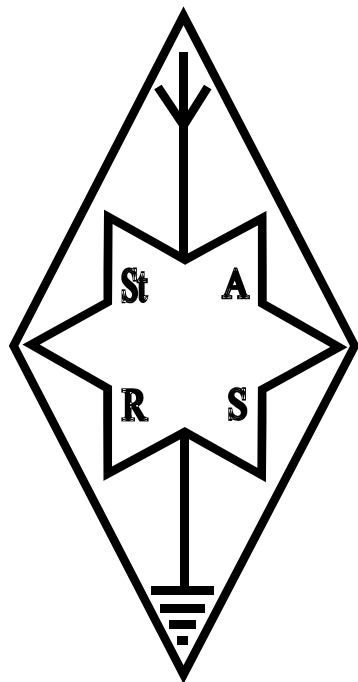


# STARLITE

G6OI  
1938

The Newsletter for Members and Friends of  
**Stourbridge and District  
Amateur Radio Society**  
incorporating  
**Old Swinford Hospital School Radio Club**

G6SRS  
1938



G4CVK

1969

**ISSUE**  
**08/2010**



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# STARLITE

Visitors always welcome

**MEETINGS**

The Society holds its full meetings on the

1st and 3<sup>rd</sup> Monday's of each Month at

**Old Swinford Hospital School**

**Heath Lane**

**Stourbridge**

**(8.00pm – 10.00pm)**

Additionally the shack is open during the same times on the intermediate Monday's

*All correspondence/enquiries should be addressed to the  
Hon. Secretary:*

**John Clarke M1EJG  
(01562) 700513**

**[honsec@g6oi.org.uk](mailto:honsec@g6oi.org.uk)**

STARS Web Site

WAP enabled ??

**STARS**

**C/O The Mill House**

**21 Mill Lane**

**Blakedown**

**Kidderminster**

**DY10 3ND**

**[www.g6oi.org.uk](http://www.g6oi.org.uk)**

**[www.g6oi.org.uk/wap/index.wml](http://www.g6oi.org.uk/wap/index.wml)**

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# STARLITE

## EDITORIAL

Included in this month's Newsletter is the concluding part of the article on the Yagi Computer Aided Design Program -YagiCAD.

Also included is a URL to access internet radio with a difference and gives access to live Police and Fire and Ambulance Service broadcasts across several continents. As expected the USA is well represented.

Wayne Mocroft's (M5LLT) talk on Digital Slow Scan T.V. was well attended, The talk included a practical demonstration of sending and receiving images using the digital mode of SSTV and was well received by all those attending.

As usual, any contributions for articles for Starlite would be well received !!!!

Best 73's

Adrian (G0NLA) – Newsletter Editor – [editor@g6oi.org.uk](mailto:editor@g6oi.org.uk)

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# STARLITE

## Computer Aided Yagi Design using YAGICAD 5.2

### Following on from the Previous Article

You may recall from last month's article that I had found an aerial that was close to my design criteria but wanted to make a few small changes.

### First Aerial proves unsatisfactory

Despite my good intentions, I took the design at face value and built the aerial using the published dimensions. The results were not what I had hoped for. The SWR was over the 3:1 expected value and the Tee match didn't seem to be a lot of help. I went back and re-read the original article and my dimensions seemed to be as stated. I had not used the recommended coax suggested for the balun and as one often does, parked the project in the corner awaiting inspiration or more likely the next clear-out.

I entered the published dimensions into YagiCAD and the radiation pattern looked good and the aerial seemed to have a good front-to-back ratio albeit at 146.5Mhz. The calculated SWR was off the YagiCAD scale of 3:1 and when I tried to use the facility in YagiCAD to calculate the dimensions for a "Tee match with no capacitor", I kept on getting the message "No match possible, Try different values". I again re-read the original article with more of an eye to detail and noticed that the aerial is not designed for transmitting and that the director length might need to be changed. Also I had taken the balun dimensions on trust and didn't understand how it worked etc.

### A glimmer of hope for my failed project

Clearly some more self education on matching and baluns was required. After some searching I came across two articles entitled "Playing with Matches". Of particular interest was that the articles related to the VK3VT aerial and also to YagiCAD. Article 1 at <http://www.yagicad.com/misc/misc.htm> is not for the faint hearted, however article 2 was of particular interest. Also I found clearer construction details at [http://www.foxhunt.com.au/2m\\_sniffer/manual\\_v2\\_1.pdf](http://www.foxhunt.com.au/2m_sniffer/manual_v2_1.pdf) on page 14 of the pdf file.

### So what does the revised VK3VT design look like in YagiCAD 5.2?

Below, I have entered the revised VK3VT aerial dimensions into YagiCAD and you should get results close to those shown below. Note that all dimensions are in meters and all measurements are taken from the reflector element of the Yagi. As per the original VK3VT design the match has been set to a Tee match in the Toolbox section on YagiCAD (Tee with no C). Also the Tee match will have an impedance of 200 Ohms and the 4:1 balun will match this to the expected 50 Ohms impedance of a hand held rig. My balun was made out of RG8 coax however I am sure that the the suggested less bulky RG174 would provide a neater result.



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## Revised Dimensions

Element	Length(Meters)	Spacing(Meters)	Diameter(Meters)
Reflector	1.029	0.0	0.0005
Driven Element	0.981	0.311	0.0005
Director	0.930	0.622	0.0005

Yagi Computer Aided Design version 5.2 Copyright 1991-2007 Paul McMahon VK3DIP

File Edit Calculate Toolbox Help

Title: VK3VT Fox Hunt Yagi - modified Source: NONE

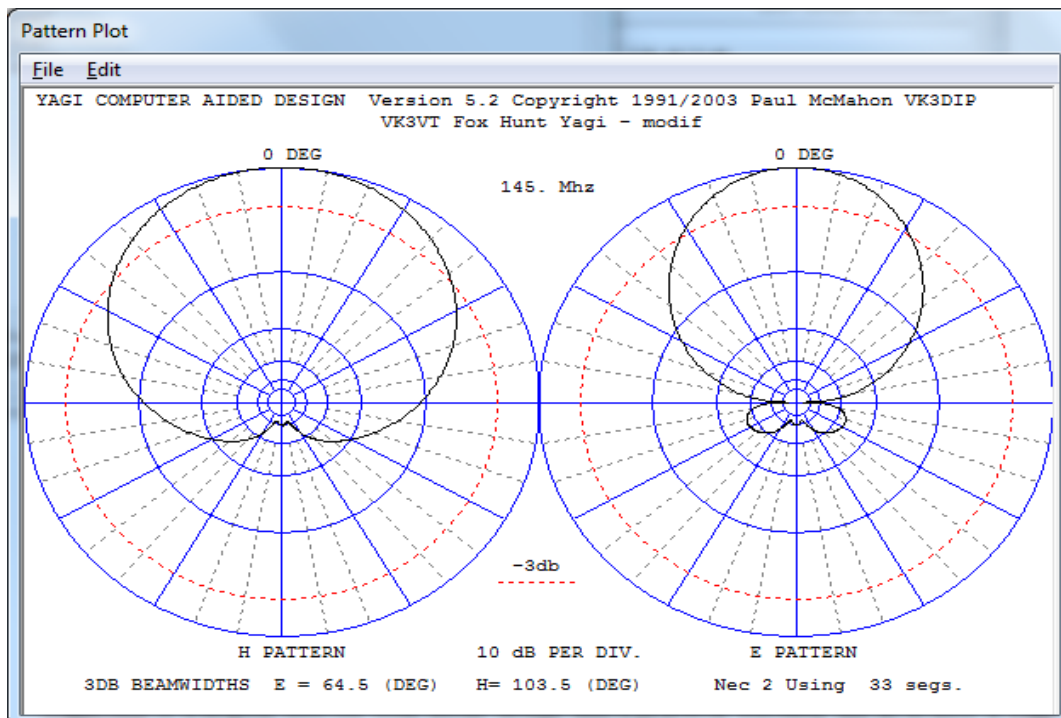
FILE: Z:\Documents\Downloads\YC52Dist\Starlite\_Aug\_2.yag LAST SAVED: 07-16-2010

Comments: Playing with matches Part 2

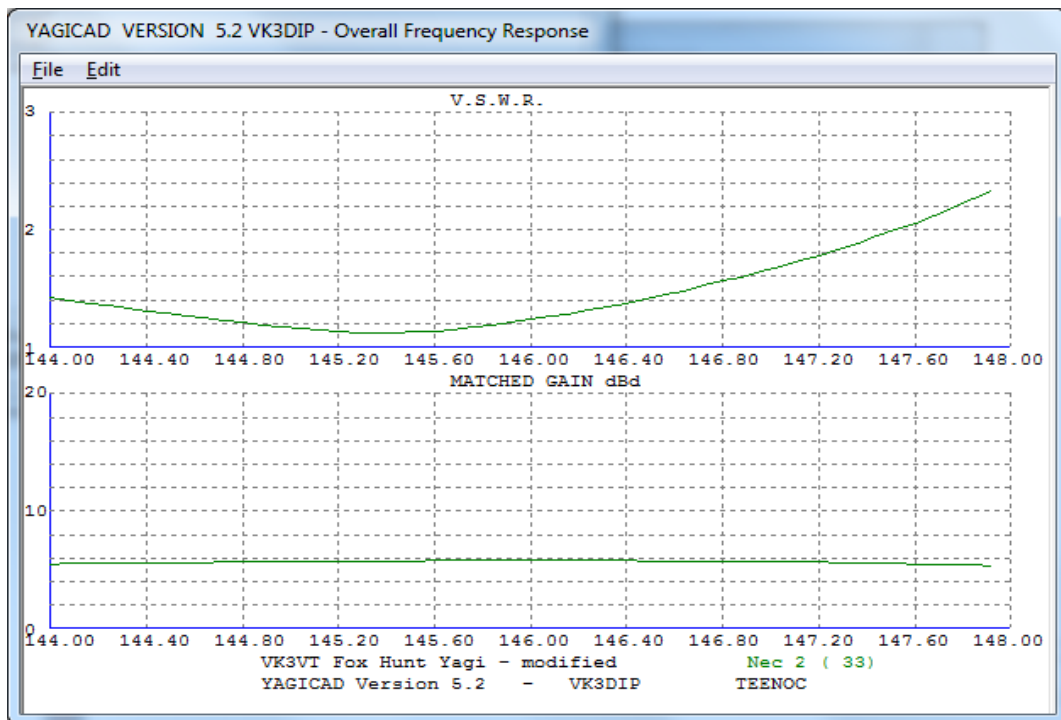
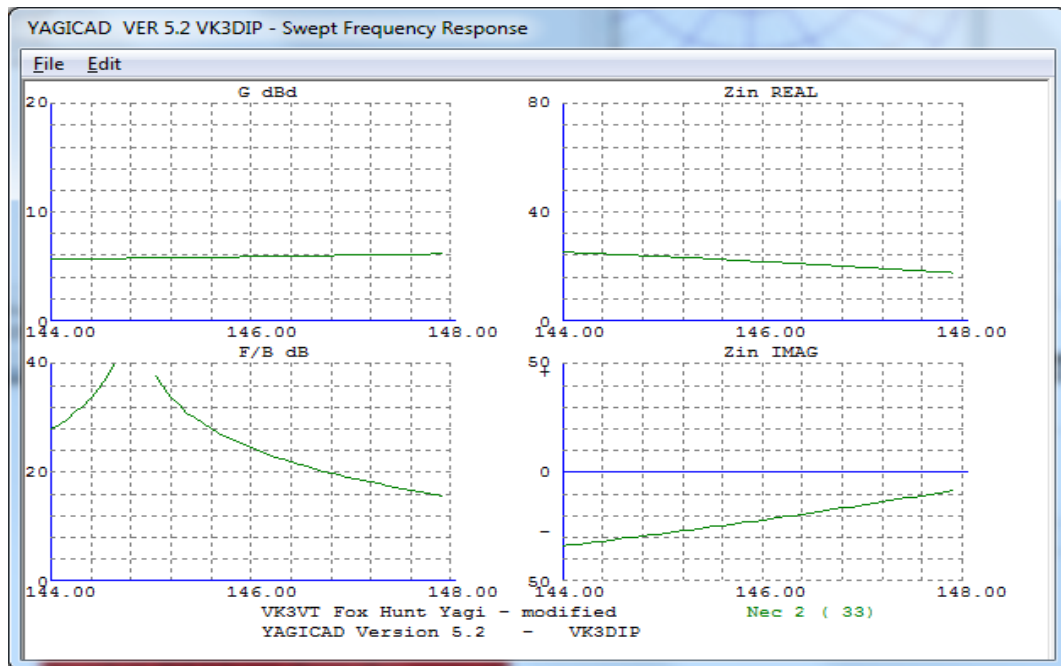
Frequency: 145 MHz F/B: 40.73 dB  
Z IN: 24.08 - J 20.96 OHMS

Elem.	Spacing(M)	Length(M)	Diam.(M)
Ref.	0.0	1.029	0.0047
Drv.	0.311	0.9811	0.0047
D1	0.622	0.919	0.0047

Boom diam. 0.014 (M) Element lengths displayed using GE3SEK/DL6WU correction factor  
Tee (No C)Match - ARM LENGTH 0.148 (M) SPACING 0.014(M) DIAM. 0.0047(M)



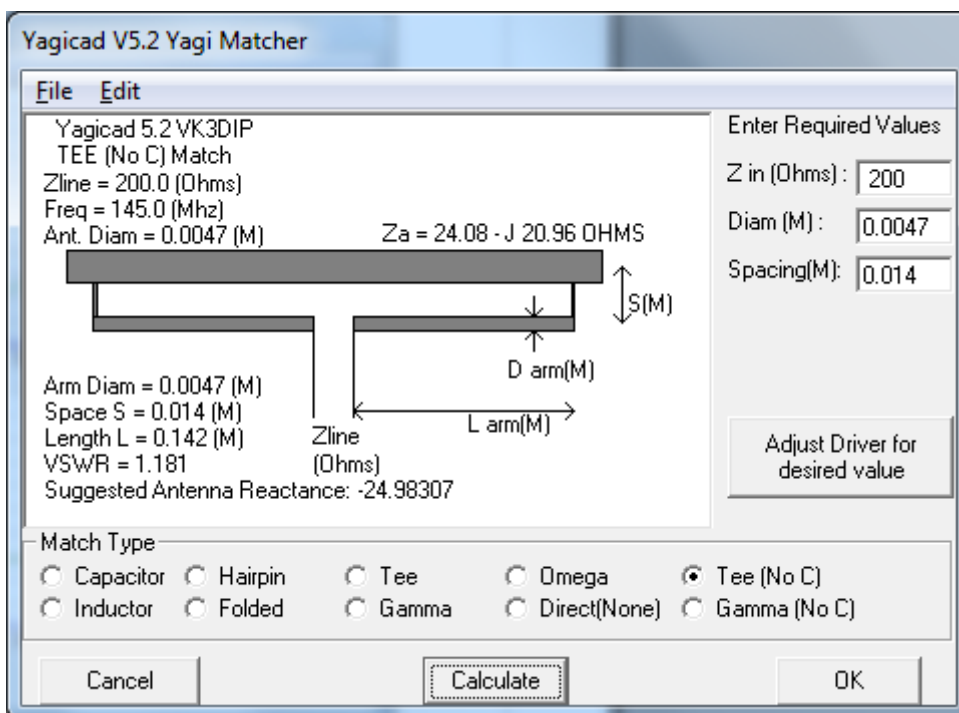
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With some trial and error in YagiCAD it is possible to shift the front-to-back peak to the desired part of band.

Below is the window in YagiCAD that gives dimensions required to construct the Tee Match with no capacitance. The coax balun is not part of any of the YagiCAD graphs other than the in the “Z in (Ohms)” box where the desired value is set to 200 Ohms. Note also that the Boom Correction has to be selected as GE3SEK/DL7WU under Toolbox > Options since the aerial elements are attached to the aerial's boom rather than insulated from the boom. On this point, the only items not directly attached to the boom are the Tee matching arms

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## So what did I learn from the project?

YagiCAD is a helpful tool for both aerial design and a practical teaching aid as to how a Yagi works.

Often one wrongly assumes that designs one finds either on the Internet or magazine articles will, if followed to the letter, work perfectly.

If a design works in practice it should also work in theory. It's worth using YagiCAD to check out a design to model the expected theoretical aerial performance.

At the time of writing (August 2010) a newer version of YagiCAD 6.1.5 is available. This is well worth investigating.

I have a better understanding of how yagi dimensions and spacing affect performance but there is still plenty left to learn.

Don't give up when a project seems to have failed. There is often a lot to be learned by trying to find out why one has failed.

Very low SWR doesn't seem to be a key factor for the Direction Finding Community.

# STARLITE

## Acknowledgements

I would like to thank VK3VT Greg Williams for his original DF aerial design and Fox Hunt beam web site and also VK3DIP Paul Mc Mahon for his splendid Yagi design software and the article Playing With Matches.

Any errors and misconceptions about Yagi design and construction and Direction Finding aerials are all mine – G0NLA – Adrian Bryan

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## Seen on the Web

Check out the following links :-

**The link for live scanners online is:**

<http://www.radioreference.com/apps/audio/>

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# STARLITE

## YOUR COMMITTEE

Hon. President	NICK	G6DQN	
Vice President	JAMES	G7HEZ	
Hon. Secretary	JOHN	M1EJG	(01562) 700513
Hon. Treasurer	JOHN	G8UAE	
Committee Members	ADRIAN	G0NLA	
	MALCOLM	G8BOP	
	ANDREW	M6APJ	

## CALENDAR of EVENTS

**It should be noted that the Shack will be open every Monday evening unless shown otherwise in the Calendar**

August	Mon 2nd	Open Shack Night - On air or natter
	Mon 9th	Open Shack Night - On air or natter
	Mon 16th	Open Shack Night - On air or natter
	Mon 23rd	Open Shack Night - On air or natter
	Mon 30th	Bank Holiday
September	Sat 4th Sun 5th	S.S.B Field Day
September	Mon 6th	Informal - On air or natter
	Mon 13th	Open Shack Night - On air or natter
	Mon 20th	Main Meeting - Not yet arranged
	Mon 27th	Open Shack Night - On air or natter
October	Mon 4th	Informal - On air or natter
	Mon 11th	Open Shack Night - On air or natter
	Mon 18th	Main Meeting - Not yet arranged
	Mon 25th	Open Shack Night - On air or natter
November	Mon 1st	Informal - On air or natter
	Mon 8th	Open Shack Night - On air or natter
	Mon 15th	Surplus Sale
	Mon 22nd	Open Shack Night - On air or natter
	Mon 29th	Open Shack Night - On air or natter
December	Mon 6th	Informal - On air or natter
	Mon 13th	Open Shack Night - On air or natter
	Mon 20th	Main Meeting - Not yet arranged
	Mon 27th	No Meeting
January	Mon 6th	Informal - On air or natter
	Mon 13th	Open Shack Night - On air or natter
	Mon 20th	Main Meeting - Not yet arranged
	Mon 27th	Open Shack Night - On air or natter

