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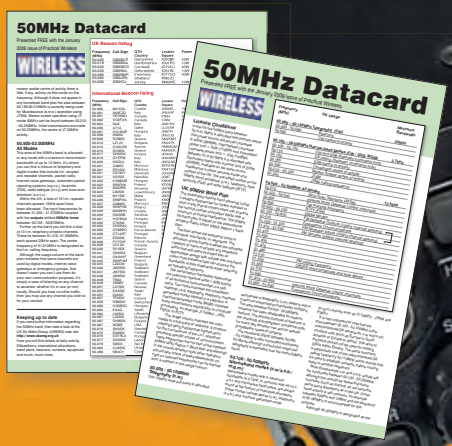

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YAESU

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SSB CW AM FM
IF DSP
Voice Memories
23 x 8.4 x 22 cm

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Deal: *Get FREE Extra DC Lead!* Exclusive to PW Readers - Request when ordering

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160 - 6m

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YAESU £
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**HF + 6m, 2m, 70cm*
**CW, SSB, AM, FMN, FMW, PACKET, DIGITAL*
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Transceiver

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* *Rx range 0.495kHz-999.9MHz*
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A fully fledged digital radio using D-Star as well as traditional dualband.

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POWER SUPPLY **NEW**

38 Amp (45A Peak) continuous switch mode PSU with Noise Offset Function (NF). *Output 4-16V DC Variable *Input 100-260V AC *Short Circuit & Over Voltage Protection

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Practical Wireless January 2009

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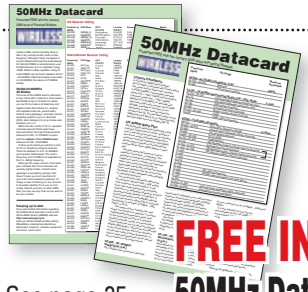

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Front cover: Our thanks go to Tex Swann G1TEX for the photograph.

Design by Steve Hunt.

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Rob Mannion's keylines

Rob chats about the Leicester Show and the new GB4FUN trailer unit.

The 2008 Leicester Amateur Radio Show (LARS) was a great success for everyone who attended and everyone on the PW Publishing Ltd. stand was very busy, especially on the Friday. Our team worked very effectively, enabling **Tex Swann G1TEX** and I to chat to readers. It was also my pleasure to introduce readers – who had commented on *PW*'s design and presentation – to **Steve Hunt** our Art Editor.

Situated in the central English Midlands the LARS is ideal for visitors to attend from England, Wales, Scotland and Ireland. The nearby East Midlands Airport is very useful but some clubs had arranged their traditional coach trips for their members, particularly from Wales and East Anglia.

The LARS is a supremely important show as far as I'm concerned as it provides the best centrally located venue to meet *PW* readers. This year, the queue waiting patiently to chat with the Editor to discuss *PW* matters, ideas and suggestions reached 27 at the peak, and I was very conscious that some readers waited for a long time. Despite the long wait, everyone was very patient. Thank you everyone and I look forward to next year's event!

New GB4FUN Unit

For a number of years the **Radio Society of Great Britain's** (RSGB) **GB4FUN** vehicle has trundled off to – what seems to be – all four corners of the UK, clocking up a huge mileage with **Carlos Eavis G0AKI** behind the wheel, promoting Amateur Radio to young people in a uniquely effective way – particularly in schools. However, the old vehicle has now been replaced by an absolutely superb custom-built trailer type exhibition unit and the RSGB took the opportunity to 'launch' the newly-fitted out GB4FUN at the LARS.

The vehicle was so full of visitors, it was only at the very end of the show that I was able to get close enough to have a detailed look. Personally, I feel that the vehicle is superb and it will enable the RSGB to continue their introductory visits in an even more effective way. The trailer unit's design and fitting-out have to be seen to be fully appreciated. Well done to everyone involved! **(Note**: The new **GB4FUN** trailer has benefited from funding from the **Radio Communications Foundation**, see their *In Focus* article in this issue).

Over the years I've been Editor of *PW* I have stressed time and time again that Public Relations are really important for our hobby. Indeed, I was co-opted on to a committee at an RSGB Conference in the early 1990s. However, with the new GB4FUN 'on the road' I'm sure that – wherever it travels to and whoever is in charge – it will become an extremely effective ambassador on behalf of Amateur Radio. So, Bon voyage GB4FUN and all who 'sail' in her!

Young People Only?

Inevitably, there are some Radio Amateurs who regard the efforts to recruit youngsters as being of secondary importance, when compared to what they regard to be poor attempts to attract older new entrants. In fact, I've had some correspondence with several people with this point of view and have made it clear I don't agree with them. Why? Because many of the Foundation Class students I've met recently, left school many years ago and they often out-number younger candidates.

The most compelling evidence I can produce – to support my opinion that GB4FUN appeals to all ages – actually presented itself at the LARS. This is where I met a reader who had – as a part time class room assistant – enjoyed visiting the old GB4FUN when it attended a school in his area. Truly fascinated by the experience, he's now enjoying the hobby and studying to obtaining his licence, thanks to his local club and is planning to be on air before retiring early next year.

Although the target audience for GB4FUN may seem – to some onlookers – to be only young people, I'm 100% certain that anyone (even with only the slightest interest in technical matters) who visits GB4FUN in its extensive travels, will be drawn to it – **whatever their age!** So, I'm looking forward to see the new unit and its special towing vehicle 'on the road' and showing the flag for Amateur Radio.

Rob Mannion G3XFD/EI5IW

Practical Wireless

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We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by PW, then please write to the Editorial Offices, we will do our best to help and reply by mail.

Practical Wireless

readers' letters

The Star Letter will receive a voucher worth £20 to spend on items from our Book Store or other services offered by *Practical Wireless*.

Free Book Featuring Daventry Transmitter!

Dear Rob,
Knowing of your own keen interest in old UK short wave 'Senders', you may be interested in this free 95-page BBC book on Daventry: **http://www.bbceng.info/Books/dx-world/dx-calling-the-world-2008a.pdf**

The book, ***Daventry Calling the World*** was originally published in 1998 by Norman **Tomalin**. It may be worth a mention in *PW* because I know many readers are interested in the old BBC transmitter stations. All the best to everyone at the *PW offices*.
David Searle ZL3DWS (GQRP Club 3218 RAOTA 2223)
PO Box 20-256
Christchurch 8543
New Zealand

Editor: *Thanks David - I enjoy hearing about your activities in ZL land! I have an original copy of Norman Tomalin's booklet and I recommend it to readers. I wonder how many readers realise that the late comedian **'Professor Stanley Unwin'** worked at the Daventry transmitter?* ***Rob G3XFD.***

Promoting The Hobby To Older People?

Dear Rob,
More than a million old people in the UK are suffering the misery of loneliness, a survey has revealed. With a third of the UK's elderly population now living alone, including half of all women over 65, **Help the Aged** is campaigning to give lonely and depressed pensioners some Christmas cheer over the festive period.

The charity's research discovered that nearly half a million pensioners only leave their houses once a week, and a further 300,000 are entirely housebound. The charity says that economic hardship increases loneliness and reports that over 2.5 million pensioners in the UK live below the poverty line.

Amy Swan, Policy Manager at Help the Aged said in a press release that, "It's such a tragic state of affairs when older people tell us that the only person they see from week to week is the postman. Isolation and loneliness are not inevitable side-effects of the ageing process, but the life events associated with older age can leave people vulnerable. Poverty, bereavement, far-flung families and failing health can all play a part, and while living alone is for some a preferred life choice, for others it can be one of the key risk factors leading to someone becoming isolated and also lonely, particularly for older people."

My own main point is, would the money the RSGB spend on the GB4FUN exhibition vehicle going to schools be more productively spent on trying to get older people into the hobby? I am not sure the money being invested in GB4FUN is good value when every pound counts. Amateur Radio involves social skills, i.e. being able to talk to people and old people find that easy. And we do have a million lonely old people in the UK. Best wishes to you all and I'm sorry I didn't make it to the Leicester Show in October – first time I've missed it for many years!
Ian Abel G3ZHI
Maltby
Rotherham
South Yorkshire

Editor's comment: *Thanks for your E-mail Ian – it's been a long time since we last heard from you and I missed our annual chat at the Leicester Show! I've already had correspondence with several other people regarding the promotion of Amateur Radio and you can read my own opinions on the* Keylines *Editorial page on just how effective I think GB4FUN is in practice.* ***Rob G3XFD.***

Star Letter

The Late John Tuckfield G2HOX

Dear Rob,
In the December issue of *PW*, the article *Amateur Radio in Focus* featured the **British Railways Amateur Radio Society**. In the second photograph, second from the left, is the late **John Tuckfield G2HOX**. My father also worked for British Railways and knew John Tuckfield, so he introduced me to him. We got on well, he even let me make my first h.f. transmission!

Later, when John updated his radio shack, I had his Trio R-599S and T-599S. Later still, after John became a Silent Key, I had his Kenwood TS-940S. Since I have no photograph of him or for that matter his wife Jean, I now have one of him as I remember him. Thank you and my kind regards to everyone at *PW*.
Paul Bradfield, G1GSN
Shefford and District Amateur Radio Society
Langford
Biggleswade
Bedfordshire

Editor's comment: *Thanks for writing John! The* PW *team are delighted that the article has helped you find a photograph of your late friend. The BRAS* In Focus *article has – much to my delight – brought quite a bit of feedback. Please join me on the* Topical Talk *page for further comment.* ***Rob G3XFD.***

A *PW* 70MHz Contest? – A Good Idea!

Dear Rob,
Yes – I think that a 70MHz contest organised by *PW* is definitely a good idea but it **should not** be run at the same time as the 144MHz event! That would only detract from the *PW* 144MHz QRP event, which is very successful.

As there are no 70MHz contests in June so I would suggest a date in that month that doesn't conflict with the established *PW* 144MHz event. Maybe the same weekend but on a Saturday? Perhaps a shorter event, say 1200 - 1700 hours? You could perhaps count a.m. QSOs as treble points, and f.m. QSOs as double points and c.w./s.s.b. as single points. **No digital modes!**

I also read with interest the letter from **Steve Wright EI5DD** in the December issue of *PW*. Steve explained that he was intending to make a large Rhombic antenna for the 144MHz band and had a problem in sourcing a terminating resistor. However, Paul may be interested to know that I was a member of a team of Radio Amateurs (that included **G3SEK**, **G4DEZ**, **G4DGU** and **G0HNW** amongst others) that carried out transatlantic meteor scatter tests (to Canada) in the period 1979 to 1982. We ran very high power c.w. and used a 100-wavelength Rhombic antenna on the 144MHz band. The tests were carried out from a hilltop location that sloped – about 10° – down to the sea on the north Devon coast.

The Rhombic was, as I've said, very large (100 wavelengths = 200 metres!) and was supported on poles at a height of 10m above ground. The only real problem we had with this system (that had also been used to make moon bounce contacts by the way) was that when it was windy – as it was most of the time on the cliff edge – the Rhombic was anything but rhombic shaped!

Anyway, I had better answer Paul's query regarding the terminating resistor! We decided at an early stage that sourcing a high power non-inductive 600Ω resistor would be rather difficult so we left the Rhombic unterminated. The only result of this was that the antenna became bi-directional but that didn't matter at the QTH we were using at the time.

And remembering that, has just reminded me of something I did when working at Baldock Receiving Station many years ago. The large site had numerous h.f. Rhombics, all of which had both ends of the antenna fed back to the control room in 600Ω open-wire feeder. (You could select which end of the Rhombic to terminate to determine the direction of maximum gain). Then I came up with an idea – why not terminate the Rhombic into another Rhombic and then into another Rhombic and so on? After the official evening schedules had been completed I fired up a home-made copy of a Codar AT5 transmitter with a 6BW6 valved p.a. running 10W on 1.9MHz into this very large antenna array. The results were amazing and although I didn't work any real DX, I did get some excellent reports from Top Band stations all over the UK!

Take a look at **http://coastradio.intco.biz/uk/baldock/** as it shows photographs that I took of the control room in 1969. It was really just a big shack staffed by Radio Amateurs! (Baldock Receiving Station is now closed so I can relate this story). Maybe another time I'll share what I accomplished when working at Ongar Transmitting Station with 30kW transmitters and large Rhombic antennas! The attached photograph is of a very young David Butler G4ASR adjusting the receivers at Baldock Receiving Station in 1969!

David Butler G4ASR
Lower Maescoed
Herefordshire

Editor's comment: *Thanks for your support on the 70MHz contest David and we'll find space (not in your* VHF DXer *column!) in* PW *so you can share the Ongar story very soon (what fascinating memories you have!). Please join me on the* Topical Talk *pages for more memories of Rhombic antennas.* ***Rob G3XFD***.

An Open Letter To Graham Hankins G8EMX

Dear Graham
It was with dismay that I read in *PW* (December 2008) that you were considering withdrawing as the author of the *In Vision* column. I would ask you to please reconsider. Your column was a breath of fresh air in its approach and content. You have a realistic awareness of the issues facing the survival and growth of Amateur TV (ATV) as part of the wider Amateur Radio world. You appreciated that actual regular presence of ATV on air was vital to sustaining our portion of spectrum.

You also realised that the average Amateur needed simple access to the hobby. Further the geographic difficulties facing the amateur living outside the large conurbations and flatter regions of the midlands and south east were appreciated by you. Moreover you understood the appeal of a truly robust a.m. mode in offering the ATVer the possibility of direct contact by DX with other enthusiasts outside of their own immediate region. You also understood the need to contact and encourage those groups that already generated a good level of activity and you were active in trying to promote similar groups elsewhere. For all of the above I earnestly ask you to reconsider. We need a representation in such a widely circulated magazine and your lively and varied column was attractive to both atv'ers and other amateurs. With thanks and in the hope you'll continue writing for our enjoyment of ATV.

PS: I also saw in your latest column that you were seeking a simple 70cm transmitter - I have found the kits below. perhaps BATC could buy a stock? See **http://www.minikits.com.au/kits1.html** Yours sincerely,

Bill Shepherd PA3FDK/G0KPR
Zoeterwoude
Zuid Holland
The Netherlands

Editor's comment: *Thanks for your support Bill! I'm very pleased to confirm that Graham G8EMX has agreed he'll continue writing* In Vision*. Please join me on the* Topical Talk *page for further comment.* ***Rob G3XFD***.

The Old RAE Papers Website

Dear Rob,
I was fascinated by **David Pratt G4DMP**'s website (**www.g4dmp.co.uk/rae**) with the old RAE papers. Looking over these and comparing them to today's papers I was struck by the similarity of the questions both then and now.

All the way through the papers there are signs of development in technology (e.g. the trend from valves to mainly solid state devices and now into digital modes) and a reflection of the changes in operating and licensing conditions and a similar mix of questions about propagation.

Having passed the Foundation exam and about to take the Intermediate I felt confident with most of the questions on the old style papers. The only thing I feel which has all but disappeared is circuit analysis. Maybe this too is merely a reflection of the hobby and the decline in home-brewing and the advent of relatively inexpensive shack-in-a-box type rigs.

What I feel the new style exams manage to achieve, is to remove the ambiguity in language which could be the difference between passing and failing on the old papers. You still need the same breadth of knowledge to answer all the questions on the new papers and breaking the syllabus down into the three stages we have now, allows a sensible progression into the hobby.

I'm sure that the debate will continue to rumble on and on about new licensees and exams and how much better it all used to be! I'm also looking forward to being a dyed-in-the-wool veteran so that I too can say, "eee, it weren't like this when I were an M6!"

Keep up the good work with *PW*, it's still a fascinating read with the added bonus that everyone new, old and at all levels can still learn something! Incidentally, I was sucessful in my intermediate exam the other night and I can absolutely confirm that there has been no dumbing down!
Rob Hall M6RGH
Masham
North Yorkshire

Editor's congratulations: *Rob E-mailed me again to say he'd received his new callsign – **2E0RBY**. Well done Sir – I've no doubt you'll soon progress on to the Advanced Licence!* ***Rob G3XFD.***

Fitting Communication Radios In Modern Cars

Dear Rob,
Returning to radio hobby over the last few months, and planning to take my Foundation Exam (finally) next month, I bought *PW* for the first time in years a few days ago. I read with interest the article on fitting radios to modern cars. This is a subject close to me, as I got into CB radio back around 1994, and still work with radio today, regularly fitting CB equipment and v.h.f. PMR radios to taxis. Finding space for the radios has become something of a problem, and indeed, is one of the reasons the 'classic' model Skoda *Octavia* continues to be popular as a taxi – it has a spare DIN space under the car stereo, and easy access to the power inputs to the fuse box. It also has easy access to a place to fit a body mounted antenna (directly above the interior light). The new model simply doesn't have this.

Ford *Mondeos* and Transit vans are simply a nightmare – there's simply nowhere to put the radio, nowhere to get the power from the battery easily and nowhere to easily fit the antenna either! Result? Fitting the radio to a *Mondeo* will cost the driver two to three times what it would to fit it to an *Octavia*!

Next, as for your Star letter writer's (**Peter Fardell G0LQU** November issue) ideas about combining Amateur Radio rigs with stereos, there's a few good points in there. Looking to my CB radio experience (new and old) for inspiration – I advise that you firstly, ditch the CD player and go straight for MP3 capability. This is already a feature of the forthcoming Ranger RCI-TLM1 40 channel CB radio (ugly as sin!) see **http://www.rangerusa.com/rci-tlm1.html** that has SD and USB slots for playing MP3 files and even JPG files on its screen.

There is also a Cobra which features Bluetooth – surely a good idea (that's why I'm mentioning them, even though they're CB rigs) – **http://www.cobra.com/index.cfm?fuseaction=product.display&Product_ID=419&category_ID=30**

The DIN fittings on h.f. and u.h.f. CBs are common in Australia and New Zealand – and there's the Team Roadcom here in Europe too, see **http://www.thunderpole.co.uk/team_roadcom.htm**

Then of course we have (the 'love 'em or hate 'em) Puxing 888 handhelds – with built in Band II f.m. radios. If they can put that in a 2m or 70cm hand-held for that price, it's not exactly going to be a stretch of the big players!

Additionally, of course, Kenwood already make car stereos, CD changers and remote TV/radio tuners (such as the KVT-M700 I have). So, perhaps the Kenwood Communications Division could help us here?

Now, pushing this on a little – surely a modular system with the control head replacing a standard stereo and the transceiver section located under the seat or in the boot has a potentially huge market in couriers' vehicles, recovery vehicles, police, taxis, etc. If a single or double DIN control head was made with a decent screen, with a modular backbone behind it then you can add GPS, data, v.h.f./u.h.f. (and Tetra for the emergency/police services) and have a massive market. Perhaps looking at some of the higher spec (or cheap Chinese) car head units out there – perhaps there's even a demand to make this computer based and make the world's first mobile Software Defined Radio?

If I could get such a system (stereo, bluetooth, GPS, v.h.f./u.h.f./CB) and it didn't cost me an arm and a leg, I'd have at least 40 sold straight away! Hopefully I'll be on the air before too long as I'm planning to take the Foundation Exam in Ayr. Best wishes.
Gordon 'Yeti' Burnett.
Troon
Scotland

Editor's comment: *Thanks Gordon – some interesting ideas there and no doubt we'll get some more now!* ***Rob G3XFD.***

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news & products

A comprehensive round-up of what's happening in our hobby.

A New Smile At Icom UK!

Laura Beavis joined Icom UK recently as Marketing Assistant and the Newsdesk decided to get the story behind the new smile at Icom UK!

Introducing herself **Laura wrot**e, "I grew up in Dollis Hill, North-west London, I moved to Kent at the age of 14, I'm now 22. My previous job was in Marketing/Administration for a local Independent record label, Phat Pilgrim. Before that I worked in Event Security for a large national company, I worked at the V festival, the Isle of Wight festival and worked backstage for bands such as Radiohead, Elton John and The Eagles.

"My hobbies are based around music – events/gigs, graphic/web design and as I have a fervent love for music of all kinds and I'm currently building a 'production' studio with my partner at home. As he's a guitarist for a number of Death Metal bands, I live surrounded by wires, speakers and audio equipment which I imagine is not far off being a Radio Amateur!

"I've always enjoyed marketing, although I didn't know it as marketing when I first got involved. I started promoting local DJs, bands and artists when I was at school in London, booking gigs, designing flyers, securing venues....I guess you could say that was the beginning of my marketing career in a sense!

"Working at Icom has been fantastic, the staff are genuinely nice (I'm not just saying that!) and I've learnt so much in the short time I've been here, I couldn't ask for a better company in which to progress professionally." **Laura**.

Bob Stockley, Icom UK's Sales and Marketing Director commented, "I'm pleased to welcome Laura to the team, she has already slotted straight in and made a positive impact to our operations, I have no doubt that Laura's appointment will further strengthen our marketing efforts."

Editor: *Everyone at* PW *welcomes you to the very special world of Amateur Radio Laura!* ***Rob G3XFD***.

New Products From Waters & Stanton

Essex-based **Waters & Stanton PLC** have announced that they have been appointed exclusive distributors for the new range of Nissei VSWR Cross Needle meters. The range comprises models covering 1.8 - 525MHz with power levels up to 2kW. Each meter has switched power ranges and can read either average or peak envelope power (p.e.p.) and features a true directional coaxial coupler for improved accuracy. They incorporate l.e.d. back lighting of the large cross needle meter, and power is applied via the rear mounted 12V d.c. lead. Further information and prices will be announced shortly.

Other new products from W&S include a new range of coaxial switches. These will range from 2, 3 and 4-way models. The company announce that,"A new improved form of coaxial switching cavity enables the u.h.f. models to work up to 3GHz. Power ratings vary from 250W at u.h.f. up to 2kW at h.f." Insertion loss is claimed to be better than 0.1dB and cross-talk is between 60 - 70dB. Prices are to be announced later and the 2-way models will be available in January 2009.

The company has also just announced the introduction their new professional standard series of dummy loads. These are rated up to 3GHz and available in either PL-259 or N-type formats and W&S state that they are "extremely rugged and feature high precision machining together with exceptionally flat v.s.w.r. right up to 3GHz." The company say that the "the v.s.w.r. never exceeds 1:1.19 and the power handling extends up to 200W." Prices are yet to be finalised and the range should be available in January.

Further details from **Waters & Stanton PLC**, ***Spa House*, 22 Main Road, Hockley, Essex SS5 4QS**. Tel: **(01702) 204965**, FAX **(01202) 205843**, E-mail **sales@wsplc.com**
Website **www.wsplc.com**

New Zealand Buildathon Success

David Searle ZL3DWS contacted Newsdesk to report on a very successful Buildathon event that took place early in November in Christchurch New Zealand.

David writes, "On Saturday November 1st, 27 Buildathon Buddies and their supporters met at a local school hall and built 16 t.r.f. type short wave radio kits as a group. They were 'A la Denco one valver' and HAC type designs – but modernised!

The first photo shows yours truly welcoming everybody and the ZL3QH NZART ZL3 District Councillor. I've also included a shot of our mascot Buildathon Bear Bert (after our oldest local Amateur Bert – 78 years young – who actively helped on the day). All the sets worked first time and the first kit finished was that assembled by 10 years-old **Zac Sanson**! Wow! (my 19 year-old daughter took a little longer!).

The **G-QRP Club** helped with parts and **Steve Hartley G0FUW** helped with advice after his UK Buildathon experiences, plus the author **Charles Kitchin** and **Fred Reimers KF9GX** at **Far Circuits** USA (**www.farcircuits.net**/) so it was an international affair!

The objective was to encourage interest from younger folk in the run up to the introduction to a Foundation Licence in NZ shortly. Those who attended felt we were on the right track. So **Rob G3XFD** at *PW*, here's the big question. Based on your time with younger folk, what kit do you and *PW* readers think we should we choose for the next Buildathon in March 2009?" Very Best Regards, David ZL3DWS

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Happy Christmas & A Peaceful New Year To All Our Readers!

Everyone at PW Publishing Ltd., **Alan Burgess**, **Peter Eldrett**, **Roger Hall G4TNT**, **Steve Hunt**, **Rob Mannion G3XFD** and **Tex Swann G1TEX**, together with all our authors and contributors, wish our readers worldwide a very happy Christmas and Peaceful New Year!

Will's Willing!

Will Outram, the well-known and friendly proprietor of the Chesterfield, Derbyshire based **Bowood Electronics**, seems to have scored a real hit with his MK484 one-chip radio kits. They're literally flying out of the door!

Will wrote: "A Poole, Dorset, Scout Troop contacted me about using the MK484 radio chips for a project. No problem with that, but they were going to build them around a piece of screw terminal strip (choc block). Fortunately, I had a better idea and I told them I can supply the kits with a pre-drilled, marked up pc.b. This is easier to build and also gives the Scouts some soldering experience.I recently did the same thing for a **Worcester Scout Troop –** see the **Worcester Amateur Radio Association** website **www.m0zoo.co.uk** for more information. **Mike King**, the chap in charge, told me it was a big success and the kids had great fun!"

For further details on the MK484 i.c. radio reciver kits contact Will Outram at **Bowood Electronics**, **Unit 10**, **Boythorpe Business Park**, **Dock Walk**, **Chesterfield S40 2QR**. Tel: (**01246**) **20022**. E-mail **sales@bowood-electronics.co.uk** The kits cost £5.95 each (discounts for clubs and quantity purchases) plus £1.65 p&p. Payment by cheque or card either direct to Bowood, or via their website **www.bowood-electronics.co.uk**/

Plymouth Foundation Course

The **Plymouth Training Team** are planning a Foundation course in the New Year 2009. Starting date will depend on demand. The course will be run for six or seven weeks on Monday evenings. Full details can be obtained from **www.radioclubs.net/plymradiotraining** where E-mail and telephone contacts can also be found. Further details from **Bob Griffiths G7NHB *Ridgeview*, 4 Wolrige Way, Plympton, Plymouth, Devon PL7 2RU**. Tel: (**(01752) 34317.**

Harrow's Foundation Seven's Success!

The Radio Society of Harrow has just successfully completed its second Foundation Course since Amateur Radio courses were resumed in Harrow this year. Seven students, including one Explorer Scout, took the Foundation Exam in October and all passed with excellent results. The successful candidates being presented with their certificates by the society's President **Don Lamb G0ACK**. From left to right they are **Don**, **Andrei**, **Corey**, **Nandesh**, **Helena**, **Ian**, **Peter** and **Paul**.

The course and exam were held at the **17th Harrow Scout HQ, Harrow on the Hill**. The RSoH are very grateful to **Mr. Vince Kingsley G7LWN**, the Group Scout Leader of 17th Harrow, who has gone out of his way to help us settle in to their premises.

Another Foundation Course will take place in early 2009 and an Intermediate Course is planned to follow. For further details please contact the Course Secretary, **Ray Snow G0BSP** at **rayasnow@aol.com** or vist the club website at **www.g3efx.org.uk**

Tool Kit In Orbit!

"We've got a problem Houston!" Things didn't go quite according to plan for astronaut **Heide Stefanyshyn-Piper** during her spacewalk outside the International Space Station on Tuesday November 18th 2008. Radio Amateurs might get frustrated losing tools in the shack – but Heidi's problems were much worse! She was beginning the job of cleaning and lubricating the gears of the station's malfunctioning starboard solar panel joint, when she discovered the grease gun had leaked and then lost the bag. The drifting tool bag joins other space junk waiting to re-enter and burn up in the atmosphere! Look out for flying grease gun debris readers!

rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations.

Send all your rally info to

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E-mail: newsdesk@pwpublishing.ltd.uk

January 18th, 2009
Red Rose Winter Rally
Steve, Tel: (01942) 888900
Internet: www.wmrc.org.uk
The West Manchester Radio Club is holding its Red Rose Winter Rally, at Lowton Civic Centre, WA3 2AH, just off the A580 East Lancs Road. This venue is all on one level with disabled facilities and free parking. There is a low cost Bring & Buy, RSGB bookstall, the usual trade stands, component and special interest groups, licensed bar, homebrew catering and large social area in which to mingle with fellow Amateurs. Doors open at 10am.

January 25
Horncastle Winter Rally
Tony Nightingale G3ZPU
Tel: (01507) 527835
E-mail: G3zpu@yahoo.co.uk
The Horncastle Winter Rally is to be held in the Horncastle Youth Centre LN9 6DZ (Note: Google Map details are wrong). With free parking, it's all on one level and ideal for wheelchair users. Entry will cost only £1 for visitors, with tables available at £5 per table, doors to be open at 10am

February 22nd
Radio Active 2009
Simon G8ATB, Tel: 01270 841506
E-mail: info@radioactiveshow.co.uk
The Mid-Cheshire Amateur Radio Society (MIDCARS) are hosting, the Radioactive 2009 rally on 10:30, Sunday 22nd February 2009 at the The Civic Hall, Nantwich, Cheshire CW5 5DG. There will be Talk-in, Car Parking, Trade Stands, Bring & Buy, Licenced Bar and Catering.

March 1st
Exeter Radio & Electronics Rally
Pete G3ZVI, Tel: 07714 198374
E-mail: g3zvi@yahoo.co.uk
The fourth Exeter Rally will be held, as previously, at the AMERICA HALL, De la Rue Way, Pinhoe, Exeter, EX4 8PW. The hall is well equipped and offers easy access, being only a few minutes from the M5 and other main roads. Traders, Bring & Buy, Refreshments, Talk-in. Doors open 10.30, (Bring & Buy book in and disabled 10.15). The entry fee is £1.50 and the speciality is in-house inexpensive catering by the XYL's. All profits from the event are shared between GB3SW, GB3EW and GB3EX, the local repeaters.

March 8th
Wythall Radio Club 24th Annual Radio and Computer Rally
Chris G0EYO, Tel: 07710 412 819,
E-mail: g0eyo@blueyonder.co.uk
Internet: www.wrcrally.co.uk
The Rally is to be held at Woodrush Sports Centre, Shawhurst Lane, Hollywood, Nr Wythall, Birmingham B47. All under cover, massive Bring & Buy, refreshements, etc. Admission £1.50. Visitors approaching from South: M42 junction 3, take A435 towards Birmingham at the first Island (Becketts Farm island) take the third exit which will have signposts to the rally site itself. When approaching from Birmingham or North, take the A435 out of Birmingham toward Redditch and at the Maypole/ Sainsbury's Island take the second exit sign-posted from there to the rally Site.

March 29th
Annual Hanger Sale
Rod Siebert, Tel: 01270-623353
E-mail: coldwar@hackgreen.co.uk
The annual spring Hangar Sale of military equipment, Amateur and PMR radio, plus vehicle spares and collectors items will be held at the Hack Green Secret Nuclear Bunker, French lane, Nantwich, Cheshire CW5 8AL. Gates open to public at 10am. Entrance fee £2.50. Bring the family and visit the museum, it's a great day out!

March 29th
Caradon Hill Repeater Group & Callington ARS Rally
Jamie 2E0JLH, Tel: 0779 554 60374,
E-mail: caradonhillrepeatergroup@hotmail.co.uk
Callington Community College, Callington, Cornwall PL17 7DR. Open at 10.00/10.30, £2 entry.

April 26th
Yeovil QRP Convention
Derek, Tel: 01935 414452
E-mail: yarc-contact@tiscali.co.uk
Internet: www.yeovil-arc.com
As in prevoious years, it is to be held at the Digby Hall, which adjoins the central shopping car park, Hound Street, Sherborne, Dorset. Talk-in S22, car park, open at 10pm, 3 lectures, guest speaker Rev. George Dobbs G3RJV, trade stands, Bring & Buy, catering, disabled facilities.

June 7th
Spalding & DARS Annual Rally
John Tel: 07946302815 or Graham, Tel: 07947764481
E-mail: rally-secretary@sdars.org.uk
Internet: www.sdars.org.uk
To be held at The Sir John Gleed Technology School, Halmer Gardens, Spalding, Lincs PE11 2EF. Doors open 10am with Free car parking, Talk-in S22, trade stands, catering, outside car boot.

June 28th
West Of England Rally
Shaun G8VPG, Tel. 01225 873 098
E-mail: rallymanager@westrally.org.uk ,
Internet: www.westrally.org.uk
The venue is unchanged from previous years and will be held at the Cheese & Grain, Frome, Somerset. Further details from Shaun or see the website.

September 13th
Torbay Rally
E-mail: secretary@tars.org.uk
Following the sucessful Rally in 2008 held at Newton Abbot Racecourse on August Bank Holiday Sunday, for the 2009 rally we have been forced to alter the date due to Horse Racing taking place over the August Bank Holiday. More details to follow!

October 4th
Annual Hanger Sale
Rod Siebert, Tel: 01270-623353
E-mail: coldwar@hackgreen.co.uk
The annual autumn Hangar sale of military equipment, Amateur and PMR radio, plus vehicle spares and collectors items will be held at the Hack Green Secret Nuclear Bunker, French lane, Nantwich, Cheshire CW5 8AL Gates open to the public at 10am. Entrance fee £2.50. Bring the family and visit the museum, it's a great day out!

November 1st
Great Northern Hamfest
Ernie G4LUE, Tel: 01226 716339.
Will be held at the Metrodome Leisure Complex, Barnsley S71 1AN. Doors Open 11.00am.

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
The World's Favourite Ham Store

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599 (Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk E-mail: sales@hamradio.co.uk

WX-2008MkII Weather Station

Latest version of this exciting touch-screen radio connected (no wires!) advanced weather station.

Everything you need is included in the box even high quality Ultra-Alkaline batteries. A short support mast and clamps are supplied to attach the assembled sensors to. There is a generous amount of cable to interconnect the sensors to each other, but as it is WIRELESS, you do not need any cable back to the LCD control console that you use indoors. You can mount the sensors up to 50m away from the LCD panel and not a cable in sight!

Special Intro Offer ONLY £79.95

RRP: £99.95

Another great feature is the large, touch controlled extra bright illuminated LCD panel. Being wireless means that you can take the panel anywhere around your house, garden or shed and be able to see all the weather parameters on a screen that is not tethered by cable. Locating your sensors is easy too as it is not governed by where the wiring should go. If you want to move them, you do not have to worry about re-wiring, IT'S WIRELESS!

Included in the package:

- Complete set of Batteries
- 23 x 14.5 x 3.5cm LCD touch screen extra-bright illuminated monitor
- Wind speed sensor
- Wind direction sensor
- Rain gauge
- Outside temperature / humidity sensor with transmit module
- Cable harness to connect sensors to transmitter
- Mounting arms for sensors and hardware
- Short stub mounting mast
- USB cable
- Latest CD with PC software and operating manual

Hustler Antennas

Full range of Hustler Mobile & Base HF antennas available from stock

Full range of Hustler accessories in stock

See web for full listing

Base Station Range, free standing, max 7.3m tall, 1kW

4-BTV 40/20/15/10m **£149.95**
5-BTV 80/40/20/15/10m **£219.95**
6-BTV 80/40/30/20/15/10m **£219.95**
17-BTV-S 17m add on for 5-BTV or 6-BTV.... **£49.95**

Mobile Range, 200W or 1kW, both stocked.
RM10 to RM-80 10M to 80m single-band whips,
£19.95 to **£31.95**

Kinetic SBS-1e

NEW MODEL

Real-time Virtual Radar

Another Gold Medal for the UK thanks to Kinetic Avionics.

SBS-1e 'Pocket Radar'

Based on the famous original SBS-1 launched in 2005, the **NEW SBS-1E Pocket Radar** is a portable low-cost Mode-S/ADS-B Receiving instrument designed for commercial, training and aviation enthusiasts. Supplied complete with antenna and Basestation Virtual Radar software. The SBS-1e Pocket Radar allows you to track ADS-B aircraft on a PC simulated radar screen and identifies and displays Mode-S equipped aircraft.

NOW IN STOCK! only **£449.95**

For full details see our website: www.virtualradar.com

ML&S are appointed distributors for the SBS-1e and associated products.

Begali Morse Keys

For the entire range and choice of bases and contacts see our website.

The finest range of keys available today.

Sculpture. The definitive CW operators dream key. Iambic with Carbon Fibre & Stainless Steel. Available from stock. **£349.95**

Begali Sculpture

Simplex. Excellent value available with Palladium or Gold Contacts. **From £109.99**

Begali Simplex

Simplex Mono. As above but single lever. **From £125.99**

Magnetic Classic. As the name implies, employing magnets for the return rather than springs. **From £169.99**

Begali Signature

Signature. Beautiful design. Uses precision bearings, magnetic system & two sets of paddles. **From £234.99**

Camel Back. Original design dates back 150 Years. Mounted on cast iron base. Superb. **£114.95**

Begali Camel Back

Kent Morse Keys

The best British range of keys money can buy!

The Kent twin paddle Morse key
Designed and precision engineered to the highest standards. The key is machined from solid brass having a solid steel base with non slip feet for stability. Precision and individual adjustment on each of the two contacts and springs. **Price: £84.95**

Kent Single Paddle Key
Designed to allow each individual operator total flexibility in setting adjustment. Precision made contact screws with instrument knurled heads and locking nuts to allow for precise and positive gap setting. **Price: £72.85**

Kent KT-1 Professional
High rigidity and stability, smooth, reliable, trouble-free operation under the most arduous conditions. The professional KT1 is the ideal choice for training, commercial and military use. **Price: £79.90**

Linear Amp UK – Ranger 572B

The 572B uses four 572B Triode Valves to produce a rugged 800W on the Amateur HF bands. This version is ideal for users who may want higher power on data modes, RTTY, PSK, including Contest SSB/CW etc. As with all Ranger models, the Ranger 572B has a toroidal transformer providing the power into a voltage doubler board. The voltage doubler is used in preference to a bridge rectifier as it keeps the AC volts down.

Price: £1,275.00

Also a selection of nearly new Rangers available from only £899

Little Tarheel II

£279.99

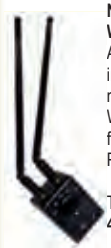
Motorised Mobile Antenna

- Freq: 3.5 to 54 MHz continuous
- Power rating: 200 watts p.e.p
- Vswr: typically 1.5 or less
- Weight: 850g
- Mast size: 1.5" diameter
- Mast length: 16 inches
- Whip length: 32 inches
- Total length in 54 MHz position 48 inches
- Total length in 3.5 MHz position 54 inches
- Includes 20ft of plug & play control box, ferrite decoupling core and 3/8 stud

When properly installed on your vehicle this antenna will provide continuous coverage from 3.5 to 54 MHz with the supplied whip. The Little Tarheel II like all of Tarheel motorized antennas are built to the highest specification

WonderWand

New! WonderWand Combo
A one-stop solution to your portable antenna requirements. The new WW Combo is a single unit housing the famous WonderWand and TCP Tuneable Counterpoise. Full operation 7MHz-440MHz, max 40PEP.
In stock now! £159.95



New! WonderWand WonderPole
As featured in CQ magazine in Japan! Yet another new antenna system from WonderWand products. 20-10M Portable dipole for any rig with an SO-239 Socket. 40 Watts PEP. **Only £129.95**

The original and best selling **WonderWand 40m-6m** portable antenna for all rigs. Ideal for IC-703, FT-817, FT-897 etc. Superbly made and excellent value for money. **Only £89.95**

WonderWand TCP
A tuneable counterpoise ideally suited to the WonderWand for increased performance.
Only £59.95

5 STAR

British Products

Mini VNA PC Controlled Antenna Analyser

The mRS miniVNA is a compact 100kHz to 180MHz antenna analyser interface that is operated via a PC powered by a single USB connection. You can see at a glance where the antenna is resonant, what the SWR and the return loss is. The best (minimal) SWR frequency is automatically found and displayed. An optional internal RS232 connection is also available. **MLS: £259.95**

Palstar - Full range now in stock

For the full range of Palstar products see: www.HamRadio.co.uk

Palstar AT-Auto Automatic 1500 Watt ATU **£999.95**
Palstar AT-1KP 1200W Antenna Tuner **£359.95**
Palstar AT-1500DT 1500W Differential Antenna Tuner **£379.95**
Palstar AT-2K 2000W Antenna Tuner **£399.95**
Palstar AT-4K (2.5kW) & **AT-5K** (3.5kW) Antenna Tuners
AT-4K.....**£679.95** **AT-5K**.....**£909.95**
Palstar BT-1500A Balanced Antenna Tuner **£529.95**
Palstar ZM-30 Antenna Analyser **£309.95**
Palstar Power/SWR Meters
PM-2000AM **£119.95**
Palstar Dummy Loads
DL-1500 (1.5KW)....**£89.95** **DL-2K** (2kW)....**£189.95** **DL-5K** (5kW)....**£309.95**
Palstar R30A Receiver
Palstar R30A, fitted Collins filters for SSB & AM **£529.95**
R30 Matching Accessories:
Palstar MW550P Active preselector & ATU for AM & 160M reception **£229.95**
Palstar SP30 Matching Desk Speaker **£49.95**
Palstar AA30 Active Antenna Matcher 300kHz-30MHz **£79.95**

Palstar AT-Auto

Palstar AT-1KP

BT-1500A

Palstar R30A Receiver

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

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All prices based on 17.5% VAT – Call for lower prices @ 15% VAT!

YAESU & KENWOOD PRICES HELD WHIST STOCKS LAST!

*Please call or see web before placing order

YAESU

Yaesu FT-2000 HF Base Transceiver

Deposit then £170 36 x £55.07p/m

The FT-2000 & FT-2000D (200W version) are available from ML&S. No cuddly toys that you don't really need, just excellent customer service and a fair deal.

Available from stock and on permanent demo in our showroom

- The Yaesu FT-2000 was the best selling HF Base Transceiver in 2007.
- The Yaesu FT-2000 was the ONLY radio used on the 3B7C St Brandon Island during 2007.
- There were NO FAILURES during 18 days of continuous 24 hour operation during 3B7C.
- ML&S sold more FT-2000's than any other dealer in the UK.
- ML&S always has the FT-2000 on permanent demo with large stocks of the 100 & 200 versions.
- Peter Hart said: "SON OF FT-1000MP, aimed at the serious DX and contest operator".

FT-2000 Accessories

DMU-2000 Data Management Unit. £619.95

- Spectrum Scope with Limited Bandwidth Sweep feature
- Audio Scope/Oscilloscope Display Page
- Swept-Frequency SWR Page
- Memory Channel List
- World Clock withGreyLine Page
- Rotator Control Page
- Log Book Feature

Deposit then £70 36 x £22.75p/m

SP-2000 External Speaker with 2 inputs & filters..... £139.95
MD-200A8X Desktop Deluxe Microphone, sounds amazing with the FT-2000! £189.95
MD-100A8X Desktop Microphone..... £116.95
CW Filters for Sub-Receiver
YF-122C (500Hz) CW Filter £94.95
YF-122CN (300Hz) CWN Filter £109.95
FH-2 Remote Control Keypad £33.95
RF External Tune Kits
3 versions available.160m Band Kit "A". 80/40 Band Kit "B". 30/20m Band Kit "C" ..... NOW IN STOCK £359.95

The Ultimate Accessory!

Quadra System 1kW HF Linear Amplifier, PSU & Auto ATU Always available from stock ..... £Call

Yaesu FT-950 HF Base Transceiver

Deposit then £90 36 x £28.89p/m

FT-950. Yaesu's "Midship Radio"
Many of you grabbed the new Yaesu FT-950 HF & 6M from us at the end of last November. Once again Yaesu identified a position in the market and hit it spot on. When Peter Hart said it was "An eye catching radio with some very nice features" and "it represents extremely good value" he wasn't kidding. If you don't need dual receive or internal PSU like its Dad, (the FT-2000) then check out the FT-950.
The FT-950 available NOW from ML&S at only £889.95
Price Match! or £90 deposit and 36 x £28.89

Winter Sizzlers

Got a Yaesu FT-2000 or FT-950?
Add a DMU-2000 Data Management Unit for only £619.95!

Yaesu FT-450 HF Base Transceiver

HF & 6m Full DSP

ML&S: £529.00 Without ATU — Without ATU: Deposit then £53 36 x £17.19p/m

ML&S: £599.00 With ATU — With ATU: Deposit then £60 36 x £19.46p/m

The Yaesu FT-450 is a major new HF & 6m transceiver offering full a 400MHz IF DSP design at a very low price. Available with or without internal ATU, this new rig offers serious performance for those who are not bothered about the upper V/U bands.

Nifty Handie Stand

Get double duty out of your HT, add an external microphone and use it as a Base Station.The HT Stand holds your radio upright and steady at a comfortable viewing angle. Stops a remotely connected antenna or external microphone from "dragging" your HT around on the desk. Only £28.95

More Yaesu at ML&S!

Winter Sizzler!

Yaesu FT-897D
Latest batch straight from the factory! Call for Lowest Price or Special 'Bundle' Offers!!
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W)

Yaesu FT-857D
The Ultimate HF Mobile Installation!
Plus ATAS-120D 40m-70cm Auto Antenna
Bundle Price Only £CALL
(Rig only: £CALL)

Yaesu FT-817ND
The worlds only all-band portable transceiver. Only £349.95
Why not add a CSC-83 Carry Case for only £19.95?

Bundle 1 FT-817ND 'Vanilla' - Basic FT-817 .....£349.95
£35 deposit, 36 x £11.37p/m
Bundle 2 FT-817ND + YF-122C 500Hz CW Filter.....£429.95
Bundle 3 FT-817ND + YF-122S COLLINS SSB Filter£449.95
All ML&S FT-817ND's include; 2 Years Warranty, Metal Hydride batteries, charger, mic, etc.

NEW Yaesu VX-8
Available End December
Latest 6/2/70 Handie with Bluetooth, APRS and optional GPS.
See web for more details, price TBA.

Yaesu FT-7800E. NOW ONLY £169.95
Bar make the tea it'll give you 2m/70cm @50W/40W.
Add a YSK-7800 Remote Kit for Only £19.95!

Yaesu FTM-10R. ML&S £239
A small compact dual band 2m/70cm transceiver with high power output of 50W on 2m and 40W on 70cm, (adjustable power levels of 50/40W, 20/20W, 5/5W). Receive range from 0.5–1.8MHz, 76–108MHz, 137–222MHz and 300–999MHz.

Yaesu FTdx9000D. ML&S £7299
200 Watts or 400 Watts, TFT Screen or not. You choose. Call for more info or see www.FTdx9000.com 'D' spec now shipping.

Quadra VL-1000. ML&S CALL
The easiest way to get 1kW output from any Yaesu HF Transceiver. Plug in 240V, attach rig & antenna and you have a fully automated amplifier with auto tuner.

Yaesu FT-8800. ML&S £219.95
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

Yaesu FT-8900. ML&S £249.95
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX! **NEW Yaesu**

FT-1802E. ML&S £99.95
2m FM Mobile. 5-50W out. Very similar to the FT-2800.

NEW Yaesu VX-3E. ML&S £119.95
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.

Yaesu FT-60. ML&S £129.95
Latest twin band handie complete and ready to go.

Yaesu VX-6R. ML&S £189.95
Yet another 2/70 handie from Yaesu.

Yaesu VX-7R. ML&S £CALL
The UKs best selling Triple Band Handie.

To Finance or not to Finance? That is the question!

Having many years of experience offering specific finance packages for our customers, we can now offer various options on payment, including 36 and 60 months on selected products. Please note that interest is calculated from the date of the original agreement at 19.9% APR. Minimum purchase available for finance is £350.

Finance Example IC-E2820 with UT-123. Discounted price of £519, £52 deposit, then 36 x £16.86p/m. TAP £658.96, APR 19.9%. E&OE.

KENWOOD

Kenwood TM-V71E v.h.f/u.h.f. Mobile Transceiver

ML&S: £269.95

- High r.f. power output (50W)
- Dual receive on same band
- Green and amber colour display
- Invertible and detachable front panel
- Programmable memory
- Multiple scan
- Built-in CTCSS/DCS
- Wide Band Reception : 118-524MHz & 800-1300MHz (excluding cellular blocked frequencies)

Kenwood TM-D710E APRS & TNC Loaded mobile

Deposit then £40 36 x £12.94p/m

ML&S: £398.00

- Built-in TNC & APRS® Ready
- Switchable Backlight LCD & Multifunction Key Display
- High RF Power Output
- Dual Receive on Same Band
- 1,000 Memory Channels
- Multiple Scan & Visual Scan
- Built-in CTCSS/DCS
- EchoLink® Memory
- EchoLink® NODE TERMINAL Operation

Kenwood TS-2000E Flagship Base Transceiver

Just superb on all bands 160m-70cm with optional 23cm (X-Version) RRP: £1699 **ML&S: £1299**

Deposit then £130 36 x £42.21p/m

Kenwood TS-2000X

As above but with 23cm fitted. **RRP: £1999**

Deposit then £160 36 x £51.96p/m

TS-2000E Bundles

Bundle 1 TS-2000E Supplied with hand Mic, DC Lead **£1299**
Bundle 2 As above with MyDEL MP-250A PSU..... **£1379**
Bundle 3 As above with MC-60A Desk Mic..... **£1499**

The TS-2000X (fitted with 10W 23cm module) version of any of the above is available for as additional £400.

Kenwood TH-F7E 2/70 Handie With Gen Cov RX.

The only dual-bander with proper SSB receive capability!
RRP: £289.95 ML&S LOW PRICE: £199.95

Kenwood TS-480SAT

This best selling Kenwood H.F. Can be used mobile or base. Includes ATU. **ML&S: £699.95**

Deposit then £70 36 x £22.75p/m

Kenwood TS-480HX

As TS-480SAT but 200 Watts, no ATU. **ML&S: £799.95**

Deposit then £80 36 x £25.96p/m

Perseus VLF-LF-HF Receiver

RRP: £649.95

PERSEUS is a VLF-LF-HF receiver based on a outstanding direct sampling digital architecture.

Unlike lower class direct sampling receivers, the PERSEUS RF analog front-end has been carefully designed for the most demanding users. PERSEUS can be operated also in a wide band mode as a 10KHz - 40MHz spectrum analyzer with more than 100dB dynamic range in a 10KHz resolution bandwidth. PERSEUS is a Software Defined Radio and relies on PC software applications to carry out the demodulation process.

New Product!

Deposit then £65 36 x £21.12p/m

ML&S are Sole Distributors for Perseus in the UK and Ireland

ICOM

BIG price increases on Icom due 1st Dec! Please Call for pre-increased price stock availability!

The New Icom IC-7700

HF/6m All Mode Base Transceiver

CALL FOR TODAY'S PRICE!

The wait is over! This fantastic new HF & 6M base station has finally arrived and is available from stock and on demo in our Chertsey showroom.

Same size as Icom's flagship IC-7800, the IC-7700 has 200 Watts output on HF & Six, Two independent DSP units (same as 7800) a +40dBm* 3rd order intercept point and ultra wide dynamic range, again like its big brother.

Icom IC-E2820

Dual Band Mobile

GB7ML D-Star repeater now active

Deposit then £52
36 x £16.86p/m

CALL FOR TODAY'S PRICE!

D-Star Capable

Buy the new IC-E2820 with UT-123 £CALL
Rig Only £CALL

PC Controlled Receivers from ICOM

All Windows XP Controlled via USB with four models to choose from:

D-Star Capable

IC-PCR1500 10kHz-3300MHz All Mode ..... **£CALL**
IC-R1500 As above but with remote head..... **£CALL**
IC-PCR2500 Twin Receiver version of PCR-1500 ..... **£CALL**
IC-R2500 As above but with remote head..... **£CALL**

See web for full details, PDFs etc.

Icom IC-7000

If you want a small IC-756Pro111 in your shack (or car) then the IC-7000 comes very close. Superb display & HF-70cm operation.
ML&S: CALL

Icom IC-706MkIIG Mobile / Base

HF+6M+2M + 70cms Mobile/Base.
ML&S: CALL

Icom IC-7400

Fantastic HF+6M+2M 100W All Mode Base Transceiver.
VERY SPECIAL PRICE - Please call
SPECIAL PACKAGE DEAL AVAILABLE - PLEASE CALL!
SM-20 Desk Mic, SP-21 Speaker, MP-250A PSU

Winter Sizzlers

NEW: Icom SP-20
Matching Desk Top Speaker for the IC-7700, 7800, IC-R9500. **£CALL**

Winter Sizzlers — FREE LDG Z-11Pro Automatic ATU!

CALL FOR TODAY'S PRICE!

NEW: Icom's Latest IC-7200

HF/6M Heavy Duty DSP Transceiver with **FREE LDG Z-11Pro Automatic ATU! CALL FOR DETAILS OR SEE WEB SITE!**

Icom IC-756Pro mkII

Package deal
IC-756ProII
SM20 Microphone
SP-23 New Base Speaker with filters
ML&S: £CALL

CALL FOR TODAY'S PRICE!

Icom IC-7800mkII

Call for ML&S package deal

CALL FOR TODAY'S PRICE!

Defer payment for 6 months - Interest FREE!*
The Icom Flagship Base Transceiver just keeps getting better & better. Now fitted with 3 Roofing Filters for even more receiver performance.
On permanent display next to the FTdx9000.

Icom IC-910X

High Performance 2/70/23 All Mode Base Transceiver.
with 23cms fitted! £CALL

CALL FOR TODAY'S PRICE!

Icom IC-E92ED

Latest waterproof VHF/UHF dual band with D-STAR Operation included!

The IC-92ED has waterproof protection and is equivalent to IPX7 (1m depth of underwater for 30 minutes). The aluminium die cast chassis and gasket-sealed housing provide performance you can count on in harsh outdoor environments; when hiking, mountain biking, touring and for alpine activities. **ML&S: £CALL**

Icom IC-E90 Triple Band Handie

Multi-band handheld transceiver
ML&S: £CALL
Or available with 4m and extra antenna for Only £CALL

Icom IC-703 IDEAL FOR M3 USERS

10W Portable/Base HF Transceiver with built-in ATU.
ML&S: £CALL

Icom IC-718 HF Transceiver

Basic ready to go 100W HF Transceiver supplied with Microphone & DC Lead. **ML&S: £CALL**

Icom IC-E208

2/70 mobile 50/55W Transceiver with host of additional features. Remote head leads included.
ML&S: £CALL

MyDEL CG-3000

With 200W and 200 memory channels.
Tunable frequency: 1.8 - 30 Mhz with long wire antenna from 8 meters
Input impendence: 50 ohms
Input power: 10 - 200W PEP
SWR: <2:1
Power supply voltage: 12V +/- 10%
Current consumption: <0.8A
Auto tuning time: Approx. 2 seconds (first time tuning)
Less than 1 second (return to memory frequency)
Memory channels: 200
Weight: 1.8 KG
Size: 310 x 240 x 72mm (L - W - H)

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The Radio Mate is an ideal companion for the FT-817

The bhi Radio Mate

Working With The Yaesu FT-817

The bhi Radio Mate is a compact key pad manufactured by bhi and works with three transceivers from the Yaesu stable, namely the FT-817, FT-857 and the FT-897. It's not designed to work with any other rig.

The Radio Mate's function is to augment the control of the radio by adding a key pad via connection to the ACC mini DIN socket, utilising the Computer Aided Tuning (CAT) interface at 9600bps. This gives the users of the transceivers the ability to change modulation type without touching the rig itself.

The Radio Mate also has 20 memories that can be used in conjunction with the the three transceivers and (for me in any way!) by far the most beneficial use, was the ability to directly input a frequency into the FT-817.

The Yaesu FT-817

I don't own an FT-817, although I did review one for *PW* some years ago and remember being impressed with the size and compact nature of the rig. However, reading comments from Amateurs on the Internet, it would seem that ease-of-use was not a strong point for the rig – due to its size, the front panel controls have been cut right back. Hence, bhi began looking at a way to help out and their introduction of the 16-key multi-function Radio Mate key pad.

For the review evaluation I was kindly loaned an FT-817 ultra-compact h.f./v.h.f./u.h.f. rig to use with a bhi Radio Mate. So, off I went!

Neatly Packaged

The Radio Mate comes neatly packaged, looking every bit as well made and professional as you would expect from bhi. It's

Richard Newton G0RSN has had the opportunity to try out a rather unusual 'add-on' keyboard unit suitable for use with some Yaesu rigs.

supplied with a 15-page instruction leaflet. However, only seven and a half pages relate to the actual functions of the Radio Mate, the remaining pages are advertising other bhi products and give the user a matrix to fill in memory settings.

The seven and half pages of manual are, however, well written and informative, and more than adequate to get you up and running in double-quick time. Even being unfamiliar with the rig I was up and running in seconds!

The Radio Mate is beautifully crafted; it has a low profile, very professionally finished key pad with a footprint of approximately 150 x 100mm (5.9 x 3.9in). The actual key pad takes up two thirds of the overall length and is less than 3mm (0.11in) deep.

The keys have a membrane over them and are slightly indented. The membrane has a very slight texture to it, so making the whole thing pleasing to the touch. This, along with the size and clear labelling, make the key pad very easy and a joy to operate. The key pad isn't back-lit but it was interesting to note bhi supply a small rubber 'bump' that can be stuck on the key pad to aid operators with impaired vision.

The remaining one-third of the Radio Mate is a small plastic control box, this is approximately 20mm (0.78in) in height and houses a small sounder and 8mm multi-colour l.e.d , both of which help inform the user of the current function being controlled.

Out from the rear of the control box comes the 2m (6.5ft) control cable, terminated in an 8-pin mini-DIN plug. On the side of the box is the power switch and incidentally, the Radio Mate takes its power from the accessory (ACC) socket of the rig, so it needs no external power at all!

The whole unit is mounted on a black anodised aluminium base with four rubber feet and it sits on a desk top without slipping and looks great! The Radio Mate is relatively small, it does however, look bigger when put next to the aptly named ultra compact '817!

Four Functions

In use on the transceiver, the Radio Mate has four functions and these are easily controlled using the keys on the right side of the pad. The functions are; **Memory**, **Modulation**, **Direct Frequency Entry** and **Tune**.

The first function I played with, was the memory function and when it's in this mode the l.e.d glows red. The Radio Mate has 20 memories in two banks of 10. The first 10 are accessed by pressing the **Memory** button momentarily and by pressing this button again for longer you'll hear two beeps – this selects the second bank of 10 memories.

All 20 memories are pre-programmed, a list is printed in the instruction leaflet, but they are extremely easily over-written with memories of the user's choice. When in this mode the Radio Mate will tune the rig to the chosen memory frequency, you can then tune away from the frequency using the rig's tuning dial.

Why, I thought, would the operator want to have memories on the key pad when the rig undoubtedly has memories of its own? Well, the answer soon came as it was then I discovered that programming and recalling memories on the FT-817 wasn't the easiest thing in the world. In fact the FT-817 I had on loan didn't have a hand-book supplied and to be honest I gave up trying to figure it out. It was so much easier to use the Radio Mate!

All you have to do is tune the FT-817 to a frequency you want in a memory, select the memory function, the l.e.d glows red, and you press the desired memory location, button 0-9, for more than a second until you hear a beep. It's as simple and effective as that! To recall it just press the number and the rig displays the stored frequency. If I owned an FT-817 I would be sold on just this feature alone!

Product: bhi Radio Mate add-on multifunctional key-pad.

Company: bhi Ltd.

Pros: Makes the FT-817 easy-to-use and the direct-entry frequency mode is a real plus!

Cons: Only works with the Yaesu FT-817, FT-857 and the FT-897 transceivers.

Price: Radio Mate retail price is £89.95 plus £6 postage and packing and is available from bhi on 01444 870333 or via one of their authorised dealers.
The CAT-MATE is priced at £49.95 and the two can be purchased together at the discounted price of £134.90 plus £6 P&P.

Supplier: My thanks for the loan of the Radio Mate goes to **Graham Sommerville M3ZGS** of **bhi Ltd.**, **PO Box 318, Burgess Hill, West Sussex RH15 9NR**. Tel: (**01444**) **870333**. FAX (**0845**) **217 9936**. Skype: **bhi sales**. E-mail **sales@bhiinstrumentation.co.uk** and website **www.bhiinstrumentation.co.uk**

Next, was the modulation function and pressing the **Mod** key turns the l.e.d. yellow. Using this function you can select all the modes that the rig will support. However, there's one exception (for the FT-817 alone) where, with this rig – if you use the Radio Mate to select the FM-N mode – you'll lock the '817 up and the only way to recover normal operation is to remove the batteries on the rig.

The bhi instruction leaflet warns you of this problem and they have also introduced a safety net, in that you have to press two buttons to select FM-N. You can select all other modes by a single button press, choosing upper sideband (u.s.b.), frequency modulation (f.m.), c.w. (Morse), lower sideband (l.s.b.), cw-r, amplitude modulation (a.m.), and packet and digital modes are a 'cinch'.

The Real Plus!

The real plus for me was the ability to have the ability to direct entry a frequency. When **Direct Entry Mode** is selected the l.e.d glows Green. The

FT-817 is so small it hasn't got a key pad and neither has the microphone. With a rig that covers such a vast range of frequencies the ability to input the desired frequency is an absolute godsend. All you have to do is input the frequency required and up it pops on the radio!

The final thing that the Radio Mate will do for you, is help you to tune up on your chosen frequency. All you have to do is select the working frequency and press and hold the **Enter**/**Tune** button, the current mode of operation is read into the keypad and the rig is then put into transmit mode in **FM** for 10 seconds to allow for the antenna system to be tuned by an antenna tuning unit (a.t.u.). If you successfully tune up before 10 seconds all you have to do is press the Enter/Tune button again and this will cancel tune mode and return the rig back to its original settings.

The Radio Mate has one more little option to offer – you can also swap from **VFO**/**a** to **VFO**/**b** using a key labelled **a**/**b**. Finally, I also discovered – by accident – that while the the Radio Mate is in **Modulation** or **Memory** mode, if the CLR key is pressed, a little symbol appeared on the display that looked like a battery save icon. (You can toggle this on and off). However, on re-reading the manual, I discovered (on page 8) that what I had actually discovered was the **VFO Split** function and bhi confirmed that they're planning to add the letters **SPLT** on the **CLR** button in the future to highlight this feature.

Sceptical Start!

I have to say that when I started this review I was sceptical, why would you want the Radio Mate? However, having played with it and discovered just how much easier the FT-817 was to use – I can see why the unit would appeal to an '817 owner!

There is one thing to bear in mind; there's a slight time delay between pressing the button and seeing the result on the radio. It's very slight, but the CAT interface is not instant. But this shouldn't cause any problem and I only mention it for those who may think the delay is a fault– it isn't – instead it's just the nature of the interface and is quite normal.

I have had the pleasure of reviewing bhi equipment before and have seen examples of their other products and I must say that I really appreciate their build quality and attention to detail. I'm sure all owners of FT-817, '857 and the '897 transceivers would find the Radio Mate very useful! ●

Graham Somerville M3ZGS of bhi writes: Thank you for letting me see a copy of Richard Newton G0RSN's excellent review on the Radio Mate. However, there's several points I'd like to clarify. First, you can press the **Tune** button again to end the tuning function more quickly rather than waiting the full 10 seconds. The other thing that I would might like to mention is the fact that new bhi CAT-MATE Electronic 'Y' splitter for the same radios, enables users of the Radio Mate to use PC software or a suitable antenna tuning unit, while still having the Radio Mate connected to the single cat port of the Radio. This was one of the key bits of feedback we received from customers when we first launched the Radio Mate because they said that although they were interested in the RM they didn't want to give up the CAT port. Regards to you all. **Graham M3ZGS**.

news extra

The RSGB 2008 HF Convention

Roger Cooke G3LDI – a keen DXer – attended the RSGB HF Convention in October 2008 on behalf of PW and it seems he thoroughly enjoyed himself.

The **Radio Society of Great Britain** (RSGB) **High Frequency Convention (HFC)** took place on the weekend of October 11th and 12th at Wyboston Lakes, near St. Neotts in Cambridgeshire. It's usually a well-planned and well attended event in the RSGB Calendar and this year it was even more so! Wyboston Lakes is a superb location, easily accessible with ample parking, with equally superb walks around the lakes. The weather was good too, with people having their coffee outside in the warm sunshine.

The RSGB President, **Colin Thomas G3PSM**, opened the proceedings with a very short welcome speech and the various of talks then began. Looking at the programme, deciding what to miss was to be the most difficult decision for me!

The event was jointly and equally sponsored by **Icom (UK) Ltd.** and **Martin Lynch & Sons** and they both had displays and **GB2HFC** was operational with a chance to try the latest Icom gear. In the same room, **Phil Brooks G4NZQ** was on the RSGB book stand, and a team of QSL card checkers was available to update your DXCC, etc.

Contest University

There is an increasing interest in contesting, and the talks on the subject were to prove the most popular. Such was the interest that all the tables had to be removed and lots of extra chairs brought in! Even then there were quite a number standing at the back. The lecturers were all seasoned DX-ers, members of CDXC and had been on DXpeditions, so they all had an invaluable pool of knowledge and skills.

Contest techniques, planning and station layout were all well covered, talks on propagation, and antennas for contesting were provided. All in all it was extremely popular and well attended.

Ray G4FON's Pile-Up Test

Ray Goff G4FON had set up in a small room to offer a daunting test! The idea was to have four minutes of callsigns thrown at you several at a time, and you had to copy as many as possible, writing them down. (There was a very nice key paddle as a prize).

The test proved quite popular and all entrants received a certificate in recognition of their participation. The winner was **Fred Handscombe G4BWP**, who managed a grand total of 65 callsigns! I'm not quite sure how Fred managed that, as I was writing as fast as I could and I only managed 32! Well done Fred – it was great fun and I hope to do better next year!

Caffeine Top-Up

Food, friendship and the necessary tea and coffee were available whenever a caffeine top-up was needed – if you managed to get there in time! Lunch vouchers had to be purchased on entry, and also for the Saturday evening Gala Dinner. My home county, Norfolk, was well represented with **Steve Nicholls G0KYA** giving two talks, and yours truly providing one. We also had talks from with **Chris Danby G0DWV** and **Mike Cooke G4DYC** (no relation), who were there for the whole weekend.

I was surprised at the attendance in my RTTY talk, with some people sitting on the floor and standing, so obviously that mode is gaining in interest! The same can be said for the c.w. (Morse) operating and I think that the **RSGB CC** contests, each only 90 minutes long, have been responsible for a lot of this, with many more stations on taking part in the last year.

Lunch Welcome!

The midday lunch was most welcome with a relaxing hour or so to chat. Then it was back to the programme, again deciding what to attend. I decided on the 3X5A and VP6DX presentations, and was glad I did as I found both to be very interesting.

It's quite amazing at the planning and preparation that goes into making a DXpedition a success. These days, all the gear goes into a container, a tonne or more, and is then shipped. The costs are enormous, so it's no wonder that donations are solicited! Handling the sort of pile-ups that they encounter must be exciting and adrenalin must flow just listening at the hot end!

One Day

Attending one day on behalf of *PW* and to give my talk, I stayed on for the evening meal and it was there that I learned how many people had travelled huge distances to enjoy the HFC. Visitors attended from the USA, South America, Japan and Eastern Europe.

During the announcements it was mentioned that an old friend of mine – **Jim Smith VK9NS** – had been presented with a birthday cake on the Friday evening. I used to work Jim regularly about 25 years ago on 14MHz. Steve G0KYA managed to find him and I went and introduced myself and we had a very long chat – it made my evening and to think that he's now 80 years young! This is what makes Amateur Radio the fine hobby it is, so you never know who you might meet at the HFC. So, make sure you mark it in your diary for 2009!

The Icom team and Martin Lynch (below) were very busy!

The RSGB President, Colin Thomas G3PSM, present a birthday cake to 80-years-young Jim Smith VK9NS, who came from Australia to attend the HFC.

Roger G3LDI very much enjoyed the company during the evening meal.

Vince Lear's

antenna workshop

Operating From A Flat Or Limited Space Location.

Vince Lear G3TKN/ZL1VL presents the second part of his article sharing the experience he gained while operating in a less-than-ideal QTH in Cheltenham.

Fig. 2.1: The operating position at G3TKN/P in Cheltenham using an Icom 751A. The a.t.u. is placed near the window where the antenna enters.

Welcome to the second part of my article, where this time I'm considering the social issues associated with Amateur Radio. Social issues have also to be taken into account and, as an example, although I own a linear amplifier, I never considered using it from my flat. Running high power from such a location is, in my opinion, a 'recipe for disaster' in terms of interference!

I started off running 50W but eventually went up to 100W once I was satisfied that all my own domestic equipment was clear of interference. I was particularly concerned about r.f. getting into the communal antenna system, but as my own TV (connected to the communal antenna distribution system) was clear, it seemed reasonable to assume that there were no problems.I started off running 50W but eventually went up to 100W once I was satisfied that all my own domestic equipment was clear of interference. I was particularly concerned about r.f. getting into the communal antenna system, but as my own TV (connected to the communal antenna distribution system) was clear, it seemed reasonable to assume that there were no problems.

Reducing Power

If you're operating in the same situation as I've described and have an interference problem that can't easily be remedied, then I suggest that you consider reducing your power. Sometimes, even a fairly small reduction in power can make a difference in terms of reducing interference levels. After all it's better to be able to operate with lower signal levels than not to operate at all!

A reduction from 100 to 25W will only drop your signal by one S-unit (6dB) in real terms regardless of what someone's S-meter may tell you! This simple reduction in power could make all the difference in reducing interference to a neighbours' equipment.

I always tried to keep a 'low profile' from an Amateur Radio perspective. I saw no reason to mention to anyone that I was a Radio Amateur and had transmitting equipment in my flat! Bear in mind that we sometimes hear stories of Radio Amateurs being blamed for interference when in fact they're not the cause.

By the very nature of our hobby, most of us like to experiment with antennas. However, we can't expect to keep a 'low profile' if neighbours see us adjusting antennas on a regular basis! This is why I feel it's important to give careful consideration to all aspects of any antenna installation prior to its installation.

Once my sloping 15m long wire was in place, it stayed there without any further adjustment or attention for the whole year of my occupancy of the flat. In fact, this is a major advantage of the end-fed wire, in so much as all its tuning is done from the 'shack end'. It's interesting for me to look back, remembering that no one ever commented on my antenna at any time! My 'low profile' approach had certainly paid off.

The Results?

Readers may ask, "What were the results"? In answering, I should mention that the flat was near a busy road junction and petrol station and there was a lift. Under these circumstances I had to expect a certain amount of general electrical noise.

In practice, I found that the noise level seemed to vary across different bands and at different times. It was quite severe on 21 and 28MHz although my main operation was on 3.5, 7 and 14MHz, with a few limited contacts around G on 1.8MHz with acceptable reports.

Results on 3.5MHz were very good. On this band, of course, the antenna was not far off a quarter wavelength and good reports were obtained around G and Europe although no DX was attempted. In the evenings reports of 59 to 59+ could often be obtained on inter-G contacts.

Results on 7MHz were also good with many 59 reports around G. I did work some DX on this band but, of course, the antenna was near a half

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Fig. 2.2: The antenna wire ran from the (second from left) top floor window on the 5th floor to the small tree just behind the garage block.

wavelength long and sloping out to the west. I worked the USA and west Africa on c.w, and I felt that with regard to DX, the antenna probably performed best on this band. Results on 14MHz were mainly the result of pre-planned scheduled contacts ('skeds') into Australia (VK) and New Zealand (ZL) with 55 to 56 reports at best.

High As Possible!

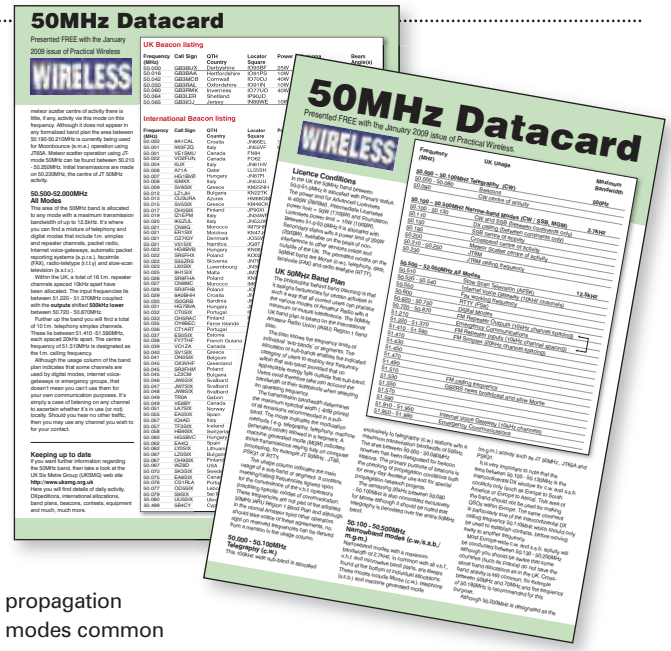
In summing up my advice, I thoroughly recommend that – if there's has any choice in the matter, it's always better to live up as high as possible in a block of flats. It gives the initial height advantage with the antenna and I was lucky in this respect! However, even if you are operating from a ground floor flat, it may still be possible to run a low wire (above head height so that it does not cause a hazard) to some convenient support. Amateurs in this situation will probably have the advantage of being able to find a better r.f. earth, although counterpoises may still bring additional benefit.

I have done many experiments from my home QTH with low antennas (heights of between 3m to 5m) and have often been surprised at the encouraging results obtained, especially on the 7MHz band. The low antennas may not be ideal for DX but I've found that we can certainly get our share of contacts and don't forget that the use of c.w. can provide a real advantage under weak signal conditions.

So, if you're in a position where there are limited possibilities for antennas – don't give up! The experiences I've shared about operating from a flat near Cheltenham town centre may give a little inspiration. ●

50MHz Datacard

David Butler G4ASR outlines the 50MHz datacard and operating on the 50-52MHz band



Hello and welcome to this 50MHz datacard – that you should have found within the magazine when you bought it. This is the second our our planned series of v.h.f./u.h.f. datacards. The Band plan for the 70MHz band was published in our November 2008 issue of *PW*, and we'll produce the datacards for other band every other month.

Band Plan UK 50MHz

The 50MHz UK band plan is based on the **International Amateur Radio Union** (IARU) Region 1 band plan. On the card is a graphic of the UK 50MHz band plan and an explanation of the various sub-bands and the type of operations that are the preferred form of transmission to be used. The philosophy behind band planning is that it assigns frequencies for certain activities in such a way that all current users can practice the various modes of amateur radio with a minimum of mutual interference.

The plan shows the frequency limits of individual 'Sub-bands' or segments. The allocation of sub-bands enables the indicated category of users to employ any frequency within that sub-band provided that no appreciable energy falls outside that sub-band. Users must therefore take into account the bandwidth of their sidebands when selecting an operating frequency.

The Sub-bands are:

50.000 - 50.100 MHz – Telegraphy (c.w.)

50.100 - 50.500 MHz – Narrowband modes (c.w./s.s.b./m.g.m.)

50.500-52.000 MHz – All Modes (above + f.m. a.m.)

Getting Started

One of the reasons why the 6m band has become very popular is the availability in recent years of multimode (c.w./s.s.b./f.m.) transceivers that cover not only the h.f. bands but also include the 50MHz band. Your choice of antenna is normally dictated by the communication modes that you want to use. If you are only interested in local f.m. communication then you should invest in a vertical antenna as this will give omni-directional coverage.

If however you want to work long distances (DX) on s.s.b. or c.w. then it's best to have some sort of horizontally polarised beam antenna. That's not to say you can't work DX with a dipole or a vertical antenna. It just means you stand much more of a fighting chance when using a beam antenna with a bit of gain. As a start you could try a simple 2-element Yagi and perhaps exchange it for something more ambitious when the bug catches.

Propagation Modes

One of the great attractions of operating on the 50MHz band is that it experiences propagation modes common to both the v.h.f. and h.f. bands. The v.h.f. modes include tropospheric (tropo) propagation, Aurora, Meteor scatter (m.s.), trans-equatorial propagation (t.e.p.) and E-layer propagation, the most common type being Sporadic-E (Sp-E).

The h.f. characteristics experienced on the 50MHz band are directly linked to the state of the sun spot cycle. The prime DX mode is F2-layer propagation and occurs during the years around the peak of the solar cycle. This should occur around 2012 and when it arrives you'll certainly know about it. The 50MHz band will literally be open to all continents for months at a time.

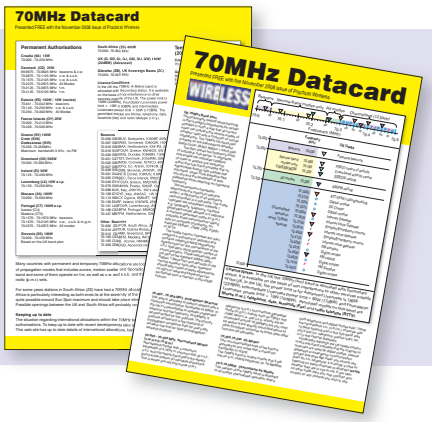
The pursuit of working world-wide DX is one of the reasons why so many people become addicted to the magic band. The interesting point is that high power and large antennas are not necessary to work long distances. During the summer Sp-E season you can easily work all around Europe with only 10W and a dipole. Many operators including novice licensees accomplish this every year and it is because of the intensity of some of these openings that surprising results can be achieved with very low power.

The same possibility of excellent results is equally true when F2-propagation returns. During the last peak in solar activity many low power stations made contacts into North America, South America, Africa, Asia, even as far as Australia on the 50MHz band. Believe me it's true and it will happen again in four or five years time.

Keeping up to date

If you want further information regarding the 50MHz band, then take a look at the UK Six Metre Group (UKSMG) web site: **http://www.uksmg.org.uk**

Here you will find details of daily activity, DXpeditions, international allocations, band plans, beacons, contests, equipment and much, much more. ●



The 50MHz Datacard with this issue is the second one of the series. Keep it in a safe place and then add to them over the coming months. Soon you'll have an in-depth operational knowledge of the v.h.f. and u.h.f. bands.

If you missed the 70MHz Datacard, which was inside the November 2008 issue, you can still get a copy for just £1.75 by calling 0845 803 1979 or send a cheque or postal order to the Editorial address, made payable to PW Publishing Ltd.

Tony Nailer's

doing it by design

The re-designed *PW* Itchen LCR Bridge completed – Tony Nailer G4CFY continues with his update of the project.

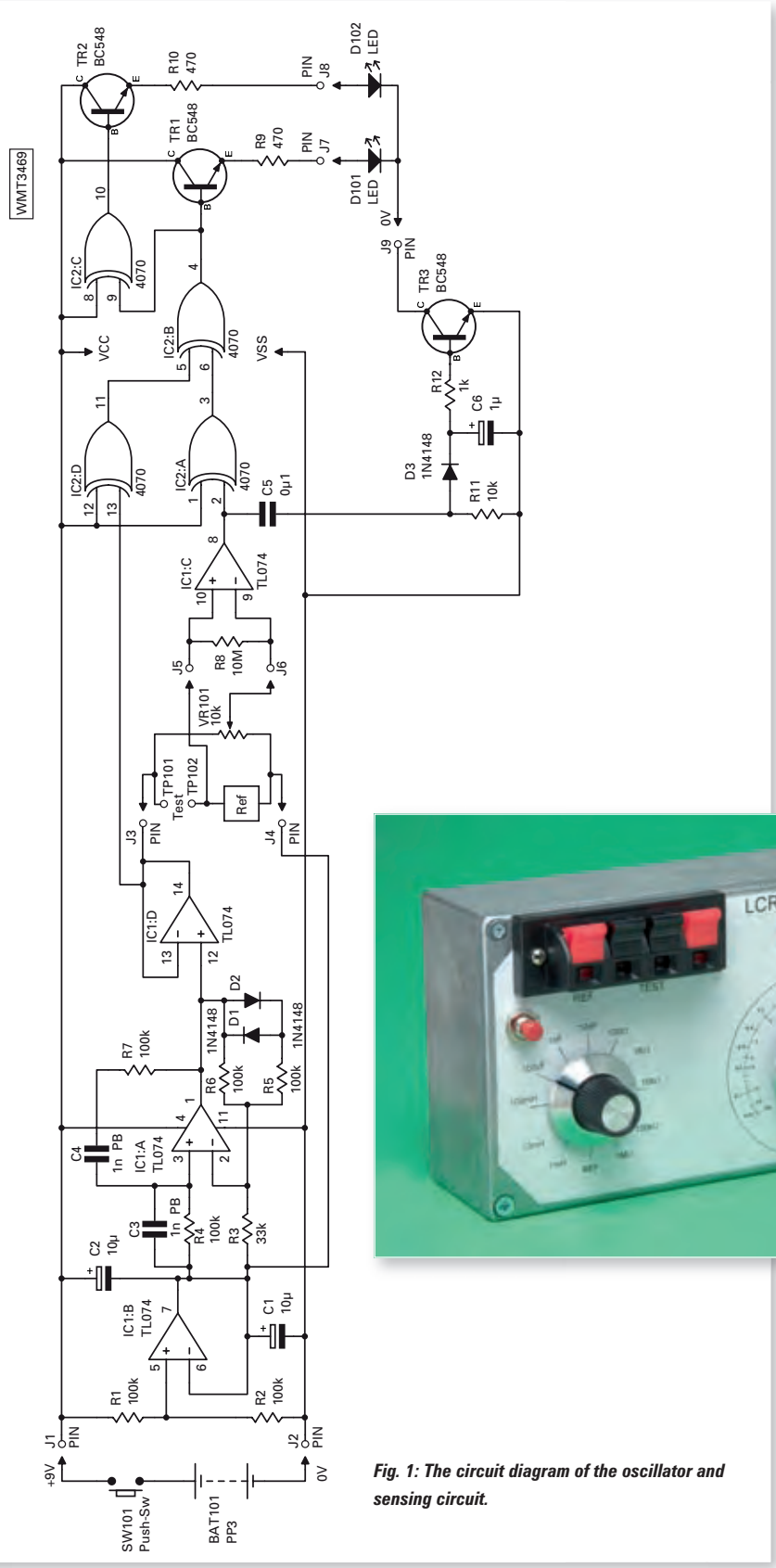


Fig. 1: The circuit diagram of the oscillator and sensing circuit.

My previous article in this series in the November 2008 issue of *PW*, detailed the redesign of the original Itchen LCR Bridge from April 1987 issue of *PW*, into a simpler to build unit. This follow-up article is because, time and article size prevented full constructional details for the enthusiast. Furthermore, being asked to send the production prototype for photography to *PW* prevented final test and evaluation of the capacitance and inductance ranges.

This follow-up article will be aimed at those who wish to build the unit, either by accumulating the parts themselves, or by buying a kit ready to assemble.

Circuit Description

I'll start with a quick resumé of the circuit of the finished version, shown in **Fig. 1**. The circuit comprises a quad Bi-FET operational amplifier (op-amp) type TL074, and a quad 2-input exclusive-OR gate (type 4070).

The op-amp IC1b is configured as a mid-supply rail generator. IC1a is a Wien Bridge oscillator running at about 1600Hz, and utilises back-to-back diodes, D1 and 2, in the feedback path to provide amplitude limiting, and to control the gain at the critical level. Amplifier IC1d is a buffer to drive the bridge circuit.

The bridge is made up of four parts: the component under test, the reference component, and the resistance on each side of the wiper of the dial potentiometer. Balance is achieved when the ratio of resistance each side of the potentiometer wiper is equal to the ratio of the component under test to the reference.

The fourth op-amp, IC1c, is configured as an open-loop differential amplifier. When the bridge is not

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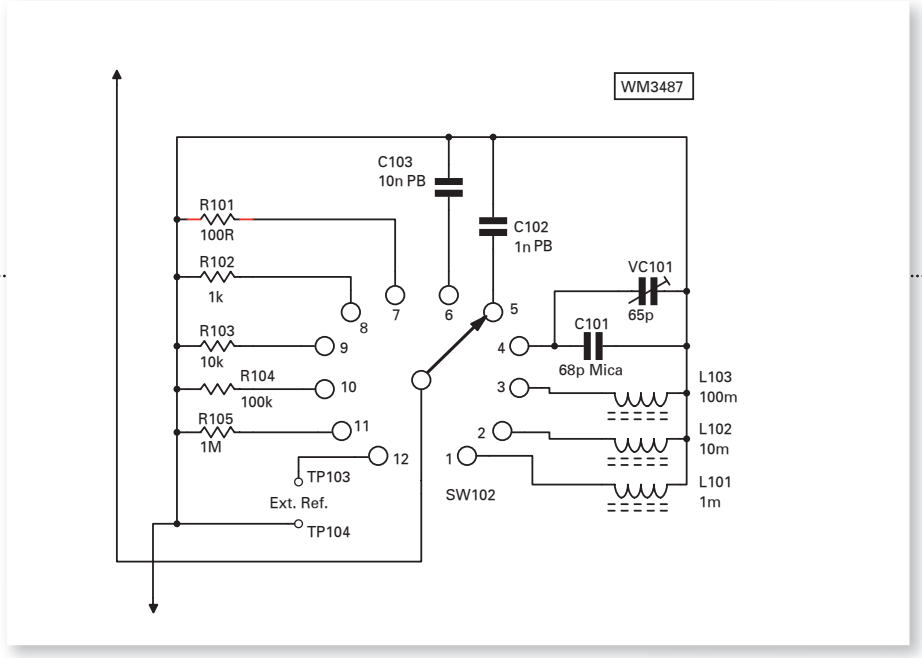

Fig. 2: The new layout for the circuit of the range switch.

balanced, there will be a sine-wave differential between its two inputs. When the bridge is only slightly unbalanced, there will only be a small amplitude difference. And, when the bridge is greatly unbalanced, the input difference will be as much as 3V peak-to-peak (p-p). The operation of this stage, also causes changes of phase of the output at opposite sides of the balance position.

The output of the differential detector, IC1c, is a square-wave to the limits of the output swing of the op-amp. The mark-space ratio varies across the dial range, being high at one end and low at the other, but approaching 1:1 at the balance point. Then at the balance point, there is no differential between the inputs, and the op-amp output either goes to a constant-high output, or to constant-low output.

The buffer stage IC1d also feeds an exclusive-or gate IC2d, which changes the sine-wave to a 1:1 ratio square wave. Similarly, IC2a is also fed from the detector and ensures that signal is squared up. These two signals are mixed in IC2b to produce a variable mark-space signal to drive the light emitting diode (l.e.d.) D101. Another exclusive-or gate IC2c inverts this signal to drive D102.

The l.e.d.s then have inverse operation and give a clear indication which side of balance the dial is. In this new version of bridge the output of the detector is also fed via a d.c. blocking capacitor C5 to an a.c. rectifier and transistor switch. When the square wave is present the transistor is saturated and provides a negative return for the l.e.d indicators. When balance is achieved, (with constant level output from IC1c), the transistor becomes effectively open-circuit and the l.e.d.s go off, thereby providing a well-defined balance position.

This LCR bridge has five ranges of resistance, three ranges of inductance and three ranges of capacitance, plus an external standard. This requires a total of 12 switch positions and is achieved using a single pole 12-way switch. The wiring of the switch is shown in **Fig. 2** and corresponds exactly with the terminal numbers and component positions.

The PCB Assembly

Before commencing the p.c.b. assembly, clean the board with solvent cleaner or methylated spirits to remove the resist coating. Fit the pins from the track-side of the board and press or hammer them home until the head is tight against the board. You can then solder them to the board. Fit the resistors to the board and bend the legs to hold them in position, then solder them and crop them as a group.

One at a time, fit the capacitors to the board and hold them in place with a finger, whilst soldering them, then crop them. Now fit the transistors, which will probably be self- supporting, and solder these too, before cropping the excess lengths off on the track side. Finally fit the i.c.s and hold them in place until two opposite corner pins are soldered on each.

Once the two corner pins of each i.c. been soldered, and the orientation is checked as correct, then solder all the i.c. pins to finish the work. Check the board visually with the aid of an eyeglass, to ensure good quality joints, with no splashes, or short circuits between pads.

Switch Assembly

To start the switch assembly, I created a copper wire common-point ring. First find a container or bottle top, or pole, rod, or pipe about 20mm diameter. Wind a length of 0.72mm (22 s.w.g.) tinned copper wire once around it. When released, it will spring out to about 22mm diameter, the same diameter as the circle of tags on the switch. Crop the ring so there is a small overlap of the ends, and solder them together.

Hold the switch in a bench mini-vice or helping hands holder. Find the 1mH inductor, which is marked as brown-black-red corresponding to 1000μH, and crop its leads very short, say 2mm. Position it vertically at terminal 1 of the switch and solder it to the terminal. Hold the wire ring up to the other end of the inductor, so it's concentric with the circle of switch tags, and dab solder onto it, to hold it in position.

Locate the 1nF poly-block capacitor and bends its legs out in line with each other. Hold it by the body with pliers, and offer it to the switch terminal 5, with the body towards the middle of the switch. Solder one lead to the terminal on the switch, the other to the wire ring. Then re-solder the connections of the 1mH inductor on terminal 1.

Solder the mica capacitor in position 4, and the 10nF poly-block in position 6. Now repeat this procedure for the resistors and inductors. The 10mH inductor is marked brown-black-orange as 10,000μH, and the 100mH inductor is marked brown-black-yellow for 100,000μH.

Finally, bend out the rotor and one of the stator legs of the trimcap, and solder it to the same position as the mica capacitor.

Box Drilling

Two types of box are recommended for this project. The first is a Hammond black painted diecast box 145 x 95 x 45mm, available from RS as part number 528 7230. The second is an ABS black plastic box type MB5 measuring 150 x 100 x 60mm and available from Maplin, with their part number YN40T.

The drilling drawing for the lid of the diecast box is shown in **Fig. 3**, and that for the plastic box shown in **Fig. 4**. (I make no apology for the fractional imperial dimensions, which match those of the terminal block.) In addition you will need holes in the base to suit a PP3 battery holder.

Front Panel & Label

Let me now turn to the front panel and the label for it. A suitable label is shown in **Fig. 5**, and which may be scanned and printed directly onto a large sticky-backed postage label. This is then covered with library film available from most office suppliers or stationers. It is then cut along the outer line including the mitred corners. These give enough clearance for the securing screws on the smaller diecast box.

The drilled lid first has two 6BA x 12mm countersunk screws fitted and secured with two full nuts and one half nut on each, to provide the fixing for the p.c.b. The label (still with backing paper on) is placed on the lid and held up to the light to adjust its position so the holes for the switch and potentiometer corresponds to the marked positions.

The location of the label with respect to panel edge is carefully noted. Then the label has its backing paper removed, and is held close to the panel and up to the light again to get the position as correct as possible. It is then lowered to the panel along one edge and smoothed across the panel to exclude air.

You'll only get one chance at sticking the label on the plastic box, because if it is misplaced the label will, almost certainly, be damaged in any attempt to remove and re-align it. After successfully fitting the scale, a scalpel should be used to cut the scale from covering the holes.

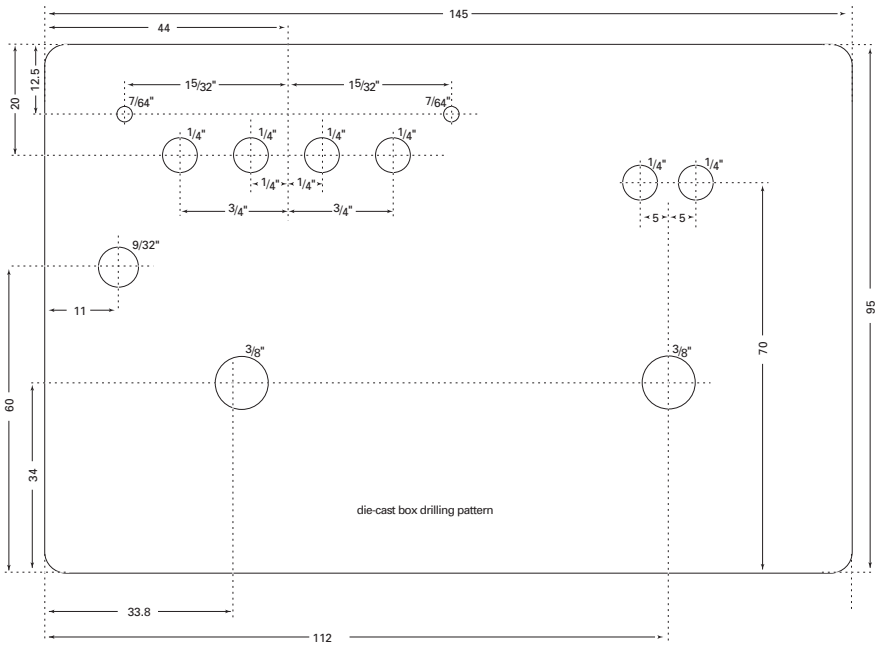

Fig. 3: The drilling layout if the diecast box suggested for the project is used.

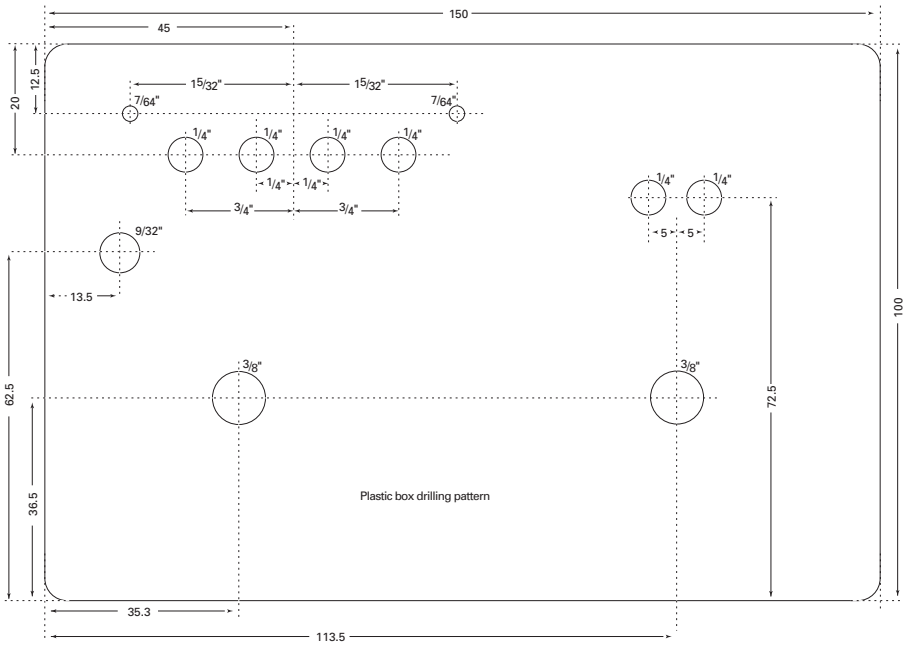

Fig. 4: This layout suits the suggested plastic box for the project.

Final Assembly

All the parts, with the exception of the battery and its holder, are mounted on the front of the box. This minimises the lead lengths between the p.c.b. and the dial potentiometer and the reference switch assembly.

Fit the l.e.d holder bodies into the panel. Crop the l.e.d legs to about 5mm each. The negative wire of the l.e.d is the one with the large internal metal part. Position the l.e.d so the negative wire is nearest the top edge of the lid, and push the l.e.d into the holder until it clicks home. The whole of the semicircular front of the l.e.d should be exposed. Press the securing ring onto the back of the l.e.d holder body.

Fit the push switch and secure it with its nut. Fit the 4-way push terminal block to the panel and secure it with 6BA x 12mm round head screws, and 6BA full nuts. Fit the p.c.b. onto its mounting screws, ensuring it is the right way round, so the pins which wire to the l.e.ds are close to them. Secure the p.c.b. with a full nut on each screw.

Fit and secure the potentiometer to

the front panel. The rotational position of the pot doesn't really matter as the knob can be fitted to correspond with the correct scale position. The switch should be fitted with the wiper closest to the p.c.b..

Wiring Up

To continue with the wiring up, connect the top wire ring of the switch assembly to pin J4 on the p.c.b. and also to one of the external reference tabs. Connect the other external reference tab to terminal 12 of the switch.

Connect pin J5 on the p.c.b. to the wiper of the switch. Also connect J5 to one of the test terminals. Connect pin J3 to the other test terminal. Then connect J3 to the fully-clockwise terminal of the pot. and connect the fully-anti-clockwise terminal of the pot to pin J4. Wire the middle terminal of the pot to pin J6.

Link the negative wires of the l.e.d.s with tinned copped wire. Connect this link to pin J9. Connect the outer l.e.d. positive wire to pin J7 and the inner l.e.d. positive wire to pin J8.

Connect one terminal of the push switch to pin J1, and its other terminal to the battery holder positive terminal. Then connect the negative of the battery holder to pin J2. The wiring is complete.

Kits & Bits

Note: Since the previous part of this article, I have increased the price of the plastic box version by £2 (the previous price was a mistake).
The p.c.b. costs £5 including P&P.
The p.c.b. and parts, wire-wound potentiometer and 12-way rotary switch £26, including P&P.

Testing & Operation

Pick a spare 1kΩ resistor and a 1nF capacitor and 10mH inductor. Fit the 1kΩ resistor to the test terminals and rotate the dial to achieve null. It usually is necessary to waggle the pot around the null position to achieve proper null indication, because it is so sharp. Adjust the position of the knob to correspond with 'x1' on the scale. Next try each of the test components in turn, first at the correct switch position, where the null should occur at the centre 'x1' position.

Then try them with the switch at the next position down, when they should null at the 'x10' position. With the switch in the next up, you should get a null reading at the 'x0.1' position on the scale. If they are the wrong way round, swap the outer connections of the potentiometer. Find a tight tolerance capacitor of 100pF and set the switch to 100pF with the pot at centre 'x1' position. Adjust the trimmer capacitor to produce the null. The alignment is complete.

Due to the design of the bridge and the limitation of the drive from the oscillator, the waveform becomes reduced and distorted when testing capacitor of 10nF and larger.

The same thing occurs for inductors below 1mH, or resistors below 100Ω. In these conditions the null becomes less well defined. For capacitors below 10nF, and inductors and resistors above these 1mH or 100Ω, the null is well defined.

Correspondence

If you wish to correspond regarding this article or previous ones, please subscribe to the list **pw-g4cfy-on@pwpublishing.ltd.uk** by sending a blank E-mail with the word SUBSCRIBE in the subject box. When you receive confirmation from the server you can send an E-mail to **pw-g4cfy@pwpublishing.ltd.uk** and your comments will be answered by myself or the *PW* team.

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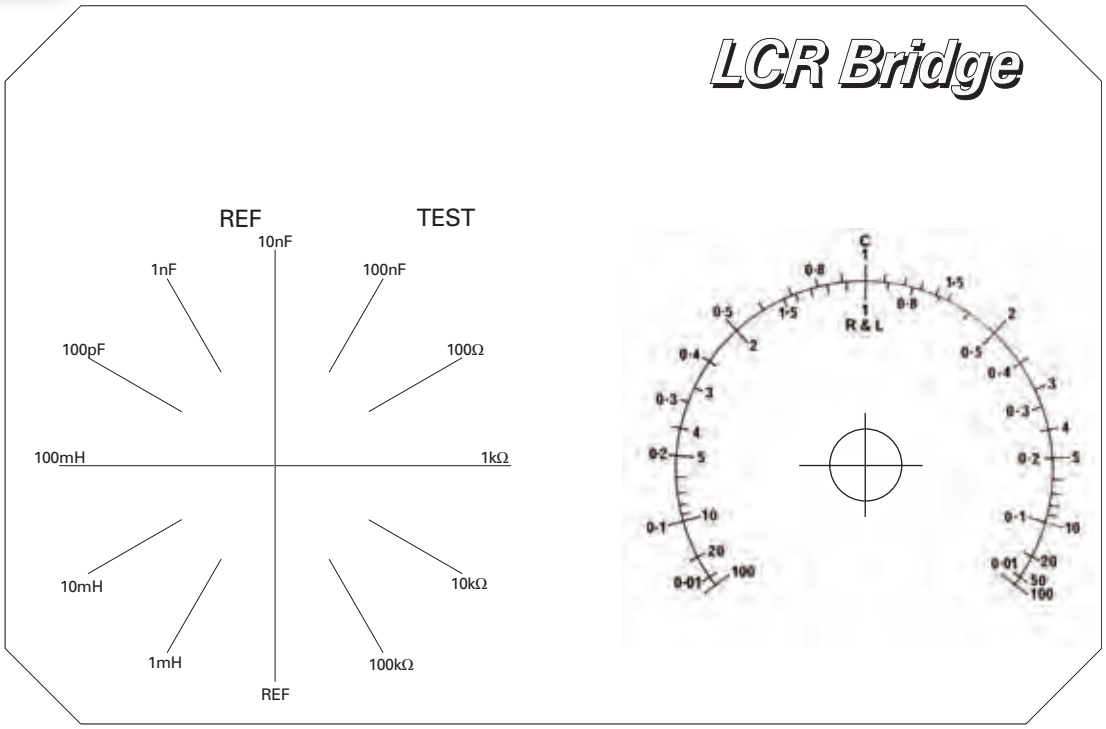

Fig. 5: This front panel 'decal' will suit either box for the project.

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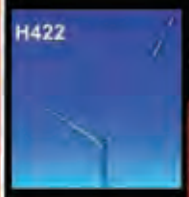

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Amateur Radio

in focus

The Radio Communications Foundation

Rob Mannion G3XFD writes: Many readers will know and be aware of **Barry Maxwell** and his important work for the much missed Radiocommunications Agency. Although Barry is not an Amateur himself, he has always had much empathy towards our hobby and now spends much of his spare time working for the RCF providing much needed support. Because of this work I was delighted to offer Barry and the RCF an opportunity to appear in the *In Focus* pages.

Barry Maxwell introduces the Radio Communications Foundation and explains how the Registered Charity for Amateur Radio supports our hobby and how individuals can get involved in its work.

Welcome to *In Focus*! I want to engage readers today in the story of the **Radio Communications Foundation** (RCF) and explain why it exists, the good it does for the hobby and how individuals can make a real difference by joining in its activities through donations and bequests that will benefit future generations.

The RCF was established in 2002 and became formally incorporated as a Charity in November 2003. In principle the RCF is an initiative to create a fund to support volunteer efforts to bring the wonders of radio into the classroom, universities and any other public place where there's a chance to gain wider public attention about the benefits of radio communications and its impact on our society and our economy.

Education is the key. That's why the RCF has focussed most of its energies and funding towards projects which show the importance of radio as a career, a challenging spare time interest and as a medium that has such a vital international importance.

So, what has the Foundation achieved so far? The RSGB's mobile radio classroom, **GB4FUN**, has benefited from RCF funding. This excellent project goes right to the heart of our aims and objectives.

We get straight into schools and influence youngsters about the benefits of radio technology. These are a few direct quotations from school teachers and students following visits: "Really opened the minds of many young people"; "Weather satellites, talking to a chap in Italy, seeing footage of an International Space Station contact and so much more!"; "Made a great impact on the children" and "We can see how it compliments our curriculum" – are just some of the comments received.

Provides Grants

The RCF also provides grants that assist individual clubs or educational institutions. For instance at its last meeting in 2007, the Foundation approved grants to help towards the refurbishment of a mobile training vehicle for a local club, assisted a project to help with Amateur Radio training classes in a local area and gave money towards a portable mast and related equipment for a school of science and technology.

Sometimes, Radio Amateurs who have become 'Silent Keys' have arranged their affairs to ensure that they can support the Foundation with a bequest. In fact, the RCF is currently handling a bequest where the legacy stipulates that the funding must be used for the development of a suitable Amateur satellite project. We are engaged with AMSAT-UK in identifying such a project.

The Foundation supports exhibitions showing the educational

Photograph courtesy of the RSGB.

Central in the display area is a large multi-media screen.

Photograph courtesy of the RSGB.

A smaller 'admin' area of the vehicle.

Photograph courtesy of the RSGB.

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potential of radio communications. These are aimed at teachers and the general public. We also support high visibility demonstrations of communications where national coverage could advance the cause of radio.

The RCF funding would also support young licensed Amateurs with a bursary to help them through university or college if the courses involve radio communications. The Foundation also provides, in conjunction with the Arkwright Trust, two annual scholarships for students who are actively considering higher education in engineering, product or industrial design and who make a commitment to design and technology at A level or maths at A/S level or who are alternatively able to demonstrate enthusiasm and aptitude in practical engineering or technology. Not only does the scholar receive a bursary but the school also benefits from a grant as well. As examples, two previous scholarships were awarded to Foundation licence holders who were keen to ultimately pursue careers in aeronautical engineering.

In addition to all this, the RCF has taken over responsibility for the Radio Communication Examination (RCE) from Ofcom. The RCF has instituted a quality control system to ensure the integrity of the process and is seeking to have the RCE recognised as a formal qualification.

The Money?

Readers may ask, "Where does the money come from?" In answering the question, I can report that the Foundation has raised £181,000 and the majority of the RCF's funding currently comes from the generosity of Radio Society of Great Britain (RSGB) members, who make donations with their membership renewals or directly. Individuals also make donations and – as a Registered Charity – the RCF takes advantage of the Government's Gift Aid scheme.

Money also comes in via bequests. The Foundation treats bequests

Photograph courtesy of the RSGB.

One operating position occupies one end of the cabin.

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as donations and respects any instructions in the legacy, as in the Amateur satellite example I've already mentioned.

In The Future

In the future, the Foundation wants to explore other sources of income. Amateur Radio companies already give generously within the hobby and the RCF wants to encourage their support directly into the Charity. Similarly, within the wider radio industry, the RCF is looking for companies in the industry to work with the Charity to raise public awareness about job opportunities and careers in the sector. Finally, there's the National Lottery and – if we can get substantial projects to fund – then the Charity will look to Lottery funding to support our work.

Getting Involved?

Readers may ask, "How can I get involved?" In replying, I can say that **any** donation is gratefully received, no matter how small or large, to this worthwhile cause. Incidentally, at the end of this article there's a link for on-line donations and an address for any who prefers to correspond. Donations can be made more valuable by allowing us to reclaim Gift Aid on your behalf so that for every pound donated we would get an extra 28p from the Inland Revenue.

Another way of donating, is through a Payroll Giving Scheme if such a facility exists with your employer for Registered Charities. The advantage of this method is that a charitable donation gives you tax relief at your top rate of tax. Incidentally, the Charity doesn't need to reclaim any tax from the Inland Revenue, as it receives the donation gross (as it was before tax).

Bequests through a Will, also provide a lasting method of keeping a memory alive by association with the Charity. Finally, Amateur Radio clubs might wish to give consideration in naming the Charity as beneficiary for any local fund raising events.

Organising The RCF

How is the RCF organised? In fact, there are very few overheads so administration costs are kept to an absolute minimum and there's a Board of Trustees chaired by **Professor Sir Martin Sweeting G3YJO**, the Chairman of Surrey Satellite Technology Ltd.

The other RCF Trustees are **Dr Bruce Smith**, Chairman of IP21PO Plc, **David Hendon**, Director Communications and Information Industries at the Department for Business, Enterprise and Regulatory Reform, **Dr Bob Whelan G3PJT**, Past President of the RSGB, **Dr Peter Blair**, Smallpeice Trust and ex Technical Director of Racal and myself, Barry Maxwell, former Director of the Radio Investigation Service in the Radiocommunications Agency and latterly in Ofcom. All trustees are unpaid, as are those in the secretariat, which comprises **Peter Kirby G0TWW** and **Marilyn Slade 2E1GKR** from the RSGB.

What Can I Do?

By now, you may be asking, "What can I do?" The answer is, of course, is to get involved and I suggest you make a donation. Then check to see if your employer has a payroll giving scheme for Charities if you want to make a regular donation.

You could get your local club to actively consider a fund raising event for the Foundation. You could make a bequest in your Will to ensure that your interest in Amateur Radio lives on. So, there are four great ways to be involved in the RCF! ●

Photograph courtesy of the RSGB.

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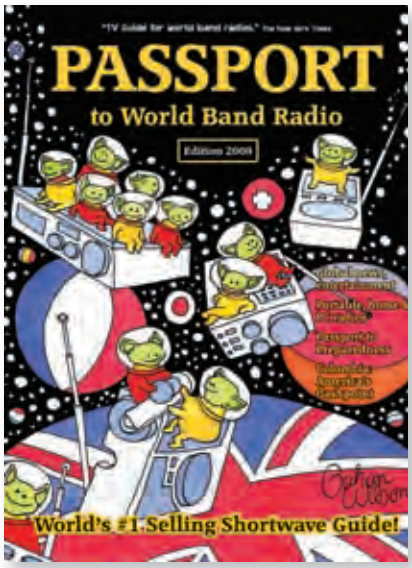

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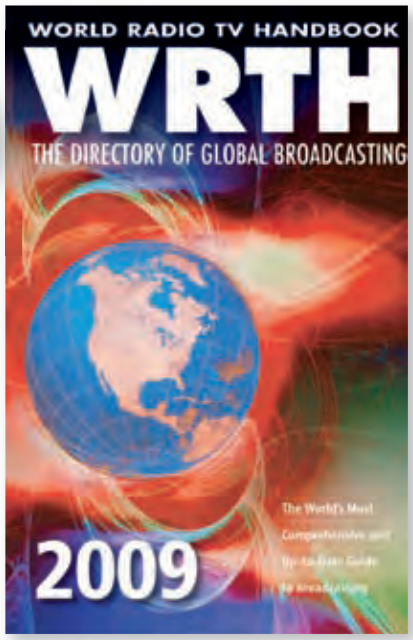

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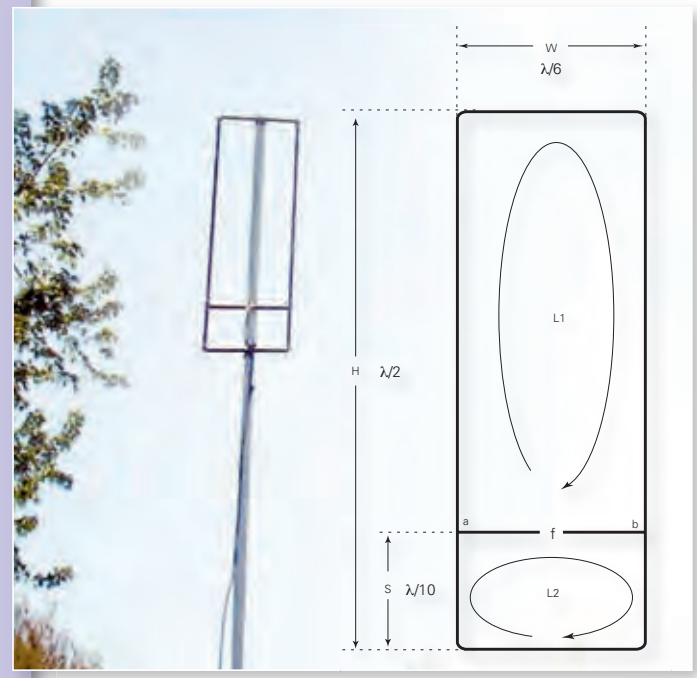
Feature

The Hentenna Antenna



The 144MHz Hentenna at the location of WA0ITP

Fig. 1: The layout of the Hentenna consists of two loops, one radiating and one matching.

The antenna I'm describing this time around came from a chance conversation that I had with the station of **Francesco Messineo IZ8DWF**. Frank is very active on the 70MHz band and during one of our QSOs he told me that, when he's active from his holiday home in Sardinia (IS0), he uses a Hentenna antenna. Frank said that the Hentenna was very simple to make and gave some great results. Subsequently, during the summer of 2008, I went on to make five c.w. and s.s.b. contacts with the station of IS0/IZ8DWF.

The 70MHz signals from Sardinia, after travelling around 1700km, were always at very good strength. I found this surprising, as Frank was only running 8W output during many of these contacts. Later in the summer he increased his power to 20W into the antenna and was successful in exchanging signal reports with the station of OY3JE (Faroe Islands) over a 2760km path. So obviously the antenna works! Although I'd heard about the Hentenna previously* I really didn't know much about it and these QSOs prompted me into investigating the antenna a little further.

(* Antenna Workshop *by Peter Dodd G3LDO in June 2004's edition of* PW. Ed.)

Hentenna Characteristics

The Hentenna is quite an old design having been originally developed in the 1970s by a group of Japanese Radio Amateurs that included **JE1DEU**, **JH1FCZ** and **JH1YST**. They eventually got the antenna to work with some good characteristics but the team couldn't explain why it performed so well or indeed how it actually worked! So they called it a Hentenna, because 'Hen' means strange in Japanese (e.g. *Hen na hito*, a strange person).

No antenna does everything well but this design has a number of useful features:

- It possesses a modest but useful gain of about 3dBd, equivalent to a 2-element Yagi and has a wide v.s.w.r. bandwidth. It also produces a low-angle of radiation, quite useful if you want to build an h.f. version.
- It has wide front and rear lobes of around 88° beamwidth (between -3dB points), which are particularly useful for general v.h.f. operation.
- It is easily adjusted to provide a low v.s.w.r. and can connect directly to a 50Ω feed line.
- It is very lightweight especially if it is made from thin aluminium tubing and wire. A 50MHz version for example can weigh less than 500g and be supported on a lightweight mast.
- The v.h.f. versions for 50, 70 and 144MHz can easily be turned with a very small rotator. Indeed as it only needs to be turned through a maximum of 90°, a rotator may not really be necessary.
- No special parts are required and you can use any electrical conductor for making the main rectangle.
- It is a simple design that is inexpensive and easy to build with minimal tools and skills.

Design

Take a look at the layout of the Hentenna as shown in the diagram, **Fig. 1**. It consists of a radiating loop L1 and a matching section L2. The feeder cable is attached at point 'f'' and adjustment made at points 'a' and 'b' to minimise the v.s.w.r. measurement. Theoretically as point 'f' is balanced a 1:1 balun (balanced - unbalanced transformer) should be inserted at this point but in practice this is often unnecessary.

Coaxial cable of 50 or 75Ω impedance may be directly connected to point 'f'. When you look at that diagram you would think that the antenna is vertically polarised but it is in fact horizontally polarised. That is one of the reasons why this antenna is 'hen'!

David Butler G4ASR looks into the strange workings of the Hentenna from Japan, and provides dimensions for h.f. to v.h.f. versions.

The Dimensions

The Hentenna has three important dimensions and these are H: its height, W: its width and S: the matching point distance. The formulas for W, H and S are generally applicable on bands all the way from 3.5MHz right through to 430MHz and beyond.

W = 1/6th wavelength (λ/6)
H = 1/2 wavelength (λ/2)
S = 1/10th wavelength (λ/10)

As an example I'll describe how to work out the dimensions for a Hentenna centered on a frequency of 50.200MHz.

- First calculate the wavelength by dividing 300 by the Frequency (in MHz). 300/50.2 = 5.976m (One full freespace wavelength).
- The width (W) is calculated by dividing the wavelength by six: 5.976/6 = 0.946m (946mm).
- The height (H) is calculated by dividing the wavelength by two: 5.976/2 = 2.988m (2988mm).
- Point (S) is calculated by dividing the wavelength by ten: 5.976/10 = 0.597m (597mm).

These calculations will put you very much in the ball park but if you want more accuracy an on-line calculator for the Hentenna (and the Moxon loop antenna) can be found at **http://www.i1wqrlinkradio.com/antype/ch13/chiave1846.htm**

The calculations, correlated well with the computer model created with *NEC* antenna modelling software, a program that allows you to enter the size of material you are using for the antenna and to see its effect. Simply enter the design frequency (MHz) and the wire diameter, in millimetres, and the program will then display the required dimensions.

I've provided dimensions for wire loop Hentennas on a variety of h.f. and v.h.f. bands in **Table 1**, but it may be better to use the on-line calculator especially if you are considering constructing versions for the 50, 70 and 144MHz bands.

The Construction

As the Hentenna may be constructed for any frequency from h.f. through to u.h.f. the choice of materials is largely dependent on the band that you are building it for. If you're going to construct a large h.f. version you should use heavy-gauge wire to form the loops. The four corners will need to be supported by two suitably placed masts or even trees. If you use the latter it may be prudent to use elasticated bungee cords for the corner supports to minimise flexing in the wind.

Versions of the antenna for bands between 14 to 28MHz are not very wide and you could use bean poles or other insulating material to support the horizontal parts of the wire loop. Alligator clips or electrical 'choc-blocks' may be arranged, as shown in the photograph **Fig. 2**, to provide a moveable connection whilst carrying out v.s.w.r. adjustment.

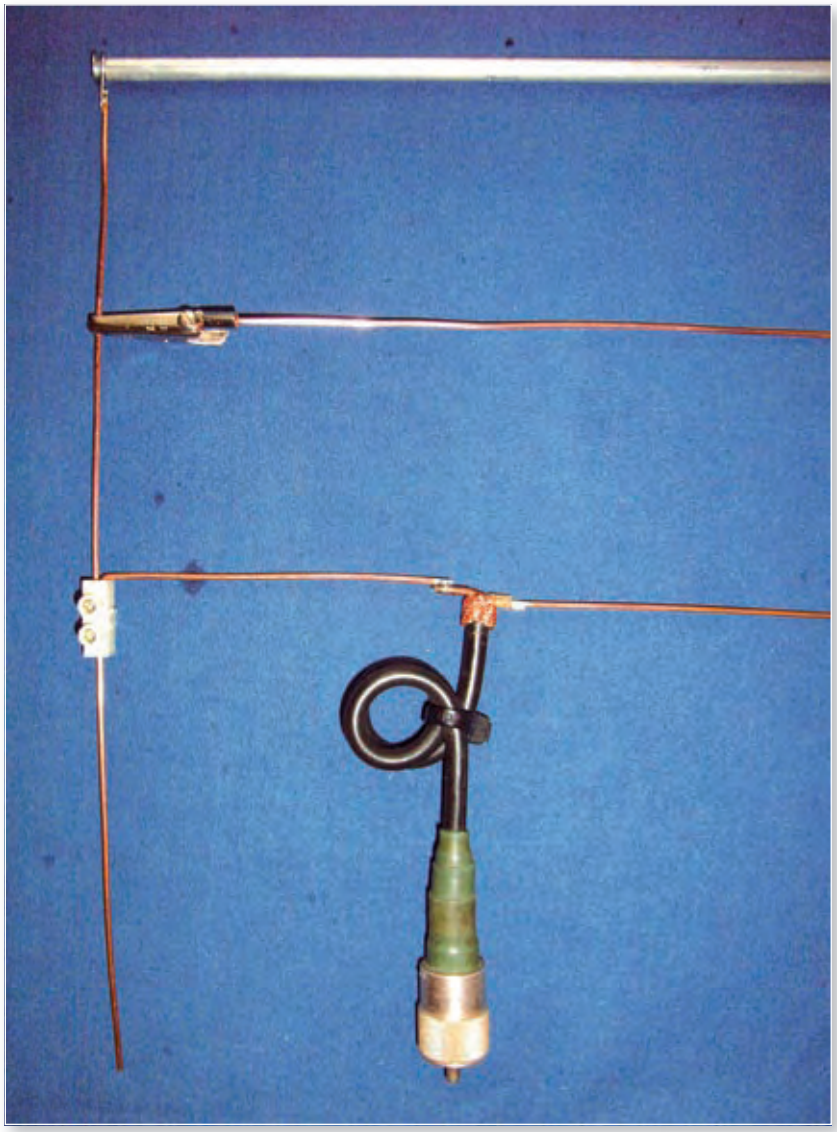


Fig. 2: Electrical connectors, known as 'choc-block' or crocodile clips are a good way of making temporarily adjustable connections.

A version of the Hentenna for the 50MHz band, at 3m high, is quite tall and here you could use a combination of horizontal aluminium tubing and vertical wire conductors. One method of connecting the wire to the tubing would be to use a self-tapping screws to clamp the cable into the ends of the aluminium tubing. **But be sure to waterproof the various joints afterwards.**

For 70MHz, the Hentenna can be made from 10mm (or thereabouts) aluminium tubing, as shown in the photograph **Fig. 3**. This is the antenna constructed by Frank IZ8DWF for use with great effect from his Sardinian holiday home. It is made from lengths of tubing simply bolted together and supported on an insulated mast section made from plastic water pipe. Simple but very effective!

Versions for the 144 and 430MHz bands may conveniently be made from 12mm (1/2") diameter copper water central heating pipe as this will make the Hentenna far more rugged. But be careful to mount the Hentenna on an insulated mast.

You could construct two Hentannas on the same

Fig. 3: The Hentenna, constructed by Frank IZ8DWF

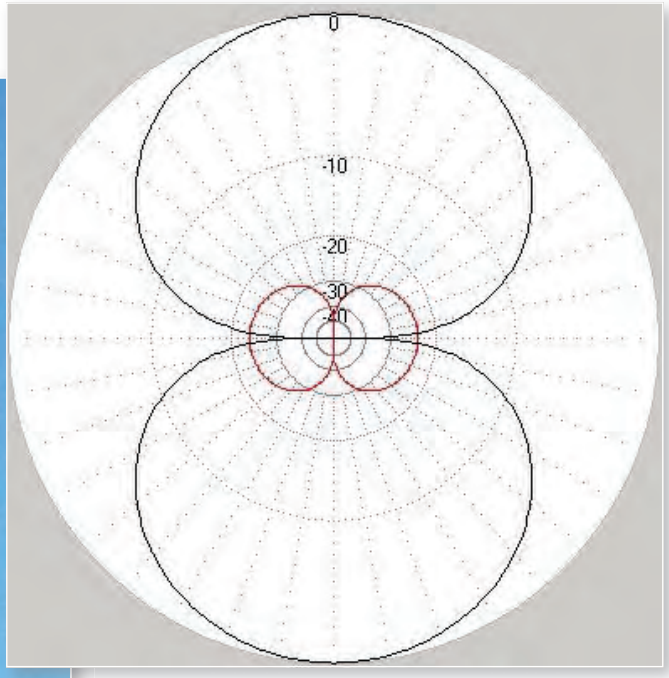


Fig. 4: The polar plot in the horizontal plane shows good wide lobes, needing little in the way of a rotator

supporting structure but mounted at 90° to each other. After individually setting the v.s.w.r. you then phase them together with a quarter-wavelength of 75Ω cable to produce an omni-direction, horizontally polarised antenna with 3dBd gain in all directions.

Finally, don't forget the strange property of the Hentenna – that a vertically shaped Hentenna produces horizontal polarisation! If you require vertical polarisation then simply mount the Hentenna so that the longest dimension is horizontal.

Adjustment

Let's now look at adjustment of the Hentenna. Temporarily connect a v.s.w.r. meter to the feed-point connector and then attach your 50Ω feed-line to the other side of the v.s.w.r. meter back to the transceiver. The dimensions given should produce a v.s.w.r. of 1.5:1 or less but you will have to adjust the tapping point S, if the v.s.w.r. is unacceptable.

Moving the tapping points to a value longer than S moves the matching frequency up and conversely, a shorter tapping point than S, moves the matching frequency down. If you are using alligator clips for adjustment you should make a permanent connection afterwards by soldering them to the loop.

That's all there is to it. Now get building! ●

Table 1: Some Hentenna dimensions for h.f. to v.h.f.

Band (m)	80m	40m	30m	20m	17m	15m	12m	10m	6m	4m	2m
Freq. (MHz)	3.550	7.050	10.10	14.20	18.15	21.25	24.95	28.50	50.20	70.20	144.2
Wavelength (m)	84.51	42.55	29.70	21.13	16.53	14.12	12.02	10.53	5.976	4.269	2.083
Height: H (mm)	44250	21280	14850	10560	8260	7060	6010	5260	2988	2070	1040
Width : W (mm)	14080	7090	4950	3520	2750	2350	2000	1750	950	700	350
Position of Loop separator : S (mm)	8450	4260	2970	2110	1650	1410	1200	1050	597	395	210

KITS, MODULES & AERIALS

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TWO TONE OSCILLATOR as featured in *PW* March 2005. A vital piece of test equipment used together with an oscilloscope for setting up AM, DSB, & SSB transmitters. **PCB & hardware kit £28.00. Ready Built £52.50**.

TRANSVERTERS for 2 or 4 or 6 metres from a 10 metre rig, or 4 or 6 metre from a 2 metre rig. Includes new overtone local oscillator, and integral interface unit. 20dB receive gain, 25W transmit power. Low level drive dual IF versions **TRC2-10dL, TRC4-10dL & TRC6-10dL**, high level drive single IF versions **TRC2-10sL**, **TRC4-10sL**, **TRC6-10sL, TRC4-2sL, TRC6-2sL**, Complete kit **£179.00**. **Built £266.00**

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MASTHEAD PREAMPS 400W rated, for 2 or 4 or 6metres. RF switched. DC fed via a separate wire. 20dB gain 1dB NF. Heavy duty waterproof masthead box with SO239 connector. **RP2SH, RP4SH, RP6SH. PCB & hardware kit £42.50, Ready Built £65.00**. **Masthead fitting kit £6.00**.

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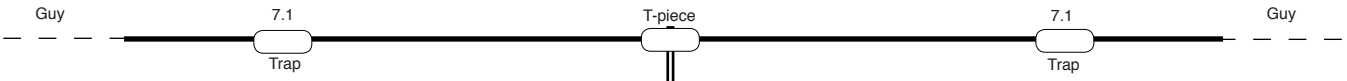

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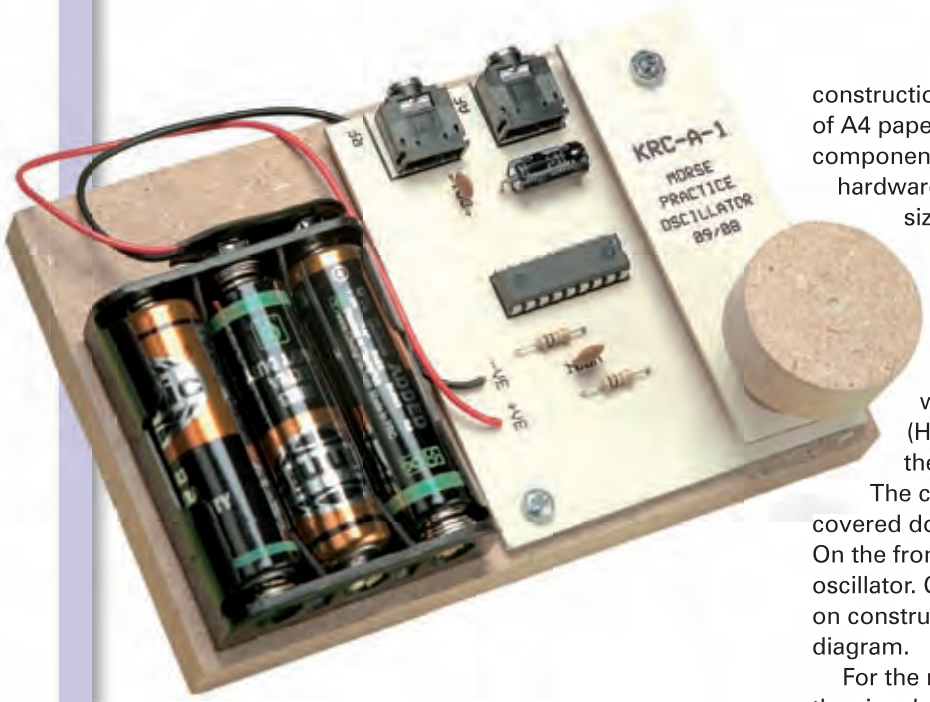
The KRC-A-1 Morse Practice Oscillator



The KRC-A-1 Morse Practice Oscillator is a recent introduction to the range of kits for the home constructor, from the **Kit Radio Company** based in Kent. The advertising leaflet describes it as being ideal as a first time construction project. It has two outputs, one audio for headphone use, and the second is radio frequency (r.f.) output used in conjunction with a medium wave radio.
All components to complete the kit are supplied including the batteries to power the unit (UK only).

At the heart of the oscillator is a programmable integrated circuit (PIC) processor, which is also pre-programmed ready for use. An unpainted wood base is supplied with all the necessary holes already pre-drilled, making the assembly very easy.

Checking The Kit!

When I receive any kit, the first thing I do is to check for transit damage and in this case all was well! My advise is that however tempting it may be to start the construction straight away, take time to confirm all the components are in the kit.

With the KRC-A-1 task of checking is easy to do in conjunction with the supplied packing list and the construction manual. The packing list is a single sheet of A4 paper, which contains pictorial diagrams of the components used, including their marking identities, a hardware list (nuts, screws, connectors etc.), and a full size plan view of the completed project.

The plan view has the resistors and battery leads shown in their correct colours, a useful aid for the novice constructor, although a minor error has occurred on the plan concerning the battery installation, the wrong polarity is shown on the middle one. (However, the correct polarities are shown in the battery holder).

The construction manual is an A5-sized, stiff-covered document containing 8-pages of information. On the front cover is a colour picture of the completed oscillator. Contained within the manual are sections on construction, testing, the Morse Code and a circuit diagram.

For the more technical constructors, details of the signals at the two outputs are given, along with examples of the PIC programming code. However, these last two items I consider to be bonus information that doesn't affect either construction or use of the completed kit, so the novice should not be deterred by them.

The style of instruction is the well known 'read, do and tick the box' type. In my opinion the style, quality of print and presentation, of both the packing list and the manual, are excellent and a credit to the KRC.

The Assembly

Having checked all the components it was time for me to start the assembly process. As with any construction project I find that good preparation is the key to success. After reading the construction manual through several times to familiarise myself with the instructions, the soldering iron was switched on in readiness for the task ahead!

Removing the printed circuit board (p.c.b.) from its wrapping paper revealed a good quality board, with component values and positions clearly marked on the component side. This again reinforces the claim that this kit can be built by first time constructors. The p.c.b. itself is made using `minimum etch' techniques where the gaps between tracks are small thus leaving large

Phil Ciotti G3XBZ is a keen home-brewer, so *PW* gave him a Kit Radio Company project to build!

areas of copper to solder the components on.

Assembly of the p.c.b. went well until I tried to fit the two jack sockets. The holes were too small to pass the lugs of the sockets through. This was quickly rectified by drilling these out to 1mm diameter. When the soldering was completed I checked the board for any solder splashes and also for good joints.

Next, I had to decide whether to leave the base unpainted or be creative with the paint brush. I chose the former leaving the wood in its original state. As the p.c.b. is mounted on the wood base, care needs to be taken when tightening the screws, so that the p.c.b. itself is not damaged. The mechanical construction was straightforward and the rest of the construction completed easily. Having checked everything again it was time to switch on!

Time For Testing

With the batteries inserted and a pair of headphones connected to the a.f. jack socket it was time for testing and the key was given a gentle tap. A loud and clear audio tone was immediately heard, confirming the oscillator was working well.

After a short time of sending Morse I tried the r.f. output. This consists of wrapping two turns of wire, supplied with the kit, around a medium wave radio to transfer some r.f. into the receiver's ferrite rod antenna. With the key pressed the m.w. radio is tuned until an audio tone is heard from the loudspeaker. Again the test worked well.

If the unit fails to operate KRC advise going back to the manual, and checking, step-by-step, that each stage has been completed correctly. If no mistakes are found KRC do offer a Get-U-Going service, for which there is a nominal charge and details can be found in the manual. They do want to encourage the novice and are there to help!

As Advertised!

With the construction and testing complete I can say that overall the kit performs as advertised. The standard of documentation is very good for a kit of this simplicity. Provided the comments regarding the jack sockets and battery orientation ***(see note)** are taken into consideration, the oscillator worked first time.

The volume from the headphones was loud enough to be heard by several people stood nearby. The Morse practice oscillator is suitable for either individual use or in a group practice session.

Only a small working area, such as the kitchen table, is needed for the construction. Being close to the tea and coffee making facilities is an important part of home kit building for me! My thanks go to KRC for supplying this kit for review. ●

Product:
The Kit Radio Company's KRC-A-1 Morse Practice Oscillator

Company:
KRC, Westerham, Kent.

Pros: Ideal kit for the novice builder, well-documented with excellent presentation from the manufacturer with good quality components.

Cons: Holes in p.c.b. for jack sockets on review kit missing.

Price:
£12.99 plus p&p £4.

Supplier:
Tony Westbrook, Kit Radio Company, Unit 11, Marlborough Court, Westerham, Kent TN16 1EU.
Tel: (**01959**) **563023**,
E-mail:
kitradioco@aol.com
Website:
http://uk.geocities.com/kitradioco@btinternet.com/web.htm

Note: Tony Westbrook** of KRC (on seeing Phil's review) confirmed that the holes should have been prepared and he's puzzled why they weren't! Tony has also corrected the battery polarity confusion on the packing list. **Editor.

KENWOOD

Listen to the Future

Unique concept, brilliant execution. Kenwood's compact TS-480HX/SAT and Simon Brown's 'Ham Radio Deluxe' operating software make a world-beating combination. HRD interfaces brilliantly with either version of the TS-480 to deliver a small-footprint base station of unrivalled flexibility in control, whether you're operating voice, data, or full-on contesting. And wherever it is, this HF transceiver delivers an astonishing punch: 200W. Performance is equally impressive. For example, a quad-mixer provides RX dynamic range in the TS-950 class, while AF DSP processing offers many powerful features, including noise reduction, a speech processor and AF filters. And of course you can enjoy all the convenience of Ham Radio Deluxe's PC-based control. The TS-480HX/480SAT lets you enjoy the best of both worlds.

● Built-in automatic antenna tuner (100W model) ● Terminals for external antenna tuner, linear amp, PC ● Electronic memory keyer ● AF DSP features: ● AF DSP filters ● Beat-cancel, noise reduction ● TX/RX equalizer ● CW auto-tune ● Speech processor ● Optional 500Hz/270Hz band CW narrow IF filters, 1.8kHz band SSB narrow IF filter ● PSK31 compatible ● 5W minimum RF output, QRP compatible ● Electronic keyer ● Plug-in voice recording/synthesis unit available ● Packet cluster tune with TM-D700E / D710E ● Supplied with mobile panel bracket, tabletop panel bracket and carrying brackets

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TS-480SAT

100W Model with Built-in Antenna Tuner

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Kenwood Electronics UK Limited

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The Rev. George Dobbs'

carrying on the practical way

The Rev. George Dobbs G3RJV describes a 'mixer' variable frequency oscillator – not a cocktail, so it can't make you unstable!

" We hope you found the above information on how to make a VFO - Vodka Frosted Orange cocktail recipe helpful."

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Welcome to *Carrying On The Practical Way* (*COTPW*), where over the years I've realised that some radio constructors find making a stable variable frequency oscillator (v.f.o.) a daunting task – unlike the Vodka Frosted Orange cocktail in this month's quotation!

The simpler designs for QRP transmitters or transceivers frequently have a free running oscillator as their primary signal source. Although this offers simplicity, it also offers some inherent problems. Not least of these is making the v.f.o. frequency stable. My experience suggests that making a stable v.f.o. for frequencies under 10MHz is quite viable but over 10MHz it becomes more difficult.

The higher the working frequency becomes, that chances of obtaining worthwhile frequency stability become much less. Experience has also taught me that it's often the way the v.f.o. is constructed that will determine its success or failure as a stable signal generator.

Even the most reliable and well-proven v.f.o. circuits can lack stability if they are poorly constructed. Mechanical stability aids frequency stability and the parts should be rigidly mounted. In fact, I was told in my early days building radio equipment that, "A v.f.o. should be designed to be dropped from a great height!"

Good Quality Essential

Good quality components are also essential for use in a v.f.o, especially those associated with frequency determination. So, I advise *COTPW* readers that whenever possible that they should choose components with a good temperature coefficient. In fact, I could go on (and on!) about v.f.o. frequency stability and will probably do so in future editions of this column!

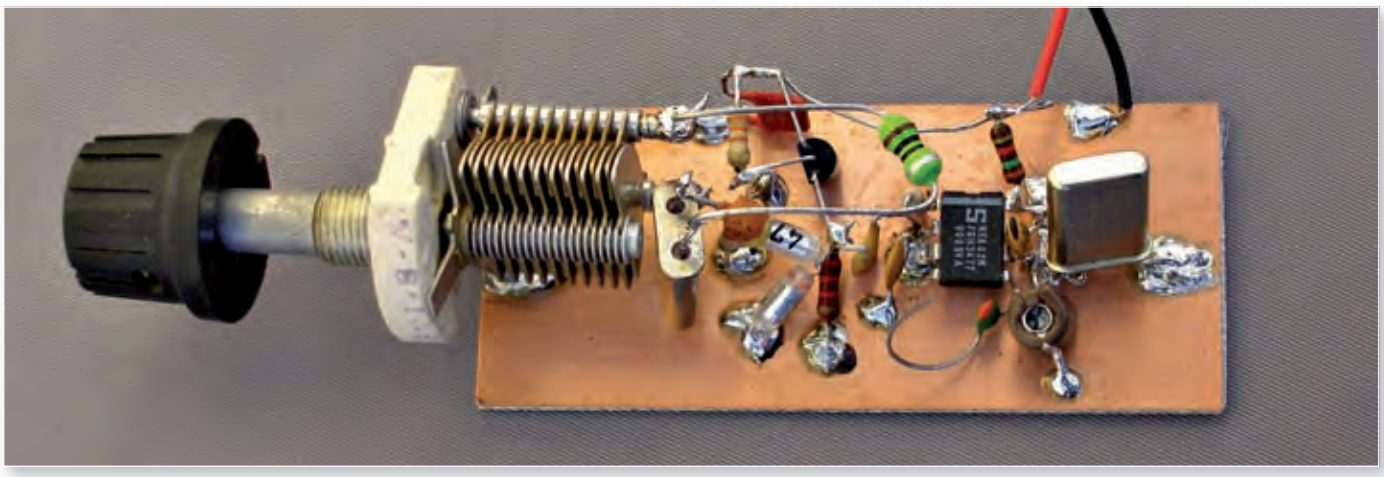
Another common problem is oscillator 'pulling'. This occurs because we can successfully build a v.f.o., which will run alone on the test bench – holding its frequency stable for many an hour. However, when it's added to a completed transmitter, or transceiver, the picture can (very annoying and frustrating!) change! The result is that during the transmit cycle of operation, the frequency of the v.f.o. changes, giving rise to a common symptom of this effect in a c.w. (Morse) transmitter in the form of a 'chirpy' keyed signal.

In fact, I can recall an embarrassing 'put-down' comments early in my Amateur Radio days when a local Amateur described my c.w. signal on 1.8MHz as "sounding like a frog". Fortunately, this effect can often be cured by adding extra buffer amplifiers between the v.f.o. and the power amplifier of the transmitter.

Unfortunately, even well-built and well buffered v.f.o. circuits can be susceptible to frequency pulling. I've actually had examples of transmitter circuits that worked well on the bench but then misbehaved when taken on the air.

On the bench, transmitting into a dummy load of correct output impedance, such transmitters perform beautifully. They are frequency stable between transmit and receive conditions and keying can sound pleasant on a monitoring receiver. But problems can then arise when the transmitter is connected to an antenna. The first indication of trouble may be a 'pulling' of the v.f.o. when the antenna tuner is adjusted – often followed by that annoying chirp when the transmitter is keyed into the antenna!

The 'pulling' is usually caused by r.f. (radio frequency) current flow through the ground of the circuit board or even the transmitter case. This is due to stray r.f. current from the transmitter output being conducted through the case or some other grounded part of the transmitter. The common cures are usually physical. Having the v.f.o. in its own screened box is helpful, as is locating the output as far away from



This month's project – a practical variable crystal oscillator (VXO).

the v.f.o. as possible and using very short connections between the power amplifier output and the antenna socket.

An Easier Alternative

An easier alternative to a v.f.o. can be a variable crystal oscillator (VXO) and here, I think it's worth taking another look at the basics behind crystal oscillators. A crystal oscillator depends on the piezoelectric effect to work and this effect converts a mechanical stress or movement in a crystal to a voltage and vice versa.

In the crystal oscillator the piezoelectric effect converts the electrical impulses to mechanical movement. The frequency of the oscillation depends upon resonant frequency of a slice of quartz crystal.

The frequency depends almost entirely on the dimensions of the crystal – essentially its thickness – and therefore a crystal oscillator is a stable fixed frequency oscillator. However, this frequency can be pulled a little by adding capacitance or inductance (or both) in series-parallel with the crystal in the oscillator circuit.

There are a lot of variable factors to take into account when a VXO is under consideration for a project. Perhaps the most important consideration – the amount the crystal frequency can be shifted – obviously depends on the value of capacitance or inductance added to the circuit. **Note:** This does require cautious approach because if too high a value of capacitance or inductance is used, the oscillator will lose the frequency control of the crystal and become unstable. In practice, the amount of frequency shift is limited to a few kHz.

The frequency shift also depends on the resonant frequency of the crystal. Crystals that operate at a higher frequency can be moved in frequency rather more than those of a lower operating frequency.

The amount of shift can also vary for individual samples of crystals of the same frequency. So, building a worthwhile VXO takes some experimentation and – as it says in Psalm 34, *"O taste and see"*!

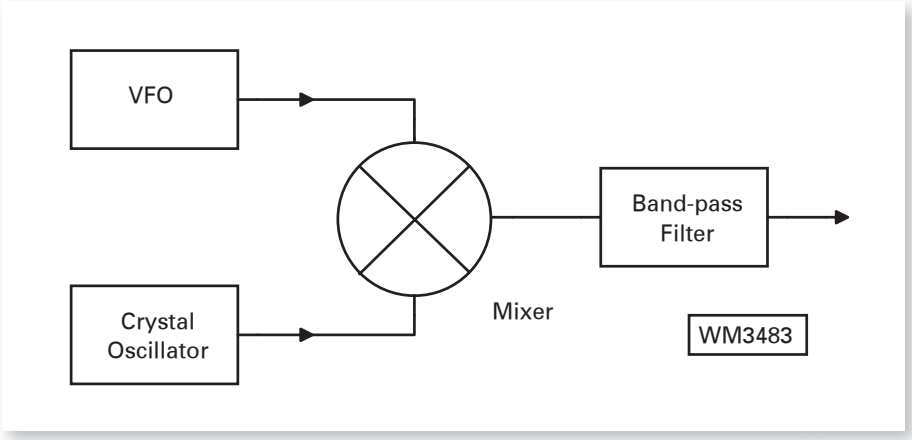


Fig. 1: The block diagram of a mixer type of variable frequency oscillator. The output is a combination of the first v.f.o. and the crystal oscillator

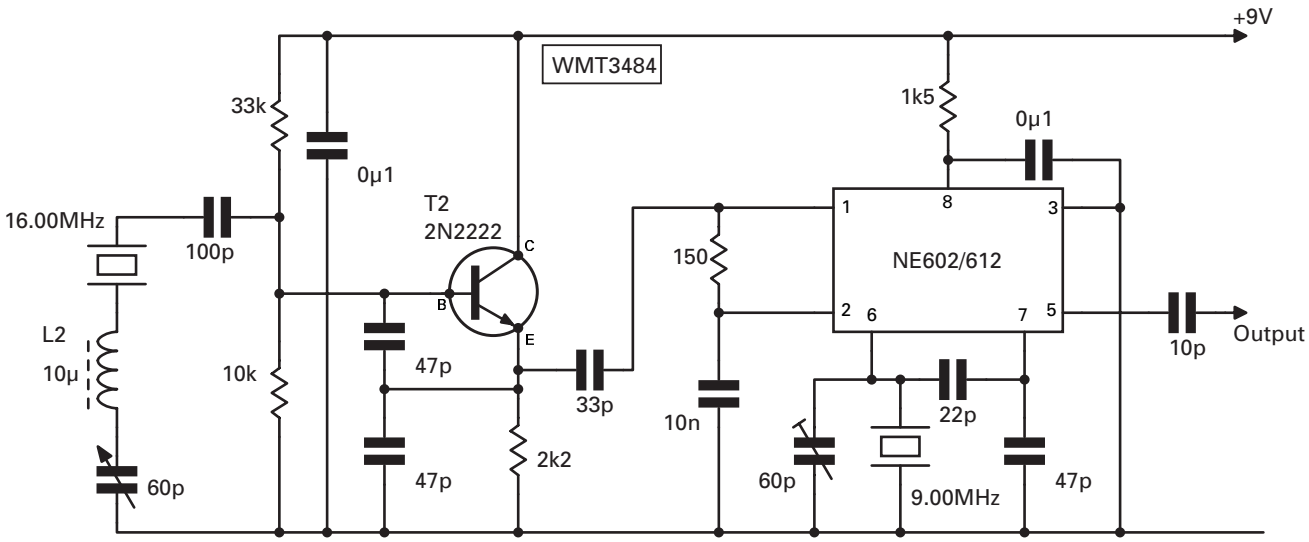
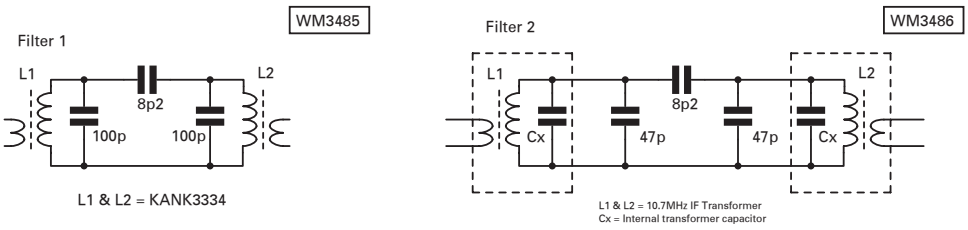


Fig. 2: The circuit diagram of a mixer v.f.o. along the lines of Fig 1. the output contains a large number of possible frequencies that may be selected by suitable combinations of band-pass filter. Those shown would be suitable for a 7MHz output.



– perhaps a VXO could be a viable alternative to the v.f.o. as a stable oscillator with a bit of frequency shift.

Crystal Mixer VFO

One solution to the problem of an oscillator being pulled in frequency by the load offered by later circuit elements or radio frequency (r.f.) from a radiating antenna is to use a crystal mixer v.f.o. The block diagram of a simple crystal mixer v.f.o. is shown in **Fig. 1**.

The signals from a v.f.o. and a crystal oscillator are both fed into a mixer circuit. The output from the mixer will have output products at several frequencies. These include the sum of the crystal oscillator and the v.f.o., the difference between the crystal oscillator and the v.f.o., and the actual frequencies of crystal oscillator and the v.f.o.

To select the required frequency from the products of mixer, a suitable band-pass filter can be added to the output of the mixer, and this arrangement has several advantages. Both oscillators are isolated from the rest of the circuit by the mixer, so the v.f.o. should not be pulled in frequency by following circuit elements. Neither of the oscillators is on the final frequency thus protecting the oscillators from stray r.f. current and if the crystal oscillator is set at a high frequency, the v.f.o. can be built at a low frequency, resulting in fewer stability problems.

The same approach can also be applied to a VXO circuit and a working example is shown in **Fig. 2**. In this example a 16MHz VXO is mixed with a 9MHz crystal oscillator and by using the 16 minus 9 product, an output can be had at 7MHz. An advantage here is that the higher frequency crystal oscillator (16MHz) has been chosen for variable crystal oscillator.

One obvious gain from this circuit is that the VXO operates at the higher frequency. Usually, the higher the frequency of the crystal, the greater is the expected VXO tuning range. The frequency shift on 16MHz will be greater than the 9MHz crystal oscillator and certainly greater than a VXO directly on 7MHz.

In a circuit like this, either or both, of the crystal oscillators could be variable. It does, though, require two crystals that can be mixed to produce the desired frequency. The frequencies of the crystals should add, or subtract, to produce the required output frequency. Bespoke crystals are very expensive so investigation of cheaper off the shelf crystals and a few pushes on calculator buttons can produce less expensive options.

Many megahertz frequency crystals are available off the shelf. Some examples additive mixing might be: 3 + 4MHz for 7MHz, 11 + 3MHz for 14MHz and so on. Those readers with stocks of surplus crystals might like to check additions and subtractions on a calculator to see if any combinations produce useful output frequencies.

Colpitts Oscillator

The circuit of Fig. 1 shows the 16MHz crystal in a Colpitts oscillator circuit using both an inductor and capacitor to obtain the frequency variation. This oscillator feeds into the NE602 mixer. The NE602 is not always easy to obtain but the more common NE612 is identical in operation and pin-out.

The NE602/NE612 is a useful chip for this application as it contains a built in oscillator which can be accessed on pins 6 and 7. This is used in Fig.1 to provide the 9MHz signal. The mixer products appear at pin 4. I guess if I had been a purist I would have used pins 4 and 5 to obtain a balanced output!

To test the circuit in Fig. 1, I built a quick (very 'ugly'!) version. The parts were all mounted over a small piece of printed circuit board (p.c.b.) that acts as a ground-plane. Commonly, 'ugly' style construction uses chips stuck to the ground-plane with their pins sticking upwards: the so called 'dead-bug' method. **Note**: It's easy to come unstuck using this method by not remembering that the pin layout is a mirror image.

I mounted the NE602 the usual way up by soldering pin 3 directly to the ground-plane and splaying the other pins outwards to lift them clear of the ground-plane. The layout is a bit tight around pins 6 and 7 but it is manageable.

Using a moulded 10μH inductor and a 60pF variable capacitor, the circuit will cover all the c.w. portion of the 7MHz (40 metre) Amateur band. Although I had a problem reaching the bottom edge of the 7MHz band, this was solved by adding a 60pF trimmer in parallel with the 9MHz crystal to shift the frequency a little.

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Without any filtering added to the mixer, my frequency counter read 7MHz at the output. So, the 7MHz product was obviously strong. I used a 9V PP3 battery as the power source but readers might like to run the circuit from a 12V bench supply but – then it's advisable to add a 9V three pin i.c. regulator to the supply line.

Range Of Harmonics

The basic circuit in Fig. 1 will have all the mixer products, plus a range of harmonics, appearing at the output. The obvious way to clean up the signal is to add a simple band-pass filter. Thankfully I had one to hand!

I have a set of band-pass filters for each of the Amateur bands. These are based on the once popular Toko KANK series of inductors and the values come from the excellent *Filter Handbook* by *PW* author **Stefan Niewiadomski**. The circuit is shown as Filter 1 in Fig 2a. Sadly this series of inductors are no longer made, although a few are still sold.

A very similar filter can be made by utilising surplus 10.7MHz i.f. transformers. A suitable circuit is shown as Filter 2 in Fig. 2a. Fortunately, 10.7MHz i.f. transformers are easy to buy or they can be culled from an old a.m./f.m. radio.

The i.f. transformers suitable for this application usually have a green coloured core. Note: The 10MHz i.f. transformers have in internal capacitor to tune them to 10.7MHz; marked Cx in Fig. 2a. By adding an additional 47pF capacitor in parallel the transformers can be adjusted (using the cores) to 7MHz.

Adding a band-pass filter cleans up the signal but reduces the output level. This can be then restored by adding an extra stage of amplification after the filter. A single stage bipolar transistor or f.e.t. should produce a more useable output.

I was pleased with the results from the little crystal mixer VXO and will probably return to the circuit again in future applications. So watch this space… as they say!

Want to know just how high your antenna is? Alan Ford shows you how!

Measuring Antenna Heights

Various circumstances occur when you need to know fairly accurately the height of an antenna above ground and this little article describes one way of achieving this. The alternatives are to hire a helicopter or climb to the top of the mast while your assistant reads off the height from a dangling tape measure or drop the mast and measure it on the ground. You may agree that the suggestions are somewhat impractical!

Instead, you use a simple inclinometer, which you can build. At the same time you can apply some trigonometry, but don't panic – you can also use the table I've provided!

The Theory

There's a mathematical relationship between the base, height and opposite angle of a right-angled triangle if we remember the trigonometry of our schooldays! This means that if the ground around your antenna mast is reasonably flat, you can determine the antenna height above ground by sighting the top of the antenna mast using a simple inclinometer, standing a measured distance from the base of the antenna.

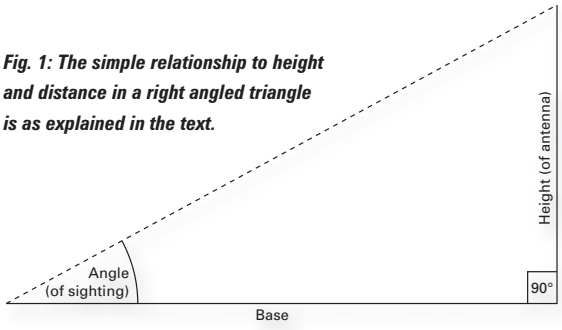

Fig. 1: The simple relationship to height and distance in a right angled triangle is as explained in the text.

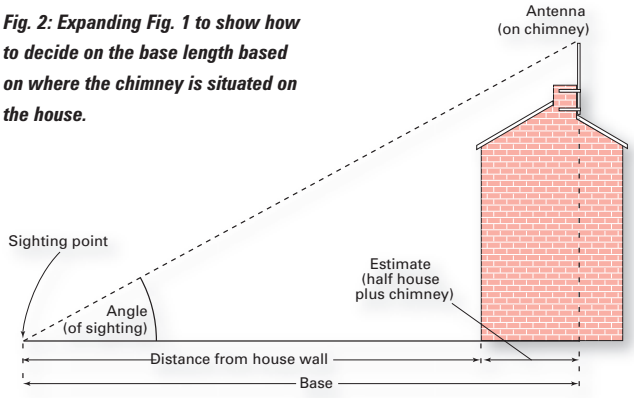

Fig. 2: Expanding Fig. 1 to show how to decide on the base length based on where the chimney is situated on the house.

The mast actually forms your right-angled triangle, as shown in **Fig 1**. By the way, if you are determining the height of a mast you can measure from its base, but if your antenna is on a building you will have to allow for the extra length (about half the width of the building if the antenna is on a centre chimney). This is shown in **Fig 2**.

Given the known distance from the antenna (length of the base), determining the angle of sighting (opposite angle) will be enough to determine the height of the antenna (height) **above eye level**, as shown in **Fig 3**. You'll need to add your eye level to the figure calculated in order to arrive at the true height of the antenna.

Having established the base distance and having found the sighted angle, you can use **Table 1** to do your calculations. Some readers will recognise the table as a set of rounded Tangent numbers, as this method makes use of that particular trigonometry function.

In a right-angled triangle the tangent of an angle is the ratio of the opposite side (in this case height) to the adjacent side (in this case base). I have rounded the numbers because the difficulty of accurately measuring the angle makes extreme accuracy meaningless. You will be aiming at finding the result to the nearest half metre (or foot) only.

Angle°	Multiplier
30	0.58
32	0.62
34	0.67
36	0.73
38	0.78
40	0.84
42	0.90
44	0.97
46	1.04
48	1.11
50	1.19
52	1.28
54	1.38
56	1.48
58	1.60
60	1.73
62	1.88
64	2.05
66	2.25
68	2.47
70	2.75

Table 1: Angles and multipliers

Rather than my table, you may care to use an inexpensive school scientific calculator.

The actual formula is:

Tan (angle) = (height of mast)/(distance from mast)

Which can be re-arranged algebraically to

height of mast = distance from mast x Tan (angle)

For simplicity I will call the tangent figure the multiplier.

You take the distance from the mast and multiply it by the Tangent (multiplier in **Table 1**). To determine the angle of sighting you will use the simple inclinometer.

Alan Ford VK2DRR – a very practical Amateur – describes how we can easily measure the heights of our antennas.

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Building The Inclinometer

Now let's look at what's needed to build the inclinometer. Materials include a School student's protractor, a drinking straw (**not** a bendy one!) and a piece of thin(ish) cord about 350mm long. Three or four M4 metal nuts or similar, one to secure the cord and the others to act as weights for keeping the cord taut.

The building stages follow, step-by-step:

1: Wear safety glasses as the protractor may shatter! Gently centre-punch and carefully drill a small hole about 1-2mm at the marked centre-reference on the protractor.

2: Glue a straight drinking straw to the straight edge of the protractor.

3: Knot the end of the string round an M4 nut and pass it through the hole.

4: Tie the weight nuts to the other end of the string.

The photograph, **Fig. 4**, shows the finished inclinometer.

The Base Line

You'll need to establish a base line for your measurements and calculations. Pick an exact distance away from the base of the antenna mast that is as near as possible to your estimate of the mast height. Hopefully that will give you a measured angle not too far from 45°, which is the ideal.

The further you are away from the antenna, the smaller the angle will be. Figures are given for angles between 30 and 70°. Outside this range results will tend to be less reliable.

Be careful not to walk backwards into a hazard when you pick a spot! Choose a spot that is an even number of metres (or feet if you wish) from the base of the mast.

Using safety glasses or a finger and thumb around the straw to avoid poking your eye, stand at the marked spot, arrange your inclinometer so that the straw is on top and sight the top of the mast in the centre of the straw. Let the cord come to a rest from any swinging and then grip the cord against the side of the protractor. Now you can inspect the protractor and read off your angle of inclination.

Note that there are two readings going in opposite directions on a standard protractor. Needless to say, you will need the reading that is less than 90° (an acute angle) or else you would be looking backwards!

Using the table

Once you've obtained your reading you should consult **Table 1**. For every 2° between 30 and 70°, I have given a multiplier (the rounded Tangent). Take the base distance (distance from the mast) and multiply it by the appropriate multiplier. The answer will be the antenna height above **eye level**. Add on the eye level height to give the height of the mast. **Note:** You can use metric or imperial units as long as you use the same units for all the measurements.

To take a simple example, if the distance from the mast (base) is 15 metres and the angle is 60°, multiply the 15 metres by 1.73 (from the table), giving 25.95. Add your eye level (as an example say 1.8 metres) and this gives you a total of 25.95 + 1.8 = 27.75. Finally round to the nearest practical amount, 28 metres, which is your antenna height.

The angle will always be greater than 0° and less than 90°. If the angle were zero, the multiplier would be zero so the mast height would be only eye level height. If the angle were 90° you would be looking straight up (an infinitely tall mast!)

Remember this most important point: The angle you read off will faithfully give you the mast height above your **eye level!** You'll have to add your eye level height to the reading in the table and don't forget that it's not your overall height that matters! It's your eye level height.

Simpler Approach

Finally, if you can safely measure and position yourself appropriately, an even simpler approach is to move until you have an angle of exactly 45°. Then the height of the mast will equal the distance away you are from it (plus your eye-level height, remember). To briefly return to the theory, the tangent of 45° is 1.

Take care – although it's very simple – this method can be very fiddly with a risk of stumbling over some dangerous and/or painful obstacle while walking backwards sighting the mast and reading the angle. So it is not recommended, except for those living in a flat area or (on field days) where cows haven't been in residence recently! ●

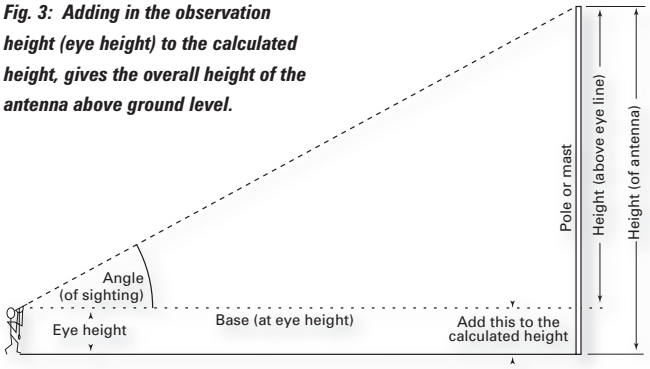

Fig. 3: Adding in the observation height (eye height) to the calculated height, gives the overall height of the antenna above ground level.

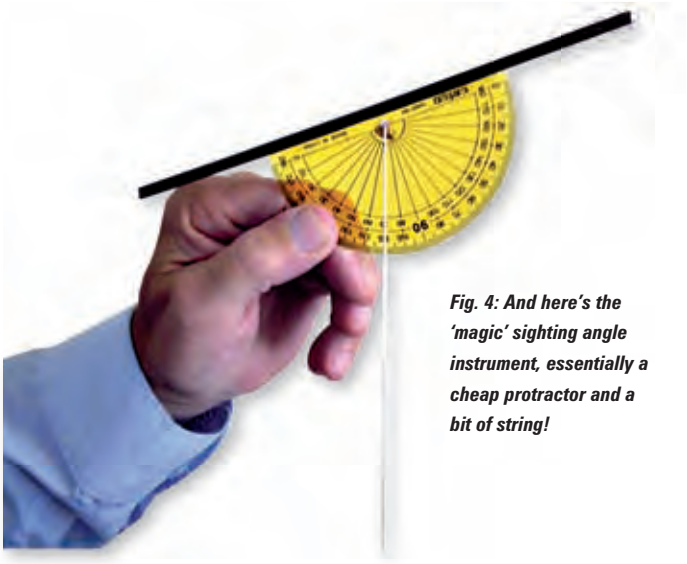

Fig. 4: And here's the 'magic' sighting angle instrument, essentially a cheap protractor and a bit of string!

Colin Redwood's

what next?

Colin Redwood G6MXL welcomes readers to his first column for 2009, where he's discussing PSK31, the popular data mode.

To start the New Year off, I'm going to look at PSK31, one of the most popular data modes and show just how easy it is to start receiving and decoding the mode. It really is as simple as downloading some software from the Internet and connecting the external loudspeaker socket of your receiver to the line input socket on your computer's sound card!

Interested readers may ask, "What do you mean by data modes Colin?" Well, in answering, these are the modes that involve the transmission of data by radio, data that has originated from a computer. To do this will require leads to be made up to link the computer with the transceiver.

In some cases, but not all, a special interface unit will be required to isolate the computer from the transceiver. In other cases a special modem-type unit known as a Terminal Node Controller (TNC) will be needed.

On transmit, all data modes work by converting whatever is to be sent into binary computer data (zeros and ones) and then converting this binary data into audio frequency tones, usually by the computer's sound card. The audio frequency tones are then sent along a wires from the computer to the transmitter where they modulate the carrier in just the same way as our voice modulates the carrier in an amplitude modulated (a.m.), frequency modulated (f.m.) or single sideband sideband (s.s.b.) transmission **(Fig. 1)**.

On receive, the receiver demodulates the a.m., f.m., or s.s.b. radio frequency signal in exactly the same way as it does for a voice transmission. The recovered audio tones are converted back to computer data – again usually by the receiving computer's sound card. As you can see in **Fig. 2,** this can be a very simple set-up. With data modes the computer is effectively doing the 'listening and talking' they are ideal modes for Amateurs who have hearing difficulties, enabling them to enjoy their favourite hobby.

Note: As data modes don't need a microphone, a separate arrangement is needed to switch the transceiver between transmit and receive – which we will look at next month.

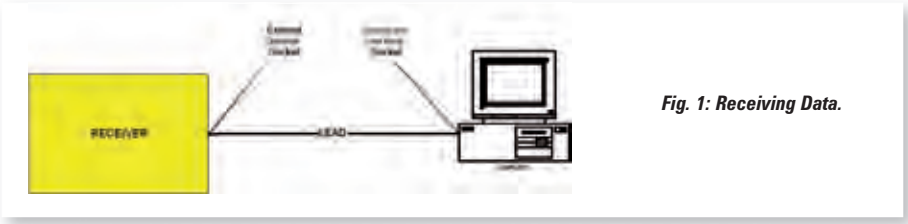

Fig. 1: Receiving Data.

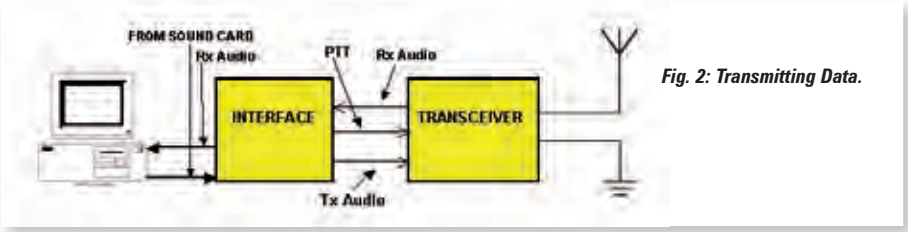

Fig. 2: Transmitting Data.

Fig. 3: Downloading **DigiPan** *from the Internet is quite straightforward. When you get this dialogue message, you should select Save.*

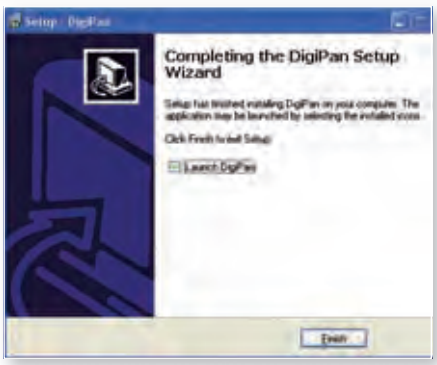

Fig. 4: Finish

Relatively New

The PSK31 mode is one of the relatively new data modes. It was developed by **Peter Martinez G3PLX**, about 10 years ago. As the data rate is slow (31.25 bits per second), it uses a very limited bandwidth. This is fast enough to send and receive text that is typed into a computer keyboard by a slow typist.

To receive PSK31, all that's needed is a 14MHz (20m) upper side band (u.s.b.) receiver (there's always some PSK31 on this band) with a suitable antenna, a reasonably modern PC with Windows 98/XP/Vista, a lead and some software which can be downloaded (for free!) from the internet. For the Apple Macintosh users amongst *WN?* readers, there are at east two PSK31 capable pieces of software available.

The Software

Under the *Windows* operating system there are many programs available for sending and receiving PSK31. *DigiPan* is one of the most popular. Version 2.0 of *DigiPan* is freeware, requires a 266MHz Pentium processor and *Windows 95* or later. If your computer is less than (approximately) 10 years old and runs Microsoft *Windows*, then it's likely to be suitable.

The *DigiPan* program can be downloaded from **http://www.DigiPan.net/** It's quite straightforward (see Fig. 3), just click on Download DigiPan. At just 700kb in size it downloads quite quickly even on a dial-up internet connection. Having downloaded the *DigiPan* software, the next step is to install it.

If you have previously installed *DigiPan* and want to install the latest version, you'll need to find and delete

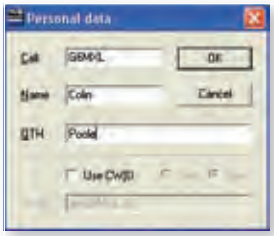

Fig. 5: Entering Callsign Name and QTH on the Personal Data pop-up window.

Fig. 6: A typical 3.5 Stereo Jack Plug. The Tip has the signal (centre of the screened lead) connected, and the sleeve has the screen connected (The ring should be left unconnected).

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a file called *DigiPan.ini* **Please note** that the *DigiPan20.exe* file does not have a valid digital signature that verifies its publisher. Provided that you understand and accept the risks, press 'Run' and the installation will continue in the same way as any other application software, except that it is much faster to install than many!

WN? readers can choose – in the same way I do – where to store the program. Within my Program Files folder I have created an Amateur Radio folder and within this folder I have separate folders for each Amateur Radio application. I therefore created a *DigiPan* folder in my Amateur Radio program folder.

When you get to the end of the installation, the Finish prompt **(Fig. 4)** will appear. Tick the Launch *DigiPan* box and then select Finish.

On running *Digipan*, the first thing that will happen is that you are prompted to supply your Callsign, Name and QTH. Enter these in the format that you want them to appear in any QSOs and click OK. **Fig. 5** shows what I entered.

Leads Required

Any *WN?* reader who is new to digi-modes will need a lead to connect the external loudspeaker socket on their transceiver or receiver to the line or microphone input socket on their PC. Most likely, both ends will need to be 3.5mm stereo jack plugs.

You can either make or buy the lead and I would suggest using a screened cable. Check that the screened lead will be long enough – depending on where you site your receiver and PC, it could be longer than you think it needs to be!

If *WN?* readers are making their own lead, I ask them to remember that the tip of the plug is the signal-carrying contact and the sleeve is the screen (**Fig. 6**). By leaving the ring unconnected, you can be certain that – regardless of whether their receiver has a mono or stereo 3.5mm socket – you will not be shorting out the audio output of their receiver or the input of your soundcard.

If readers use an all-metal (rather than a plastic covered version) 3.5mm jack plug, please don't forget to put the supplied plastic sleeve over the connections to help prevent a short circuit between the connections and outer metal case. To be absolutely certain, I would recommend that readers test the lead for continuity of the signal (and also the screen) and then check to ensure that there are no short circuits between the signal and screen before plugging in and getting ready to receive.

Almost Ready To Go!

With the final leads ready, you'll be able to connect everything up. But be prepared for silence – and bear in mind that many receivers mute their internal loudspeaker when you plug in the lead to the external speaker socket!

Next, check with the documentation that came with your computer/sound card to determine the line-input socket. As you can see in **Fig. 7,** this is usually light blue in colour, while pink is used for the microphone in socket (green being the line-out / headphone socket).

Nowadays, most computers come with a 'sound-card' built-in as part of the main motherboard, so you probably won't find a separate card if you decide to take the cover off your computer. The sockets themselves may be found on either the front or the back of the computer (or even both).

Be careful not to confuse the soundcard sockets with similar sockets sometimes found on internal dial-up modem cards. If you are using a lap-top computer, it may only have a pink microphone input socket and no line input socket.

If you don't want to make up a lead to go between your receiver and computer, as an alternative you could just lay the computer microphone (perhaps the one you use for Skype or similar) on your receiver's loudspeaker grill! Plug the computer microphone into its usual microphone-in socket on your computer. (It will do the job, but not as well as a dedicated lead).

Receiving Signals

At this stage you'll be ready to switch on your receiver and start receiving signals. Personally, I think that the best place to find PSK31 signals is on 14.070MHz using u.s.b.

There were certainly plenty of signals on the 14MHz (20m) band when I checked mid-morning and mid-afternoon on a couple of weekends in early autumn. Remember that 20m will not usually be open in the evenings in the winter at this point in the sun spot cycle.

The 3.5MHz (80m) band will also provide many PSK31 signals during the dark winter evenings too – with much activity between 3.570 and 3.590MHz.

What's On Screen?

So, now you're up and running - you may be wondering just what is likely to be on the screen? To help, As you can see, the *DigiPan* screen **Fig. 8**, is divided into three sections. As is usual with a *Windows* application, you can alter the relative size of the three sections to suit you. (The default settings seem pretty good to me).

Colin's waiting to hear from You!

I like to solve problems with anything to do with amateur radio! I can answer questions and publish my findings here for the benefit of all *PW* readers.

Remember the mains supply is potentially lethal. Unless you really know what you are doing, always pull the mains plug out, do not just switch off at the wall socket, when working on equipment.

Fig. 7: Soundcard sockets. (The light blue socket is the line input socket).

Starting at the bottom of the screen, there is what's termed a 'waterfall', something that may be new to some *WN?* readers who are perhaps more familiar with E-mails and spreadsheets. This shows the chunk of radio spectrum that has been resolved within the audio pass band of your receiver. As PSK31 signals have such a small audio bandwidth, a number of PSK31 QSOs can easily fit within the audio passband of a typical s.s.b. receiver. So you can actually see (and even decode) several QSOs simultaneously!

Each of the vertical yellow lines represents a separate QSO. As the waterfall moves up the screen over a few minutes, you may notice that sometimes the yellow lines stop and then start again. This is the end of an over from one station, but the other station is not audible, perhaps being within the skip zone. The yellow line may reappear a minute or so later when the first station transmits his next over.

The little green flag with the red diamond immediately below it is the station that is currently being decoded. By clicking with the mouse on one of the yellow lines, you can choose a different QSO to decode. In the small middle part of the screen is whatever you have typed to send. In **Fig. 8** this is blank (We'll come back to this next month). Above this on the screen is the receive part where the decoded text appears.

At the top of the screen are a number of buttons. Pressing the multi-button at the top of the screen will toggle between decoding multiple QSOs and decoding the one QSO with the little green flag in the waterfall.

Volume Control

The volume control should be set so that the waterfall (the area at the bottom of the screen) shows some yellow lines against a blue background. If it is all yellowish, then the volume is too high. If you don't see any yellow lines, the volume control may be too low, or the PC socket may be muted.

Fig. 8: The **DigiPan** *screen. At the bottom of the display is the 'waterfall', the small middle area is for data to be sent (blank in this example) and the top is the receive window, which is configured in this example to just show a single QSO.*

There are two ways of adjusting the volume. One is to adjust the volume control on the receiver. The other is to select the Config>Waterfall Drive from the top menu bar. This will open up the Recording Level window **(Fig. 9).**

Next, using the mouse, drag the slider of the line-in or microphone up or down like on an audio mixing desk. Make sure that the select box for line or microphone input, whichever you are using, is ticked. Note that this is the opposite arrangement to the Windows volume control where the box at the bottom left of each slider mutes the input.

Not Working?

If things don't appear to be working, try plugging some headphones into the sound-card's output socket (usually pale green coloured) and have a listen. If you're not hearing anything, then you'll need to investigate connections, volume levels and check that the correct input box is selected. (This is a good approach to help fault-finding).

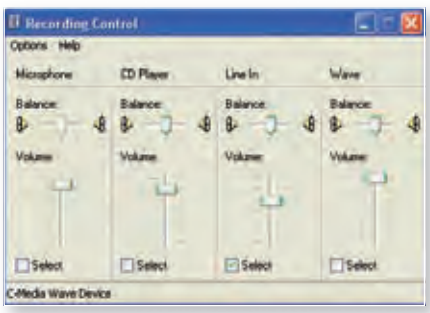

Fig. 9: The **DigiPan** *recording control. Make sure that you tick the Select box for the appropriate slider.*

Reception Techniques

Reception techniques aren't difficult when you're using a modern receiver. With a stable, accurate digital read-out you shouldn't need to adjust the tuning control on the receiver. Remember that all the usual considerations regarding propagation, antennas, modes etc. still apply. Just because we are trying to receive data doesn't mean that everything is as reliable as the Internet, we still need good radio propagation!

I think that *WN?* readers will be quite surprised at just how easy it is to receive PSK31 signals. Indeed, within five minutes of first setting up on a Saturday morning I received signals from Spain, Austria, Germany, Finland, Greece, Ethiopia, Netherlands, Hungary, Luxembourg, Norway, Russia, Israel, Croatia, Slovenia, Kazakhstan and Poland!

Transmitting PSK31

Next month I will be looking at transmitting PSK31 and at a simple interface that can be built from a kit, which will be available from **Spectrum Communications**. I'll also be providing more detailed instructions than is usual for a *Practical Wireless* project to help those who are new to home construction to make a success of the project. It will be suitable for those looking for a project for their Intermediate Licence Course.

The interface kit can also be used with other data modes such as Slow Scan Television (SSTV) which I will be covering in the March issue. In the mean time, please let me know how you get on and what you have received on PSK31.

●

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club news

Please remember to include full details of your club, E-mail and telephone contact details and the postcode of your meeting venue - it helps potential visitors to find you!

Send all your club info to

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Broadstone,
Dorset BH18 8PW
E-mail: newsdesk@pwpublishing.ltd.uk

BEDFORDSHIRE

Shefford &DARS
David Lloyd. Tel: (01234) 742757
www.sadars.org.uk
The Shefford and District Amateur Radio Society meets every Thursday at the Community Hall, Ampthill Road, Shefford, SG17 5BD (next to the Chip shop). See web site for our full programme.

BERKSHIRE

Reading & DARC
Pete Milton. Tel: (01189) 695697
www.radarc.org
The Reading & District Amateur Radio Club meets on the second and fourth Thursday of the month at Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Berkshire RG5 4LY.

CHESHIRE

Chester & DRS
Barbara Green Tel: 07957 870770
E-mail: barbara@rutland.go-plus.net
www.chesterdars.org.uk
The Chester & District Radio Society meets on Tuesday evenings at the Burley Memorial Hall, Common Lane, Waverton, Chester CH3 7QT.

Halton RC
Sam. Tel: (01928) 714231
http://g7wfs.sytes.net/hrc/index.htm
The Halton Radio Club meets in The Play Centre, Norton Hill, Windmill Hill, Runcorne WA7 6LJ every Thursday from 7.30 to 9.30pm. There's plenty of parking and full disabled access.

Macclesfield & DRS
Ray King. Tel: (01260) 278431
www.gx4mws.com
The Macclesfield & District Radio Society meets every Monday at the Pack Horse Bowling Club, Westminster Road, Macclesfield SK10 3AT at 8pm.

Stockport RS
David Simcock. Tel: 0161 456 7832
www.stockportradiosociety.co.uk
The Stockport Radio Society meets on the first and third Tuesdays at the Bramhall Air Scouts HQ, Leewood Hall, Benja Fold off Ack Lane East, Bramhall, Stockport SK7 2BX.

Warrington Amateur Radio Club
Paul Carter. E-mail: g7odj@warc.org.uk
www.warc.org.uk
The Warrington Amateur Radio Club meets every Tuesday at 8pm at the Grappenhall Youth and Community Centre, Bellhouse Lane, Grappenhall, Warrington WA4 2SG.

CORNWALL

Cornish RAC
Ian Williams. Tel: (01872) 561058
E-mail: ianporsche964@aol.com
www.cornishradioamateurclub.org.uk
The Cornish Radio Amateur Club meets at the Church Hall, Church Road, Perranarworthal, Truro TR3 7QE on the first Wednesday of every month at 7.30pm. There is also a Computer Section that meets at the same venue and time on the second Monday of every month, except December.

Poldhu ARC
Keith Matthew. Tel: (01326) 574441
E-mail: g0wys@yahoo.co.uk
www.gb2gm.org
The Poldhu Amateur Radio Club meets at The Marconi Centre, Poldhu Cove, Nr Mullion, Cornwall TR12 7JB. Tel: 01326 241656.

COUNTY DOWN

Bangor and District ARS
Mike. Tel: 028 4277 2383
http://www.bdars.com
The Bangor and District Amateur Radio Society meets on the first Thursday of every month in 'The Boathouse', Harbour Car Park, Groomsport BT19 6JP at 8pm. Visitors and new members are most welcome.

COUNTY DURHAM

Bishop Auckland RAC
Mark Hill. Tel: (01388) 745353
http://barac.m0php.net/
The Bishop Auckland Radio Amateur Club meets every Thursday at 8pm in the Village Community Centre, Stanley Crook, Co. Durham DL15 9SN. Tuition for Foundation, Intermediate and Advanced licences is available. The club is registered as an RSGB exam centre.

Great Lumley AR&ES
David Barclay. Tel: 0191 3888113
E-mail: m0bpm@btinternet.com
The Great Lumley Amateur Radio & Electronics Society meets in the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co. Durham DH3 4JD on Wednesday nights from 7 to 9pm.

DERBYSHIRE

South Normanton Alfreton and District ARC
A J Higton. Tel: (01773) 783658
E-mail: Snadarc@aol.com
www.snadarc.com/
The South Normanton Alfreton and District Amateur Radio Club meets in the Village Hall, Community Centre, Market Street, South Normanton, Derbyshire DE55 2EJ.

DEVON

Exemouth ARS
Mike G1GZG, Tel: 01395 274172
E-mail: micael.newport1@btinternet.com
The club meets on the 1st and 3rd Wednesdays of each month at 'The Scout Hut', Marpool Hill, Exmouth Devon EX8 1TD.

Exeter ARS
Paul Cheshire. Tel: 01392 660246
E-mail: pchesh-29@hotmail.co.uk
The Exeter Amateur Radio Society meets on the 2nd and the 4th Monday at 7.30pm in the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter EX2 5RP. Tuition for Foundation, Intermediate and Advanced licence is available. The club is registered as an RSGB examination centre.

Torbay ARS
Dave Helliwell. E-mail: g6fsp@tars.org.uk
www.tars.org.uk
The Torbay Amateur Radio Society meets Fridays at 7.30pm in the Teignbridge District Scout Headquarters, Wolborough Street, Newton Abbot, Devon TQ12 1JR.

DORSET

Bournemouth RS
John. Tel: 07719 700 771
www.brswebsite.org.uk
The Bournemouth Radio Society meets on the first and third Friday of each month at the Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth BH10 7LH. Meetings take place in Room 5 at 8pm and members assemble in the bar from 7.30pm. Visitors are always welcome.

Poole Radio Society G4PRS
'Tex' G1TEX Tel: 07966 460 552
www.g4prs.org.uk
Meetings are every Friday at 19:30 for 20:00 at the The Old Chapel Hall, Cabot Lane, Creekmoor, Poole BH17 7BX, the second friday meeting of each month is the formal evening, all others are basically shack and Natter nights. The Foundation class is presently fully booked and well underway!

DUMFRIES & GALLOWAY (Scotland)

The Wigtownshire Amateur Radio Club
Ellis Gaston Tel: 01776 820413
Web: www.gm4riv.co.uk
The club meets every Thursday from 19:00 Hrs at the The Aird Unit, Stranraer Academy, Stranraer, DG9 8BQ, South West Scotland

EAST SUSSEX

Brighton RC
Reg Moores. Tel: (01273) 503869
The Brighton Radio Club meets on the second and fourth Tuesdays of each month at the Vallance Community Centre, Conway Court, Sackville Road, Hove BN2 3WR at 7.30pm. Anyone wishing to know more are welcome to come along to a meeting, entrance is free.

Hastings E&RC
Gordon Sweet. Tel: (01424) 431909
E-mail: gordon@gsweet.fsnet.co.uk
www.herc.uk.net or http://g4cus.mysite.wanadoo-members.co.uk/
The Hastings Electronics & Radio Club meets on the third Wednesday at the Taplin Centre, Upper Maze Hill, St Leonards on Sea TN38 OLQ at 7pm.

ESSEX

Braintree & DARC
Keith. Tel: (01376) 329279
www.badars.org.uk
The Braintree & District Amateur Radio Society meets on the first and third Monday of the month in The Clubhouse, Braintree Hockey Club, Church Street, Bocking CM7 5LJ. December 15th is a social evening, Jan. 5th Equipment Safety Testing, 19th Benchtop test-jigs and test-probes.

Colchester RA
www.g3co.ccom.co.uk
The Colchester Radio Amateurs meets at 7.30pm on alternate Thursdays at St Helena School and The Colchester Institute, Sheepen Road, Colchester, Essex CO3 3LE. Members and non-members welcome.

Chelmsford ARS
Martyn Medcalf. Tel: (01245) 469008
E-mail: info2007@g0mwt.org.uk
www.g0mwt.org.uk
The Chelmsford Amateur Radio Society meets on the first Tuesday of each month in the Marconi Sports & Social Centre, Beehive Lane, Great Baddow, Chelmsford CM2 9RX at 7.30pm. - All welcome

Loughton & Epping Forest ARS
Marc Litchman. Tel: 020 8502 1645
E-mail: info@lefars.org.uk
www.lefars.org.uk
The Loughton & Epping Forest ARS meet Friday fortnightly at All Saints House, Romford Road, Chigwell Row, Essex IG7 4QD between 7.45 and 10pm. All visitors will be made most welcome.

South Essex Amateur Radio Society
Contact: Dave (G4UVJ) 01268 697978
E-mail: southessex.ars@btinternet.com
www.southessex.ars.btinternet.co.uk
Local Network: 145.225MHz
Meet second wednesdays of each month at South Benfleet Primary School, High Rd, South Benfleet, Essex SS7 5HA. (Entrance: 51°33'10.45N 0°33'39.65E), (Opp. Smiths Wood Yard). All welcome. On the night it's Canvey Rally Preparations.

FIFE (Scotland)

Glenrothes&DARS GM4GRC
Contact: D Francis MM0DYX 01383 823878
Meet Wednesdays at the Football Pavillion, Station Rd. Thornton Fife. Club Chairman Ken GM3YBQ runs course at all licence levels.

GLOUSCESTERSHIRE

Cheltenham Amateur radio Club G5BK (CARA)
Alan Errock, G3HC. Tel: 01452 813
E-mail: alan@errock.co.uk
www.caranet.co.uk
The club meetings are held on the first Friday of each month, starting at 8p.m. at Prestbury Library, The Burgage, Cheltenham, Gloucestershire, GL52 3DN. On Jan 2nd it's the Annual Quiz" by Pat G3IKR. 6th Feb. Surplus equipment sale, 6th Mar. it's a construction evening including a display of home-constructed radio equipment.

GLOUCESTER

Amateur Radio and Electronics Society.
Anne 2E1GKY/M3GKY 01452 548478
(After 10am)
E-mail: hamreed@blueyonder.co.uk
www.g4aym.org.uk
Meet at Churchdown School, Winston Road, Glos. GL3 2RB EVERY MONDAY EVENING 7-30pm until 10pm except for Bank Holidays when we operate from a local escarpment. Monday 12th Jan. the years starts with a quiz, 19th there's a RAYNET talk and on the 26th, they're operating.

HAMPSHIRE

Andover Radio Amateur Club.
Martin M0MWS. Tel: 01980 612070
E-mail:- martinsmith@kukltd.co.uk
Website: www.arac.co.uk
The Andover Radio Amateur Club meets on the first and third Tuesdays in the month at the Club venue in The Village Hall at Wildhern, SP11 0JE. Map Ref SU350510 at 19:30 hours.

Fareham & District ARC
Ken Sapsed. Tel: 023 9279 7240
E-mail: secretary@fareham-darc.co.uk
www.fareham-darc.co.uk/
The Fareham & District Amateur Radio Club meets on Wednesdays evenings from 7.30pm in the Portchester Community Centre, Westlands Grove, Portchester, Fareham PO16 9AD.

Horndean & District ARC
Stuart Swain. Tel: (02392) 472846
E-mail: g0fyx@msn.com www.hdarc.co.uk
The Horndean & District Amateur Radio Club meets on the first and fourth Tuesdays each month in the Lovedean Village Hall, 160 Lovedean Lane, Lovedean, Hants PO8 9SF at 7.30pm. Visitors are always very welcome.

Isle Of Wight Radio Society
Tony Pegg Tel: 01983 868 978
e-mail tony.pegg1@btinternet.com
www.g3sky
The IWRS meets every Friday evening 7.00pm-10.pm at Haylands Farm,Salters Rd. Ryde PO33 3HU. Visitors very welcome.The club runs courses for Foundation, Intermediate and advanced licenses. The club is registered as an RSGB exam centre

HERTFORSHIRE

Verulam Amateur Radio Club (St Albans)
Norman. Tel: 07773 628912
E-mail: g1bsz@aol.com (sec)
www.radioclubs.net/verulam
The club normally meets every 3rd Tuesday of the month 800pm at Aboyne Lodge School.Etna Road, St Albans, AL3 5NL. New members and visitors are always very welcome. Regular talks, events, Foundation, Intermediate courses exams are held. Club nets also take place every Sunday 12.00noon 40m (7.150MHz), then 14.00pm 2m (145.375) and on Tuesday 19.45pm 160m (1.975) then 20.00pm 2m (145.375). For further information about the club and events please see the website.

HUMBERSIDE

Hull & District ARS
Raymond Penny. Tel: (01482) 504618
E-mail: sirraymond@sirraymond.karoo.co.uk
The Hull & District Amateur Radio Society meets every Friday at the Walton Leisure Centre, Walton Street, off Anlaby Road, Hull HU3 6JB.

JERSEY

Jersey Amateur Radio Society - GJ3DVC
Rob Luscombe (secretary) 2J0RZD
Tel: 07797 923916
E-mail: gj3dvc@gj3dvc.org.je
http://www.radioclubs.net/gj3dvc/
The Jersey Amateur Radio Society meets every Friday at 7.30pm at The German Signal Station, Rue Baal, La Moye, St. Brelade, Jersey, JE3 8HQ, also on a Wednesday evening from time to time to maintain, alter and improve the shack, antennas etc. and also for club training. Plentiful coffee and car parking, visitors are always welcome, shack rental available. See our website for further information.

KENT

Bredhurst RATS
www.the-brats.co.uk
The Bredhurst Radio Amateur & Transmitting Society meets on Thursdays at the Parkwood Community Centre, Rainham, Gillingham, Kent ME8 9PN at 8.30pm. If you are interested in joining the club, write to: Membership, The BRATS c/o The Club Room, The Parkwood Community Centre, Long Catlis Road, Rainham, Gillingham, Kent, ME8 9PN.

Hilderstone Radio & Electronics Club
Mike Howland E-mail: g4mix@waitrose.com
Website: www.g0hrs.org.uk
Meetings now at The Science Block, Chatham House School, Chatham Street, Ramsgate,

CT11 7PP on 2nd and 4th Friday of the month at 7-30pm.

Bromley & DARS
Graham
E-mail: bdars@grahamc.net
www.bdars.org
The Bromley & District Amateur Radio Society meets in The Victory Social Club, Kechill Gardens, Hayes, Kent BR2 7NH (off B265, Hayes Lane, Bromley) on the third Tuesday of the month at 7.30pm.

LANCASHIRE

Oldham RC
Christopher Cunliffe. Tel: 07749347142
E-mail: secretaryoarc@btinternet.com
www.oarc.org.uk
The Oldham Radio Club meets on Thursdays at Royton Air Training Corps, Hillside Avenue, Royton, Oldham OL2 6RF at 7:30pm.

Ellenroad RC
David. Tel: (01706) 358650
E-mail: info@ellenroadradioclub.org.uk
http://www.ellenroadradioclub.org.uk/info.htm
The Ellenroad Radio Club (ERC) meets every Monday evening from 7 to 9pm at the Ellenroad Steam Museum, Elizabethan Way, Newhey, Rochdale OL16 4LG. The museum houses the UK's only fully-working cotton mill engine, complete with its 220ft high chimney. Newcomers are always welcome and made to feel at home.

LINCOLNSHIRE

Spalding & DARS
Graham Boor. Tel: 07947764481
E-mail: secretary@sdars.org.uk
www.sdars.org.uk
The Spalding & District Amateur Radio Society meets at the Castle Sports Swimming Complex, Spalding PE11 1QF on Fridays at 7.30pm.

LONDON

Cray Valley Radio Society
Bob Treacher. Tel: 020 8265 7735
www.cvrs.org
The Cray Valley Radio Society meets on the first and third Thursdays of the month at the Progress Hall, Admiral Seymour Road, Eltham, London SE9 1SL at 7.30pm for 8pm.

Southgate ARC
Southgate ARC
David Sharp. Tel: 01992 422622
E-mail: david.sharp1@tesco.net
The Southgate Amateur Radio Club meets on the second Wednesday of the month at Hazelwood Lawn Tennis and Squash Club, Ridge Avenue, Winchmore Hill, London N21 2AJ at 7.30 for 8 pm.

Wimbledon and District ARS
Contact:Jim Bell M0CON
Tel: 020 8874 7456
E-Mail: jamesm0con@o2.co.uk
Website: http://www.gx3wim.org.uk
The Wimbledon & District Amateur Radio Society welcomes new comers to our meetings whether they are licensed or not. We hold our meetings the second and last Friday of each month at Martin Way Methodist Church, Buckleigh Avenue, Merton Park, London SW19 9JZ. The church is on the corner of Martin Way and Buckleigh Avenue. On 9th of Jan. Dennis G0OLX talks about the GB3NS, 30th it's Amateur Digital Radio On Air.

THE LOTHIANS (Scotland)

Cockenzie & Port Seton ARC
Bob Glasgow. Tel: (01875) 811723
E-mail: gm4uyz@cpsarc.com
www.cpsarc.com/news.php
The Cockenzie & Port Seton Amateur Radio Club meets in the Thorntree Inn (Lounge Bar), High Street, Cockenzie, East Lothian EH32 0HP from 7pm till late. Organised talks are held in the Port Seton Community Centre, South Seton Park, Port Seton, East Lothian EH32 0EE. Timings 18:30 to 21:30hrs.

Lothians Radio Society
Tony Sigouin. Tel: 07739742367
E-mail: enquiries@lothiansradiosociety.com
www.lothiansradiosociety.com
The Lothians Radio Society meets on the second and fourth Mondays of the month in the Royal Ettrick Hotel, 13 Ettrick Road, Edinburgh EH10 5BJ from 7pm. Membership costs £12 per year and includes a free BBQ every June!

MERSEYSIDE

Wirral & District ARC
Tom. Tel: 07050 291850
E-mail: secretary@wadrac.com
www.wadarc.com
The Wirral & District Amateur Radio Club meets at the Irby Cricket Club, Mill Lane, Irby CH61 4XQ on the second and fourth Wednesdays of each month. Other Wednesdays are informal (D&W) meetings at a local hostelry.

NORFOLK

King's Lynn ARC
Ray Dowsett, MBE.
Tel: (01553) 671307
E-mail: ray-g3rsv@supanet.com http://www.klarc.org.uk
King's Lynn Amateur Radio Club meets every Thursday at the Scout HQ, Chequers Lane, West Winch, King's Lynn, PE33 0NY off the A10 at West Winch at 7.30pm.

Norfolk ARC
Mark Taylor. Tel: (01362) 691099
E-mail: narc@g0lgj.co.uk
www.norfolkamateurradio.org
The Norfolk Amateur Radio Club meets every Wednesday at the Eaton CNS School, Eaton Road, Norwich, NR4 6PP, where it meets weekly,from 7-10pm, usually in 6th form centre at front of school, every Wednesday from 7-10pm.

North Norfolk ARG
Tony Smith. Tel: (01263) 821936.
E-mail: g4fai@btinternet.com
www.radioclubs.net/nnarg/
The North Norfolk Amateur Radio Group meets in the Radio Hut at the Muckleburgh Collection Military Museum, Weybourne, North Norfolk NR25 7EG on Wednesdays and Thursdays from 10am to 4pm and some Sundays from 1 to 4pm. New members always welcome.

NORTHAMPTONSHIRE

Kettering & District Radio Society
Lorna Froggatt. Tel: 0153 676 2523
E-mail: LornaSteveLorna@aol.com The Kettering & District Radio Society meets each Tuesday from 7 to 9pm in the winter at The Lilacs Pub, Church Street, Isham, Northants NN14 1HD and in the summer at the Carpetbagger Aviation Museum, Sunnyvale Farm Nursery, Harrington NN6 9PF. Foundation, Intermediate and Advanced courses are held regularly.

SHROPSHIRE

Salop ARS
Richard Golding. Tel : 01743 356195
The Salop Amateur Radio Society meets in The Telepost Club, Railway Lane, Abbey Foregate, Shrewsbury SY26BT on Thursday between 8 and 10.30pm.

Telford & District ARS
Mike Street. Tel: (01952) 299677
E-mail: mjstreetg3jkx@blueyonder.co.uk
www.tdars.org
The Telford & District Amateur Radio Society meets on Wednesdays at the Little Wenlock Village Hall, Malthouse Bank, Little Wenlock. Telford TF6 5BG at 8pm.

NOTINGHAMSHIRE

Worksop Amateur Radio Society (W.A.R.S.)
'Daz' Spence 01623 747314
Email- g3rcw@qsl.net
website- www.qsl.net/g3rcw/
Meets every Tuesday at 7:00 pm. Our cubhouse is located at 59 - 61west street, Worksop, Nottinghamshire. S80 1JP. Exams and courses run frequently for all licence levels. Construction nights due to start in the autumn, and we also put on various special events amongst which is the famous Sherwood Forest. Licensed bar & hot food available on club meet nights. Membership fee for the year is £10.

SOMERSET

North Bristol ARC
Dick Elford Tel:(01454) 218362
E-mail: g0xay@aol.com
www.nbarc.org.uk
North Bristol ARC meet Fridays at 7.30pm at SHE7, Braemar Crescent, Northville, Filton Bristol BS7 0TD. We carry out training for all the Radio Amateurs examoination, and our next training course is to be for Intermediate exams.

South Bristol ARC
Len Baker. Tel: (01275) 834282
E-mail: g4rzy@msn.com
www.sbarc.co.uk
The South Bristol Amateur Radio Club meets every Wednesday evening at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol BS14 0LN. Dec 17th Social evening, 24th and 31st club closed, 7th Jan. Circuit Diagrams, 14th Jan Club Archives, 21st Jan. PSK and digital voice.

Yeovil ARC
Gary.
E-mail: g.swain@tesco.net
www.yeovil-arc.com/
The Yeovil Amateur Radio Club meets at the Red Cross Centre, Grove Avenue, Yeovil BA20 2BE (on the corner where Grove Avenue meets Preston Road).

SOUTH GLOUCESTERSHIRE

Thornbury and South Gloucestershire ARC
Tony. Tel: (01454) 417048
E-mail: tonytsgarc@sky.com
The Thornbury and South Gloucestershire Amateur Radio Club meets in the United Reformed Church Hall, on the corner of Chapel Street and Rock Street, Thornbury BS35 2BA at 7.30 - 9.30pm.

SOUTH WALES

Barry ARS
Glyn Jones. Tel: (01446) 774522
E-mail: glyndxis@talktalk.net
www.bars.btik.com
The Barry Amateur Radio Society meets on Tuesdays from 7.30 to 10.30pm in the Sully Sports & Social Club, South Road, Sully CF64 9TG.

SOUTH YORKSHIRE

Axholme Radio Club
John Fennell. Tel: (01427) 872522
E-mail: g4hoy@tiscali.co.uk
The Axholme Radio Club meets at Hollytree Farm, Westend Road, Sandtoft, Epworth DN9 1LB on Wednesdays at 10amm to 4pm, Thursdays at 7 - 9pm and
Saturdays from 10am - 4pm (other times by arrangement).

Sheffield ARC
Trevor Wood. Tel: 0114 2216947
E-mail: trevorwood6@yahoo.co.uk
www.sheffieldarc.org.uk
The Sheffield Amateur Radio Club meets at the SYPTE Social Club, Greenhill Main Road, Sheffield S8 7RH every Monday at 7.15pm. All three types of classes are held for the Foundation, Intermediate and Advance levels of licensing.

STAFFORDSHIRE

Tamworth Amateur Radio Society
Colin Marks. Tel: (01827) 700893
E-mail: colin.marks2@ntlworld.com
The Tamworth Amateur Radio Society meets every Thursday at 7.30pm at St Francis Church, Masefield Road, Leyfields, Tamworth B77 8JB.

SURREY

Sutton & Cheam RS
John Puttock. Tel: 020 8644 9945
E-mail: info@scrs.org.uk
www.scrs.org.uk
The Sutton & Cheam Radio Society meets on the third Thursday of the month at 7.30pm in Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey SM1 2EY. In addition to monthly meetings, licence training courses are held at regular intervals in Banstead Surrey.

TYNE & WEAR

Angel of the North RARC
Nancy Bone. Tel: 0191 477 0036
E-mail: nancybe2001@yahoo.co.uk
www.anarc.net
The Angel of the North Radio Amateur Radio Club meets every Monday 7 to 9pm at Whitehall Road Methodist Church Hall at the corner of Whitehall Road and Coatsworth Road, Bensham, Gateshead NE8 4LH. The entrance to radio club room is through door at the side of building next to the car park. The car park entrance is on Whitehall Road.

Tynemouth ARC
Tony Regnart. Tel: 0191 280 1981
E-mail: tony.regnart@gmail.com
www.gx0nwm.co.uk
The Tynemouth Amateur Radio Club meets each Friday from 7 to 9pm at St. Hilda's Church, Stanton Rd, North Shields, Tyne & Wear NE29 9QB. It's known locally as 'the church near the fire station'.

WEST MIDLANDS

Aldridge & Barr Beacon ARC
Roy Horton. Tel: (01922) 691646
E-mail: leslie137@btinternet.com
www.g0neq.co.uk
The Aldridge & Barr Beacon Amateur Radio Club is a daytime club and meets at the Aldridge Community Centre, Middlemore Lane, Aldridge, Walsall WS9 8AN on the first and third Monday of every month at 2pm to 4pm. They have a long wire and a 2 metre antenna for radio operation using the club callsign G0NEQ.

Midland AX25 Packet Radio Users Group
Miles. Tel: 01384 254199
www.maxpak.org.uk
The Midland AX25 Packet Radio Users Group, MaxPak, meets on the first Monday of the month at The Sir Robert Peel, 104 Bell Lane, Bloxwich, Walsall WS3 2JS.

Stourbridge and District ARS
John. Tel: (01562 700513)
www.g6oi.org.uk
The Stourbridge and District Amateur Radio Society meets on Monday evenings, except for Bank Holidays at The Radio Shack, Old Swinford Hospital School, Heath Lane, Stourbridge, West Midlands DY8 1QX at 8pm. We have Open Shack Nights - Tea/Coffee always available, along with an opportunity to get on the air or just a natter with whoever attends

Sutton Coldfield RS
Andy Sherman. Tel: (01827) 875155
E-mail: peugeotnut@hotmai.com
www.hamradio.piczo.com
The Sutton Coldfield Radio Society Meets on the second and fourth Monday of the month at 7.30pm (no meeting on bank holiday Mondays) in the Sutton Coldfield Rugby Club, 160 Walmley Road, Sutton Coldfield, West Midlands B762QA.

Wythall Radio Club
Chris Pettitt. Tel: (07710) 412 819
E-mail: g0eyo@wythallradioclub.co.uk
www.wythallradioclub.co.uk
The Wythall Radio Club is based at Wythall House, Silver Street, Wythall, near Birmingham B47 6LZ. They meet every Tuesday at 8pm and meetings are informal and friendly. Their 2009 annual rally is planned for March 8th – see rallies pages in this issue.

WEST SUSSEX

Horsham ARC
Andrew Vine. Tel: (01483) 272456
http://www.harc.org.uk/
The Horsham Amateur Radio Club meets on the first Thursday of the month at The Guide Hall, Denne Road, Horsham, West Sussex.

Worthing & DARC
Roy or Joyce. Tel: (01903) 753893
www.wadarc.org.uk
The Worthing & District Amateur Radio Club meets every Wednesday at 8pm in the Lancing Parish Hall, South Street, Lancing, BN15 8AJ. There's a free car park at the rear and full disabled access. Visitors are always welcome.

WEST YORKSHIRE

Pontefract & District Radio Club
Colin. Tel: (01977) 677006
E-mail: info@pontefractradioclub.org
www.pdars.com
The Pontefract & District Radio Club meets every Tuesday from 7pm and Thursday from 8pm at the Carleton Centre, Carleton Grange, Carleton Road, Pontefract, West Yorkshire WF8 3RJ. O the 13th of Jan. Robin Belerby, GM3ZYE, is giving a talk on **"Some aspects of Radio Propagation"** and on the 27th – make a vertical a J-pole antenna for 144MHz.

WILTSHIRE

Trowbridge & District AR
Ian Carter. Tel: (01225) 864698
E-mail: ian.l.carter@btinternet.com
http://uk.geocities.com/tdarc@btinternet.com
The Trowbridge & District Amateur Radio Club meets at Southwick Village Hall, Southwick (nearest postcode is BA14 9QN). On August 20th it's a Natter night

WORCESTERSHIRE

Worcester RAA
Martin Carter. Tel: 07976 917987
E-mail: secretary@m0zoo.co.uk
www.wraa.co.uk
The Worcester Radio Amateurs Association meets on the second and fourth Tuesday at the Hallow Scout HQ, off Main Road, Hallow, Worcester WR2 6PP. Visitors, as always, will find a warm welcome at the new clubhouse, as will potential new members.

Club Secretaries

Please remember to include full details of your club, E-mail and telephone contact details and the postcode of your meeting venue - it helps potential visitors to find you!

David Butler's

vhf dxer

Share your news, views and reports with fellow readers. Reports to David by the last Saturday of each month please.

This month David Butler G4ASR has reports of Sporadic-E openings during October on the 50MHz AND 70MHz bands.

Your reports show that a total of ten Sporadic-E (Sp-E) openings occurred on the 50MHz band during October with three reaching as high as the 70MHz band. Four auroral (Au) openings were reported during the middle and end of October with back-scatter contacts being made on the 144MHz band.

A considerable number of meteor scatter (m.s.) and Earth-Moon-Earth (e.m.e.) contacts were completed on most v.h.f. bands during October, helped somewhat by the Orionid meteor shower and the ARRL e.m.e. contest. Tropospheric propagation on the 144MHz and 430MHz bands was fairly poor for much of October, but there were a few good days during the month when openings were reported deep into mainland European and the Scandinavian countries.

Sporadic-E Opening

A few months ago I mentioned that there had been an increase in the number of Sporadic-E openings on the 50MHz band during the month of October. Indeed my records show that there have been more openings during October in the last three years, than during the traditional peak in winter Sp-E events that normally occur between December and January.

In 2006 there were 17 days of Sp-E that were reported on October 1st and 2nd, 15th-18th and between the 21st-31st. In 2007 your reports show that there were 16 days of 50MHz Sp-E openings that occurred on October 5th, 7th, 13th-14th, 18th-21st, 23rd-24th and over 26th-31st. This year there were 10 days of openings that were reported on October 3rd, 4th, 5th, 12th, 13th, 19th, 20th, 22nd, 30th and 31st. This unusual propagation in October does appear to be in decline but we shall just have to wait and see what happens in 2009.

Ian G6TGO (Manchester IO83) notes that in a three-day period between October 27th-29th 2007 he contacted 50MHz stations in Austria (OE), Croatia (9A), Germany (DL), Hungary (HA), Italy (I), Portugal (CT), Sardinia (IS) and Spain (EA). Then on December 26th, five minutes after the end of an RSGB contest, he worked eight stations in Poland (SP). To make these s.s.b. contacts Ian used a Kenwood TS-2000 transceiver and a rotary dipole at 5m above ground.

Earlier this year Ian upgraded the antenna to a 3-ele Yagi, but even with a bit more gain he didn't hear any DX stations at his place during October. However on September 21st of this year he did contact the stations of IZ0DEI (JN61), IK4ADE (JN54) and EA7FZS (IM87) before conditions on the band faded out.

The Sp-E openings that occurred this October were mainly to the southeast of the region and generally quite short in duration. Some of the DX stations worked from the UK included SQ9IAU (Poland) and UZ5DU (Ukraine) on October 3rd, DG0UHF (Germany) on October 4th, EA1BSH (Spain) and CT1ANO (Portugal), CT1BXT and CT1QP on October 12th. On the following day, October 13th, G-stations reported working IT9TYR (Sicily) and IG9/I2ADN located on Lampedusa in the Pelagie Islands.

Although this island counts as Italy as far as DXCC countries are concerned it is geographically within the African continent. The station there is operated by the well-known operator on 50MHz, Angelo I2ADN, who was also contacted on October 19th by many UK operators, as was the station of EA7DLD (Spain IM77).

One of the lengthier events occurred on October 30th, with Sp-E openings between 1010-1030UTC to the stations of HA5HS (Hungary), LZ2CM (Bulgaria) and YO2RR (Romania), from 1215-1420UTC to EA7AH (Spain), I0JX (Italy) and IS0GQX (Sardinia), between 1730-1825UTC to stations in Portugal and Spain and from 1940-2020UTC with the stations of 9A5CW (Croatia), HA8FK (Hungary), OE5MPL (Austria) and SP2IJ (Poland).

The final opening of the month on October 31 was reported by UK operators to have taken place between 1015-1345UTC. Signals were initially heard from the stations of OE1TGW, OE2UKL, OE4VIE, SP6NVN and YT1T (Serbia) before the propagation moved towards the Mediterranean area with s.s.b. contacts being made with the stations of IK4WMA, IW4BET, IK5RLP, IC8TEM, IG9/I2ADN, IS0AWZ and IS0GQX.

The 70MHz Band

On the 70MHz band, there were two Sp-E openings, the first on October 13th from 1710-1808UTC and the second on October 30th between 1250-1300UTC. Although the mode 'reached' the 70MHz band, there were very few stations to work. Indeed the only station that was contacted was that of **Francesco Messineo IZ8DWF** (JM78) located around 2000km away in the toe of Italy. Frank is very active on the 70MHz band and when he is in his holiday home in Sardinia he uses the Hentenna antenna design that I've described this month (see page 37).

Another Sp-E opening was reported right at the end of the month on October 31st between 1030-1210UTC. Stations in G, GD, GM and GW call areas reported making c.w. and s.s.b. contacts with the DX stations of IK0SMG, I6BQI, IZ8DWF and S51DI. The longest distance contacts made during this opening were probably those between the stations of G7RAU (IO90) and IZ8DWF (JM78) at 1934km and GM3NKG (IO85) and IK0SMG (JN61) at 1954km. Not bad for a very late season Sp-E opening on the 70MHz band.

Now here's some good news for 70MHz (4m) operators. Amateur radio stations in Spain now have temporary access to the 70MHz band until April 25 2009. They may operate on two spot frequencies of 70.150MHz and 70.200MHz with a maximum

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Fig. 1: The 144MHz antenna array at the QTH of David Johnson G4DHF

bandwidth of 12kHz. In reality this means that c.w. and s.s.b. stations can move slightly either side of these frequencies to lessen the chance of mutual interference.

The power level available to the spanish stations is only 10W e.r.p. (i.e. 10W to a dipole or equivalent) but this may be sufficient for Sp-E contacts (if there is any!) and meteor scatter QSOs using JT6M modulation. The good news is that this authorisation covers territory in EA (Spain), EA6 (Balearic Islands), EA8 (Canary Islands) and EA9 (Ceuta & Melilla). That's four DXCC countries, two of which are in the African continent.

Auroral Openings

Auroral back-scatter openings were reported on October 11th, 28th, 29th and 30th but very little seemed to have been worked. Perhaps this is because these weak events were a long way north of the UK and as a consequence, are often called 'Scottish' auroras.

Generally speaking during these Scottish Auroral openings, only stations located in northern England and Scotland are able to make the most of these weak openings. As the events build in intensity then stations further to the south are able to participate. The strength of signals scattered back from the auroral zone can often be quite weak so the more antenna gain you have, the better your results tend to become.

The aurora on October 11th was reported from 1715-1730UTC with the 50MHz station of MM0BSM (Stirling IO86) hearing the SK3SIX beacon (50.069MHz) peaking 55A and the 144MHz station of **David Johnson G4DHF** (Lincolnshire IO92) making c.w. contacts with LA8NK (Norway JO48) and OZ1BEF (Denmark JO46). David is able to participate in quite weak auroral events because he has a large 144MHz array (shown in the photograph **Fig. 1**) of eight stacked 9-ele Yagis.

Later in the month from October 28th David, operating as GM4DHF/P (IO78), heard the SK4MPI beacon (144.412MHz) peaking around 53A on three consecutive evenings. On October 29th at 1645UTC he made an auroral c.w. contact with the station of SM7GVF (Sweden JO77GA) over an 1190km back-scatter path.

Tropospheric Propagation

Tropospheric propagation (tropo) on the 144MHz and 430MHz bands was fairly poor for much of October. Some enhancements did occur at times, particularly during the period from October 10th-12th although it generally favoured stations located in East Anglia (JO01, JO02) and southern England (IO80, IO90). Other UK operators reported making s.s.b. contacts on the 144MHz band with the stations of OZ1BEF (Denmark JO46), SK7OA (Sweden JO65) and HB9RDE (Switzerland JN37).

Contacts were also made into the Czech Republic with the stations of OK1RI (JO60), OK1TEH (JO70) and OK1VVT/P (JO60). The best tropo path was into Poland with stations reporting contacts with SP1FJZ (JO84), SP2JYR (JO92), SP2QBQ (JO94), SP3IYM (JO82), SP3MGM (JO73), SP3TYF (JO82) and SP6NVN (JO81).

Another period of widespread enhanced tropo propagation was reported on October 25th with contacts being made into Denmark and Sweden in the north, through Germany and Poland and down into southern France and Spain. Some of the DX contacts made on the 144MHz band included the stations of OZ1BNN (JO55), SM7DTT (JO65), DL7YS (JO62), SP2MKO (JO93), F2PI/P (JN09) and EA1FBF (IN73).

First Time Report

Steve Norman 2E0MVB (Suffolk JO02) has sent in a report for the first time. Thanks for that Steve, and I hope it will be the first of many! He has recently upgraded from his Foundation Licence callsign (M3MVB) to the Intermediate licence and has just become active on

the 144MHz band. His initial foray into the world of v.h.f. DXing was during the RSGB 144MHz contest held over the weekend of September 6th-7th.

Running a Yaesu FT-857 transceiver at 10W output into a 9-ele Yagi Steve contacted a number of contesters around the UK and also the stations of F2YT (JO10), F6HHR (JO10), F6HPP/P (JN19), ON4WY (JO11), OQ4U (JO20), PA0WMX (JO21) and PA6NL (JO21). Steve reports that his longest distance contacts were with the s.s.b. stations of GM0AYR/P (IO75) at 450km and DK5EZ (JO31) at 472km.

It's interesting to learn Steve, that your initial QSOs with stations located in The Netherlands, Belgium and France, were achieved almost exactly 60-years after the first UK 144MHz contacts were made into those countries. On September 14th 1948 **Dennis Heightman G6DH** (shown in the photograph **Fig. 2** at his station in Clacton-on-Sea, Essex) contacted the station of PA0PN to establish the first ever UK contact with The Netherlands on the 144MHz band. On September 25th 1948, Dennis worked ON4FG (Belgium) and on November 10th 1948 he made another first by contacting the station of F8OL (France)

If you can run amplitude modulation (a.m.) on the 144MHz band you may be interested to know that Monday nights have been nominated as the activity night by the Yahoo v.h.f. group. More details are to be found at **http://groups.yahoo.com/group/VHFam**

Stations are generally active between 2000-2100 hours on 144.550MHz. Please inform me if you hear any activity in your area and I will let readers know via this column.

Meteor Showers

Two major meteor showers occur in the next few weeks and both will create additional activity on the v.h.f. bands. The Geminids shower is active from December 7th to 15th with maximum activity occurring on Saturday December 13th. The shower rises at 1800UTC and sets at 1000UTC with the best path to southeast Europe being around 0500UTC.

The first shower of the New Year, the Quadrantids, is relatively short lived but can be quite intense as the Earth encounters the stream from January 1st-6th. The maximum activity should be occurring on Saturday January 3rd at 1200UTC. The best path at this time is northeast towards Sweden, Finland and the Baltic States.

A weekend meteor shower peak always guarantees an increase in activity so why not take a listen. The 50MHz band may possibly sound like there's a Sp-E opening is in progress but with signals coming in from most directions. Take a look at the **50MHz Datacard** enclosed with this issue to find out where the activity will be! There is still a small amount of s.s.b. around 144.200MHz and an ever increasing amount of computer-driven JT6M modulation around 144.370MHz.

A series of RSGB Christmas contests are being held over the period December 26th, 27th, 28th and 29th. Each session is from 1400-1600UTC on the 50, 70, 144 and 430MHz bands. See **http://www.vhfcc.org** for the rules and scoring information.

Fig. 2: Dennis Heightman G6DH made the first 144MHz contacts into Belgium, France and The Netherlands over 60-years ago in 1948.

Deadline Time Again

That's it again for this month. Don't forget to keep a look out on the 144 and 430MHz bands for enhanced tropo conditions during December. In the last four years there have been some excellent v.h.f. openings from the UK to stations in the Czech Republic (OK), Poland (SP), Belarus (EW) Estonia (ES), Kaliningrad (UA2), Latvia (YL), Lithuania (LY), Russia (UA) and Ukraine (UR).

Incidentally there's a very old saying "When the chimney and bonfire smoke lays flat then streak home, my lad, the bands will be open." So even if you're not in the shack you can always keep tabs with prevailing conditions!

If you do hear or work any DX stations then please send me your reports - or any other news - to reach me before the last Saturday of the month. Have a Happy Christmas and I'll see you in the New Year.

73 David G4ASR ●

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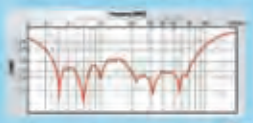

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Harry Leeming's

in the shop

Cleaning difficult-to-get-to switches, looking at the shutter timer and discussing capacitors that seem more like inductors.

An E-mail from '**Melvyn**' asked as to how on earth he could clean a switch with intermittent contact problems on his rig? The switch and rig in question was the attenuator switch, on an FT-101ZD, and he wondered how to do it without stripping the whole rig down.

The five switches in a row under the meter on the '101ZD, **Fig. 1**, do look extremely difficult to get at, but once again the penetrating properties of WD40 penetrating oil can come to the rescue. Place the rig on its back with the front panel facing upwards, and using the fine-bore tube in the nozzle, squirt a little WD40 into the front of the offending switch.

Then start operating the switch vigourously, and eventually, just as you think your finger will drop off, the switch problems will most likely be 'cured'. It's simple when you know how! It then only remains to clean the smelly, oily mess off the front of the rig!

Calibrating & Checking

At this point, let me return to the problem I faced creating and calibrating a camera shutter tester. In the late 1960s, I had developed a very simple circuit for a camera shutter-timing tester, using mainly parts we had to hand.

The diagram of how the system was operated, is shown in **Fig. 2**. The big problem I had, was how to calibrate the scale over all the speeds from one second to a thousandth of a second, (usually marked as the series of numbers such as: 1, 2, 4, 8,15, 30, 60, 125, 250, 500,1000. on cameras).

Engineer **Derek Fielding** had a bright idea, and like most of the best ideas, it was also the simplest. He suggested we fit a multi-pole range switch, (that needed only 11 positions, one for each shutter speed), and calibrate the system on just one speed – say an eighth of a second, so that the meter read half scale when this was correct.

If the charge resistors used on the other speed settings were then chosen so as to be in the ratio of an-eighth, half, quarter, twice, four times etc. relative to this reference charge resistor, then all ranges from '1' to '1000' would, when correct, read half scale when the camera shutter was tested. And either side of this half-scale reading would show the amount of error.

Carrying out a few tests, we adjusted the calibration so that a few known-good cameras gave an average reading of half scale when set at an eighth of a second. We calculated the value of the resistors for all the other ranges, taking into account for a slight offset at some speeds so as to comply with the agreed international standards of shutter times. We wired it up and it worked!

Precisely Accurate

For a more exact calibration we then needed a precisely accurate shutter to act as a standard. I obtained a large sheet of aluminium, and cut out a 4-foot (1.3m) disc. This was painted black, then slots were cut in it this and it was mounted on an infinitely variable speed gramophone turntable. (*Shades of Baird's first 'Televisor' TV system too!* Ed.)

By varying the speed of the turntable and shining a light through the slots, we then had our own 'camera shutter' which could be set at any speed between an half, and a 30th of a second to an accuracy of 1 or 2 percent. (Years later we confirmed our readings using pulses of light and an electronic counter).

At first we used the prototype shutter tester ourselves, as a promotion for the new and second–hand cameras. We also started rejecting cameras that did not meet the international standards, and set about advertising the fact of our testing policy. As you can probably imagine, this caused quite a bit of 'fun', including letters from the solicitor, of a camera importer. It also got us a very nice write–up in the local paper, and eventually in national and international photographic magazines.

At this stage we knew we were onto something that was completely original, and applied for a patent. It did however, puzzle us, as to why no one else had thought of such a simple arrangement before? But having created the machine, we then discussed how we could make something that would look more like a professional instrument. The meter scale was a problem, but once again Derek solved it. If you want to know how to make a professional looking meter scale – watch this space!

Earth Loops

Last time we looked at earth loops on Hi-Fi equipment, this time we will look at earth loops in Amateur Radio equipment. On your transmitter, if the screen of the lead from the microphone input socket to the printed circuit board (p.c.b.) is earthed at both ends, this can form a loop. It's also probable, that there may be some hum injected into the microphone input line, as the loop formed will most likely couple inductively to the windings on the mains transformer.

The FT-101ZD, like most rigs, has the wires on the microphone input socket isolated from the chassis at the socket end, to cure just this problem. And no doubt the first production samples worked perfectly in the factory, or at a test site with the rig well away from the antenna. When we first sold them however they started coming back with complaints that they were distorted on some bands, and that once the microphone was keyed or the VOX activated, the rig would occasionally not switch back to receive.

As the rigs were perfectly clean, and had no problems when operated into a dummy load, it seemed that this was a case of r.f. feedback entering via the leads to the microphone socket, and to prove the point, and effect a temporary cure, I asked customers to try wrapping the mic lead round a ferrite core.

The Yaesu FT-101ZD transceiver is fitted with a four-pin microphone

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Fig. 1: How can you get to clean switches, when they're on the front panel like these on a Yaesu FT-101Z?

socket, but with only three pins used. Two of the pins are connected to the inner and outer of the screened internal mic lead, the other pin used is the push-to-talk (p.t.t.) connection lead. To affect a complete cure, I decided to bypass all three pins to chassis with capacitors at the microphone socket using the shortest leads possible for the capacitors. But what type of capacitor should I use?

Whilst, on a circuit diagram, all capacitors may look like ideal devices, in reality most capacitors are not ideal, and look like **Fig. 3** (only the value of the inductor will change. If the capacitors are of the foil-paper type construction (made up from rolled-up metal foil elements), or are wired with long leads, then they can have an appreciable amount of inductance (self-inductance) in series with them.

Because of this in-line inductance, at audio frequencies the capacitor looks like a series resonant circuit, with falling impedance as the frequency rises. But at higher radio frequencies (r.f.) this self-inductance starts to causes the capacitor to act as an r.f. choke. This of course, makes such capacitances ineffective when it comes to trying to bypass radio waves to chassis.

For most decoupling purposes disc ceramic capacitors are much better, as they have one of the lowest self-inductance when wired with short leads. Their marked value is not very accurate, often in the region of ±50%, but this usually does not matter when used as decouplers.

But what should the capacitor value be? In searching for an answer, I took into consideration that the most sensitive lead as far as r.f. is concerned is the live microphone lead. Any r.f. on this lead needs shorting completely to chassis. The higher audio frequencies (a.f.) must however be allowed to pass, and so the capacitor value has to be carefully chosen.

The impedance of the recommended microphone for the FT-101ZD is 600Ω. So, a decoupling capacitor has to have a reactance quite a lot higher than this value at the higher audio frequencies, but must have a low reactance on the h.f. amateur bands at the same time.

When tacking this type of problem I make straight for the chart in the basic theory section of the *ARRL Handbook*, this shows the reactance of various values of capacitor from low audio up to v.h.f. frequencies. According to the ARRL chart, a 10nF capacitor has a reactance of around ten times the impedance of the microphone at 3kHz, and less than 10Ω at any frequency above 1.8MHz. Hence this value is idea for the decoupling the live audio lead, and also very suitable for removing the r.f. from the p.t.t. lead, and the microphone lead outer braid as well.

Fitting three 10nF capacitors with **very short leads** across the microphone socket pins, completely cured the problem. It was as if the wires on the mic socket were short

Fig. 3: Almost all capacitors look like this combination, but how do you choose the best one for the job of decoupling r.f. but not audio from microphone lines?

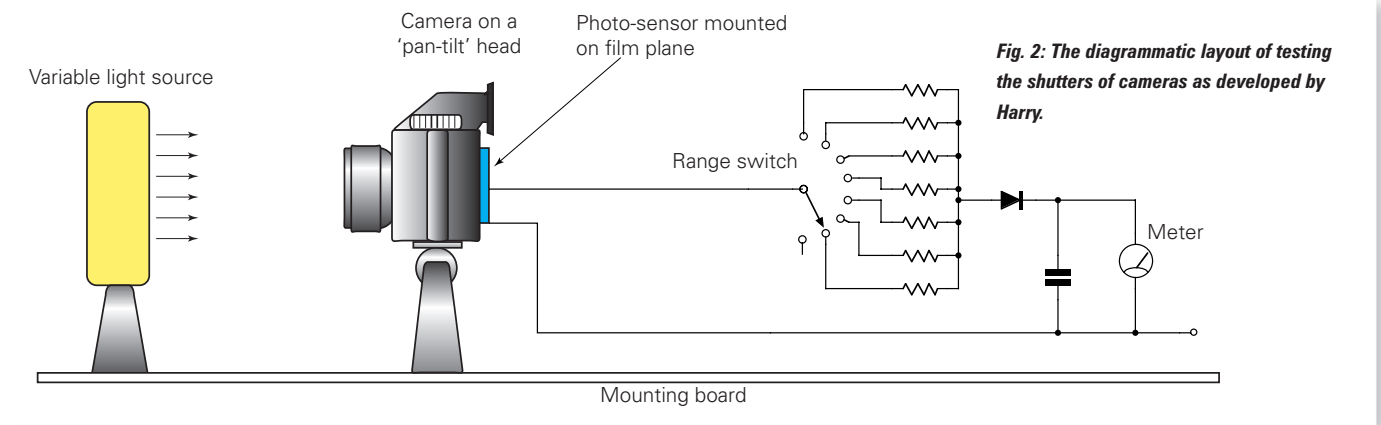

Fig. 2: The diagrammatic layout of testing the shutters of cameras as developed by Harry.

circuited to the chassis at r.f., but isolated from it at audio and mains supply frequencies. (Yaesu did something similar in later production models).

Earth loops & Modifications

Various official and unofficial add-on boards have been made for rigs, and some like tone burst or f.m. units require a connection to the microphone input. In these cases earthing can be a real problem, even for the manufacturers, and can cause some odd faults.

Later models of the FT-101ZD had an optional f.m. board, and when this was fitted I had many complaints. Some rigs had no modulation and transmitted way off frequency in the f.m. mode, others suffered from transmitted hum, more about this next time.

Whenever I heard the comment "**I've been ripped off**" I began to wonder what was the cause. I always tried to help people, but I drew the line when it came to being expected to support complaints against other dealers, especially when many of their complaints were totally unfounded.

'Joe' came in with a rather nice discone antenna that he had purchased from a CB dealer for use with his scanner. It had a length of coaxial cable and a plug attached, and he wanted to demonstrate to me that his £50 had been completely wasted, as reception with it was no better than that obtained with the scanner's pull-up whip.

I advised him that if the scanner and the discone were in the same room, I would not expect the discone to receive any better. If fact, I said that I'd expect the signal to be slightly worse, and pointed to a book on the use of scanners and suitable antennas, and suggested that he read it.

I also told him that the best kind of antenna for reception is normally a resonant one, and a pull-up whip has the advantage that it can be resonated at most frequencies in the v.h.f./u.h.f. range by simply pulling it up and down. I also said that height and a clear path to the transmitter were more important than any specific antenna.

I was tempted to say that his scanner would give its optimum performance if he perched himself on the top of a pole on his chimneystack, and had then adjusted the whip for maximum signal strength, but he might not have seen the joke!

Discone antennas are a 'jack of all frequencies compromise', in that they attempt to give a reasonable performance over a wide range. At some frequencies in their range they will not perform as well as one specifically optimised for that frequency. But they do have the advantage that they can be mounted high up in the clear, and do not need adjusting when tuning around. If your interests are specialised however, and you want for instance to listen mainly on the 144 and 430MHz Amateur bands, it would be best to purchase a dual band collinear, rather than a discone.

Funnier Than Folk!

We employed an 18-year old lad for a while on one of the Government youth training schemes. He seemed bright intelligent and helpful, but perhaps at times there was a clash of culture. One Wednesday he came to me and asked if he could have the following Saturday off.

As in a shop Saturday was the day when we normally wanted 'all hands on deck', I was somewhat taken aback at the short notice and asked him for his reason. He explained politely that he was getting married. My obvious response was 'Why on earth have you not told us before' to which he responded, "Sorry I had forgotten all about it". (Poor girl!)

Talking about remembering. I am 'hammering this column out' months ahead, but by the time you read it Christmas will be here. May I wish you all a very Happy Christmas, and a peaceful New Year, and at the same time offer a special big 'thank you' to all those who have contacted me with suggestions, questions, and constructive criticism during the past year, it is people like you who keep the column going. ●

Problems

I like to hear about problems with older equipment, particularly pre-1990 Yaesu rigs. Please E-mail me, (add some radio related term in the subject heading, to differentiate against spam), or write and enclose a stamped addressed envelope. Remember that electricity is dangerous, if you are not familiar with safety precautions you must never work on your equipment whilst it is plugged into the mains. (Switching off at the wall socket does not necessarily make equipment safe).

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How the time flies when you are having fun! I hope some of you will have taken part in some of the contests at the latter end of 2008?

Perhaps some of you have taken the plunge and bought a new paddle? Winter is the time to practice, with the long dark evenings, so try to devote a few hours a week just mastering the art of sending.

The **Affiliated Societies** team contest (usually known as the AFS) is the first major c.w. contest of the year, usually the first weekend in January and although it can be daunting for the first-timer. Hanging around in the 'QRS Corral' (slower) will give you some practice and after a while you'll gain confidence and find yourself venturing down the band. It's a four-hour event, from 2p.m. until 6p.m., so plan a supply of refreshments on the operating desk!

Stand-Alone Keyers

A lot of modern transceivers have a built in keyer so they can be a useful tool to use for practice, but stand-alone keyers are also available. I have been using an MM3 by AEA, **Fig. 1.**, for a number of years. I taught Morse with it as well, and have always been very pleased with the keyer, as it has many functions. It also includes *Doctor DX*, a contest simulator, various groupings of characters sent randomly, a QSO simulator and many others. Unfortunately it's no longer being made but occasionally you will find them on eBay. Others that are available include the **K1EL WINKEY**, **Fig 2.** Take a look at **http://www.k1el.com/** for further details.

The K1EL keyer are available in either kit form or as a ready made item and this keyer is used in the MicroHam Mk II digital interface and is extremely nice to use. However, you can get them in kit form from the USA and make up a standalone c.w. keyer.

Most transceivers have keyers built in these days, usually of the Curtis type. They perform well but it's always valuable to have a separate keyer that's provided with some memories.

Modern keyers can make us lazy however, just having – what we call locally herein Norfolk – a 'two button' QSO when working DX in a pile-up situation. There are others available, of course, so it's down to an individual choice. Hint: It pays to listen to the keyer's side tone before purchasing it – as you'll have to listen to that a lot!

Fig. 1: Roger G3LDI's MM3 keyer – made by AEA

Morse Clubs

One c.w. club that's still very active is FISTS – deriving its name from an operator's 'fist'. If you like reading about other c.w. operators and taking part in a few challenges, reading regular news letters and so on, then this might be for you. The FISTS club exists to promote the use of Morse on the air, helping newcomers to the hobby and also encourage the use of well sent Morse code.

If you would like more details, then go to their website at **www.fists.co.uk** where you'll find all the latest news, pictures and details of how to join. It's a world-wide club too, and there are activity events, frequencies used by FISTS members and so on. They even have a QSL service, together with badges, key-fobs, and soon to be available will be some audio practice CDs at varying speeds.

All this and more can be found on their web site, so take a look, you could be making new friends around the globe with similar interests. Their quarterly magazine, *Keynote*, is well worth a read. If you want to hear a few FISTs members, listen on 1.818, 3.558, 7.028, 10.118, 14.058MHz as those are the most likely frequencies.

High Speed Club

The **Radio Telegraphy High Speed Club** (HSC) was founded in 1951 as a community within the **Deutscher Amateur Radio Club** (DARC) of Radio Amateurs who are interested in high speed telegraphy. Today there are members in more than 70 countries (DXCC list) and all six continents.

The HSC is a member of the **European CW Association** (EUCW) and cooperates with other telegraphy clubs. There are extensions to this club, such as the VHSC, the SHSC, and the EHSC. I will leave you to work out just what they mean, as it might frighten you! However, it's interesting to look at the web site **www.morsecode.nl/hscn.html**

Happy New Year, 73 and may the Morse be with you! **Roger G3LDI.** ●

Fig. 2: The K1EL Winkeyer USB

Ben Nock's

valve & vintage

Ben Nock G4BXD discusses frequency synthesised man-pack radios.

A big hello once again as its my turn at manning the Valve & Vintage store! I hope you've all had a good summer, although not much sun was seen here at the Kidderminster Kollection. There's not been much done about the overcrowding on my shelves, in fact several new additions making the situation even more problematic!

So, turning the sign to 'Open' lets see what's in the store today. Despite my misgivings last time about military man-packs it seems I'm destined to keep making the same mistakes, as these offerings are yet more of the same because I don't seem to be able to say "No – enough is enough!"

The Balkans

The Balkans area of Europe has long been a volatile region, it takes its name from the Balkan Mountains that run through the centre of Bulgaria into eastern Serbia. The First World War was finally triggered by the assassination of Archduke Franz Ferdinand of Austria and his wife in Sarajevo.

During the Second World War there was much activity in the area by the likes of the British Special Operations Executive (SOE) in the fight against the German occupiers. More recently the area has produced some interesting radio equipment including the first set I'll be describing. This is the RUP-15, manufactured in the former Yugoslavia by RIZ, 'Radio Industrija Zagreb', actually in Croatia.

The RUP-15, **Fig. 1**, is a high frequency (h.f.) man-pack transceiver, running 15W p.e.p. of lower sideband, (l.s.b.), amplitude modulation (a.m.), and Morse (c.w.). The coverage is 2 to 12MHz and the set runs off internal 12V batteries. A small clip on attachment allows a whip to be mounted on the side of the set for portable vehicle borne or man-pack use, while a standard SO-239 socket allows connection of coaxial cable fed antennas for fixed or base station use.

What's most uncommon in a piece of equipment of the RUP-15's nature and role – is its generation of l.s.b. as opposed to the more normal military use of u.s.b. However, this does mean that s.s.b. can be used on 3.5, 7MHz bands. The photograph, **Fig. 2**, shows an internal view of the set's construction.

It's always hard to judge an entire line by having only one example. For example, I've had poor examples of the R1155 and also had fantastic examples of this famous Second World War set – but I have only the one example of the RUP-15.

Searching the web produces some good reports on the RUP-15, but I have to say I find my example quite poor compared to other sets of the type. The click-stop tuning mechanism for instance! On this set there's sometimes a pause while the synthesiser locks onto-frequency when the kHz knob is turned. Additionally, the quality of the a.m. produced is poor and the built-in antenna tuning unit (a.t.u.) is rather jerky and (a faulty tuning capacitor doesn't help!). Despite my reservations, it's a nice addition and this example – fortunately – is in a good cosmetic condition.

The PRC-319 Set

Yet another man-pack arrived recently (I really can't resist them!) and this time it was a PRC-319 set, manufactured by MEL, a division of Phillips. Great stead is made for this set being used by the likes of the SAS and Special Forces.

In fact, there's quite a bit of information on the '319 on the Internet and there's even a Yahoo group web site dedicated to it! While the set, **Fig. 3**, has a dedicated following it's even more Radio Amateur unfriendly than the other

Fig.1: The RUP-15 transceiver, clean lines and in nice condition.

Fig. 2: Inside the RUP-15 showing the modular construction.

Fig. 3: The PRC-319 with hand turned battery charger fitted.

man-packs I've covered recently and this is because entering a frequency to receive and transmit on takes 22 button presses!

The set covers 1.5 to 40MHz running some 50W p.e.p. of upper sideband or c.w. Frequency selection is via a 20-button keyboard on the front and the set can store up to 10 pre-set channels.

To enter a frequency for receive, the channel is selected (let's say R1) requires two presses. The frequency is entered, say 036250 (3.625MHz) so, six presses are needed, then these are stored with one more press, **Fig. 4**. Once the frequency is entered the a.a.t.u. needs to be set, the buttons R and Tune are used for this and require two presses. So, there are 11 key presses and you'll then need to do the same for the transmit frequency, hence 22 in total!

Once the 10 channels (20 frequencies) are loaded, three key presses to change receive channel, say R5 then Change, and another three for the transmit channel. Both receiver and transmitter channel then need the a.a.t.u. retuning, with two presses for each. Once this flow chart has been fully ingrained into the operator's brain's synapses – the speed of frequency change is quicker but the operator can't 'tune' across the band. The set is ideal for military use (obviously), and for operation on spot frequencies such as the QRP channels, the HF Back Pack club channels, a local net, etc., but is very limited otherwise.

In military use, a digital encoder can be fitted and digital messages sent at high speed along with high speed Morse. Two controls below the keypad allow the mode to be selected and test options, high and low power and standby mode. But beware – if it's switched to 'off' all the programmed data is lost!

Although the '319 is called a back-pack or man-pack, it couldn't be used on the move as it was originally issued as there's no provision for fitting a whip to the set. Originally it was supplied with a ground stake into which a whip fitted,with the set lying on the ground. Indeed, the a.a.t.u. can be mounted away from the set with a coaxial cable line between them.

There are in fact two tuners, see **Fig. 5**, a main a.t.u. and what is called an 'Extender' a.t.u. allowing use of small antennas at lower frequencies. However, most Amateur collector and operators have mounted whips on backpack frames along with the set or contrived some other way of mounting the whip for fully portable operation.

The space to the left of the keyboard is where the Electronic Message Unit (EMU) fits. The chart I have placed there details the various

Ben Nock G4BXD
62 Cobden Street
Kidderminster
Worcestershire DY11 6RP
E-mail: military1944@aol.com

Fig. 4: The l.c.d. readout of frequency, battery voltage and tuning state.

QRP and HF Backpack frequencies on the different bands as an 'Aide-memoire'.

Man-Pack Operations

Of the various sets I mentioned last time, the PRC-74, the SEG15D and BDR510C, the SEG15D and 510C have been used over a few weeks. Reports on the SEG's s.s.b. were very good but poor when I was using the a.m. mode. It seemed the carrier was set at around 5W and then 'talked up' to 15W. I managed to find the carrier insertion trimmer and increased the resting carrier to 10W in a hope of reducing the s.s.b. type sound effect on the am signal. Unfortunately there seems little improvement and reports are still poor. Further investigation of this problem is under way.

However, the BDR510C is proving far better on a.m, and reports are very good. Unfortunately this set generates u.s.b. only, so it's unsuitable for 3.5 or 7MHz although it would okay for the 5MHz section. Thanks to **Tony Helm G4BCX**, I now have the circuit diagram of the set and can see that there are two filters fitted in the 455kHz signal path. Thanks to Tony's help it should be possible to find and fit a replacement sideband filter and get the set on to l.s.b. making it far more usable.

And Finally!

Well that's about it for this stint at the V&V shop, and as this is my last time in house before Christmas, I wish you all a very happy time and a 'Bon Noel'. Visit my web site at **www.qsl.net/g4bxd** and as always I can be contacted via E-mail at **military1944@aol.com** Cheerio for now! ●

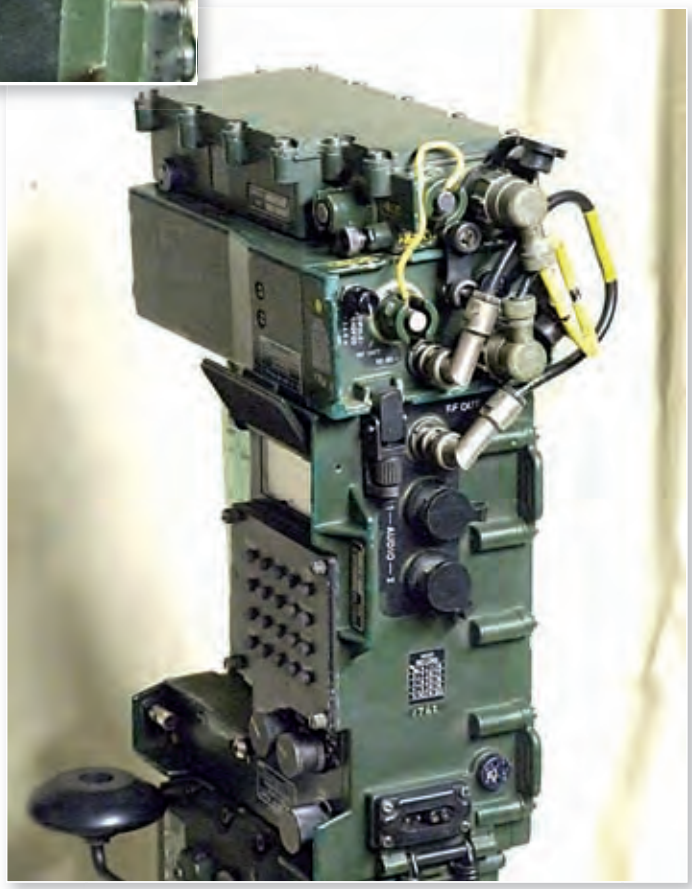


Fig. 5: The two a.t.u.s, the main tuner on top of the set, also showing the extender tuner mounted above that.

Carl Mason's

hf highlights

Share your news, views and reports with fellow readers. Reports to Carl by the 15th of each month please.

Carl Mason GW0VSW looks at your reports of conditions on the h.f. bands and a mystery plaque in Selsey Bill!

I'll begin this month with a short letter from **Tom Hutton G0HUT** in Farnborough, Hampshire who titled his letter 'A shot in a million' and went on to say "While out for the day on the South Coast I stopped off at Selsey Bill and while walking along the sea front decided to take a rest on a bench with my wife. Quite by chance the one we chose had a plaque on it which read '*Raymond John Guest 28.3.1941 – 29.8.2001, Aged 60, Gone is the face we love so dear, silent is the voice we loved to hear, G0FCE*' and I wondered if any readers recall G0FCE and who placed the plaque there?" So, over to you readers! Let us all know.

The DX News

On to this month's DX news now and first, from near the Equator, in Gabon, Western Africa, where **Roland Caillau F8EN**, who will be back to Libreville from the middle of December to mid January 2009. He will operate on the h.f. bands as **TR50R** until December 31st and as **TR8CR** from January 1st 2009. You can QSL both calls via **Jean Michel Duthilleul F6AJA, 515 Rue du Petit Hem, 59870 Bouvignies, France**.

Another French operator **Freddy Laigu F5IRO** has had a new work assignment on Martinique NA-107 until the end of February 2009 and plans to be active as **FM/F5IRO** in his spare time, usually after 2200UTC and at weekends. You can expect him to operate using c.w., digital modes and some s.s.b. voice operation on the 7, 10 and 14MHz bands with any QSLs going via his manager **David Bonnet F8CRS, 18 rue du Carmel, 67240 Bischwiller, France**, direct or through the bureau. His last log can be found at **http://lesnouvellesdx.fr/voirlogs.php**

Across 'the pond' **Jay Allen VY1JA** is taking a new work assignment in the Canadian Forces Station *Alert* on Ellesmere Island NA-008, mentioned in readers' reports last month. Jay will remain there for some 11 months and during his stay he'll be operating as **VY1JA/VY0** using a vertical or sloping dipole. The QSL is via **Steven Larson N3SL, 22 N Hidden Acres Drive, Sioux City, IA 51108-8641, USA**. Interestingly, *Alert* is named after *HMS Alert*, a British warship that wintered nearby in 1875-76 and onboard was **Sir George Nares** who became the first known person to reach the northern end of Ellesmere Island.

A weather station was established on Ellesmere Islland in 1950 and the military station in 1958. There have been several accidents there including the crash of a C-130 Hercules, which came down 30km (19 miles) short of the runway on October 30th 1991 when 4 of the 18 crew died. The pilot was one of those who died during the 30 hours it took the search and rescue teams to reach the crash site due to severe blizzard conditions. The event prompted several books including *Death and Deliverance: The True Story of an Airplane Crash at the North Pole* by Robert Mason Lee and even a film called *Ordeal In The Arctic* starring Richard Chamberlain.

Continuing the French theme, **Nicolas Chatelain F4EGX** has begun working at Dumont d'Urville Base on Petrel Island AN-017 in Antarctica until the middle of December. You can expect Nicolas to operate in his spare time using s.s.b. as **FT5YI** and a QSL will be available via his home call. Check his website at **http://f4egx.homelinux.net/** for more information.

Also in Antarctic **Bob Branford VK2ABP/VK2MRP** who should be working at Davis Base until at least the March 7th 2009. Davis is the most southerly Australian Antarctic station and is situated 2,250 nautical miles south-south-west of Perth, on the Ingrid Christensen Coast of Princess Elizabeth Land. As this is a work assignment Bob, does not know when he will be able to operate on the h.f. bands so, finding him could be a little difficult. His callsign will be **VK0BP** and updates will be available at **www.vk0bp.org** The QSL route is via **Allan Meredith VK2CA, P.O. Box 890,**

Carl Mason GW0VSW
2, Golwg-y-Bryn,
Woodland Road,
Skewen,
Neath Port Talbot,
SA10 6SP
Tel: 01792 501176
E-Mail: gw0vsw@btinternet.com

Mudgee NSW 2850, Australia. You can check out "Davis Base" at **www.aad.gov.au/default.asp?casid=404**

Finally, The Institut National Belge de Radiodiffusion (INR) began television broadcasting from Brussels in 1953 and to celebrate that anniversary the Club Radio de Durnal (ON4CRD) will be active on most h.f. bands as **ON55INR** until the 31st December. A QSL is good via bureau.

You Tube

I was browsing the internet site 'You Tube' recently and came across an interesting short film that may be of interest to you. Made in 1937 'On The Air' explains in simple terms just how radio works and has been made available by **Gregg OH2FYY** – who says he added the film as a 'joke'. However, it is obviously popular as there have been well over 6,000 viewings to date. You can find the film at **http://uk.youtube.com/watch?v=6VHtZr_xsT8**

Ethical Operating

Now to touch on the subject of ethical Amateur Radio operations. Poor radio operating, deliberate jamming and abuse are some of the more unfortunate aspects of our hobby and something we have all experienced at one time or another. The June meeting of the IARU Administrative Council (A-C) bought the subject up and has noted that "**poor operating behaviour adversely affects the enjoyment of all radio amateurs and does not enhance the reputation of the Amateur Radio Services**.

"The Administrative Council has therefore resolved that all Radio Amateurs are encouraged to operate to the highest levels of proficiency and with proper consideration for others using the amateur radio bands." It also said, "that member-societies make every effort to teach newcomers and others correct operating behaviour". The Council has therefore endorsed and recommended the principles set out in the booklet *Ethics and Operating Procedures for the Radio Amateur* by **John Devoldere ON4UN** and **Marc Demeuleneere ON4WW**.

The A-C wants to encourage each IARU Region to consider adopting the booklet and adding any variations that they feel might be appropriate to their region. The 67-page booklet is currently available for free download from a number of websites including the RSGB's so take the time to check out **www.rsgb.org/operating/** and see what you think!

The booklet does make an interesting read and explains many things including the correct use of phonetics and Q-codes to making a QSO and using band Plans. Anything that helps us all to improve our operating standards on the bands can only be a good thing. Let me know what you think!

Working DX By Phone

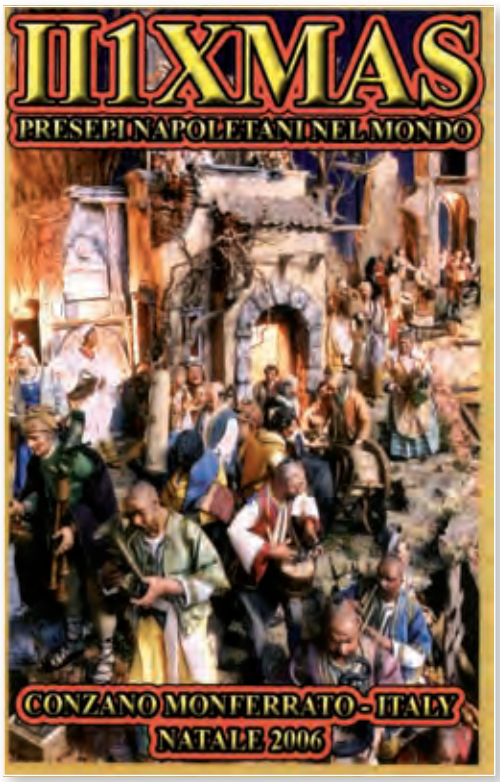
It is not often that you hear of 'Ham' software for use with a mobile device. So, those of you with a *Windows*-based mobile 'phone may be interested in a product recently developed by **Igor Tomalchev UU0JC**. The programme *DXPocket* is a DX Cluster application, that will enable you to connect to your favourite DX Cluster via the Telenet service.

So, on your 'phone, with just a few taps of the keyboard, you can find a known station in the Cluster, obtain DXCC information, send DX Spots and announce or make WWV reports. The demonstration application can be downloaded free of charge and will run for 30 days. After that time, you will need to register the product at a cost of $20. When you need to register the software, you'll find further details and screenshots, at **http://www.dxpocket.com/**

Your Reports

Now on to your reports. The log of **Leighton Smart GW0LBI** in Trelewis, Mid Glamorgan starts us off this month. Leighton was using a Yaesu FT-100 and 5W c.w. to a 55m inverted–L antenna, with a set of tuned counterpoises. Leighton lists late evening contacts with OZ1CTK (Denmark), EA6/DL5DSM (Balearic Islands) EU-004, OH0/G3FM (Aland Islands) EU-002 and ER4ER (Belarus) using around 2300 while 100W found 6W/DL4JS (Senegal) a new entity on the band and K1LZ (U.S.A.) in Natick, Massachusetts. A change to s.s.b. and CN2R (Morocco), EA9KA (Ceuta & Melilla), CQ9K (Madeira Islands) AF-014, AO8A (Canary Islands) AF-004, RU6LA (European Russia) and US5ED (Ukraine) were all logged.

Over on the Isle of Sheppy in Kent, 'all c.w. man' **Ted Trowell G2HKU**, worked JW8BCA (Svalbard) EU-026, TF4M (Iceland) EU-021 and LX1DA (Luxemburg) using his Ten Tec Omni V and 70W to a Butternut Vertical antenna. Moving to 3.5MHz Ted



managed a 5W QRP contact with OH0/DL2SWW (Aland Islands) around 2100UTC and using an Icom IC-703.

Also on the band, **Eric Masters G0KRT,** in Worcester Park, Surrey and he was using a Kenwood TS-570 at 100W s.s.b. Feeding his signal into a modified W3EDP antenna he found HB3YAV (Switzerland) at 1928 and a little later, he found SM6/DJ7UA (Sweden) at 1934UTC.

The 7MHz Band

On 7MHz Eric found LY7A (Lithuania) 0628, RW3QJA (European Russia) 1628, EA3RR (Spain) 1916 and then had a two–way QRP contact with IW3IMF (Italy) at 1919UTC.

Also operating on the band was **Martyn Medcalf M3VAM,** in Chelmsford, Essex who logged OL4HQ (Czech Republic) 1022 and GB7QH 1028 using his Icom IC-746, feeding his SGC-237 auto tuner into an half-sized G5RV antenna.

Having some time to 'play radio' was **Steve Norman 2E0MVB** in Newmarket Suffolk who used a Kenwood TS-570D and 35W to a G5RV antenna, Using PSK31, he worked stations EA8FJ (Canary Islands) 0040, K1NKA (U.S.A.) in Rowley, Massachusetts at 0047, UT7ZZ (Ukraine) 0059, OH8GKP (Finland) 0818, DG6OBP (Germany) 0826, IT2PJ (Italy) 1743, SV9AHZ (Crete) EU-015 at 1756, SP1DOZ (Poland) 1809, CT1BWU (Portugal) 1815and Sm4SXQ (Sweden) at 1843UTC.

Owen Williams G0PHY in Biggleswade, Bedfordshire managed to get OJ0B, at Market Reef (EU-053) in the log at 2011UTC. For this entry, he used his Yaesu FT-747 and s.s.b. at 100W to a dipole antenna.

The 14MHz & 18MHz Bands

On 14MHz Owen found CU7/DH3NB (Azores) EU-175 at 1720, W4PL (U.S.A.) on Hatteras Island, North Carolina at 1809 and VE7IG/P/9 on NA-068 New Brunswick Province at 1937UTC.

The PSK31 signals of Steve 2E0MVB worked 9A7OLP (Croatia) 0803, RK6DH (European Russia) 1029, IK2HNG (Italy) 1034, HG5BMZ (Hungary) 1110, TF3GC (Iceland) EU-021 at 1119, UN7DA (Kazakhstan) 1136, EW1AD (Belarus) 1218, YU1LC (Serbia) 1226, F4EZD (France) 1254, YL2MR (Latvia) 1332, and YO50AW (Romania) at 1530UTC.

In East Finchley, London **Martin Addison 2E0MCA** spent a good deal of time logging EA8/DL8NBR (Canary Islands) 0835, ZA0/I8LWL (Albania) on Sazan Island EU-169 at 0847, LY70W (Lithuania) 0854, IU8SRE (Italy) 1215, KF3B (USA) in Alberis, Pennsylvania at 1224, YR8D (Romania) 1448, SV9CVY (Crete) EU-015 at 1458, LZ1BJ (Bulgaria) 1500, OH4XX (Finland) 1502, EW8KY (Belarus) 1504 and IM0/IK0FMB (Sardinia) EU-165 at 1600UTC using a Heil headset modulating his Yaesu FT-2000, to a 50W power level into a G5RV antenna.

Back in Essex Martyn M3VAM had voice contacts with SN0HQ (Poland) 1010, LY9A (Lithuania) 1015, YT8HQ (Serbia) 1225, US5D (Ukraine) 1415, EW5HQ (Belarus) 1241 and RW3F (European Russia) at 1243UTC.

Moving up to 18MHz Eric G0KRT used c.w. to find K8CW (USA) in Mansfield, Ohio at 1401 and s.s.b. again to log 9H4DX (Malta) EU-023 at 1600UTC all with 100W.

Martin 2E0MCA had QSOs with K4PV (USA) in Milton, Florida at 1324 and NN3W in Vienna, Virginia at 1401 while Ted G2HKU also worked K8CW at 1500UTC.

Finally Steve 2E0MVB worked s.s.b. stations RA3RBL (in European Russia) 0855, EE5GG (Spain) 1015, VK4FNQ (Australia) OC-001 in Charters Towers, Queensland at 1025, 7X/DB1JAW (Algeria) 1108 and ZC4VJ (U.K. Sovereign Bases on Cyprus) AS-004 at 1300. These were followed by 9M2CNC (West Malaysia) at 1540UTC, while running 50W from a Yaesu FT-857D.

The 28MHz Band

The 28MHz band was very quiet over the period, and Eric G0KRT worked just one station, OL600VB (Czech Republic) at 1342UTC (QSLs to go via OK2JS). In his report, Eric also asked me to mention the 'Home Counties 10–metre s.s.b. net', which operates every Saturday at 2100 local time on 28.500MHz. Members welcome anyone calling in and they encourage more activity during the sunspot minimum. Carlos G1UAI, Bill G4MHO/M, James M0BOV and Frank G3ZMF all called in just after the net opened, even though conditions were very poor at the time!

Signing Off

Well once again that's about it for another month and indeed almost for another calendar year as I write this column. My thanks to everyone who has contributed to the column over the past twelve months and to **Mauro Pregliasco I1JQJ/KB2TJM** editor of the 425 DX Newsletter for all the DX information. Until next time I wish you all a very Happy Christmas.

73, Carl GW0VSW ●

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ICOM IC-746 mint, boxed and manual, £550. Base mic MP-4000 NLS syncron, unused, £15. MFJ Deluxe Versa Tuner II, £40. Sharmans SWR power meter, SWR 2000, £20. No timewasters. Tel: Erv 2E0UTP 0191 529 4732 (Tyne and Wear).

ICOM IC-703 DSP mint condition, £280. Watson PSU W-25 AM, mint, £45. Kenwood TH-F7 2m, 70cm dual bander, £95. Alinco DJ-V17 2 mtr, £50. Tel: Joe M3UVJ 01843 864618 after 6pm (Kent).

ICOM IC-756PRO boxed, mint, £700. Drake R-8E receiver, mint, £300. NEIM 1031 DSP filter, £70. Tel: John G4XYY 01937 844197 (West Yorkshire).

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VALVES 6080WA x 10, new, Thompson boxed. CV345 x 13 STC boxed. S11E12 x 5 boxed, Gov. 11E3 x 2. Any offers. Tel: 01353 663362 (Cambridgeshire).

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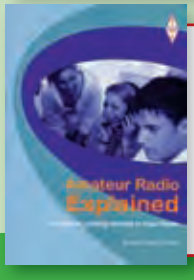

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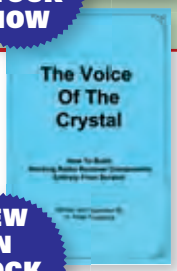

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Rob Mannion's

topical talk

This month Rob Mannion G3XFD discusses feedback on the *In Focus* feature, Rhombic antennas and the *In Vision* column.

The *PW* features *Amateur Radio In Focus*, were introduced to provide Amateur Radio clubs and associated organisations, free publicity and encouragement. The articles form an important part of our active support for the Amateur radio hobby and the Editorial team is pleased with the way they are working.

However, despite the fact that *In Focus* seems to be appreciated with everyone involved – we've not received as many feed-back letters from readers as I expected. That was until the article featuring the **British Railways Amateur Radio Society** (BRARS) appeared in the December 2008 issue of *PW*!

The letter (Letters pages this issue) from **Paul Bradfield G1GSN**, typifies the response to the BRARS article, where old friends have been featured. And, of course, due to my own connection to the Society as a founding member, I had many memories stirred while I prepared the article for publication. I was delighted that *In Focus* helped Paul G1GSN, fill a gap with a photograph of his late friend **John G2HOX**.

However, I was a little disappointed that we – due to lack of space in that issue – had to leave out a special scanned-in article from the *Short Wave Magazine* from 1966. The scanned-in article featured the late **Ron 'Snowy' Hooper G3SCW** on duty at Tavistock North Railway Station that year, shortly before the station closed. In fact, the *SWM* article was temporarily re-titled that month and appeared as *The Man's Other Station*! Ron G3SCW was a great friend and there are many personal family connections to the old railway station for me – but that's another story!

I also had an E-mail from my friend **Paul Hunt G8CRZ**, who lived and worked in the Torbay area of South Devon and knew 'Snowy' G3SCW very well. The letters from John and Paul (and many comments from other readers) show how useful the *In Focus* series can be. So, I ask anyone who might be thinking of promoting their club to contact me to request the *In Focus Guide*, which can now – thanks to **Tex Swann G1TEX** – be E-mailed as a PDF. Let's be hearing from you!

Rhombic Antennas

David Butler G4ASR's support (Letters this issue) for a possible *PW* 70MHz contest is very encouraging, and his memories of Rhombic antennas are fascinating! Strangely enough, I often came across v.h.f. Rhombic antenna erected by the old Post Office Telephones (later British Telecom), which were used for v.h.f. radiotelephone-link services in the Highlands and Islands of Scotland. In fact, I remember one telephone box that relied solely on its own transmitter, with an associated Rhombic on the hill above!

Additionally, the late **Canon Ian Gillies**, the Priest in Arisaig, near Mallaig, erected a Band I v.h.f. Rhombic antenna in the early 1970s, to get the old 405-line TV service (via cable) to the village. The system was very effective, with the antenna surviving many a gale on its hilltop, which was the very reason why he used it in the first place! Ian was also wonderful carpenter and many left over cable drums were turned into remarkable coffee tables, with very few visitors to Ian's home recognising what they were originally!

Even though they can be big, I'm surprised that the v.h.f. Rhombic design isn't used much in Amateur Radio, especially with enthusiastic DXpedition groups. Having used Rhombics myself on Scottish mountainsides (for remote TV installations) I think we're missing out on a good, robust directional antenna!

Graham Hankins G8EMX

Graham Hankins G8EMX and I chatted at the Leicester Show and we discussed his *In Vision* ATV column. Fortunately, Graham was pleased we didn't want to lose him as an author and he was very happy to agree to carry on with his excellent 'tell it as it is' style! So, on behalf of *PW* and the many readers who've asked you to continue writing your column Graham – thanks for your decision!

From everyone on the *PW* team, I wish a happy Christmas and New Year to our readers, contributors and advertisers worldwide.

Rob Mannion G3XFD/EI5IW

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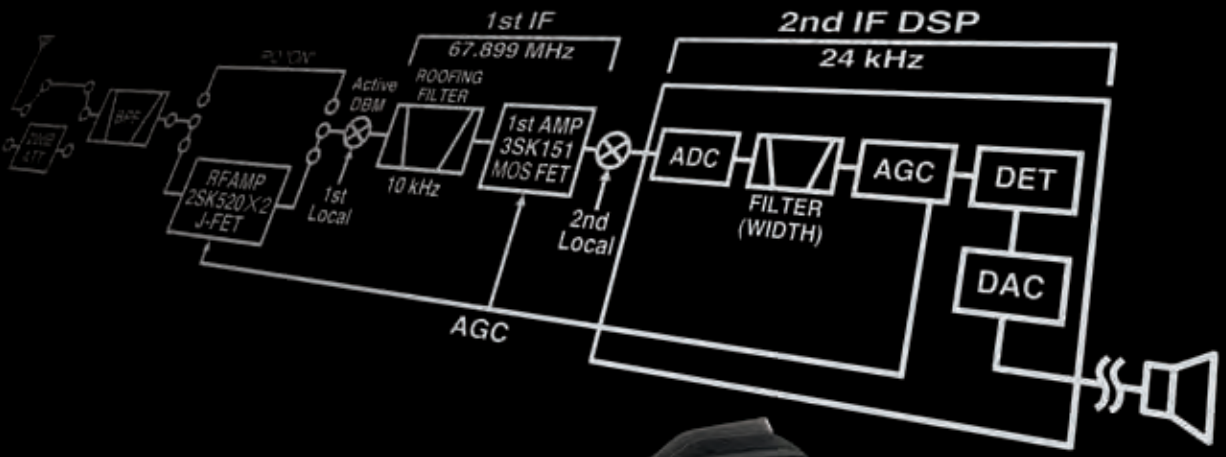

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