STARLITE

THE NEWSLETTER FOR THE STOURBRIDGE AND DISTRICT A.R.S.

G6OI
G6SRS

G4CVK

ISSUE: MAY 2020

STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY

INCORPORATING

OLD SWINFORD HOSPITAL SCHOOL RADIO CLUB

MEETINGS HELD AT

OLDSWINFORD HOSPITAL SCHOOL
HEATH LANE
STOURBRIDGE
[8:00 TO 10:00 PM]

VISITORS ALWAYS WELCOME

THE SOCIETY HOLDS ITS MEETINGS
EVERY MONDAY (EXCLUDING BANK HOLIDAYS)

MEETINGS CANCELLED UNTIL ???

RSGB AFFILIATED SOCIETY

The views expressed in STARLITE may not be those of the Committee – Stourbridge and District Amateur Radio Society

STARLITE

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John Clarke M1EJG
[01562] 700513

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21 Mill Lane
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DY10 3ND

StARS Website URLs:-
www.g6oi.org.uk
http://g6oi.ross-lewis.co.uk

StARS Facebook Page:-
https://www.facebook.com/groups/stourbridge.ars/

Forthcoming Meetings

May 4th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
May 11th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
May 18th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
May 25th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
June 1st	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
June 8th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
June 15th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
June 22nd	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
June 29th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
July 6th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
July 13th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
July 20th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
July 27th	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST
August 3rd	Club Net on 145.325MHz FM & Zoom Video @ 20:00 BST

Editor's Comment

What strange times we are currently experiencing with no Club meetings for helping those in need or for socializing. I would hope this “close-down” doesn't last as long as the previous one during WW2!

On a positive note, the Club Net has been very well subscribed with several members and visitors, too. If you can spare the time, perhaps you will consider joining the chat for an hour or so. It's on 145.325MHz (S13) FM at 20:00 BST on Monday evenings. You will be most welcome. (*Please note: I have made this change to the calendar until further notice. Ed.*)

Looking to the future, perhaps we could be thinking of a “Freedom” activity, when we are finally released from this imposed incarceration. It is only a suggestion, but would show that StARS is still a viable Club and may help to attract new members. I know it's early days in this worrying time, but could be considered for our future. So what do you think of this idea?

Some of you may have noticed that many radio amateurs have been dusting the cobwebs off their radios and returning to activity on the bands. This is, surely, a positive outcome of this awful contagion and shows that there ***are*** potential new members out there.

This may be a larger issue than usual, as I have received a couple of good articles from Geoff G0KVK (*Simple Theory, Part 2*) and Jim G4WAO. Also, a couple of items for dipole suspension mounts, a note about online Foundation licence exams and a Club Net photo. John G8UAE sent a letter, which was received by Alec G8GF (one of our founding fathers), from a Polish amateur in 1947 and is included for interest.

G8UAE informed me that StARS has been an Affiliated RSGB Society for 50 years. What a pity we have the current situation, otherwise we could have commemorated this somehow.

The June issue is well under way, but I am still short of future input. So, if you can put pen to paper (or finger to keyboard), I would be most grateful for anything you could submit for publication. You know the way it works; send your item to:

g4xom@g6oi.org.uk

Thanking you in advance.

This came from John G8UAE for your interest, due to the VE Day commemorations on May 8th.... **And** it's part of StARS history, too.

Mieczysław Kapczynski
Al. Waszyngtona 67 m.11
Warszawa 26.

Warsaw, Novermber 15 th. 1947

Mr. W.A. Higgins,
35 John Street,
Brierley Hill,
Staffs.
England.

Dear Om!

I hope that writing this letter to you I will be understood because there is no other way to maintain this kind of contact.

I will be very glad to exchnage letters with you. Really I am not writing this letter only for myself but also in the name of Polish amateurs that areliving in Warsaw.

As you know Warsaw has been destroyed by the Nazis, nad by this we have lost everything. Many of Polish Hams have lost their lives in the great struggle for our independence . We have started from the beginning to maintain primitive bases for living and the starting of our amateur work. We here have no sufficient equipment etc., but we are slowly gathering and buying things as much as our financial positions allow. The equipment is veryexpensive here and is difficult to obtain. The main point is also the lack of technical radio literature, radio books etc..

I am kindly aksing you if it ispossible for you to send me any kind of technical radio literature(Handbooks, QSTs etc. which will be distributed by me among other Hams.

For your information I am stating that the Polski Zwiazek Krotkofalowcow (our main club) has been accepted and recognised by thePolish Authorities and that we are reactive since May 1947. Our prewar licences will be renewed in the nearest future and we will be on the air soon again.Hi.

I will be much obliged to receive your reply. Upon receipt I will be glad to give information concerning myself First I am a Pole, 38 years of age, married and I haave 3 children. By proffession Imam an accountant. All correspondence can desptached to the above address.

Regretting for myeventual impudance, I remain with best

73

SP3AE Mieczysław Kapczynski

PS. Any used second hand clothes, boots etc. received from you will be also greatly appreciated by me and by other Hams.

Saw this on Southgate Amateur Radio News

Coronavirus: RSGB is introducing remote invigilation for Foundation exams

Foundation Amateur Radio exams in the UK will be able to resume by using remote invigilation, the Practical Assessments will be waived.

Due to the Coronavirus outbreak amateur radio exams in the UK ceased in mid-March, the new online system enables them to restart. Candidates will take the Foundation exam in their own home on their PC or Laptop (Windows 7+) or Apple Mac running Mac OS 10.8+. The invigilation is done remotely, there is no need to complete the Practical Assessments.

The RSGB will be ready to receive online bookings from Monday, April 6. The Society says in due course they will consider extending it to the other licence levels.

The price of the exam is unchanged.

Read the RSGB announcement at

https://rsgb.org/main/blog/news/rsgb-notices/2020/04/02/rsgb-to-introduce-remote-invigilation-for-foundation-exams/

Online exam FAQ for candidates & tutors

http://rsgb.org/exam-faq

Essex Ham provide free online Foundation amateur radio training

https://www.essexham.co.uk/train/foundation-online/

Following the 6th April on-air Meeting/Club Net on 145.325MHz (S13) FM, Wayne M5LLT posted this photo on Facebook.

Zoom for video.
2m for voice.
Success!

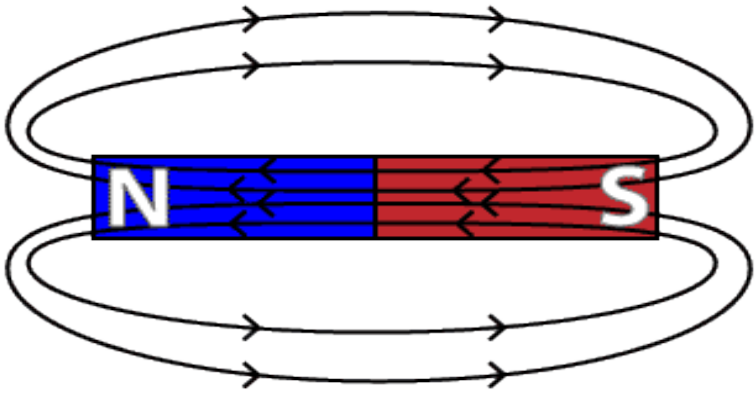
Simple Theory by Geoff Cooper G0KVK

Basic Magnetism

The phenomenon of magnetism has been known and used probably longer than any other in electrical science. Magnetism is the property by which forces may be set up at a distance to attract certain materials. The materials which are attracted by the forces of magnetism are called ferromagnetic materials like iron, nickel, cobalt.

Some materials are naturally magnet (the earliest permanent magnets were made from lumps of magnetite magnetic iron ore).

If a permanent magnet is covered with a sheet of paper and sprinkled with iron filings and tapped gently the iron fillings form up into curved lines between the poles these are called the lines of force (magnetic flux) . Also the closer the lines of force are together the more intense is the magnetic field and in particular around the poles



The direction of the flux lines is taken to be from the NORTH POLE to the SOUTH POLE of the magnet. Hence the magnetic flux is assumed to pass through the magnet and emerge from the north pole and returned to the south pole.

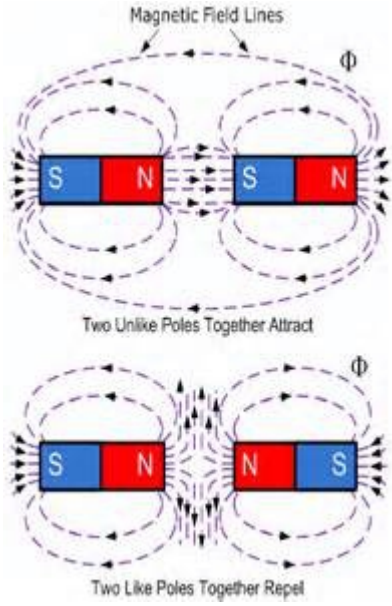
Attraction and repulsion of magnetic poles

Lines of magnetic flux do not really have any physical existence but the form a convenient and useful way of explaining many different magnetic effects and calculating there magnitudes. We have seen that each line of flux of the magnetic field forms a closed path and never crosses other flux lines.

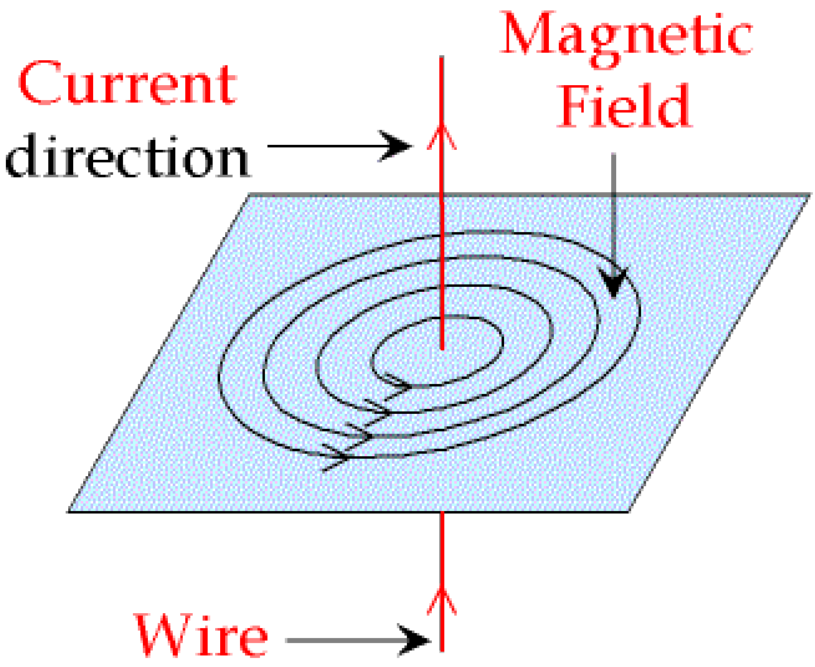
If to dissimilar magnetic poles are placed near to each other it is found that the unlike poles attract one another. The flux lines try to shorten themselves and thereby causing the dissimilar poles to attract to each other.

The opposite effect occurs when two similar poles are placed together.(two north or two south).Here to like poles repel one another. This effect occurs when the flux lines are parallel to one another and act in the same direction.

These flux lines behave as if they exerted a lateral pressure on one another thereby moving the poles apart.



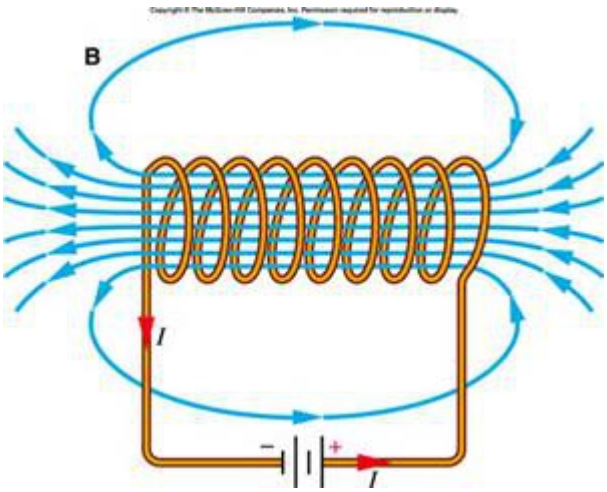
MAGNETIC FIELD DUE TO AN ELECTRIC CURENT



When a current flows through a wire a magnetic field is produced. The magnetic field exists within and around the wire and weakens as the distance from the wire increases. Magnetism

attributed to the flow of an electric current is called electromagnetism. With current flow into the end of the conductor the magnetic field acts in a clockwise direction. Current flow in the opposite direction (out of the conductor) will cause the direction of the

Magnetic field to reverse to an anticlockwise direction.



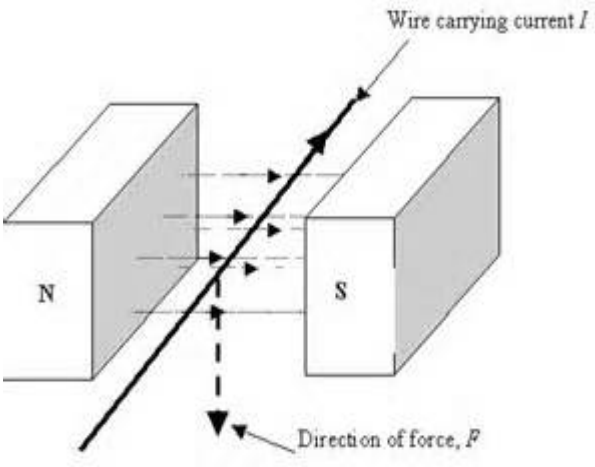
If the wire is made into a loop and a current is passed through it the magnetic field will be made stronger, and if it was made into a coil. As a result of coiling a long wire the flux in adjacent turns of the coil reinforce each other to produce a strong magnetic field which is concentrated into a very small space. The resemblance of this field pattern is that of of a bar magnet.

The strength of the magnetic field can be increased by the addition of a iron core ,the iron core becomes magnetised and behaves like a permanent magnet as long as the current in the coil is maintained, such an arrangement is referred to as an electromagnet.

Ferromagnetic cores (such as iron) are used when strong magnetic fields are required e.g. in relays, transformers, electric motors or generators. The cores are made from magnetically soft materials and may be either solid, laminated, iron dust or of the ferrite type. Solid cores which have limited applications are used in solenoids and relays.

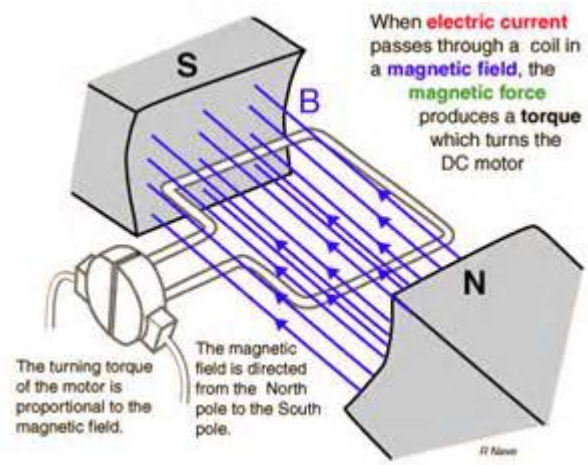
Laminated cores which use laminations of the core material that are electrically insulated from one another can be found in transformers. Iron dust cores and ferrite are used for high frequency applications such R.F. inductors and transformers.

Conductor carrying a current in a magnetic field.



When a conductor is carrying a current is placed in a magnetic field a force acts on the conductor.

Suppose we have a magnetic field as above and a current flowing in the conductor (if the current flowing in the conductor was taken as flowing into the paper) then the conductor will produce a magnetic field in a clockwise direction. At the top of the conductor the magnetic lines of flux are in the same direction and thus will add together, below the inductor then the lines of flux are in opposition so they are weaker and a downward force is exerted on the conductor as shown. If the current was in the opposite direction then the conductor would move upwards. This is known as the motor principle and is fundamental to the operation of all electric motors, and moving coil loud speakers, and some measuring instruments.



Simple D.C. Motor.

In small motors a permanent magnet is used to produce a magnetic field. The conductor is formed into a loop and mounted so that it is free to rotate in the magnetic field. If the current is flowing in the conductor closest to the north pole and out passed the south pole there will be an upward movement in the conductor and a downward movement on the other side. These forces will cause the loop to rotate in a anticlockwise direction.

Unfortunately, the movement will stop when the conductor has rotated through a quarter turn. Should it tend to rotate further due to its momentum the force acting on the conductor will cause it to move in the opposite direction. To obtain continuous rotation in one

direction it is necessary to reverse the direction of the current flow when the loop reaches vertical position and at every following half revolution. This is achieved by the use of a spilt ring or commutator which rotates with the loop. Current is supplied via carbon brushes which are in contact with the commutator. When the loop reaches the vertical position and carries on just beyond due to its inertia, the current flowing in the conductor is reversed. Current enters the loop via conductor B and leaves via conductor. A after a further half turn current will enter via conductor A and leave via conductor B and so on. In a practical motor many loops are formed with the loops wound in slots in an iron armature and the commutator is divided into a similar number of segments. The operating principle however remains the same.

To be continued next month.

Aerials

Do you like designing or making aerials? Then you may get some ideas from DK7ZB's web site. Follow this link:

https://www.qsl.net/dk7zb/start1.htm

One of our members was asking about an UnUn type of balun. Here are a selection of links, which I found on the internet. Maybe one of them will help.

https://palomar-engineers.com/balun-and-unun-styles

https://m0ukd.com/homebrew/baluns-and-ununs/91-magnetic-longwire-balun-unun/

https://www.instructables.com/id/How-to-Make-a-Balun-Or-Unun/

http://www.philipstorr.id.au/radio/technical/Balun%20and%20UnUn.pdf

http://vk6ysf.com/unun_9-1.htm

You can, also, find at least one video on You Tube.

The Radio Network that Allowed Communication with Submarines

Communicating with covert fleets during WWII required some special equipment.

What do you do when you need to communicate with a crew of **50 sailors** submerged in a submarine in an undisclosed location somewhere in the world's oceans? That was a difficult but vital question for Navy leaders to answer in WWII.

Radio waves don't easily travel through saltwater, which meant that getting active communication with a submarine crew meant using the surface of the submarine as an antenna. This was the obvious solution, but it also turned the previously covert submarines into visible targets.

The solution to the problem

Engineers tasked with finding a more covert solution soon discovered that radio waves with low frequencies, around **10 kHz**, could penetrate saltwater to depths of up to around **20 meters**. They realized that if the transponders on submarines were switched to these frequency ranges, then they communicate with leadership on land.

The problem with this idea was that creating and broadcasting these low-frequency radio waves required massive antennas. Essentially, the lower the frequency of a radio wave, the longer and larger the antenna was required to be. Engineers eventually honed in on a range of frequencies lower than **30 kHz** for submarine communication. The wavelength of these frequencies were roughly **10 kilometers** or more, meaning that engineers would need massive antennas. The only way to produce these frequencies with such a high range was to use a massive system of antennas with massive amounts of power.

Nazi engineers seeking to communicate with their fleet of U-boats had the same problem. They designed the Goliath antenna network in Saxony-Anhalt, Germany. After construction, it was operated during World War II and had a transmission power of up to **1,000 kilowatts**. For comparison, that's equivalent to the power used today by **500 average** American households.

The Goliath Radio Transmitter

The Goliath network would regularly transmit frequencies between **15 kHz** and **25 kHz**. It was powerful enough to reach any German submarine located anywhere in the world

submerged up to **20 meters**. The only time communication was hindered was when German U-boats were navigating deep Norwegian fjords.

The Goliath antenna used three different umbrella antennas. These were essentially massive antenna towers that were draped with kilometers of guy wires radiating out from the mast. These helped not only to support the antenna tower, but they also formed part of the antenna itself.

In total, the system used three, **210 meter** or **688-foot** masts arranged in a triangle. The system also had cables buried around it, with a total length of **350 kilometers**. Once it was completed, the system had an impressive efficiency of **50%** at **15 kHz** and **90%** at **60 kHz**. This massive antenna site was undoubtedly a key strategic tool used by the German Navy in communicating with their U-Boat fleet.

After the war ended, the Soviets dismantled the Goliath and shipped it to Russia. It was then re-erected near Moscow. Today, one of the original towers is still in operation, communicating low-frequency signals to submarines, and broadcasting time signals.

A deeper dive into how low-frequency networks function

Low-frequency radio frequencies are anywhere in the range of **30 to 300 kHz**, and their wavelengths range from **1 to 10 kilometers**.

Because their wavelengths are so long, these frequencies are the perfect tool for long-range communication networks. Low-frequency radio waves, or LF radio, is used for AM radio stations across the world, allowing them to broadcast from a centralized location across many hundreds of miles.

Watch a video here: https://youtu.be/61UqLXVJM7s

One of the other massive benefits of LF radio signals is the fact that their long wavelength allows them to diffract over very large physical obstacles, like mountains, or even the Earth. LF waves can follow the curvature of the Earth with ease, utilizing ground wave propagation. Low frequency waves sent through ground propagation can be clearly received more than **1,200 miles** from the original source.

Another way that LF radio waves can be transmitted ultra-long distances is by intentionally reflecting the waves off of the Earth's ionosphere. This is called skip propagation or skywave, and it allows frequencies to be transmitted distances of over **190 miles** from the original source. Not as far as ground wave propagation, but still an impressive distance.

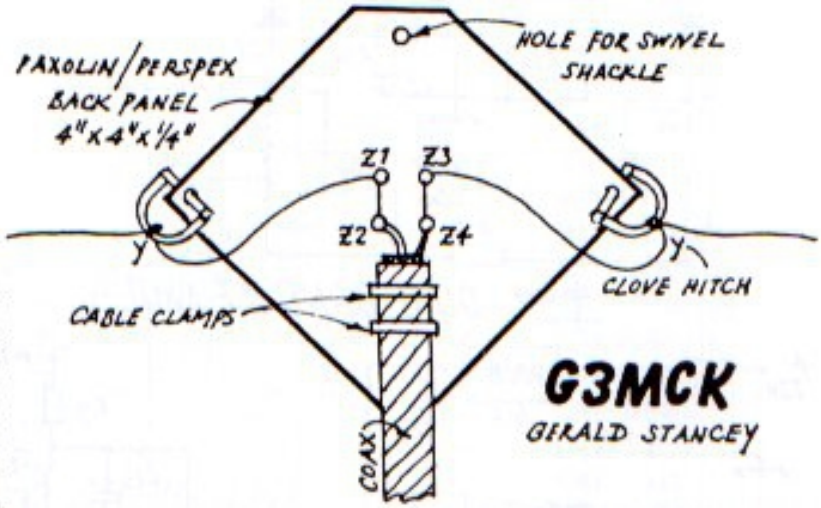
The other benefit of low-frequency waves, underscored by the use of the Goliath transmitter, is the fact that low kHz low-frequency waves, under **50 kHz**, can penetrate ocean depths of roughly **200 meters**. As the wavelength gets longer, the penetration depth gets deeper.

Most of the world's superpowers still use some form of this LF transmission to communicate with submarines and underwater vessels today. British Royal Navy nuclear submarines stationed around the United Kingdom listen to a **198 kHz** frequency for orders to launch their ballistic missiles.

The U.S. eventually built out something called the Ground Wave Emergency Network, named GWEN. It ran between the ranges of **150 kHz** and **175 kHz** up until 1999, when satellites far outperformed the LF network's usefulness.

DIPOLE CENTRE INSULATOR

DIPOLE CENTRE INSULATOR
Gerald Stancy G3MCK



As experimenters, many of us live surrounded by things we have just cobbled together. However, there are a few things that are worthwhile doing correctly the first time. In this class I would put antenna work. A cobbled antenna will always fall down at the most awkward moment, also climbing ladders loses its attraction with the passage of time!

DIPOLE CENTRE INSULATOR

The insulator described was designed for inverted Vee Dipoles where there is no constraint on the weight. In fact, it is not very heavy so could probably be used in the centre of a normal dipole but I have not tried it. It is meant to be a 'fit and forget' item and seems to be just that.

The drawing is self-explanatory but the following points are worth noticing:

1. Seal the ends of the coax joints with Araldite or non-acidic scalant. ie. one that does not smell of vinegar

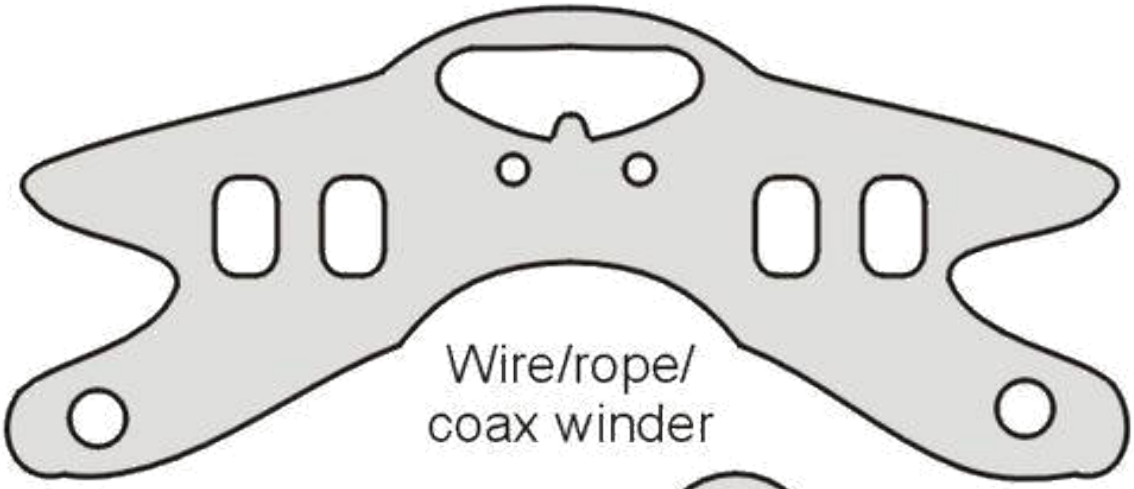
2. Marine fittings are expensive but last forever and are easily obtained at a sailing emporia - of which there are several in the immediate area.

3. Stranded insulated wire is more resistant to wind and corrosion effects than a bare single conductor

Secure each leg of the antenna to the D-shackles at points 'Y' with a clove hitch knot, leaving enough wire to connect up to the centre insulator. Feed one leg of the dipole through Z1 then through Z2 (to hold it in position) and join to the inner of the coax. The other leg of the dipole goes through Z3 and is joined to the coax braid which is led through Z4. Then effectively weatherproof the entire joint.

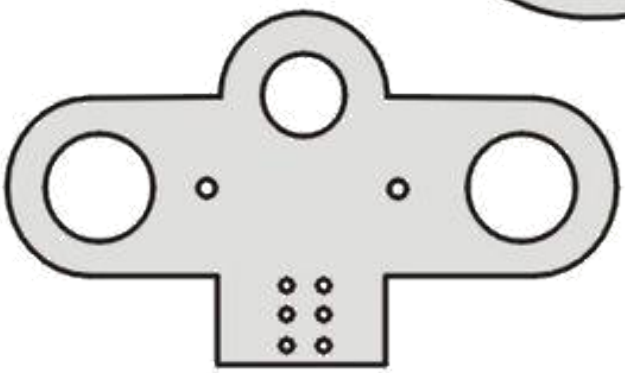
9

Homebrew
wire dipole suspension kit

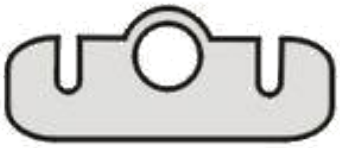


Wire/rope/
coax winder

Designed to be cut from cheap plastic kitchen cutting boards available from most pound shops or dollar stores. The boards I am using are a quarter inch thick and fairly rigid. I get them from Home Bargains in the U.K. Price £1.99.
One board yields twice what's here plus numerous suspension points from all the scrappy bits.
An electric jigsaw with fine hacksaw blade goes through these boards like a hot knife through butter.



Wire dipole centre



Antenna wire suspension point

All you need except for the wire and coax. The winder will keep your long wires tangle free if you wind it on in a figure eight. One winder for each side of the dipole. The dipole centre needs a couple of appropriately sized nuts'n'bolts to join the coax to the wire elements. The holes down the middle are for using zip ties to secure the coax. Twin feed of course can be used too.
The suspension point can be used if you have to bend the long wire around corners. Just hook the wire in the slots and hang via a piece of cord from an appropriate point

G1SLP (2014)

WARNING: *Do not even think about taking the one out of the kitchen or caravan otherwise someone is liable to give you a fat ear!*

Finally, and just for fun.

Wayne M5LLT put this on Facebook and commented "*If they say we've got to wear masks, when out I'm sorted...* "

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