

Service Bulletin

from

hallicrafters

GENERAL CONDITIONS AFFECTING RECEPTION

NIGHT AND DAY

Reception of short wave stations varies from season to season and between daylight and darkness. It is a good plan never to tune for distant short wave stations operating on a frequency above 12 MC after sunset or below 9 MC during daylight. It will be generally found that the frequencies from 9 to 19 MC provide good daylight reception, but are usually unsatisfactory for night time reception.

FADING

Fading will be encountered only on distant stations. It will be recognized by a gradual diminishing of volume, sometimes to a point where the signal is no longer heard, followed by a gradual return to normal volume. It is often accompanied by distortion of the program. By means of the automatic volume control in your receiver, the effect is reduced considerably. In severe cases, however, it will be necessary to tune to some other station.

LOCAL INTERFERENCE

Local interference of "man-made" static is a form of interference often confused with static. It is due to electrical apparatus which, because of arcing or high leakage radiates interference. The principal sources of "man-made" static are high voltage power lines, ignition systems of automobiles, brush type motors, street car trolley lines, flasher signs and electrical appliances. The noise from these sources is distributed throughout the entire frequency range used in radio and is always strong in cities and particularly in business and industrial areas. In such instances the use of an antenna with a shielded lead-in is recommended. Complete information on such an antenna can be obtained from your radio dealer.

STATIC

Static is caused by atmospheric disturbances and lightning, and can be identified from "man-made" forms of interference by its characteristic crackling and frying noises. Static is more evident during the spring and summer months and may make distant reception almost impossible at times.

BROADCAST STATIONS ON LOWER SHORT WAVE BANDS

If the receiver is operated in a vicinity where there are strong local broadcast stations it is possible for the second harmonics or images of these local broadcast stations to be heard on the lower short wave bands. This condition is normal and is due to the nature of radio broadcasting. It generally appears somewhere in the range from 1.8 MC to 3.5 MC.

POLICE CALLS

Police calls were originally broadcast on frequencies in the 1.6 to 2.0 MC range. Broadcasts were on AM and were capable of being received on a conventional radio set covering these frequencies. Many areas still use this band, however, presently, most police broadcasts are transmitted in FM in the 30 to 50 MC and 150 to 170 MC ranges. Specialized receivers are required to receive these broadcasts.

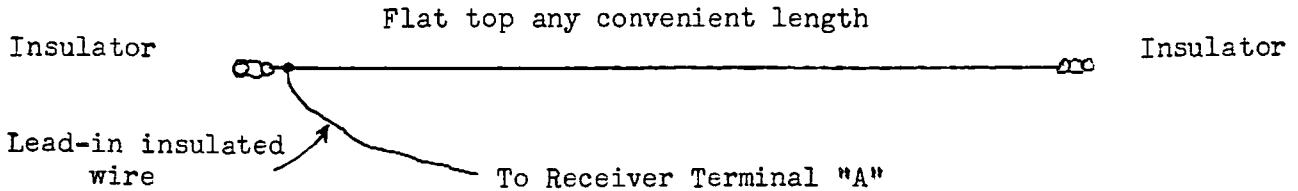


ANTENNA INSTALLATIONS

The following information regarding antennae is intended to supplement instructions contained in the manual that was provided with your Hallicrafters communications receiver.

A good antenna installation will enable you to enjoy more fully the fine communications receiver performance and engineering design that has been built into your Hallicrafters receiver.

Perhaps the most simple, yet highly effective, antenna is the single wire type consisting of the flat top and single lead-in as illustrated below:

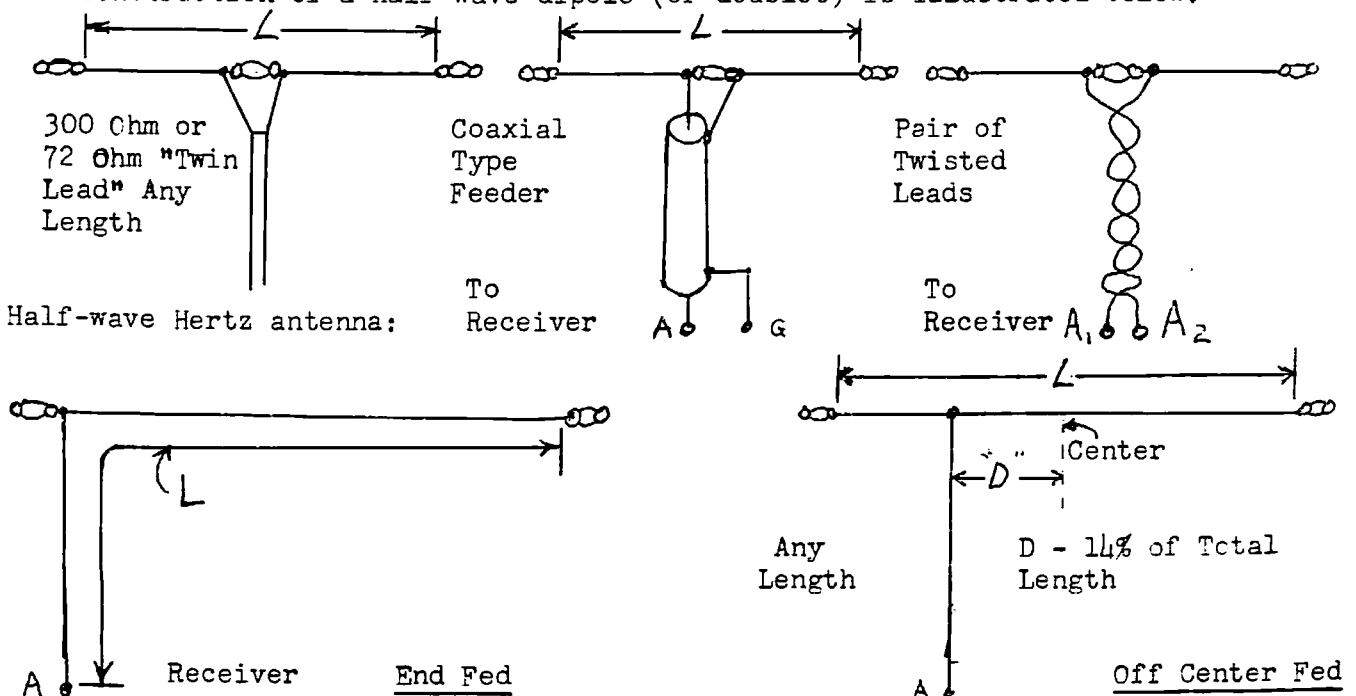


The flat top part of the antenna can be of random length. Of course, the longer the wire, the more signal pickup. Because of the high sensitivity of your Hallicrafters receiver, a large antenna is not mandatory for picking up signals at good strength.

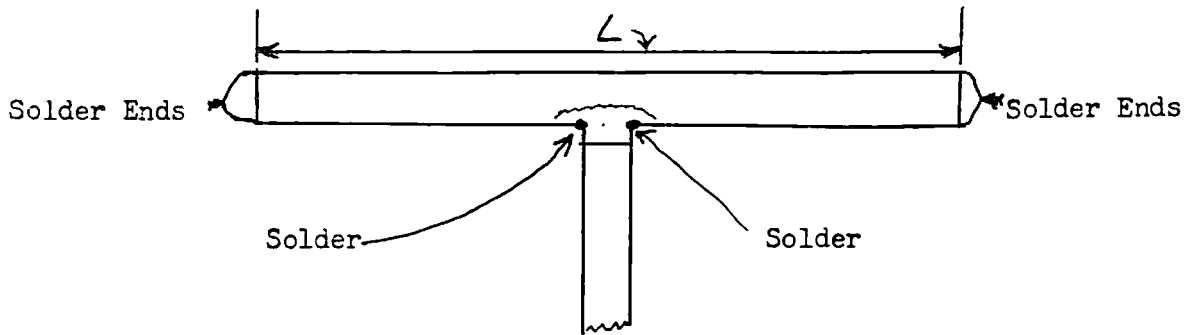
Although the single wire antenna described will work satisfactorily over a broad range of frequencies, a more efficient antenna is a single wire whose length is equal approximately to half the transmitting wave length. This is a fundamental type of antenna and the well known variations are more commonly referred to as a half-wave dipole, half-wave doublet, or Hertz. The length of a half-wave antenna for frequencies up to 30 megacycles can be determined from the following formula:

$$\text{Length of half-wave antenna (feet) } L = \frac{468 \text{ (MC)}}{\text{Freq.}}$$

The construction of a half-wave dipole (or doublet) is illustrated below:



A folded dipole type of antenna can be constructed from ordinary 300 ohm "Twin-lead" used with television antennae as follows:



For best results the antenna should be mounted as high as possible and in the clear away from trees, power lines and other surrounding objects. Standard glass or porcelain type insulators can be used on the ends for support and in the center where doublet type antennae are used.

Antennae have directional characteristics and, theoretically, the best reception is from directions broadside to the antenna. For example, if the antenna is constructed with ends pointing North and South, the best reception will be from the East and West.

Dipole type antennae employing low impedance lines, such as the twisted pair or coaxial type, have noise reducing qualities and are suggested for use in noisy locations subject to man-made electrical interference.

An antenna terminal strip is provided on the majority of Hallicrafters communications receivers and three terminals are available:



When the receiver is shipped from the factory, a small shorting bar is connected across terminals A2 and GND. With the single wire feed antennae, the feeder is connected to terminal A1 and the shorting bar remains in place. In the case of doublet antenna one leg of the feeder is connected to A1 and the other to A2. Theoretically the bar between A2 and GND should then be removed. However, in many cases it will be satisfactory to leave the bar in place. This best can be determined by experimentation when the receiver is placed in operation.

In case of the coaxial fed doublet antenna, the shorting bar should remain and a good ground connection should be made to the GND terminal.

The use of a ground connection is optional. In some cases better receiver performance can be obtained if a ground is used with your particular antenna installation.

The most convenient ground connection in most instances is the cold water pipe. A cold water pipe is recommended since it usually goes more directly to the ground than the hot water variety. Gas pipes should NEVER be used as in many instances insulated joints are included in the piping.

For proper ground connection to the pipe, it is recommended that the pipe be carefully scraped and sandpapered. A good ground clamp should be fitted tightly and the ground wire should make good connection to the clamp. The whole ground connection can be taped with rubber tape if there is considerable dampness.

In the case of AC-DC type receivers, if sparking occurs when a ground connection is made, the AC plug on the line cord should be reversed in the outlet. If the sparking still persists, or if a hum appears in the receiver, then perhaps a "floating ground" connection has been made and the ground is not very good. In this case it would be best to use an antenna connection only and eliminate the ground connection.

The construction of an outside antenna does not necessarily create a lightning hazard. However, the National Underwriters' requirements specify that every outside antenna system should incorporate a U/L approved lightning arrester, which is to be connected to a proper ground for protection against fire, if lightning should accidentally strike the antenna. Your local Hallicrafters communications receiver distributor can supply you with antenna accessories such as lightning arresters, antenna wire, insulators and lead-in (transmission line).

With the models S-81, S-82, S-94, S-95, SX-104 and SX-105 Civic Patrol Receivers, the antenna should be vertically polarized because the transmissions in the frequency range of these receivers are similarly polarized. This means your antenna must be mounted vertically. Mobile type whip antenna systems can be used satisfactorily.

For more detailed information regarding the extensive subject of antennae, you may obtain a copy of the Amateur Radio Handbook, or the Antenna Handbook published by the American Radio Relay League, West Hartford, Connecticut. These reference books can be purchased from the League directly or from your local Hallicrafters communications receiver distributor.

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