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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December, 2015

EDITORIAL

Welcome to the December 5&9 Newsletter. Christmas is approaching ever faster each year as is the time for New Year Resolutions. I think each year I promise myself to get on the air more and particularly to join more of the Club nets. So my rare QSL card may see light of day once again!

This month's Meeting is **a week earlier on December 14th** and is of course our **Club Christmas Party** to which members' family and friends are cordially invited. The format will be very similar to previous years - namely **free of charge** but **donations of additional food, goodies and/or Raffle prizes will be gratefully received**. So Chris and myself hope to see as many of you there as possible for a really enjoyable evening of good food, good company and a great time.

Have you revalidated your Licence ??? Remember this needs to be done via Ofcom who have started revoking those which have not been revalidated.

See the article on page 4.

So it just remains for me on behalf of your Committee to wish everyone a Very Merry Christmas and a Healthy Happy New Year.

Terry (G4CHD)

CLUB MEETINGS

Meetings are held at the Appledore Football Social Club starting at 7.30pm for 8.00pm. Visitors always welcome.

December 14th	"Club Christmas Party" (open meeting)
January 18th	"Radio Quiz" by John (G3JKL)
February 15th	"Whistles to Radios - Police Communications" by Alan (M6CCH)
March 21st	"Club AGM"
April 18th	"QSLing - Traditional to the latest methods of confirming a QSO" by John (G3JKL)

For further information, contact Alan (M6CCH) - details in the top panel.

DON'T FORGET, IT'S OUR XMAS PARTY ON MONDAY, DECEMBER 14th

SEE YOU ALL THERE

REPORT ON THE NOVEMBER MEETING

"MX0LDG Operations from Lundy"
by John (G3JKL)

Another good attendance of members to hear of John's first hand experiences in setting up and operating from Lundy during a period of both bad weather and solar unrest leading unfortunately to some very poor HF conditions. The very interesting talk was well illustrated by a slide presentation which visually demonstrated the difficulties the team had in setting up and repairing the antenna installation after the storm struck the very exposed Island.

However, despite such adversities, the expedition managed to get on the air and make some very welcome contacts. A very big thank you to John for all his hard work in preparing the talk and giving everyone present a most enjoyable and interesting insight into the trials and tribulations of operating a Special Event Station from Lundy.

Terry (G4CHD)

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**
Slow Morse:	Run by **Dave (G3YGJ)** every **Tuesday and Thursday, 7pm clock time on 145.250 mode FM.**
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/

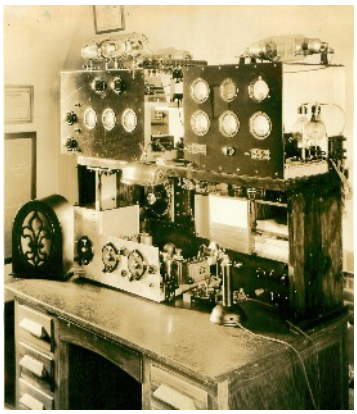
SUDOKU PUZZLE

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**.

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

Terry (G4CHD)

BIT OF RADIO NOSTALGIA



Guess this was taken well before the likes of Yaesu, Trio etc appeared!!

CROSSWORD

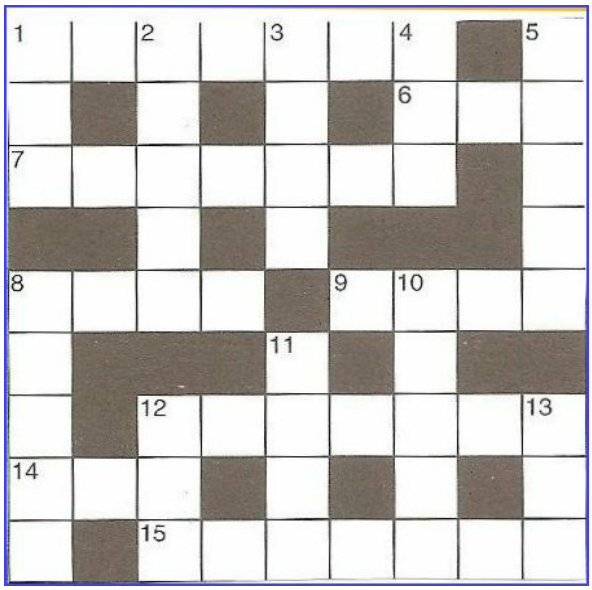
This month's Crossword is by Stuart (M1FWD).
The answers will be published in next month's Newsletter. Good luck !

Clues Across

1) Nine Uniform land (7)
6) Voice-operated switch (3)
7) The presentation of signals or data on a visual unit (7)
8) In technological applications, any function that can be used to map data of arbitrary size to data of fixed size (4)
9) Christmas (4)
12) Displacements and protrusions of parts of organs through the walls of the cavities containing them (7)
14) A large constellation said to represent the lion slain by Hercules (3)
15) An internet services company (7)

Clues Down

1) Make an offer at an auction (3)
2) Possibilities of adverse consequences (5)
3) An area or vector in an aerial's radiation pattern where the signal cancels out almost entirely (4)
4) Climbing evergreen shrub, Hedera helix (3)
5) Force out or eject (5)
8) Evergreen shrub, Ilex aquifolium (5)
10) Brilliant constellation on the celestial equator (5)
11) A language native to Victor Uniform and Alpha Papa lands (4)
12) A portion of a signal's journey from source to receiver (3)
13) To adjust an alarm clock to sound at the required time (3)



Last month's answers :-

Across 1) kegs 5) scope 7) two-step 8) filters 11) shorter 13) groan 14) Eros

Down 1) kite 2) Glorioso 3) ace 4) tern 5) station 6) operator 9) giga 10) iris 12) Hal

CHRISTMAS WORDSEARCH

Many thanks to Stuart (M1FWD) for this festive Wordsearch puzzle to keep you occupied over Christmas :-

O G Z Z C E W R G R L N I V O R Y F B G
S L E G N A R C Y T E G W B E D H L E I
B E E R K X T E E I S G E I N A R A E V
W W E R L Q K D G N N S N A N U X T F I
S D N E I R F H O W I E R A B E P U D N
S Y O I U N B I F T T B B B M Q R L R G
Y N T T F O T K Y S L G V R M V O E V W
U O P I U A I N D I G E S T I O N N M L
Y I F R R E Y C F C A N D L E A G C G J
O F S O G A A V L A S H I F S Y T E W C
J Y C T N B H C O Y M P S T A U D I H K
K E P T I Q L C D X V T R K E M S R O E
D L U L L M D F U H N I S O Q E I E Q N
U N D N K Z Q J R E Z B M Z U S R L J X
A N D H C C P A S A N T A Q T T E G Y L
X Y I Q A O L E S A U S A G E S S H U O
J T N U R A R A Y R I A F F B L L O B R
Z J G K C P O D U C P R O W E I N L B A
E T A L O C O H C S I L B E H N O L U C
X L M C A Z K U S X Z P P N M Y H Y B B

ANGELS	BEEF	BEER
BRANDY	CANDLE	CAROL
CHARITY	CHOCOLATE	CHRIST
CLAUS	CRACKLING	DECORATIONS
FAIRY	FAMILY	FLATULENCE
FRIENDS	GIVING	GREETINGS
HOLLY	HYMN	INDIGESTION
INEBRIATION	IVY	JESUS
JOY	MANGER	NEIGHBOURS
NOEL	OBESITY	PORK
PRESENTS	PUDDING	RUDOLF
SANTA	SAUSAGES	SLEEP
SPROUTS	TINSEL	TURKEY
WINE		

WORD GAME

For a 'bit of fun' try to see how many words can be made from the word 'RESISTOR'.
A quick go myself produced 20

Give it a try and see how much better you do.

UK AMATEUR RADIO LICENCES REVOKED

The following is an excerpt from the QRZ.COM website :-

Ofcom has revoked the first batch of amateur radio licences, they are believed to be the first amateur radio licences to be revoked since Ofcom was created in December 2003

Licences used to expire annually but since December 2006 Ofcom has issued Lifetime Licences and these remain in effect until Ofcom takes specific action to revoke them. Ofcom has cancelled some amateur radio licences when specifically requested by the licence holder but Cancellation is a completely different process to Revocation.

Ofcom say the reason these licences have been revoked is because the holders of those licences have not revalidated the licences as required by Clause 6(3) of the Amateur Radio Licence. The revocation of the affected licences has immediate effect. Some 529 call signs are listed by Ofcom. The revocation procedure for this first batch took about 7 weeks, the initial announcement was made on October 15 with the final stage being completed on December 4. There is a formal appeal process but Ofcom reports that no-one appealed.

It is thought that tens of thousands of amateur licences have not been revalidated as required. It remains to be seen how long subsequent batches will take but given that revocation appears to be an expensive labour intensive process it may be sometime before the backlog is cleared.

To revalidate or check your Licence expiry date, go to :-

https://services.ofcom.org.uk/

and follow the prompts with your Username & Password. Validation lasts for 5 years.

Finally, the following 3 pages contain an article I wrote many moons ago regarding the versatile W3EDP antenna which I hope some of you will find interesting.

So that's it for this month - I hope everyone enjoys the read

Best 73s and a Very Merry Christmas de Terry (G4CHD)

Merry Christmas

W3EDP

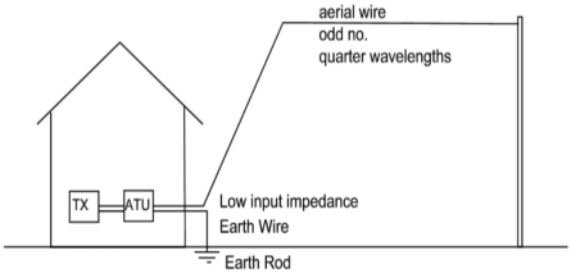
Introduction

The present qth lends itself to the use of an End Fed wire aerial system at hf. Various options exist which will be discussed in turn together with the W3EDP.

Marconi

This is normally considered to be a λ/4 (or odd multiples of λ/4) length of wire end fed against a good electrical ground since it must provide the image which forms one half of the aerial. Since one terminal is at earth potential, then the system is unbalanced and can be fed with coax. For 40m operation, λ/4 = 10.5m (35 feet) of wire is needed.

The earth wire to a good earth rod must be much shorter than λ/4 since it acts as a single wire transmission line. A λ/4 wire will present anything BUT earth to the ATU! This is not a problem on 40m where λ/4 is 10.5m but on 10m it is only 2.5m.

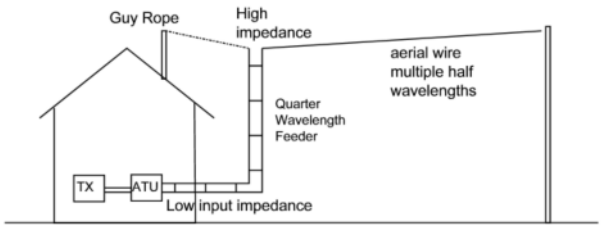


For an aerial wire 10.5m (35 feet) long we have λ/4 on 40m, and 3λ/4 on 15m giving a low input impedance on both bands at the feed point. However on 20m the wire is λ/2 long and on 10m it is λ long both giving a high impedance at the feed point and is to be avoided.

End Fed Zepp or J Match

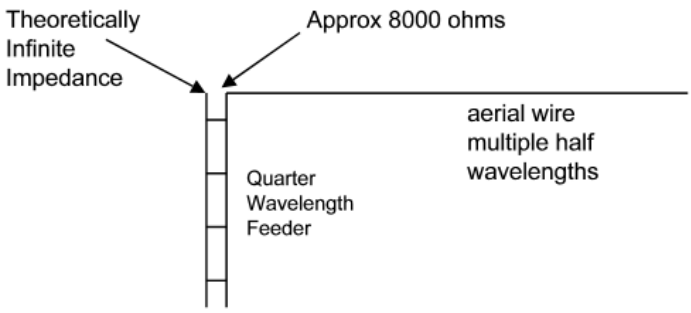
Unlike the Marconi, this aerial must be a multiple of λ/2 long. It is also end fed and presents a high impedance at the wire end. It is fed via λ/4 length of transmission line to transform the high impedance down to a low value given by the formula Z_o^2/Ra. (where Z_o is the characteristic impedance of the feeder and Ra is the end impedance of the aerial – typically 8kΩ. Hence for 600Ω feeder we get 600 x 600/8000 = 45Ω at the base of the feeder which is presented to the balanced input of the ATU.

For 40m, λ/2 is approx 21m (70 feet). Such a wire length would be 2 x λ/2 on 20m, 3 x λ/2 on 15m, and 4 x λ/2 on 10m as required.



L. A. Moxon (G6XN) has doubted the validity of the end fed Zepp.

Redrawing it we get:



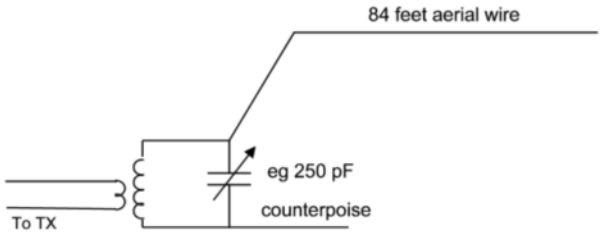
which will lead theoretically to unequal currents in the feeder wires causing feeder radiation. In practice the presence of nearby objects etc will also unbalance the line and hence there is much debate as to whether the aerials works as per theory or that its performance is helped or hindered by feeder radiation.

W3EDP

According to an article in Technical Topics Scrapbook 1985 – 1989 (RSGB) page 4, this aerial was developed by W3EDP in the 1930's and can be described as :-

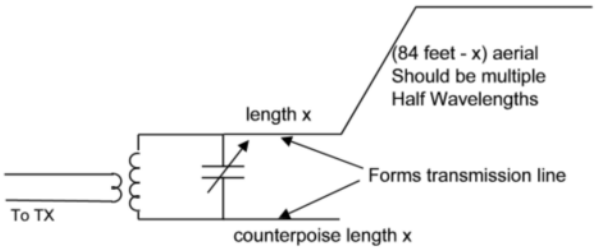
An End Fed wire some 84 feet long with a short counterpoise that varies in length with the band in use. G8PP used one in 1938-39 and the design is summarised in the following table and diagram :-

Band	Counterpoise Length (feet)
40m	17
20m	6.5
15m	3.3
10m	none



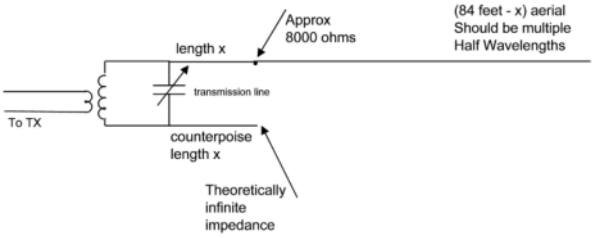
Most users report favourably on the aerial's performance.

However, to explain how it works appears to be not that easy. The 'counterpoise' is not an artificial earth as in the normal use of the word, but its purpose has been described in various ways in different articles.
One opinion is that the 'counterpoise' and the first equal length of aerial wire form a transmission line as shown in the diagram opposite :-

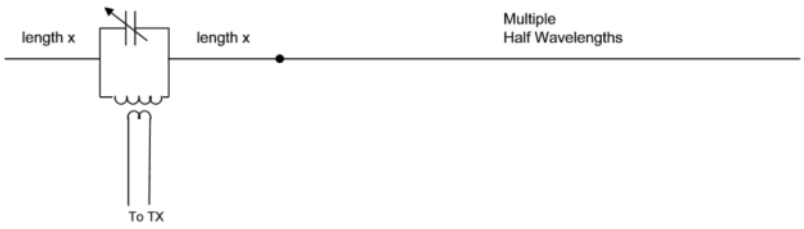


The characteristic impedance Z_o of this line will depend upon wire diameter, spacing, and relative position of the wires eg whether parallel, at right angles or in opposite directions and thus will possibly be somewhere in the region of between 500 and 1000 ohms. Hence there will be much variation the impedance presented to the tuned circuit depending upon how the wires are arranged.

However, the previous diagram can be redrawn as shown opposite:-
Although the transmission line is not λ/4 long on any band, none the less the circuit resembles that of the End Fed Zepp with all the potential problems of feeder radiation as described earlier.
However if the feeder is 'opened up' then feeder radiation will certainly occur which may have been intended in the original design.

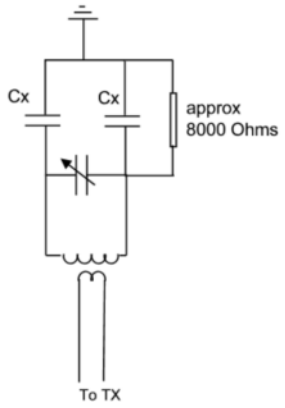


If one assumes that the counterpoise and the whole of the aerial wire should radiate, then the following is my simplified approach to explaining how the W3EDP might work.



The theory is based upon an article by L. A. Moxon in 'HF Antennas for All Locations', page 46, Fig 4.23 in which he discusses the End Fed Zepp problems and suggests adding a length x of wire to both the aerial wire and also to the open end of the feeder. Since the feeder in the Zepp is resonant (λ/4 long) then it can be considered equivalent to a tuned circuit as per the W3EDP.

If we yet redraw the previous diagram in a manner similar to Moxon's article, then we get the diagram opposite.



Each length x should be less than λ/4 and have equal capacitance to earth which is less in impedance than the end feed impedance of the multiple half waves of wire (typically 8 kohms). In this way the system will be virtually balanced as shown in the equivalent circuit opposite:-

Moxon suggests that 3 feet of counterpoise would suffice on 20m to give approx. 6pF which should give a reactance of approx. 2000 ohms on 20m. This assumes that the aerial wire is a multiple of half wavelengths and thus presents approx 8000 ohms as shown. Presumably a longer counterpoise but less than λ/4 would be even better – for 20m this would have to be less than 16 feet. Hence the figure of 6.5 feet given in the Table above would be acceptable.

The Table opposite shows the counterpoise lengths given earlier and derived lengths based upon factoring the 6.5 feet length for the other bands. Differences may be due in practice to the effects of stray capacitances particularly as originally the tuned circuit was link coupled directly to the PA which was 'hot' to rf.

Band	Factored length (Moxon (feet)	W3EDP (feet)
40m	13	17
20m	6.5	6.5
15m	4.3	3.3
10m	none	none

If we therefore use the original W3EDP lengths of counterpoise, then the remaining length of 84 feet wire should be a multiple of half a wavelength. The following Table attempts to check whether this condition is met. The final column should equal 84 feet and is only approximately met!!

Band	Frequency (MHz)	Wavelength (m)	Multiple of half wave-lengths (feet)	Counterpoise length (feet)	Required total wire length (feet)
40m	7.07	42.43	λ/2 = 21.22 = 70	17	87
20m	14.2	21.13	λ = 21.13 = 69.7	6.5	76
15m	21.3	14.09	3 x λ/2 = 21.13 = 69.7	3.3	73
10m	28.5	10.53	5 x λ/2 = 26.3 = 87	none	87

Suggested Alternative Design

If a link coil is made to the tuned circuit to step down to a low impedance for feeding an ATU and stray capacitances are minimised, then hopefully a common length of counterpoise would work. Based upon the need for the counterpoise to hence be less than λ/4 on 10m (ie be less than 8.5 feet) then if a value of about 7.3 feet is used as a counterpoise on each band, then a 77 feet length of wire should be appropriate as shown in the following Table:

Band	Frequency (MHz)	Wavelength (m)	Multiple of half wave-lengths (feet)	Counterpoise length (feet)	Required total wire length (feet)
40m	7.07	42.43	λ/2 = 21.22 = 70	7.3	77.3
20m	14.2	21.13	λ = 21.13 = 69.7	7.3	77
15m	21.3	14.09	3 x λ/2 = 21.13 = 69.7	7.3	77
10m	28.5	10.53	4 x λ/2 = 21.05 = 69.5	7.3	76.8

So much seems to depends upon the effects of stray capacitances that only a practical investigation of this design will show its worth. The design does assume that the extra lengths x present equal capacitances to earth and hence should be symmetrical and with little interaction between themselves. I have yet to test this design but would be very interested to hear of anyone else's attempts to use the W3EDP aerial.