

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



October 2014



Affiliated to the RSGB

CATS Committee

Chairman: Stuart Barber, G6CJR
Secretary: Steve Beal, G3WZK
Treasurer: Steve Conway, G7SYO
Members: Glenn Rankin, G4FVL
Andy Briers G0KZT
Dennis Noe, M0NDJ
Vacancy

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

Regular Society Meetings

These are held on the second Monday of each month at:
St. Swithun's Church Hall, Grovelands Road, Purley, Surrey, CR8 4LA at 20:15 to 22:15

Society Nets

1st Saturday of month - 17:15 - Crescenta Valley / CATS Net on Echolink/ GB3NS
Sunday mornings - 11:00 - Call on 145.400 MHz \pm QRM
Sunday evenings - 17:00 - Call on 3.700 MHz \pm QRM
Wednesday evenings - 21:00 - Call on 70.425 MHz

CATS Website

www.catsradio.org

Email

enquiries@catsradio.org

Forthcoming Meetings

Monday October 13 Bletchley Park DVD
Monday November 10 Quiz
Monday December 8 AGM



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

CATS September Meeting

Our September meeting featured a talk by Dave Smith M0SXD on repairing vintage and old radio equipment – meaning, in David’s case, anything using valves and built before 1960.



Dave Smith M0SXD ready to begin his talk

After briefly explaining his background in radio and electronics David, who is a member of the Dorking club and of Sutton and Cheam, explained the various stages that he goes through in any repair/restoration work.

Look, touch, smell, listen ...

First is cleaning, often using cleaning foam. This is followed by a thorough visual inspection, looking for a whole range of issues such as burn marks, melted wax, perished wiring or broken drive cords. It is a good idea to pay attention to any unusual odours inside the equipment, as this may indicate a problem in the past. It is also useful to operate all of the set’s controls as this can reveal other problems eg if they are stiff or even too loose. All of this is done before applying any power to the equipment.

Safety is obviously important, particularly when working with AC/DC equipment. The wiring of the mains plug should always be checked.

David then explained the workings of a typical mains domestic superhet radio – using the Bush DAC90A as an example. He outlined the functioning of each stage and backed this up with photographs of inside the set to demonstrate how the schematic related to physical reality.

Some of the typical faults to look out for are electrolytic capacitors (as these may need to

be reformed), leaky paper coupling capacitors or resistors changing value. Although paper decoupling capacitors can normally be left in circuit even if they are slightly leaky, David recommends replacing all paper inter-stage coupling capacitors, due to the damage that may be caused if they are leaky.



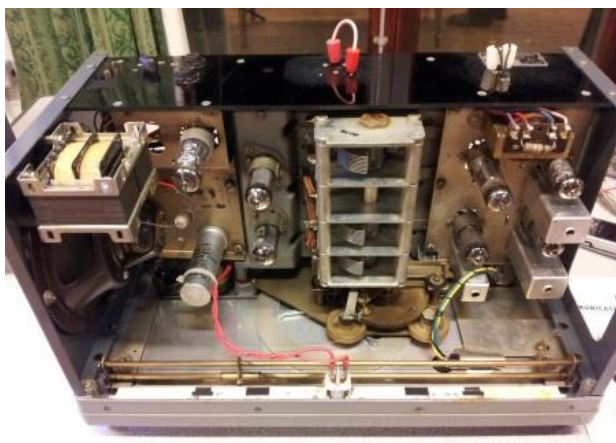
A Bush DAC90A of the type whose repair and restoration David described

In a typical domestic superhet radio, there can be as many 80 non-soldered connections (such as valve pins) that with time can become corroded or dirty and lead to fault conditions.

When it comes to eventually applying power to the set, David recommends a cautious approach. First the resistance of the HT line to chassis should be measured with no power applied. Any reading less than about 20,000 ohms should be investigated. It can then be useful to apply an external HT source, of a lower voltage than would normally be present inside the set, and measuring the DC current consumed. If all is okay at this stage, one can try applying mains power using a variac and progressively increasing the voltage applied. At each stage of the procedure, the behaviour of the set should be monitored using “look, smell, touch and listen” – keeping one hand in a pocket at all times for safety. Using a cautious approach and pausing at each stage should allow time for the electrolytics to reform – however if any of them become too hot that would be a definite warning sign. It is normal for the audio stages to begin to work before the RF and IF stages, so if the set has a PU (gramophone pick-up) connection, David recommends switching to the “gram” setting and applying a finger to the PU input. This should result in hum being emitted from the loudspeaker even before the RF/IF stages have begun to work.

A voltmeter is then a good pointer to possible faults by listening carefully to the set at the same time as the meter's test probe is applied, particularly in a control grid circuit. A click should be heard in the loudspeaker, its loudness depending on the stage of the set that the probe has been applied to.

David then described a simple way of aligning a set once any faults have been cleared, by listening for the local oscillator on another radio that is known to be properly calibrated. He demonstrated how easy it is to pick up the local oscillator of a set such as his Eddystone 840C (see below) on a modern radio with a digital display such as one of the Éton range.



Inside David's Eddystone 840C

Once the frequency limits of each waveband have been properly established, the tuning of the RF amplifier stage/s can be set, adjusting the appropriate inductor at the low frequency end of each range and the appropriate trimming capacitor at the high end, and alternating the two adjustments until no further improvement can be achieved. Although the textbook way of doing this is with a modulated RF signal generator and an analogue meter across the loudspeaker terminals, surprisingly good results can be achieved by ear alone.



An Eddystone 840C front panel

A big CATS' thank you to David for giving us such an interesting talk.

Editors' Note: the above summary of David's talk is not intended to be a set of full instructions on how to restore an old radio. Anyone uncertain of how to proceed is advised to seek proper advice before starting work.

Next month's issue of CW will include the second half of my article about how I restored an Eddystone 940.

CATS October Meeting

This meeting will feature a DVD about Bletchley Park.

The date for your diaries is October 13th 2014.

CATS November Meeting

This meeting will feature a CATS favourite – a quiz – and on this occasion the quizmaster will be Steve G7SYO. As usual, partners are very welcome to attend. The questions will be mainly general knowledge, so a knowledge of radio will not be necessary to fully enjoy the evening.

The date for your diaries is November 10th 2014.

CATS December Meeting

This will be the Annual General meeting and more details will be published in due course. In the meantime members are invited to think about the future of the society and next year in particular, and whether they would be willing to be on the committee in 2015. Steve G3WZK has announced that he will be standing down as Secretary and there is also a vacancy outstanding from the 2013 AGM, so if you think you may be interested in taking on these or one of the other roles, please be sure to give it some serious thought before the AGM which this year will be on Monday December 8th. Don't be shy!

New Member

CATS Whispers is pleased to announce that Martin Broadway G4GFI has joined the Society. Martin lives in Epsom and his main radio interests include VHF/UHF and contesting. He is also a keen photographer. A big CATS welcome to Martin!

Helpers needed for Kempton Park rally and CATS bazaar

It's now only a few weeks until these two regulars in the CATS' calendar and more helpers are needed for both events. If you would like to help on either or both of these occasions, even if you only have a couple of hours to spare, please contact Graham 2E0XDZ (who will be in charge of the Bring & Buy stand at Kempton Park) or any committee member.

The dates for your diary are:

Kempton Park - November 9th - Help needed on B&B stand

CATS Bazaar - November 23rd – Help needed to set up on the early evening of 22nd November and to run the event, including the B&B stand, on 23rd November.

Many members will be aware of plans to redevelop the site of the car park that we use for the CATS Bazaar. Currently, this work is due to begin in January 2015.

In case it becomes necessary to make last-minute changes to plans for the 2014 CATS Bazaar, particularly for parking and access, anyone proposing to attend is advised to check the CATS website (www.catsradio.org) before setting out.

Low Power Contests 2014: 144 MHz

Andy G0KZT writes: The results have been published for our effort in the 2 metre Low Power (Open Section) contest that took place on the Saturday of our Play Weekend in August.

The adjudicator Richard G4WFR said: "Poor conditions and low UK activity were yet again reported by many entrants. This year did however see an increase in entry level (35 this year, 32 in 2013) and overall active stations were considerably higher with a 23% increase over 2013. Some parts of the country suffered heavy rain & strong winds, just what you expect for an August contest weekend!"

Congratulations go to:

1. Winner Open Section
– A1 Contest Group G4ZAP/P
2. Runner-up Open Section
– G4RLF/P operated by Frank Mitchell G8PCB
3. Winner Single Operator Fixed Section
– Bill Harrison M0BTZ
4. Runner-up Single Op Fixed Section
– Richard Staples G4HGI
5. Winner Single Operator Others Section – Chris Parnell G0HFX
6. Runner-up Single Op Others Section
– Nigel Hearne GW0IRW
7. Leading Intermediate Licensee Single Operator Fixed Section
– Andrew Garratt 2E0NRD

You may recall that we were plagued with aerial problems (falling down) plus not having any operators for about the last 2 hours. We had only two errors detected in our log which were simply not logging the /P for the contacts with G3WIRT/P and G1KAR/P.

432 MHz

Also published were the results of the 70cms contest that took place on the Sunday of the Play Weekend.

Once again, G4WFR reported: "Poor conditions and low UK activity were yet again reported by many entrants. This year did however see a considerable increase in entry level and a higher level than on 2m (39 this year, 27 in 2013) and overall active stations were also far higher with a 30% increase over 2013. The weather was better than the 2m contest on the previous day."

Congratulations go to:

1. Winner Open Section
– A1 Contest Group G4ZAP/P
2. Runner-up Open Section
– Matthew Cabban G0XDI
3. Winner Single Operator Fixed Section
– Pete Millard 2E0NEY
4. Runner-up Single Op Fixed Section
– Tony Pugh GW8ASD
5. Winner Single Operator Others Section – Chris Parnell G0HFX
6. Runner-up Single Op Others Section
– Nigel Hearne GW0IRW

There was only one error reported which was on an incorrect received signal report from our contact with G0HFX/P.

Good effort I think!

Andy G0KZT

Editor's Note: A full set of results appears on page 9 of this issue of CATS Whispers.

Useful Test Gear

Steve G3WZK writes: I recently saw a useful bit of kit being advertised on eBay. Listed as a “New Transistor Tester Capacitor ESR Inductance Resistor LCR Meter NPN PNP MOSFET” at a cost of £15 post free from China (where else?) it seemed like a good bargain. The next time I looked at it, the price had fallen to £14.25 so I ordered one straight away. It arrived, apparently from Belgium, 10 days later.

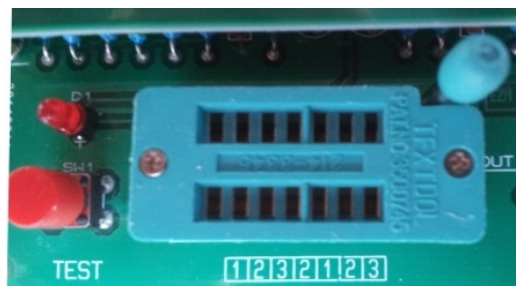


The item as it appeared on eBay

The unit works off a PP3 9 volt battery and is very simple to use – just as well as there were no instructions whatsoever although the eBay page does at least list the facilities that it is claimed the unit will provide.

However, things are pretty easy in practice. You simply insert the device to be tested into the green socket in the front of the PCB, lock it in place with the tiny lever and press the test button.

What is good about this little gadget is that it doesn't matter where exactly you insert the component you are testing – it works out what you have inserted and where and displays the results on the screen. This is very useful for identifying the connections on unmarked transistors, for example.



The component test socket. Note the legend below the socket to identify the pin numbering system. When the lever at the top right of the socket is operated it locks the component being tested into place.

To test the device, I connected a PP3 battery, inserted a few components - one at a time - into the IC socket, locked them in place, and pressed the Test button. The unit did a self-test procedure including measuring the battery voltage and then displayed what it had found. The first item to be tested was a disc ceramic capacitor – see below:

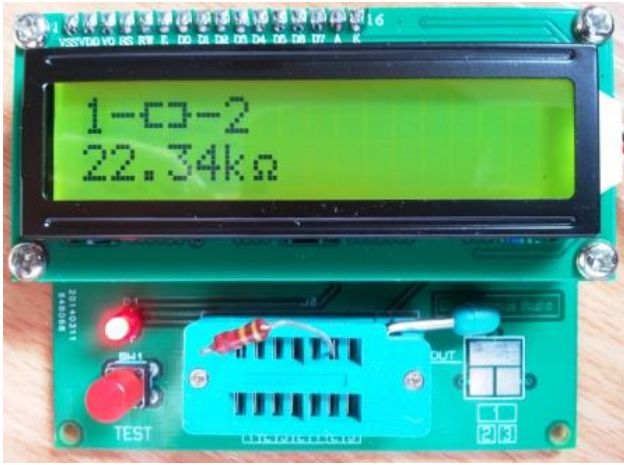


A 1000pF capacitor under test

I then put the device through its paces more thoroughly, to test its capabilities with inductance and resistance, and as a transistor tester. It didn't work too well with a very low inductance which it seemed to think was a faulty component, but with an RF choke of sizeable inductance it gave a reasonable reading. It also worked very well on resistors and transistors (see below.)



An RF choke of unknown value under test



A 22 kohm 5% resistor under test



A J310 JFET under test.

Note how the pinout of the FET is automatically identified (ie Pin1 = Gate, Pin2 = Drain, Pin3 = Source)

According to the information on eBay, the device will also test diodes, thyristors and much more. It can even test two capacitors simultaneously by using the right combination of connection pins. I did not test these options however.

There is a complicated menu structure which can be accessed by giving the "Test" button a long push. It is a shame that these do not also appear in written instructions as it is not at all clear about what you need to do.

As supplied, the unit is a bare PCB and really needs to be boxed up. There is unfortunately no simple way to do this as the LCD display sits high above the board, but the IC locking lever is very close to the PCB in the locked position. I plan to obtain a second latching IC socket and piggyback it on the existing socket. This will hopefully make it possible to insert the whole arrangement in a rectangular ABS box.

This is a device I would thoroughly recommend CATS members to obtain, especially as the

price (as of Sept 15th) has now fallen to only £12.99 post free.

Search for "New Transistor Tester Capacitor ESR Inductance Resistor LCR Meter NPN PNP MOSFET" on eBay it interested.

Denis Bailey's Train Set

CATS member Denis M6XLS has dismantled the OO gauge train layout that he used to have in his garage. He is therefore looking for someone to provide a good home for all the bits and pieces. This includes over 30 metres of Peco track with points etc, several locomotives of British and continental origin, other rolling stock, and trackside buildings.

Contact Denis on 01737 643242 if interested.

Useful Links

CATS member Tom G4DFA has kindly sent in details of a YouTube video about Orford Ness, primarily covering the BBC's 648 kHz transmitter but also delving into the history of the site including early over-the-horizon radar experiments. Worth a watch.

https://www.youtube.com/watch?v=4dMfb3nY_rE

Another CATS member, Colin G3YCR, sent in the following which will be of interest to any CATS members who use 2.3GHz:

<http://rsgb.org/main/blog/all-regions/region-9/2014/09/09/lte-test-transmissions-2-3-ghz/>

Editor's note: LTE stands for "Long Term Evolution" which is a new set of standards for cellular mobile services.

Meanwhile a third CATS member, Mike M1CCF has sent in a link, relating to a Skills Night recently organised by the Chelmsford Amateur Radio Society at the Village Hall in Danbury in Essex, which looks like good fun.

Mike says that he might be able to offer a location in Addiscombe or New Addington if members were interested. Visit the following site to find out more:

<http://www.essexham.co.uk/news/cars-skills-night-21-july-2014-report.html>

Please contact any Committee member if you would like this idea to be pursued further.

Contests Coming Soon

<u>Tuesday Activity Activity</u> <u>Contests 2014 – all begin at</u> <u>8pm local time</u>	
Oct 14	70 cm
Oct 21	23 cm
Oct 28	6 metres
Nov 4	2 metres
Nov 11	70 cm
Nov 18	23 cm
Nov 25	6 metres
Dec 2	2 metres
Dec 9	70 cm
Dec 16	23 cm
Dec 26	Christmas Cumulatives: 70cm, 2 metres, 4 metres, 6 metres
Dec 27	70 cm
Dec 28	23 cm
Dec 29	6 metres

Other Contests **2014**

Oct 29: 50MHz AFS Contest
Oct 23: 80m Club Sprint SSB
Nov 1/2: 144MHz CW Marconi
Nov 8: Club Calls (1.8MHz AFS)
Nov 12: 80m Club Sprint SSB
Nov 15/16: 2nd 1.8MHz Contest
Nov 27: 80m Club Sprint CW
Dec 7: 144MHz AFS

Local Rallies & Events

10-12 October RSGB 2014 Convention
Kents Hill Conference Centre in Milton Keynes
<http://rsgb.org/events/find/rsgb-convention-2014/>

9 November 2014
West London Radio & Electronics Show
Kempton Park Racecourse.
Open 10:00. Parking, trade stands, catering, disabled facilities. Contact info@radiofairs.co.uk
NOTE: CATS involvement in this event. The CATS bring and buy sale is a permanent feature of this rally.
www.radiofairs.co.uk

23 November 2014
CATS 37th Annual Radio and Electronics 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

1 February 2015
30th Canvey Radio & Electronics Rally
The Paddocks Community Centre, Long Road, Canvey Island, SS8 0JA
Open 10:30
Parking, Catering, Disabled Facilities, Trade Stands
Major Amateur Radio and Electronic component exhibitors Selling New and S/Hand equipment .
Freshly made refreshments. (And by popular demand the famous Canvey Radio Rally Bacon Rolls are back on the Menu).
Free car parking with space outside main doors for disabled visitors
Contact: Vic Rogers G6BHE Tel 01702 308562
NVR@bluevonder.co.uk
www.southessex-ars.co.uk/canveyrally.html

22 February 2015
Rainham Radio Rally
Rainham School For Girls, Derwent Way, Gillingham, Kent, ME8 0BX
Opens 10:00,
Talk in on 2metres using G0BRC.
RSGB RAIBC RSARS RNARS Peter Weatherall / QRP club, Clifton ARS contest Group
Traders incl Sycom
Contact Trevor, G6LYW, 07717 678795 or
trev@wig1.co.uk
www.brats-gth.org

15 March 2015
Dover Radio Rally
Location: Whitfield Village Hall, Sandwich Road Whitfield, Dover. CT16 3LY
Doors open at 10.00am.
Auction starts at 12.30pm.
Rally ends at 1pm.
Entrance £2.00.
www.darc.org.uk/

21 June 2015
27th Newbury Radio Rally & Boot Sale
Newbury Showground, M4 J13.
Located right next to junction 13 of the M4 Motorway.
Nearest Post Code: RG18 9BB
Open 09:00. Free parking, trade stands, catering, disabled facilities.
Contact rally@nadars.org.uk
www.nadars.org.uk/

26-28 June 2015
39th Hamtronic Show, Friedrichshafen
Messe Friedrichshafen, Germany
Open 09:00 each day

- 63rd DARC Lake Constance Meeting
- with lectures and meetings
- HAM RALLYE - Friday and Saturday
- HAM tent camp
- HAM NIGHT - Saturday

www.hamradio-friedrichshafen.de/ham-en/index.php

19 July 2015
McMichael Rally & Boot Sale
Reading Rugby Club Holme Park Farm Lane, Sonning Lane (B4446), Sonning on Thames, Reading. RG4 6ST off A4 east of Reading
Open 09:30.
Contact: Pete G8FRC 01189 695 697
www.mcmichaelrally.org.uk

Other Club News & Contact Information

BROMLEY & DISTRICT ARS

Website: www.bdars.org.uk/

Email: info@bdars.co.uk

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

21 Oct - Advanced level mentoring - Q&A on any topic

18 Nov - Members short talks

16 Dec - Project Night plus mince pies

CPREC (CRYSTAL PALACE)

Website: www.qsl.net/g30ou/ or <http://www.g30ou.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

3 Oct - Railway Signalling

7 Nov - Guide Dogs For The Blind

CRAWLEY ARC

Website: www.carc.org.uk

Meetings: Every Wednesday at Hut 18, Tilgate Forest Recreational Centre, Tilgate Forest, Crawley from 19:30, and Sundays, 10:30 to 13:00.

4 Oct - Club Dinner - The Crown Pub, Turners Hill

5 Dec - Fish and chip supper

CRAY VALLEY RS

Website: www.cvr.org

Contact: Lawrie Atkinson G4FAA. (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 1st Royal Eltham Scouts HQ, Rear of 61 - 71 Southend Crescent, Eltham, London, SE9 2SD.

2 Oct - Ballooning - G0TDJ

16 Oct - TBC

6 Nov - Surplus Sale

5 Dec - Xmas meal

DORKING & DISTRICT

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

Email: ddrs.secretary@yahoo.co.uk

Contact: George Brind, G4CMU

Club Nets: Sunday 08:15 on 3.770 MHz & Thursday 20:00 on 144.775 MHz

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

28 Oct - How to build a 4 square antenna Garth Swanson G3NPC

25 Nov - 3 dimensional measurement and mapping of an antenna radiation pattern + AGM Garth Swanson G3NPC and Alan Hopper M6NNB

TBA 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

2 Oct - Junk Sale

6 Nov - Ian Gledhill - Trams etc

4 Dec - AGM

6 Dec - HARC Christmas Bash - The Countryman - Shipley

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

17 Oct - AGM

24 Oct - Radio Night and Table Top Sale

31 Oct - Licensing Conditions Revisited. Kim G7AIE

21 Nov - Radio Night and Table Top Sale

28 Nov - Grand Winter Used Equipment Sale

12 Dec - Fish and Chip Supper

19 Dec - Christmas Quiz

REIGATE ATS

Website: www.qsl.net/rats

Email: rats@qsl.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: John Kennedy G3MCX, 020 8688 3322

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

6 Oct - Surplus equipment sale

3 Nov - Short talks

1 Dec - Construction contest

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

16 Oct - Some experiments in SDR by M0EBI

20 Nov - How Valves Work by David M0SXD

11 Dec - Christmas Junk Sale

15 Jan - A Beginners Guide to Amateur Satellites by David G0MRF

19 Feb - Talk by Chris Ridley of Icom UK

WIMBLEDON & DISTRICT ARS

Contact: Andrew Maish G4ADM

020 8335 3434

andrew.maish ATntlworld.com

Club Net: Mondays 20:45 on 145.500 MHz

Meetings: 2nd & last Friday of each month at

Martin Way Methodist Church, Buckleigh Avenue, Merton

10 Oct - TBA

31 Oct - AGM

14 Nov -

28 Nov - Surplus Sale

12 Dec - Christmas Social at WDARS QTH

26 Dec - No meeting

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Low Power Contests 2014:

144 MHz

Open Section

Pos	Group	Callsign	Loc	QSOS	Score	Mults	Total	ODX	Kms	Power
1	A1 CG	G4ZAP/P	IO93EH	171	34,448	103	3,548,144	F6DCD/P	817	25
2		G4RLF/P	IO80WX	117	22,560	86	1,940,160	GM8FFX	677	25
3	Five Bells Group	G4SIV	IO92WS	92	19,125	87	1,663,875	GM8EXI/P	662	25
4	Middlesex DX Group	M0MDG/P	IO91MP	94	14,269	73	1,041,637	PA4VHF	535	25
5	Blacksheep CG	G0XDI	IO91RQ	70	10,212	62	633,144	F4FCW	605	25
6	Sheffield & DWS	G5TO/P	IO93FL	57	8,327	54	449,658	PA4VHF	578	25
7	Burnham Beeches RC	G3WIR/P	IO91PK	57	6,568	51	334,968	PA4VHF	523	10
8	Medway ARTS	G5MW/P	JO01IH	40	5,859	39	228,501	GW0IRW/P	348	20
9	Blackwater ARCG	M0HCY/P	JO01JQ	32	4,506	36	162,216	F5VHN	359	25
10	Coulsdon ATS	G4FUR/P	IO91XG	24	3,361	28	94,108	G4HGI	306	25

432 MHz

Open Section

Pos	Group	Callsign	Loc	QSOS	Score	Mults	Total	ODX	Kms	Power
1	A1 CG	G4ZAP/P	IO93EH	72	12,321	65	800,865	DF2VJ	741	25
2	Blacksheep CG	G0XDI	IO91RQ	42	5,824	46	267,904	DF2VJ	590	20
3	Five Bells Group	G4SIV	IO92WS	33	6,031	43	259,333	DF2VJ	624	25
4	Sheffield & DWS	G5TO/P	IO93FL	31	4,158	37	153,846	GM4CXM	329	20
5	Burnham Beeches RC	G3WIR/P	IO91PK	31	3,210	38	121,980	GW4EVX/P	262	25
6	Coulsdon ATS	G4FUR/P	IO91XG	26	2,512	29	72,848	G5TO/P	266	25
7	Medway ARTS	G5MW/P	JO01IH	20	2,391	25	59,775	DF2VJ	494	20
8	Poole RS	G6MXL/P	IO80WP	3	625	7	4,375	G4ZAP/P	299	25