well as the other six classes of radio broadcasts.

There have been short-wave receivers before . . . but like the old "two-lunger" broadcast receivers of the early 1920's, they were inadequate for the purpose for which they were built. Called "adapter" sets, and really attachments to broadcast receivers, they succeeded in picking up stations but the quality of reception was so poor and the difficulty in tuning so great that only a few "bugs" persisted in using them.

Now, thanks to the wizards of radio science, a set has been designed which makes it possible to receive short-wave programs that really can be enjoyed. This set is an excellent radio for standard broadcasts to begin with . . . a full-size set of superb tone quality. Its short-wave features are an integral part of the set . . . not an "attachment." It uses the superheterodyne circuit throughout . . . the most efficient radio circuit yet devised.

You have probably heard "short-wave" sets. You haven't heard the best short-wave reception until you listen to a General Electric. So get ready for your biggest radio thrill, and tune in a G-E radio. You will discover the difference immediately . . . the difference in tone, reception, flexibility

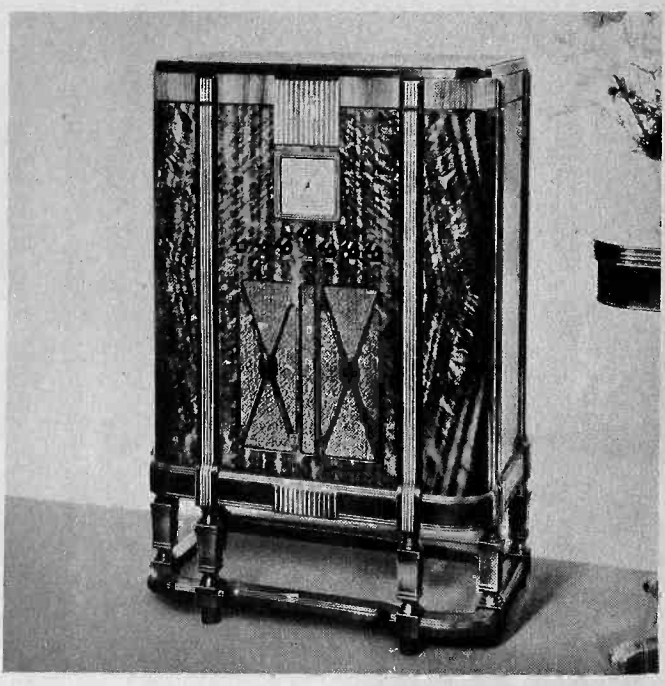
and all-around performance. The reason? Because General Electric, a pioneer in short-wave communications, waited to produce sets with short-wave reception that would satisfy . . . to assure clearer, better, more realistic performance . . . before introducing them to the public. A General Electric Radio is not a hit-or-miss receiver. With the G-E, it is possible to get amateur broadcasts or foreign stations with less noise and interference . . . for the first time to get real entertainment from short-wave broadcasts. There are a number of models of General Electric receivers. There is one to suit your taste and pocketbook.



GENERAL ELECTRIC 5-BAND ALL-WAVE DE LUXE RADIO

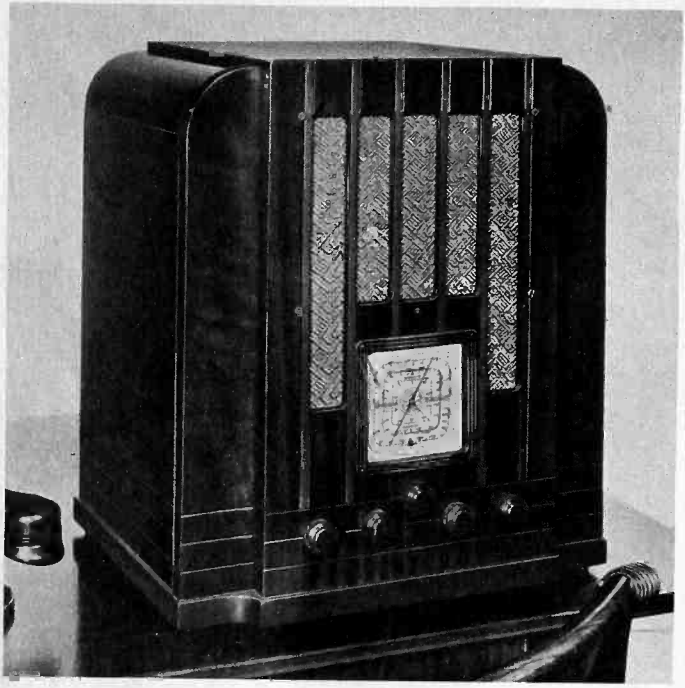
MODEL M-125. This General Electric model combines supreme all-wave reception with genuine cabinet beauty. Its five bands, with extended long-wave and ultra short-wave, cover the entire sound broadcast range from 140 to 36,000 kilocycles. You hear not only your favorite standard programs, foreign and domestic short-wave broadcasts, and police calls, but also aircraft weather reports, European long-wave, Coast Guard communications, ultra high-frequency police calls and experimental broadcasts. Other features: Class "A" Prime or Twin-Push amplification; 5-band, square, airplane-type dial; band-spread dialing; band indicator; instant-shift tuning control; hi-ratio tuning; individual bass and treble tone controls; sensitivity control, dual automatic volume control.

GENERAL ELECTRIC 5-BAND ALL-WAVE CONSOLE



MODEL M-106. Housed in a handsome neo-classic cabinet, this G-E model gives you complete radio service. Its five receiving bands cover all sound broadcasting between 140 and 36,000 kilocycles. Your favorite standard broadcasts, of course. Domestic and foreign short-wave, police calls and amateur phone, too. Then—experimental broadcasts, ultra high-frequency police calls, aircraft weather reports, European long-wave, and Coast Guard communication. Other features: Class "A" Prime or Twin-Push amplification; 5-band, square, airplane-type dial; band-spread dialing; band indicator; instant-shift tuning control; hi-ratio tuning; improved automatic volume control; individual bass and treble tone controls; sensitivity control.

GENERAL ELECTRIC 4-BAND ALL-WAVE TABLE MODEL

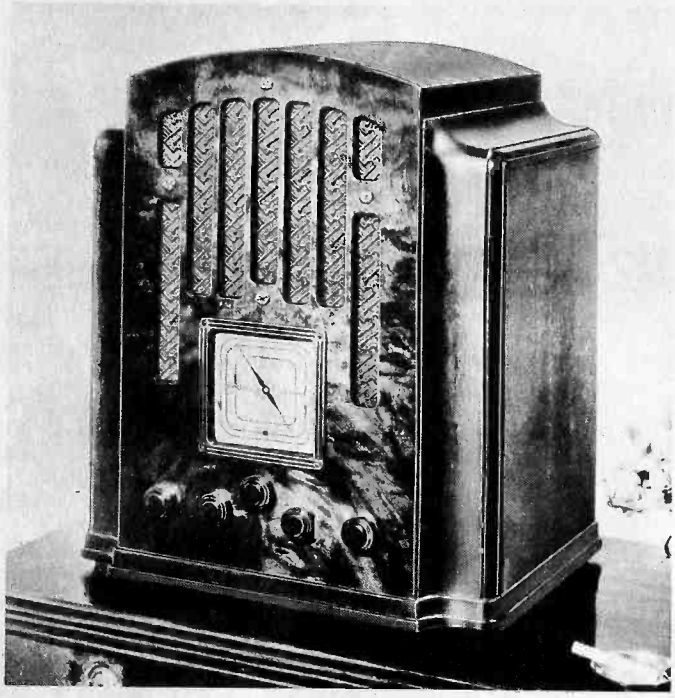


MODEL M-81. Virtually the entire world of radio entertainment is yours with this 4-band G-E table model, in its attractive semi-cathedral type cabinet. One band brings you standard broadcasts, some police calls, and experimental broadcasts; the second, more police calls, amateur phone, aircraft; the third, foreign and domestic short-wave broadcasts; and the fourth, European long-wave, aircraft weather reports, and Coast Guard communications. Other features, 4-band, square, airplane-type dial; band-spread dialing; band indicator; instant-shift tuning control; hi-ratio tuning; positive automatic volume control; variable tone control; sensitivity control; pure class "A" audio amplification.

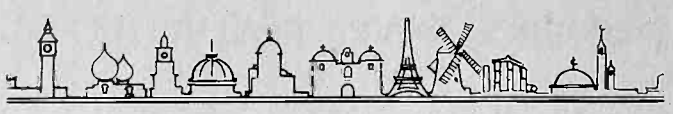
GENERAL ELECTRIC 2-BAND STANDARD AND SHORT-WAVE TABLE MODEL

MODEL M-51. Housed in a handsome semi-cathedral type cabinet, this General Electric table model incorporates both standard and a short-wave receiving band. The former brings you the standard broadcasts you always like to hear, police calls, and experimental broadcasts. The latter covers foreign and domestic short-wave broadcasts on 49, 31, 25, 19 and 16 meters. You will be pleased with the good tone quality. Other features: extra-large chassis; dynamic speaker; two-band, square, airplane-type dial; instant-shift tuning control; hi-ratio tuning; two-point tone control; automatic volume control.

GENERAL ELECTRIC 3-BAND ALL-WAVE TABLE MODEL



MODEL M-61. A remarkable small radio in the all-wave class, with extended broadcast range and two bands of short-wave reception. Having an uninterrupted range from 540 to 18,000 kilocycles, it brings you domestic and foreign short-wave programs, aircraft, amateur phone, police calls, and experimental as well as standard broadcasts. The beauty of its tone is difficult to equal. Other features: 3-band, square, airplane-type dial; band indicator; dual-speed, instant-shift tuning control; hi-ratio tuning; positive automatic volume control; continuous tone control; improved electro-dynamic speaker; beautiful *modern* semi-cathedral-type cabinet, finished in blended, hand-rubbed walnut.



HOW TO IDENTIFY SOME OF THE LEADING SHORT-WAVE STATIONS

ENGLAND'S EMPIRE STATIONS — Strokes of Big Ben on the hour.

MOSCOW (RV59) — "Hillo, hillo. Ici Moscow." Also the playing of the "Internationale."

SYDNEY, AUSTRALIA (VK2ME) — Laughing notes of the kookaburra at the opening and closing of each program.

VATICAN CITY (HVJ) — "Pronto, pronto, Radio Vaticano."

ZEESEN, GERMANY (DJA-DJC) — Opening bars of an old German song played over and over again on chimes.

LISBON, PORTUGAL (CT1AA) — "Coo-coo. Coo-coo."

MADRID, SPAIN (EAQ) — "Hillo, Ay-Ah-Coo, Transradio Madrid."

PONTOISE (PARIS, FRANCE) — Playing of "Marsellaise" at opening and closing of programs.

KOOTWIJK, HOLLAND (PCV) — "Hillo, Bandoeng."

ROME, ITALY (12RO) — Voices of women announcers. Also "Radio Roma-Napoli."

RABAT, MOROCCO (CNR) — "Hillo, hillo, Radio Rabat dans Maroc."

SHORT-WAVE RADIO LOG

100 LEADING SHORT-WAVE STATIONS

(Arranged by frequency in kilocycles)

		Kilocycles	*Meters*
KFZ	Little America	21515	13.94
GSH	Daventry, England	21470	13.97
WKK	Lawrenceville, New Jersey	21420	14.00
LSN	Buenos Aires, Argentina	21020	14.27
FTM	St. Assise, France	19355	15.55
PLE	Bandoeng, Java	18830	15.93
FZS	Saigon, Indo-China	18350	16.35
PMC	Bandoeng, Java	18180	16.50
LSY	Buenos Aires, Argentina	18110	16.55
PCV	Kootwijk, Holland	18050	16.82
XGOX	Nanking, China	17800	16.85
GSG	Daventry, England	17790	16.86
W3XAL	Bound Brook, N. J.	17780	16.87
PHI	Huizen, Holland	17770	16.88
JYT	Tokyo, Japan	17760	16.89
WOO	Ocean Gate, N. J.	17120	17.52
GBC	Rugby, England	17080	17.56
W2XAD	Schenectady, N. Y.	15330	19.56
CP4	La Paz, Bolivia	15295	19.60
W2XE	Wayne, N. J.	15270	19.64
W1XAL	Boston, Mass.	15250	19.67
FYA	Pontoise (Paris)	15243	19.68
W8XK	Saxonburg, Pa.	15210	19.72
DJB	Zeesen, Germany	15200	19.73
VE9BA	Montreal, Quebec	15190	19.75
GSF	Daventry, England	15140	19.82
J1AA	Tokyo, Japan	15120	19.83
HVJ	Vatican City	15123	19.84
DJL	Königswusterhausen, Germany	15110	19.85
RAU	Tashkent, U. S. S. R.	15104	19.87

		Kilocycles	*Meters*
T14NRH	Heredia, Costa Rica	15075	19.90
WNC	Hialeah, Florida	15051	19.93
W9USA	World's Fair, Chicago, Ill.	14160	21.18
YOI	Bucharest, Roumania	13950	21.50
HAT	Szekesfehervar, Hungary	13685	21.91
CNR	Rabat, Morocco	12825	23.39
CT1CT	Lisbon, Portugal	12028	24.93
RNE	Moscow, U. S. S. R.	12000	25.00
FYA	Pontoise (Paris)	11880	25.25
W9XF	Chicago, Ill.	11880	25.25
VUC	Calcutta, India	11870	25.27
W8XK	Pittsburgh, Pa.	11870	25.27
GSE	Daventry, England	11860	25.29
KZRM	Philippine Islands	11830	25.35
KFZ	Little America	11830	25.36
W2XE	Wayne, N. J.	11830	25.36
W9XAA	Chicago, Ill.	11830	25.36
12RO	Rome, Italy	11810	25.40
OER2	Vienna, Austria	11800	25.42
W1XAL	Boston, Mass.	11790	25.45
DJD	Zeesen, Germany	11760	25.51
GSD	Daventry, England	11750	25.53
FYA	Pontoise (Paris)	11710	25.63
LSN	Buenos Aires, Argentina	11530	26.01
CT3AQ	Funchal, Madeira	11181	26.83
XFD	Mexico City, Mexico	11111	27.00
LSX	Buenos Aires, Argentina	10350	28.98
J1AA	Tokyo, Japan	9870	30.40
EAQ	Madrid, Spain	9860	30.43
IRM	Rome, Italy	9830	30.52
T14NRH	Heredia, Costa Rica	9675	31.00
VQ7LO	Nairobi, Kenya, Brit. E. A.	9616	31.19
CT1AA	Lisbon, Portugal	9600	31.25
XETE	Mexico City	9600	31.25
YV5BMO	Maracaibo, Venezuela	9600	31.25
HBL	Geneva, Switzerland	9595	31.27

		Kilocycles	Meters
VK2ME	Sydney, Australia	9590	31.28
W3XAU	Philadelphia	9590	31.28
GSC	Daventry, England	9585	31.30
XGBD	Shanghai, China	9581	31.30
W1XAZ	Springfield, Mass.	9570	31.35
DJA	Berlin, Germany	9560	31.38
W2XAF	Schenectady, New York	9530	31.48
GSB	Daventry, England	9510	31.55
VK3ME	Melbourne, Australia	9510	31.55
OXY	Skamleback, Denmark	9495	31.59
CNR	Rabat, Morocco	8035	37.33
HPB	Geneva, Switzerland	7797	38.47
HBQ	Geneva, Switzerland	7444	40.30
HJ4ABB	Manizales, Colombia	7150	41.90
KEL	Bolinas, Cal.	6860	43.70
8KR	Constantine, Algeria	6660	45.00
PRADO	Riobamba, Ecuador	6620	45.31
HJ1ABB	Barranquilla, Colombia	6447	46.53
W3XL	Bound Brook, N. J.	6425	46.69
W3XAL	Bound Brook, N. J.	6425	46.70
HC1DR	Quito, Ecuador	6382	47.10
HKC	Bogota, Colombia	6270	47.81
CN8MC	Casablanca, Morocco	6250	48.00
HKD	Bogota, Colombia	6243	48.02
W8XK	Pittsburgh, Pa.	6140	48.86
ZTJ	Johannesburg, S. Africa	6122	49.00
W2XE	Wayne, N. J.	6120	49.02
F31CD	Saigon, Indo-China	6111	49.04
YV1BC	Caracas, Venezuela	6120	49.08
VE9HX	Halifax, Nova Scotia	6110	49.09
VUC	Calcutta, India	6110	49.10
W9XF	Chicago, Ill.	6100	49.18
VE9GW	Bowmanville, Ont., Canada	6095	49.22
VE9BJ	St. John, N. B., Canada	6090	49.26
CP5	La Paz, Bolivia	6080	49.34
W9XAA	Chicago, Ill.	6080	49.34

		Kilocycles	*Meters*
YV5BMO	Maracaibo, Venezuela	6070	49.40
VE9CS	Vancouver, B. C., Canada	6069	49.43
OXY	Skamleback, Denmark	6060	49.50
W8XAL	Cincinnati, Ohio	6060	49.50
VQ7LO	Nairobi, Kenya, Africa	6060	49.50
W3XAU	Philadelphia, Pa.	6060	49.50
GSA	Daventry, England	6050	49.58
W1XAL	Boston, Mass.	6040	49.67
W4XB	Miami, Florida	6040	49.67
VE9CA	Calgary, Alta., Canada	6030	49.75
DJC	Zeesen, Germany	6020	49.83
VUB	Bombay, India	6020	49.83
ZH1	Singapore, S. S.	6012	49.90
VE9DR	Montreal, Canada	6005	49.96
EAJ25	Barcelona, Spain	6000	50.00
RV59	Moscow, U. S. S. R.	6000	50.00
HVJ	Vatican City, Rome, Italy	5970	50.26
HJ4ABE	Medellin, Colombia	5950	50.42
FIQA	Tananariva, Madagascar	5690	52.70
PMY	Bandoeng, Java	5170	58.03
RV15	Khabarovsk, U. S. S. R.	4273	70.20
HCJB	Quito, Ecuador	4109	73.00

Bgm Dance 11 00 (Sat) 7-45-8-48

Amos + Andy 1160 — 780 —
890 voice of experience

Wheaties 1100+
6-45

Stations Heard

Station	*Location*	*Date*	*Kilocycles*
WFBL	Syracuse		1360
WESG	Cornell U. Elmira N.Y.	12:15	1090
WGY			790
	Dan Poling	1:30	1000
	Pickhardt's	6.00	1002
	Kerry	7:15	880
	Bachelor's Kids	6.45	650 II
WRBa	Ed. McHugh	10:15 am	1800 I 790
	N. Grange Prog	12:30	1100 I
	Lizzie [illegible]	12:15	800 II
	Little Jimmy	8:45 am	827
	Sat. nite	6-45	840
	Little Jimmy		
	Radio Scrapbook	11:15	790
	Cowboys	8:30-3:00	840
	Agriculture	12:30	800
Los Angeles KHJ	country church	1:45 [illegible]	8 II
York [illegible] Springs	Antediluvian	9:30-3:30	1340-0
790	3rd Sat. in Mo. Nat. Grange Program		

National B.
2½ above 6 o
[illegible]

Pickford family 1002

Caddle - 6ft 2 in - 180 lbs 1200 3/4