



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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February 2021

EDITORIAL

Welcome to another Club Newsletter.

Regrettably it looks as if Covid 19 prevents the Club holding its AGM with members attending in person and having a good chat afterwards - so instead we will be having another **Zoom hosted Virtual AGM on Monday March 15th** (beware the Ides of March!) starting at 7.30pm with the Waiting Room open from 7pm.

I'm delighted to report that **everyone presently on the Committee is willing to stand for re-election** for their present positions. In addition, **Ben (2E0FTZ)** is willing to stand for election to the Committee. If anyone else wishes to either propose a Club member or wishes to stand themselves for any position on the committee, then please contact any Committee member ASAP.

Members may recall that due to the Covid 19, last year's AGM was postponed until last June. Consequently, the Jim McFee Cup and the new John G0UNB Award were not awarded for this last Club year. However, the Committee have decided to announce at this year's virtual AGM the **recipient of the John G0UNB Award** for the member who has done the most to promote constructional activity within the Club and help practically in general. Due to the present pandemic, the Committee are debating whether to further delay awarding the **Jim McFee Cup** until a degree of normality returns to Club activities.

Finally, with no other options on offer, the **February Club Meeting on February 15th (next Monday)** will be a short Zoom Talk on **Setting Up and Using the NanoVNA** given by yours truly - Terry G4CHD. If members so wish there could be a follow up Zoom Talk looking at using the NanoVNA with suitable software on the following Monday. However, I would certainly **NOT** be offended if there was a huge plea to not be subjected to further torture!!

Keep safe and keep healthy Terry (G4CHD)



CLUB MEETINGS

Due to the present Covid 19 pandemic, **ALL** meetings scheduled to be held at the Appledore Football Social Club have been **CANCELLED** until further notice. Until Meetings are reinstated a programme of 'virtual meetings using Zoom' has been arranged :-

Date	Topic
Feb 15th	Zoom Talk - "Setting Up & Using the NanoVNA" by Terry (G4CHD)
Feb 22nd	Zoom Talk - "Using the NanoVNA with Software" by Terry G4CHD
Mar 15th	Virtual AGM via Zoom followed by general chat

It is hoped to add further Zoom Meetings so if you want to give a talk, please contact any Committee member.

JANUARY ZOOM MEETING

IC-705 by Mike (G4KXQ)

Mike (G4KXQ) gave us a most informative and interesting talk on his newly acquired IC-705 which he got from his xyl for Xmas.



Mike explained how easy it was to interface it to a laptop etc and how the display was similar to that of the IC-7300.



The rig uses a BNC connector for both HF and vhf/uhf and Mike had designed and fitted an adaptor to allow the use of PL259s. There are only a few niggles such as no internal ATU and no USB

cable provided. Being such a new rig, for anyone interested in getting one for themselves, it was brilliant to be able to hear Mike's enthusiasm for the rig and get his in detail assessment. This was yet another most interesting talk from Mike and considering how little notice he had to prepare, the Club is most grateful for all his hard work. For anyone who missed the talk, drop me an e mail and I can send you the link to access a recording of the Meeting. Once again Mike, many many thanks for a great talk.

LOCAL REPEATERS

2m Stibb Cross Repeater (GB3DN)

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

User: Listen 145.6375 MHz - Transmit 145.0375 MHz.

Access 1750 Hz Tone or 77 Hz CTCSS

Repeater keeper is Tony (G1BHM)

Fusion/C4FM/WiresX Gateway (MB6DT)

Frequency 144.8125 MHz.

Keeper Darren (2E0LVC)

Fusion/C4FM/WiresX Gateway (MB6DN)

Frequency 144.825 MHz.

Keeper Drew (2E0FQE)

LOCAL NETS

Zepp FM Net: Mon/Tues/Thurs/Fri :
145.450MHz - 4pm - 5pm
Wed via GB3DN - 4pm - 5pm

2m Elevenses FM Net: Mon/Tues/Thurs :
11 - 12.00 noon 145.475MHz
Wed/Fri :
11 - 12.00 noon via GB3DN

Friday Night 2m Net: Friday : 145.450 FM, 8 - 9pm

2m SSB Nets: Wed: 8 - 9pm 144.260MHz
USB SSB
Sun: approx 10.30am (follows
Top Band Net) 144.260MHz
USB SSB (Vertical polarised)

Top Band Net: Sunday 1.860 Mhz
9.30 - 10.15am
(LSB - 32W pep max)

CROSSWORD

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

The answers are in next month's Newsletter. Good luck !

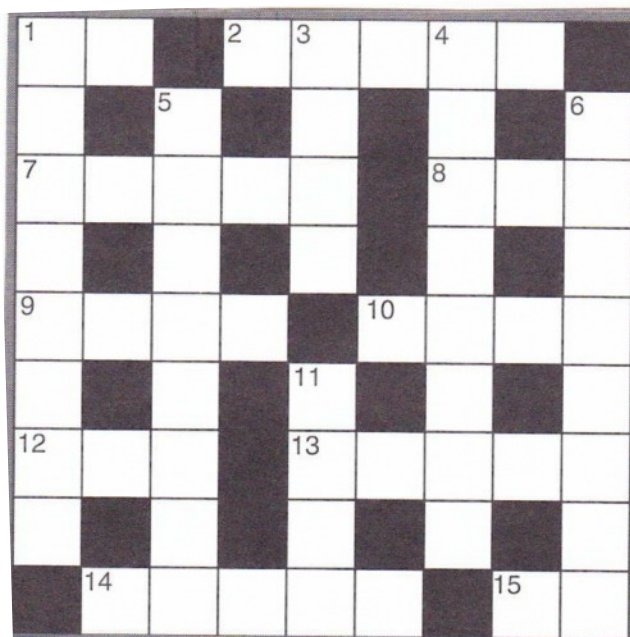


CLUES ACROSS

- 1) ? Chi Minh City, the largest city in X-Ray Victor (XV) land (2)
- 2) Sea bird of the family Sulidae (5)
- 7) 1977 US historical drama about slavery – main character Kunta Kinte (5)
- 8) ? Lanka, Four Sierra (4S) location (3)
- 9) A chemical cleaning agent used during soldering (4)
- 10) Thin flat strip of wood forming a foundation for plastering (4)
- 12) One of a series of bones (12 pairs in humans) articulated to the spine (3)
- 13) Type of small lizard (5)
- 14) ? electricity, an alternating current power supply (5)
- 15) The impulsive part of our psyche (2)

CLUES DOWN

- 1) Capital of the state of Connecticut, USA (8)
- 3) River in North Yorkshire (4)
- 4) Capital of the state of North Dakota, USA (8)
- 5) Capital of the state of South Carolina, USA (8)
- 6) Capital of the state of Virginia, USA (8)
- 11) Dialect form of 'against' (4)



Last month's answers :-

ANSWERS ACROSS: 1) station 6) erg 7) Madaira
8) core 9) Lima 12) printed 14) tea 15) catarrh

ANSWERS DOWN: 1) sum 2) adder 3) iris 4) Nea
5) agora 8) Crete 10) inter 11) pint 12) Pac 13) doh

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

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

Terry (G4CHD)

USING EZNEC TO MODEL 40M DIPOLE FED VIA A BALUN AND COAX

by Terry (G4CHD)

This article, written hurriedly by myself, uses the latest free version of EZNEC which offers all the functions of the full paid versions but limits the number of allowed segments - not a problem for antennas having few elements.

This latest version (v6) includes transformers and transmission line feeds and is therefore very powerful.

The article follows on the next 3 pages and I hope you enjoy the read and perhaps may feel like having a go yourself. Work through my simple example and then try it on your own design if that helps.

So that's it for this month

Hopefully not too many errors this month!!

Terry (G4CHD)

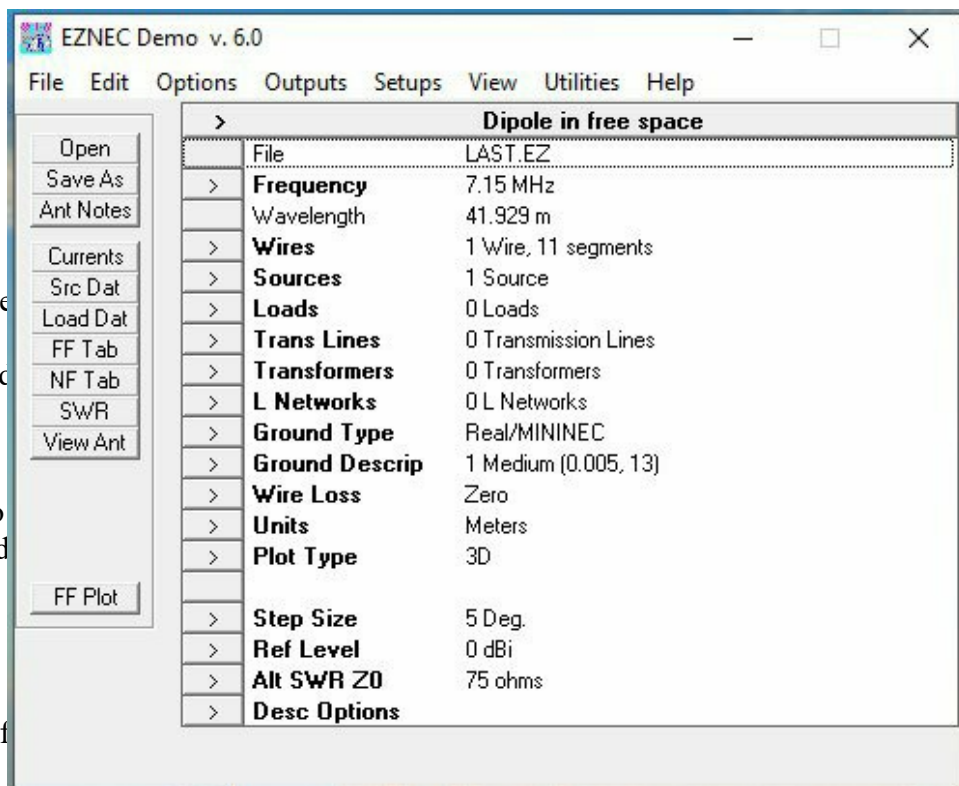
USING EZNEC V6 TO SIMULATE 40M DIPOLE FED VIA BALUN AND COAX

by Terry (G4CHD)

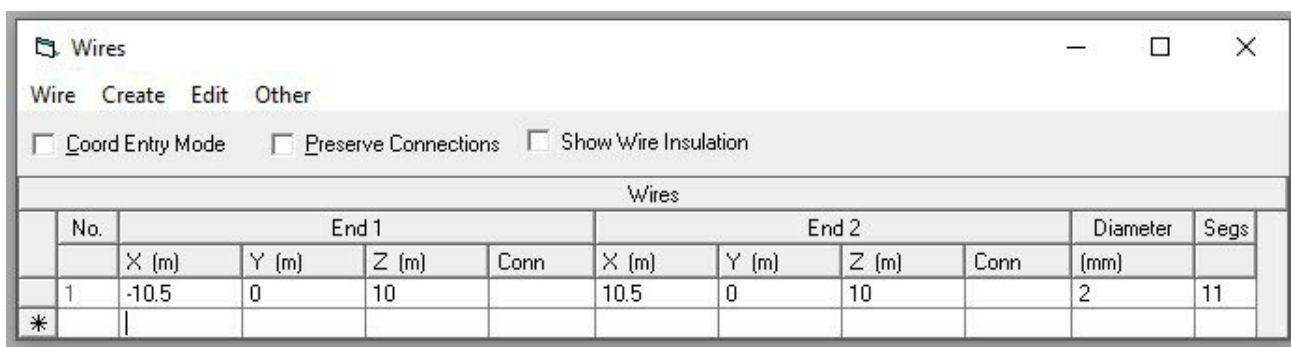
- Download and install from :

<https://www.eznec.com/demoinfo.htm>

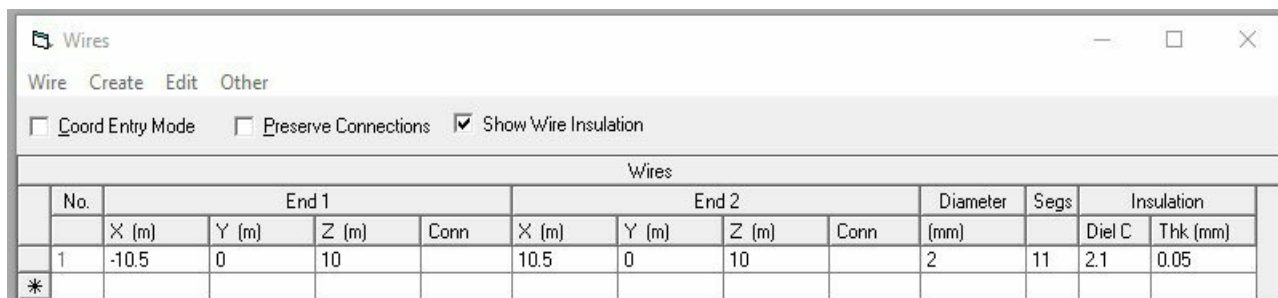
- Run program and get opening screen :-
- File tab is automatically the last one you worked with.
- Set your working frequency
- Wires tab allows you to define the end coordinates of each wire. Wires can only be joined at their ends having the identical coordinates.
- The 40m dipole is assumed to be 10m above real ground and made from 2mm diameter copper wire.
An initial overall length of 21m is assumed which is divided into an odd number of segments (so a true antenna middle can be



defined) - note that the free version of EZNEC is limited to 20 segments in total. Selecting the Wires tab gives the following window which has the values entered. Note that to enter any value, use the Tab key:-



- Wire Insulation can be added by clicking Show Wire Insulation which adds 2 further Insulation columns as shown below :-



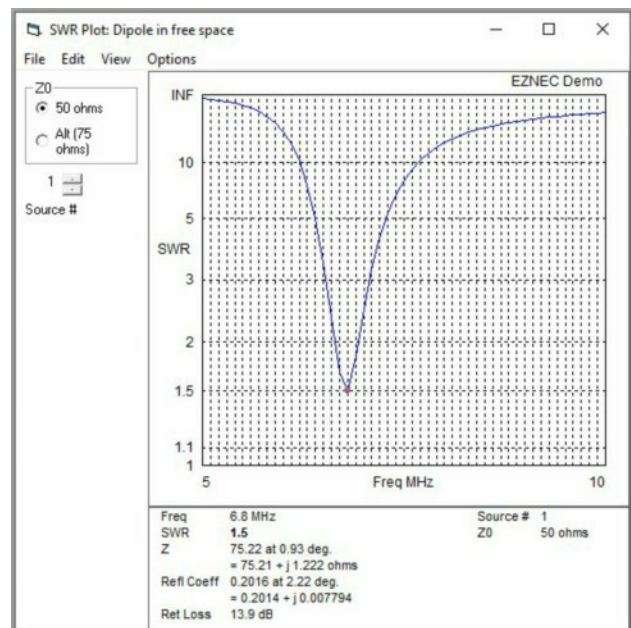
Move the cursor to Diel C entry box and right click to bring up options. Select the insulation material. Now enter the insulation thickness.

8. Sources tab allows a source to be located ON a wire at a given position. We need the source to be at the centre (50% from one end) of the only wire 1 as shown :-

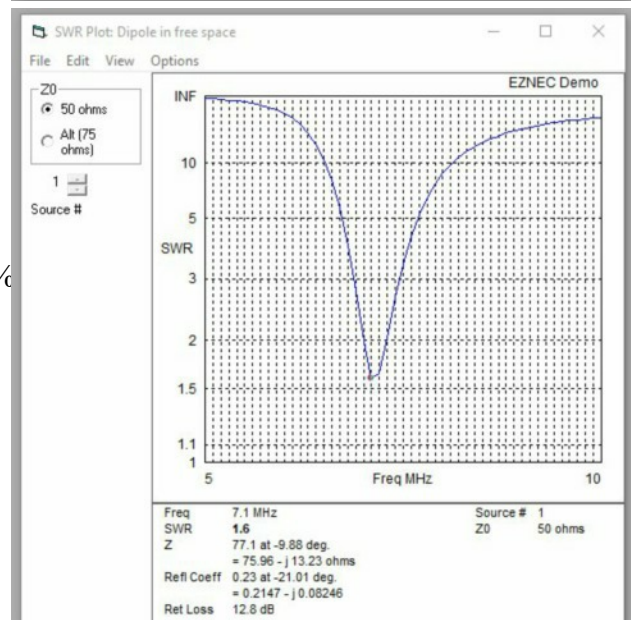
Sources								
No.	Specified Pos.		Actual Pos.			Amplitude	Phase	Type
	Wire #	% From E1	% From E1	Seg	[V, A]	(deg.)		
1	1	50	50	6	1	0	V	
*								

9. Now that the antenna geometry and source have been defined, the wire material and type of ground can be defined. Open the Wire Loss tab and select Copper as the material and click OK. Now open the Ground Type tab and select Real and MININEC and click OK.

8. A View of the antenna can be seen by pressing 'View Ant' button on left.
9. To see an SWR Plot of the antenna, press the SWR button on the left and enter the Start, Stop and Step frequencies eg 5MHz Start, 10MHz Stop, 0.1MHz Step and press Run. Eventually a plot as shown opposite will appear. Clicking on the minimum of the plot reveals the SWR value and frequency at which it occurs.



The plot opposite shows a minimum SWR of 1.5 at 6.8MHz. Hence the antenna is too long and needs shortening. Return to the Wires tab and edit (using tab key) the X values to -10 and + 10 instead of -10.5 and +10.5 and once done rerun the SWR Plot to give the lower Plot shown opposite :-



The plot minimum SWR is now 1.6 at between 7.1 and 7.2MHz. The antenna impedance is 77 ohms resistive and -10 ohms capacitive reactive.

10. Now that we have a correctly tuned antenna, the source will now fed the antenna via a 1:1 Transformer (Balun). One side of the transformer will connect to 50% along Wire 1 whereas the other side connects to 50% along a Virtual Segment V1.

This will require the Source connection to be changed from 50% along Wire 1 to 50% along V1.

To do this open the Transformers tab and enter the above values as shown below :-

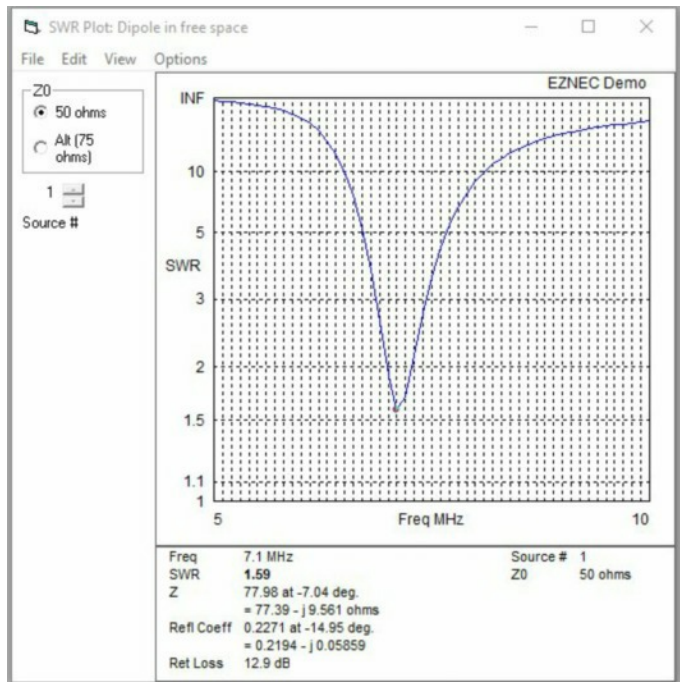
Transformers											
No.	Port 1 Specified		Port 1 Act		Port 2 Specified		Port 2 Act		Port 1	Port 2	Rev/Norm
	Wire #	% From E1	% From E1	Wire #	% From E1	% From E1	Rel Z	Rel Z			
1	1	50	50	V1			50	50		N	
*											

The Source now should look like this :-

Sources							
No.	Specified Pos.		Actual Pos.		Amplitude	Phase	Type
	Wire #	% From E1	% From E1	Seg	(V, A)	(deg.)	
1	V1				1	0	V
*							

If we now rerun the SWR Plot function, we get the Plot shown lower down opposite :-

As can be seen the resonant frequency is still between 7.1 and 7.2MHz with a minimum SWR of 1.6 but the impedance at the output of the Balun is now slightly different ie 78 ohms resistive (was 77 ohms) and -9.5 ohms capacitive reactance (was -10 ohms) - so virtually a perfect Balun.



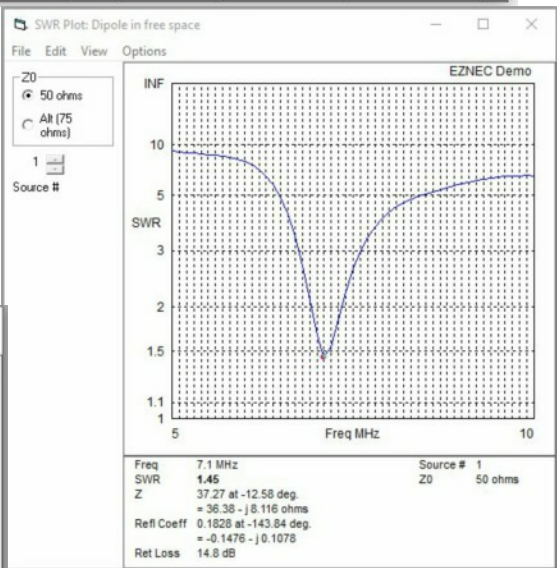
- Finally, the Source will now be changed from directly feeding the Balun to feeding it via eg 40m of RG8 X having a Velocity Factor of 0.8 and losses of 3dB/100m at 10MHz.

This is achieved by opening the Trans Lines tab and similar to the Balun, one end is connected to the Virtual Segment V1 (the output of the Balun) and the other end connects to another Virtual Segment V2. Also similarly to the Balun, there must be a change to the connection point of the Source which must change from the centre of V1 to the centre of V2. The Transmission Line entry should look like this :-

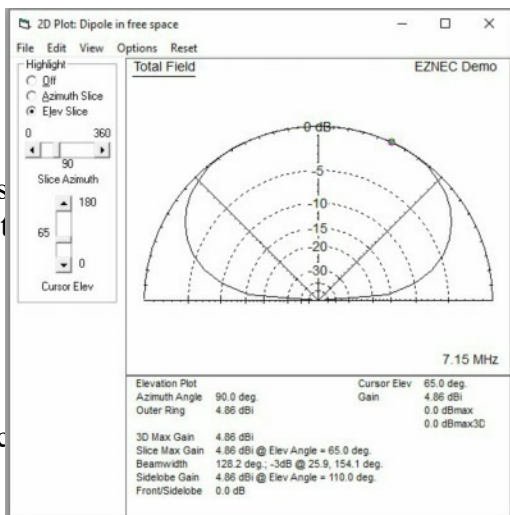
Transmission Lines												
No.	End 1 Specified Pos.		End 1 Act	End 2 Specified Pos.		End 2 Act	Length	Z0	VF	Rev/Norm	Loss	Loss Freq
	Wire #	% From E1	% From E1	Wire #	% From E1	% From E1	(m)	(ohms)			(dB/100 m)	(MHz)
1	V1			V2			40	50	0.8	N	3	10
*												

- After changing the Source feed point to V2 instead of V1, the final SWR Plot can be run to get the plot shown opposite

The final SWR presented to the transmitter is 1.45 at a renyency just above 7.1MHz. The impedance presented to the transmitter is 37 ohms resistance and -12.5 ohms capacitive reactance.



- The radiated signal pattern is obtained by clicking on the FF Plot button and in the window that opens click on Show 2D Plot to get :-



- Now that the antenna system has been modelled, it is easy to investigate the effect of any change.

The plot shows the expected NVIS pattern resulting from the antenna being only $\lambda/4$ (10m) above ground.