

COULSDON AMATEUR TRANSMITTING SOCIETY
G4FUR  **M1FUR**

CATS WHISPERS



**November
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 November 10 Quiz
Monday December 8 AGM
Monday January 12 CATS New Year Dinner

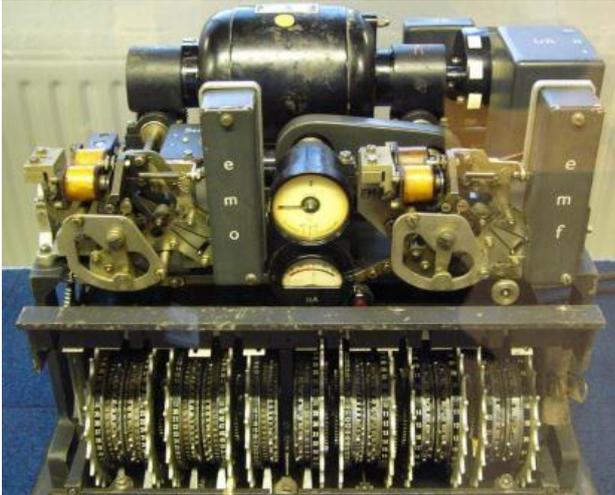


CATS is twinned with the Crescenta Valley Radio Club
Glendale California USA www.gsl.net/cvrc

CATS October Meeting

This meeting featured a DVD about an interesting aspect of Bletchley Park's work on intercepted wartime messages of the German High Command.

The DVD described how the Lorenz SZ40, SZ42A and SZ42B German rotor stream cipher machines were used by the German Army during World War II.



A Lorenz cypher machine

British cryptographers, who referred to the encrypted German teleprinter traffic as Fish, dubbed the machine and its traffic "Tunny."

A key figure in the process was a mathematician from Cambridge University called Bill Tutte who had initially been rejected for work on the code-breaking team by none other than Alan Turing. However, without that rejection he would never have been put to work on Tunny and hence to discover exactly how it worked. The successful cracking of Tunny meant that for many years the allies had full details of German battle plans without there being any suspicion that this was possible.

Overall, a very interesting evening.

CATS November Meeting

This meeting will feature a quiz with a prize for the winning team. The quizmaster on this occasion is Steve G7SYO. CATS members are reminded that partners are very welcome to attend this event. Members of other clubs are welcome to come along too.

The date for your diaries is November 10th 2014.

CATS December Meeting **Advance Notice Of AGM**

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 8th December 2014 at St. Swithun's Church Hall, Grovelands Road, Purley, Surrey CR8 4LA, commencing at 20:15 hours.

Now is a good time for all members to consider any issues they may wish to raise at the meeting and whether they might wish to nominate someone new, or perhaps stand themselves, for election to the CATS Committee.

Glenn G4FVL has announced that he will not be seeking re-election as a Committee member and that he also wishes to hand over responsibility for running the annual CATS Bazaar to someone else. In addition to the vacancy outstanding from the 2013 AGM, Steve G3WZK has announced that he will be standing down as Secretary. This means there is a clear need for at least two people to join the Committee, so if you think you may be interested in taking on one of these roles, please be sure to give it some serious thought before the AGM which this year will be on Monday December 8th.

Serving on the committee is not as onerous as you might think, because most committee meetings are now run using Skype so you can take part from the comfort of your own home. Please give it a thought. CATS needs YOU ...

CATS 2015 New Year Dinner

Plans for this are close to being finalised and will be communicated by email to CATS members shortly. The date for your diaries is January 12th 2015.

New Member

CATS Whispers is pleased to announce that Dave Bassett M0TRQ has joined the Society. Dave lives in Loughton and his main radio interests include VHF/UHF and contesting. He is also interested in car maintenance and fishing. A big CATS welcome to Dave!

Kempton Park rally and CATS bazaar

These two events are now almost upon us.

The dates for your diary are:

Kempton Park - November 9th

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.

Nevertheless, anyone proposing to attend this year's CATS Bazaar is advised to check the CATS website (www.catsradio.org) before setting out as there may be last-minute changes to access or parking arrangements.

CATS members to visit Japan in 2015



Stuart G6CJR and Denis M0NDJ have been invited to Japan next July to take part in the 23rd World Scout Jamboree as members of the International Amateur Radio Team. The trip will cost £2,800 each and they plan to raise money for the trip by selling non-drop Christmas trees. Full details are given in a letter from Stuart which appears on the final page of this issue of *CATS Whispers*.

Ofcom's Extension Of The 2 Metre Band

Andy Briers G0KZT writes: From Friday 31st October 2014, Ofcom granted extended operation (146 to 147 MHz) in the 2-Metre

band to Full Licence holders, subject to the issue of a NoV (Notice of Variation) which is obtainable via the RSGB, to whom Ofcom have entrusted the administration.

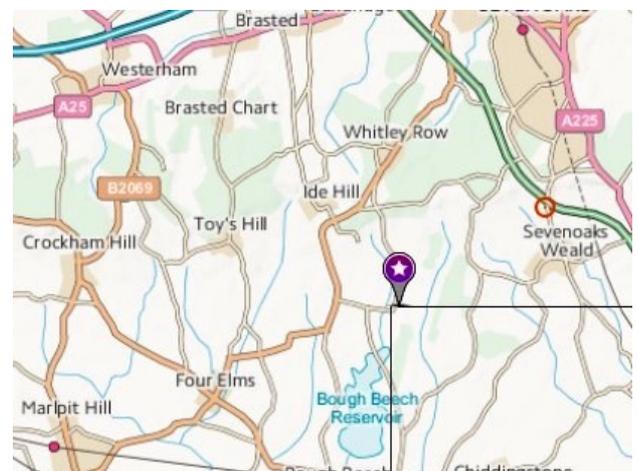
There are a number of restrictions imposed on the use of the band between 146.000 MHz and 147.000 MHz:

- Maximum power of 25 watts ERP
- Maximum aerial height 20m AGL
- Restriction of operational area.

The following maps show the operational area restrictions.



These 25 x 25 km squares show areas where operation is not permitted



This is the top NE corner of the zone. For CATS, we are well outside the zone

The restrictions have been put in place to protect existing users of 147 MHz and above. The extra 1MHz has been granted on the condition of non-interference to any primary users. This appears to be the reason that Foundation and Intermediate licence holders have not been granted this permission.

The NoV allows fixed, mobile and portable use.

At the time of writing, there is no formal band plan (*however, see below) although Ofcom has stated that the new bandwidth is intended to facilitate experiments into new modes of operation and early signs are that these will be with a slant towards digital techniques.

Time will tell what happens with this new allocation. The NoV is limited until 31st October 2015 when holders will have to re-apply.

** Editor's Note: Since Andy wrote the above, the RSGB has published a band plan and other information that Colin G3YCR has kindly brought to Cats Whispers' attention. Visit the site below for more information:*

<http://rsgb.org/main/operating/band-plans/vhf-uhf/vhf-spectrum-release/>

New 2M Extension Marked

Andy G0KZT writes: At 1900 hours on Friday 31st October, the beginning of the latest NoV was marked with a radio contact between CATS members when Stuart G6CJR, Denis M0NDJ, Martin G4FKK and Andy G0KZT made contact on 146.480 MHz. Operation started on FM but it was decided to explore other modes, so operation moved to AM and then to LSB. It was while on LSB that they were "discovered" by John G6JOV located in West Drayton who had been looking for a contact to log, also to mark the event.

There appeared to be no other activity and G6JOV reported that he had been looking most of the day for stations.

A little bit of fun was had but now the serious work begins as the RSGB have now published a draft band plan suggesting experiments with digital modes.

Eddystone 940 by G3WZK Part Two

Steve G3WZK writes: In the March issue of Cats Whispers I described my work to restore an Eddystone 940 receiver to working condition. I had reformed or replaced all of the electrolytic capacitors - but had not yet connected it to a power source. I had measured the resistance from the HT line to chassis to be 30 kohm which I was happy with.

Before daring to connect to the mains, I decided first to connect an external HT supply to the receiver and measure the current drawn. The result – 60mA - seemed high but as the HT stabiliser valve (a VR150/30) can take up to 40mA on its own I wasn't too worried. I felt I was ready to take the plunge and apply mains voltage via a variac. I began by applying 10% mains voltage and increased this in 10% steps while watching, listening and sniffing at frequent intervals in case of problems. I was aware that it isn't generally good practice to under-run valves, so I increased the voltage as quickly as seemed sensible. It took two minutes to go from 10% to 100% but there were no problems at any stage. I measured the three HT rails (150V, 220V and 240V) and each was almost spot on. All the valves were lighting up ok. It was now time to connect an aerial – my top band quarter wave!

It was early evening and on medium waves the radio was lively. On 7MHz only a few amateur stations could be heard although Radio Beijing was armchair copy on 7.4 MHz AM. I noticed that unless the RF gain was turned fully up, nothing could be received at all and that the S-meter could not be zeroed below mid-scale even with the aerial disconnected. This suggested some sort of biasing problem.

There were other problems too. The BFO was off-frequency and could not be used to resolve LSB signals although CW was ok.

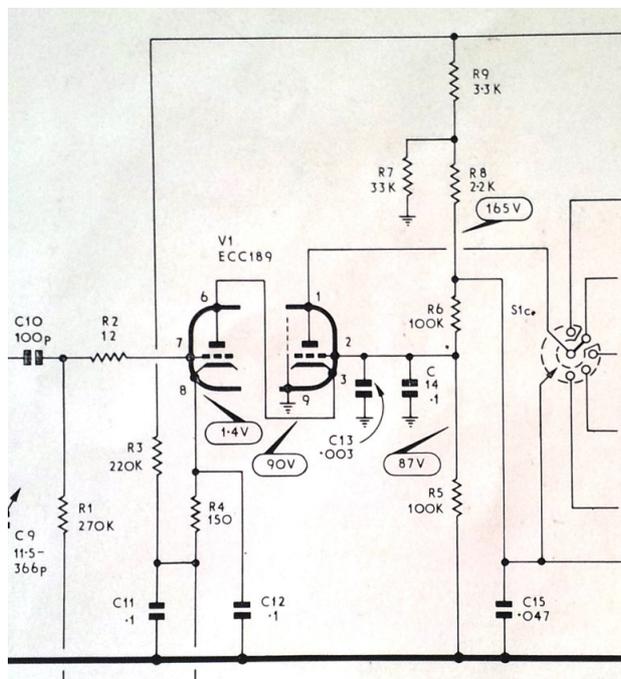
The on-load LT seemed a little low. On inspection it was revealed that the mains transformer's 6.3V winding was rated at 4.2 amps. The total current drawn by the valves should be 3.02 amps, plus an unknown amount for the dial lamps. The transformer was only slightly warm after an hour's use, suggesting that it was conservatively rated.

Fortunately I had the original circuit diagram which includes the voltages to be expected at key points in the circuit. On measurement, one of the voltages in the AGC rectifier circuit was low and on inspection, I found that the 100kohm resistor R44 feeding it was not the original. R44 is part of the circuit which sets the voltage at which delayed AGC operates but the replacement R44 had also gone high (197kohm), suggesting that a decoupling capacitor (C90) may have gone leaky some time ago, causing the failure of two resistors. I therefore replaced all components in that part of the circuit. Voltages were then normal and, overall, the set seemed more lively. However, it

was still not possible to zero the S-meter properly.

Another example of the voltage being wrong was in the cascode RF amplifier stage which was drawing no significant current. Disconnecting the AGC from this stage resulted in greatly increased S-meter readings, but the stage was still drawing no current! This was something of a mystery, not helped by the fact that is physically impossible to get a test probe onto many of the valve pins.

In the Eddystone 940 there are two RF amplifiers, a mixer and a local oscillator stages, all housed in a diecast metal box, with partitions to separate the various stages. Looked at from underneath, the valve holders are in a trough with the partitions immediately above them so that each partition screens the input and output of each valve stage. The wafers of the wavechange switch sit on top of the whole arrangement. The benefit of doing this is improved stability due to the effectiveness of the electrostatic screening and low losses due to very short wiring on all the RF circuitry. The disadvantage is that servicing and repair of the passive components is a nightmare! It was, for example, impossible to get a test probe onto either pin 6 or pin 3 of the valve so as to measure the 90 volt test point (see circuit diagram below.) However I was sure there must be a fault there somewhere.



The cascode RF amplifier stage

To cut a long story short, taking as many voltage readings as I could led me to suspect R6 – 100 kohm. This component was so well hidden under a partition that it was not possible

even to discern its colour code! However, by measuring between R8 (2.2 kohm) and R5 (another 100 kohm) I found that R6 appeared to be open circuit. (I would love to be able to publish a photo of how inaccessible it is, but its very inaccessibility makes it impossible to photograph!) It was going to be impossible to replace this component without dismantling all the RF stages, so I took advantage of the fact that it had failed open circuit and wired a new resistor between R8 and R5 – effectively in parallel with the failed resistor. It was very tricky indeed to position the soldering iron's bit onto suitable areas to anchor the new R6 but I managed to do it without singeing adjacent components or wiring. The end result was untidy-looking: that wouldn't matter so long as the repair worked and the stage was stable in operation. But would it actually clear the fault?

I connected my multimeter to the 165 volt test point (see circuit diagram). Prior to installing the new R6 I had been getting a reading of 235 volts or so – far too high. As soon as I switched on I got a high reading again, but as the set warmed up and began to draw current from the HT line, the reading I was getting began to drop and bottomed out at 177 volts – much better. I connected the antenna and noticed an immediate improvement in reception on all bands. I adjusted the core of the BFO inductor to the correct midrange setting and then had a proper tune around.

Before the repair, 14 MHz had been very quiet but now it was full of amateur signals. Tuning up to the 21 MHz band I heard a lovely signal from K5HCT in Texas, so I tried 28 MHz. This too was buzzing with Canadian and American amateur transmissions.

I then systematically compared all the voltages in the receiver with those indicated on the manufacturer's circuit diagram. There were some anomalous readings in the IF stages and in the main VFO, despite all resistors being close to the nominal values. Fortunately, the readings in the IF stages eventually turned out to be a red herring. I had carefully turned the RF gain fully up, and turned the AGC off as called for by Eddystone in the manual, but what I hadn't done (and which is not mentioned in said manual) was to earth the antenna socket centre pin effectively. This resulted in there being enough stray signal pick-up for there to be minus 147 volts on the control grid of the final IF amplifier due to amplified and rectified RF – more than enough to completely upset the radio. This was easy to put right of course by thoroughly short-circuiting the

antenna input connections and trying again.

All voltages were now within specification except for those around the 6C4 local oscillator valve. Its anode voltage was so high that it suggested that the stage was not drawing enough current. The supply voltages were okay, all resistors were within spec. and the circuit seemed to be working well so I obtained a replacement 6C4 on eBay. It made no difference at all. Yet the radio seemed to be working well enough, proving that the local oscillator must be doing its job somehow.

I felt mystified by this fault, so I posted details of the problem on Eddystone Radio Users' Forum on Yahoo. A helpful person enquired what type of meter I was using – suggesting that I ought to use an old-fashioned analogue meter, not a new-fangled digital one. I took their advice and remeasured all the voltages with an ancient Avo Model 40 that I had bought at a rally. The voltages were all now within spec.!

So I had learned the lesson that if the manufacturer says that measurements should be made with a 20,000 ohms per volt meter, then they mean it! The readings that you get may technically be wrong (because the analogue meter draws current and upsets the voltage readings) but it doesn't matter if the resultant readings are within spec.

This left only one major task – to realign the RF and IF stages. However, the receiver was working very well so I didn't feel that this was an urgent job. Besides, I had no RF signal generator.

It made sense to me to simply enjoy the receiver and to construct a suitable signal generator myself at my leisure, perhaps using the AD9850 DDS Signal Generator Module which I had recently read about.



An AD9850 DDS Signal Generator Module

I hope to publish a write-up of how I get on in a future issue of CATS Whispers.

Contests Coming Soon

<u>Tuesday Activity Activity</u> <u>Contests 2014 – all begin at</u> <u>8pm local time</u>	
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

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

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

Please check our website for any updates on parking or access arrangements.

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

Contact: Vic Rogers G6BHE Tel 01702 308562

NVR@blueyonder.co.uk

www.southessex-ars.co.uk/canveyrally.html

8 February 2015

Harwell Radio and Electronics Rally

Didcot Leisure Centre, Mereland Road, Didcot, OX11 8AY, Oxfordshire.

Radio, electronics and computing trade stalls, secondhand stalls, special interest groups, displays. Refreshments. Entrance £2.50.

Open 10:00 to 15:00.

Contact: Ann Stevens 01235 816379 or

rally@g3pia.org.uk

www.g3pia.org.uk

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

Contact Trevor, G6LYW, 07717 678795 or

trev@wig1.co.uk

www.brats-qth.org

15 March 2015

Dover Radio Rally

Location: Whitfield Village Hall, Sandwich Road Whitfield, Dover. CT16 3LY

Doors open at 10.00am.

Entrance £2.00.

www.darc.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.

18 Nov - Members short talks

16 Dec - Project Night plus mince pies

CPREC (CRYSTAL PALACE)

Website: www.qsl.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

7 Nov – Guide Dogs For The Blind

5 Dec - Club Project and Video

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.

26 Nov - VHF/UHF contesting /P by Alwyn Seeds

5 Dec – Fish and chip supper

CRAY VALLEY RS

Website: www.cvr.org

Contact: Lawrie Atkinson G4FAA. (see website)

Meetings: 1st and 3rd Thursdays at 1st Royal Eltham Scouts HQ, Rear of 61 - 71 Southend Crescent, Eltham, London, SE9 2SD.

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.

25 Nov – 3 dimensional measurement and mapping of an antenna + AGM Garth G3NPC and Alan M6NNB

TBA Dec - Christmas Dinner

HORSHAM ARC

Website: www.harc.org.uk

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

6 Nov - Ian Gledhill - Trams etc

4 Dec - AGM

6 Dec - HARC Christmas Bash

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

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

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

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

20 Nov - How Valves Work by David MØSXD

11 Dec - Christmas Junk Sale

WIMBLEDON & DISTRICT ARS

Website: www.gx3wim.org.uk (currently unavailable also checked 28.10.13))

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

14 Nov –

28 Nov – Surplus Sale

12 Dec – Christmas Social at WDARS QTH

26 Dec – No meeting

CATS Whispers is published monthly by
S J Beal G3WZK on behalf of the
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Stuart Barber
 Homedale
 St Monica's Road
 Kingswood
 KT20 6ET
scouttrees@btinternet.com

Dear Parent,

Next July, I shall be travelling to Japan with another Banstead District Scout Leader, Denis Noe, where we will be spending just over two weeks as part of the organising team for the 23rd World Scout Jamboree.

The event will be attended by over 30,000 Scouts from all over the world and we will be involved in the planning and running of activities for the young people whilst they are at the Jamboree.

The cost of the trip to both Denis and myself will be in excess of £2800 each and we are currently raising money by selling Christmas trees which we hope that you will buy to support us. We are offering you the chance to buy Premium Grade Nordman Fir non drop Christmas trees at competitive prices and we will have them delivered to Park Farm Scout Campsite, Holly Lane, Banstead, SM7 2BY for you to collect during the weekend of 6th/7th December 2014.

Your support is greatly appreciated and you can order the tree of your choice by sending a completed order form and payment to me at the address above by no later than **Wednesday 26th November**.

Cash, cheque (payable to 7th Banstead Scout Group) or payment by Paypal to gb4bds@btinternet.com (**Pay or Send Money option Only**) are all acceptable. Thank you.

.....
 Name..... Phone number.....
 E-mail (for order confirmation).....

Nordman Fir	3/5 foot	5/6 foot	6/7 foot	7/8 foot	8/10 foot
Price	£25	£30	£40	£50	£65
Order Quantity					