

G3WSC
G6RC
GX3WSC

CARC News Bulletin

December 2014

Crawley Amateur Radio Club

Editor: John G4PEO

Meetings:

Every Wednesday: 8pm

Every Sunday: 11am -1pm

Formal events are on the last Wed of the month, 7-30pm for 8pm.

Please note: some formal events will also be held on a Sunday. Members / non-members welcome.

CARC Dates:

December 5th (Friday)

Fish & Chip Supper (Club Hut)

December 7th (Sunday)

144MHz AFS - See Page 7

January 28th (Wednesday)

CARC AGM

February 25th (Wednesday)

DC to Light - G4ZCS

Also of Interest/Other Clubs:

Dorking & District

<http://www.ddrs.org.uk>

27th Jan: UFOs - G8JIC

Surrey Radio Contact Club

<http://g3src.org.uk>

5th Jan: The 5Mhz Experiment

G0TLK

Sutton & Cheam & District

<http://scrs.org.uk>

15th Jan: A beginners guide to

Amateur Satellites - G0MRF

Wimbledon & District

<http://gx3wim.abar.co.uk>

30th Jan: Contesting - G8MNY

Harwell Rally

www.g3pia.org.uk

8th Febuary: 10:00am, £3

Updates to the CARC program check:
www.carconline.blogspot.co.uk

or contact Brian, 2E0MZB:

[Brianstrada\(at\)gmail.com](mailto:Brianstrada(at)gmail.com)

News Bulletin items contact G4PEO:

[john\(at\)g4peo.net](mailto:john(at)g4peo.net)

Associated Repeaters

GB3MH: 145.625Mhz / 88.5 **GB7MH:** 439.6375Mhz D-Star

GB3WS: 145.750Mhz / 88.5 **GB3NX:** 430.8500Mhz / 88.5 (Input 438.4500Mhz)

CARC News

Welcome to the December 2014 edition of the News Bulletin, this time I'm trying out MS Publisher instead of MS Word, so apologies if there are some rough edges I haven't ironed out...!

No, not a new member initiation ceremony, but, as it is the festive season, I thought it would be good to start off with a caption contest...



Well not really a contest as there are no prizes, but the best (printable) entries will be published in the next news bulletin. I'm sure some of you can come up with a suitable caption for the above photo!

Moving onto the contents for this edition, we have further training successes from **Malcolm G3NZP**, and also a new feature in the guise of the 'The Chairman's Column', courtesy of **Keith, G3VKW**.

Additionally, some of you may have noticed a document on the notice board in the hut outlining the early history of the club. **Phil, MOTZZ** has kindly converted this to a text document for inclusion in the newsletter.

Hopefully, some of the longer serving club members may be able to update this very interesting snapshot of the early CARC years and possibly fill in the 'missing bits' from where it leaves off to present day....

Richard, G3ZIY has been working on a design for a 60m resonant loop antenna, the results of which he shares with us in this newsletter.

Club Dignitaries (Committee Members & Others)

President: Derek Atter (G3GRO)

Hon Treasurer: Howard Palmer (G4PFW)

Hon Secretary: Phil Moore (2E0TZZ)

Programme Secretary: Brian Gutteridge (2E0MZB)

Committee Member: Alex Sheppard (M1YAP)

Shack Managers: Mike Davies (G0KAD), Rob Barter (M0ZAF)

Chairman: Keith Evans (G3VKW)

Vice Chairman: John Longhurst (G3VLH)

Training Secretary: Malcolm Harman (G3NZP)

QSL Manager/News Editor: John Pitty (G4PEO)

Committee Member: Richard Hadfield (G4ANN)

CARC News Cont:

You may remember mention was made of the Ofcom consultation document and proposed changes to the UK amateur radio licence in the last news bulletin. Well it appears Ofcom received over 2000 responses, of which some were from CARC members of course. Interestingly, in comparison to the 2000 plus who did take the time to put finger to keyboard, shown below are the Ofcom amateur licence stats for November 2014.

Type	No. of Licences
Club Radio Licence	1499
Foundation Radio Licence	19687
Full (Reciprocal) Radio Licence	755
Full Radio Licence	52962
Intermediate Radio Licence	8341
Total	83244

Not so much news but an update and reminder regarding the previous club project involving the building of the excellent Hans Summers (G0UPL) Ultimate2 QRSS transmitter kit. Not surprisingly, things have moved on and there is now a new and improved Ultimate3 QRSS/WSPR kit, introduced about a year ago, and designed around a modular format. The new format enables the inclusion of a relay-switched LPF board kit which is available as a separate item, plus space for any future enhancements.

As can be seen from the photographs, there is also a new back-lit blue screen, plus, very recently introduced, the option of a black anodised aluminium silk-screen printed case which also includes an accessory kit comprising of switches, buttons, connectors etc.



If you are looking for something to do over Xmas and the New Year (!), further, more detailed information can be found here, together with builders photos:

<http://www.hanssummers.com/ultimate3.html>

There is also a very active 'QRPLabs' Yahoo Group mailing list which is well worth subscribing to.

Calendar Items

As always, a reminder, if you have any suggestions for future meetings, **Brian, 2E0MZB** will be (*very*) pleased to hear from you. Also, don't forget to keep an eye out for the very comprehensive and up to date CARC Calendar that Club Secretary **Phil MOTZZ** sends out on a regular basis.

Brian 2E0MZB has indicated he would like to stand down from the committee and role of Programme Secretary following the next AGM. It goes without saying that we all owe Brian a huge vote of thanks for the time and effort he has put into arranging the very interesting talks and presentations, which at times have proved to be very challenging in terms of finding suitable speakers and topics, and then having to slot them into the dates we have available. The good news is that we have a willing, yes willing, volunteer, as **John, G3VLH**, has kindly agreed to take over the reigns.

This is also a good opportunity to remind members that a lot of work goes into organising speakers, who in turn also freely give up their time for our benefit. So if able to, please make every effort to attend !

Calendar Items cont:

Fish & Chip Supper - Friday Evening, December 5th, CARC Hut.

A brief reminder that this hotly anticipated annual event is almost upon us. This year it is being organised by Jane and Lorna, XYLs of **Keith G3VKW** and **Phil MOTZZ**. There are possibly one or two spaces still available, please contact **Phil, MOTZZ**, secretary@carc.org.uk ASAP.

AGM - Wednesday January 28th 2015, CARC Hut.

Please make a note in your diaries, (and please also note the later date), for the most important event in the club calendar, where you can let the committee and members know your thoughts on how the club has fared over the previous year, and what you would like to see happen in the future.

Advance Notice - Surplus Equipment Sale - Wednesday 22nd April. Again, if you are at a loose end over Xmas and the New Year, it could be a good time to start thinking about sorting out and putting to one side those 'treasured' and highly collectable items you would like to reluctantly dispose of at next years equipment sale!

Previous Meetings & Events

October Club Dinner - Turners Hill.

The smiling faces in the photos, courtesy of **John, G3VLH**, say it all!



HARC - CARC Challenge 12th November.

A very enjoyable evening was experienced by those who attended, with the event comprising of a rather devious technical and radio knowledge quiz set by **Keith G3VKW**. A flavour of which included having to put call-signs to well known personalities faces...

HARC sent along two participants, so as **Richard G4ANN** is also a HARC member, he temporarily joined HARC's two man team to bolster their numbers. It was a very close fought battle, but in the end CARC triumphed by just one point, and well done to HARC for putting up such a stiff challenge despite being well and truly outnumbered.



Previous Meetings & Events cont:

CATS Bazaar, Sunday 23rd November.

Originally there was a question mark as to whether the event would take place due to the impending redevelopment of the site and associated archaeological dig that was planned, but in the end this was postponed until the New Year and warmer soil...

Hence, **Keith, G3VKW, Howard, G4PFW, Mike GOKAD, Chris G4TZF and John G4PEO** were able to man the CARC table at the bazaar, from setting up at 9-30am, until close at 1pm. Despite the extremely wet and miserable day, it is thought about 120 people passed through the door, (it felt like a lot more!). Consequently, we sold a considerable amount of 'gear', so very much a worthwhile effort as the final tally looks as though CARC achieved just under £200 net profit.



VHF / UHF Contesting - Dr Alwyn Seeds, G8DOH 26th November.



We were very fortunate to be given, at short notice, a talk by **Alwyn G8DOH** on VHF / UHF Contesting . This extremely interesting presentation, highlighted the trials, tribulations and rationale relating to the choice of equipment, site location and associated issues. Alwyn discussed how the various 'challenges' have been tackled over the years in an effort to find a consistent winning formula when competing /P in the various VHF & UHF contests, including VHF Field Day, mainly as the combined Reigate ATS & CARC group.

If you would like to learn more, or join them on their outings, (they would be *very* pleased to see you!), please speak to **Alex, M1YAP** or **Mike, GOKAD**.

Chairmans Report - Keith G3VKW

Hello All,

I like the rest of you, are probably wondering what happened to 2014 as Christmas rapidly approaches.

Well the club had some interesting "Talks", of which the two that stand out in my mind was the one on "WW1 radio", and the one on the communications of the 2012 " Olympic Games " .

The club shack refurbishment is nearly complete, and we have purchased a FT2000 which allows integration with the HRD Logging Program, For computer control of the antenna, rotator, and amplifier, used for all the bands up to 6mtrs. The TS2000 runs with various amps and antenna's for 2m, 70cm, 23cm bands. Because of this, they are easy to operate....

Sadly we had to dispose of the " Comfy " chairs, as they were not compliant with current legislation. That said the Sunday morning " Natter " sessions are still proving very popular.

Necessary maintenance on the Clubs Mobile and Fixed Towers, emptied a fair amount out of Howard our Treasurers coffers, but we now have three well maintained Towers.

These highly expensive items, are however sadly very under used by club members.

Chairmans Report cont:

Mike GOKAD, and Peter Tribe compete in various VHF / UHF events through the year, and are always looking for operators to help, and contesting is fun!! If you are frightened to have a go, at least have a chat to Mike, and even if you do not operate, you can observe, log, or assist, Do give it a go, Contesting will soon sharpen up your skills, and you may soon wonder why you didn't do it sooner.

Likewise, the club this year participated in the RSGB AFS, and 80m Club Calls contests. These are good fun, and are team events, where all the clubs ops scores add to the club total. The CC events take place for 1 ½ hours on weekday evenings, and are good way to improve your skills, and we are not worried if you just make 1 QSO, although you will probably make more and have some fun. If you are interested See Phil M0TZZ. The "Museums on the Air" operation seems to gone well, and we are planning doing it again this next year, and also the "Mills on the Air" weekend. Hopefully from "Outwood Mill ".

The reason for these events not in any specific order are:- Publicity for the club, public exposure to Ham Radio, operator training, operating portable and fun day's out. This hopefully leads to enquiries from prospective new club members. We do need new members if our club is to survive in the long term.

Club Training is still producing commendable results, thanks to the efforts and hard work by Malcolm G3NZN our lead instructor, And has in return brought new members to the club.

Mike GOKAD is well on the way to being able to supply this year's Club Project, I am sure you have seen the long boom 2m Yagi in the club house. And Peter G4FYY is in the later stages of being able to offer a kit for temperature controlled soldering iron for SMD work, at a very competitive price.

Remember, If you have any ideas your committee members would like to hear from you.

73 BCNU Keith G3VKW.

Club News

Training - Malcolm G3NZN - Lead Instructor

More good news from Malcolm regarding two more Foundation courses passes:

Tempie and Albert Williams are our latest members to successfully complete Foundation courses. Albert took his examination in early November and is now **M6EWQ**. Tempie's pass is more recent and so she is awaiting her result to be processed by the RSGB and Ofcom before obtaining a call sign. Congratulations to them both.



Club News cont:

EQUIPMENT SALE - Compiled by John G3VLH

You will remember that fellow club member Ken Wheatley G3BBR sadly became a Silent Key back in the summer. Mary, his XYL feels that the Crawley Club should have the first opportunity to benefit from Ken's equipment, the main items of which are listed below. If you are interested in any items please get in touch with **John G3VLH** (01342 714402) for further information and to discuss prices. This is a limited time offer and if there is no interest the equipment will be listed elsewhere.

KEN G3BBR		SK EQUIPMENT LIST	
MFR	MODEL/TYPE No.	DESCRIPTION	COMMENTS
Trio Ken-wood	TS-930	HF Transceiver	Clean - working order
Yaesu	FT-902DM	HF Transceiver	Clean - working order
Yaesu	FV901DM	Ext. VFO for FT-902	Clean
Hammarlund	HXL-1	HF Linear Amplifier	good for year-needs cleaning
Yaesu	YO-301	Monitor scope	Scruffy
Icom	IC-27A	2m mobile transceiver	Good - clean
Homebrew	In 19" cabinet	Antenna Tuning Unit (Hi-power)	Nice condition
Daiwa	1.8 to 150MHz	RF Power Meter	Good
Star	Master Key MK2	Electronic CW Keyer	Clean
Daiwa	PS-120 M2	230vAC/12v 12A DC PSU	Clean
Altai		230vAC/12v 15A DC PSU	Clean
Nentone	PP137	230vAC/12v 7 - 9 A DC PSU	Clean
Kenwood	TR2500	2m Handheld + dropin charger	Nice and clean
AEA	PK88	Packet controller	Clean
AOR	AR1500	RF Monitor	Clean
Yaesu	YM-38	Desk Microphone	Clean
Steepletone		L/M/VHF/Airband Receiver	Clean
Panasonic	RF-542	Domestic portable radio	Clean
Various		Desktop PC	Clean
Panasonic		Laptop	Clean but approx 10 yrs old
BenQ		17" flt screen monitor	Good used condition
Dell		15" flt screen monitor	Good used condition
?	?	15" CRT monitor	Clean condition but old tech.
HP	870Cxi	Deskjet Printer	clean
Lexmark		Printer	Clean
Racal Dana	9911	VHF Frequency meter 10Hz -120 MHz	Clean
Heathkit	AO1-U	Sine/square wave audio generator	Clean
MFJ	MFJ-906	6m ATU	VGC looks new
	FAX-1	Weather Fax Unit	Average
BigEar		System 500A CB?	OK
Daiwa	DC-7055 "round" controller??	Antenna Rotator	OK
CDE	Direction controller	Antenna Rotator	OK
?	"Full automatic"	Antenna Rotator	Scruffy
Home Brew?	Morse Key	Squeeze Keyer	Used condx but probably good
	Standard Morse Key		Used but looks good

Club News cont:

Contesting

As already mentioned in Keith G3VKW's column, and previously in the June 2014 newsletter, a few members of the club were involved in the **80m Club Championships** this year, which took place once a month between February and July, for 1½ hrs per session.

Below is an extract taken from the RSGB contesting web site showing the final positions within the club. Congratulations to **Phil, 2E0TZZ / M0TZZ** !

Incidentally, apologies for the small print, the table taken from the web page wasn't designed to fit on A4, so it's had to be shoe-horned in. Further details and analysis can be found here:

<http://www.rsgbcc.org/cgi-bin/hfresults.pl?Contest=80m%20CC%20SSB&Band=3500&Club=Crawley%20ARC&year=2014>

Pos	Call	03/02/14 SSB	12/02/14 DATA	20/02/14 CW	03/03/14 DATA	12/03/14 CW	20/03/14 SSB	07/04/14 CW	16/04/14 SSB	24/04/14 DATA	05/05/14 SSB	14/05/14 DATA	22/05/14 CW	02/06/14 DATA	11/06/14 CW	19/06/14 SSB	07/07/14 CW	16/07/14 SSB	24/07/14 DATA	Total
Pos by Month		33	35	41	30	32	28	31	28	25	24	24	24	22	23	24	24	25	25	
1	2E0TZZ				403		170			484	200			496						1,753
2	G4PEO	179					257				318									754
3	G3VKW										390		199							589
4	M0TZZ																	224		224
5	G3GRO								151											151
6	G3ZIY										113									113
7	M1YAP										87									87
8	G0UCF										0									0

The event wasn't taken too seriously, especially, as can be seen from the table, it wasn't practical or convenient on occasion for members to participate in every session. However it was good fun, although a little manic! If you would like to have a go next year, please speak to **Phil, M0TZZ, or Keith G3VKW**.

Similar events for VHF/UHF also take place once a month throughout the year known as UKAC (UK Activity Contest), with a separate night for each band (4m, 6m, 2m, 70cm, 23cm, SHF). From experience this is rather more restrained than the 80m contest, and can be a good training ground if you would like to join the RATS/CARC team on their various VHF/UHF contest outings. See **Alex, M1YAP** for more details of the UKAC events, and/or check the RSGB web site.

Another club contest this year, in which CARC will be participating, is the **144MHz AFS** (Affiliated Societies) contest on the **7th December, 1000-1600**. You don't have to leave home for this one, (but do need to know your QRA locator), or you can operate from the club station if desired. Also you don't need to operate for the whole period, as just a few contacts, scored on one point per Km, will count towards the clubs overall score, as long as you are within 80Km of the Virtual Meeting Place of the club, which essentially means any CARC member in the S.E. UK.

For more info, please see **Mike GOKAD**, or **Alex, M1YAP**, who will be delighted if you are able to participate.

The rules can be found here:

http://www.rsgbcc.org/cgi-bin/contest_rules.pl?year=2014&contest=afs144MHz&seq=

Also, a reminder from **Mike, GOKAD**, that there is a (closed) Yahoo group specifically for CARC/RATS contest discussions etc. If you would like to partake, please contact Mike: mike (at) gokad.com

A HISTORY OF C.A.R.C.

Originally compiled by Albert Davis (G3MGL)

Chapter 1.

Prior to the Late fifties there had been no real requirement for a radio club in the Crawley area as, up until then, it was a small town with a number of outlying villages, some fairly large but in general, a low population per area. However, with the development of the New Town and the influx of electronic companies that resulted, among the first being Redifon, the amateur radio population began to grow.

The mention of Redifon is no idle comment, for with this company, which was expanding its departments at Wandsworth, came an engineer who was to change the face of amateur radio in a number of ways.

In September of 1959 a notice appeared in the amateur radio press announcing the intention of forming a club in Crawley, and it asked anyone who was interested to contact a Mr. R.G.B, Vaughan, G3FRV, at an address in Tilgate. At the same time a number of people received a letter from Mr. Vaughan inviting them to a meeting at "The Brewery Shades" on 15th October, 1959. This meeting was attended by 15 people who agreed to form a committee of four and elected Mr. R. Vaughan, G3FRV, as Chairman and Mr. D. Hunt, G3LBH, as Secretary. The other two committee members were Mr. J. Parsons, now G8BLT, and Mr. R. Fautley, G3ASG. At the same time the group adopted the title Crawley Amateur Radio Club. The subscription was to be 2/- per month. All of these arrangements were on a temporary basis for 3 months.

Chapter 2

Last month we reached the stage where a temporary Committee had been formed.

Within a month the trend of the Club's activities for many years was beginning to show with operation in M.C.C. This was done from G3FRV's QTH in Tilgate with assistance from G3JKF, G3MET, G3NVB, G3ASG, G3LBH and John Parsons.

At about the same time it was agreed to become affiliated to the Radio Society of Great Britain, a connection that was to be strengthened as the years passed.

In December of 1959 a meeting was held to determine a Committee for 1960. It consisted of V. Bryant G3NVB as Chairman, R. Vaughan G3FRV as Secretary/Treasurer with D. Hunt G3LBH, R Fautley G3ASG and J. Parsons BRS 22560 as ordinary Committee members. The subscription was now formalised at one Guinea, with a reduction to 10/6 for members under 18.

Shortly after this John Parsons become treasurer, also our first entry in the Affiliated Societies Contest was made from G3JKF's QTH in Gossops Green, on this occasion resulting in 20th out of 52 entries.

Right from the start a high standard of lectures was maintained. Within the first few months there were talks by G8KW on KW equipment, G3FZL and G2FKZ on "The IGY and the Radio Amateur" (do you remember the International Geophysical Year? - there's still a 2m beacon OZ71GY!) and G4ZU (of the "minibeam") on Aerials for Restricted Spaces.

In April of 1960 an idea was raised about arranging an "Annual Dinner" and the members' views were requested.

This is all we have - if any member would like to continue the story please let me know—John G4PEO

60 metre band resonant co-axial loop aerial

by

Richard Drinkwater, G3ZIY

This simple aerial intended only for local contacts via Near Vertical Incidence Skywave (NVIS) propagation up to 300–500 km range, was inspired by a 40 metre design described by Peter, G4FYY.

RAYNET has a requirement for a system that should work throughout Surrey from temporary locations, at any time, without relying on any repeaters or mobile 'phones etc. NVIS on this band was deemed to be suitable for this requirement. Very occasionally, the propagation does fail due to extreme solar activity etc., but this is a rare occurrence.

So this aerial is not designed to be very efficient – just to be effective enough with the power permitted on the 60 metre band to enable local communications without reliance on other services.

As this design does not require an expensive, bulky and somewhat delicate high voltage variable capacitor, it can be easily constructed from readily available materials using DIY tools. The idea is that the shield of the coax is the inductor in the loop, and the coax's self-capacitance the resonating capacitor. Thus, to maximise the size of the loop (and thus the aperture and radiating effectiveness) a low capacity coax should be selected for the main loop, so that more inductance (= a bigger loop and greater aperture) is required to resonate it.

As a free drum of unknown type 75 ohm coax was donated to the club, it seemed a shame not to make use of it. It is similar in dimensions to RG-11, but this unknown cable has a solid centre. It is quite flexible, and easy to transport to the temporary location as it can be folded up. It does need supporting at several points around its periphery.

This cable has about 67.6pF/m capacitance, so I constructed a spreadsheet to determine the length of coax needed to resonate on a particular frequency. The braid of this coax is about 7.2mm diameter, and using the standard formula for one turn loops made from copper, the spreadsheet calculated the inductance for a given length (which is a non-linear relationship, unlike the capacitance per unit length). Using the standard formula, the resonance was then calculated from the figures obtained, and a suitable starting length of coax determined for the band of interest. This was 4 metres of this particular coax for the 60 metre band loop.

I constructed an experimental model, and found that with maximum sliding braid it resonated a little below the lowest frequency in the band. Sliding the coax braid resonator to minimum length resonated the loop to a little above the highest frequency in the band. A bigger loop I tried for the 80 metre band also worked as expected, so I can confirm that the spreadsheet seems to be accurate enough for initial dimensions. As it comes up a little bit on the low side, one can always remove a bit of the loop to raise the frequency range if necessary.

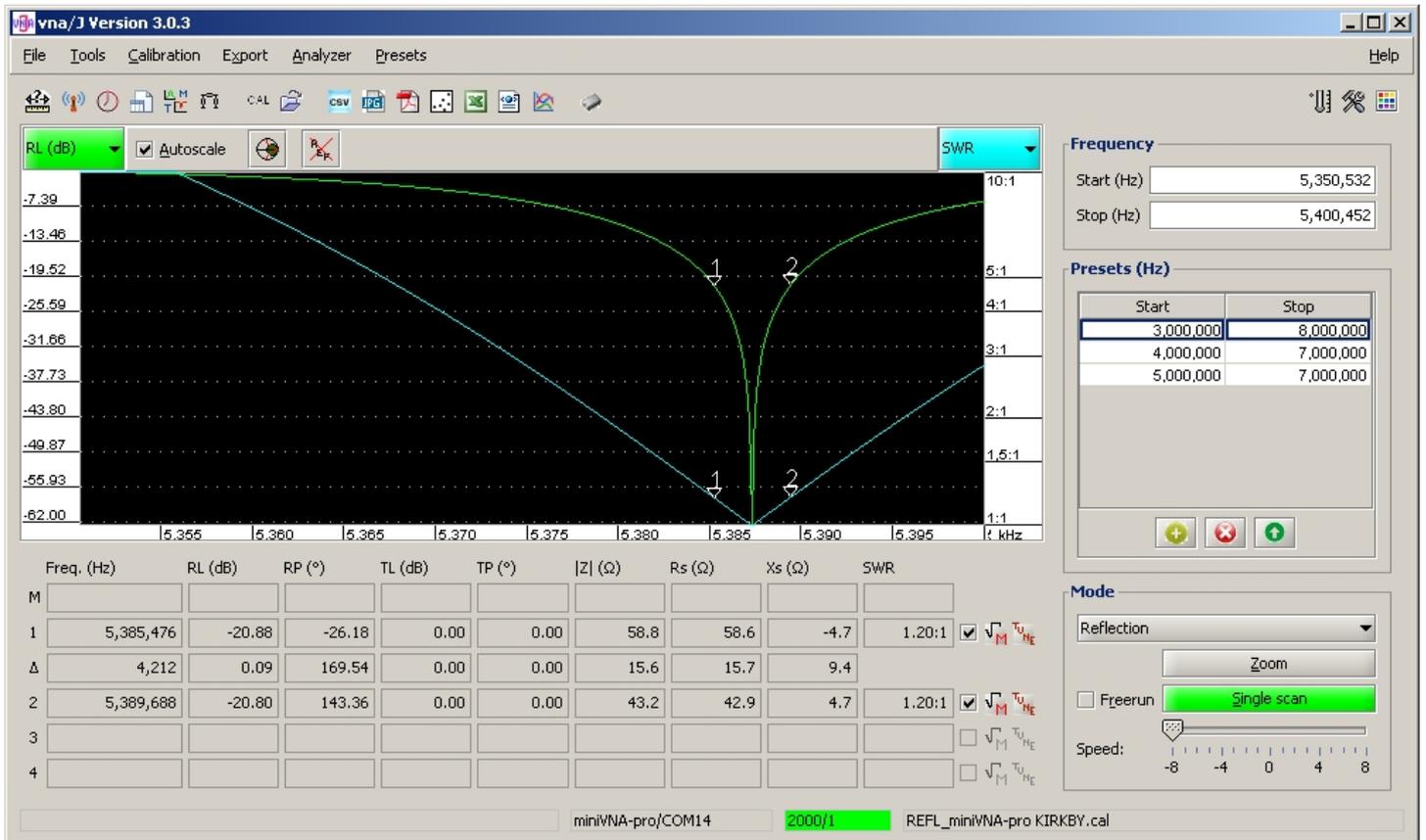
For the optimum match, I found it necessary to experiment a bit. The loop's braid is short in terms of wavelength and the current and voltage distribution around the loop varies, and thus the impedance around the loop differs depending on where it is measured – maximum current is where the voltage is at a minimum etc. I found that I could obtain a VSWR of 1.0:1 at a point approximately opposite the sliding braid. Tuning is naturally quite critical, as the Q is moderately high with quality coax. Moving the coupling coil around did not seem to unduly affect the resonance of the loop.

The screen shot from my Vector Network Analyser (VNA) shows a sweep taken at an arbitrary frequency in the 60 meter band. A return loss of over 60 dB quite surprised me, so I re-calibrated the VNA, with no change in the result. I set both markers 1 and 2 at a VSWR value of 1.2:1 to measure the usable bandwidth, which is shown as 4.212 kHz; the Δ values

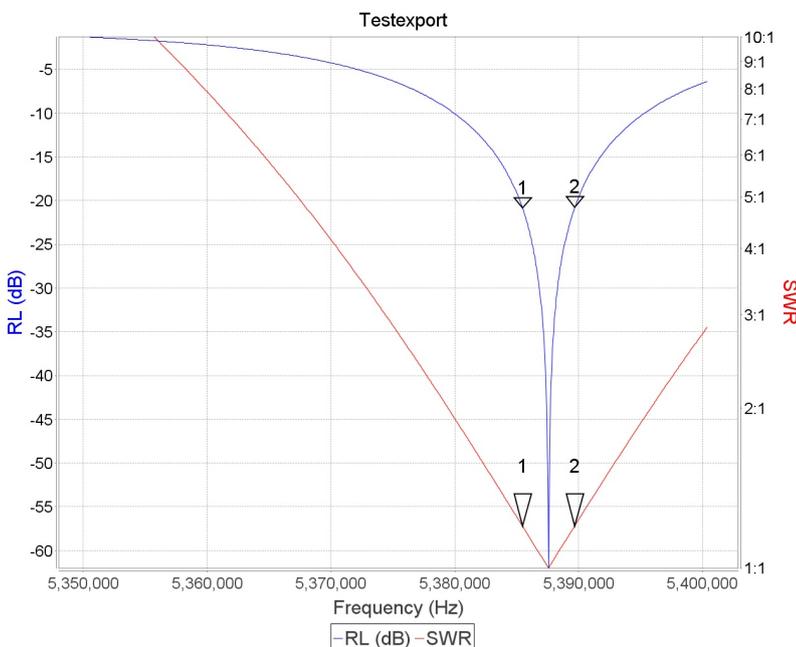
calculated by the program show the differences between the two markers.

Putting 100 watts of CW into the loop for 5 minutes continuously did seem to warm it a little; the air temperature was about 11°C. Comparing the received signal from my loop at the Hack Green Software Defined Radio (267 km away), with that from my dipole at 12 metres above ground, showed a difference of 19-21 dB over a few minutes monitoring.

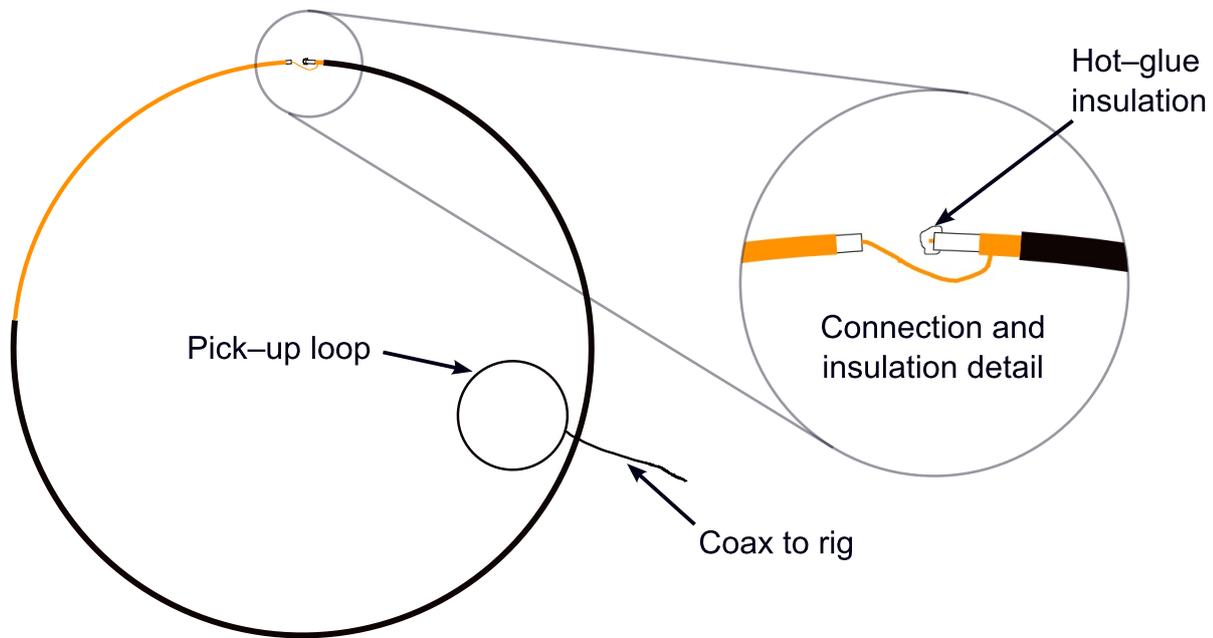
As virtually none of the RF is coming back to the transmitter, it's all going to either heat up the structure or being radiated into space, and this is where some of the inefficiency occurs; the braid is not as low a resistance material as silver plated large diameter loops typically made for the military etc. The loop also has a smaller aperture (πr^2) than a 60 meter half wave dipole ($0.1305\lambda^2$) which makes it a less effective radiator than a dipole.



Vector Network Analyser display

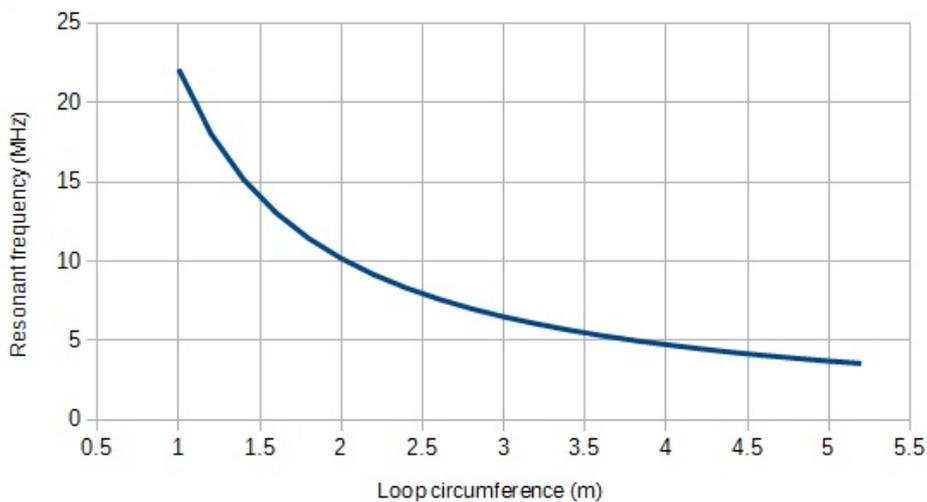


Vector Network Analyser showing detailed output



60 metre resonant coaxial loop

60 metre self resonant coax loop tuning arrangement detail (achieved by sliding the braid to change the capacitance, and holding in place with a clothes-peg)



Loop circumference versus frequency for 'unknown' 75 ohm coax cable