Introduction to Radio Scouting, Ham Radio & JOTA-JOTI 2023

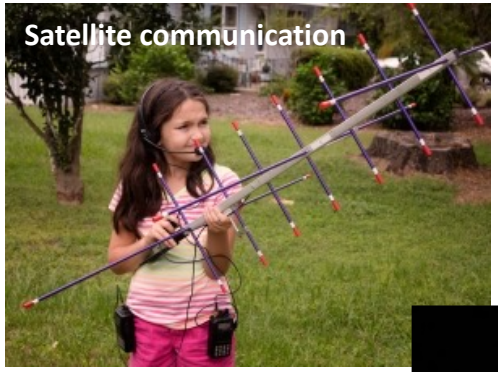
https://vimeo.com/325220441

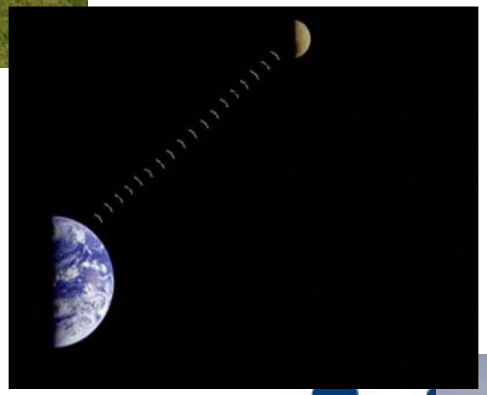
Radio Scouting

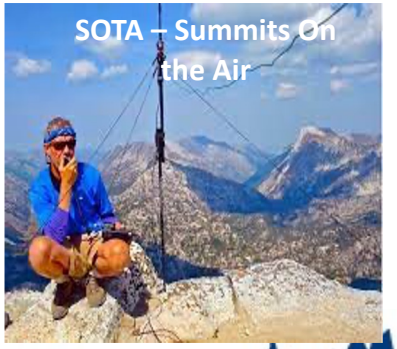
- Amateur (Ham) Radio has been a fun part of scouting since at least 1918
- Many countries have very well-established radio scouting programs
- Radio Scouting Ireland is in the process of setting up a program and stations at scout centers in Ireland
- There are lots of ways to participate and learn
- There are plenty of badges for different levels of achievement and participation
  - S1-S9 Program Badges up to license level
  - Licensed Operator & Special Interest badges
  - JOTA-JOTI badge – Biggest annual event

Ham Radio - lots of fun & interesting things to do!

- Contacts all around the world!
- Antenna building
- Building own radio/electronics
- Contesting – Radio sport
- Rag chewing (chat)
- Direction finding
- Voice, Morse (CW) Packet/Data modes
- DX communication
- DX-pedition
- Earth-Moon-Earth
- Emergency communications
- Morse code
- Operating awards
- Portable operation
- QRP operation
- QSL card collection
- Satellite communications
- Special event stations
- Television
- Slow scan Television
- IOTA -Islands
- SOTA -Summits
- POTA - Parks
- And many more!!!

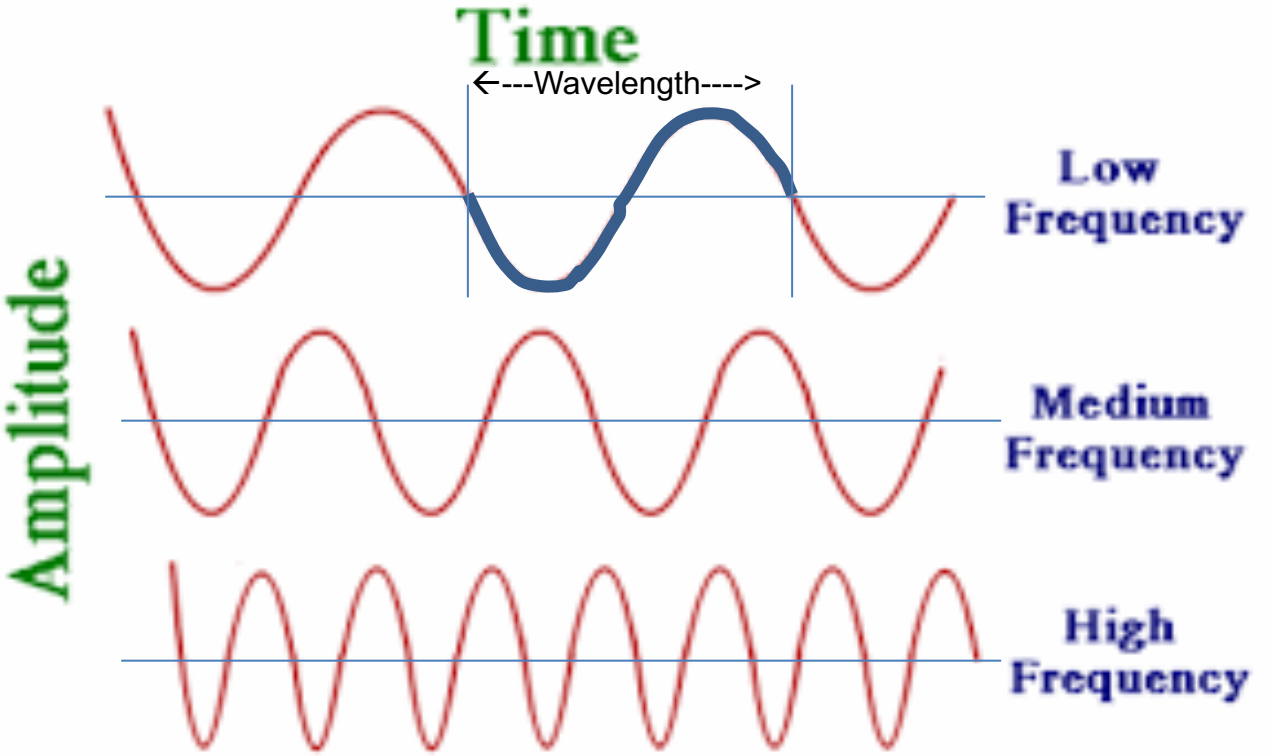






Frequency & Wavelength

Energy can travel in waves through the air – Sound energy, Light energy, Radio



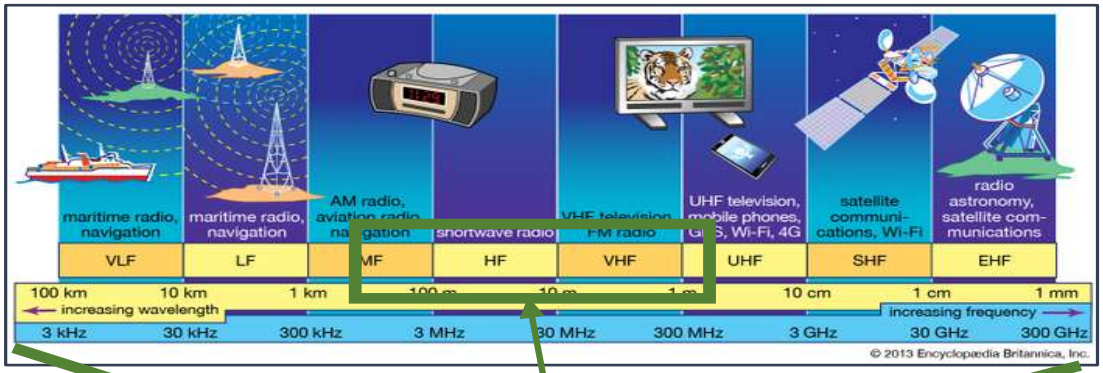
Long Wave Lengths = Low frequencies

Short Wave Lengths = High frequencies

- Listen to some high frequency and low frequency Audio waves
- Why do you think loudspeakers are different sizes?
- What size speaker do you think is best for low frequencies?
- What size speaker do you think is best for high frequencies?

https://www.szynalski.com/tone-generator/

The Spectrum of Electro Magnetic Frequencies



Ham radio

TV remote

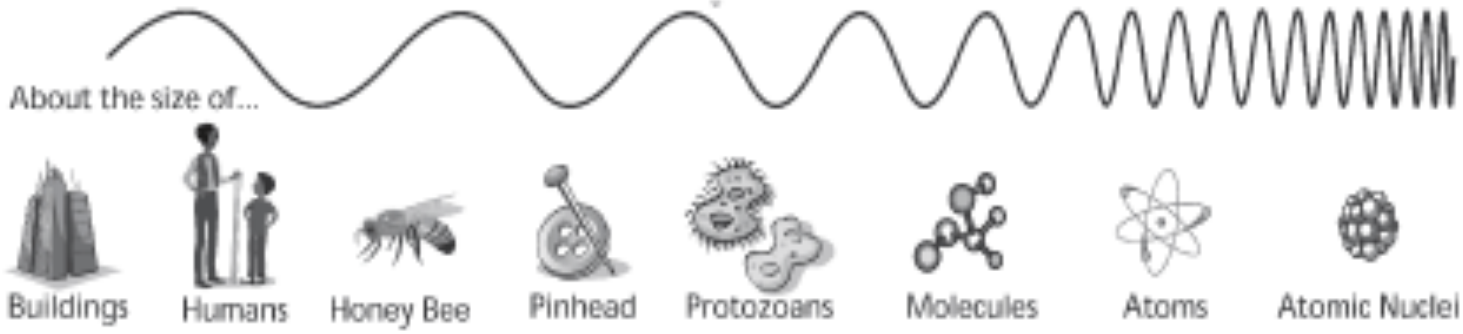
Ionising – Generally Dangerous

Sound | Radio | Microwave | Infrared | Visible | Ultraviolet | X-ray | Gamma Ray

10^{3} 10^{-2} 10^{-5} $.5\times10^{-6}$ 10^{-8} 10^{-10} 10^{-12}

Wavelength (meters)

Non-ionising – Generally not dangerous unless very high power



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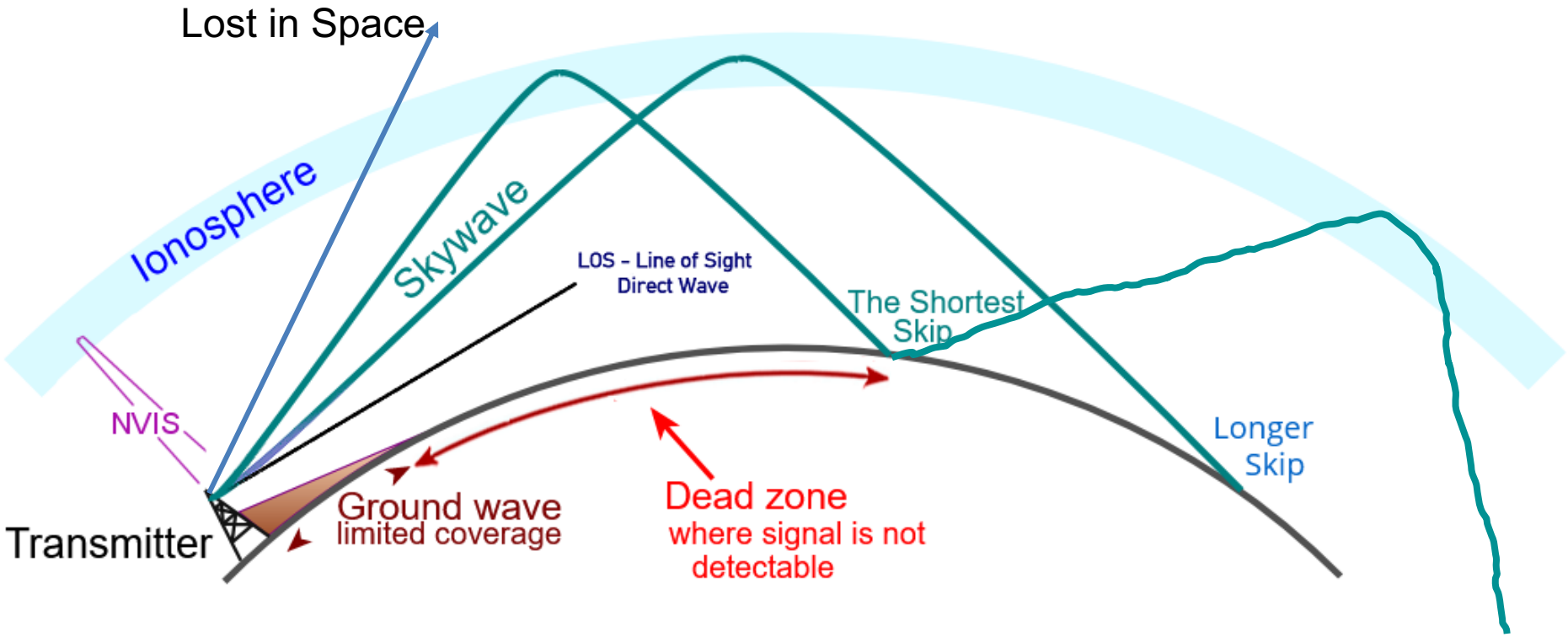
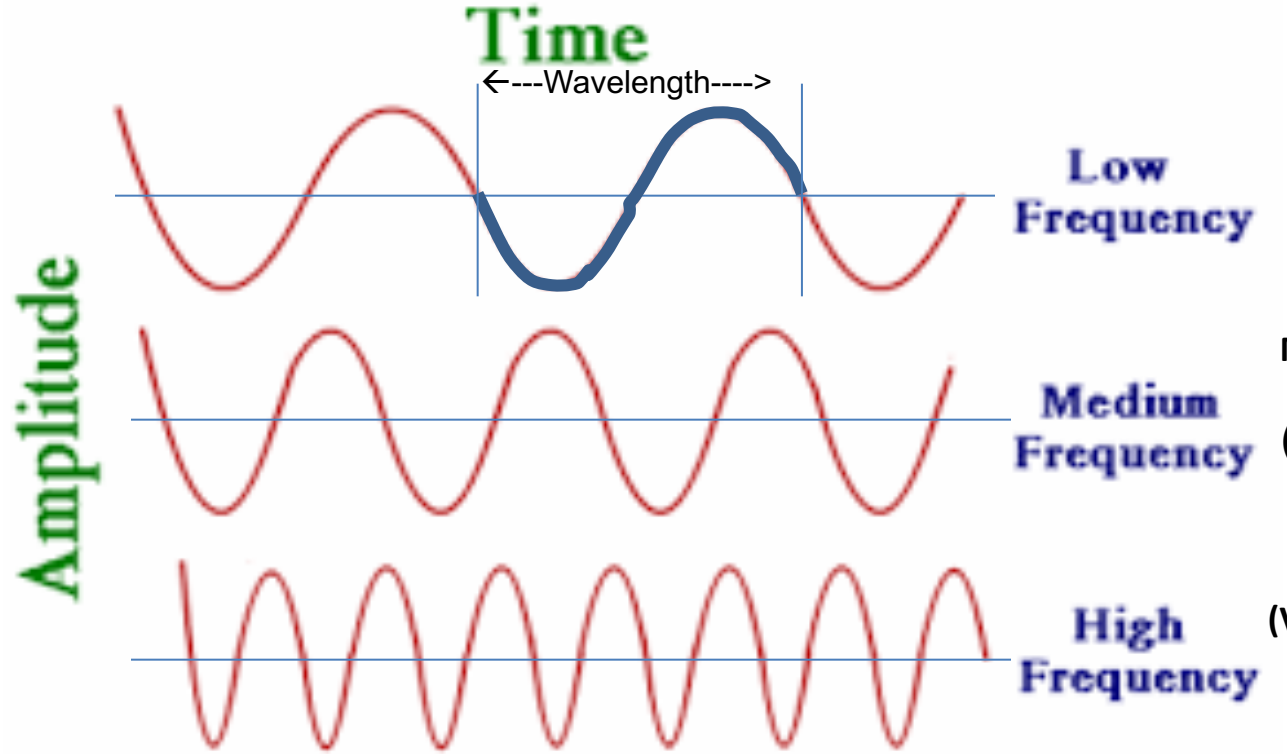
Long distance propagation –"Skip"



- Varies a lot over the day, night, season and sun weather!
- Varies with frequency

How Does An Antenna Work?

- Like a loud speaker can turn an electrical signal and convert it to transmit* **Audio waves** through the air, an antenna is used to transmit and receive **Radio waves**.
- To be efficient the antenna should be matched or "resonant" on the intended frequency of use. Two lengths of wire ¼ wavelength long resonates well!



Big Antenna
(LF – Long Wave)

Medium size antenna
160m-6m
(HF-Shortwave radio)

Small antenna
(Very High Frequency – VHF and Ultra High Frequency UHF)

*Believe it or not a speaker can also be used to receive sounds and convert them to an electrical signal!

Examples of antenna types

Whip / Monopole Antenna

Works best for narrow range and can be collapsable.
Used on small radios and vehicles.

Dipole Antenna

Two Monopoles facing away from each other.
Used to create a powerful signal in a restricted space.

Yagi Antenna

Ideal for long distance range
and directional applications. Can reach multiple frequencies.

Loop Antenna

Works like a Dipole and can reach multiple frequencies.
Commonly used for TV and RFID Systems.

Bowtie Antenna

Another type of Dipole.
Angles can be set to work well with different frequencies.

Dish Antenna

Large surface space collects a lot of signal.
Works well for high frequencies, TV and sound.

Jamboree On The Air Jamboree on the Internet – JOTA-JOTI

- JOTA-JOTI is the largest Annual Scouting Event in the World since 1957!
- ~1.8m Scouts, 13,500 stations in 142 countries take part each year in October
- Introduce Scouts to the fun and technology of amateur radio & STEM
- Scouts can learn skills, gain perspective on other countries and their culture and scouting programs --- by talking to other Scouts and Amateur Radio enthusiast around the world

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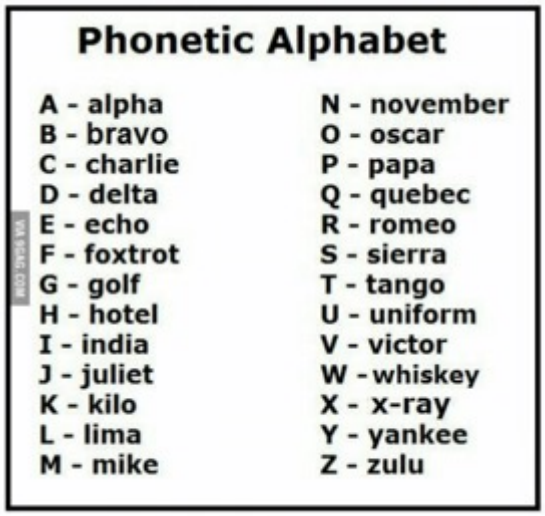
Preparing for JOTA-JOTI – Making Contact!

- Many hobbies and sports have their own language words & code for example Scouts have Jamboree's, woggles, neckers, Moots etc, golf has birdies, bogies, Eagles, holes in one, fades, slices etc.
- Because radio reception can be very variable hams regularly use code to help with effective and accurate communication
- For example:
  - We use Q-code, Morse Code, The phonetic Alphabet
  - A basic contact is called a QSO!
  - To call on the air we say CQ CQ maybe short for Seek You Seek You!
  - We use call signs which identify the radio station and country for example EI3ISB EI10JOTA
- Would anyone like a go at phonetically spelling and guessing the country of these following call signs?
- **FR9AA IK2VCV VK7AC DL4TP ZL4AD SP9CQ**



QSL	Can you receive?	Confirmed, received.
QSO	Can you communicate with ... directly or through support?	I can communicate with ... directly NOTE: It is also synonymous of direct communication or direct connection.
QSP	Will you transmit to...?	I'll transmit back to....
QSY	Should I change my transmission to another frequency?	Change transmission to another frequency.
QTH	What is your position	My position is ..... : QTH generally describes the place from which you are transmitting.
QTR	What time is it ?	It's ...

Q Codes & Shorthand

- **QSO** – A call with another station
- **QSL?** – Can you hear me
- **QSL QSL** – Yes I heard you
- Your **QTH** – Your Location – Dublin
- **QRZ**? – Who is calling me?
- **73** – Best wishes
- **You are 59** – I Hear you loud and clear

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Preparing for JOTA-JOTI – QSO & Logging

- A Basic QSO:

1.) Press Mic button and Call - **CQ JOTA CQ JOTA Echo - India - One - Zero – JOTA**

2.) Listen for callsign replies e.g. **DL4TP**

Listen especially for calls with JOTA in the callsign, Like say. **Fox-Radio 5-JOTA** – They will be other scout troops

3.) Press the mic button and repeat call sign heard back with "**59"** or say part of the callsign you heard and "**Station Only Please"**

For example if you only heard the 1st or 2nd bit of the callsign DL4TP, Delta – Lima- 4 or Tango –Papa**,** you should press the mic button and say "**Delta – Lima- 4 station only please"** or **"Tango – Papa station only please"**

4.) Repeat as needed and when you have their callsign write it down, press the mic and repeat it back with 59.

For example "**Delta – Lima- 4 - Tango –Papa 59". -** 59 signifies you have heard them clearly

5.) They should reply "**Echo - India - One - Zero – JOTA 59"** indicating they have heard you properly

6.) If you have lots of stations calling you should then go to the next contact by pushing the mic key and saying **"Thank you for the contact 73"** which means thank you for the contact best wishes

7.) If there are not many stations calling you, you can talk some more with them, tell them your name and Scout Troop ID e.g. "**My name is Katie – Kilo-Alpha-Tango-India-Echo and our JOTA Id is : *2 India – Quebec – 3-2- Uniform, 2 India – Quebec – 3-2- Uniform"***

8.) They may come back with more info about themselves which you can note in your log.

9.) Once finished you press the mic and say **"Thank you for the contact 73"**

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If you really want to be adventurous Learn Morse! The king of All Codes! -“CW” or Morse Code

- Morse code, named after it’s inventor Samuel Morse is a way of sending messages efficiently using simple communications devices.
- Morse code is made up of “dit” (dot) and “dah” (dash). The duration of a dah is three times the duration of a dit.
- Below is a list of morse codes for the alphabet, numbers and punctuation.

Free Ham Radio receiver on the internet!

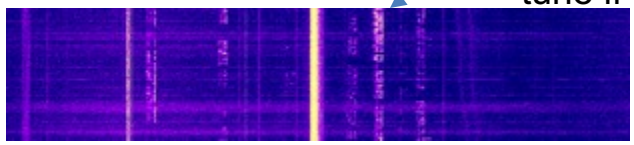
1.) Download and install Firefox web browser

2.) Search for Hackgreensdr or type in http://hackgreensdr.org:8901/

3.) Best Ham Radio frequencies to start and get familiar with listening and logging are:

- 7050-7200 Khz – The 40m Band
- 14101-14350 Khz – The 20m Band

4.) Listen & Practice logging calls



RADIO SCOUTING
Ireland

You can even make your own efficient 20m Antenna and make contacts around the world with it at JOTTA - JOTI! Make at home and bring and make on site.

A.) What you Need –Picture 1

- 1 x Plastic Bottle top
- 2 x Plastic Bottle top rings
- 2x 3m lengths of string or twine
- 2 x 5.05m (TBC) lengths of wire e.g.
  - 2 lengths of old bell/ telephone or electrical wire
  - Halfords 7m spool of speaker wire, wire split in two
  - Strip and old LAN cable and use two lengths of the wires inside

B.) Instructions

1. Make 3 x 5-10mm holes in Bottle top and tie one end of each length of wire to the two outer holes on the bottle top leaving 2” or 5cm of wire spare as illustrated in picture 2.
2. Strip back ½” or 1.5cm of insulation and twist the wire to stop any fraying as in picture 2.
3. Twist about 2” or 5cm of the other ends of the wires around the two bottle top rings as illustrated in picture 3.
4. Tie the two 3m strings to the other side of the bottle top rings as illustrated in picture 3.
5. Wind up your dipole antenna and bring it to use on the day to test! Picture 4.