INSTRUCTIONS for INSTALLATION
and OPERATION of

Grunow Radio

MODELS 670 • 671

CHASSIS 6D SPEAKER 8C4, 10A5

ALL-WAVE SUPERHETERODYNE RECEIVERS

● INTRODUCTION

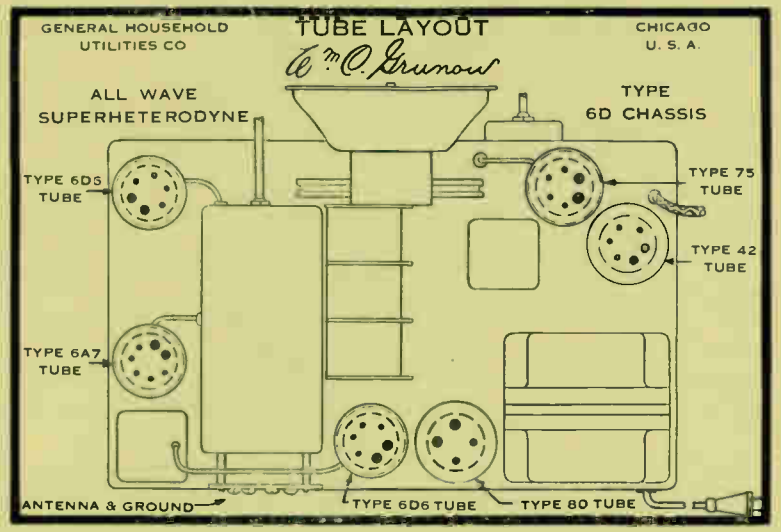


Fig. 1

This receiver, which makes use of Grunow Chassis type 6D is a highly efficient six tube model, utilizing the Super-Heterodyne circuit. It is designed for operation on voltages between 105 and 125 volts—50 to 60 cycles. If there is any doubt as to the rating of your power supply consult your *Grunow* dealer or the local power company before endeavoring to operate your receiver. This model is also obtainable for operation on power supplies of 105 to 125 volts—25 to 50 cycles A. C. in localities having this type of power service.

Provision is made in this receiver for operation not only in the broadcast range of 550 to 1500 K.C. but also in the shortwave bands. The total frequency range of the receiver is from 550 to 21,700 Kilocycles or approximately 550 to 14 meters. Owing to the wide range of frequencies covered by the receiver, the tuning range is divided into four ranges or divisions. Any one of these ranges may be instantly selected by turning the Range Switch Knob located on the front panel.

Through the use of recently developed tubes performance equal to that of an ordinary nine tube receiver is obtained from the six tubes used in this model. Automatic Volume Control is incorporated which aids in preventing fading of reception from comparatively distant stations and blasting from local stations. Superior reproduction is assured by the use of an electro-dynamic speaker. Tone Control is incorporated so that the ratio of high and low note reproduction may be adjusted to suit the individual taste.

● INSTALLATION

Preliminary. After unpacking the receiver remove the packing material used to protect the tubes during shipment. Loosen the four mounting bolts at the corners of the chassis beneath the shelf until the rubber washers may be turned readily, and remove the wooden shipping blocks beneath the ends of the chassis. Then refer to Fig. 1 which shows the location of the tubes and be sure that they are firmly inserted in their proper sockets and that the grid leads are connected to the top contacts of the 75, 6A7 and 6D6 tubes as shown in the figure.

Location. The receiver should be located so that its power cord is within reach of an electrical outlet or lamp socket of the proper rating. Also, to avoid running the antenna and ground leads around the room any further than necessary the receiver should be located close to the point at which these leads enter.

Antenna and Ground. This receiver has been designed to operate in conjunction with the Grunow All-Wave Antenna. To assure that the remarkable results, of which the receiver is capable, are obtained it should only be used with this antenna. This is a special antenna system designed to give best results on all frequencies and to provide maximum pickup of station signals while reducing the effects of static or local interference to a minimum. Complete instructions covering the installation of the Grunow All-Wave Antenna accompany each Grunow All-Wave Antenna Package.

The connections from the Grunow All-Wave Antenna and ground are made to the terminal board on the rear of the receiver chassis as shown in Fig. 2A. The link on the terminal board is thrown to the left connecting together terminals "J" and "ANT." *Extreme care must be taken that none of the fine strands of the wire connected beneath the screws fray out so as to touch one of the other screws as this would cause the receiver to be inoperative.*

If, for any reason, it is impossible to make use of the Grunow All-Wave Antenna System a single wire antenna of the type usually used for broadcast reception will be fairly satisfactory, provided it is carefully installed. The antenna should have a length of approximately 100 ft., including lead-in, and should be erected as high as possible and in a location where it will not be shielded by nearby buildings or trees. The antenna should be carefully insulated at each end and under no circumstances should a shielded lead-in be used. If necessary to erect the antenna close to a power line it should be located at right angles rather than parallel to the line. An indoor antenna will in general not give very satisfactory results on short wave reception.

The proper connections to the terminal board and the location of the link when using this type of antenna are shown in Fig. 2B.

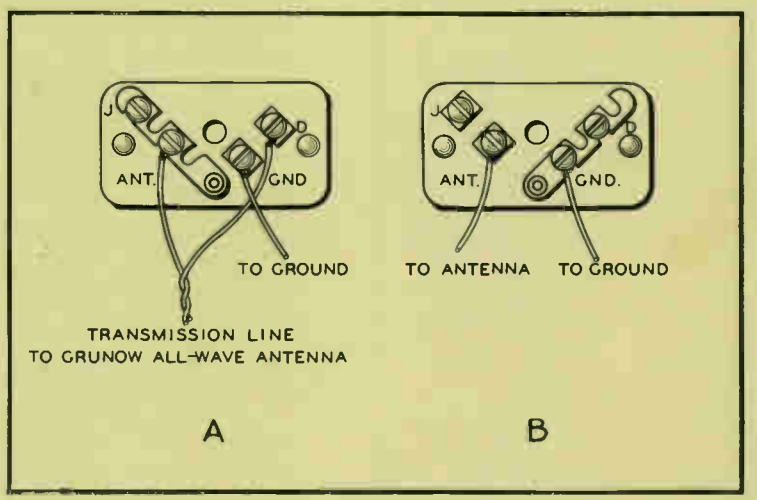


Fig. 2

It is important that a good ground connection be used. As a general rule, water pipes make good grounds. The ground lead should be connected by means of an approved ground clamp to a section of the pipe that has been scraped and cleaned to insure a good electrical connection. If a water pipe is not available, a pipe or metal rod may be driven into the ground to a depth of several feet.

● DESCRIPTION

It is recommended that before attempting to operate the receiver the user familiarize himself thoroughly with the following paragraphs which describe the functions of the receiver controls. The controls are four in number, all located on the front panel as shown in Fig. 3.

Volume Control. This control serves to vary the volume of reproduction as desired.

Station Selector. By means of this control the receiver is tuned to stations which operate in the frequency ranges indicated by the four dial scales. The tuning range of this receiver is divided into four ranges or divisions because of the wide frequency range covered.

The receiver is provided with a high ratio or slow speed tuning drive which is essential for the careful tuning necessary in picking up short wave signals.

Range Switch. The frequency range in which the receiver is to be operated is controlled by this switch. The letters "A," "B," "C," and "D" appearing on the front panel of the receiver refer to the A, B, C and D Dial Scales. The frequency range in which the receiver may be operated is indicated by the dial scale corresponding to the letter to which the dot on the range switch knob points.

Tone Control. The Tone Control is an arrangement for controlling the degree of reproduction of the higher audio frequency notes. Turning this knob clockwise brings out the higher notes and turning it counter-clockwise emphasizes the lower notes.

For best voice reproduction it is advisable to have the Tone Control turned in a clockwise direction, bringing out the high notes. When listening to orchestra music it will probably be best to turn the Tone Control in a counter-clockwise direction, softening the higher notes slightly.

The Tone Control also incorporates the "On-Off" Switch. When first turned in a clockwise direction it actuates the switch, turning the receiver "On." Further rotation in the same direction increases the ratio of high note reproduction.

Receiver Dial. The dial chart of this receiver has printed upon it four different scales corresponding to the four frequency ranges in which the receiver may be operated. These scales are calibrated directly in frequencies, the "A" and "B" scales in Kilocycles and the "C" and "D" scales in megacycles (one Megacycle is equal to 1,000 Kilocycles). The "A" frequency range is from 550 to 1600 Kilocycles in which will be received the standard broadcasting stations operating in the United States and adjoining countries. The "B" frequency range is from 1600 to 4500 Kilocycles in which range will be heard police stations, airplane stations and numerous amateur stations. In the "C" frequency range, which covers from 4.5 to 12.8 Megacycles, the short wave broadcasting stations which come in best after dark will be received. The "D" frequency range is from 10.0 to 21.8 Megacycles. This range includes the short wave stations which give best daytime reception.

The frequency calibration of the dial scales makes for ease in locating stations whose operating frequency is known, as the Station Selector may be adjusted so that the dial pointer turns slowly back and forth over the station frequency mark on the dial scale. The desired station will be received provided it is operating at the time and receiving conditions are favorable.

The locations on the dial where the majority of short wave stations using phone transmission may be tuned in are indicated by shaded sections with accompanying designations, such as "16M" for the 16 Meter band, "19M" for the 19 Meter band, etc. The classes of service indicated by the shaded sections on the dial are as listed below:

Approx. freq. on dial	Class of Service
1700 KC	Police
2000 KC	Amateur Phone
2400 KC	Police
4000 KC	Amateur Phone
6.0 MC	Shortwave Broadcast
8.0 MC	Shortwave Broadcast
10 MC	Shortwave Broadcast
12 MC	Shortwave Broadcast
14 MC	Amateur Phone
18 MC	Shortwave Broadcast
21 MC	Shortwave Broadcast

● SHORT WAVES

Short waves open up for the listener a new and varied field of radio reception. No longer is he limited in choice to programs originating from stations located in the same or adjoining countries but can obtain enjoyable radio programs from all parts of the world. Short waves are again furnishing the thrill that came in the early days of broadcasting upon receiving a distant station, but this time on a world wide scale.

However, short waves have peculiarities and skill is required in the operation of a short wave receiver in order to obtain the world wide reception which may be had. For this reason, read carefully the next sections of this booklet which describe thoroughly the operation of the receiver and which give valuable suggestions regarding short wave reception. When these sections are thoroughly understood, tuning of short wave stations will be practically as simple a procedure as that of tuning present day broadcasting stations.

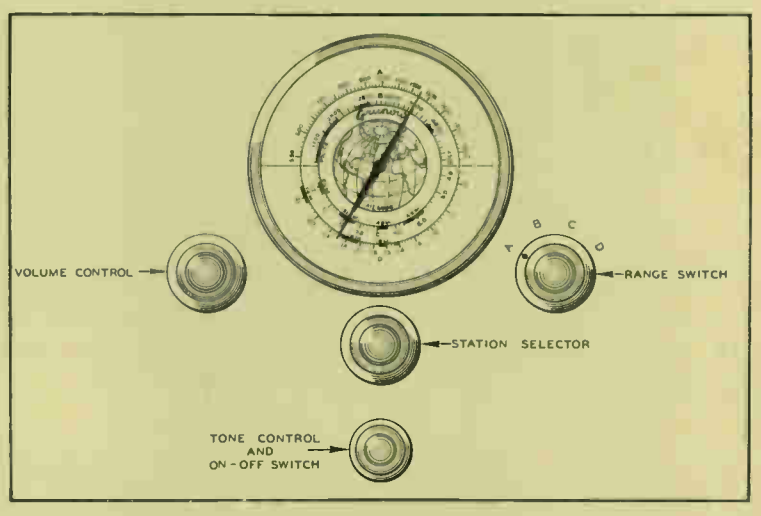


Fig. 3

● OPERATION

1. *Preliminary*. Apply power by inserting the plug connector at the end of the power cord into an electrical outlet and then turn the Tone Control knob clockwise from the "Off" position of the switch. A click will be heard and the pilot lamps will illuminate the dial indicating that power is applied to the receiver. Allow approximately thirty seconds for the tubes to heat to operating temperature. Then advance the Volume Control fully and set the Range Switch for operation in the desired frequency range. It is recommended that the user become thoroughly familiar with the operation of the receiver in the Broadcast or "A" frequency range before attempting reception of short wave stations.

2. *Broadcast Tuning*. Rotate the Station Selector Knob slowly until some station is heard, and then decrease the volume to somewhat below the desired intensity. Then adjust the Station Selector Knob until the signal is tuned in at its clearest and strongest point. The volume control may then be readjusted to give the desired intensity of reproduction. Other stations which are operating may be tuned in similarly.

3. *Short Wave Tuning*. The essential difference between Broadcast and Short Wave tuning lies in the extreme care which must be taken when tuning for short wave stations. *It is extremely necessary that the Station Selector Knob be turned very slowly when tuning for these stations, as it is possible to pass over a short wave station without knowing that it is there if the Station Selector Knob is turned too fast.*

On Pages 6 and 7 is a large illustration of the *Grunow* dial with an accompanying tabulation of the principal short wave stations of the world, segregated as to the Wavelength band in which they operate. These are the stations which may most readily be picked up and it will be noted that the sections of the dial in which the stations will be received are indicated. The portion of the dial in which to tune your receiver is determined to a great extent by the time of day. In the morning best reception will be obtained in the 14, 16 and 19 Meter bands, in the afternoon on the 19, 25 and 31 Meter bands, and at night on the 25, 31, 39 and 49 Meter bands.

Turn the Range Switch Knob so that the dot points to the letter on the panel corresponding to the letter on the dial scale indicating the range in which the receiver is to be operated, this range having been determined by the time of day. If, for example, it is about four o'clock in the afternoon, Eastern Standard Time, best reception will probably be obtained in the 25 Meter band and the range switch should be set at "C". Then rotate the Station Selector Knob *very slowly* so that the Dial Pointer moves across the portion of the "C" Scale marked "25M". If a station is operating its presence will be denoted by the characteristic "hiss" or "swishing" sound which indicates the presence of the station carrier wave. Carefully adjust the Station Selector Knob until the station is being received at its clearest and strongest point, and then adjust the Volume Control to give the desired volume of reproduction. If the characteristic carrier wave "hiss" is heard but no voice or music is in evidence do not immediately assume that something is wrong. Many short wave stations allow a considerable length of time to elapse between numbers on their programs and it may be that the station has been tuned in during one of these silent intervals.

In the same way, the other bands indicated on the dial may be explored keeping in mind that reception in different bands will be had at different times of the day. Some stations operate in portions of the dial not covered by any particular wavelength band and may sometimes be picked up with very good results. A complete list containing many stations not shown in Fig. 4 is given in the back of this booklet and as you become more familiar with the operation of your Grunow receiver you may try tuning for some of these.

4. *Radio Telegraph Reception*. Many amateur and commercial stations transmit signals using the Morse Code. Certain of these signals may be readily received on this receiver, and will be heard as an interrupted musical note. For users who are interested in transcribing these messages the International Morse Code is given in this instruction book immediately preceding the list of short wave stations.

5. When through operating the receiver turn off the power by rotating the Tone Control counter-clockwise until the click of the power switch is heard and the pilot lamps go out.

● SUGGESTIONS FOR SHORT WAVE RECEPTION

The *Grunow* All-Wave Receiver is capable of receiving any radio signal that is available. This includes American, Mexican and Canadian regular broadcasting stations, short-wave broadcasting stations, ship stations, aircraft and airport stations, amateur stations, transoceanic radiotelephone stations and experimental stations in all parts of the world. This does not mean, however, that any one or all of these stations can be received at any hour of the day or night. Short waves have their peculiarities and many different things enter into the story. Of greatest importance are two things—*Time* of the day and *Wavelength* or frequency. In addition, these things vary with the change of seasons of the year. One broadcasting station on a certain wavelength or frequency which can be received regularly during the summer months may not be as reliable during the winter months.

There are several experimental broadcasting stations on the air on a wavelength of about 14 meters, but these stations are operated at irregular periods and they maintain no regular schedule of operation. Stations on the 14-meter wavelength would be heard during the daylight hours, especially during the morning and perhaps as late as noon, Eastern Standard Time. Likewise, stations operating on 16 meters and 19 meters would be better during the morning hours and early in the afternoon, in most cases. Seldom are the 25-meter stations heard before the middle of the afternoon, and these signals increase later in the day, particularly during the summer and early fall months. At times, the 25-meter wavelength will give good reception as late as eight or ten o'clock at night. Again, at other times, reception on this wavelength will be unsatisfactory.

The 31-meter wavelength is an early evening and night wave. Under freakish conditions, this wavelength may get across the Atlantic Ocean during the day, but seldom is this the case. On the other hand, the 31-meter wavelength will bring in the Australian short-wave broadcasting stations in the very early hours of the morning. At times the Australian station, VK3ME can be heard

gal uses a bugle call; the Mexican station uses three short cuckoo calls.

The *Grunow* dial on pages 6 and 7 which list the calls and locations of stations is given as a guide to aid you in knowing where to find stations. It cannot be absolutely accurate because many short-wave broadcasting stations do not hold to regular daily periods of broadcasting. The dial guide gives you the call letters of the stations and the wave-length range most generally used when the station is on the air. It is not to be misconstrued as indicating that all of the stations listed may be received at any time.

Once you become familiar with the various stations you will be able to find the station you want because you will know the wavelength range in which to tune and when to tune for the station. Always tune slowly and carefully.

The English and German short-wave broadcasting stations use directive beam antennas at the transmitting stations. When they want to direct a broadcast program over great distances, the directive beam antenna is used. When the beam, for example, is directed toward South Africa, reception of that particular station in the United States is very poor. But, when they use the directive beam antenna for North America, reception is considerably better, although this does not always mean perfect reception from that station. The beam antenna directs the radio wave in one direction just the same as a flashlight directs a beam of light in one direction. Many of the short-wave signals actually go all the way around the world. Radio waves travel at a rate of speed of 186,000 miles a second, therefore it takes only about one-seventh of a second for a wave to go completely around the world—half way around in one-fourteenth part of a second.

Fading, which is often very pronounced on the short waves is believed to be caused by changing atmospheric conditions during the different seasons of the year. Short-wave fading usually is more rapid than fading on the broadcast range. Sunlight also is believed to have an influence on short waves as does the barometric pressure and the phases of the moon. Static, in most cases, is less than on the regular broadcast wavelengths; the shorter the wavelength, the less the static.

Man-made interference, however, is worse on the short waves. Street car motors, flashing signs and other electrical appliances cause interference. Automobile ignition interference is much worse on the short waves. Some automobiles cause no interference at all and others can be heard several hundred feet away from the receiver. In all cases, install your shortwave antenna in the best possible location. It may be that your location makes it very difficult to receive any but the most powerful short-wave broadcasting stations, yet your regular broadcast reception may be perfect. Interference may be caused by electric fans, oil burners, heating pads, irons, washing machines and refrigerators. Much of this interference can be filtered out, but it should be done by a skilled radio service expert.

For a complete list of every available station, we suggest the WORLD SHORT-WAVE RADIOPHONE TRANSMITTERS published by the Department of Commerce, Washington, D. C. This list of 96 pages contains the call letters, wavelength and frequency of about 2,400 short-wave stations. They are listed by the country and by the wavelength and frequency. Included in the book are two maps—one a time chart for time in every part of the world, and the other a distance chart. This complete list costs 25c, and can be obtained at the above address, or at your local branch of the Department of Commerce.

● MAINTENANCE

The tubes in the receiver should be checked occasionally, either by taking them out and having them tested by your *Grunow* dealer or by obtaining a new set of tubes, inserting them in the set one at a time, noting any difference in the performance.

Periodic inspection of the antenna and ground system is recommeded to be sure that all joints are clean and tight, and that the antenna is well insulated from the ground at all points.

● IN CASE OF TROUBLE

Power Supply. Be sure there is power at the electrical outlet in which the connector plug is inserted and that it is of the correct rating for this receiver.

Antenna and Ground. Check the antenna and ground to make sure that all connections are clean and tight, that the antenna is well insulated from ground at all points and that antenna and ground leads are properly connected to the chassis.

Tubes. Inspect tubes to see if they are all lighted, in the correct sockets and firmly inserted in the sockets. Make sure that the grid caps are in place on the tops of the 75, 6A7 and 6D6 tubes.

If the above three tests do not reveal the source of the trouble, turn the Volume Control Knob to the "Off" position and get in touch with your *Grunow* Dealer.

A list of the principal short wave stations now operating is given on the following pages for the convenience of the listener. The frequency and wave length of each station is given in Megacycles and Meters respectively, and its location on the dial can be found by comparing its frequency in Megacycles with the receiver dial. It should, of course, be borne in mind that the proper band or range must be selected on the dial and on the range switch.

Since short wave station schedules are subject to frequent changes, the accuracy of this Station List cannot be guaranteed.

INTERNATIONAL MORSE CODE

A	·–	H	····	O	–––	V	···–
B	–···	I	··	P	·––·	W	·––
C	–·–·	J	·–––	Q	––·–	X	–··–
D	–··	K	–·–	R	·–·	Y	–·––
E	·	L	·–··	S	···	Z	––··
F	··–·	M	––	T	–		
G	––·	N	–·	U	··–		

1.	·————	5.	·····	9.	————·
2.	··———	6.	–····	0.	—————
3.	···––	7.	––···		
4.	····–	8.	–––··		

The letters "de" (–·· ·) mean "from" and are followed by the call letters of the transmitting station.

as late as seven or eight o'clock in the morning. Japan, JVM, on 28.92 meters (10,375 kilocycles) can be heard very often as late as seven o'clock in the morning. For night reception, the 39-meter and the 49-meter wavelengths are the ones to use, especially for reception from the South American stations. The 39-meter wavelength is used by fewer stations with irregular periods of broadcasting, but the 49-meter wavelength is used quite generally.

Keeping this information in mind, the best wavelengths for morning reception are 14 meters, 16 meters and 19 meters. Early afternoon, 19 meters. Middle afternoon and late afternoon, 25 meters. Late afternoon and early evening, 25 meters and 31 meters, and then 39 and 49 meters after dark. Of course, these conditions will change during the seasons of the year, but a careful listener will soon become familiar with these changing conditions. Reception of "local" United States short-wave broadcasting stations will be different in the different parts of the United States. For example, when a station like W1XAZ, located at Springfield, Massachusetts, has "faded" out at Cleveland, Ohio on 31 meters, reception may be very good at St. Louis, Missouri, and this may be during broad daylight. Similarly W3XAL, at Bound Brook, New Jersey may have "faded" out at Chicago, Illinois on the 16-meter wavelength, yet that same station will be received with strong volume at San Francisco, California.

Another interesting thing which the careful listener will find is that the short wave stations can be received with perfect clarity when it would be very difficult to receive a nearby broadcasting station during a local electrical storm. There were numerous days when England and Germany were being received on 19 and 25 meters at Marion, Indiana when it was impossible to understand the broadcasting from the powerful WLW at Cincinnati, Ohio—just a couple of hundred miles away. Listeners in many parts of the United States will find programs of the National Broadcasting Company and of the Columbia Broadcasting System on the short waves and they will be able to hear those programs over great distances, and at times, possibly, when the local broadcasting station is not broadcasting the same program.

Why is this the case today? Because modern types of short-wave receivers have reached a higher stage of development than ever before. They are equipped with automatic volume control—so necessary for good short-wave reception. Coil designs have been improved materially—the coils really are low in losses. Tubes have been improved in sensitivity and the whole technical aspect of radio has been advanced over what it was even a year ago. At the short-wave broadcasting stations, likewise, equipment has been made much more efficient and the power of many of these stations has been increased five and ten times. These stations also operate more hours daily than they did a year ago.

As mentioned previously, you cannot receive any station in any part of the world just when you want to receive it. There are other stations which can be heard at practically any time of the day. Consult the dial and station chart. The aircraft stations during the daylight hours can be heard between 4.2 megacycles (4,200 kilocycles) and 5.6 megacycles (5,600 kilocycles). The night frequency is 2,300 kilocycles to 3,500 kilocycles. The amateur radiotelephones can be heard between 1,800 and 2,000 kilocycles; 3,900 and 4,000 kilocycles and 14,250 and 14,400 kilocycles. For long distance daylight communication across the United States and for communication with foreign radio amateurs, they use 14,240 to 14,400 kilocycles. At night, the 3,900 to 4,000-kilocycle range is used for communication throughout the United States for long distances. For shorter distances, the amateurs use 1,800 to 2,000 kilocycles although this frequency does give coast-to-coast communication at favorable times. The police broadcasts come in on two ranges, 1,650 to 1,712 and 2,400 to 2,500 kilocycles. The complete list of police broadcast stations is listed alphabetically by call letters. The ship-to-shore stations use the following frequencies: 4,100 to 4,420 kilocycles; 8,202 to 8,843; 12,346 to 13,335 and 16,420 to 17,800. Not all of these frequencies are used at the same time. The frequency used is that which provides satisfactory communication for the distance between ship and shore, and the time of day.

Another important factor to consider is the *time* and the difference of time in all parts of the world. When it is seven o'clock in the evening in New York, it is midnight in London, six o'clock in Chicago, five o'clock in Denver, four o'clock in San Francisco, and one-thirty in the afternoon at Honolulu, etc. When you look at the scheduled time of the broadcasting stations, be sure you change the time to correspond to your local time, so that you will be listening at the right hour. The time shown in this instruction book is Eastern Standard Time.

In tuning for short-wave stations, tune slowly and carefully and go over the band several times. You can easily pass by a short-wave station if it is not actually broadcasting right at the time you happen to be tuning. Most of the foreign stations operate to meet their requirements, and since these stations use no paid advertising programs, they are not required to make station announcements every fifteen-minute period. Very often you may hear a station for long periods of time before a station announcement is made. A good example is the London station at Daventry, England which comes on the air at midnight in London (seven o'clock, P.M., in New York). Several minutes before seven o'clock, you can hear the musical tone signal on the 25-meter and 31-meter wavelengths—there is no announcement of any kind. Promptly at midnight (London) you can hear Big Ben strike twelve times. Then the announcer usually says, "This is London calling—on GSD, 'D' for Daventry on 25.5 meters and GSC, 'C' for Corporation on 31.3 meters—Good evening everybody—Our program commences immediately." Perhaps there may be no further announcements for a half-hour or even an hour. This would be GSD on 11,750 kilocycles (25 meters) and right next to GSD you find the German station, DJD on 11,760 kilocycles. The same program which is broadcast on GSD also is broadcast over GSC on 31 meters (9,580 kilocycles). There may be days when the 25-meter station is better than the 31-meter station and vice versa. When the German stations are on the air but not broadcasting, they use an interval signal. This interval signal consists of eight notes—try them on your piano in the C scale. They are played in this order: C F F G G A G F. Several short-wave broadcasting stations use signals for identification. CT1AA, at Portu-

POLICE CALLS
SET RANGE SWITCH AT B

AMATEUR RADIOPHONES
SET RANGE SWITCH AT B

POLICE CALLS
SET RANGE SWITCH AT B

BROADCAST RANGE
SET RANGE SWITCH AT A

AMATEUR RADIOPHONES
SET RANGE SWITCH AT B

25 METER BAND
SET RANGE SWITCH AT C

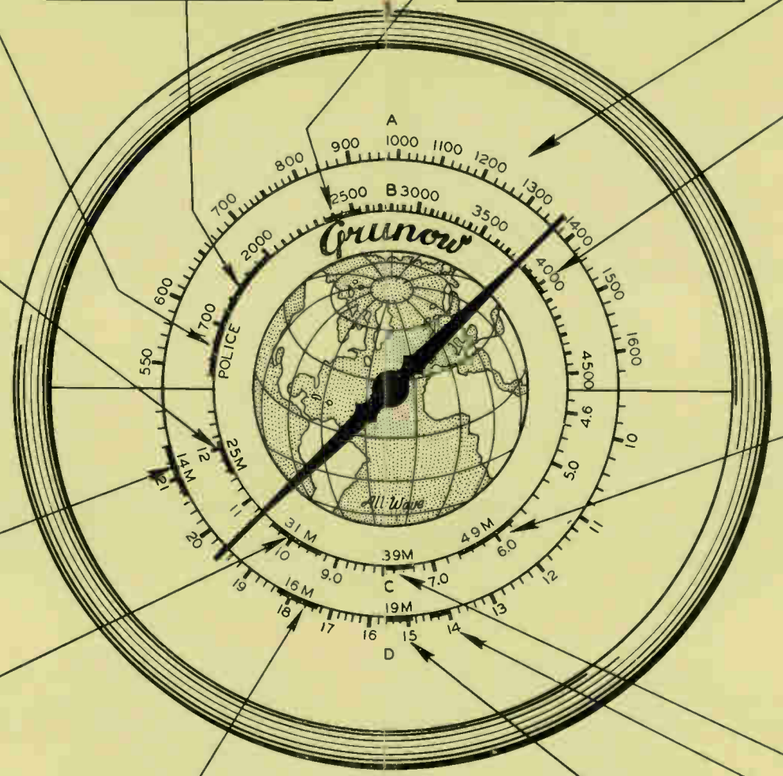
VE9JR	WINNIPEG, CANADA
FYA	PARIS, FRANCE
PHI	HUIZEN, NETHERLANDS
HRB	TEGUCIGALPA, HONDURAS
RRRR	TACHKENT, RUSSIA
GSD	DAVENTRY, ENGLAND
DJD	ZEESEN, GERMANY
F3ICD	SAIGON, FR. INDO-CHINA
W1XAL	BOSTON, MASS.
EAQ	ARANJUEZ, SPAIN
12AO	ROME, ITALY
W2XE	WAYNE, N.J.
KZRM	MANILA, P.I.
GSE	DAVENTRY, ENGLAND
W8XK	SAXONBURG, PA.
YNA	MANAGUA, NICARAGUA
RNE	MOSCOW, U.S.S.R.

49 METER BAND
SET RANGE SWITCH AT C

RW59	MOSCOW, U.S.S.R.
VE9DN	MONTREAL, CANADA
HRB	TEGUCIGALPA, HONDURAS
DJC	ZEESEN, GERMANY
PGD	KOOTWIJK, NETHERLANDS
YNA	MANAGUA, NICARAGUA
W1XAL	BOSTON, MASS.
EAQ	ARANJUEZ, SPAIN
GSA	DAVENTRY, ENGLAND
W8XAL	MASON, OHIO
VQ7LO	NAIROBI, KENYA
W3XAU	NEWTON SQUARE, PA.
OXY	SKAMLEBAK, DENMARK
W9XAA	CHICAGO, ILL.
W3XAL	BOUND BROOK, N.J.
F3LCD	SAIGON, FR. INDO-CHINA
W2XE	WAYNE, N.J.
ZTJ	JOHANNESBURG, U. OF S. AFR.
ZGE	KUALA LUMPUR, F.M. STATES
KZRM	MANILA, P.I.
W8XK	SAXONBURG, PA.
HJ3ABF	BOGOTA, COLOMBIA

14 METER BAND
SET RANGE SWITCH AT D

W1XAL	BOSTON, MASS.
GSH	DAVENTRY, ENGLAND
	WARSAW, POLAND
FYA	PARIS, FRANCE
NAA	WASHINGTON, D.C.
W8XK	PITTSBURGH, PA.
VK3LR	LYNDHURST, AUSTRALIA
XGBA	SHANGHAI, CHINA



31 METER BAND
SET RANGE SWITCH AT C

PLV	BANDOENG, DUTCH INDIES
SRI	POSEN, POLAND
YV3BC	CARACAS, VENEZUELA
VK3ME	MELBOURNE, AUSTRALIA
GSB	DAVENTRY, ENGLAND
OXY	SKAMLEBAK, DENMARK
W2XAF	SCHENECTADY, N.Y.
VK2ME	SYDNEY, AUSTRALIA
EAQ	ARANJUEZ, SPAIN
DJA	ZEESEN, GERMANY
KZRM	MANILA, P.I.
W1XAZ	MILLIS, MASS.
W8XK	SAXONBURG, PA.
VK3LR	LINDHURST, AUSTRALIA
COLONIAL STA.	PARIS, FRANCE
TIRA	CARTAGO, COSTA RICA
PCJ	HILVERSUM, NETHERLANDS
W3XAU	NEWTON SQUARE, PA.
HBL	PRANGINS, SWITZERLAND
XETE	MEXICO CITY, MEXICO
LSN	BUENOS AIRES

16 METER BAND
SET RANGE SWITCH AT D

W3XL	BOUND BROOK, N.J.
DJE	ZEESEN, GERMANY
FYA	PARIS, FRANCE
PHI	HUIZEN, NETHERLANDS
	WARSAW, POLAND
W3XAL	BOUND BROOK, N.J
W9XAA	CHICAGO, ILL.
W9XF	DOWNERS GROVE, ILL.
W8XK	SAXONBURG, PA.
GSG	DAVENTRY, ENGLAND

19 METER BAND
SET RANGE SWITCH AT D

HVJ	VATICAN CITY
GSF	DAVENTRY, ENGLAND
	BATAVIA, DUTCH INDIES
DJB	ZEESEN, GERMANY
W8XK	SAXONBURG, PA.
FYA	PARIS, FRANCE
W1XAL	BOSTON, MASS.
EAQ	ARANJUEZ, SPAIN
W2XE	WAYNE, N.J.
W2XAD	S. SCHENECTADY, N.Y.

39 METER BAND
SET RANGE SWITCH AT C

HJ3ABD	BOGOTA, COLOMBIA
HBQ	PRANGINS, SWITZERLAND
HBP	LEAGUE OF NATIONS
LCN	JELOY, NORWAY

AMATEUR RADIOPHONES
SET RANGE SWITCH AT D

AIRCRAFT STATIONS WILL BE RECEIVED WITH RANGE SWITCH SET AT B, IN FREQUENCY RANGES OF 2300 TO 3500 K.C. & 4200 TO 4500 K.C.
WITH RANGE SWITCH SET AT C, AIRCRAFT STATIONS WILL BE RECEIVED IN RANGE OF 4.6 TO 5.6 MEGACYCLES.

~DIAL LOCATIONS~
PRINCIPAL SHORT-WAVE STATIONS OF THE WORLD
GRUNOW MODELS 670 & 671.

SHORT WAVE BROADCASTING STATIONS

Frequency (Megacycles)	Wave Length (Meters)	Call Letters	Location	Eastern Standard (New York) Time
21.55	13.92	XGBA	Shanghai, China	
21.54	13.93	VK3LR	Lyndhurst, Australia	
21.54	13.93	W8XK	Pittsburgh, Pa.	7 A. M.-3 P. M.
21.49	13.96	FYA	Paris, France	
21.48	13.97		Warsaw, Poland	
21.47	**13.97**	**GSH**	**Daventry, United Kingdom**	**11 A. M.-1 P. M.**
21.46	13.98	W1XAL	Boston, Mass.	
19.72	15.21	EAQ	Aranjuez, Spain	
17.79	**16.86**	**GSG**	**Daventry, United Kingdom**	
17.78	16.87	W8XK	Saxonburg, Pa.	
17.78	16.87	W9XF	Downers Grove, Ill.	
17.78	16.87	W9XAA	Chicago, Ill.	
17.78	**16.87**	**W3XAL**	**Bound Brook, N. J.**	**Sat. to Thurs. 10 A. M.-4 P. M.**
17.78	16.87		Warsaw, Poland	
17.78	16.88	PHI	Huizen, Netherlands	
17.77	16.88	FYA	Paris, France	
17.76	**16.89**	**DJE**	**Zeesen, Germany**	
17.31	**17.33**	**W3XAI**	**Bound Brook, N. J.**	**11 A M. -5 P. M.**
17.13	17.51	HAS5	Szekesfehervar, Hungary	
15.37	19.52	HAS3	Szekesfehervar, Hungary	
15.35	19.53	CT1AA	Lisbon, Portugal	
15.33	19.57	W2XAD	S. Schenectady, N. Y.	3-4 P. M.
15.31	19.60		Australia	
15.30	19.61		Batavia, Dutch Indies	
15.30	19.61	FYA	Paris, France	
15.29	19.62		India	
15.28	19.64		Warsaw, Poland	
15.27	19.65	W2XE	Wayne, N. J.	11 A. M.-1 P. M.
15.27	19.65	EAQ	Aranjuez, Spain	
15.25	19.67	RIM	Tachkent, Russia	
15.20	19.67	W1XAL	Boston, Mass.	10:50 A. M.-1:30 P. M.
15.24	**19.68**	**FYA**	**Paris, France**	**8-11 A. M.**
15.23	19.70	VK3LR	Lyndhurst, Australia	
15.21	**19.72**	**W8XK**	**Saxonburg, Pa.**	**10 A. M.-5:15 P. M.**
15.20	**19.74**	**DJB**	**Zeesen, Germany**	**1:30-3:15 A. M.; 7:45-10:45 A. M.**
15.16	19.79		India	
15.15	19.80		Batavia, Dutch Indies	
15.14	**19.82**	**GSF**	**Daventry, United Kingdom**	**1:45-5:45 Daily; 11:30-1:30 P. M. Sun.**
15.13	19.83	NAA	Washington, D. C.	
15.12	19.84	HVJ	Vatican City	6-6:15 A. M.
15.11	**19.85**	**DJL**	**Zeesen, Germany**	
13.98	21.46	LCO	Jeloy, Norway	
13.41	22.37	YID	Baghdad, Iraq	
12.84	23.36		Australia	
12.83	23.38	CNR	Rabat, French Morocco	7:30 A. M.
12.00	25.00	RNE	Moscow, Russia	Sun. 12-1 A. M., 7-8 A. M., 11-12 A. M.
11.91	**25.20**	**FYA**	**Paris, France**	
11.90	25.20		Paris, France (Colonial Station)	
11.89	25.23	YNA	Managua, Nicaragua	
11.88	25.25		Paris, France (Colonial Station)	11:15 A. M.-2:15 P. M.; 3-6 P. M.
11.88	25.25		Australia	
11.87	**25.27**	**W8XK**	**Saxonburg, Pa.**	**5:15-10 A. M.; Sun. 5:15 A. M.-1. P. M.**
11.87	25.27	VUC	Calcutta, India	
11.87	**25.28**	**GSE**	**Daventry, United Kingdom**	**1:45-5:45 P. M.**
11.86	25.30		Batavia, Dutch Indies	
11.85	25.33		Paris, (Colonial Sta.) France	
11.84	25.34	FZRM	Manila, Philippine Islands	
11.83	**25.36**	**WZXE**	**Wayne, N. J.**	**3-5 P. M.**
11.83	25.36	W9XA	Chicago, Ill.	
11.81	**25.40**	**I2RO**	**Rome-Prado Smeraldo, Italy**	**11 A. M.-2 P. M.; 5-7:30 P. M.**
11.81	25.40	EAQ	Aranjuez, Spain	
11.80	25.42		Vienna, Austria	
11.80	25.42		Japan	
11.79	25.45	W1XAL	Boston, Mass.	6-7:30 P. M.
11.79	25.45	TITR	San Jose, Costa Rica	
11.78	25.46	F3ICD	Saigon, French Indo-China	
11.77	25.49		Batavia, Dutch Indies	
11.76	**25.51**	**DJD**	**Zeesen, Germany**	**10-12 A. M.; 1:20-3 P. M.**
11.75	**25.58**	**GSD**	**Daventry, United Kingdom**	
11.74	25.55	RRRR	Tachkent, Russia	
11.74	25.55		Poland	
11.74	25.55	HRB	Tegucijalpa, Honduras	
11.73	25.58	NAA	Washington, D. C.	
11.72	25.60	VE9DR	Winnipeg, Man., Canada	
11.72	**25.60**	**FYA**	**Paris, France**	
11.72	25.60	VE9JR	Winnipeg, Man., Canada	8-11:30 P. M.
11.71	25.62		Australia	
11.71	**25.63**	**FYA**	**Paris, France**	
11.18	26.83	CT3AQ	Funchal, Madeira	Tues., Thur. 6-10:30 P. M.

Frequency (Megacycles)	Wave Length (Meters)	Call Letters	Location	Eastern Standard (New York) Time
10.53	28.50	VLK	Sydney, Australia	1-8 A. M.
10.35	28.99	LSX	Monte Grande, Argentina	4-5 P. M.
10.33	29.04	ORK	Ruysselede, Belgium	1:00 P. M.
9.99	30.03	LSN	Buenos Aires, Argentina	12-6 P. M.
9.86	**30.43**	**EAQ**	**Aranjuez, Spain**	**6:30-8:30 A. M. Sat. 2-4 P. M.**
9.60	31.25	XETE	Mexico City, Mexico	9-11 P. M.
9.60	31.25	CT1AA	Lisbon, Portugal	Tues., Fri. 4:30 P. M.–7 A. M.
9.60	**31.27**	**HBL**	**Prangins, Switzerland**	**Sat. 6:00-6:45 P. M.**
9.59	**31.28**	**W3XAU**	**Newton Square, Pa.**	**12-6 P. M.**
9.59	31.28	PCJ	Hilversum, Netherlands	6-10 A. M.; 10-30 A. M. 1 P. M.
9.59	31.28	T1RA	Cartago, Costa Rica	
9.59	**31.30**	**GSC**	**Daventry, United Kingdom**	**11 A. M.- 6 P. M.**
9.59	31.30		Paris (Colonial Station)	
9.58	31.32		Batavia, Dutch Indies	
9.58	31.32	VK3LR	Lindhurst, Australia	4:15-8 A. M.
9.58	31.32	SCBD	Shanghai, China	
9.58	31.33	VUC	Calcutta, India	
9.57	**31.35**	**W8XK**	**Saxonburg, Pa.**	
9.57	31.35	W1XAZ	Millis, Mass.	7 A. M.–1 A. M.
9.57	31.35	SRI	Posen, Poland	
9.57	31.35	KZRM	Manila, Philippine Islands	
9.57	31.36	VUB	Bombay, India	
9.56	**31.38**	**DJA**	**Zeesen, Germany**	**7:45-10:45 A. M.; 6-9 P. M.**
9.55	31.41	NAA	Washington, D. C.	
9.55	31.41	LKJ1	Jeloy, Norway	
9.55	31.41		Batavia, Dutch Indies	
9.55	**31.43**	**EAQ**	**Aranjuez, Spain**	
9.54	31.45		Batavia, Dutch Indies	
9.53	**31.48**	**WZXAF**	**Schenectady, N. Y.**	**6:40-10 P. M.**
9.52	31.51	OXY	Skamlebak, Denmark	2-6:30 P. M.
9.51	**31.55**	**GSB**	**Daventry, United Kingdom**	**5:15-7:15 A. M.; 1:45-10:30 P. M.**
9.51	**31.55**	**VK3ME**	**Melbourne, Australia**	**Wed. 6-7:30 A. M.; Sat. 6-8 A.M.**
9.50	31.56	YV3BC	Caracas, Venezuela	9:30-10:30 P. M.
9.40	31.90	PLV	Bandoeng, Dutch Indies	6-8 P. M.
9.18	32.70	YUR	Maracay, Venezuela	Irregular
9.12	32.89	CP5	La Paz, Bolivia	
8.86	33.86	GBC	Rugby, United Kingdom	
8.76	34.19	PNI	Makassar, Dutch Indies	5 P. M.
8.19	36.65	PRA3	Rio de Janeiro, Brazil	8-8:30 A. M.
8.19	36.65	PSK	Maracipu, Brazil	6-7:30 P. M.
8.04	37.33	CNR	Rabat, French Morocco	Sun. 4:00-5:00
7.84	38.29	LCN	Jeloy, Norway	
7.80	**38.48**	**HBQ**	**Prangins, Switzerland**	**6:30-8:15**
7.44	**40.30**	**HBQ**	**Prangins, Switzerland**	
7.40	40.55	HJ3ABD	Bogota, Colombia	9-12 P. M.
7.22	41.55	HKE	Bogota, Colombia	Tues., Fri. 8-9 P. M.
7.21	41.60	EA8AB	Teneriffe, Canary Islands	
7.21	41.60	HJ4ABB	Manizales, Colombia	Irregular
7.20	41.60	YV2AM	Maracaibo, Venezuela	
7.16	42.00	OA4B	Lima, Peru	12-1 A. M.
7.08	42.37	LU5CZ	Buenos Aires	11:30 P. M.-2 A. M.
6.99	42.92	LCL	Jeloy, Norway	11 A. M.-6 P. M.
6.98	43.00	EAR110	Madrid, Spain	Tues., Sat., 6 P. M.
6.96	43.10		Australia	
6.68	44.91		Australia	
6.67	44.93	BC2RL	Guayaquie, Ecuador	Sun. 6-9., Tues. 10 P. M.-1 A. M.
6.67	45.00	F8KR	Constantine, Algeria	
6.66	45.00	YNCRG	Granada, Nicaragua	
6.63	45.25		Moscow, Russia	
6.62	45.31	PRADO	Riobamba, Ecuador	Fri. 10 A. M. 12:40 P. M.
6.61	45.38	RW72	Moscow, Russia	
6.61	45.38	REN	Moscow, Russia	
6.58	45.59		Australia	
6.58	45.59	HJ1ABB	Barranquilla, Colombia	11:45 A. M.-12:45 P. M. exc. Mon.; 7-9:30 P. M.; Mon. 2-6 P. M.
6.48	46.30	HJ5ABD	Cali, Colombia	6-11 P. M.
6.45	46.51	HJ1ABB	Baranquilla, Colombia	11:45 A. M.-12:45 P. M., Exc. Mon.; 7-9:30 P. M.; Mon. 2-6 P. M.
6.43	**46.69**	**W3XAL**	**Bound Brook, N. J.**	
6.43	46.70	HJA3	Barranqui'la, Colombia	Irregular
6.32	47.50	HIZ	Santo Domingo, Dominican Republic	4:40-5:40 P. M.
6.28	47.80	HI1A	Santo Domingo, Dominican Republic	Irregular
6.25	48.00	HJ3ABF	Bogota, Colombia	7-11 P. M.
6.24	48.10	OCN	Lima, Peru	
6.23	48.15		Australia	
6.15	48.75	CJRO	Winnipeg, Man., Canada	
6.15	48.78	YV3BC	Caracas, Venezuela	4:30-9:30 P. M.
6.14	**48.86**	W8XK	**Saxonburg, Pa.**	**4:30 P. M.-1 A. M.**
6.14	48.86		Poland	
6.14	48.86	KZRM	Manila, Philippine Islands	
6.14	48.86		Australia	
6.14	48.90	YID	Baghdad, Iraq	
6.14	48.90	ZGE	Kuala Lumpur, Fed. Malay States	Sun., Tues. and Fri. 7:40-9:40 A. M.

Frequency (Megacycles)	Wave Length (Meters)	Call Letters	Location	Eastern Standard (New York) Time
6.12	49.00	ZTJ	Johannesburg, Union of S. Africa	12 1:30 A. M.; 4:30 8 A. M.; 10 A. M. 4 P. M.; Sun. 9 11:15 A. M.; 1:30 3 P. M.
6.12	49.02	W2XE	**Wayne, N. J.**	**6-11 P. M.**
6.12	49.02	NAA	Washington, D. C.	
6.12	49.02	PKIWX	Bandoeng, Dutch Indies	5 6 P. M.
6.12	49.02		Batavia Dutch Indies	
6.12	49.02	OQU	Basankusu, Belgian Congo	
6.12	49.02	HJIABD	Cartegena, Colombia	
6.12	49.05	F3LCD	Saigon, French Indo China	
6.12	49.05		Warsaw, Poland	
6.11	49.10	Ve9HX	Halifax, N. S., Canada	Sat., Sun. 5 11 P. M.; Mon. to Fri. 9:30 12 A. M., 4 11 P. M.
6.11	49.10	YV1BC	Caracas, Venezuela	12 2:30 P. M., 6:45 11:30 P. M.; Sun. 10 A. M. 12:30 P. M., 3 7:30 P.M., 8:30 P. M. 12:30 A. M.
6.11	49.10	VUC	Calcutta, India	Fri. 11:30 A. M. 2 P. M.; Fri. 10:30 11 A. M.; Sat. 11:30 A. M. 5 P. M; Sat. 9:30-12 A. M., 11:45-3A. M.
6.11	49.10	EAQ	Aranjuez, Spain	
6.10	49.18	W9XF	Downers Grove, Ill.	Tues., Thurs., Sat. 4:30 8 P. M.; Mon., Wed., Fri. 10:30 P. M. 3 A. M.
6.10	49.18	W3XAL	**Bound Brook, N. J.**	**4:30-1 A. M.**
6.09	49.26	VE9GW	Bowmanville, Ont., Canada	Mon. to Thurs. 3 12 P. M.; Fri. and Sat. 8 12 P. M.; Sun. 12 9 P. M.
6.09	49.26	OXY	Skamlebak, Denmark	2 6:30 P. M.
6.09	49.29	VE9BJ	St. John, N. B., Canada	7 8:30 P. M.
6.08	49.30	CP5	La Paz, Bolivia	8 11:30 P. M.
6.08	49.34	TIRA	Cartago, Costa Rica	
6.08	49.34	W9XAA	Chicago, Ill.	Sun. 11:30 A. M. 9:15 P. M.; Tues., Thurs. and Sat. 3 P. M. 1 A. M.; Mon. Wed., Fri. 3 4 P. M.
6.08	49.34		Takoradi, Gold Coast	
6.07	49.32	YV5BMO	Maracaibo, Venezuela	7 10 P. M.
6.07	49.41	OER2	Vienna, Austria	Tues. Thurs., 9:30 A. M. 5 P. M.,
6.07	49.40	OXY	Skamlebak, Denmark	2 6 P. M. irregular.
6.07	49.42	VE6CS	Vancouver, B. C., Canada	12:30 1:45 A. M.; Sun., Noon-Midnight.
6.07	49.42	EAQ	Aranjuez, Spain	
6.07	49.46	SASH	Motala, Sweden	
6.06	49.50	W3XAU	**Newton Square, Pa.**	**8 P. M.-1 A. M.**
6.06	49.50	ZL2ZX	Wellington, New Zealand	2 6:30 P. M.
6.06	49.50	OXY	Skamlebak, Denmark	
6.06	49.50	VQ7LO	Nairobi, Kenya, Africa	11 A. M. 2 P. M.
6.06	49.50	W8XAL	**Mason, Ohio**	**Irregular**
6.05	49.59	GSA	**Daventry, United Kingdom**	**4-8 P. M.**
6.05	49.60	HJ3ABI	Bogota, Colombia	
6.05	49.63	EAQ	Aranjuez, Spain	
6.04	49.67	W4XB	Miami Beach, Fla.	8 12 P. M.
6.04	49.67	W1XAL	Boston, Mass.	5:45 7:15 P. M.; Sun. 7:30 9:30
6.04	49.67		Soerabaya, Dutch Indies	
6.04	49.67	CMCI	Habana, Cuba	
6.04	49.71	YNA	Managua, Nicaragua	
6.03	49.75	VE9CA	Calgary, Canada	
6.03	49.75	OQT	Buta, Congo	
6.02	49.83	PCD	Kootwijk, Netherlands	
6.02	49.83	DJC	**Zeesen, Germany**	
6.01	49.90	ZHI	Singapore, Straits Settlements	Mon., Wed., Thu. 6:40 9.10 A. M.; Sat. 1:10 2:10 A. M.; Sun. 11:40 A. M.; Mon. 2:10 A. M. 10 P. M.-12:30 A. M., 1.30-3 P. M.
6.01	49.92	COC	Habana, Cuba	5 7 P. M.
6.01	49.92		Australia	
6.00	49.96	HRB	**Tegucigalpa, Honduras**	**12:30-11:45 P. M.**
6.00	49.96	VE9DR	Montreal, Canada	7:30 12 A. M. Sun.
6.00	49.96	VE9DN	Montreal, Canada	11:30 P. M.-1 A. M.
6.00	49.96	CMCI	Habana, Cuba	
6.00	50.0	YOI	Bucharest, Rumania	
6.00	50.0	RW59	Moscow, U. S. S. R.	5 7 P. M.
6.00	50.0	HIX	Santo Domingo, Dominican Republic	8 10 P. M.
6.00	50.0		Radio St. Denis, Renunion	
6.00	50.0	EAJ25	Barcelona, Spain	Sat. 4:30 5:30 P. M.
6.00	50.0	3L3ZC	Christchurch, New Zealand	
6.00	50.0	VSZAB	Kuala Lumpur Federated Malay States	
5.95	50.4	HIX	Santo Domingo, Dominican Republic	8 P. M.-1 A. M.
5.95	50.4	HJ4ABE	Medellin, Colombia	8 12 P. M.
5.80	51.7	VK3LR	Lyndhurst, Australia	
5.74	52.3		Australia	
5.72	52.5		Australia	
5.69	52.7	FIQA	Tananariva, Madagascar	Sun. 5:30 6 A. M; Sat. 1:30 3 P. M.; 4 4:5 A. M., 11 12 A. M.
5.17	58.0	PMY	Bandoeng, Dutch Indies	
5.15	58.3	OK1MPT	Prague, Czechoslovakia	
4.47	67.1	YID	Baghdad, Iraq	
4.37	68.7		Samarang, Dutch Indies	
4.32	69.4	GDB	Rugby, United Kingdom	8 10:30 P. M.
4.27	70.2	RWI5	Kharbarovsk, U. S. S. R.	
4.27	70.4	RWI5	Kharbarovsk, U. S. S. R.	3 9 A. M.

Police Radio Stations

Call Letters	Frequency Kilocycles	Location
KGBZ	2,406	Little Rock, Ark.
KGHD	2,490	Seattle, Wash.
KGHE	2,490	Snoqualmie Pass, Wash.
KGHG	2,474	Las Vegas, Nev.
KGHJ	2,490	Long Beach, Cal.
KGHK	1,674	Palo Alto, Cal.
KGHM	2,474	Reno, Nev.
KGHO	1,682	Des Moines, Ia.
KGHS	2,414	Spokane, Wash.
KGHX	2,490	Santa Ana, Cal.
KGHY	1,712	Whittier, Cal.
KGJX	1,712	Pasadena, Cal.
KGOZ	2,466	Cedar Rapids, Ia.
KGPA	2,414	Seattle, Wash.
KGPB	2,430	Minneapolis, Minn.
KGPC	1,706	St. Louis, Mo.
KGPD	1,674	San Francisco, Cal.
KGPE	2,422	Kansas City, Mo.
KGPF	2,414	Santa Fe, N. M.
KGPG	2,422	Vallejo, Cal.
KGPH	2,450	Okla'ma City, Okla.
KGPI	2,466	Omaha, Nebr.
KGPJ	1,712	Beaumont, Tex.
KGPK	2,466	Sioux City, Iowa
KGPL	1,712	Los Angeles, Cal.
KGPM	1,674	San Jose, Cal.
KGPN	2,466	Davenport, Iowa
KGPO	2,450	Tulsa, Okla.
KGPP	2,422	Portland, Ore.
KGPQ	2,450	Honolulu, T. H.
KGPR	2,430	Minneapolis, Minn.
KGPS	2,414	Bakersfield, Cal.
KGPW	2,406	Salt Lake City, Utah
KGPX	2,442	Denver, Colo.
KGPZ	2,450	Wichita, Kan.
KGZA	2,414	Fresno, Cal.
KGZC	2,422	Topeka, Kan.
KGZD	2,490	San Diego, Cal.
KGZE	1,658	San Antonio, Tex.
KGZF	2,450	Chanute, Kan.
KGZG	2,466	Des Moines, Ia.
KGZH	2,382	Kla'th Fal's, Ore.
KGZI	2,458	Wich. Falls, Tex.
KGZJ	2,430	Phoenix, Ariz.
KGZM	2,414	El Paso, Tex.
KGZN	2,414	Tacoma, Wash.
KGZO	2,414	Santa Barbara, Cal.
KGZP	2,450	Coffeyville, Kan.
KGZQ	1,712	Waco, Tex.
KGZR	2,442	Salem, Ore.
KGZT	1,674	Santa Cruz, Cal.
KGZU	2,490	Lincoln, Nebr.
KGZV	2,414	Aberdeen, Wash.
KGZW	2,458	Lubbock, Tex.
KGZX	2,414	Albuquerque, N. M.
KGZY	1,712	San Bernardino, Cal.
KSW	1,658	Berkeley, Cal.
KVP	1,712	Dallas, Tex.
WCK	2,414	Belle Isle, Mich.
WEY	1,558	Boston, Mass
WKDT	1,558	Detroit, Mich.
WKDU	1,706	Cincinnati, Ohio
WMDZ	2,442	Indianapolis, Ind.
WMJ	2,422	Buffalo, N. Y.
WMO	2,414	Highland Park, Mich.
WMP	1,666	Fram'ham, Mass.
WPDA	2,414	Tulare, Cal.
WPDB	1,712	Chicago, Ill.
WPDC	1,712	Chicago, Ill.
WPDD	1,712	Chicago, Ill.
WPDE	2,442	Louisville, Ky.
WPDF	2,466	Flint, Mich.
WPDG	2,458	Youngstown, Ohio
WPDH	2,442	Richmond, Ind.
WPDI	2,430	Columbus, Ohio
WPDK	2,450	Milwaukee, Wis.
WPDL	2,442	Lansing, Mich.
WPDM	2,430	Dayton, Ohio
WPDN	2,382	Auburn, N. Y.
WPDO	2,458	Akron, Ohio
WPDP	2,474	Phi'adelphia, Pa.
WPDR	2,332	Rochester, N. Y.
WPDS	2,430	St. Paul, Minn.
WPDT	2,490	Kokomo, Ind.
WPDU	1,712	Pittsburgh, Pa.
WPDV	2,458	Charlotte, N. C.
WPDW	2,422	Washington, D. C.
WPDX	2,414	Detroit, Mich.
WPDY	2,414	Atlanta, Ga.
WPDZ	2,490	Fort Wayne, Ind.
WPEA	2382	Syracuse, N. Y.
WPEB	2,442	Grand Rapids, Mich.
WPEC	2,466	Memphis, Tenn.
WPED	1,712	Arlington, Mass.
WPEE	2,450	Brooklyn, N. Y.
WPEF	2,450	New York, N. Y.
WPEG	2,450	New York, N. Y.
WPEH	1,712	Somerville, Mass.
WPEI	1,712	Providence, R. I.
WPEK	2,430	New Orleans, La.
WPEL	1,666	Middleboro, Mass.
WPEM	2,466	Woonsocket, R. I.
WPES	2,442	Saginaw, Mich.
WPET	1706	Lexington, Ky.
WPEW	1,666	Northampton, Mass.
WPFA	1,712	Newton, Mass.
WPFC	2,442	Muskegon, Mich.
WPFE	2442	Reading, Pa.
WPFG	2,442	Jacksonville, Fla.
WPFH	2,414	Baltimore, Md.
WPFI	2,414	Columbus, Ga.
WPFJ	2,490	Hammond, Ind.
WPFK	2,430	Hackensack, N. J.
WPFM	2,382	Birmingham, Ala.
WPFN	1,712	Fairhaven, Mass.
WPFO	2,474	Knoxville, Tenn.
WPFP	2,490	Clarksburg, W. Va.
WPFQ	2,474	Swarthmore, Pa.
WPFT	2,442	Lakeland, Fla.
WPFU	2,422	Portland, Me.
WPFV	2,466	Pawtucket, R. I.
WPFX	2,442	Palm Beach, Fla.
WPFZ	2,442	Miami, Fla.
WPGA	2,466	Bay City, Mich.
WPGB	2,466	Pt. Huron, Mich.
WPGC	1,658	Schenectady, N. Y.
WPGD	2,458	Rockford, Ill.
WPGE	2,430	Shreveport, La.
WPGF	1,712	Providence, R. I.
WPGG	1,682	Find'ay, Ohio
WPGH	2,414	Albany, N. Y.
WPGI	2,430	Portsmouth, Ohio
WPGJ	2,414	Utica, N. Y.
WPGK	2,466	Cranston, R. I.
WPGL	2,442	Binghamton, N. Y.
WPGM	2,414	La Grange, Ga.
WPGN	2,490	South Bend, Ind.
WPGO	2,490	Huntington, N. Y.
WPGS	2,490	Mineola, N. Y.
WRBH	2,458	Cleveland, Ohio
WRDQ	2474	Toledo, Ohio
WRDR	2,414	Gresse Pt., Mich.
WRDS	1,666	E. Lansing, Mich.

WARRANTY

GENERAL HOUSEHOLD UTILITIES COMPANY *warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to repair or, at its option, replace any part of any unit of its manufacture which under normal installation, use and service, discloses such defect, provided the part is returned to our authorized distributor from whom purchased, intact, for our examination, with all transportation charges prepaid, within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.*

GENERAL HOUSEHOLD UTILITIES COMPANY

2638 North Crawford Avenue CHICAGO, ILL.

GRUNOW RADIO

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