

COULSDON AMATEUR TRANSMITTING SOCIETY
G4FUR  **M1FUR**
CATS WHISPERS



Affiliated to the RSGB

**November
2009**

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CATS Committee

Chairman: Steve Conway, G7SYO
Secretary: Andy Jackson, G8JAC
Treasurer: Derek Hands, G1PGS
Members: Steve Beal, G3WZK
Stuart Barber, G6CJR
Dennis Noe, M0NDJ
Frank Emery, G3ZMF

CATS Whispers Editor: Steve Beal, G3WZK
email address for contributions: newsletter@catsradio.org

Regular Society Meetings

These are held on the second Monday in each month at:
St. Swithun's Church Hall, Grovelands Road, Purley, Surrey, CR8 4LA at 20:00 to 22:00

Society Nets

1st Saturday of Month - 17:15 - Crescenta Valley / CATS Net on Echolink
Normally via MB7IPL node on 145.2875 MHz
Sunday mornings - 11:00 - Call on 145.2875MHz.
Sunday evenings - 17:00 - Call on 3.700 MHz ± QRM
Wednesday evenings - 21:00 - Call on 70.425 MHz

CATS Website

www.catsradio.org

Email

enquiries@catsradio.org

Forthcoming Meetings

Monday 9th Nov Annual CATS Quiz with question master Frank, G3ZMF
Monday 14th Dec AGM
Monday 11th Jan 2010 CATS Annual Dinner at the Rubbing House, Epsom Racecourse



CATS is twinned with the Crescenta Valley Radio Club
Glendale California USA www.qsl.net/cvrc

October Meeting Report

The lecture at our October meeting was called “Loops And Other Small Antennas” and was given by Professor Mike Underhill, G3LHZ.

For anyone brought up to believe that “bigger is better” this concept might have come as something of a shock, but as Mike was about to explain, in this context “small” means less than a sixth of a wavelength long.

Mike began by outlining his view that loops are efficient, that the textbooks are wrong, and that heuristics show the way – but with the caveats that if efficient, a loop will have very small bandwidth, will need careful tuning, and that the Q and transmit voltage will both be high.



Mike, G3LHZ, begins his talk

The designer’s goal is therefore to reduce Q so as to increase bandwidth, thus enabling a higher power to be used before the tuning capacitors flash over. The practical power limit before flash over, depending on design, is a maximum of a few hundred watts unless, of course, vacuum variable capacitors are used.

Mike explained that the RF capture area of an antenna such as a half wave dipole is bigger than its physical size, because the antenna changes the refractive index of the space around it.

Mike’s first demonstration was of a magnetic loop antenna, similar to ones he had installed in the roof of his house when he first became interested in the subject. Using a fluorescent tube he demonstrated that the area of maximum radiation was in the plane of the loop and that the polarisation was horizontal. He also showed that there was a magnetic displacement current perpendicular to the plane of the loop.



Where it started in 1994 – Public Demonstration at IEE and University of Surrey Inaugural Lecture Label (G3LHZ photo)



Loop antenna: Note that the twisted gamma match on the left was used for feeding this antenna in Mike’s lecture and not the coupling loop at the bottom

Using the same fluorescent tube, Mike then showed us the radiation pattern from a simple 3 element yagi antenna; making visible phenomena such as polarisation, nulls and front to back ratio.

To explain his approach to engineering, Mike introduced the concept of heuristics as “hindsight theory” ie theory based on observation rather than the more conventional scientific approach of mathematical reasoning from first principles. His basic argument was that if carefully-made measurements disagree with mathematical theory, then it’s the maths that’s wrong. Many activities in amateur radio use heuristics - such as exchanging signal

reports, comparing signal strengths on a net over time, A/B antenna comparisons, measuring impedance, Q, bandwidth, efficiency or front to back ratio, and many more. Mike's antenna theory uses a heuristic approach and this evening was only the third time that Mike had presented it.

<http://en.wikipedia.org/wiki/Heuristic>

Mike's work has led him to the belief that in many antennas, the electrical fields at the element ends radiate RF, as do the magnetic fields at the centre – but that the parts in between radiate relatively little. This, Mike said, was related to the Goubau line effect that had been discovered in the 1950s – where a single wire can be used to convey RF power between two horns with very low loss, even at frequencies as high as 2.5 GHz.

Work with G8TB and others showed that the Goubau wave could even be made to turn corners, as illustrated in the following photos from an SRCC VHF NFD site in 1990:



SRCC 13cm station tent showing Goubau-type feeder horn (left) and perspex corner transition (right) (SRCC Photo)



Close up showing antenna and Goubau-type feeder horn (SRCC Photo)

One of the alleged criticisms made by the radio establishment about small loops is that they are inefficient. To counter this, Mike described his experiment that employs two loops of identical size. One is made of resistance wire and fed with DC, the other is made of a suitable conductor and fed with a known amount of RF (RF_{IN}). Using sensitive thermal equipment, the DC is adjusted until the temperatures of both loops are stable and identical. Mike's argument is that in this state, the heat energy being given off by both loops (which are painted with the same matt black paint to equalise emissivity) must be identical; and that any surplus energy being fed into the RF loop must be being radiated as RF (RF_{OUT}).

The loop efficiency is then given by the following equation:

$$\eta = 100 \times (RF_{OUT} / RF_{IN}) \%$$

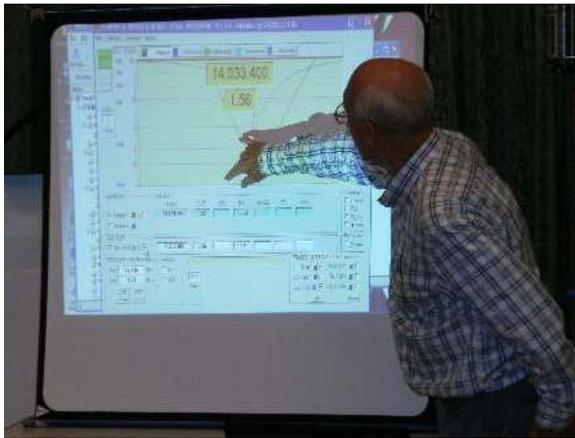
Mike's results were fascinating: theory dictates that the efficiency of a 1 metre loop at 1.8 MHz would be in the region on 0.1%. This is very poor and feeding it with 400 watts of RF power (for example) could cause parts of it to melt. However, Mike's measurements show the following efficiencies (η) :

| Freq (MHz) | 1.8 | 3.5 | 7.0 | 10.1 |
|------------|-----|-----|-----|------|
| η % | 74 | 86 | 88 | 90 |

Although these efficiencies are clearly very good, Mike explained that the problem is that practical loops often couple into a lossy environment, particularly into the soil, resulting in poor radiated signal strength. However, ground losses can be greatly reduced by mounting the antenna above the "Goubau Height". This varies inversely as the square root of frequency: at 3.5 MHz it is about 3 metres and at 14 MHz about 1.5 metres.

Another factor affecting radiation efficiency is the presence of nearby trees: Mike explained a little-known fact that tree leaves have much lower loss when they freeze and that trees radiate RF noise. This noise also reduces when the leaves freeze. Typically a loop antenna should be sited at least 2 to 6 metres from any tree, depending on frequency.

Using a mini VNA (vector network analyser) connected to his laptop computer, Mike made measurements of the resonant frequency (14 MHz) and Q (330) of one of his loops.



Mike, G3LHZ, explains a VNA display (M1CCF photo)

G3LHZ also analysed the performance of an ex-military loop antenna that CATS member Mike, M1CCF, had kindly brought to the meeting and pronounced its SWR as “satisfactory” - not bad for an antenna that is meant to be used outdoor and definitely not intended to function when propped up against a radiator in a church hall !



The ex-military loop antenna of Mike, M1CCF

Mike then took us on a whistle stop tour of other loop and small antennas, such as the Crossed Field Antenna (CFA – these work best over a sandy soil), the E-H dipole (must be high!), the use of loops that are resonant on two or even four frequencies, mini-midi loops, a loop monopole, a folded dipole with resonances at 14 MHz (SWR 1.19:1) and 5.9 MHz (SWR 2:1); a tuned hairpin antenna and a Goubau tuned sleeve vertical.



Tuning capacitor on Mike's tuned hairpin antenna

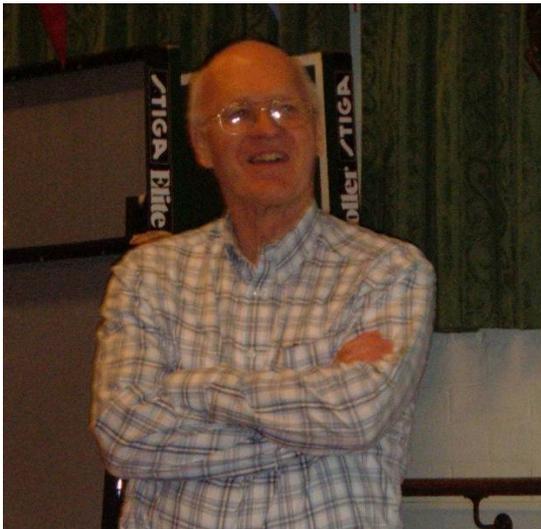
But it was Mike's coiled double-tuned hairpin (see photo) that attracted most interest. Using the VNA, this antenna's double resonance was evident, with a strikingly-wide bandwidth for the second resonance that was clearly visible to the audience. Mike explained how all this was happening by analogy to an overcoupled IF transformer.



The coiled double-tuned hairpin antenna

The coiled tuned folded dipole requires 4m of 10mm copper tubing and, if doubly tuned, can provide a covering 1.8 to 45MHz with 90%

efficiency and with a Q not exceeding 150.



Mike, G3LHZ, at the end of the lecture

As Mike's lecture drew to a close, we looked at the clock and realised that we had been so engrossed that the meeting had overrun by over half an hour. Thanks to Mike for a thoroughly enthralling and entertaining evening!

Editor's note: a full set of Mike's slides is available on the internet and may be accessed from the events page of the CATS website or by clicking [here](#).

Membership Matters

New Secretary & Treasurer needed: Andy (G8JAC) and Derek (G1PGS) have announced their intention to resign as Secretary and Treasurer respectively with effect from the CATS AGM on 14th December 2009.

We thank them both many years hard work over the years.

Both roles are very important to the functioning of CATS so if you are a member, please give some serious thought about whether you would like to volunteer for election to either of these posts.

CATS November Meeting

This will be the CATS annual quiz, led again this year by Frank, G3ZMF. The rounds include questions on History, Sport, General

Knowledge, Geography, "Big Screen, Little Screen and Books" and Amateur Radio, with a Music section provided by Andy, G8JAC - so get swotting everyone! Other clubs invited to participate include Crawley ARC, Dorking & DRS, Reigate ATS, Surrey RCC, Sutton and Cheam RS and Wimbledon & DRS.

CATS December Meeting

Advance AGM Notice

Annual General Meeting Of The Society

In accordance with the rules of the Society, notice is hereby given that the Annual General Meeting of the Coulsdon Amateur Transmitting Society will be held on Monday 14th December 2009 at St. Swithun's Church Hall, Grovelands Road, Purley, Surrey CR8 4LA, commencing at 20.15 hours.

Please do your best to attend this meeting: the existing committee will report on the past year's activities, following which there will be an election of next year's Society officers. As at least two vacancies are arising (see above) new volunteers are urgently needed. Alternatively, you may wish to propose or second someone - so please give some thought to this important process before the meeting. There will also be two small proposed changes to the Society's Rules to be voted on. Full details of the AGM will be sent direct to members.

CATS January Meeting

On January 11th 2010, the 2010 CATS annual dinner will be held at the Rubbing House restaurant on Epsom Downs racecourse. Based on members bookings received by CATS Secretary Andy, G8JAC, we have reserved a table for 27 (check) members and partners.

<http://www.rubbinghouse.com/home.html>

CATS Contesting

Frank, G3ZMF, writes: "As I'm still researching the next issue of Shak Nowtz, I thought I'd update you on CATS contesting instead.

"Most of you will be aware that Andy, G0KZT, is a family man who is also very busy at work. He can no longer find sufficient spare time to continue as CATS Contest Secretary, so as deputy contest secretary, I've been promoted !

"That means I'll be hounding you to support the club in any way you can, even if that means only visiting the contest site for a short while. After all, CATS is your club!

"The next contest on the CATS agenda is the 'Brass Monkeys' event which we believe will take place next year (2010) on 6th/7th March, subject to confirmation. It's a dual band event (144 and 432 MHz) and lasts 24 hours. I'll be there, of course, doing the graveyard shift from midnight to 08:00 hours but hopefully, others will be there to help set up, operate, cook the breakfast (subtle hint to Len, G0GNQ) and dismantle the station when it's all over.

"As for kit for outside events, the club is fortunate to have a good stock of radios from HF to VHF.

Question: Can you go on HF or VHF? If not, why not?

Question: Do you NOT have the equipment or is it a case of no antennas?

Question: Do you need help? Within the club's equipment list is a vast array of HF and VHF rigs. Also there are many of us who would be very happy to come to your QTH and help put up a basic antenna. All we need is a nice cuppa afterwards!

"As for ATUs – for HF we don't seem to have any in the Club stock but many club members may have an unused one for loan. (At G3ZMF, I have two L-Match ATUs for 80m to 10m and a separate ATU for 160 m only, all rated at 50 watts. Just call me!)

"Next, as I'm on my soap box, I'm asking you, the members, whether you have any items of redundant or unused equipment, either simply not required, or available for loan?

"If so, you could help a member of the club to get on the air. Please call either me (new 'phone number 07780 347 906 – no texts in "textspeak" please) or any Committee member.

"Finally, I was recently browsing through some 25+ year old Radcoms and came across these images of morse sending styles that originated on DK1BP's QSL card. DK1BP does not feature in any current online databases – so is

now presumably a silent key. I hope you find them amusing!"



73 de Frank, G3ZMF

JOTA

This year's Jamboree On The Air (JOTA) was on 17th/18th October, once again led by Stuart, G6CJR, and assisted by CATS members Denis M0NDJ, Jim G4WYJ and Steve G3WZK, plus SCRS members Martin M1MRB, Tim 2E0TTA, Paul M0TZO and others. We were visited by nearly 40 youngsters all told and it was all a lot of fun.

The newsletter editor was deputed to deal with the Morse Code element of the weekend and this required each participant to send and receive three CW messages. This was rather a lot of dashes and dots for your ageing scribe to deal with, but there were many lighter moments as messages from the youngsters included, "my brother is stupid", "I'm Homer Simpson", "my sister is very annoying" but best of all... "Steve is cool!" Can't be bad!

Amateur Radio Training & Examinations

Attached to this issue of *Cats Whispers* is a flyer from Sutton and Cheam RS (SCRS) about the courses and examinations that they are planning to run over the next year or so.

Members are advised that the closing date for applying for the Foundation Course is imminent: November 14th 2009.

Stolen Equipment

If your radio equipment was stolen would you remember its serial number? Have you recorded it somewhere safe? Would you like to notify people who might potentially purchase it or have participating shops checking on repairs and 2nd hand purchases?

If so, you might wish to consider signing up to The Rig Register - a free service. You can record your equipment details in a safe and easy to find place and your equipment can be marked as lost or stolen for others to check.

The Rig Register has been set up by Hugh, G7UOD, and can also be used as an asset register by clubs and societies. For more information, visit: www.therigregister.com

Kempton Park Rally 2009

This autumn's Kempton Park Rally was quieter than usual – despite being blessed with near-perfect weather. Perhaps however that was the problem as the event is indoors and potential visitors preferred to be somewhere where they could be outside and enjoy the warm rays of autumn sunshine.

The CATS Bring and Buy stand was a success with 31 items accepted for sale. Organised by Andy, G8JAC, helpers on the CATS stand included Frank (G3ZMF), Glenn (G4FVL), Ian (M3IGP), Mike (G8AAI), Steve (G3WZK) and Steve (G7SYO.) Overall, we made a net profit of £103.30 for club funds.

CATS Bazaar

As stated last month, the 32nd annual CATS Radio & Electronics Bazaar, takes place this year on Sunday November 15th 2009, with admission to the public from 10:00 am to 2:00 pm. With all tables now allocated, this promises to be a busy and successful event.

If you would like to help – either with set up at 5pm clock time on the previous day or from 8 am on the event day - please contact CATS Secretary Andy, G8JAC, at secretary@catsradio.org

A flyer for the Bazaar is attached to this issue of *CATS Whispers*.

Contests Coming Soon

Nov 7/8: 144 MHz CW Marconi
Nov 12: 80m Club Sprint (SSB)
Nov 14: Club Calls Contest (1.8 MHz)
Nov 21/22: 2nd 1.8 MHz contest
Nov 25: 80m Club Sprint (CW)
Dec 6: 144 MHz AFS
Dec 26-29: 50/70/144/432 Christmas Cumulatives Contest

If anyone can track down reliable information about contests planned for 2010, please email the editor at newsletter@catsradio.org

Local Rallies & Events

15 November 2009

CATS Bazaar

1st Coulsdon Scout Group headquarters, Lion Green Road in Coulsdon, Surrey. [Map](#)

Open 10:00 to 13:00

Parking, trade stands, bring and buy, refreshments

Contact: enquiries@catsradio.org or

www.catsradio.org

7 February 2010

25th Canvey Radio & Electronics Rally

'The Paddocks', Long Road, Canvey Island, SS8 0JA

Open 10:30

Parking, Catering, Disabled Facilities, Trade Stands
Contact: Dave, G4UVJ, 01268 697978 (evenings)

www.southessex.ars.btinternet.co.uk

14 February 2010

Harwell Radio and Electronics Rally

Didcot Leisure Centre (Adjoining St. Birinus School), Mereland Road, Didcot, OX11 8AY, Oxfordshire.

Contact: Ann Stevens 01235 816379

www.g3pia.org.uk

e-mail rally@g3pia.org.uk

28 February 2010 (note corrected date)

Rainham Radio Rally

Rainham School For Girls, Derwent Way, Gillingham, Kent, ME8 0BX

Contact Trevor, G6LYW, 0771 7678 795

For Sale & Wanted

WANTED – RSGB callbook for 1969 to 1972 era. Must contain details of G8CAX. Contact Frank, G3ZMF, on 01737 218463, or call on GB3NS.

Other Club News & Contact Information

BROMLEY & DISTRICT ARS

Website: www.bdars.org.uk

Email: bdars-news@talk21.com

Meetings: 3rd Tuesday of every month at Victory Social Club, Kechill Gardens, Hayes, Kent, 19:30 for 20:00.

CPREC (CRYSTAL PALACE)

Website: www.gsl.net/g3oou/ or

<http://www.g3oou.co.uk/>

Club Net: Wednesdays 20:00 on 145.525 MHz

Meetings: 1st Friday at All Saints Church Parish Rooms, Beulah Hill at 19:30

6th Nov 09 - EGM

4th Dec - Christmas Social

CRAWLEY ARC

Website: www.carc.org.uk

Club Nets: Tuesdays 20:00 on 145.550 MHz and Fridays 19:00 on 1.970 MHz

Meetings: Every Wednesday at Hut 18, Tilgate Forest Recreational Centre, Tilgate Forest, Crawley from 19:30, and Sundays, 10:30 to 13.00.

CRAY VALLEY RS

Website: www.cvr.org

Contact: Richard Perzyna, G8ITB (see website)

Club Nets: Wednesdays 21:00 on 145.500/QSY and 22:00 on 3.720 ± QRM, and Sundays 11:00 on 3.720 ± QRM

Meetings: 1st and 3rd Thursdays at Progress Hall, Admiral Seymour Road, Eltham, SE9 1SL.

DORKING & District RS

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

Email: ddrs.secretary@yahoo.co.uk

Contact: David Smith, M0SXD, 07808579501

Club Nets: Sunday 08:15 on 3.770 MHz & 20:30 on 144.775 MHz

Meetings: Friends Meeting House, Butterhill, South Street Dorking at 19:30.

24th Nov - Millimetre wave radio propagation/antennas - Dr David Browning.

22nd Dec - Christmas Dinner

HORSHAM ARC

Website: www.harc.org.uk

Club Nets: Saturdays 21:30 on 144.725MHz and Sundays 10:00 on 3.722 MHz

Meetings: 1st Thursday at The Guide Hall, Denne Road, Horsham, Sussex

5th Nov – Electrical oddities - John Narborough

15th Nov - Sunday Morning Fox Hunt

3rd Dec - AGM

5th Dec - HARC Christmas Bash -Staplefield

MID SUSSEX ARS

Website: www.msars.org.uk

Club Nets: Sundays 08:00 on 3.740 MHz and at 11:00 on 145.350 MHz, Wednesdays 20:00 on 145.350 MHz and Daily 13:30 on 21.330 MHz

Meetings: Every Friday at Cyprus Hall, Cyprus Road, Burgess Hill, West Sussex for 19:45

REIGATE ATS

Website: www.gsl.net/rats

Email: rats@gsl.net

Club Nets: Thursdays 20:00 on 145.500 MHz and Sundays 20:00 on 3.740 – 3.760 MHz

Meetings: 3rd Thursday at RNIB, Redhill College, Philanthropic Road, Redhill for 19:30

SRCC

Website: www.g3src.org.uk

Contact: Ray Howells G4FFY 020 8644 7589

Club Nets: Sunday 09:30 on 1905 kHz

Daily natter channel – 144.215 MHz at 19.30.

Meetings: 1st & 3rd Mondays at Trinity School, Shirley Park, Croydon CR9 7AT 19:45 for 20:00

7th Dec - TBA

SUTTON & CHEAM RS

Website: www.scrs.org.uk

Contact: John Puttock G0 BWV 020 8644 9945

Club Nets: Monday 20.00 on 145.500 MHz

Saturday 11.00 on 145.500 MHz

Meetings: 3rd Thursday at Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton. 19:30 for 20:00

19th Nov – Weak Signal Propagation Reporter (WSPR), Walter Blanchard, G3JKV

10th Dec – Christmas Junk Sale

21st Jan 2010 – D-Star. Chris Howard M6HUD

18th Feb - An Introduction to Military Communications Mike O'Beirne G8MOB

WIMBLEDON & DISTRICT ARS

Website: www.gx3wim.org.uk

Club Net: Mondays 20:45 on 145.500 MHz

Meetings: 2nd & last Friday of each month at Martin Way Methodist Church, Buckleigh Avenue, Merton Park SW20. 19:30 for 20:00

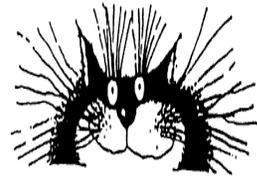
13th Nov – On air with Morse

27th Nov - Surplus Equipment Sale

12th Dec - Christmas Social

CATS Whispers is published monthly by
S J Beal G3WZK on behalf of the
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**THE COULSDON
AMATEUR
TRANSMITTING
SOCIETY presents:**



**CATS 32nd Radio &
Electronics Bazaar**

Sponsored by SYCOM www.sycomcomp.co.uk

Sunday November 15th 2009

10:00 am – 2:00 pm

Admission £1

Secondhand equipment

Flea Market

Refreshments

Traders' stalls

Disabled access/ toilet

New equipment

Easy parking

PLUS CATS Bring & Buy:

Bring your gear and we will sell it for you.

**QTH: 1st Coulsdon Scout Group HQ Lion Green
Road Car Park Coulsdon, Surrey, CR5 2NL**

Web www.catsradio.org Email enquiries@catsradio.org



AMATEUR RADIO LICENCE COURSES & EXAMINATIONS

Sutton & Cheam Radio Society is pleased to announce their forthcoming Amateur Radio Licence courses and examination schedule.

Foundation Level

Course to be held on 28th and 29th November with revision and examination on 5th December 2009. Applications to be received by 14th November.

Intermediate Level

Course to be held on 6th & 13th February, 6th, 21st & 27th March with revision and examination on 28th March 2010. Applications to be received by 23rd January.

Advanced Level

We will not be holding a formal course, but will be hosting the examination on 3rd June 2010. To assist candidates we will hold a revision weekend with question and answer sessions on 22nd & 23rd May. Applications to be received by 1st May 2010.

All courses and examinations are held in Banstead, Surrey.

For further details including charges e-mail training@scrs.org.uk
or g3whk@blueyonder.co.uk ☎ 020 8330 5795