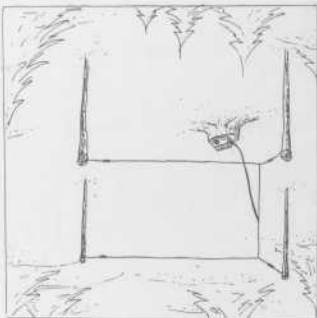


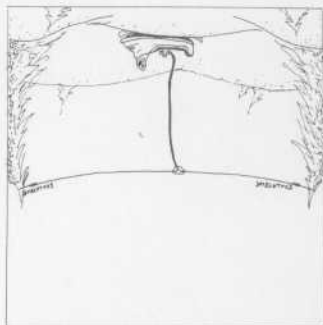
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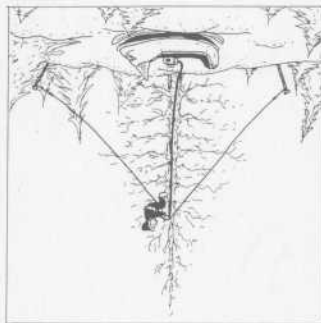
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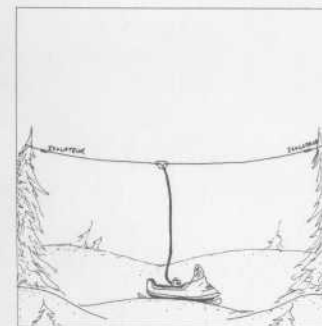
COMMENT ÉRIGER UNE ANTENNE RADIO HF DANS UN ENDRIT ISOLÉ



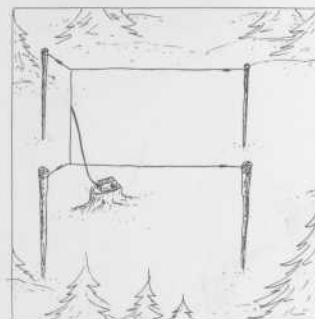
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HOW TO ERECT AN HF ANTENNA IN REMOTE AREAS



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HF COMMUNICATIONS IN REMOTE AREAS

Think about it: hurt and alone in the bush with no one in sight for 200 kilometres - your radio may be your only lifeline. For your safety, please read this document before you go into the bush.

Mining companies, trappers, expeditors, prospectors and adventurers often need reliable point to point communications. To do so, they must use the HF (High Frequency) radio spectrum. The Department of Communications reviews applications from individuals and organizations and issues licences for this service.

If you need to operate your radio while in motion, you need a mobile radio licence. If you need to operate your radio from a fixed or transportable location, you need a land radio licence.

PROPER USAGE

Learn to use the radio properly.

You may only use frequencies which are indicated on your licence. Although they are your assigned frequencies, they are not for your use alone. All frequencies are assigned on a shared, non-interference basis. You must remember that communications dealing with DISTRESS, URGENCY or SAFETY messages have priority over all other communications. Definitions for these words can be obtained from your district office. Unless you have a distress, urgency or safety message, you must wait until normal communications which are in progress are completed before transmitting. Radio nets and other scheduled operations do not have priority.

Remember to identify yourself with your complete call sign, as assigned by the Department of Communications. Using radio telephone numbers assigned by the telephone company is not the correct procedure unless you are using a radio telephone frequency.

It is important to speak all words plainly and clearly. Remember, although you may have the microphone depressed, you will not radiate any power until you speak.

Keep your communications as brief as possible. Profane or obscene language is not allowed. If the radio licence is in your name, you are responsible for any agent or employee who uses the radio and does not comply with the Radiocommunication Act and General Radio Regulations.

Transmitting and receiving conditions vary from day to day and from daytime to nighttime. Communications with other stations many hundreds of kilometres away are possible when atmospheric conditions are ideal. At times, periods of intense solar activity drastically change the make-up of the atmosphere to the point that few signals can be reflected back to earth. Such HF communication "blackouts" may, on occasion, last several days.

INSTALLING AN ANTENNA

If you are not familiar with the basic skills of setting up your antenna, you may not achieve satisfactory results.

Portable radio stations which are in service at most camps use less than 10 watts of power, therefore it is very important to install an effective antenna. Various types in use include the Inverted V, Dipole or Horizontal Driver. The most used of these is the Inverted V.

Inverted V

This antenna is best suited for mobile radios or transportable stations. If lost in the bush, or unsure of the location and bearing of the station with which you wish to communicate, the most suitable antenna is one that will radiate effectively in all directions. The Inverted V is such an antenna.



Figure 1: Ideally, the middle of the antenna should be 15 metres (50 feet) high and the ends 3 metres (10 feet) off the ground. Install your antenna as high as possible, avoiding obstructions which can cause interference.

Set up of Inverted V antenna

Put the middle of the antenna as high as practical off the ground, using a tower or tree. Extend each of the two ends at a 45 degree angle to the supporting structure. Place an insulator at each end of the antenna and, maintaining the correct 45 degree angle, tie off to a nearby tree or to some other suitable support. If the only trees available are too far away to be able to tie the antenna at the proper angle, then anchor the antenna to the ground with a piece of rope. It is important that no portion of the antenna come in contact with the ground. Otherwise, your signal might not radiate correctly. Remember, it is the length of the wire, the angle it comes down from the middle support and the height from the ground that is important to make the antenna work properly.



Figure 2: It is important that no radiating portion of the antenna come in contact with the ground.



Figure 3: The Inverted V antenna allows you to communicate with an airplane, a base camp you don't know exists, or a walking trapper.

The length of this and other "half wave" antenna varies according to the frequencies being used. This may be calculated using the following formula:

Tip to tip of "half wave" antenna length.

$$\text{Length (in metres)} = \frac{143}{\text{Frequency (MHz)}}$$

Example:

$$\text{Desired frequency} = 4.441 \text{ MHz}$$

$$\text{Length (in metres)} = \frac{143}{4.441} = 32.2 \text{ metres}$$

OR, if preferred

$$\text{Length (in feet)} = \frac{468}{4.441} = 105.4 \text{ feet}$$

Figure 4: The following chart gives the tip to tip antenna length for some commonly used high frequency assignments:

FREQUENCY (MHz)		TIP TO TIP ANTENNA LENGTH	
ASSIGNED	CARRIER	METRES	FEET
<u>Bell Canada radiotelephone network Alma, Que. (CGD 206)</u>			
3,167.4	3,166	45.2	147.9
5,391.4	5,390	26.6	86.8
5,431.4	5,430	26.3	86.2
7,466.4	7,465	19.2	62.7
<u>Bell Canada radiotelephone network Frobisher Bay, NWT (CGE86)</u>			
3,299.4	3,298	43.4	141.9
4,630.4	4,629	30.9	101.1
5,129.4	5,128	27.9	91.3
6,782.4	6,781	21.1	69.0
10,856.4	10,855	13.2	43.1
7,624.4	7,623	18.8	61.4

Dipole

This type of antenna is often used by base stations such as those in mining camps transmitting to other mining camps. Use this type of antenna when you know how and where both radio station antennas are set up. For best results, both your antenna and the antenna of the station you are transmitting to must be oriented broadside to each other. (See Figure 7)

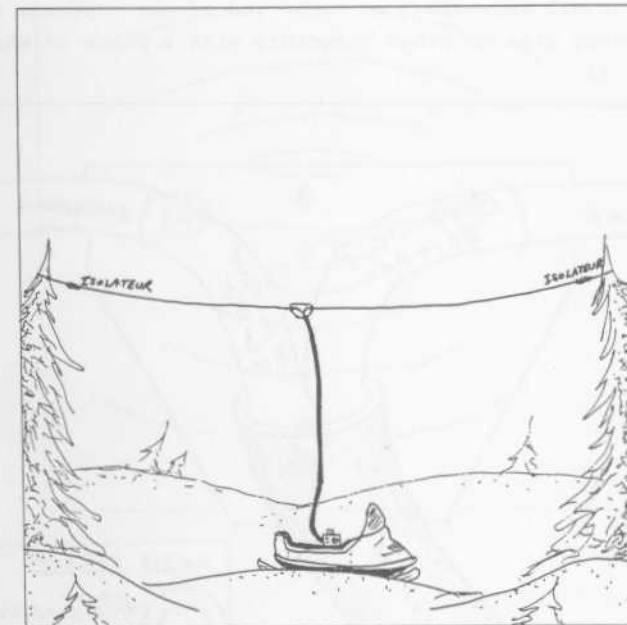


Figure 5: Stretch the antenna in a straight line between two poles or trees at a minimum of 3 metres (10 feet) above the ground.

Set up of Dipole antenna

The length of this antenna again depends on the frequency that is being used. Please refer to the Tip to Tip Antenna Length Chart. (See Figure 4)

Stretch the antenna in a straight line between two poles or trees at a minimum of 3 metres or approximately ten feet above the ground. Install insulators at each end of the antenna and tie off to a nearby tree or other structure with a piece of rope. (See Figure 5)

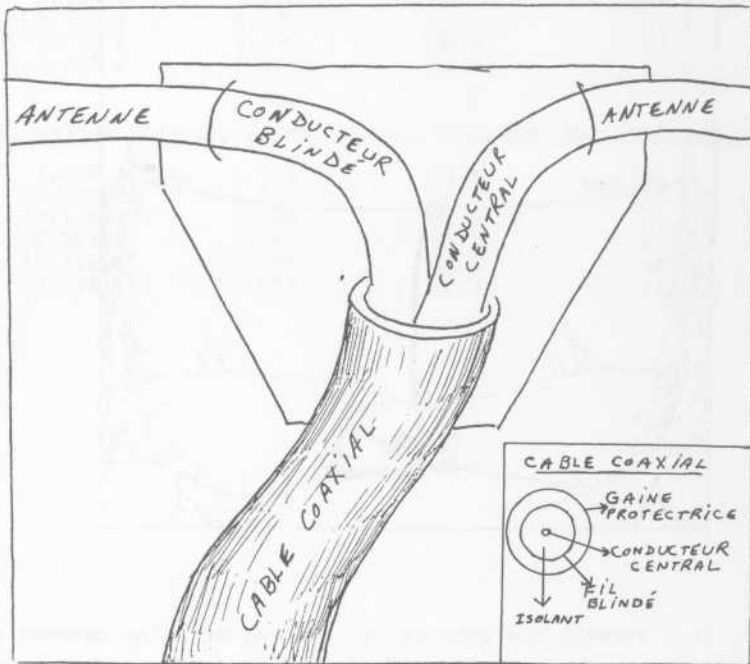


Figure 6: How to connect coax to antenna

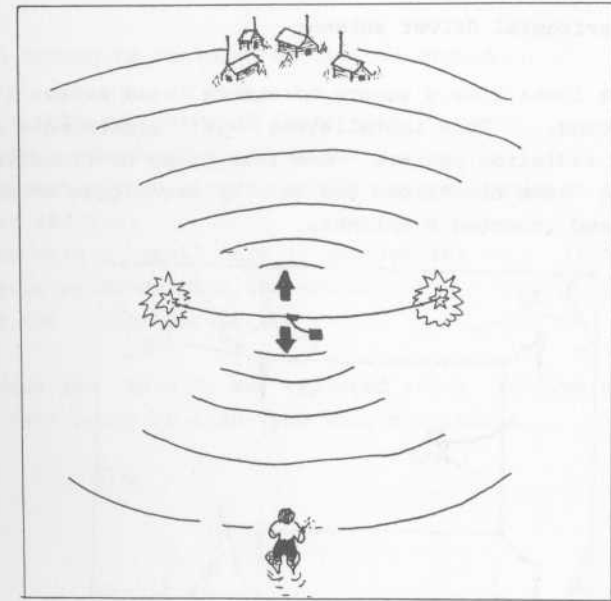


Figure 7: A Dipole antenna is suitable for use when it is known how and where both radio station antennas are set up.

Horizontal Driver

This is a useful antenna for a fixed base, used for example by expeditors or outfitters who have a number of people moving around an approximate 300 kilometre radius.

Set up of Horizontal Driver antenna

This antenna looks like a square horseshoe three metres (10 feet) off the ground. This installation will approximate an omni directional radiation pattern. Use four poles or trees to set it up. Use the same dimensions and set up techniques as used for the Dipole and Inverted V antennas.

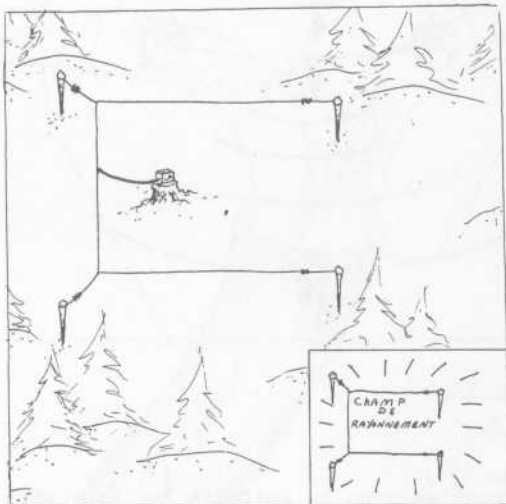


Figure 8: The Horizontal Driver antenna looks like a square horseshoe 3 metres (10 feet) off the ground.

GROUNDING

If a camp is to be set up permanently, or on a recurring basis, you should make every effort to create a suitable electrical ground. This will improve the performance of your radio system.

Suggested method to build an electrical ground:

1. Dig a hole one metre (3 feet) deep.
2. Put in a length of copper pipe.
3. Bury back with a mixture of fire ashes, table or road salt, water and soil.
4. Allow only a small part (5 centimetres or 2 inches) of the pipe to protrude from the ground.
5. Make the connection to the radio.

This process may have to be repeated every few years, or more often in very sandy or clay-type soil conditions.

For further information on this subject or other items related to radio communications, contact:

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