



FIVE AND NINE PLUS

THE OFFICIAL NEWSLETTER
OF THE
APPLEDORE AND DISTRICT
AMATEUR RADIO CLUB

Club Callsigns: G2FKO and GX2FKO
Web Site : www.adarc.co.uk

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Editor	Terry Adams	G4CHD	

February, 2017

EDITORIAL

This month's Meeting on February 20th will be hosted by Mike (G4KXQ) and promises to be an interesting new approach to our Club Meetings lineup when

members are invited to give a short talk of 5 mins or so on any historical aspect relating to their interest in amateur radio. Mike has a few



volunteers already lined up but would welcome anyone else who feels they would like to contribute to the evening - so don't be shy and let's hear your story.

Next month's meeting is of course our AGM and so please inform any Committee member if you wish to be put forward for Committee membership. I will be able to report in next month's Newsletter as to which present Committee members are willing to stand for re election.

Many of you will know that a warm welcome awaits anyone at an informal **Coffee Morning between 10am and noon every Tuesday at the Christ Church Methodist Church, Bear Street, Barnstaple** where anything (inc radio!) is discussed over a cuppa and biscuit. Most people arrive around 10.30 but please try to pop in anytime and be made very welcome.



Like most things, it is a case of use it or lose it! So that's it for this month - and see you all at the Meeting Terry (G4CHD)

CLUB MEETINGS

Meetings are held at the Appledore Football Social Club starting at 7.30pm for 8.00pm. Visitors always welcome. For further information, contact the Secretary, Alan

February 20th Memory Lane hosted by Mike (G4KXQ)

March 20th Club AGM

April 10th Club Quiz Night John (G3JKL)

(M6CCH) - details in the top panel.

CLUB HELPS TWO CORNISH AMATEURS GET THEIR INTERMEDIATE LICENCES

The Club was recently asked if we could hold an exam for two Foundation license holders from Cornwall. They were unable to find any club willing to do this south of Bath!

We of course were happy to help, and on Sunday the 22nd of January Roger and Paul May made the 2 ½ hour trip up from Penzance and took their exams. We are pleased to say they both passed and now have the calls 2E0YHQ (Paul) and 2E0EFL (Roger).

Thanks go to Beryl G1SVP as 1st invigilator, John G3JKL as exam secretary and 2nd invigilator, and Mike G3PGA for the practical assessment. To show their gratitude Paul and Roger have joined the club for this coming year.

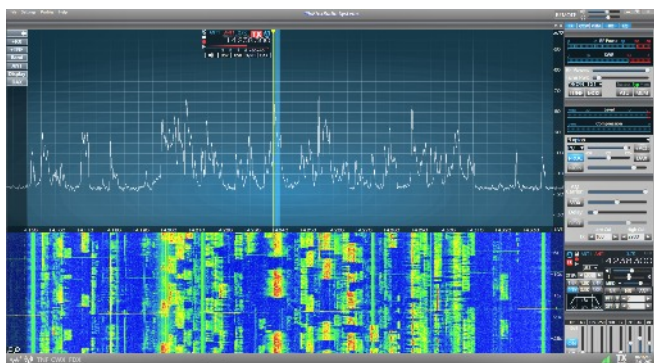
REPORT ON THE JANUARY MEETING

Flex 6300 Demonstration by John (G3JKL)

After setting up the Flex 6300 fed from an Ipro Portable 40m antenna outside on the football pitch, John began an excellent Powerpoint presentation on the many aspects of this SDR Transceiver.



The waterfall display shown below was taken previously at John's QTH and shows how easy it is to either spot the appearance of a new strong signal or equally find an unused space to call cq. The transceiver also can easily be interfaced to other software including hamradio and fldigi for example.



John explained that he is now so taken with this type of transceiver that he cannot conceive going back to the conventional type.

As always, such talks take an enormous amount of preparation and planning to produce such an informative and interesting talk. A huge thank you John for giving everyone such an enjoyable evening

Terry (G4CHD)

CROSSWORD



Many thanks to Stuart (M1FWD) for this month's Crossword.

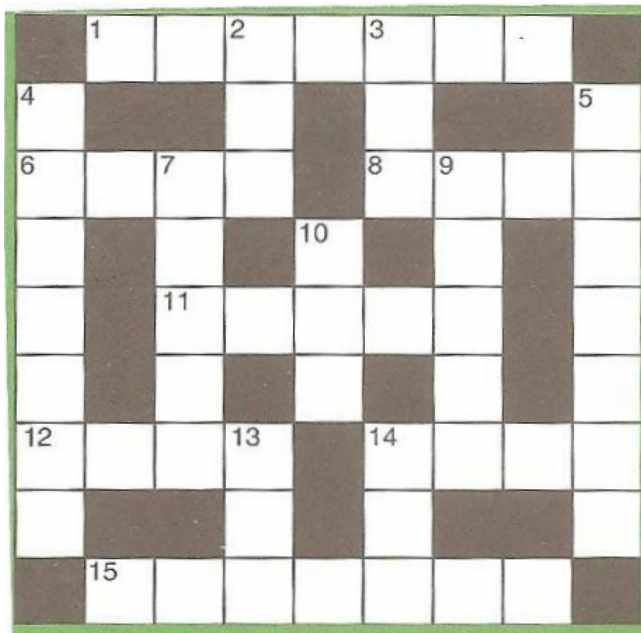
The answers will be published in next month's Newsletter. Good luck !

CLUES ACROSS

- 1) Cable enabling transmission by means of two concentric conductors separated by an insulator (7)
- 6) Arguably the most famous 20th century clown in the UK (4)
- 8) Area in an aerial's radiation pattern where the signal cancels out almost entirely (4)
- 11) An old form of measurement equivalent to 20.117 metres (5)
- 12) The sixth longest river of the UK (4)
- 14) In accordance with fact or reality (4)
- 15) The horizontal angle or direction of a compass bearing (7)

CLUES DOWN

- 2) Much ? About Nothing – Shakespeare comedy (3)
- 3) ? Rush, Liverpool FC's all-time leading goal scorer (3)
- 4) Hotel Charlie (HC) land (7)
- 5) Castle near Cork in Echo India (EI) land (7)
- 7) Tango India Nine (TI9) island (5)
- 9) Relating to the long bone in the forearm (5)
- 10) In golf, the number of strokes a first-class player should normally require for a hole or course (3)
- 13) Biblical figure in the Books of Samuel, a High Priest of Shiloh (3)
- 14) The first Pharaoh of Lower Sierra Uniform (SU) land (3)



Last month's answers :-

ACROSS: 1) switches 6) Budapest 8) gate 9) Ashe
12) software 14) crystals

DOWN: 2) Inuit 3) Chad 4) eve 5) otter 7) agist
10) Syria 11) owls 13) fir

LOCAL SKEDS

Zepp Net: Mon, Tues, Thurs : 145.450 MHz 4pm
Wed via **GB3DN** - 4pm

6m Net: Wednesday, 8pm, **51.480 MHz FM**

HF Net: Friday at 3pm **7.145 MHz ± qrm**

70cm Net: Sunday, via **GB3ND**, 11am - noon
local time.
Available on Echolink node 221334

LOCAL REPEATERS

70cm Handy Cross Repeater/Echolink (#221334)

Gateway (GB3ND)

User: Listen 433.35MHz– Transmit 434.95MHz
Access 1750Hz Tone (Timeout 4.25 mins)/ 77Hz CTCSS
Repeater keeper is Jeff (G4SOF)

2m Stibb Cross Repeater

(GB3DN)<http://www.g0rql.co.uk/gb3dn.htm>

User: Listen 145.6375MHz - Transmit 145.0375 MHz.
Access 1750 Hz Tone or 77 Hz CTCSS Repeater keeper is
Tony (G1BHM).

Yahoo users group for general chat and banter at
<http://groups.yahoo.com/group/GB3DN/>

SUDOKU PUZZLE

The aim is to enter a number into each cell so that **any column, or any row, or any block of cells contains all numbers from 1 to 9.**

4			1					5
		3			6	2		8
				3				9
				5		9		
	6		7		8	3		
	1			6				
		5		9				
	3	2	6					7
		6			3		8	

Terry (G4CHD)

Finally, I have included on the next pages a technical article that I have hurriedly written which despite this, I hope members may find interesting.

That's it for this month - hope you enjoy the Newsletter

73s de Terry (G4CHD)

WHICH ARE BEST - VERTICAL OR HORIZONTAL POLARISED ANTENNAS

It was during one Tuesday coffee morning in Bear Street, Barnstaple that this regularly debated topic raised its head yet again and thus prompted this personal view on the subject.

VERTICAL ANTENNAS

Vertical antennas produce vertically polarised radiation (ie the electrical component of the electromagnetic radiation is vertical and thus parallel to the radiating element).

In a mobile hf installation, the antenna generally uses a base, centre or continuous helical loading coil to enable the shortened antenna to resonate on the chosen hf band. Such loading coils thus introduce resistive losses which can only be minimised through the use of larger diameter wire producing a bulkier coil which is therefore only practical for base loading to minimise wind resistance.

For a quarter wave vertical, the current at its base is a maximum and therefore the I^2R losses in a base loading coil can be relatively high. G Whip manufactured an antenna which was centre loaded (requiring less inductance than base loading) together with a helically wound lower section which offered an acceptably modest wind resistance. The ProAm Whips instead adopted a varying continuous helically wound construction (windings close at the base becoming more space as one travels up the antenna).

Despite such losses, the vertical antenna has one big plus - its radiation pattern is omni directional with ideally a radiation lobe at a maximum in the horizontal. This is due to vertically polarised waves not suffering any phase shift when reflected by the ground and as a result, direct and reflected waves are additive.

However the operative word is 'ideally' as in practice the ground is not a perfect conductor resulting in the radiation lobe (ie take off angle) being more elevated and can typically be 30 degs as shown in the diagram. It has therefore always been my personal preference when operating 'static mobile' to park the car on wet earth as opposed to concrete etc. The hope is that this reduces the reactive capacitance between the base of the car and the actual conductive earth. It is then possible to achieve quite low take off angles with a mobile vertical antenna.

Why is this 'take off' angle so important - well the answer lies in the number of sky wave hops required between the transmitting and receiving antennas. The higher the take off angle, the greater the number of hops as shown in the diagram opposite. As each hop introduces a propagation loss then the fewer hops the better.

For example, for an ideal horizontal take off, angle of 1 deg, then from the diagram, a single hop distance via the F layer is between 2000 and 2600 miles depending upon the height of the F layer. It would thus take 2 hops to cross the Atlantic (approx great circle path 4000 miles).

However for a more realistic take off angle of 30 degs, a single hop distance via the F layer is only between 400 to 700 miles depending upon the height of the F layer and thus requiring anywhere from **5 to 10 hops** to cross the Atlantic! These calculations are based upon the take off angle of the lobe maximum whereas in practice, lesser strength lower angle waves will also contribute to improve the situation. This shows just how important it is to achieve as low a take off angle as possible.

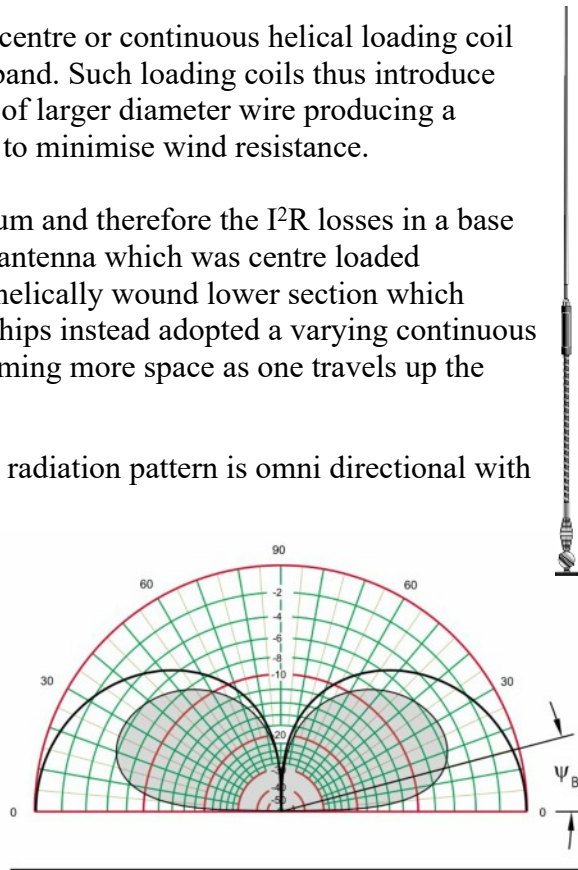
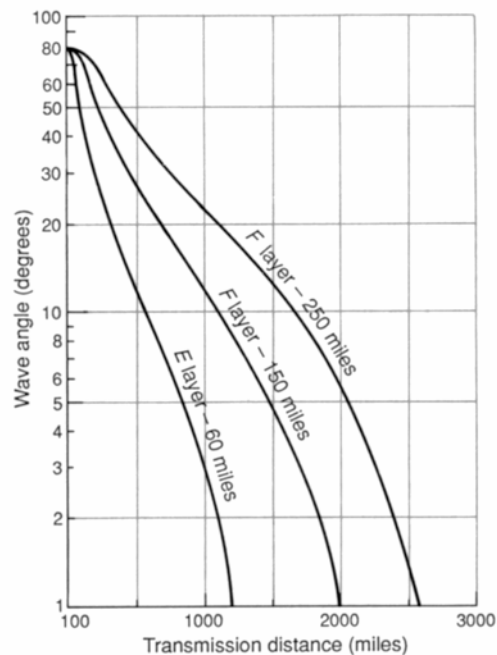


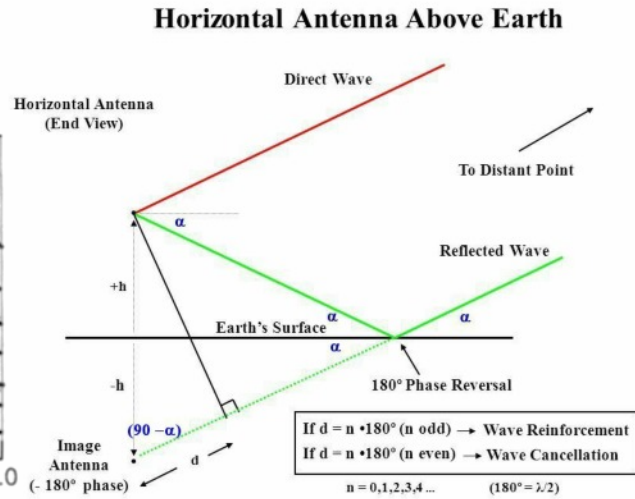
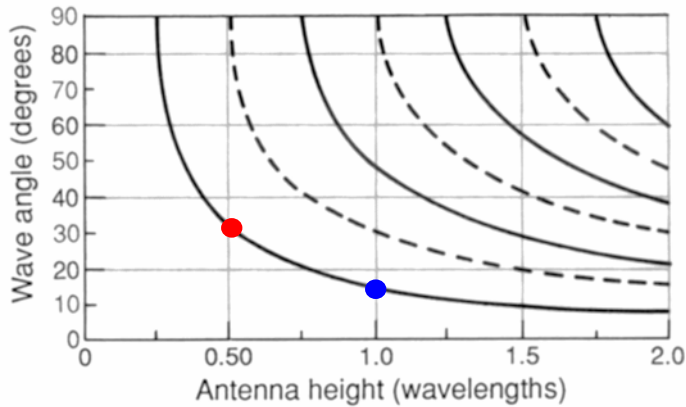
Fig 3—Vertical-plane radiation pattern for a ground-mounted quarter-wave vertical. The solid line is the pattern for perfect earth. The shaded pattern shows how the response is modified over average earth ($k = 13$, $G = 0.005$ S/m) at 14 MHz. ψ is the pseudo-Brewster angle (PBA), in this case 14.8° .



HORIZONTAL ANTENNAS

Horizontal antennas produce horizontally polarised radiation ie the electrical component is horizontal and parallel to the radiating element. However, unlike a vertically polarised wave, a horizontally polarised wave suffers a 180 deg phase shift when reflected off the earth. This leads to low angle direct and reflected waves virtually cancelling each other out resulting in horizontal antennas producing very little low angle radiation unless the antenna is at least a wavelength or more above ground.

The diagram opposite shows the geometry but the following diagram shows the resultant take off angle for various horizontal antenna heights.



For example, an antenna only half a wavelength above ground radiates with a **30 deg take off angle** (ie on 20m, the antenna is approx 33 feet above ground or 66 feet above ground for 40m operation) whereas an antenna at a height of a wavelength (ie 66 feet on 20m) radiates at a much lower **15 deg take off angle**. However as stated previously, there is a spread of take off angles about the lobe maximum which complicates the analysis. However, the need to have a horizontally polarised antenna as high as possible to minimise the number of hops required still applies.

This disadvantage is offset by horizontal antennas often having antenna gain eg using a Yagi and also being rotatable but the relatively high take off angle at low antenna heights can still have an overriding effect.

CONCLUSION

I do believe that despite the lack of directivity with a vertical antenna, its intrinsic property having a lower take off angle than a horizontally polarised antenna at a typical height of half a wavelength, can give it the edge in such a comparison. However, as always, there are many other factors which can come into play eg the nature ie conductivity of the surrounding earth and whether the land rises or falls away in the required direction. I am sure that many reading this article will probably disagree with my analysis but I would be very happy to publish their views in the 5&9 Newsletter.

Terry (G4CHD)