



Mid Sussex Matters

Volume 5 - August Issue 2017



With August Bank Holiday nearly here we are reminded that we have very little time to check that we

have signed up for either helping during 23 September for Haywards Heath Town Day or our yearly trip to Barcombe for a game of Skittles on September 29. Please make sure that if you want food you should let me know by 22 September. Remember to take your money with you for both food and drink on the night.

Looking onward we are due the AGM. There are

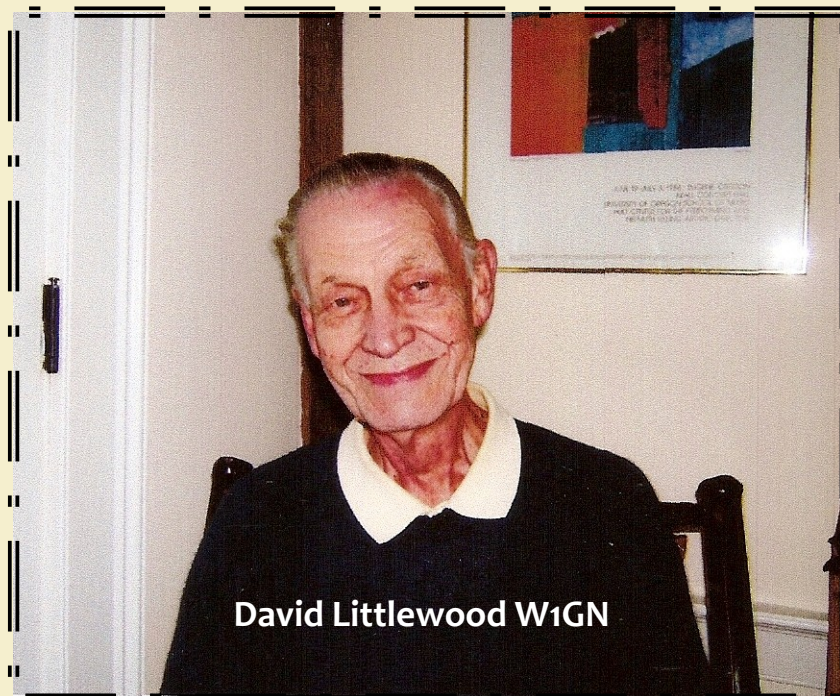
a couples of posts that need a fresh pair of eyes on.

One of these jobs does not even need to be on Committee. This is QSL Manager. If you feel you would like to help the club but not be on the Committee may be this job is for you.

The other as previously mentioned is the Programme Secretary, this alas is a Committee post.

- September 23
Haywards Heath
Town Day
- September 29
Skittles at
Barcombe menu
sent separately
- October 13
AGM

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David Littlewood W1GN

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(This will only work from a members email address registered with the society)

Mid Sussex ARS Net Times—all times local

Sunday	0800	3.740MHz ⁺ /.QRM
Sunday	1100	145.350MHz
Weekdays	1330	21.330MHz ⁺ /.QRM
Tuesday	2030	3.725MHz ⁺ /.QRM (SCARF)
Wednesday	2000	145.350MHz

GB3HY is now working on the following frequency:

Listen 430.900Mhz, Transmit 438.500Mhz, CTCSS 88.5hz

From the President's Corner

I'm very pleased to note the enthusiasm shown by some of our newly licensed members in getting on the air the moment that their callsign arrives and the results gained by some of them using the new digital modes. Japan with 10 watts is a good achievement and a long way however long you've had your license so well done!

I have some concerns though about the DX: realizing that these new modes make low power contacts easier will spend more time on them to the detriment of CW and SSB, making contacts on these "older" modes even more difficult. I hope this is not the case but in any event DX has been hard to find during the past month or so and we old timers look forward to the winter months and a few Dxpeditions to help increase our scores.

I note also that activities at Cyprus Hall during our "On the air" nights is increasing and that we now have G3ZMS regularly on the air working others. This is another way to get free publicity for the Society apart from the opportunity for newly licensed (and others) to learn how to operate our own equipment and the fun in doing so. It also allows us to set up and test out members own transceivers on the air if they bring them along.

All this is what MSARS is about and I am very glad to see the enthusiasm now evident on Friday nights.

It saddens me to record the passing of David Littlewood; one of our Honorary Members who passed away at the end of July. David with his tribander antenna installed inside his all metal barn and his Vee beam with 200 feet legs firing into Europe was a very regular participant in our 15m nets for many years and was instrumental in giving many MSARS members their first US contact. We shall all miss him.

Now we wait for Bob, N4XAT to get a decent antenna up at his new house so that we can resume our regular chats with him once again. Keep listening on 21.330 at lunchtimes or better still join in to welcome him back soon.

As I've said before, don't forget the HF nets, you never know who is listening.

73, Ken G3WYN.

Copy

I am hoping to go to print each month. For this I need copy from any one of you however small and it **may or may not be** radio related.

All articles and photographs are the copyright of the authors. Contributions are invited from Club members and should be sent to newsletter@msars.org.uk

If you have some great old pics that need to be aired I can share them with the rest of the club.

If I get no copy there will be no MSM, it is as simple as that.

73

Stella, Editor of MSM

So just what do you examine for entry into the hobby?

The RSGB plans to revise all three examination syllabuses. More details of the proposed content can be found on the RSGB web site.

The change to the Foundation exam affects about 10% of the current content – but it's a significant 10% resulting in maybe 30% more content during lectures. The 30% adds some material that we've had to teach for years – like coverage of E, F1 and F2 regions when discussing the ionosphere. But it adds some bizarre elements like the need to know about waveguide and ICNIRP ionisation standards! And its treatment of digital technology (in areas like SDR and modulation schemes) is nothing short of confusing and, in places, technically wrong.

The RSGB recently ran a consultation and Chris, G4ZCS, collated an MSARS response. We'll have to wait and see if those planning the future exams take counsel from our input.



In working through the proposals, one has to ask, "Just what do we need to examine to grant access to the hobby?" Here's a reasoned answer.

Firstly one must define the 'use case'.

Take a 14 year old. He or she would need to be able to go to a retailer, enter a discussion about rigs with a salesperson and buy one that would fit the Foundation licence. He or she would then need to construct an antenna and safely erect it to so as to give reasonable performance. That done, the new young Foundation amateur would need to switch it on and use it with due respect for others.

The submission we put in gave a full use case. This defined what we, as guardians of the hobby, would expect that newcomer to be able to do the day after a Foundation pass.

Secondly – and here comes the controversial bit – who do we expect to pass?

We must accept that we are all different – and significantly in addressing a technical hobby, we all differ in our ability to pass the Foundation exam. The central personal characteristic that determines who passes and who fails is intelligence and psychologists consider this to comprise two parts - innate and learned.

We get the innate bit of intelligence from our parents and we learn the other bit in school and early life experience.

To make sense of where the pass criteria should lie, one might add an arbitrary constraint that the Foundation exam should be able to be passed by reading the Foundation manual and attending a weekend of tuition. That seems a sensible initial hurdle. Instantly, this sets the intelligence level needed – because anyone below that intelligence would take greater than the assistance available to reach the understanding and recall needed.

So just what do you examine for entry into the hobby continued?

So back to that 14 year old and the use case. Considering today's schooling, about 50% of 14 year olds would be able to do what the use case defined above demands. Because there's a spread of intelligence across society with age, if we set the age limit lower, fewer will meet the standard. And if it's higher, more will pass as their life experiences add to their intelligence.

So that was the basis of the submission to RSGB – given the use case, we expect that with no prior knowledge of the hobby, 50% of 14 year olds will pass by reading the book and attending a weekend course.

Instantly this asks RSGB to dump proposed additions like manipulation of exponents and angular representation of a sine wave. Such content has no place in the use case, would not have been covered to date on entering Year 10 schooling and breaches the pass criterion.

Now, you can disagree with this reasoning and develop your own – but like it or not, that's the practical reality of having an exam as entry qualification. Some will pass and some will fail. Those developing the exam must choose who in society will be given entry to the hobby and develop questions to a considered criterion.

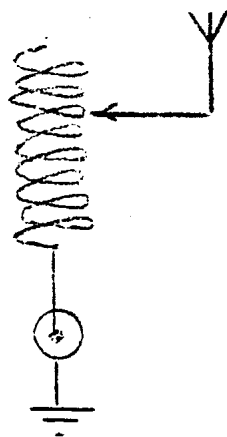
For reference, MSARS has an impressive Foundation exam pass rate – something like 98%. And we've often pondered as to why this might be.

We look forward to learning more of the Foundation changes in the coming months.

John Berry G8JBJ

A COMPACT, UNOBTRUSIVE AND INEXPENSIVE ANTENNA FOR 80 METRES.

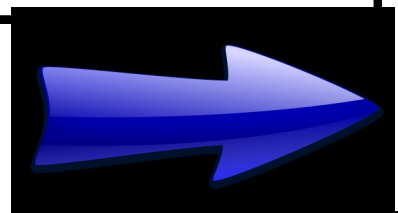
Figure 2. Antenna Tuning Coil.



L 15 turns 14 SWG 2" diameter
Turns spaced 3/16 inch.

50 ohm coax input from Tx/Rx

See Next Page for Content by Louis Varney of
which this diagram is part.



A COMPACT, UNOBTRUSIVE AND INEXPENSIVE ANTENNA FOR 80 METRES.

By Louis Varney, G5RV/CX5RV.

Many amateurs find it impossible to use the 80 metre band because they simply do not have the space to put up a half-wave (128 ft at mid-band 3650 KHz) antenna for such a relatively low frequency, not to mention Planning Permission. For some considerable time I have been experimenting with various types of antenna which could, perhaps, meet the essential requirements for effective transmission and reception on this band, occupy small space, be acceptable for obtaining Planning Permission (if that should be essential) and be inexpensive and simple to construct and erect. The arrangement shown in Figure 1. meets all the requirements mentioned above and is giving excellent results.

Theory of Operation.

The HELICAL wound antenna functions as a $\lambda/4$ vertical with a short horizontal "lead-in" wire which also radiates and forms an essential part of the antenna. This wire should be about 20 to 25 feet long and be supported at not less than 10 ft above ground so as to be out of reach of children (and inquisitive grown-ups !). Although, ideally, it should be run in as straight a line as possible, it can include bends or curves if necessary. By using such thin wire as 16 SWG, it can be led into the radio room over an exterior door or opening window without drilling a hole. The coil L1 in Figure 2. functions as a very simple pre-adjusted antenna tuning unit. Once set, by observing the VSWR at the transmitter end of the 50 ohm coaxial feeder at the mid-band frequency of 3650 KHz and selecting the optimum antenna coil tap a VSWR of 1:1 or very near it will be obtained over 200 KHz of the total 300 KHz wide band. This should be adequate for most purposes. However, if necessary, a coil tap either side of the tap for 3650 KHz operation can be selected to obtain optimum VSWR in the CW portion or in the higher SSB frequencies of the 3500 to 3800 KHz band. Table 1 shows the typical VSWR performance of the antenna over the whole band after setting the coil tap for 1:1 VSWR at 3650 KHz.

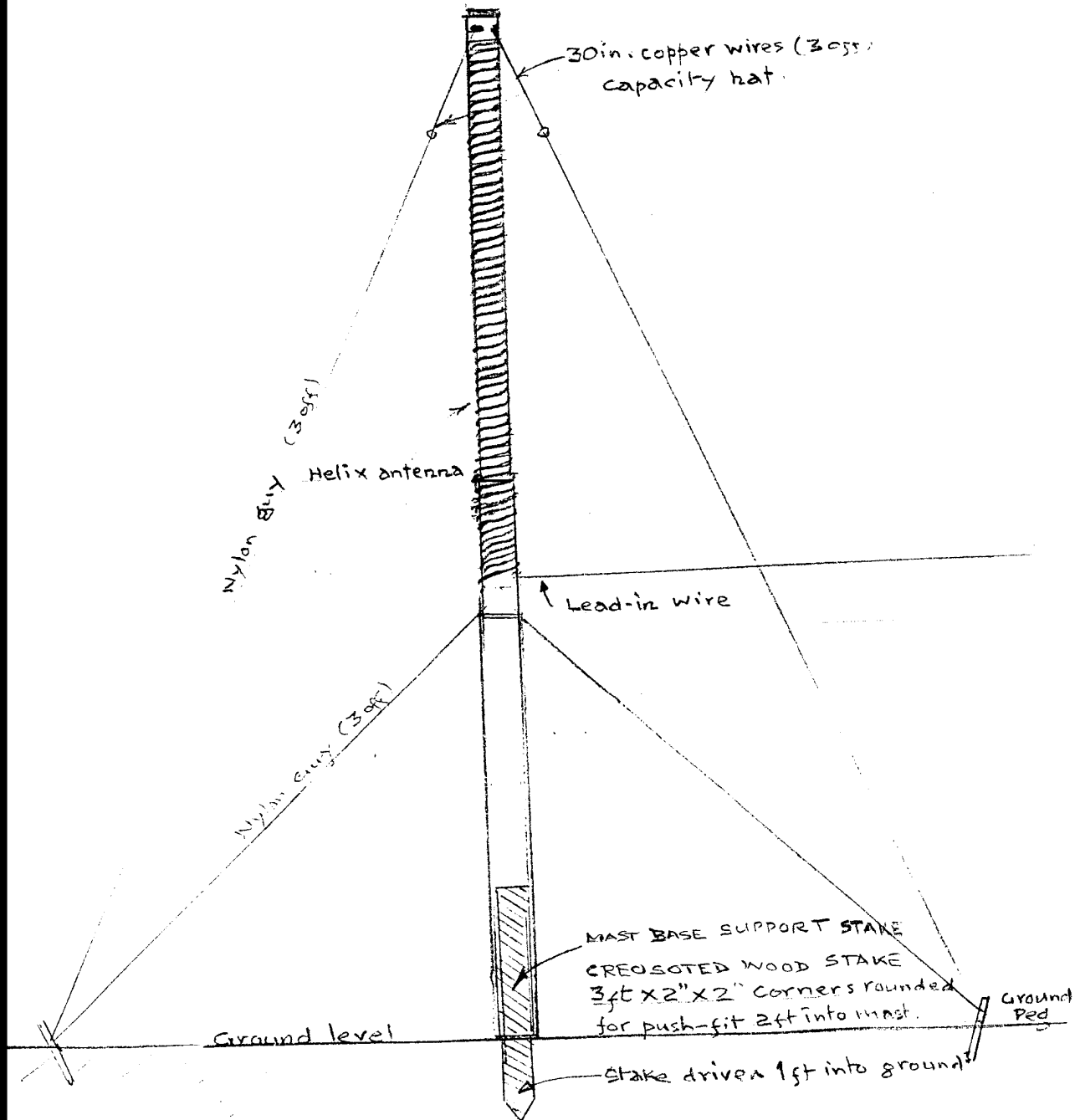
Table 1.

KHz	VSWR	Antenna loading coil turns.
3500	2.2:1	10 turns 14SWG 2 inch dia. Turns spaced 3/16 inch.
3550	1.4:1	
3600	1 : 1	
3650	1 : 1	
3700	1 : 1	
3750	1.5:1	
3800	2.5:1	

To be continued
next month: Editor

Figure 1. A COMPACT, UNOBTRUSIVE AND INEXPENSIVE ANTENNA FOR 80 METRES.

THE G5RV HELICAL 80 metre ANTENNA



G5RV November 1995

Figure 1

Fox Hunt held on the Evening of Friday 28th July 2017

Walking Burgess Hill

Seven hounds gathered in Cyprus Road car park in plenty of time for the first transmission on 145.375MHz at 7.30pm.

Amongst the range of antenna used by the Hounds, were a sheet of copper, the Human body and a couple of HB9CV's.

The Satellites, comprising of Mike G8KMP, Peter G4AKG and Tony G3XQM using an HB9CV antenna, took a bearing on the first transmission which pointed north west.

That took us to St John the Evangelist church. It was decided to use the north side of the church building as a screen. It's a bit odd walking around consecrated ground with 'ones' VHF antenna in hand!

Meanwhile a group of other hounds were last seen walking across St Johns Park in a north west direction.

Second transmission by the Fox and a definitive due north reading.

Straight ahead was Upper St Johns Road, so it was decided to follow our nose and keep walking due north.

To the right of Upper St Johns road, is access to a recreation ground, and a tree lined foot path which leads all the way up to Marle Place. Could this lead us to the Fox's lair?

The third transmission from the Fox showed a compass bearing of due south. Perhaps we had passed them on the way up the foot path?

As we walked back down we heard a faint rustling - a movement - was it the Fox?

And there they were Alan and Stella in their lair trying not to make a sound, hugging the tree, moving around it, hoping not to be seen.

"The Windmill Inn on Leylands road that's where we are all meeting up" said the fox.

We decided to take a photo of the Winners outside the pub with antenna in hand. Well this caused a lot of interest to a packed pub on a Friday evening - a load of faces peering out of the window with beer in hand.

I think we were treated suspiciously at first when we entered the pub. Once we had explained, we were welcomed by the landlady especially when she learned there would be another 6 customers arriving!

Tony Finch G3XQM



Above the foxes and hounds.

Right Mike G8KMP & Pete G4AKG two of the winners the third Tony G3XQM is behind the camera.



Radio Training

As many of you might have heard, or some might not;

As discussed on page 4 & 5 of this magazine the RSGB, Ofcom, et al, are in the process of reviewing our exam and licence structure.

The current system has been in place since 2002 and with a few minor tweaks to the syllabus, some changes to the band plans and privileges, have stayed much the same for the last 15 years.

Now “they” are in the process of looking at it all again.

The registered tutors and assessors have been kept in the loop, sort of, during the process.

Several months ago, we were presented with a new set of exam syllabuses, and asked for feedback.

Our record on Foundation courses is second to none of the best with 200ish students and a pass rate of 98% compared with the national average of 65% or so.

As you know we run at least two courses each year over a two- day weekend.

This has been developed over a number of years and produces good results at minimum cost to the students and least inconvenience for the training team.

On the club’s behalf, we have replied to the proposals as best we could pointing out our results. The revised draft gave us concern that the changes would mean we could not teach enough in two days and would therefore need two weekends!

This is nigh on impossible.

To book the Cyprus hall, get tutors for two weekends, and the students, would be a nightmare. Then the costs for the students would double!

When the powers that be have had a chance to read the feedback and made changes we will go through it all again prior to it being adopted, we think, for the 2019 season onward.

I’ll keep you informed as best I can.

Chris, G4ZCS

Lead Instructor.

Trapped Dipole, 1:1 Voltage Balun and 1:1 Current Balun

Introduction

My involvement in the use of a trapped dipole and voltage balun came about through an article I had read in 'Antennas' in October 2016, RADCOM written by Mike Parkin GoJMI. Also In the loft, some time ago, I had put up a long wire which I had used for a home-built H.F. receiver; however this facility was now no longer needed. As a result, I thought I may be able to make better use of the space. The length of the loft was limited, but I thought I might be able to squeeze-in an antenna for the 15m and 18m bands. In the end there was not enough room for the 18m antenna. (Being a half-wavelength dipole, in theory, it would also work as a three-half-wavelength dipole.) The 15m Band antenna would need to be trapped somewhere along its wire length in the loft; a trial-and-error process.

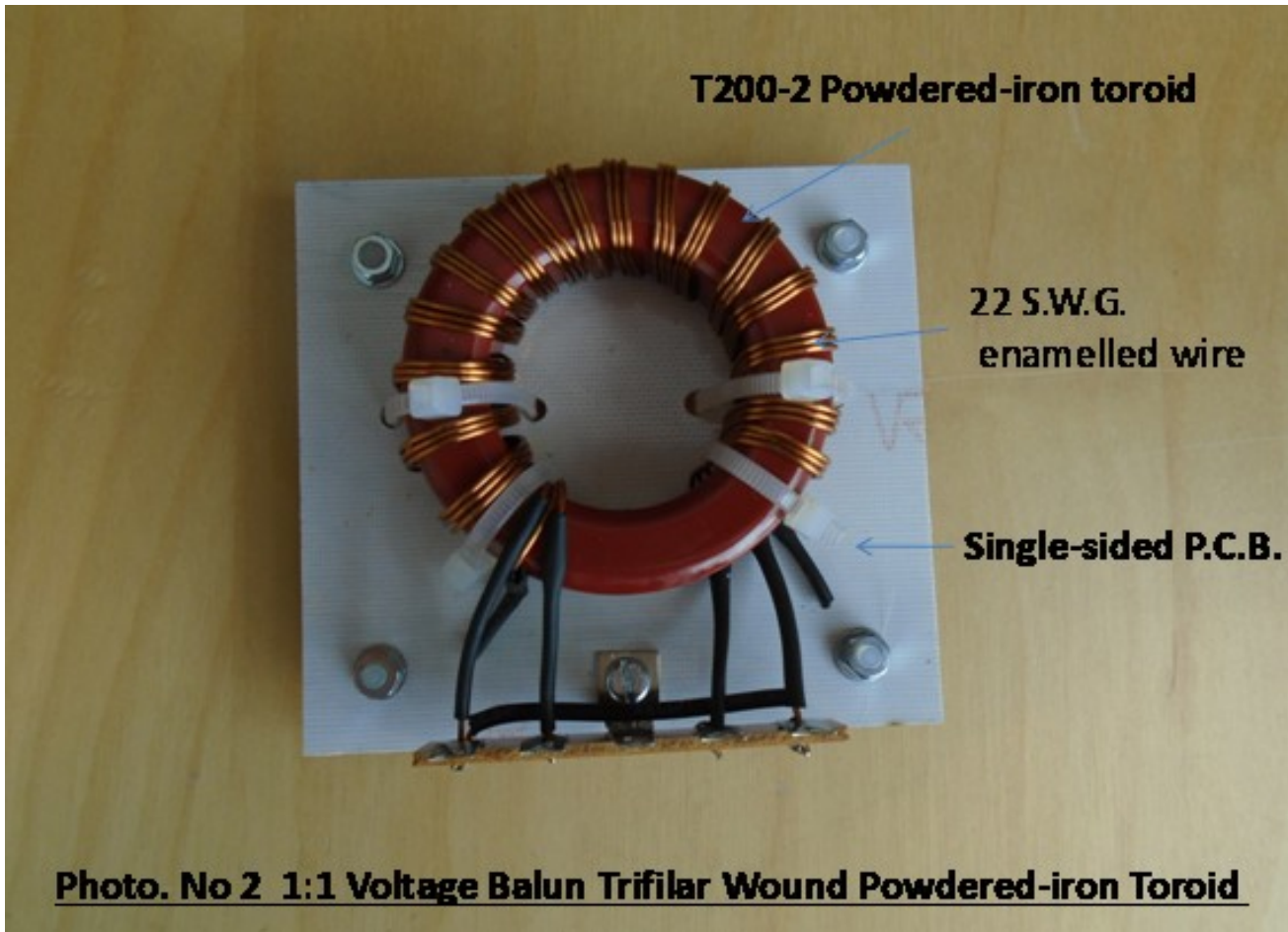
The make-up of a trap, bought in pairs, is fairly simple, comprising an inductance and capacitor(s), forming a parallel-tuned circuit. It has a resonant frequency with a high impedance. At frequencies below the resonant frequency, Reactance will be inductive (X_L). Above the resonant frequency, the Reactance will be capacitive (X_C) {See Photo. No 4}. This circuit can be constructed at home, but it was easier to buy it direct, in kit form, from SOTABEAMS. **See Photo. No 1.**



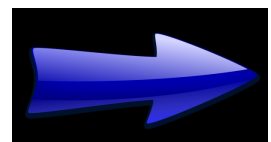
Photo. No 1 SOTABEAMS 15 metre Traps

Trapped Dipole, 1:1 Voltage Balun and 1:1 Current Balun continued

SOTABEAMS recommendation for 15m Band: 18 to 30MHz; 2 x 100Pf, 1Kv capacitors and 12 turns of 19/20 S.W.G. enamel wire on a T94-6 powdered-iron toroid. Powdered-iron cores are often used for tuned circuits needing a high 'Q'. Whereas ferrite cores are generally used in wide-band auto-transformers (1). After constructing the pair of traps, I checked the resonant frequency with a VNA and found it a bit low. SOTABEAMS recommended removing one turn from the toroids. This brought the frequency into line, together with some 'shuffling' of the turns on the toroids. **See Photo. No 2**



In theory this trapped dipole is a balanced load, fed by 50Ω feeder; the latter being part of the antenna. Normally this antenna would perhaps be fed by a 1:1 current-balun to reduce the common-mode currents. However, as an experiment I decided, first of all, to fit a 1:1 voltage-transformer/balun, and to compare the results with a 1:1 current balun. This decision, regarding a voltage balun, came about after reading the above article by Mike Parkin G0JMI, where he describes tests carried out using a 1:1 trifilar voltage-transformer/balun. More information was available, on the same topic, in an article by John Welsh G0NVZ in 'Moving On', May 2015, RADCOM.



Trapped Dipole, 1:1 Voltage Balun and 1:1 Current Balun continued

The test-setup is shown in Photo. No 3.



Single-sided copper board

T200-2 Powdered-iron trifilar toroid

miniVNA

Photo. No 3 Testing 15m band trapped Dipole with 1:1 Voltage Balun

The VNA results for the 1:1 voltage balun can be seen in Photo. No 4: S.W.R. = 1:1.34 and $Z = 66.8$ with no A.T.U.. An R.F. meter was attached to the feeder that produced a reading of 20mA at 80 Watts, C.W..

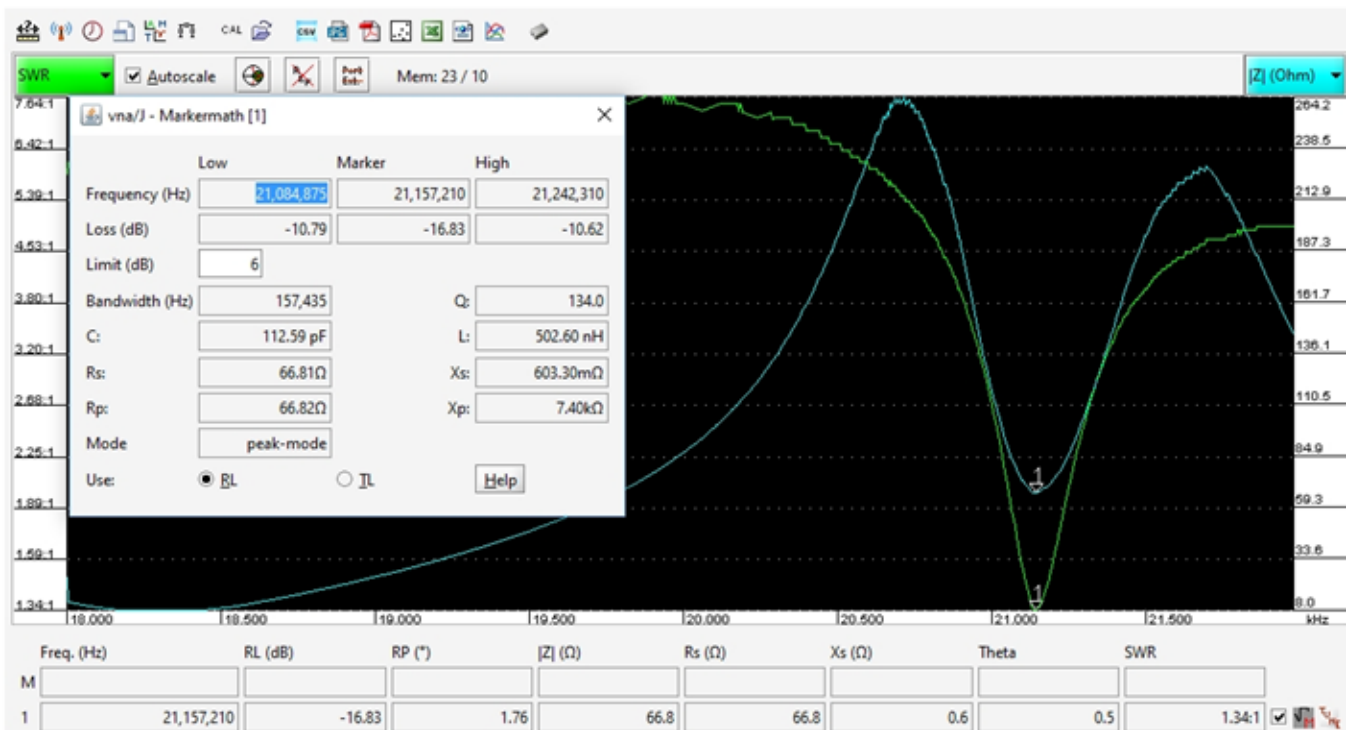


Photo. No 4 miniVNA readings for 15 m band trapped dipole with 1 to 1 Voltage Balun

Trapped Dipole, 1:1 Voltage Balun and 1:1 Current Balun continued

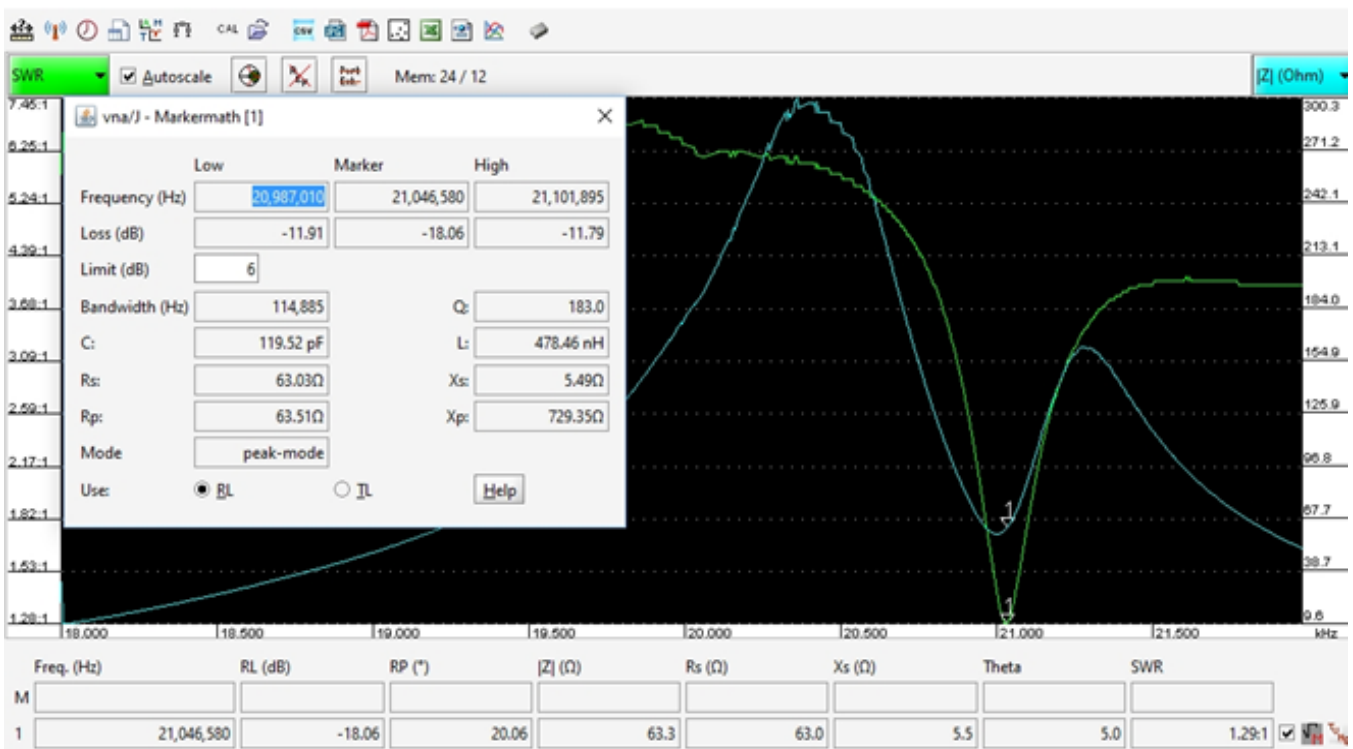
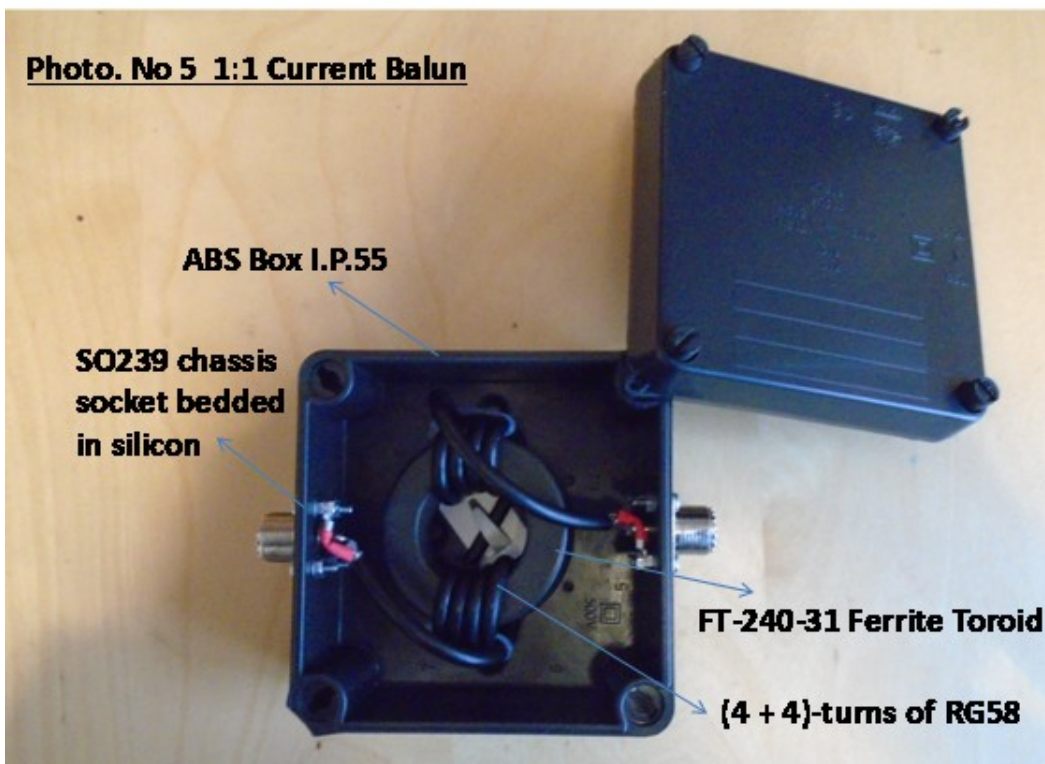


Photo. No 6 miniVNA reading for 15m band trapped dipole with 1:1 Current Balun

The VNA results for the 1:1 current balun can be seen in **Photo. No 6**: S.W.R. = 1:1.29 and $Z = 63.3$ with no A.T.U.. In either case, an A.T.U. would be used in practice. As can be seen there is very little difference between the two types of baluns



Trapped Dipole, 1:1 Voltage Balun and 1:1 Current Balun continued

When I sent the VNA test results of the types of baluns to Mike Parkin GoJMI, the following were his comments:

'Essentially the two baluns should provide similar performances, even though they work slightly differently. This is because both designs, in this case, provide 1:1 transformer impedance ratio for matching and a mechanism to minimise common mode currents.

Essentially, the voltage balun uses transformer action to minimise common mode currents by providing a balanced to unbalanced transition via transformer action, while the current balun introduces a significant impedance into the outer shield of the coax cable (mainly inductive) to minimise the common mode current flowing by reducing it (i.e. block it).

Basically, the choice of which type of balun to use depends on the antenna in terms of what is practical/convenient. For example, a VHF Yagi beam where the feed-point has been designed to be close to 50 ohms (resistive) as possible would tend to lend itself to a 1:1 current choke because it is practical to wind several turns of the 50 ohms coax cable around the boom close to the feed-point (usually the dipole centre) to form a choke balun. For an HF wire dipole whose feed-point impedance has also been arranged to be close to 50 ohms, where the centre is supported by a central mast for example, a 1:1 voltage transformer balun housed in a weatherproof box might be a practical option to interface the antenna with 50 ohms coax cable. A current balun could be used for the HF wire dipole above, however making this up using several large loops of coax cable could result in quite a large arrangement.'

'Practically speaking, a 1:1 current or voltage balun does the same thing but using differing techniques. The other point to note that both types tend to be wide-band devices which is useful when using a balun to match a range of antennas (however both balun techniques will tend to have their own resonances, so watch out for this).'

1) Spectrum Communications: 'Toroids for the Terrified'.

Diary Dates September 2017 and October 2017

25 August Friday Millfield RNLI Talk by Trish Penney

01 September Friday OUT Fox Hunt

08 September Friday Millfield Talk by Chris ZCS Smart Phones

15 September Friday Millfield Radio Night

22 September Friday Millfield Prep for H/H Town Day

23 September Saturday OUT H/H Town Day

29 September Friday OUT Skittles Evening

30 Sep/01 Oct Sat/Sun Foundation Course + Other Exams

06 October Friday Millfield "On Air Night"

13 October Friday Millfield AGM

20 October Friday Millfield Radio Night & Table Top Sale

27 October Friday Millfield "On Air Night"

03 November Friday UPSTAIRS Surplus Equipment Sale

Mid Sussex Amateur Radio Society



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