



*short wave listeners' guide*

25¢

PREPARED BY

**National**



EST. 1916  
**NATIONAL COMPANY, Inc.**  
MALDEN, MASSACHUSETTS

# *they all choose National*

It's no coincidence that such famous users of radio equipment as the U. S. Navy, the Kon-Tiki Expedition, the Idlewild and other major airports,

Scotland Yard, the Army Polar Expedition and movie makers in Africa — all chose National radio receivers.

These professional users know what experienced "hams" and shortwave listeners all over the world know — that National receivers are designed and ruggedly built to give top performance in the middle of a desert, in the frozen wastes of the Arctic, or in the comfort of your home — not for just a few months — but, literally, for generations! In short wave receivers, there is no substitute for a National!

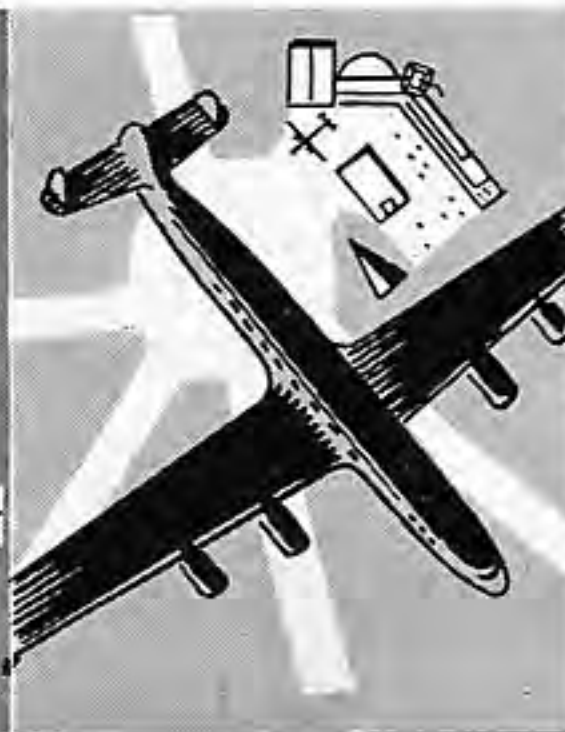
Scotland Yard



U. S. Navy



Idlewild International Airport



Kon-Tiki Expedition



Army Polar Expedition



Movie Makers in Africa



# **EXPLANATION** *of short wave reception*

Why is short wave reception different from ordinary broadcast reception? Because the ordinary broadcast station transmitter is designed to cover a restricted area surrounding the transmitter, using so-called "ground waves". However, this is not the case with short wave radio. Short wave radio makes use of the well-known fact that radio waves can be reflected from the ionosphere, a region from 125 to 250 miles above the earth.

Depending upon the season of the year, and time of the day or night, and other factors, the ionosphere acts like a mirror for certain frequencies, reflecting them back to the earth. The earth in turn, reflects the waves back to the ionosphere. "Bouncing" back and forth between earth and sky, short waves can travel enormous distances — even completely around the earth. Because conditions in the ionosphere are constantly changing, making it a better or a poorer reflection device, the signals reach the earth louder or weaker from one minute to the next, accounting for the rapid fading which usually accompanies a distant station. Also a receiver located between two points where the waves return to the earth may receive no signal even though a receiver much further away may pick up a perfect signal. Because of these changing con-

ditions, a multi-band type of short wave receiver (one having several short wave bands) is usually much more satisfactory than one which tunes only one or two of these bands.

Since reception conditions vary from summer to winter, as well as from day to night, it is advisable to consult the chart showing the best time to listen to the various frequencies for optimum reception (see page 8)

## **NEED** *for a good antenna*

From the foregoing, you can appreciate that the reception of short waves is a special problem. Also, for optimum short wave reception on any band, the antenna is extremely important, since the receiver, in effect, amplifies what it "hears" on the antenna. An antenna that is "tuned" to a certain band of frequencies will receive those frequencies much better than others. Where several bands of frequencies are desired, it will be necessary to compromise, but the advantage of a good antenna should not be over-looked and one should be provided whenever possible. The following antenna data will be of great value in determining a suitable antenna set-up for your particular use.

# ANTENNA *data*

The simplest receiving antenna is a single wire of random length. In general, the longer the wire, the stronger the received signals. Because of the high sensitivity of National receivers, a large antenna is not necessary for picking up stronger signals, and at frequencies below 30 megacycles, 15 to 20 feet of wire strung up indoors will serve as an antenna. However, for maximum results on any one band of frequencies, particularly on frequencies above 15 megacycles, it is desirable to have an outside antenna cut to the proper length to "tune" it to the frequencies desired. The tuned antenna will improve the operation of the receiver at frequencies for which it is designed, because the signal strength is raised more in proportion to the stray noises picked up than is the case with a random wire. The feed wires connecting the antenna to the receiver should also be "matched" to the antenna and receiver for maximum performance.

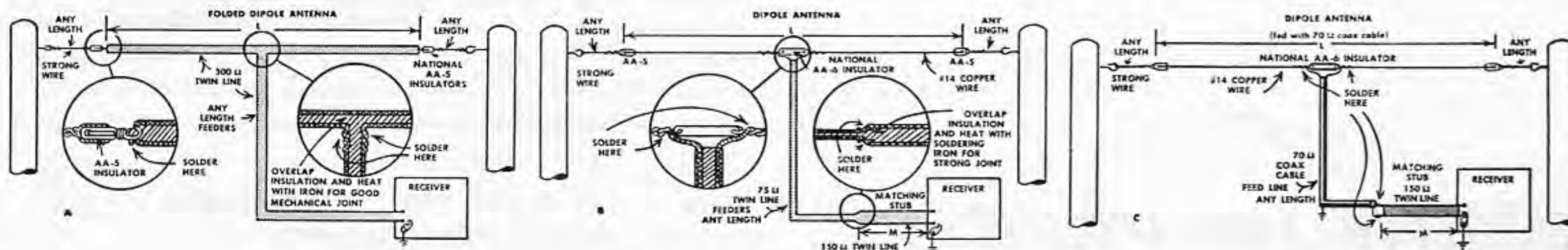
At frequencies lower than those for which the antenna is designed, the feeders can be tied together at the receiver, and the entire antenna system used as a single wire antenna. It should also be borne in mind that antennas of the horizontal dipole type, such as shown on the following pages, are somewhat directional, and signals originating at right angles to the antenna will generally be picked up with greater strength than those originating off the ends of the antenna wire.

A few easily constructed antennas and feed systems, and a chart showing correct dimensions for various frequencies are shown on the following pages. The performance of these antennas is about equal and the choice of an antenna depends largely on the material at hand and the amount of time and labor the user wants to put into it.

As a general rule, best results will be obtained from an antenna that is free of surrounding objects and at least 30 feet above the ground.

For a detailed explanation of the design and application of antennas for transmitting and receiving, we refer you to the ARRL Antenna Book and the ARRL Radio Amateurs Handbook, published by the American Radio Relay League, 38 La Salle Road, West Hartford, Connecticut.

# CHART OF ANTENNA DIMENSIONS



METERS	MEGA-CYCLES	A L	B L M		C L M	
* $\frac{3}{4}$ Amateur Band	420-450	13"	18"	5"	18"	5"
* $1\frac{1}{4}$ Amateur Band	220-225	2'	2'4"	10"	2'4"	10"
*2 Amateur Band	144-148	3'1"	3'3"	16"	3'3"	16"
6 Amateur Band	50-54	8'9"	9'	3'8"	9'	3'8"
10-11 Amateur Band	27. -30	15'9"	16'3"	6'7"	16'3"	6'7"
14 Foreign Broadcast	21.5-21.7	21'	21'9"	8'9"	21'9"	8'9"
17 Foreign Broadcast	17.7-17.9	25'6"	26'3"	10'7"	26'3"	10'7"
19 Foreign Broadcast	15.1-15.3	30'	30'9"	12'5"	30'9"	12'5"

METERS	MEGA-CYCLES	A L	B L M		C L M	
20 Amateur Band	14-14.4	32'	33'	13'4"	33'	13'4"
25 Foreign Broadcast	11.7-11.9	38'6"	40'	16'	40'	16'
36 Foreign Broadcast	9.5-9.7	47'6"	49'	19'8"	49'	19'8"
40 Amateur Band	7-7.3	63'6"	65'6"	26'5"	65'6"	26'5"
49 Foreign Broadcast	6-6.2	74'6"	77'	31'	77'	31'
80 Amateur Band	3.5-4.0	120'	125'	50'	125'	50'
American Broadcast Band	.55-1.60	450'	Recommend single wire			
New F.M. Band	88-108	4'8"	4'10"	23"	4'10"	23"

\*For best non-directional results antenna should be vertical with feeders running off at a right angle for a distance equal to at least one-half the length of the antenna ( $\frac{1}{2}$  dimension L).

## *need for a ground connection*

A good ground connection is usually desirable, especially on the higher frequencies, to eliminate undesirable tuning effects. By experimenting you can determine whether the ground helps or hinders in your particular instance. The ground connection is usually made to a water pipe or a pipe sunk into the ground for several feet.

## **KNOW** *your receivers*


Receivers designed for the reception of short wave signals generally differ from the "home broadcast" variety receivers. They usually have greater sensitivity and selectivity needed to receive the weak and fading short wave signals, do not have a built-in aerial and generally include some sort of "logging scale" to record the exact place on the dial where the short wave station was received.

The increased sensitivity also makes audible extraneous noises such as ignition, elevators, sparking motors, and many other electrical disturbances usually not noticed on ordinary home receivers used for receiving strong broadcast signals. The extra "gain" built into such receivers also results in the "rushing noise" heard in the background when no strong signals are present. However, these are perfectly normal in a short wave receiver and can be used by the discerning experienced listener to determine receiving conditions on a band at any time, that is, to tell whether the band is "dead" or "alive". A little experience listening to your receiver under

all conditions will pay off when you are attempting to pull in some distant stations under adverse conditions.

Since tuning in a short wave station on the short wave bands is quite a bit more difficult than tuning the broadcast bands, the operator should get accustomed to tuning slowly, smoothly and carefully, adjusting the volume control so that the station can be understood, with background noise at a minimum.

## *relation between meters and megacycles*

The frequency of a station is always given in kilocycles or megacycles, and its wavelength is given in meters. It is common to indicate a certain band of frequencies in meters, such as the 25 meter band, but the exact frequency of a station will be given always in kilocycles or megacycles. The relation between kilocycles and megacycles is a common one, since megacycles can be converted to kilocycles merely by moving the decimal point three places to the right as follows: 

# *10 megacycles = 10,000 kilocycles*

The relation between meters and kilocycles is not as easy to explain since it is determined by the formula

$$\text{Wave length (meters)} = \frac{300,000}{\text{frequency (KC)}}$$

For example, the wavelength corresponding to a frequency of 30,000 kc is

$$\text{Wave length (meters)} = \frac{300,000}{30,000} = 10 \text{ meters.}$$

Therefore, 10 meters equals one wavelength at 30,000 kc. This in effect means that a half wave antenna to receive a frequency of 30 megacycles is 5 meters long or  $5 \times 39'' = 195'' = 16\frac{1}{4}$  feet long. This formula generally is used to figure the proper length of an antenna at any frequency.

A Brief rundown of the various bands in meters against the station frequencies in megacycles is shown below:

INTERNATIONAL S. W. BANDS		FREQUENCY
11 meters		25.6 to 26.1 megacycles
13 "		21.4 to 21.8 "
16 "		17.7 to 17.9 "
19 "		15.1 to 15.5 "
25 "		11.7 to 12.0 "
31 "		9.5 to 9.8 "
41 "		7.0 to 7.5 "
49 "		
		{ 5.9 to 6.2 "
		{ 5.0 to 5.1 "
60 "		4.8 to 5.0 "
AMATEUR BANDS		FREQUENCY
10 meters		28.0 to 29.7 megacycles
11 "		26.96 to 27.23 "
15 "		21.0 to 21.45 "
20 "		14.0 to 14.4 "
40 "		7.0 to 7.3 "
80 "		3.5 to 4.0 "
160 "		1.8 to 2.0 "

# TIME *of best reception*

## SUMMER

Morning 16-19 meters  
 Afternoon 25-49 meters  
 Evening 16-19-49 meters

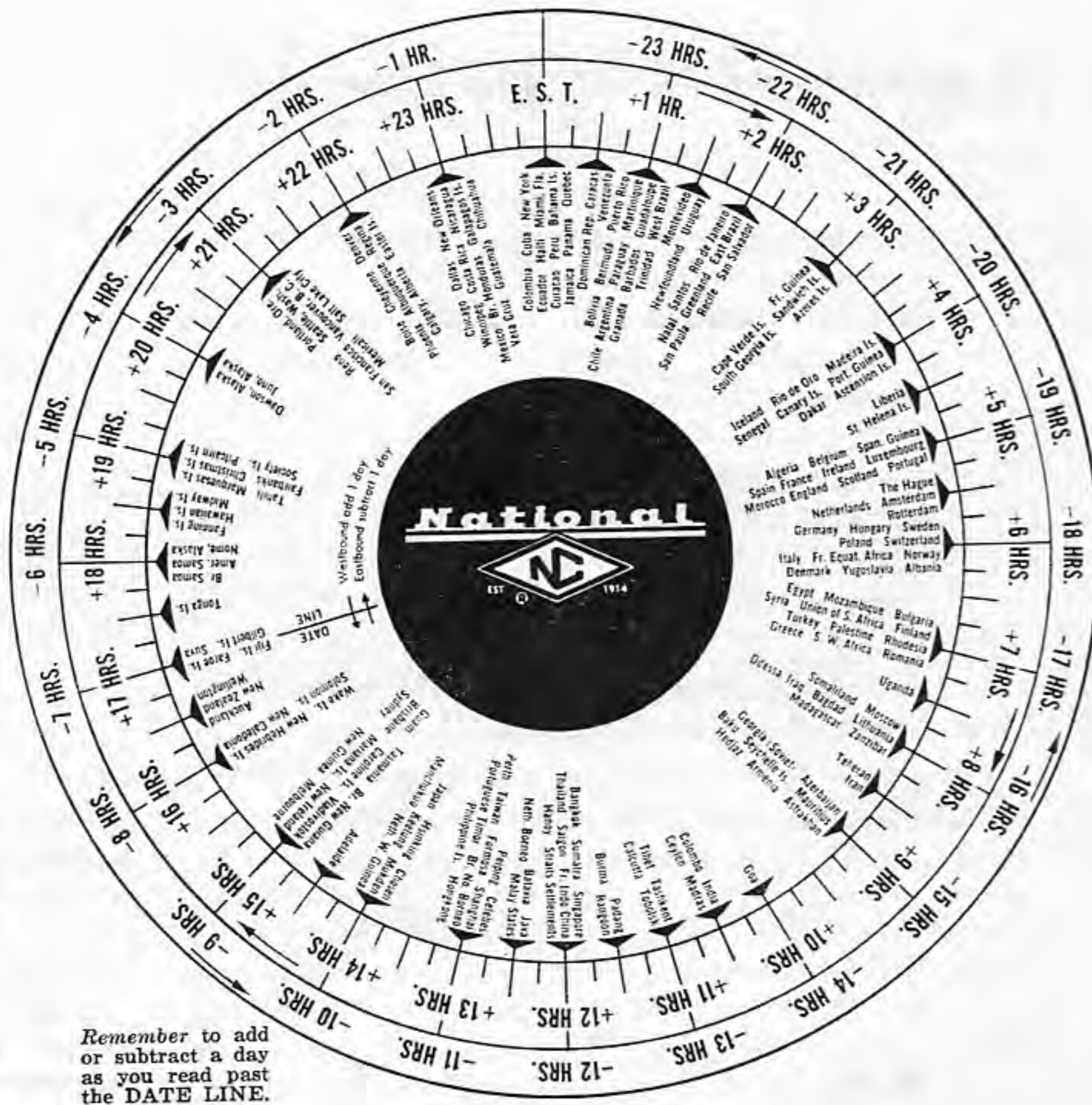
## SPRING & FALL

Morning 11-15-17-21 meters  
 Afternoon 15-17-21-25 meters  
 Evening 9-11-15-17-21-25-49 meters

## WINTER

Morning 11-15-49 meters  
 Afternoon 15-17-21-26-49 meters  
 Evening 17-21-31-49 meters

World Wide Time Wheel showing time in various parts of the world compared to Eastern Standard Time.





# STATION *listing*

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Alaska		12.250	WXFD	8pm to midnight
Albania	Tirana	7.853	ZAA	1 to 5pm
Algeria	Constantine	11.830		1:30 to 3:15am; 6:30 to 9:15am; 1:15 to 2pm; 2:30 to 5pm
Andorra		5.980		6 to 8:30am; 1 to 7pm
Angola	Louanda	9.470	CR6RA	1:15 to 2:30am; 6:30 to 7:45pm; 2 to 3:30pm
Argentina	Buenos Aires	9.690	LRA1	8am to 10pm
Argentina	Buenos Aires	11.880	LRS	4am to 9pm
Australia	Melbourne	9.540	VLR	8 to 9:15am; 9:30 to 10am; 12:45 to 2:15pm
Australia	Melbourne	11.710	VLG3	2:45 to 3:45am
Australia	Melbourne	15.230	VLG3	11:30pm to 12:45am; 1 to 1:45am; 10 to 11pm; Sat and Sun, 9 to 11pm
Australia	Perth	9.520	VLW7	5:30 to 10:30am; 4 to 7pm
Australia	Shepparton	9.615	VLC6	10 to 11:15am; 3 to 4:15pm
Australia	Shepparton	11.810	VLC7	11:30pm to 12:45am; 3 to 4:15pm
Australia	Shepparton	15.320	VLC4	2:45 to 3:45am; 3:55 to 7:50am; 8 to 10:45am
Austria	Vienna	9.560		Midnight to 2am; 4 to 8:30am; 10am to 4pm
Azores	Ponta Delgada	11.090		3 to 4pm
Bahamas	Nassau	6.090	ZNS4	7:45 to 8:30am; 11:30am to 1:30pm; 4 to 19pm
Belgian Congo	Leopoldville	9.380	OTC	Midnight to 2am; 11am to 3pm
Belgian Congo	Leopoldville	9.470	OTC	8:30 to 4:15pm; 5 to 11pm

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Belgian Congo	Leopoldville	9.770	OTC2	9 to 11pm
Belgian Congo	Leopoldville	17.770	OTC	5 to 9:30am; 11:30am to 12:15pm
Bolivia	Cochabamba	6.510	CP40	7:30 to 10pm
Bolivia	LaPaz	6.770	CP49	7 to 9am; 11am to noon; 5:30 to 9pm
Brazil	Fortaleza	6.100	PRE9	9am to noon; 4 to 7pm
Brazil	Rio de Janeiro	11.720	PRL8	3:45 to 7am
Brazil	Sao Paulo	6.090	ZYB7	4 to 9:50pm
British Guiana	Georgetown	6.000	ZFY	9 to 10pm
Br. Somaliland	Hargeisa	7.130	VQ6MI	8 to 10:30am; noon to 1pm
Brit. W. Indies	Jamaica	3.480	ZQI	4 to 5:30pm; 7:30 to 10pm
Bulgaria	Sofia	9.330		11pm to 1am; 5:30 to 7am; 11am to 1:30pm; 2 to 3:45pm
Burma	Rangoon	6.040		6 to 11:15am
Cameroons	Dousala	7.950		1 to 3pm
Canada	Montreal	9.630	CKLO	4 to 6pm
Canada	Montreal	15.190	CKCX	8:45 to 11am; 6:20 to 7:35pm
Canada	Montreal	17.820	CKNC	11:45pm to 1am; 8:45am to 4:30pm; 6:20 to 9pm
Canada	Toronto	6.070	CFRX	6am to 11:45pm
Canada	Vancouver	6.160	CBRX	9am to 2am
Canary Islands	Santa Cruz	7.570	EAJ43	7:30 to 9am; 12:30 to 5pm
Cape Verde Is.	Praia	6.400		3:30 to 5pm
Ceylon	Colombo	17.820	SEAC	7:30pm to 1:35am; 5 to 7am; 7:15 to 11:15am

# STATION *listing*

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Chile	Santiago	11.740	CE1174	7am to 11:30pm
China	Chungking	11.900	XGOY	4 to 5:30am; 7:45 to 8:30am; 8:45 to 10:45am
China	Nanking	5.980	XGOA	Heard at 6am
China	Shanghai	11.690	XORA	5 to 10am
Colombia	Armenia	4.880	HJFH	6am to 10pm
Colombia	Barranquilla	4.780	HJAB	5 to 11:55pm
Colombia	Bogota	4.850	HJCA	7 to 10pm
Colombia	Bogota	4.890	HJCH	6 to 10pm
Colombia	Bogota	6.000	HJKD	7 to 11pm
Colombia	Bogota	6.240	HJCF	5 to 11pm
Colombia	Cartagena	4.960	HJAE	4 to 10:30pm
Colombia	Cali	4.820	HJED	7 to 11pm
Colombia	Cucuta	4.810	HJBB	5 to 10pm
Colombia	Medellin	6.140	HJDE	11am to 11pm
Costa Rica	San Jose	9.610	TIPG	7am to 11:30pm
Cuba	Havana	8.700	COCO	8am to 1am
Cuba	Havana	8.830	COCQ	7am to 1am
Cuba	Havana	9.270	COCX	7am to 12:30am
Cuba	Havana	11.616	COX	11am to 11pm
Cuba	Havana	11.680	CMCY	afternoons & evenings
Cuba	Santa Clara	6.450	COHI	6:30am to midnight
Cuba	Santiago	8.950	COKG	6am to 11pm

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Curacao	Willemsted	7.250	PJCI	11:30am to 12:30pm; 4:30 to 9:30pm
Denmark	Copenhagen	9.520	OZF	7 to 8:30pm
Dominican Rep.	Ciudad Trujillo	5.970	H12T	7pm to midnight
Dominican Rep.	Ciudad Trujillo	6.240	HIIN	4 to 10:30pm
Dominican Rep.	Ciudad Trujillo	6.310	HIIZ	4 to 10:55pm
Ecuador	Ciudad Cuenca	3.930	HC5EH	6 to 10:30pm
Ecuador	Quito	6.280	HCJB	6pm to midnight
Ecuador	Quito	15.110	HCJB	7 to 8:15am; noon to 2pm; 6 5am to noon; 1:30 to 10:30pm to 11pm
Ecuador	Quito	5.970	HC1QRX	5am to noon; 1:30 to 10:30pm to 11pm
Ecuador	Reobamba	4.950	HC5HC	6 to 11pm
Egypt	Cairo	7.850	SUX	2 to 7:20pm
England	London	9.580	GSC	1:30 to 1:45pm; 2:30 to 3:30pm; 4 to 4:15pm; 6:15 to 8:30pm
England	London	11.700	GVW	11pm to 12:30am
England	London	11.750	GSD	8pm to 3am; 12:15 to 5:45pm
England	London	15.104	GSF	6 to 7:15am; 9:15 to 10:15am; 10:30am to noon; 1 to 4pm; 4:15 to 8:15pm; 11pm to 1am
England	London	18.080	GVO	10:30am to 4pm
England	London	21.470	GSH	5am to 12:15pm
England	London	21.530	GSJ	4am to 12:15pm
England	London	21.550	GST	1 to 4am; 12:30 to 3pm
England	London	21.640	GRZ	6 to 9am; 10:30am to 12:30pm; 1 to 4pm

# STATION *listing*

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
England	London	21.750	GVT	2 to 7:15am; 10:30 to 10:45am; 11 to 11:30am
England	London	26.100	GSK	6:15am to noon
Finland	Lahati	9.500	OIX2	3:50 to 7:30am; 10am to 4pm; 11pm to midnight
France	Paris	17.760		7 to 9am; 11am to 12:30pm
Fr. Eq. Africa	Brazzaville	9.440	FZI	midnight to 2:30am; 11am to 4:30pm; 5 to 8:30pm
Fr. Eq. Africa	Brazzaville	17.530	FZI	midnight to 1:30am; 4:45 to 7:45am; 11am to 5pm
Fr. Morocco	Rabat	16.670	CNR3	7:45 to 8:30am
Fr. W. Africa	Dakar	11.710	FHE3	1:30 to 5pm
Germany	Munich	6.160		midnight to 3am or later
Germany	Munich	7.250	II	Balkan beam 11am to 5pm
Germany	Munich	9.540	II	East European beam, 11am to 5pm
Germany	Stuttgart	6.180		11pm to 3:30am; 4:30 to 7:15am; 9am to 4:30pm
Gold Coast	Accra	7.290	ZOY	10:45am to 1pm
Guam		10.510	KUIG	heard around 5:30pm
Guatemala	Guatemala City	9.670	TGWA	6:30 to 11:30pm
Guatemala	Guatemala City	15.170	TGWA	7:30am to 3pm
Haiti	Port-au-Prince	6.400	HHCN	8 to 10pm
Hawaii	Honolulu	15.250	KRHO	Chinese-Philippine beam, 4 to 9:15am
Hawaii	Honolulu	17.800	KRHO	Chinese-Philippine beam, 2:30 to 9:15am; 5 to 8pm

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Honduras	La Ceiba	6.240	HRD2	noon to 2pm; 7 to 11pm
Honduras	San Pedro Sula	6.360	HRPI	11am to 2:15pm; 6 to 11:30pm
Honduras	Tegucigalpa	5.870	HRN	8 to 10am; 1 to 3pm; 6 to 11pm
Iceland	Reykjavik	12.270	TFJ	Sundays, 9 to 9:30am
India	Delhi	17.830	VUD10	4:30 to 7am; 7:45 to 8am; 10:15pm to 2:15am
Indochina	Saigon	11.780		5 to 5:45am; 8:45 to 9am; 6:30 to 8pm
Iran	Tehran	6.150	EQB	9:30am to 2pm; 10:30 to 11:15pm
Italy	Rome	9.630		2 to 5pm; 5:15 to 8:15pm
Italy	Rome	15.120		5:15 to 8:15pm
Japan	Kure	6.100	WKLS	4:30 to 8:30pm
Japan	Tokyo	7.280	JLW	Home Service, 3 to 9am; 4 to 6pm; 10pm to 2:30am
Kenya	Nairobi	10.730	VQ7LO	5 to 6am; 8:30 to 9:15am; 9:45 to 11am
Korea	Seoul	7.930	HLKA	2:50 to 8:30am; 4:30 to 6:30pm; 9pm to midnight
Lebanon	Beyrouth	8.030	FXE	midnight to 1:15am; 5:15 to 8am; 10:30 to 4pm
Luxembourg		15.350		6 to 8am
Madagascar	Tananarive	6.060		1:30 to 2pm
Malaya	Singapore	15.300		3:30am to noon
Martinique	Fort de France	9.700		5:30 to 6:45pm and later
Mexico	Guadalajara	4.820	XEJG	10pm to midnight
Mexico	Vera Cruz	6.020	XEUW	9 to 11pm

# STATION *listing*

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Mexico	Mexico City	9.500	XEWW	8am to 2am
Mexico	Tampico	6.040	XETW	7:45am to 12:45am
Morocco	Rabat	9.080	CNR3	1:45 to 5am; 1:15 to 7pm
Mozambique	Lourenco Mar.	4.920	CR7BU	10am to 4 pm
Mozambique	Marques	11.718	CR7BH	
Netherlands	Hilversum	9.590	PCJ	9 to 10pm; Sun and Wed, 10 to 11pm
Neth. Indies	Batavia	18.130	PMC	11 to 11:30am
New Caledonia	Nouema	6.200	FK8AA	2 to 4am; 4:30 to 5am
Nicaragua	Managua	6.760	YNDS	8 to 10am; 5 to 11:30pm
No. Rhodesia	Lusaka	3.910	ZQP	4 to 5:30am; 10am to noon
Norway	Oslo	9.540	LKJ	1:25 to 2:30am
Nova Scotia	Halifax	6.130	CHNX	7am to 11pm
Nova Scotia	Sydney	6.010	CJCX	5:30am to 10pm
Panama	Colon	6.000	HP5K	7:30am to 11pm
Panama	Panama City	11.780	HP5G	6:30 to 10:30pm
Peru	Lima	5.890	OAX4Z	4:30 to 11:30pm
Philippines	Manila	11.890	I	Far East beam, 4 to 9:15am; 5 to 6 pm
Poland	Warsaw	6.100		11am to 6pm
Portugal	Lisbon	11.040	CSW6	12:30 to 3:30pm; 4 to 6pm
Port. Gui.	Bissau	7.100		1:45 to 5:30pm
Salvador	San Salvador	6.250	YSUA	evenings till midnight

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
Capetown	South Africa	9.610	ZRL	3 to 7am; 9 to 10:30am
South Africa	Johannesburg	9.900	ZTJ	3:15 to 7:15am; 9 to 11:10am
Spain	Alicante	7.950		7 to 10am; 2 to 6pm
Spain	Madrid	9.370	EAQ	1:30 to 4pm; 6:30 to 10pm
Span. Morocco	Tetuan	6.060		2:30 to 3am; 1:30 to 3pm
Sweden	Stockholm	15.150	SBT	1:45 to 6:45am; 10 to 11am; 12:30 to 1:30pm; 8 to 9pm weekdays
Switzerland	Berne	6.160	HER3	2:45 to 7:15am; noon to 5pm; 8:30 to 10:30pm
Switzerland	Berne	11.710	HEI5	Mon, Tues, Thurs, Fri, 2:15 to 3:30am
Switzerland	Berne	11.860	HER5	3 to 4am
Tahiti	Papeete	6.980	FO8AA	Tues, Wed, Fri, Sat, 10:30pm to 12:30am
Turkey	Ankara	15.190	TAQ	Midnight to 2am; 4:15 to 7:30am
United States	Boston, Mass.	6.040	WRUS	Mexican beam, 7 to 10:30pm
United States	Boston, Mass.	9.570	WRUW	South American beam, 7 to 10pm
United States	Boston, Mass.	11.790	WRUL	South American beam, 7:30 to 9pm
United States	Boston, Mass.	11.897	WBOS	European beam, midnight to 3:15am; 1 to 5:45pm
United States	Boston, Mass.	15.210	WBOS	European beam, 11am to 5pm; So. Amer. beam, 8 to 10pm
United States	Boston, Mass.	15.290	WRUL	European beam, noon to 5pm
United States	Boston, Mass.	15.350	WRUS	European beam, 11am to 6pm; Mexican beam, 8pm to mid- night

# STATION *listing*

COUNTRY	CITY	Freq'cy me.	CALL	Broadcasting Time, E.S.T.
United States	Boston, Mass.	15.350	WRUA	No. African beam, 11am to 6pm; Cent. Amer. 8pm to midnight
United States	Boston, Mass.	17.750	WRUW	Cent. Amer. beam, 6:30 to 8:15 pm; European beam, 9am to 12:45pm
United States	Cincinnati, O.	6.080	WLWK	So. Amer. beam, 7:30 pm to 12:15am
United States	Cincinnati, O.	9.700	WLWR1	So. Amer. beam, 7pm to midnight
United States	Cincinnati, O.	11.790	WLWO	So. Amer. beam, 6 to 7pm; 8 to 10pm
United States	Cincinnati, O.	15.130	WLWR1	European-North African beam, noon to 5pm
United States	Cincinnati, O.	15.200	WLWS1	South American beam, 5 to 7:15pm
United States	Cincinnati, O.	15.230	WLWL2	No. African, 6 to 7:45am; 8am to 12:45pm; 1 to 5:45pm
United States	Cincinnati, O.	15.250	WLWR1	North African beam, 7:30am to 3pm
United States	Cincinnati, O.	21.650	WLWS1	European beam, noon to 5pm; South American beam, 7pm to midnight
United States	Delano, Cal.	9.650	KCBA	Hawaiian-Australian beam, 4 to 10am
United States	Delano, Cal.	15.130	KCBA	So. American beam, 7pm to midnight
United States	Delano, Cal.	15.150	KCBR	Philippine beam, 4 to 10am
United States	Delano, Cal.	17.780	KCBR	Japanese-Chin. beam, 12:30 to 3:45am
United States	Delano, Cal.	21.480	KCBF	So. American beam, 7pm to midnight
United States	Dixon, Cal.	9.650	KNBA	Hawaiian-Aus'n beam, 2:45 to 3:45am

COUNTRY	CITY	Freq'cy me.	CALL	Broadcasting Time, E.S.T.
United States	Dixon, Cal.	15.330	KNBX	So. American beam, 7pm to midnight; Jap-Chin. beam, 11:15pm to 3:45am
United States	Dixon, Cal.	17.850	KNBI	Hawaiian-South Pacific beam, 8:15pm to 2am; Chinese beam, 2:45 to 3:45am; Philip.-Guam beam, 5 to 8pm
United States	Dixon, Cal.	21.630	KNBA	Japanese-Chinese beam, 5 to 8 pm; 8:15pm to 2am
United States	Los Ang., Cal.	9.750	KCBF	So. American beam, 11pm to 1am; East Indies beam, 4 to 9:45am
United States	Los Ang., Cal.	15.270	KCBR	Oriental beam, 4 to 10pm; 10:15pm to 1am
United States	New York City	6.060	WCBN	Mexican beam, 6:30pm to 1am
United States	New York City	6.120	WOOW	European beam, midnight to 3:15am
United States	New York City	7.565	WNRE	European beam, midnight to 3:15am; 4:30 to 6pm
United States	New York City	9.490	WCBX	Brazilian beam, 4 to 10:30pm
United States	New York City	11.830	WCRC	European beam, 10:45am to 4:30pm; South American beam, 5 to 11pm
United States	New York City	11.830	WCDA	Mexican beam, 8 to 10pm
United States	New York City	15.270	WCRC	So. American beam, 7pm to midnight
United States	New York City	15.280	WNRE	European beam, 11am to 6pm
United States	New York City	17.780	WNBI	South American beam, 5 to 6:15pm; European beam, 7:30am to 1pm
United States	New York City	18.160	WNRI	European beam, 9am to 6pm
United States	San Fran., Cal.	7.250	KGEX	Philippine beam, 5am to noon

# STATION *listing*

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
United States	San Fran., Cal.	9.490	KNBI	Oriental beam, midnight to 3:45am; Hawaiian beam, 4 to 9:45am
United States	San Fran., Cal.	9.550	KGEI	East Indies beam, 4 to 10:45 am; Alaska beam, 11am to 12:45pm
United States	San Fran., Cal.	9.570	KWID	Oriental beam, 11:15am to 1 pm; So. American beam, 7:45 to 11:15pm; Alaska beam, 11:30pm to 1:45am
United States	San Fran., Cal.	9.570	KWID	Chinese beam, 7 to 10am
United States	San Fran., Cal.	9.570	KWIX	Alaskan beam, 1:15 to 3:45am
United States	San Fran., Cal.	11.730	KGEX	2 to 4:45am; 5 to 11am
United States	San Fran., Cal.	11.790	KNBA	Philippine beam, midnight to 3:45am; South American beam, 5 to 11:45pm
United States	San Fran., Cal.	15.150	KNBX	Oriental beam, 9 to 11:45pm
United States	San Fran., Cal.	15.290	KWIX	5:30 to 8:15pm
United States	San Fran., Cal.	15.340	KNBI	South American beam, 5 to 11:45pm; Oriental beam, 2 to 4:45pm
United States	San Fran., Cal.	17.760	KWID	So. American beam, 7pm to midnight
United States	San Fran., Cal.	17.880	KGEX	Guam-Philippine beam, 11:15 pm to 3:45am
United States	San Fran., Cal.	21.490	KGEI	South Pacific beam, 5pm to 1am
United States	Sch'n't'dy, N.Y.	11.810	WGEA	Brazilian beam, 8 to 10pm
United States	Sch'n't'dy, N.Y.	11.847	WGEA	European beam, 6am to 3:45 pm; Brazilian beam, 4 to 10:30pm
United States	Sch'n't'dy, N.Y.	17.880	WGEX	European beam, noon to 6pm; So. Amer. beam, 7pm to midnight

COUNTRY	CITY	Freq'cy mc.	CALL	Broadcasting Time, E.S.T.
United States	Wash'ton, D.C.	15.000	WWV	U.S. Bureau of Standards, frequency, time and musical pitch; continuously day and night
U.S.S.R.	Kiev	11.718		No. Amer. beam, 6:20 to 9:15 pm
U.S.S.R.	Komsomolsk	9.565		9pm to midnight; 2 to 9am; 11am to 2pm; 4 to 6pm
U.S.S.R.	Moscow	9.860		8 to 9:30am; 10pm to 2am; 8:30 to 9:30am; 10am to noon
U.S.S.R.	Moscow	11.630		7:30 to 10pm
U.S.S.R.	Moscow	11.885		6:45 to 8am; 6:30 to 7:30pm
Uruguay	Montevideo	11.835	CXA19	6am to 10pm
Vatican City		5.968	HVJ	11am to noon; 1 to 3pm
Venezuela	Barquismeto	4.990	YV3RN	6:30am to 10:30pm
Venezuela	Caracas	4.890	YV5RM	5:30 to 10:30pm
Venezuela	Coro	4.770	YV1RY	4 to 10pm
Venezuela	Ciudad Bolivar	6.200	YV6RD	5 to 9:30pm
Venezuela	La Guaira	4.760	YV5RV	5 to 9:30pm
Venezuela	Maracaibo	4.810	YV1RL	6:30am to 11pm
Venezuela	Maracay	3.390	YV4RK	6 to 10.30pm
Venezuela	Puerto Caballo	3.480	YV4RQ	5 to 9:30pm
Venezuela	Trujillo	3.310	YV1RO	5 to 9:30pm
Venezuela	Valencia	4.780	YV4RO	4:30 to 9:30pm
Venezuela	Volera	4.840	YV1RZ	4:30 to 9:45pm
Yugoslavia	Belgrade	6.150		1 to 6pm



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*whatever the purpose . . . whatever the price*



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*Slightly higher west of the Rockies*



SW-54

- 3 Shortwave Bands Plus Standard Broadcast (550 kcs. — 30 mcs.)
- Voice or Code
- AC-DC
- Speaker or Phones
- Unbreakable Metal Case
- Separate Logging Scale
- Standby Switch

