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Reviewed

PW 2009 70MHz QRP Contest Results

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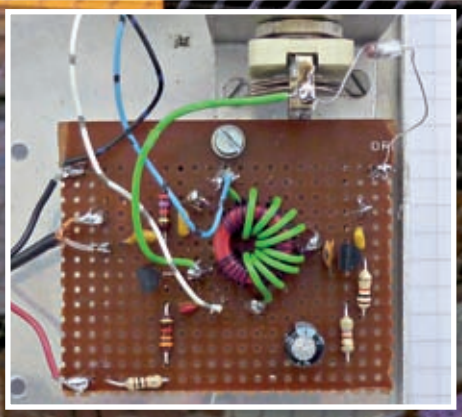

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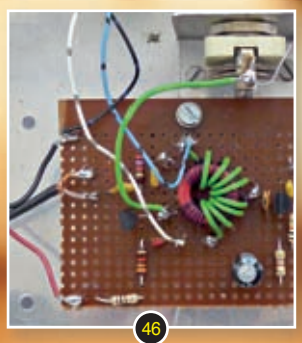

Practical Wireless December 2009

contents

Volume 85. Number 12. Issue 1231. On sale 12 November 2009

Cover Subject
Paul Irwin GI6FEN had his 60 minutes of fame on the fourth plinth in Trafalgar Square.
Cover design by **Steve Hunt**.

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Rob Mannion's

keylines

Rob discusses the vital part Amateur Radio plays in the aftermath of disasters.

Whenever, and wherever, natural disasters occur in the world, Amateur Radio comes to the fore in providing emergency communications. All too frequently it seems, as another natural disaster occurs, the media contacts *PW* to enquire if we know of any active Radio Amateurs who are involved.

Invariably, we'll know of the disasters (often feeling helpless at the same time) but it's not often that we know of anyone who is directly involved. I usually suggest that the media should contact the **International Committee of the Red Cross** (**ICRC**) in Geneva Switzerland and (where appropriate) the **Red Crescent** organisation, that operates in Islamic countries. These organisations have their own communication systems and carry out their work very effectively.

Incidentally, I think that most Radio Amateurs are never really surprised when the media suddenly seems to become aware of our international hobby whenever there's a war or disaster! Indeed, **Tex Swann G1TEX** and I often chuckle at the memories of the frenetic telephone calls from the general media when they discovered just how many members of the Kuwaiti Royal family were Radio Amateurs, following the attack on their country by Iraq in 1990.

However, to be fair to my professional journalist colleagues, who were anxious to get information from **any** resident in Kuwait who could provide details. The hoary old phrase *It's an ill wind.....* comes to mind here as Amateur Radio was again really given a great deal of publicity, before the TV cameras pointed elsewhere and we were again left alone to enjoy the hobby.

Of course, nowadays everyone is made fully aware of the many (forgive the unfortunate – but appropriate term) 'newsworthy' disasters, where Radio Amateurs might be playing a part providing emergency communications. However, I have been reminded that it's all too easy to forget that there are many other occasions – completely unsung, except within the hobby – where Radio Amateurs are providing pre-arranged non-emergency communications on an almost day-to-day basis.

Indeed, here in the UK we have the **Radio Amateurs' Emergency Network** (RAYNET) and in the Republic of Ireland the **Amateur Radio Emergency Network** (AREN). Both organisations are busy providing radio communications for everything, from marathon races to sponsored walks, cycling and other endurance events. At the same time their members are on-call ready to provide full emergency communications anywhere within this extensive group of Islands scattered off the European coastline. And those occasions arise quite frequently.

News Of RAYNET

Occasionally (though not often enough unfortunately!) we are able to publish news stories from RAYNET groups, or mention their activities, which range from supporting literally everything from providing communications and marshalling staff at Amateur Radio rallies and other events.

However, I think there's much more *PW* could do to support this very worthwhile aspect of Amateur Radio. Although, I know much has changed since my days in RAYNET, when my Morris *Minor* was equipped with an ancient Pye *Reporter* – with less than 1W of radio frequency (r.f.) output of amplitude modulation (a.m.) on 144MHz!

Despite my lack of experience with modern day RAYNET activities, I'm sure that they have supporters who read *PW* and I encourage them to take the opportunity of featuring their group in the *In Focus* (*IF*) series. We introduced the *IF* articles to help all aspects of our hobby to promote their activities.

Last month, in the November *PW*, the **Kilmarnock & Loudon Amateur Radio Club**, based in Ayrshire took their turn in the *IF* spotlight and we'd be pleased if more groups – including RAYNET– would like to be featured. So, please contact the *PW* offices and your *In Focus Guide* will be E-mailed to you!

Thank You Everyone!

I'm most grateful for the many 'get well soon' greetings that have come my way in the months I've been suffering from health problems, which have seriously affected my mobility. Both Tex G1TEX and **Steve Hunt** have passed your messages on from the rallies and shows they've recently attended. I'm also particularly grateful for the understanding shown by those clubs who've had *PW* visits postponed. You can all be sure that following surgery, I'll be back on the road again soon – looking forward to meeting friends again!

Rob Mannion G3XFD/EI5IW

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Technical Help
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.

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*.

Telford Rally Problems

Dear Rob,
I thought you might be interested in the following letter, following all the problems with dates and venues for the 60 plus radio rally type events in the UK this year. It certainly gave us a headache in Telford, as the final date was our third choice !

I've also attached a couple of photos from our event in September which gives it a bit more graphic appeal for readers. I hope you agree !

After more than 30 years of organising a radio rally in the Telford area of Shropshire, we are hoping that a little more common sense may prevail next year. I am referring to the aspect of settling dates and venues for such events, which have always been a little problematic, since all organisers wish to avoid clashes with other similar events in their part of the country, and have to find a suitable venue which is available on a specific date.

This year, however, has been like no other! **Telford & District Amateur Radio Society** finally settled for September 6th, having announced two previous 'firm' dates for our show. A mixture of dithering by certain organisers and commercial pressure from the trade on the RSGB may have led to this year's problems.

However, that is now water under the bridge. When our day arrived, all went well, as you can see from the attached photograph(s). Attendance by traders was up this year, and numbers coming through the entrance was about the same as in 2008, for which we are most grateful.

In the November issue of *PW*, the funding of beacons and repeaters was mentioned (in the *Letters* pages and *Topical Talk*) and the Telford Radio Rally already helps to fund our three microwave propagation beacons (GB3ZME) as well as our voice repeater GB3TF. As a result, we have never asked for donations.

But what about next year? To avoid this year's debacle, we have made arrangements already to go for **Sunday September 5th**. Our venue, the superb *Enginuity* hands-on technology centre, has been booked, and the Barbecue Summer promised for 2009 by the weather people has been moved to early September 2010! Other radio rally organisers, RSGB, would-be visitors and exhibitors – please note! Yours sincerely.

Martyn Vincent G3UKV
Telford & DARS
Telford, Shropshire
E-mail ukv@ukv.me.uk
Website www.tdars.org/

Star Letter

Berlin Wall Down!

Dear Rob,
As we are just about to celebrate the 20th anniversary of the fall of the Berlin Wall, I was rather amused to see that the map on page 25 of this month's *PW (November issue)*, illustrating the 2009 *PW* 144 MHz QRP Contest Results, still shows East and West Germany as separate countries, along with the prefixes "DA-DL" and "DM" respectively, and West Berlin as an island in the middle of Eastern Germany. Fortunately, this map is now only of nostalgic value as DM prefixes are now also available for the whole of Germany, and as far as I know, Y2 is no longer issued and as rumours have it, has been returned to the ITU. Still, it has been only a slight historic glitch in an excellent magazine that helps me to brush up my English "on the side" whilst enjoying the variety of information around my favourite hobby. Keep up the good work! All the best, 73!
Norbert Volz DL6VN
Platenstrasse
Ludwigshafen
Germany

Editor's reply: *My apologies for the error Norbert! You have 'eagle eyes' Sir, because I'm afraid that I didn't notice the problem until you pointed it out. However, you can be sure that we'll be extremely careful next year, ensuring a modern map is used. Incidentally, there's an old saying in publishing that's proved every day – 'you can be sure that mistakes will jump off the page at you – after publication'!*

Old Callsigns & G3KPO Collection

Dear Rob,
I read the request for help from **Robert Hanley** regarding his late father Geoff Hanley (*Letters* section in September's *PW*) – with interest. My copy of *Radio Amateur Callbook Magazine*, Spring 1937 issue, shows: G5AW = A. E. Wood, 14 College Rd, Preston Rd, N. Wembley, Middlesex. There is no entry for G8LP. This was a USA based publication and I suspect that updates took some time to get across the Atlantic to its base in Chicago. Interestingly, it states that "This is the official call book of the Radio Society of Great Britain ..." but my copy omits all G3 callsigns with two-letter suffices.

My *RSGB Amateur Radio Call Book* of 1960 shows: G5AW = A. E. Wood, 64 Norval Road, North Wembley, Middlesex. There is no entry for G8LP. My guess is that your father was in-between callsigns when that 1937 Callbook was published and that his G8LP callsign had closed down by the time that the 1960 *Call Book* was compiled.

I've also heard (elsewhere) that **Peter Whatley** has been about his late father, **G2BY**. Peter says that much of his father's radio collection, including his log books, were passed to **Douglas Byrne G3KPO** and he asks if anyone knows what happened to G3KPO's collection after his death.

There is some information in **http://www.m0tiw.co.uk/G3KPO.htm** but this concentrates more on the Marconi collection than on G3KPO's collection. Browsing the postings at **http://www.vintage-radio.net/forum/showthread.php?t=16169** I get the impression that G3KPO's collection may have been broken up and sold off. So, Rob, that's why I ask if you or any reader knows what happened to the G3KPO collection, please contact me so I can pass it on.

Ian Brothwell G4EAN
Arnold
Nottingham
Ian.Brothwell@talktalk.net

I Just Love This Hobby! (I really do!)

Dear Rob,
I'm a newcomer to Amateur Radio, having had my licence since the end of March 2009. So far I am very pleased with the results I have been achieving with the very basic equipment I'm running.

I operate a 5W QRP station from my bedroom in the Kingdom of Fife using nothing more than an Yaesu FT-817 and a half-sized G5RV, but still it gets me contacts from Europe and Russia to Central and Northern America. If I am achieving these results at 5W, imagine what could be done when I get my 2M0 call!

As I write, I am actively seeking to take the Intermediate course, and hope to develop my love for the hobby. However I seem to have caught the QRP bug and may end up sticking to lower powers anyway. I just thought I would write and say, "I just love this hobby!" Many regards.

Steven Scott MM6TMS
Cowdenbeath
Fife
Scotland

Editor's comments: *It's truly heartwarming to hear from newcomers to the hobby who are enjoying themselves Steven. Congratulations and I wish you well as you progress through the hobby and, on that point, I am really impressed at the number of Foundation Licencees who are working towards their Intermediate Licence. Please join me on the* Topical Talk *page for further discussion.*

The 5SC Radio Circle

Dear Rob,
I'm writing to you following the publication of the origin of the 5SC Radio Circle Badge from **Dale** (**Slim**) **Haines G4IPZ** in the October 2009 issue of *PW Letters*.The Radio Circle was the name given by the British Broadcasting Company (BBC) to its Childrens' Hour Club, which young listeners could join.

The BBC stations were then town or city based from 1922 right up to the start of the Regional Scheme in 1929 (by this time it had become the British

Advice From A Professional Installer

Dear Rob,
I was very interested to note the comments made by Steve Ward **G4MVL** in the September issue, under the intro 'Advice From a Professional Installer'. He goes onto to describe the way to get to the battery through the bulkhead of the car,something most keen mobile operators have done in their time. However, in doing this, there is always the risk of causing damage if a mistake is made,I would not dream of doing it on my new car.

There is another way to power your h.f/v.h.f. radio without drilling any holes, by investing in the MFJ-4403 Voltage Conditioner, it does come at a cost but just plugs into the cigarette lighter style socket supply, which always seems to be in a handy position. I run my Icom IC-706 and an Alinco 430MHz (70cm) radio via this unit. The only changes I made to the MFJ unit was to change the cigarette plug with a heavy duty one from a motor factor which incorporates a small tube in the plug, into which the 10A fuse drops into. This is important to stop any arcing.

The unit allows me to run up to 60W on h.f., which is quite sufficient to work the world from the car. The MFJ-4403 is fully protected against incorrect voltage connections and comes with additional heavy duty fuses. I've found it to be very useful when out with Raynet and its simplicity and small size means that it can be removed from the vehicle when not in use. I hope this information might be of interest to your readers. Regards,

Geoff Pendrick M5GAC
Spondon
Derbyshire

Amateur Radio On The Fourth Plinth?

Dear Rob,
My wife **Jean** and I enjoyed a weekend coach trip to see the sights in London recently – a very early start from Yorkshire on Saturday morning and quite late back return too. Part of our trip's itinerary included a tour past the Palace of Westminster – I didn't know it was called a Palace until the guide mentioned it – perhaps that's why our MPs need so many expenses if they're paying 'Palace' prices? Joking apart, we throughly enjoyed the tour and the trip on the River Thames too.

Part of our tour passed by Trafalgar Square and I think that Lord Nelson looking down from his column, would have been amused at the activities going on below at the fourth plinth! As our coach went by they were lifting someone up using something like the special tractors that our local farmers use to load the giant Shredded Wheat biscuits that have replaced hay bales nowadays.

I don't know what was going on that day as there was a big crowd as we drive by, with lots of press and TV cameras in evidence. However, to my knowledge I haven't heard of any Amateur Radio activities from the plinth. What a pity – it could of provided good publicity for Amateur Radio – nobody seems to have taken up the challenge. Or have I missed something! Finally, thanks for the E-mails, and I'm sorry to say **I'm not related** to the local John Smith's product you and **Tex G1TEX** have seen on your way past Tadcaster. Like your family, we were a railway family, which meant a limit to sampling (the other) Mr Smith's product! Hoping to be on the air soon, my regards to Tex and yourself. Thank you for supporting the Newark Show, my wife and I enjoyed chatting to **Steve** first, before catching up with Tex. Hope to see you there next year Rob! Best wishes.
Barry Smith
Tadcaster
North Yorkshire

Editor's comment: *Thanks for your E-mail Barry and I enjoyed our correspondence. I'm delighted you enjoyed the Newark Show and meeting Steve Hunt and Tex (see the item on the Newark Show from **Steve** on the news pages). I'm looking forward to the 2010 Newark event and I'm sure you'll enjoy the news item featuring a very brave (I don't agree with the suggestion 'foolhardy' for one moment) **Paul Irwin GI6FEN** who has been well and truly 'plinthed'!*

Broadcasting Corporation) and each station made its own programmes for children.

The 5SC callsign was that of the station based in Glasgow. London was the well known 2LO and Edinburgh was 2EH.

With the start of the Regional Scheme in 1929, with the London station at Brookmans Park and each transmitting site site transmitted two services – the National Programme and the appropriate Regional Programme. As the Second World War approached the Regional Transmitters were synchronised from September 1939 to deny the German Luftwaffe a direction finding system every station transmitted the same programme – the *Home Service*. The name continued until 1967 when it became BBC Radio 4.

I would think that the Radio Circular badges are quite a rarity these days and it is a significant piece of British Broadcasting history. Many thanks thanks for an excellent magazine. I look forward to its arrival each month. With best wishes.
Stephen Slater G0PQB
Borehamwood
Hertfordshire

Editor's comment: *Thank you for the information Stephen and also to the other readers who contacted the office to try to help Slim. Our readers obviously have a great interest in the history of broadcasting in the UK and*

A great deal of correspondence intended for 'letters' now arrives via E-mail, and although there's no problem in general, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please include your full postal address and callsign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'. **Editor**

Send your letters to:
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E-mail: pwletters@pwpublishing.ltd.uk

I again recommend the truly superb BBC Engineering History 1922 – 1972 *by **Edward Pawley**, published by the BBC. Although long out of print it is often available second-hand and through libraries and Amazon UK, and has a fascinating chapter where the Second World War synchronising techniques are described in detail.*

Replacements For Incandescent Bulbs

Dear Rob,
There are replacements for incandescent lamps which are not fluorescents. They use more than the fluorescent types, but use up to 30% less energy than the old tungsten filament types.

These have a small amount of halogen gas inside the envelope, but still use a tungsten filament. The blurb from the Philips advertisement for their 105 Watt unit, which would be the replacement for your 150 Watt 'normal' lamps says the following. *"105W Philips Eco Classic, A-Shape. These 105W halogen GLS bulbs are a direct replacement for a 150W incandescent GLS. Halogen lamps are fully dimmable and give instant 100% light output. With twice the lamp life and pure bright halogen light, these Philips halogen GLS light bulbs are an excellent alternative to incandescent GLS bulbs. Same familiar light bulb shape, same light output... yet less expense. Simply replacing the standard bulb for a HALOGEN Energy Saver with 30% lower wattage yields the same light with twice the product life. Minimising your lamp replacement and electricity costs."*
I hope this helps.
Dave Ackrill G0DJA
(Energy Conservation Engineer)
Bolsover, Derbyshire

National Hamfest - A Leap of Faith!

The RSGB and The Lincoln Shortwave Club have just staged the biggest Radio Show seen in the UK in many a year at the Newark and Nottingham Showground. **Steve Hunt**, PW Publishing Ltd.'s Rally Manager reports.

"The decision to organise such a huge event was taken quickly and the hard work began just 16 weeks before the doors opened to radio enthusiasts on Friday and Saturday, October 2nd and 3rd.

Major radio importers and traders supported the event, which should have guaranteed a healthy turnout, but there were still a few fingers crossed that the new show would be well attended by paying customers!

"Any fears were unfounded though, as an estimated 2500 people attended over the two days, making for a busy atmosphere and providing brisk trade for the companies who displayed their wares – from expensive rigs and antenna arrays to 75p datacards!

"The stars of the show though, on both days, were the many volunteers in red and yellow fluorescent jackets from the **Lincoln Shortwave Club**. They were busy and efficiently going about their various duties, from a welcome at the entrance to constant help in and around the venue The show would not have been such a success without their valuable support and I hope that they are very proud of their achievement.

"The success of this year's aptly named 'National Hamfest' has meant that it will now be an important annual date in the rally calendar. Next year's event is provisionally booked for October 1st and 2nd 2010 and, with more time to organise, the event may well include a lecture programme and a possible marquee for an 'indoor' flea market. Mark it in your 2010 diary as soon as you get one and the PW Publishing Ltd. Team look forward to seeing you there!"

Nevada Wins The Rob Williams Business Enterprise Award 2009

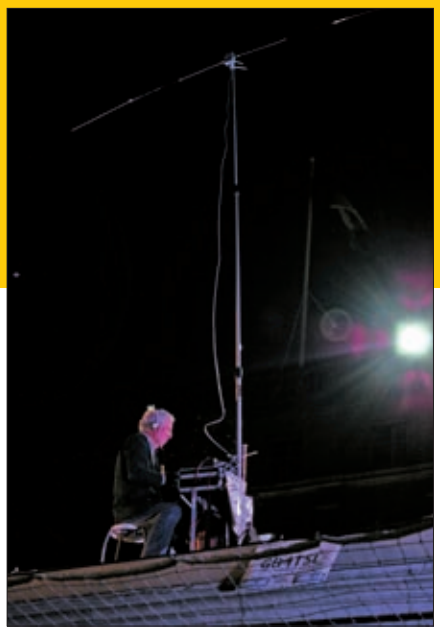
The well-known Portsmouth-based Nevada Amateur Radio business, has received recognition for its commercial success by being awarded the prestigious **Rob Williams Award for Business Enterprise**. The Award, presented in October at the Sheraton Park Lane Hotel, London, recognised the innovation and creativity Nevada has employed over the past year to increase sales. The Award is the first of its kind, named in honour of **Rob Williams**, Director of Dolphin Music, who died earlier this year aged only 41. The Nevada team were thrilled to receive this Award from the Music Industries Association as an acknowledgement of their use of technology and innovation.

Over the past year Nevada has implemented the latest technology on its websites with improved design, navigation and ease of use for customers. Nevada has developed its own web based software programme, *Boomerang* an on-line customer returns management system that will go live in early 2010.

Mike Devereux G3SED, Nevada's Managing Director, who collected the Award commented, "It is an honour to receive such an accolade on behalf of my team. Celebrating our 40th anniversary, we are not too old to understand how important it is to embrace and use the latest ideas and technology. At Nevada we have a fantastically skilled team with entrepreneurial spirit and enthusiasm, keeping us ahead of the game."

Further details from **Marcia Brogan** (Nevada Public Relations) on **(01489) 578737**

From Left to Right: Jon Gold, President of Music Industry Association, Betty Heywood, Director of International Affairs NAMM (sponsors of the Ceremony), Jenny Devereux, Nevada Finance Director, Mike Devereux G3SED, Nevada Managing Director and Jason Tavaria Director of Dolphin.



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Paul Irving GI6FEN busy on his plinth in the early hours on Saturday October 3rd 2009.

Editorial comment: Everyone on the *PW* team admire you for your achievement Paul! Congratulations for your great efforts to publicise Amateur Radio. **Rob G3XFD**.

Front Cover Story

Paul GI6FEN's Been Well & Truly Plinthed!

Paul Irwin GI6FEN has had his 60 minutes of being foolhardy (beg pardon – we mean brave!) perched on top of the fourth plinth in London's Trafalgar Square. This is how his ordeal (sorry – adventure) began and ended!

Paul wrote: "Dear *Newsdesk*, what was probably the shortest Special Event Station in the history of Amateur Radio took place on October 3rd 2009 when I ascended the dizzy heights of the Fourth Plinth in Trafalgar Square, London at 0000 for my one hour of fame and opened up **GB4TSL** (**G**olf **B**ravo **4** **T**rafalgar **S**quare **L**ondon).

"I'm getting on (well on) in life and have never been the adventurous type. But, I decided, why not give it a go! Off went the application and to cut a long story short, with the September 1st draw I won a place on the Plinth at 0000hrs local time October 3rd, 2009, for my hour of my infamy (sorry, fame).

"The big question then was, just what on earth can I do for one hour on the Plinth? Watching some of the other 'Plinthers' stand there – some just scratching their posterior or promoting good causes – just wasn't my scene! It's okay when you can throw the lot in the car and drive, but that's too long a journey for me coming from Belfast in GI land. So I needed antenna, power, something to hold the Yaesu FT-857D and my LDG AT-200Pro antenna tuner.

"Then *Practical Wireless* came to the rescue (July 09 issue) and there was the answer to my antenna problem. **Roy Walker G0TAK**'s portable dipole project. A quick call to Moonraker and two SPX 200s where on their way along with the necessary ¾in to PL259 converters.

How to transport it all onto the Plinth was another problem. The rules stated that you must be able to carry everything onto the Plinth yourself.

"In came *Practical Wireless* to the rescue once again! I remembered an article sometime back where a shopping trolley was used to carry a portable station. A quick search found *PW* December 2008, and **Andy Foad G0FTD**'s 'Shopping Trolley Portable Station'. Nothing as elegant as Andy's but a folding plastic box, a few cable ties and I had a place to store my car battery and a shelf for the FT-857D and its transit case.

"Because of the weight I arranged to borrowed a battery in England. The only other problem the was a mast and I found the perfect answer in B&Q. A Harris Pro Painter's pole approximately six foot high when down and expanding up to 16 feet with quick release locks.

"With my antenna securely packed in a piece of plastic drain pipe, my shopping trolley, and of course, some plastic bags to protect the gear if it rained, (Ikea blue shopping bags are waterproof and dirt cheap), clothes et al went into a large cardboard box. The FT-857D and the LDG 200 travelled in their transit case as hand luggage on board the aircraft to Luton.

Security's Field Day!

"After picking up my battery and pole it was off to the 'Big City' and the Fourth Plinth. However, the security staff at the Plinth in Trafalgar Square had a field day when I produced all my bits and pieces! Fortunately, my gear all checked out and I was given a pep talk on health and safety it was onto the JCB and off to the Plinth at the 'witching hour'.

"When the hoist stopped on the Plinth I suddenly realised **I had made a bad mistake**! What on earth was I doing here? The Plinth looked so big on TV, but now with me about to step on it looked like a pocket handkerchief! Setting up was a bit hairy, it was okay looking down but when I had to look up putting the antenna on the pole and raising it I had the horrible feeling of the edge of the plinth and me falling off.

Horrendous Noise On 3.5MHz

"Tuning up on 3.5MHz (80m) I found the noise was horrendous, S9+ and the London traffic didn't help. I'd also never heard so many ambulance and police sirens! Then I realised I hadn't a clue what direction I was facing, so using my strong right hand rotator (SRHR) I turned the antenna for the lowest noise level, which was reading S7 to 8.

"Then I was on the air – calling "CQ, CQ, CQ, 80 metres, this is Golf Bravo 4 Trafalgar Square London a few times, but I heard nothing – only the noise back up to S9+. I then put a few more "CQs" out on 3.5MHz but no luck. Then I changed to 7MHz (40) but that was worse. So it was back to 80m.

"Time was going fast as I scanned the band for a contact. I did hear a couple of German stations but that was all. Then came the bright idea, which I had planned to do in the first place – write my frequency on a sheet of paper and show it to the cameras. It worked! At 0045 I heard a call way down in the noise and it was my friend **Paul Menown GI4FZD** back in Belfast. Eventually, we had a good QSO receiving each other at 5/9. Five minutes later, with only minutes to go, I heard **Daniel Urbat DO7DU**, and one other German station called QRZ but regrettably didn't come back to me.

"It was quite an experience on the Plinth being part of "living art" and congratulations to all those who stood there. I hope my time on the Fourth Plinth benefited Amateur Radio in some small way, I did try hard! If anyone heard me call from GB4TSL or saw me on **oneandother.co.uk** please contact me through my call GI6FEN at QRZ.COM or **www.oneandother.co.uk** Then look for 'view plinthers', Week 13 Saturday GI6FEN. 73 **Paul GI6FEN**.

President of Yaesu Vertex Standard Japan visits Martin Lynch!

Mr Jun Hasegawa, President of Vertex Standard Yaesu Japan visited ML&S Ltd. in August.

Martin Lynch G4HKS and his team were delighted to have the President of Yaesu Vertex-Standard and four senior managers visit the ML&S Store in Chertsey in August. Martin told *Newsdesk* that "This is the first time Mr Hasegawa has visited our Chertsey headquarters and it was superb to meet him once again along with his colleagues. We haven't met since our move from London and they were very impressed with the large display of Amateur Radio products in the store.

The visit included a lengthy meeting to discuss current trends in Amateur Radio, future models and even feed-back on present Yaesu models from our customers. **Martin Lynch G4HKS**

Lynchie's Open Day – Don't Miss It!

Martin Lynch G4HKS contacted *Newsdesk* to remind readers to make sure that they don't miss 'Lynchie's Open Day' on **Saturday December 5th**! The event is famous for the catering – so make sure you're there early to get in the long queue for the famous (and absolutely delicious – hot roast pork rolls - the Editor **Rob G3XFD** had two last year!

Supported by **Icom UK**, **Yaesu UK** and **Kenwood UK**, Martin promises that there there will be, "Many bargains and great deals on offer – and our tills will be working overtime to make sure you don't have to wait too long to pay for your special buy!" Graced by beautiful but very cold and clear weather in 2008, the 2009 'Lynchie's Open Day' promises to be a great day out for anyone heading towards Chertsey!

Further details from **Martin Lynch** G4HKS
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E-mail: **Martin@MLandS.co.uk**
Website: **www.MLandS.co.uk**

The New Look RSGB

Roger Cooke G3LDI, acting on behalf of Newsdesk, reports on his visit to the event at Wyboston on the Cambridgeshire/ Bedfordshire border.

The RSGB Convention – or what used to be known as the HF Convention (HFC), now encompasses v.h.f. and up, as well as h.f. combined with the Contest University (CTU). Judging by the attendance this year, the Convention is in danger of out-growing the venue, the splendid Wyboston Lakes Convention Centre. The waterfront venue has all the facilities that an event like our Convention could possibly desire, not least of which are the wonderful views across the lakes from the restaurant. **Pic. 1.**

The rooms are all named after the world's major cities. Access is easy from most directions, although talking to **Ian White GM3SEK**, it was a marathon for him! Ian took over 10 hours to drive down from Scotland! There were also some people from Europe, DL, I, PA and a couple from Cyprus. At 8.45 a.m. there were already lots there and a queue to sign in and register. **Pic. 2**. Seen here as soon as we arrived were **Victor Brand G3JNB** and **Hilary Claytonsmith G4JKS**. **Pic. 3**.

Talks were varied, ranging from Operating and DXing, through technical to techniques for v.h.f. and up, plus of course, quite a number of Contest University lectures. My own club – the Norfolk ARC – was well represented this year, with talks from **Steve Nichols G0KYA**, lecturing on propagation, **Jim Bacon G3YLA**, who was dealing with his favourite subject, weather related v.h.f. propagation and myself, giving an insight into RTTY Contesting for the beginner.

There were so many streams this year that it was difficult to make time for all those that I wanted to attend! Obviously the social side of meetings such as this takes quite a bit of time, meeting up with old friends and making new ones is always a large part of the attraction of such events. were any left!

Layout The Same

The layout was roughly the same as last year, with the back rooms set aside for several displays. The RSGB bookstall was manned by two amateurs from Norfolk, **Phil Brooks G4NZQ** and **Mark Taylor G0LGJ**. **Pic. 4**. The QSL card checking was also very busy, with **Fred Handscombe G4BWP** and several others doing a much needed and requested job. **Pic. 5**. **Martin Lynch & Sons Ltd.** and **Icom UK**, were joint sponsors of the event and both had large displays. I'm not sure how much gear was sold, but I was talking with **Mike Cooke G4DYC** and telling him how impressed I was with the c.w. on the FT-2000. **Pic. 6**. On the strength of this he was convinced enough to go and buy one!

Ray Goff G4FON once again had the FOC Morse test, for those that dare take it! However, it was good fun and quite a number participated, with a certificate being issued at the end and entry into a prize draw.

The CDXC were well represented with CDXC badges all over the place. They had a stand touting for business and **Pic. 7**, shows **Chris Duckling G3SVL** persuading a new member to join. IOTA and the UK Microwave Group were also represented in this room. **Pic. 8.**

The **GB4FUN** vehicle was on display outside, **Pic. 9**, as was the live demonstration of moonbounce with **David Hilton-Jones G7RAU**. David had a long yagi there as can be seen in **Pic. 10**. There was also a Convention Special station operating on h.f., **Pic. 11.**

Finding the time to do everything is impossible, especially when on just a one day visit! The same applies to the talks and lectures. It is sometimes just a toss of a coin that decides which one to attend. Ideally, two days are needed – but that can be expensive!

Programming the day and trying to stick to the schedule is the way to go. I arrived in time for the first presentation by **Tom Heritage M0TJH**, the **ZD8UW Ascension Island trip** closely followed by **Secrets of the Database**, by **Roger Ballister G3KMA**. **Pic. 12.** One of the aspects I always enjoy from the DX-pedition presentations is the coverage of the history and wildlife that compliments the talk. Another such talk was from **Phil Whitchurch G3SWH**, on Mayotte, **Pic. 13**.

I then went to see the remote presentation by **Tim Duffy K3LR,** featuring the Building a Successful Contest Station. If you haven't seen his station, then 'Google' it on the internet and watch the video. It really is a fascinating tour. Not many can attain these standards. Tim was at home in the USA and gave the talk via *Skype*, with **Mark Haynes M0DXR** flipping the slides when needed. This worked very well indeed and Tim was also able to answer questions too.

Icom UK produced 175 hard copies and 250 CDROMs of information in a course book that provides frame prints from the PowerPoint presentations, plus all of them in software on the accompanying CD.

Field Day Contesting

After a quick coffee break-I went to the Field Day Contesting talk by **Dave Lawley G4BUO**, **Pic. 14**. Even after 50 years of NFD I found it's still possible to learn something new from others!

Then it was time to the SO2R talk by **Don Beattie G3BJ**. Interesting, but I feel that SO2R is for the youngsters! This needs a lot of training, a lot of strategy thinking and a real strain on the brain, not to mention doubling up on transceiver, linear

Convention 2009

and a variety of antennas and switching arrangements. Don has done a great job mastering this technique.

There were a few problems accommodating all those that wanted to attend certain talks required some changes in designated rooms. This caused some confusion with people rushing from one room to another, quite funny at the time!

The RTTY Contesting Talk

It was then time for my own talk on RTTY Contesting for Beginners. The room for the talk had been changed too and when I entered it was already half full! However, I mentioned that the RTTY talk was taking place there, whereupon the room just about emptied! Luckily enough there was an influx of people who had gone to the original room so my talk was well attended after all.

Then a problem occurred with the computer so, that had to be replaced, leading to my talk starting about 10 minutes late. I had to rush it somewhat to get through it. However, it all seemed to go down well, and luckily enough my RTTY/PSK booklet for beginners was being released the next week but I managed to get a couple of pre-issue copies.

Next, I got into discussions with other people there so a number of interesting talks sadly I had to miss, including one by **Sam Jewell G4DDK**, who gave a talk entitled DXCC at Microwave, which looked interesting. The microwave DXCC photo features Sam Jewell and the 'thing' on the table is the feed for his dish. It uses a cake tin! Apparently it provides 2dB more gain than the large pie dish he used to use! **Pic. 15**.

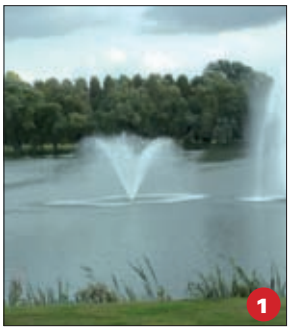
I also managed to squeeze into the talk by **Alan Hayes G3XSV**, on antenna gain as affected by terrain. I would have also liked to have seen several other presentations, the K5D Desecheo one especially, but time didn't permit. If I had been staying overnight, I could have seen it as it was repeated again on the Sunday. The HF Contest Forum with **Don Field G3XTT** was also on the Sunday, so it looks like I shall have to consider an overnight stay in 2010.

All the remarks I have heard so far have been positive and most say that it is the best Convention yet, so congratulations go to **Mark M0DXR** and **Gemma Haynes 2E0WPX**, for organising Convention 2009 keeping the flow going so well. I also understand that Mark and Gemma are looking forward to an addition to the family – so I hope that event goes well for them too!

For interest, there were 244 unique participants (in comparison to 125 last year) and 80 certificates have been achieved. With an event of this size there are bound to be a few problems on the way, but none were too serious. All I can say is, if you wish to attend in 2010, book early!

Roger Cooke G3LDI

Convention Gallery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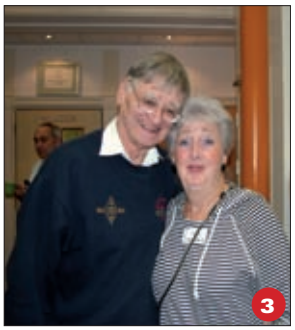
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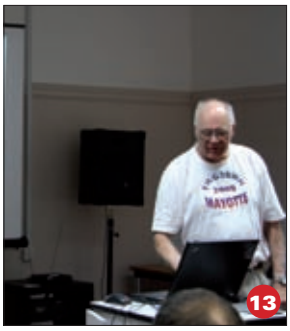
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Please check with the organisers that the rally is 'on' before leaving home.

rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations. PW Publishing Ltd. is attending at rallies marked *.

Send all your rally info to

PW Publishing Ltd.,
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E-mail: newsdesk@pwpublishing.ltd.uk

November

November 14th

The Rochdale & District Rally

The Rochdale & District Radio Society Traditional Rally will be held in St Vincent's Church Hall, Caldershaw Road, Rochdale OL12 7QL. Doors will open at 10.30am, admission will be £2.50 (with concessions for under 12s and seniors) and there will be a Bring & Buy and catering. A percentage of the proceeds will go to the Floyd Neuro-Rehabilitation Unit in Rochdale.

Dave G0PUD
Tel: 07710 243107
E-mail: dave.shaw@zen.co.uk.
www.radars.me.uk

November 15th

The CATS Radio & Electronics Bazaar

The CATS Radio & Electronics Bazaar will be held in the 1st Coulsdon Scout HQ at the rear of the Council Car Park, Lion Green Road, Coulsdon, Surrey. Doors will open from 10.00am to 1.00pm, admission will be £1.00 and there will be free car parking, catering, a Bring & Buy and facilities for the disabled.

Andy G8JAC
E-mail: g8jac@btinternet.com

November 22nd

The Plymouth Rally

The Plymouth Radio Club Rally will take place in the Elm Community Centre, Leypark Walk, Estover, Plymouth PL6 8UE. Doors will open at 10.30am (10.15am for the disabled) and there will be car parking, talk-in, a Bring & Buy, trade stands, catering and a raffle.

November 22nd

The Mayo Radio Rally

The Mayo Radio Rally will be held in the Welcome Inn, Castlebar, Co. Mayo. The doors will open at 11.30am.

Padraic Baynes EI9JA
E-mail: pbaynes1@eircom.net
www.ei7mre.org

November 29th

The Bishop Auckland Rally

The Bishop Auckland Radio Amateurs Club Rally will take place in the Spennymoor Leisure Centre, Co. Durham DL16 6DB. Doors will open at 10.30am (10.15am for disabled), admission will be £1.50 (under 14 free) and there will be talk-in on S22 and V44, car parking, trade stands, catering with a licensed bar, a Bring & Buy, facilities for the disabled and attractions for the family.

Mark G0GFG
Tel: 01388 745353

January 2010

January 31st

The Horncastle Rally

The Horncastle Winter Rally will be held at the Horncastle Youth Centre, Lincolnshire LN9 6DZ. The doors will open at 10.30am (10.00am for the disabled) and admission will be £1.50. There will be free car parking, catering and facilities for the disabled.

Tony G3ZPU
Tel: 01507 527835
E-mail: G3ZPU@yahoo.co.uk

February

February 7th

The Canvey Radio & Electronics Rally

The 25th Canvey Radio and Electronics Rally will take place in The Paddocks, Long Road, Canvey Island, Essex SS8 0JA, which is at the southern end of the A130. There will be free car parking, the doors will open at 10.30am and admission will cost £2.00. There will be trade stands, catering and facilities for the disabled.

Dave G4UVJ
Tel: 01268 697978 (evenings).
www.southessex.ars.btinternet.co.uk

February 28th

The Rainham Radio Rally

The Rainham Radio Rally will be held in the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX.

Trevor G6YLW
Tel: 0771 7678 795

March

March 7th

The Exeter Rally

The fifth Exeter Radio & Electronics Rally will be held at the America Hall, De la Rue Way, Pinhoe, Exeter, EX4 8PW. The hall is well equipped and offers easy access as it's only a few minutes from the M5 and other main roads. Doors will open at 10.30am (Bring & Buy booking in and disabled 10.15am) and admission will be £2.00. There will be talk-in, traders, a Bring & Buy and refreshments (in-house inexpensive catering by the XYLs, including their celebrated bacon rolls). All profits from the event will be shared between GB3SW, GB3EW and GB3EX, the local 2m and 70cm repeaters.

Pete G3ZVI
Tel: 07714 198374
E-mail: g3zvi@yahoo.co.uk

March 20th

The Lagan Valley Rally

The Lagan Valley Amateur Radio Society Rally will be held in The Village Centre, 7 Ballynahinch Road, Hillsborough. Doors will open at 11.30am and there will be car parking, catering and trade stands.

Jim GI0DVU
Tel: 02892 662270
E-mail: jim.henry@ntlworld.com

March 21st

The Wythall Rally

The Wythall Radio Club 25th Annual Radio and Computer Rally will be held in The Woodrush Sports Centre, Shawhurst Lane, Hollywood, Nr Wythall, Birmingham B47 5JW (two miles from junction 3 of the M42). Doors will be open between 10.00am and 3.00pm and admission will be £1.50. There will be talk-in on S22, car parking, radio and computer traders, a massive Bring & Buy and catering.

Chris G0EYO
Tel: 07710 412 819
E-mail: g0eyo@blueyonder.co.uk
www.wrcrally.co.uk

April

April 24th

The Chesterfield Amateur Radio Rally

The Fourth Chesterfield Amateur Radio Rally will be held in Hasland Village Hall, Eastwood Park, Hasland S41 0AY (M1 junction 29/30). Doors will open at 10.00am and there will be talk-in on S22 (V44) and GB3EE, catering and trade stands.

E-mail: rally@chesterfieldrally.com
www.chesterfieldrally.com

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To answer, in a recent review in Radcom, Peter Hart writes: "For a budget priced radio covering HF and 6m, the FT-450 is an excellent all-rounder for general use. With a high level of features for SSB, CW and data modes, easy to use and a good overall performance, it will suit the home station operator or someone looking for a lightweight radio which is easily transportable".

Yaesu FT-450 without ATU: **£589.95** Yaesu FT-450AT with ATU: **£639.95**

Options

MyDEL MP-8230 23Amp PSU	£69.95
Stand-FT450 Bail Stand	£19.95
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MMB-90 Mobile Bracket	£18.95
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With the introduction of their latest release the "PEP" or Performance Enhancement Program" the Ft2K is without question the very best value base HF on the market today.

For more information on what the PEP upgrade delivers see: www.hamradio.co.uk/pdf/Yaesu_PEP_Enhanced_Version.pdf

The FT-2000 & FT-2000D (200W version) are available from ML&S.

- 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".

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Add a DMU-2000 Data Management Unit

- Spectrum Scope with Limited Bandwidth Sweep feature
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- Memory Channel List
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The Ultimate Accessory!
Quadra System VL-1000 1kW HF Linear Amplifier, PSU & Auto ATU Always available from stock £3599.95

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All ML&S FT-817ND's include;
2 Years warranty, metal hydride batteries, charger, mic, etc.

FT-950 HF Base Transceiver

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Yaesu's "Midship Radio"

Many of you grabbed the new Yaesu FT-950 HF & 6M from us at the end of 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.

All FT-950s supplied by ML&S are latest PEP factory versions!

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NEW MODEL NOW INCLUDES AIRBAND and FM Receiver!

SBS-1eR Portable Low-cost Mode-S/ADS-B receiver.

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Unlike lower class direct sampling receivers, the PERSEUS RF analog front-end has been carefully designed for the most demanding users. PERSEUS can also be operated 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.

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Don't be fooled by its mobile radio sized dimensions. The IC-7000 really is a spin-off of the IC-756Pro111 together with all the additional bands (2/70) that the IC-706mk11G has to offer.

If you require a good performance HF IF DSP transceiver that offers exceptional all round versatility then the IC-7000 is the rig for you.

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KENWOOD TS-480SAT/HX

ML&S Price:
£749.95 (SAT)
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The very popular TS-480 is available in two versions, 100W with Auto-ATU (SAT) and the 200W version without ATU (HX). For those that want the extra power we recommend the MyDEL MP-9600 60Amp PSU and LDH AT-200Pro Auto tuner. **What a package!**

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An example:
At the start of your walk, car or cycle ride turn on the G730 and when you finish your journey, turn it off. Once home plug the G730 into your PC, open the software, click on two icons and the route and pictures you have taken are viewed on Google earth/maps.

The G730 records your speed, altitude, distance etc., even showing how long you have stopped for during your journey. You can even use your digital images taken on route for future reference. How good is that!

Accuracy is to within 5 metres and you get up to 18 hours continuous use after a 2 hour charge via your USB port on your PC. Use the MyDEL VENTUS GPS-logger for cycling, rambling, jogging, skiing, trekking, sailing etc.

MyDEL Ventus WX-831

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This new much improved wireless Weather Station is built to a very high standard and even includes O-Ring seals on battery compartments that are mounted externally. The quality of external hardware is built to last for years and really moves the game on when it comes to "Professional Weather Stations"

RRP £169.95.
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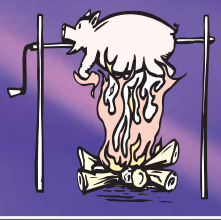

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Palstar are pleased to announce a new range of HF Linear Amplifiers built to the highest standard (As you would expect from the USA Manufacturer). We have started with the "Commander HF-2500" which is available from stock. The 2m & 6m versions will be available during early 2010. See web for more details.

ML&S: £3499.95

Full range of Palstar now in stock.
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AT-500 600 Watt PEP Antenna Tuner ... **SPECIAL PRICE £329.95**
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AT-5K (3.5kW) Antenna Tuner **£1079.95**
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ZM-30 Antenna Analyser **£359.95**
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Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£139.95
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RBA-1:1	Probably the best 1:1balun out there	£34.95
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DTS-6 + 6R	Remote Antenna Switchers. 1.5kW 1-54MHz.	£43.95

NEW FTL- Meter
Jumbo size meter for your FT-857/FT-897. LDG's new version of the its popular Yaesu meter is the FTL-Meter. It's a highly readable 4.5 inch meter face with calibrated scales for signal strength or disc on receive; power out, SWR, Mod, ALC or supply voltage on transmit. Each function is selected from the radio's meter menus. RRP: 79.95 INTRO PRICE: £67.95

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ML&S: £279.95

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)

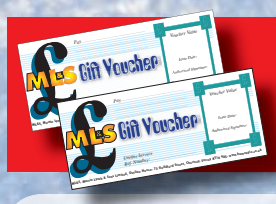
CG-3000 shown with optional remote switch.

NEW! Remote control for the CG-3000 and CG-5000. £39.95

CG-5000MkII

At last! 600W PEP High Speed Remote Tuner from MyDEL
Specifications:
- Tuneable frequency:
  1.8 - 30Mhz with long wire antenna from 8 meters
- Input impendence: 45-55 ohms
- Input power: 10 - 600W PEP
- SWR: <2:1
- Power supply voltage: DC 13.8V
- Current consumption: <1.5A
- Memory channels: 800
- Auto tuning time: 0.5-6 seconds (first time tuning), less than 0.2 second (return to memory frequency)
- Weight: 3 Kg.
- Size: 385mm x 280mm x 110mm (L - W - H)

ML&S: £549.95



Don't know what to buy your hubby or Mrs for Christmas?
How about an ML&S Gift Voucher?
Available from only £10 value with no time limit on spend.

MyDEL Power Supplies

New MyDEL PS-30SW11

Latest high performance switch mode PSU. Die-cast Alloy chassis, full over-voltage protection and short circuit design. **RRP £119.95.**
Introductory offer only £69.95

SPS-8250	25A continuous, fully metered power supply	£79.95
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MP-8230	13.8V DC, 25A power supply	£69.95
MP-925	Linear 25-30A, 13.8V DC power supply	£99.95
MP-9600	60A switch mode power supply	£179.95
MP-6A	13.8V DC, 6A power supply	£29.95

MyDEL **AS REVIEWED IN THIS ISSUE!**

CG SB-2000 USB Radio Interface

NEW PRODUCT

This small self contained beautifully styled box weighing only 400 grams really is a one stop solution to your data and radio control. It employs a CAT/CIV interface as standard and supports CAT with RS232 protocol.

The MyDEL CG SB-2000 Interface connects to your PC via USB and Sound Card and connects to your radio via Custom leads.

Once connected and configured you have Computer Control via USB and decoding via your soundcard using HamRadio Deluxe or other packages.

Intro price of only £99.95 High quality ready-made leads for most rigs available at only £18.95.

Mini VNA PC Controlled Antenna Analyser

ML&S: £259.95

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.

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

Fun on Four Metres

How did you do in the first contest?

Editorial acknowledgement: Our new 70MHz contest would never have 'got off the ground' if it were not for the support and hard work from our keen and efficient Adjudicator Colin Redwood G6MXL, who now seems to have two contests a year to run! So, on behalf of everyone (we all seemed to thoroughly enjoy it) who supported the event, I offer a sincere and hearty 'Thank you Colin' and look forward to the 2010 contest – it'll be with us soon! **G3XFD**.

When *PW* decided to run a 70MHz contest, I don't think anyone really knew quite what the level of support would be – it was a real 'shot in the dark'. However, between them the 24 entrants in the first *PW* 70MHz Low Power contest on Saturday June 13th 2009 made 384 valid QSOs with over 100 other stations. This level of support certainly confirmed that it was right for us to organise the contest.

As can be seen from the map, **Fig. 1**, there was a lot of 70MHz activity and support from Eire. However, no completed contacts into Europe were made this year, although one station had an incomplete contact with a Portuguese station.

The 2009 Winners

The overall winner, winning team and leading English station of the first *Practical Wireless* 70MHz Low Power Contest is **The Warrington Contest Group G3CKR/P**, comprising just two operators, **Erik Gedvilas G8XVJ** and **Michael Ryder G0CDA**. Erik and Michael operated from Thorncliffe near Leek in Staffordshire in IO93AD using two 8-element yagis on separate masts.

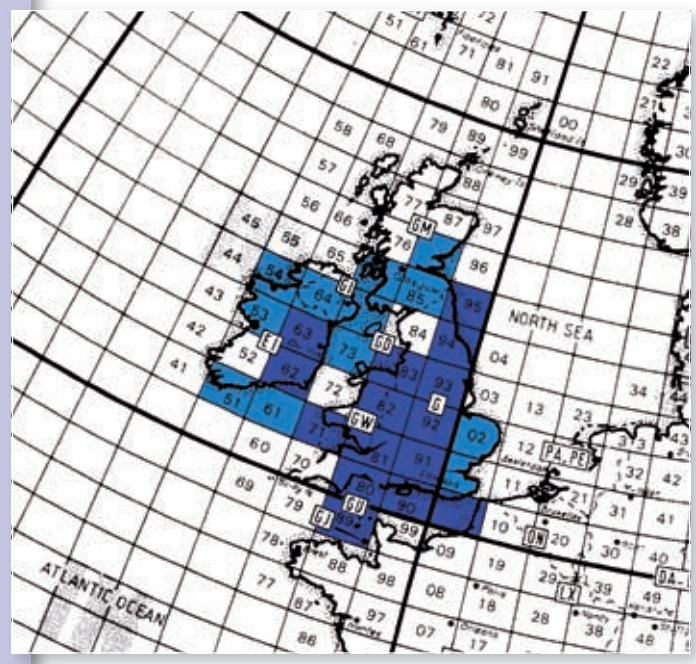

Fig. 1: Map showing locator squares of stations that entered (in dark blue) and other stations worked (light blue).

As in the *PW* 144MHz QRP contest, The Warrington Contest Group used a Kenwood TS-850S as the prime mover, this time working with an OZ2M Transverter, **Fig. 2**.

In second place overall is the **Guildford and District Radio Society G5RS/P**, operating from JO00EW. The leading single operator station is **Graham Jones G4DPH/P**, operating from IO81PH. The leading fixed station and leading Welsh station is **Martin Shelley GW3XJQ**, operating from IO71RR.

The leading GI/EI station is **Declan Lennon EI9HQ/P**, operating from IO62RH. There were no entries from Scotland or mainland Europe.

Enjoyed Contest!

Most entrants seem to have enjoyed the contest. **Martin GW3XJQ** commented, "I am not really a 'contester' but enjoyed myself for a few hours today." The weather was generally kind to entrants and **Barrie Palin G4AHK** submitted the **Bromsgrove Amateur Radio Society G3VGG/P** entry. "We all enjoyed the day, pity the conditions were not better. Looking forward to next year and hopefully a few more stations".

Steve Wright EI5DD submitted the log for the **Galway VHF Group EI4ALE/P**. He thought, "Conditions were pretty flat from our location."

First Time

Declan Lennon EI9HQ/P commented that it was his, "first time on 4m" He drove down from Dublin to Wexford to pick up the tower and then on to site to set up. Declan's best DX was G5RS/P in JO00EW at 501km. He felt that there was a lot of QSB, and that it would be good if there were more people on the bands. He said, "I know it was the first 4m contest, and I will do better next year – now I know what to do!"

John Walker G0TKP says, "Here's my first ever entry for a radio competition!"

Stations generally welcomed the new contest. **Dave Thorpe G4FKI** stated that it is "good to see *PW* supporting the 4m band" although he was disappointed not to work more stations.

Colin Redwood G6MXL, the Adjudicator of our new contest, presents the results of an enjoyable day for everyone involved!

Fig. 2: The winning team, The Warrington Contest Group G3CKR/P.

Fig. 3: Peter Thompson G8DDY/P's compact station.

Another entrant commented that the contest was particularly welcome. "I must say that I'd become a little fed up with 4m contests as (sporadic E aside) every contest would bring the same callsigns into the log and not only that, they'd even be found on the same frequencies as the previous event. It almost seemed superfluous to exchange QTH/Locator info as this never varied, and was well known from earlier."

Home Brew Equipment

Chris Rees GU3TUX, on Alderney in the Channel Islands, was one of several stations prompted by the contest to build transverters or antennas. "The transverter was only completed a couple of days before the contest. Perhaps I should mention that it was a kit I had purchased in 1997! I finally took the plunge as I was unable to source spares for my existing 4m transverter in time for the event. The first few contacts reported f.m. of the transmission. I diagnosed that the transverter was being overdriven (I originally aligned it on 12V, but in the contest used a 13.8V p.s.u.). Turning down the supply volts seemed to effect a cure and I pressed on and was pleasantly surprised by the results."

John G0TKP, had built an antenna for the contest. "My antenna was a home-brew dipole constructed with coaxial cable, made especially for the competition. Horizontally polarised and turned by hand, out of the loft window!"

Some stations are already making improvements ready for the 2010 contest. John G0TKP says, "I'm in the process of building a transverter for 4m, so single-sideband for next year's contest".

Technical Problems

The Guildford & District Radio Society G5RS/P had its fair share of technical problems! "Things might have gone better had we not lost the masthead pre-amplifier and had to swap a rotator prior to the contest. We have also discovered that our 8-element yagi performs worse than our 4-element one. A rebuild will occur before next year! We also anticipated a higher level of participation from f.m. stations but this didn't materialise on the day!"

Peter Thompson G8DDY discovered a horse, **Fig. 3**, starting "to eat the yagi and had a BNC plug and a bit of feeder in his mouth when I was packing up!"

Logging Accuracy

Logging accuracy was generally much better than on the *PW* 144MHz QRP contest and few /P errors were noted.

Some stations also made use of c.w. in addition to other modes to gain a few extra points or a multiplier.

As might be expected, there appears to be a close link between the gain of the antenna system and position in the table. Stations with the greater number of elements (roughly approximating to gain), generally feature in the higher positions of the results tables. Entrants should perhaps focus their efforts on their antenna systems, and so increase their effective radiated power, as well as improving the strength of signals received.

Where directional antennas are used on 70MHz, it's just as important to rotate them as on 144MHz to get the best results. Steve EI5DD, one of the operators of EI4ALE/P, observed that, "the majority of G contact were made off the back of their beams and sounded very much like backscatter. Aircraft flutter also enhanced one or two. Best DX was into G5RS/P in JO00EW **who did** have his beam in the right direction! One other station went from 51 to 59 ++ after turning beam through 180°."

Observing Rule 1

One station spent a period of time calling "CQ contest" within 1kHz of the 70.200MHz calling frequency and, despite requests from another non-participating station, refused to QSY. This was contrary to Rule 1, which requires contest stations to 'allow other users (including

Table 1: Leading Stations

Description	Name/Team	Callsign
Overall Winner	Warrington Contest Group	G3CKR/P
Runner Up	Guildford and District Radio Society	G5RS/P
Leading Fixed Station	Bruce Wallwork	G7PAL
Leading Single Operator	Graham Jones	G4DPH/P
Leading Multi-Operator	Warrington Contest Group	G3CKR/P
Leading English Station	Warrington Contest Group	G3CKR/P
Leading Welsh Station	Marin Shelley	GW3XJQ
Leading Station in Eire and N. Ireland	Declan Lennon	EI9HQ/P

non-Amateur users) of the band to carry out their activities without hindrance'. In addition this type of operating is contrary to the spirit of v.h.f. (or any other) contesting. In this instance, no credit has been given for the contacts made by the station concerned during the period in question. Any future infringement of this rule by any entrant is likely to result in a greater penalty.

Comments On Rules

Based on feedback from those participating, and other active 70MHz stations that didn't enter the contest – there may still be some work to do to refine the rules for future years.

Some stations suggested an increase in power for future years from the 10W limit. Whist I have some sympathy with this, I am keen to ensure a level playing field for all participants – especially to include Foundation Licence holders. So for 2010, it's likely that the 10W power limit will remain.

My impression is that the contest is perhaps a little too long. While leading stations made a few new contacts and multipliers during the last hour of the contest, many stations appear to have packed up earlier. **Dave Thorpe G4FKI** suggested, "an earlier start and no more than four hours in length." (I'll keep this under review for future years).

Scoring Fairing

I thought that finding a fair scoring approach for 70MHz might prove to be the biggest challenge, but perhaps I was unnecessarily concerned? One entrant commented, "The use of multipliers gives the contest added interest, as it's a delicate balancing act between getting contacts and hunting for multipliers."

Stations from near the Scottish border to the South Coast of England, from Eire to the Home Counties are all in the top the eight places, so I'm inclined to leave the scoring system as it is for 2010.

Those stations using s.s.b. and c.w. generally have done better than those using only a.m. or f.m. One idea I'm

Table 2: Overall Results Table, Practical Wireless 70MHz Lower Power Contest 2009.

Pos	Call	Name	Single	QSOs	Squares	Score	Locator	Transceiver	Antenna	Ht. asl
1	G3CKR/P	Warrington Contest Group		87	23	2001	IO93AD	Kenwood TS-850 + OZ2M TVTR	8el x1 /8el x1	460
2	G5RS/P	Guildford & District RS		43	14	602	JO00EW	TS-2000 + Spectrum TVTR + PA	8-ele yagi	170
3	G0BWC/P	Bolton Wireless Club		39	14	546	IO83RO	Yaesu FT-857 + 4MTR TVTR	5-ele beam	1060
4	G8PNN/P	G8PNN/P		23	13	299	IO95CI	Kenwood TS-450S + Spectrum TVTR	5-ele	192
5	G4DPH/P	Graham Jones	S	24	11	264	IO81PH	Yaesu FT-817 + HB TVTR	6-ele yagi	310
6	G4PRS/P	Poole Radio Society		24	10	240	IO80WP	Alinco DX-70 + Spectrum TVTR	5-ele Yagi	200
6	G3VGG/P	Bromsgrove & D.A.R.C		20	12	240	IO82XI	Icom IC-756PRO + Spectrum TVTR	5-ele Eagle	428
8	EI9HQ/P	Declan Lennon	S	18	10	180	IO62RH	Yaesu FT-847	6-ele beam	120
9	G8DDY/P	Peter Thompson	S	18	9	162	IO90JO	Yaesu FT-290 + HB Andover TVTR	HB 4-ele yagi	235
10	EI4ALE/P	Galway VHF Group		13	8	104	IO63EB	Yaesu FT-40r + MM TVTR	5-ele yagi	460
11	GW3XJQ	Martin Shelley	S	12	8	96	IO71RR	Kenwood TS-2000 + HB Spectrum TVTR	4-ele	300
12	G2CP/P	Scarborough A.R.S.		10	5	50	IO94PJ	Yaesu FT-817 + Spectrum TVTR	Tapped Longwire	290
13	GU3TUX	Chris	S	8	6	48	IN89VR	Yaesu FT-817 + Andover	3-ele Yagi	61
14	M0COP/P	Pete Wesley	S	8	5	40	IO82NN	Yaesu FT-817 + MM TVTR	MOXON RECTANGLE @ 3 METRES	488
15	G0XAZ/P	Bill and Malcolm		13	3	39	IO91GI	Key KME80	HB vertical dipole	292
16	G3XNO	Otley A.R.S.		5	4	20	IO93DW	Yaesu FT-847	4-ele J-Beam	138
17	GU6EFB	Keith Le Boutillier	S	4	4	16	IN89RK	Yaesu FT-847	5-ele Q-Tek	93
17	G4RYV	David Rumbold	S	4	4	16	IO91OI	Icom IC-706 MK1 70MHz TVTR	5-ele HB Yagi	67
19	G7MHL	John Britton	S	5	2	10	IO83NJ	Yaesu FT-847	Half Wave Vertical and Halo Antenna	200
20	G4FKI	David Thorpe	S	2	2	4	IO92SA	Yaesu FT-847	3-ele yagi	170
21	G7JJZ/P	Phil Johnson	S	1	1	1	IO93DF	PYE PFX	Helical Whip	223
21	M3RHV/P	Weston Big Wheel Contest Gr	S	1	1	1	IO81PH	Ascom SE550 FM	1/4-wave whip	312
21	G0TKP	John Walker	S	1	1	1	IO83UK	Ascom SE550	horizontal dipole	15
21	G0OIW/P	Mark Palmer	S	1	1	1	IO91PN	Wouxun KG-699E handheld	1/4 wave groundplane	87

Table 3: Leading multi-operators

Pos	Call	Name	QSOs	Squares	Score	Locator	Transceiver	Antenna	Ht. asl
1	G3CKR/P	Warrington Contest Group	87	23	2001	IO93AD	Kenwood TS-850 + OZ2M TVTR	8el x1 /8el x1	460
2	G5RS/P	Guildford & District R.S.	43	14	602	JO00EW	TS-2000 + Spectrum TVTR + PA	8-ele yagi	170
3	G0BWC/P	Bolton Wireless Club	39	14	546	IO83RO	Yaesu FT-857 + 4MTR TVTR	5-ele beam	1060
4	G8PNN/P	G8PNN/P	23	13	299	IO95CI	Kenwood TS-450S + Spectrum TVTR	5-ele	192
6	G4PRS/P	Poole Radio Society	24	10	240	IO80WP	Alinco DX-70 + Spectrum TVTR	5-ele Yagi	200
6	G3VGG/P	Bromsgrove & D.A.R.C	20	12	240	IO82XI	Icom IC- 756PRO + Spectrum TVTR	5-ele Eagle	428
10	EI4ALE/P	Galway VHF Group	13	8	104	IO63EB	Yaesu FT-40r + MM TVTR	5-ele yagi	460
12	G2CP/P	Scarborough A.R.S.	10	5	50	IO94PJ	Yaesu FT-817 + Spectrum TVTR	Tapped Longwire	290
15	G0XAZ/P	Bill and Malcolm	13	3	39	IO91GI	Key KME80	HB vertical dipole	292
16	G3XNO	Otley Amateur R.S.	5	4	20	IO93DW	Yaesu FT-847	4-ele J-Beam	138
21	G0TKP	John Walker	1	1	1	IO83UK	Ascom SE550	Horizontal dipole	15

Table 4: Leading single operators

Pos	Call	Name	QSOs	Squares	Score	Locator	Transceiver	Antenna	Ht. asl
5	G4DPH/P	Graham Jones	24	11	264	IO81PH	Yaesu FT-817 + HB TVTR	6-ele yagi	310
8	EI9HQ/P	Declan Lennon	18	10	180	IO62RH	Yaesu FT-847	6-ele beam	120
9	G8DDY/P	Peter Thompson	18	9	162	IO90JO	Yaesu FT-290 + HB Andover TVTR	HB 4-ele yagi	235
11	GW3XJQ	Martin Shelley	12	8	96	IO71RR	Kenwood TS-2000 + HB Spectrum TVTR	4-ele	300
13	GU3TUX	Chris	8	6	48	IN89VR	Yaesu FT-817 + Andover	3-ele Yagi	61
14	M0COP/P	Pete Wesley	8	5	40	IO82NN	Yaesu FT-817 + MM TVTR	Moxon rectangle @ 3m	488
17	GU6EFB	Keith Le Boutillier	4	4	16	IN89RK	Yaesu FT-847	5-ele Q-Tek	93
17	G4RYV	David Rumbold	4	4	16	IO91OI	Icom IC-706 MK1 70MHz TVTR	5-ele HB Yagi	67
19	G7MHL	John Britton	5	2	10	IO83NJ	Yaesu FT-847	Half Wave Vertical and Halo Antenna	200
20	G4FKI	David Thorpe	2	2	4	IO92SA	Yaesu FT847	3-ele yagi	170
21	G7JJZ/P	Phil Johnson	1	1	1	IO93DF	PYE PFX	Helical Whip	223
21	G0OIW/P	Mark Palmer	1	1	1	IO91PN	Wouxun KG-699E handheld	1/4 wave groundplane	87
21	M3RHV/P	Weston Big Wheel Contst Gr	1	1	1	IO81PH	Ascom SE550 FM	1/4-wave whip	312
21	G0TKP	John Walker	1	1	1	IO83UK	Ascom SE550	Horizontal dipole	15

considering is whether it might be a good idea to remove the single/multi operator split, and change the categories to multi-mode or a.m/f.m. only.

Choice Of Date

The choice of date is particularly difficult. **Dave G4FKI** felt that Sunday would be a better choice of day. Other non-entrants also suggested that Saturday wasn't a good choice, due to other commitments and that Sunday would be a better choice.

The problem is to find a suitable Sunday! There are a number of 50MHz contests that take place on Sundays in June and my instinct is to avoid clashing with these. Feedback indicates that single operator entrants would prefer not to hold the *PW* 70MHz Low Power Contest on the same day as the *PW* 144MHz QRP Contest, although multi-operators seem less concerned about this. Additionally, moving away from June is likely to reduce the possibility of Sporadic E propagation.

Several entrants to the *PW* 144MHz QRP contest commented that they are intending to enter the 70MHz contest next year. So, provided that the contest continues to build support, I think there's every reason to run the contest again. For 2010 I'll try to find a Sunday in June that doesn't clash with the *PW* 144MHz contest and major 50MHz contests.

Table 5: Square Winners

Square	Name	Call	No. entries
IN89	Chris	GU3TUX	2
IO62	Declan Lennon	EI9HQ/P	1
IO63	Galway VHF Group	EI4ALE/P	1
IO71	Martin Shelley	GW3XJQ	1
IO80	Poole Radio Society	G4PRS/P	1
IO81	Graham Jones	G4DPH/P	2
IO82	Bromsgrove & D.A.R.C	G3VGG/P	2
IO83	Bolton Wireless Club	G0BWC/P	3
IO90	Peter Thompson	G8DDY/P	1
IO91	Bill and Malcolm	G0XAZ/P	3
IO92	David Thorpe	G4FKI	1
IO93	Warrington Contest Group	G3CKR/P	3
IO94	Scarborough A.R.S.	G2CP/P	1
IO95	G8PNN/P	G8PNN/P	1
JO00	Guildford & District Radio Society	G5RS/P	1

Congratulations & Thanks

Finally, congratulations to the winners and on behalf of all entrants a big 'Thank You' to everyone who participated and made the contest such a success. Let's all hope that the contest goes from strength-to-strength. ●

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The MyDEL SB-2000 Data Interface

Fig. 1: The SB-2000 interface itself, the accompanying software on the obligatory CDROM and the rig-specific interface cable that plugs into the large 'D' socket on the reverse side of the interface.

The *PW* Editor **Rob G3XFD** knows that I'm keen on many of the keyboard modes and offered me the job of reviewing the SB-2000 Data Interface. I accepted the job, which then started a little adventure that ended up with me buying a new rig and, of course, the Editor is totally responsible! So, let's begin the story!

The MyDEL SB-2000 is only 135mm x 75mm x 45mm, weighs only 400g and employs a CAT/CIV interface as standard. It supports CAT with RS232 protocol. Custom leads are available for most transceivers, **but I've discovered that it's not compatible** with the FT-847. The interface is small, as is the handbook! It's supplied *Windows* driver disk and the leads of your choice, **Fig. 1**.

"Good things come in small parcels", so the old saying goes. Well, that saying was about to be tested as I immediately found a major problem because my station transceiver was a Yaesu FT-1000MP. Apparently this interface will not work with that particular transceiver.

With the 'okay' from *PW*, I contacted and confirmed the problem with **Martin Lynch**, who supplied the SB-2000. They gave as a reason the fact that the FT-1000MP is now considered to be an 'old' transceiver and perhaps I should come into the 21st Century! Hmm, well, I guess

Roger Cooke G3LDI diverts from other *PW* work, evaluates an interesting data interface and ends up buying a new rig!

the transceiver suits its owner! Heck, it certainly doesn't seem to me to be an 'old' transceiver, but I suppose it is in 'time on the market' terms.

In fact, I purchased my FT-1000 in 1998 and I would not have thought that a transceiver just 11 years old wouldn't be catered for. Perhaps but it's just another manifestation of the rapid progress of technology in the age we live in?

Borrowed Yaesu FT-2000

Fortunately for me, my friend **Steve Nichols G0KYA**, who lives nearby, has the very modern Yaesu FT-2000 and he kindly let me borrow that for testing the interface. After playing with the transceiver for a while, (dreaming of a change of rig!), I returned to the reality of testing the SB-2000. I then had to ask Martin Lynch for a new set of leads specifically for the FT-2000.

Further problems then ensued, this time with the FT-2000. I was trying this transceiver for the first time and wanted to check/change some of the menu settings. Unfortunately (a steep learning curve!) I found that the menu settings didn't compare with those given in the handbook. So, I then spent a lot of time playing with various settings, modes and so on and a study of the actual menu listing within the transceiver.

Eventually, I managed to get the problems sorted, although it took me some time. The problems I found were due to the fact that the transceiver had undergone a firmware upgrade, which managed to change some of the listings in the menu. However, the more I played, the more I got to like the transceiver – but that's another (expensive) part to this story!

Finally, I then plugged the leads into the rear of the transceiver and the main 25-pin connector into the rear of the SB-2000, with the audio frequency (a.f.) leads connecting the SB-2000 to my shack computer. That was when I discovered another problem!

My computer is in a 'tower' style case and sits under the desk. The audio leads of the SB-2000 are about two feet long! So, the interface ended up dangling over the back of my desk. These leads need to be two metres long to allow for situations like this. As supplied they are fine for use with a lap-top, but I still use a 'big' PC in the shack.

Following the instructions, I then put the disk into the CD drive and installed the drivers. Once that had been accomplished, I then plugged the Universal Serial Bus (USB) lead into the computer and the interface was installed.

Problems Solved!

Once all the problems had been sorted and solved, the software was fairly simple to install and get working. I had to connect the transceiver first and then install the drivers from the supplied disk. Then the SB-2000 can be connected to the PC with the USB lead.

There's no need for an older COM port on the PC and no need for a separate power supply. All necessary interconnections are via the USB lead and this is fully compatible with USB versions 1.0, 1.1 and 2.0. The FT232R USB to 'UART' bridge chip is used to avoid the COM port problem.

All signals are optically isolated and the audio has a 1:1 audio transformer in line to provide a similar isolation. Most digital modes are catered for, including RTTY, PSK, SSTV, possibly the three most popular modes.

The front panel is simple and self-explanatory. The rear panel is the same – just follow the instructions for lead connections in the booklet. **Figs. 2** and **3**.

The computer will find 'New hardware' and install the software for it. Then you can look for the COM port designated to the SB-2000 by going to **Control Panel**:>**System**, **Hardware**:>**Device Manager**. You'll need to know this when configuring the software.

I decided to use a piece of software called *MMTTY* and not *Hamradiodeluxe* to start with. This has to be

Fig. 2: In its normal operating position, other than the four activity l.e.d.s, there's little to look at on the SB-2000.

configured correctly. The *COMFSK* software has to be installed first and then in the Port configuration, you have select EXTFSK. This too, has to be configured, using DTR for FSK and RTS for PTT. In *MMTTY,* in choosing the TX Port, select Com-TXD(FSK)-(USB Port).

Other Programs

Other programs will have to be configured correctly but the SB-2000 should be compatible with most. I tried it later with *HRD*, *Digipan* and *Winwarbler* with no problem. For RTTY general use *MMTTY* is my favourite and we all have our own, so I have not gone into too many details of the different programs.

I had quite a few QSOs using RTTY mainly because that's my main interest, and also PSK31. I had a few QSOs with mainly USA-based stations on 14MHz (20m) with the interface and compared the performance to my FT-1000MP using the MicroHam interface and couldn't detect any difference. No other problems were found, other than those I have already described! It's a basic interface, in that it doesn't have a built-in soundcard or Winkey as my MicroHam does. Nor does it have other 'bells and whistles', but then again it's not in that category or price range.

Using a program such as *HRD*, computer assisted tuning (CAT) control is possible. It's a cost-effective way of becoming active with Data modes. The only minor criticism I have is the length of the audio leads, which is easily solved. The SB-2000 interface represents good value for money and is ideal for the beginner to Data modes. My thanks to Martin Lynch for the loan and for supplying the new cable set for the FT-2000. ●

Fig. 3: Just four connectors on the back panel, three to and from the computer and the large 'D' type connector to the radio, via a rig-specific set of cables.

Product: The MyDEL SB-2000 Data Interface.

Company: UK importers Martin Lynch & Sons Ltd.

Pros: Good value for money. Cost effective way of getting on to data modes. Ideal for beginner.

Cons: Short audio leads.

Price: The MyDEL CG SB-2000 is £99.95 inc. VAT. Leads are extra at £18.95 each and are available for most modern radios. **If readers quote *PW* then carriage will be FREE (UK Mainland) for the month (November) of the review.**

My thanks for the loan of the review unit go to Martin Lynch G4HKS of
Martin Lynch & Sons Ltd,
***Outline House*,**
73 Guildford Street,
Chertsey, Surrey KT16 9AS.
Tel: (**01932**) **567333**, FAX (**01392**) **567222**.
E-mail **Martin@MLandS.co.uk**
Website: **www.MLandS.co.uk**

Chris Taylor G0WTZ Technical Sales Director of ML&S Ltd. comments:

Thank you for the courtesy copy of Roger G3LDI's review. The SB-2000 is basically designed to run with *Ham Radio Deluxe* so it would have been nice to see some more detailed feedback on how it works with *HRD* and what settings are needed plus comments about why the unit has a low baud rate.

I also think it prudent to mention that older radios are not so hot on data modes and the radios should be reduced to at least 50% duty cycle. Best Regards. **Chris**.

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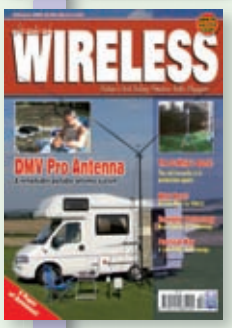

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Transmitting on 500kHz ...Simply!

For over a year now, I've held a Notice of Variation (NoV) from Ofcom, which allows me to transmit, with very low radiated power, in the 501-504kHz band. On one occasion I did a test with my locally-based friend, **Andrew Burge G6ALB**, using my low frequency signal generator as a transmitter and sending Morse by keying its output.

Andrew reported that the signal was chirpy, but he did manage to copy me some about 3km (about 2 miles) away. But apart from this very brief excursion, I'd not used the band other than on receive.

However, a wide range of UK and European experimental Amateur stations can be copied with a very simple set-up. For a long time my Yaesu FT-817 receiver has been used directly connected to a random wire. My best reception is of SM6BHZ, who was using 1W effective radiated power (e.r.p.) of single sideband (s.s.b.).

Most 500kHz transmissions use Morse code at normal or very slow speeds. There are also other exotic data modes used which work well with very weak signals and using these modes, some stations have bridged the Atlantic on the 500kHz band!

Beaconing Mode Program

Having recently discovered *WSPR*, a beaconing mode program, I knew that very weak signals could be copied using this software on the high frequency (h.f.) bands. A few weeks earlier I'd been copied in Australia several times when using 2W in *WSPR* mode on the 7MHz (40m) band into to my very indifferent 15m long end-fed wire that runs down the garden.

So, the question arose – just what could be achieved on 500kHz with something I could put together quickly? The traditionally low frequency (l.f.) bands such as 136kHz and 500kHz are associated with big antennas, enormous loading coils and very high power transmitters. Another problem is that although on h.f. most of the transmitter's radio frequency (r.f.) output is actually radiated, on l.f. only a tiny fraction of the power applied to the antenna is radiated. Only a tiny fraction of the power applied to the antenna is radiated on l.f. as the antenna lengths are only a very small fraction of a wavelength.

To generate a *WSPR* signal I needed a transmitter that would produce upper sideband (u.s.b.). The *WSPR* software running on a PC generates a tone around 1.5kHz, which is very slowly frequency shifted. If this is applied to the microphone or data input of a transmitter it produces a constant amplitude carrier which contains FSK data. So, for my purposes the answer was a low powered transmit down-converter, taking the output from my FT-817 h.f. transceiver and mixing it down to the 500kHz band.

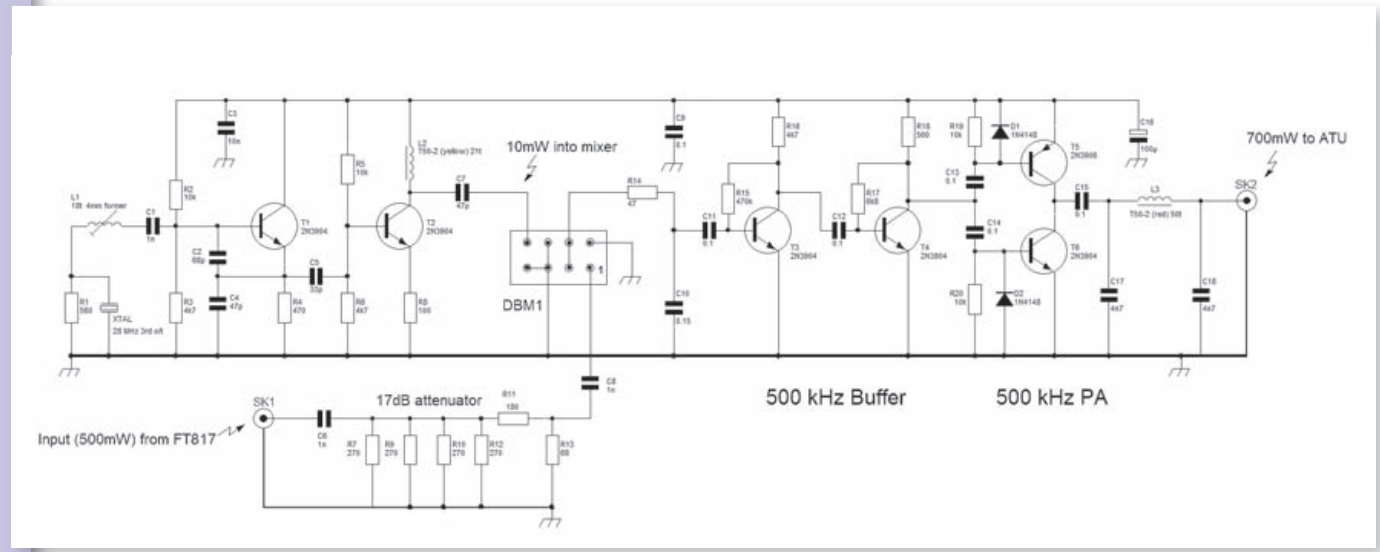

Fig. 1: The circuit of the down-converter and l.f. amplifier that Roger uses, gave an indicated e.r.p. of 6µW.

Roger Lapthorn G3XBM tries a band that provided many us with our first encounter with Morse transmissions – on domestic receivers!

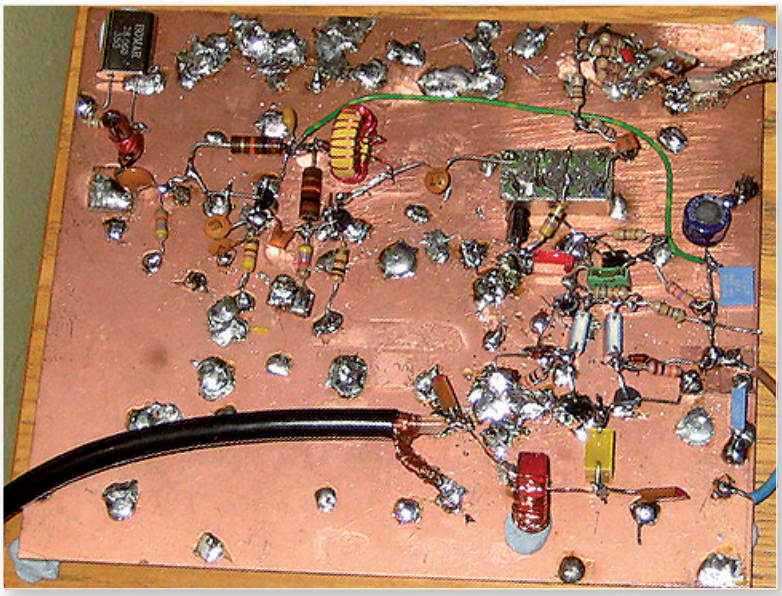

Fig. 2: The bread-boarded layout of Fig. 1 is still awaiting tidying up and boxing.

Fig. 3: Initial tests were carried out with this antenna tuning unit, constructed from a ferrite rod from a medium wave radio, wound with around 100 turns of 0.2mm wire.

Down Converter Circuit

The down-converter circuit **Fig. 1**, I used consists of three sections: the local oscillator, the mixer and the 500kHz power amplifier (p.a.). A 28MHz third overtone oscillator feeds a buffer stage that raised the output to around 10mW.

An SBL1 double-balanced mixer is used in the circuit, although there are several suitable alternatives. The output from the FT-817 (set at 500mW) needs to be reduced by 17dB before it is applied to the double-balanced mixer, so a simple resistive attenuator is employed.

The output of the mixer at 500kHz is then applied to the small three-stage p.a. The ubiquitous, and very inexpensive, 2N3906 and 2N3904 transistors are used throughout the design including the p.a. stage which produces around 700mW. Finally, the output of the p.a. is passed through a low pass filter (l.p.f.) to produce a clean sine wave signal.

As the transverter is essentially a bread-boarded prototype **Fig. 2**, that I built on a piece of copper clad board 'ugly style' the finished result is far from pretty. But it works, although it's still awaiting a tidy layout and box.

Antenna & Matching Systems

As part of the experiment I wanted to avoid using large antennas and matching coils – in fact I wanted to use the h.f. antennas I'd erected already. These were a 15m long end-fed wire and a 28MHz band wire halo (the *Homebase 10* published in *PW* in September 2008 on pages 38 and 40) fed via around 5-6m of coaxial cable.

So, my antenna tuning unit was constructed using a small section of ferrite rod from a medium wave radio, wound with around 100 turns of 0.2mm wire tapped about every 20 turns. This was tuned using a series 365pF variable capacitor **Fig. 3**.

Initially, the antenna tuning unit was set up on receive for strongest signal, adjusting tapping points as required. A final adjustment was made on transmit using a small in-line current meter using a toroidal transformer, with its resistive load and diode detector.

The primary of the transformer is the antenna wire and the secondary is 50 turns of 0.2mm wire wound on the toroid and connected to a 470Ω load. A diode detector then rectifies the voltage across the resistor. The rectified output is connected to a digital meter set to the millivolt (mV) range. Tuning is very sharp.

Test Results

Having built the system, it was then time to test it. A sked was arranged with the local station, Andrew G6ALB I mentioned earlier, for the following evening. At the time, this was almost two days away so, instead of waiting, I connected everything up and put out my first *WSPR* transmission on 500kHz using the 15m long wire fed via the antenna tuning unit (a.t.u.).

One of the advantages of *WSPR* is that, if stations are connected to the internet, signal reports received can be automatically uploaded to a central database. Stations can then see if anyone is copying them and at what signal strength – the more stations that are monitoring, the more useful the database becomes.

Incidentally, even if you can't transmit on 500kHz there's

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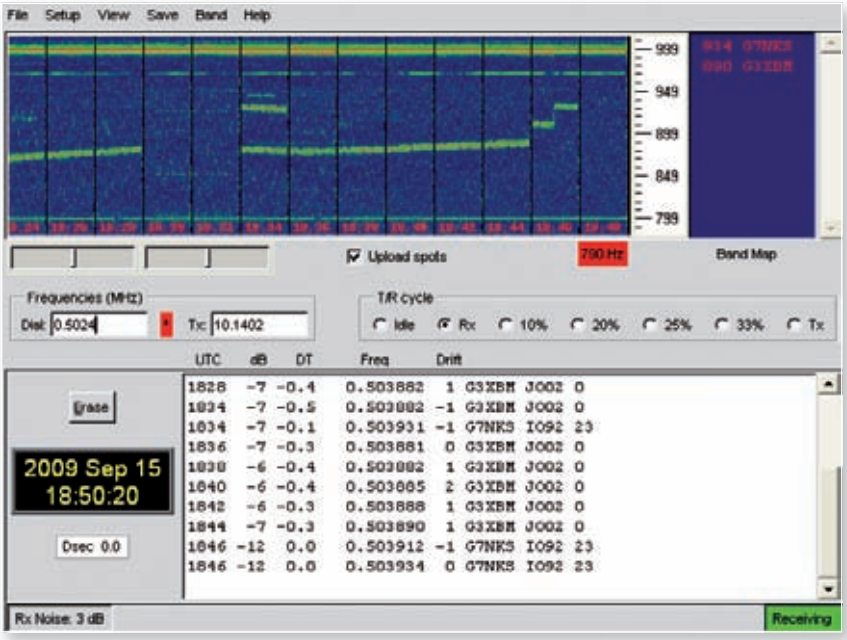
Fig. 4: Just two of the reports of the 6µW from G3XBM showing the paths.



A* WSPR *signal showing a small degree of drift.

nothing stopping you becoming a *WSPR* monitoring station and uploading reports to the database!

Having set up my *WSPR* software and put the transmitter on the air I then started to monitor the on-line database for reports, more in hope than expectation. I was only moderately hopeful that G6ALB might hear me in a few days' time.

However, to my **utter** astonishment there, before my very eyes, appeared a report of my 500kHz *WSPR* signal on the database from **Chris McCarthy G3XVL**, some 61km away in Ipswich, Suffolk! I was amazed – my ultra low e.r.p. station was actually getting out and being copied at some distance **Fig. 4**.

In the few days that followed I got many more reports from a total of four different stations in the east of England. The best DX was **Jim Moritz M0BMU**, in Hatfield, Hertfordshire some 69km away from my Burwell, Cambridge QTH.

Eventually, I found out that the most effective antenna was the vertical coaxial cable leading to my 28MHz halo antenna (with inner and outer connected together) with the latter acting as a top capacity hat. The total length is only about 5-6m or 1/100th of the signal's 600m wavelength. For my ground system I just used the copper pipe work of my central heating system.

Calculating ERP

After a week of experimenting with this very low power system I received a calculation of my effective radiated power from Jim M0BMU based on the signal level at which he was receiving my signals over several days. He calculated my e.r.p. was **just 6µW** (six microwatts), quite staggeringly small. Clearly there was a lot of scope for improvement.

Firstly, the power can be raised by 10dB using a simple field effect transistor (f.e.t.) power amplifier stage such as the IRF510. Then the antenna can be improved and the ground system too.

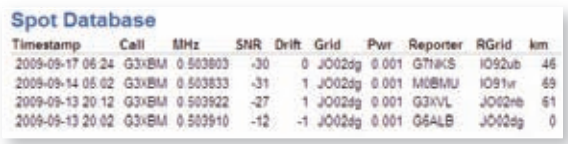
In all, I think another 20dB of e.r.p. can be found by changes which won't break the bank or make the garden look like a missile tracking station. With these changes in the coming months I would expect my 'sphere of influence' on the 500kHz band to increase quite considerably.

Next Steps

The next stage of my experimentation is to convert the down-converter to a full transmit-receive transverter. This will be possible with just the addition of a couple of relays and an r.f.-sensed changeover switch. With a few more watts it should be possible to make a few c.w. contacts on the band as well.

Overall, this has been a most interesting exercise. The 500kHz band does not **need** expensive high powered equipment or complex antennas to get results, especially using modes such as *WSPR* or very slow (QRSS) c.w.

Certainly, if you're prepared to optimise your station fully – then some quite remarkable distances can be spanned. But a great deal of fun and real experimentation is possible with an extremely basic system. Will you join the fun on 500kHz soon? ●


Spot Database

Timestamp	Call	MHz	SNR	Drift	Grid	Pwr	Reporter	RGrid	km
2009-09-17 06:24	G3XBM	0.503803	-30	0	JO02dg	0.001	G7NKS	IO92ub	46
2009-09-14 05:02	G3XBM	0.503833	-31	1	JO02dg	0.001	M0BMU	IO91vr	69
2009-09-13 20:12	G3XBM	0.503922	-27	1	JO02dg	0.001	G3XVL	JO02hb	61
2009-09-13 20:02	G3XBM	0.503910	-12	-1	JO02dg	0.001	G6ALB	JO02dg	0

Just some of the WSPR stations reported on the Spot Database.

LINKS

WSPR software	**http://physics.princeton.edu/pulsar/K1JT/wspr.html**
Getting on 500kHz	**http://wireless.org.uk/geton501.htm**
LF reflector	**rsgb_lf_group@blacksheep.org**
G3XBM blog	**http://g3xbm-qrp.blogspot.com/**
G3XBM website	**http://www.g3xbm.co.uk**

Peter Dodd's

antenna workshop

Peter Dodd G3LDO describes how we can join him on 136kHz – once he's described getting over the antenna problems!

Suburban Antennas For 136kHz

Many *PW* readers will be aware that we now have a low frequency (l.f.) allocation of 135.7 to 137.8kHz. In this rather unusual *Antenna Workshop* I'm discussing a method for using your existing 1.8, 3.5 and 7MHz (160/80/40m) antenna on this very low frequency band. It's unusual because I'm also including some suggestions of what receiver to use and some ideas for constructing a simple transmitter.

A book I can thoroughly recommend for those interested is *LF Today, a Guide to Success on 136kHz*, (*LFT*) an RSGB publication by **Mike Dennison G3XDV**. It's available from the RSGB or from the PWP Bookshop.

The LF Antenna

The half-wave dipole length for 136kHz is approximately 1100m and a full size quarter-wave antenna would be approximately 550m high, so clearly these antennas are out of the question for us! The solution is to use an electrically-lengthened short vertical where its physical length is much less than a quarter wavelength by using inductive loading, as is done with h.f. mobile antennas. And, as with mobile antennas, a capacity 'hat' above the loading coil can be used to increase antenna efficiency.

The most commonly used antenna on l.f. is the end-fed wire fed against ground, often referred to as the Inverted L or Marconi antenna. This type of antenna is often used on 1.8MHz (160m). The antenna will work just as well if connected as a T as shown in **Fig. 1**.

As I've suggested, you can make an antenna for 136kHz simply by using an existing dipole for 1.8, 3.5 or even 7MHz. Start by connecting both conductors of the feeder together and then end feeding them both via a loading coil against ground. In this case, the near vertical feeder can be considered as vertical antenna and the existing dipole as the capacity hat.

An l.f. antenna should be designed to have as long a vertical section as possible, and a top section giving as much capacitance to ground as possible without compromising on height. However, this need not be in the classic L or T shape of the Marconi antenna, the shape isn't important. The secret is to use as much wire as possible, as high as possible – even with low power the r.f. voltages at l.f. are high so good quality insulators are required.

The Loading Coil

The loading coil is a critical part of any l.f. antenna system. Note that the coil will perhaps have several tens of kilovolts across it, so small ferrite loaded coils are unsuitable. The coil

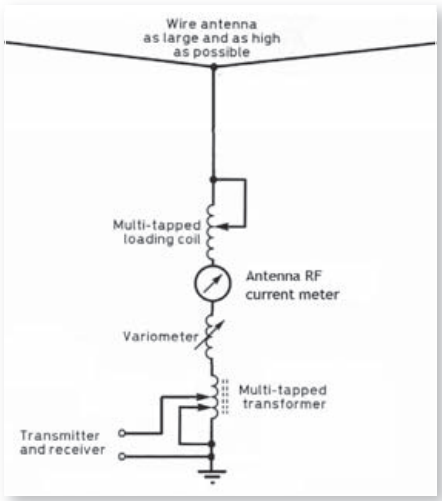


Fig. 1: Diagram of an l.f. antenna. The main multi-tapped coil needs to be large in both size and inductance (3 to 4mH). The matching transformer is wound on a T-200 ferrite ring. Match and tune for maximum noise in the receiver or maximum r.f. current on transmit.

Fig 2: Using a 7MHz centre fed dipole operate on 136kHz. The large coil former is made from a plastic manhole access point, available from builders suppliers. The smaller coil on the red box is a variometer from a vintage 500kHz transmitter.

Fig. 3: Close up of the matching transformer and the IC-706 used for testing on receive only. The IC-706 does not transmit on 136kHz.

Peter Dodd G3LDO
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former should be between 50 and 500mm diameter and 200-500mm long.

The actual diameter can vary, depending on the thickness of the wire used and the inductance required. The sides of former must be parallel but it is not essential for the former to have a circular cross-section. Formers can be made from plastic piping, rolled up plastic fence material, compost bins, and plastic boxes.

Factors affecting the *Q* include the coil's size and shape, the type of wire used and the spacing between the wires. The optimum spacing between wires is the width of one wire. In practice, this is achieved by using plastic covered wire, so that the insulation on adjacent wires keeps them about one wire diameter apart.

On the h.f. bands, it is normal to use a combination of inductors and capacitors in an a.t.u. to tune out any reactance. Unfortunately, the voltages at l.f. are so large that any capacitor is likely to flash over. Any tuning must be carried out in the inductance itself – a variable inductor is required. A crude, but simple, way of producing a variable inductor is to make 'taps' on the coil every few turns. This is certainly an excellent method if you have little idea of the inductance required to tune the antenna.

A better and more conventional method of varying inductance is to make another, smaller coil that rotates inside the larger one. This works because, depending on its position, a portion of the inductance of the small coil either adds or subtracts from that of the large coil. This is known as a variometer.

When the antenna and coil resonance has been established, another coil can be constructed with a fixed inductance slightly less than is needed. Then a smaller inductance, with a variometer coil, can be placed in series with the large one and used for fine-tuning within the amateur band as shown in **Fig. 2**. Note: It's often convenient to place the large inductor outside, and beneath the antenna, and to house the variometer coil in the shack.

You may wonder why an antenna needs fine tuning in a band that is only 2.1kHz wide! The answer is that an efficient l.f. antenna is likely to have a high enough *Q* that it has a 3dB s.w.r. bandwidth of only 1kHz or so. Furthermore, the antenna's frequency will change with the seasons and the weather, due to changing losses in the soil and adjacent objects such as trees.

The simplest method of matching the coils and the antenna is to connect them to a receiver as via a tapped auto-transformer wound of a ferrite ring as shown in **Fig. 3.** The loading coil inductance and the connections on the auto transformer are adjusted for maximum noise from the receiver. When you have built your transmitter you then tune for maximum antenna current.

The Ground System

As I've already stated, a vital part of the antenna system is the 'ground' connection. This ground can be as simple as a single stake in the ground, or as complex as hundreds of radial wires. Commercial l.f. stations use hundreds of kilometres of wire spread out over a radius of several km. **Note:** Don't be tempted to use the a.c. mains supply earth in the house as this will introduce noise in the receiver and may possibly lead to circuit breakers being activated.

The efficiency of the ground connection, and hence the efficiency of the antenna itself, will depend on the conductivity of the soil around the antenna. Sea water makes an excellent ground and proximity to the sea can be a great advantage – but watch out for the incoming tide!

The most basic ground connection is a single metal stake, such as a copper water pipe, driven a metre or so into the ground. The current density is highest at the bottom of the vertical section, so the earth stake should be as close as possible to this point. This simple arrangement will get your station on the air, but should not be regarded as optimum.

In practice, successful l.f. earth systems include a mixture of earth stakes, radials and any other earthed items such as water pipes and even old copper water tanks. Ground stakes should be as long as possible. Copper water piping is cheap and easily obtainable and works fine, though it is soft and will bend when driven into hard ground.

The LF Receiver

Many modern h.f. transceivers tune down to around 100kHz, which theoretically makes them suitable for reception of 136kHz signals. However, many receivers have built in filters to reduce sensitivity at medium frequency (m.f.) because of the high powered broadcast stations in the medium wave band.

The old Kenwood TS-850 has a good l.f. receiver, which performs very well and is available these days at a reasonable price second-hand. Dedicated general coverage receivers, for example the AOR-7030, are also capable of good reception at l.f. Even the diminutive IC-706 gives a good performance on this band, see Fig. 3.

For very slow Morse (QRSS)

reception, (see below) the receiver's oscillators must have minimal drift, especially with the longer dot lengths.

Because the 136kHz band is so narrow, and to avoid interference from commercial stations close to the band, it's highly desirable to fit a c.w. filter in the receiver's intermediate frequency (i.f.). This type of filter is suitable for all modes used on l.f.

A Simple l.f. Transmitter

We now need a simple l.f. transmitter and one method of generating a stable signal in 136kHz is to use a variable crystal oscillator (VXO)/mixer as shown on page 48 of *LFT*. This circuit will work with any two crystals over 5MHz and separated in frequency by 135kHz. The trimmer capacitors are ganged together and arranged to increase one oscillator's frequency, while decreasing the other.

The exciter is inherently frequency stable because the two crystal oscillators constructed in the same enclosure are thermally coupled so, any frequency drift in one oscillator due to temperature, is compensated by the same frequency drift in the other.

The signal from the Oscillator/mixer can be keyed and filtered and amplified to produce a square wave switching stage to drive the power amplifier shown on page 7 of *LFT*. The (power m.o.s.f.e.t.) transmitter featured in *LFT* is based on a design by **Peter Schnoor DF3LP.**

An IRF630 can be used for the final stage but the IRF640 is much better choice since its on-resistance is lower and will have no problem producing 100W. This small amplifier will give even more power by using a greater supply voltage and an IRF840.

The output from a simple l.f. transmitter can be high in harmonics, so a low pass filter is not only recommended, but almost obligatory. And as you'd expect, a suitable filter is shown on page 8 of *LFT*. The filter is a double-π filter unit with outer capacitor pairs of (10+2.2)nF, and an inner pair of (22+4.7)nF and two coils of 54μH.

The two inductors comprise 59 turns of 0.8mm enamelled wire on a T157-2 powdered iron toroid. High voltage polypropylene capacitors with a working voltage of 400 to 1000V must be used. It could be built as a stand-alone unit.

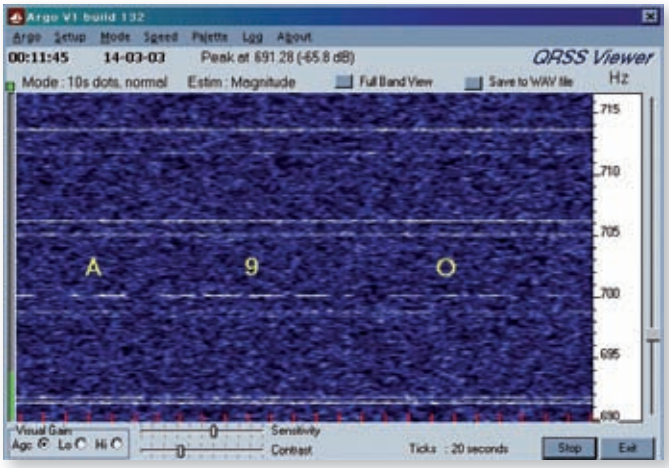

Fig. 4: A very weak signal from UA9OC using QRSS with 10 second dots viewed using Argo. The other lines on the display are sidebands from the Loran navigation system.

Slow Morse

Very few l.f. operators send fast Morse (c.w.), even if signals are strong, because there is always a chance that others are listening at a great distance. This makes 136kHz a good place to practice your Morse.

However, there are other modes that do not require proficiency in Morse code and are designed to be machine-read, or at least displayed on a computer screen. One of these is QRSS operation, which actually uses Morse but at such a very slow speed that any received characters could be looked up in a table by the receiving station.

The QRSS method was pioneered in 1997, on the then new band of 73kHz by **Peter Martinez G3PLX** and **Andy Talbot G4JNT** and enabled the reception of G4JNT's callsign in Morse over a distance of 393km. The transmission was such, that it had just 1 milliwatt (1mW) effective radiated power (e.r.p.) and the signal was completely inaudible at the receive end.

To achieve the QSO, the transmission sending G3PLX DE G4JNT, using a Morse dot length of 80 seconds, took three hours to transmit. Some idea of the dot length and signals-to-noise improvement can be seen in **Table 1**.

Three hours to send a couple of callsigns may not sound very practical, so in practice a dot length of three seconds is the default mode. This allows a meaningful two-way contact to take place in less than an hour. Slower speeds are used, but usually only for intercontinental DX.

The mode was christened QRSS by Mike Denisson G3XDV because "extremely slow c.w." was rather cumbersome. Because QRS is used in Amateur Radio to mean "slow Morse", QRSS is "very slow Morse", using the similar Q-code grammar adopted when QRP (low power) was extended to make QRPP (very low power).

Some time after the G4JNT-G3PLX record-breaking test, it was found that freely available software originally written to analyse birdsong could be employed, using the software in association with a computer soundcard to decode the signals.

Nowadays, several Amateurs have produced soundcard software specifically for l.f. use, including *Argo*, *EasyGram*, *Spectran* and *SpecLab*. These are capable of displaying Morse with dot lengths from less than one second to over 100 seconds. Some also provide audio filters and facilities to decode other types of transmission. An example of a very weak signal using *Argo* software is shown in **Fig. 4**.

Well, that's how easy it is to get going on 136kHz! So, can I hope to work some more of you there? ●

Table 1

Speed	Optimum bandwidth	S/N Ratio *
12 w.p.m.	10Hz	0dB
4 w.p.m.	3.33Hz	+4.8dB
3 sec/dot	0.33Hz	+14.8dB
60 sec/dot	0.0165Hz	27.8dB

Table 1. Signal rate, bandwidth and signal to noise ratios relative to to a 12w.p.m. transmission.

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Tony Nailer's

technical for the terrified

This month Tony Nailer G4CFY deals with amplifier operations, in-circuit capacitor functions and two well-known oscillators.

This month I will explain the operation of amplifiers from a viewpoint of alternating current (a.c.) and direct current (d.c.) equivalent circuits, deal with capacitive coupling and decoupling. I'll also explain different arrangements of both the Hartley and Colpitts oscillators.

Analogue circuits usually include resistive components to set the d.c. and voltage conditions of the active device. There's usually a resistive combination to make it function in the required no-signal, or quiescent, state. There may also be resistive components to set device gain, or to provide feedback, which may also control overall stage gain.

Using Capacitors

Capacitors are used to couple a.c. signals into and out from a stage. They may be used to decouple a.c. at bias points, or to work, in conjunction with resistors and inductors, to define the stage's frequency characteristics.

You're probably aware, when d.c. is applied, that capacitors only charge up to fixed levels at which point no further current is passed through it. They do though allow pass a.c. levels through and so, exhibit reactance, which is specifically frequency related to their value.

As the signal frequency is reduced, capacitor exhibit steadily increasing reactance. At a specific frequency, they become series resonant together with their internal series inductance, Above this frequency, they then begin to look progressively more like an inductor than a capacitor.

Looking At Inductors

Inductors, on the other hand, while allowing d.c. to flow through, with only resistive limits, also have an additional low value reactance at low frequencies. The reactive steadily increases with increasing frequency. They may also be used to resonate in conjunction with capacitors to select or reject ranges of frequencies.

There's also a complication with inductors, as with capacitors, in that coils also contain capacitance between the winding turns, which is in parallel to the inductance itself. So, there will be some frequency where an inductor will exhibit parallel self-resonance.

An additional point to consider, is that power supplies (p.s.u.), including batteries, usually present a very low circuit series-resistance, often less than one ohm. Regulated high-current supplies may appear with a series-resistance as low as 0.01Ω. From a d.c. viewpoint they appear as a voltage source and a very low value resistance. From an alternating current (a.c.) viewpoint, power supplies and batteries appear as a virtual short circuit.

Interconnecting Cables

At all alternating frequencies the inductance of interconnecting cables and wiring can be significant. This can give rise to a.c. signals appearing on the wiring, and the supply rail in particular can no longer be considered as low resistance. It's therefore vitally important that supply line de-coupling capacitors present a low reactance at the operating frequency.

As a guide to suitable values of coupling and de-coupling capacitors I have created **Tables 1-3**, which give the reactance of suitable de-coupling capacitors from 100Hz through to 150MHz.

In the following analysis and circuitry I have designated coupling capacitors as Cc, de-coupling capacitors as Cd, and tuning capacitors as Ct. Coupling capacitors are usually calculated to have a reactance less than one tenth of the resistance or impedance into which they feed.

Low Frequency Circuit.

The circuit of **Fig. 1**, is an operational amplifier (op-amp) which, by suitable choice of components, can be configured to work from very low frequency up to about 100kHz. If the circuit is considered from a d.c. viewpoint, taking into account that capacitors are invisible to d.c. then the circuit becomes as shown in **Fig. 2**.

In Fig. 2, resistors R2 and R3 set the voltage operating point, but as the source resistance of the power supply is very low, these resistors are effectively in parallel. Usually, designers will make the parallel value of R2 and R3 equal to the value of R4. This is done to minimise any offset voltage between the two inputs.

Considering the circuit of Fig. 2 from

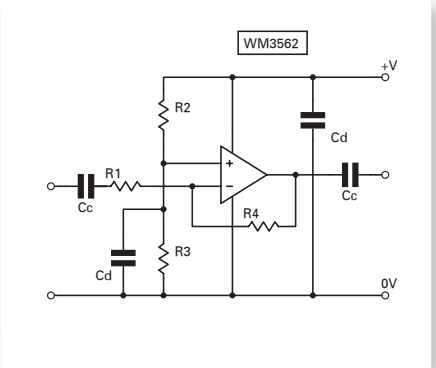

Fig. 1: A an operational amplifier suitable to work from very low frequency up to about 100kHz.

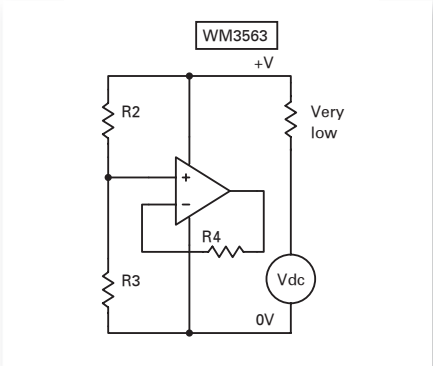

Fig. 2: When considered at d.c. capacitors are 'invisible' so, the circuit of Fig. 1 becomes as shown.

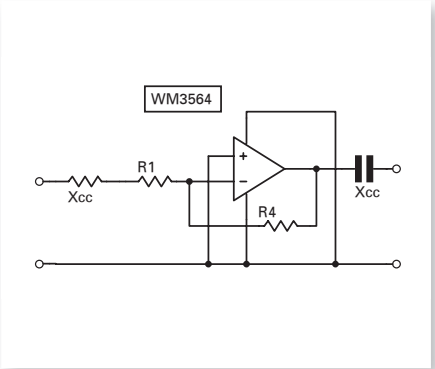

Fig. 3: The a.c. equivalent of Fig. 1, as some capacitors can be considered to be effectively an a.c. short circuit.

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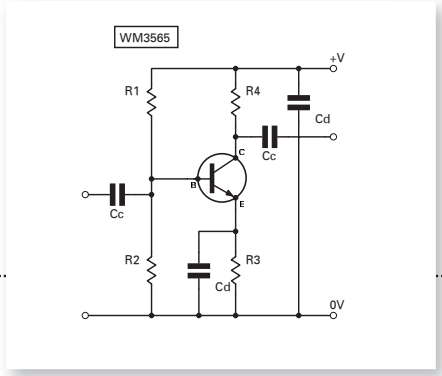

Fig. 4: A transistor common emitter amplifier, that can be used up to about 3MHz.

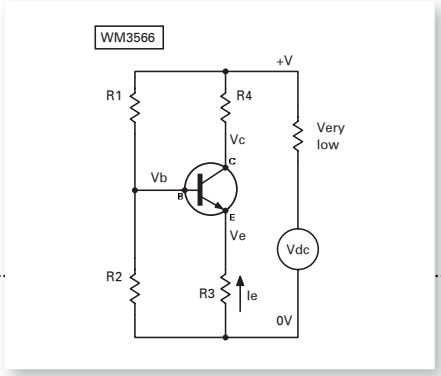

Fig. 5: Resistors R1 and R2 are used for base bias voltage.

the a.c. viewpoint, the input capacitor Cc may have a value chosen to be a low reactance relative to R1 at the operating frequency, or may be chosen to be equal value to R1 at a particular frequency, thereby providing a high pass filter function.

Capacitors Cd will be chosen to be very low reactance at the lowest operating frequency, and can be considered to be effectively an a.c. short circuit. The diagram, **Fig. 3,** then shows the a.c. equivalent circuit of Fig. 1. The a.c. gain of the circuit is specifically set by the ratio R4/R1, and the high pass function has a corner frequency F = 1/(2*π*R1*Cc).

Table 1 shows why supply line de-couplers for audio amplifier stages should be 1000μF and why capacitors driving four and eight ohm speakers need to be 220μF or 470μF. It also shows that the practice of de-coupling emitter resistors with 10μF may not be sufficient at speech frequencies, and 100μF would be better suited.

Medium Frequency Circuit

In **Fig. 4**, the transistor is shown as a common emitter amplifier, which normally can be used up to about 3MHz. The actual limits are dependant upon values of coupling and de-coupling capacitors.

Considering first the d.c equivalent circuit shown in **Fig. 5**, where resistors R1 and R2 are used for base bias voltage. The emitter voltage Ve is typically 0.65 to 0.7V below the base voltage (both referenced to 0V). Resistor R3 is determined by the choice of emitter and collector currents, as Re = Ve/Ie.

The collector voltage Vc is normally chosen to be halfway between +V and Ve. So if +V is 9V, and Ve is 1V, then Vc would be set around 5V, by suitable choice of R4. If the collector and emitter currents are considered to be the same then R4 will have 4V across it and Ie flowing through it. In this case R4 = 4/Ie.

Operating Conditions

Now I will consider the a.c. operating conditions. Capacitors Cd are considered an a.c. short circuit at the operating frequency. Capacitor Cc, can be chosen to act in conjunction with the input resistance to provide a high pass function, or may be made low reactance in relation to the input resistance. The a.c. equivalent circuit is shown in **Fig. 6**.

The input resistance of this circuit is much lower than it may at first appear as the transistor has only a medium value of base resistance, which may be significant in relation to R1 and R2. The output resistance is dominated by the value of R4.

Table 1. 100Hz to 10kHz

C (μF)	F (Hz)	Xc (Ω)
1000	100	1.59
1000	300	0.53
1000	1000	0.16
470	300	1.13
470	1000	0.34
470	3000	0.11
220	1000	0.72
220	3000	0.24
220	10000	0.07
100	1000	1.59
100	3000	0.53
100	10000	0.16
10	1000	15.92
10	3000	5.31
10	10000	1.59

The a.c. gain of the circuit is R4 divided by the sum on any non de-coupled emitter resistance and the internal resistance Re of the emitter, which is approximately 26/Ie, where Ie is in milli-amps. For example if the transistor is set for an Ie of 2mA, then Re will be 13Ω. Unfortunately internal capacitance of the transistor together with inductance of the leads makes the achievable gain fall rapidly much beyond 3MHz.

A guide to suitable coupling and de-coupling capacitors is given in **Table 2**. Notable here is data on the 100nF (0.1μF) poly-block or mylar capacitor, commonly used for interstage coupling at audio frequencies. It is 1591Ω at 1kHz, which means it is 5300Ω at 300Hz. Used in conjunction with a circuit with 5600Ω input resistance,

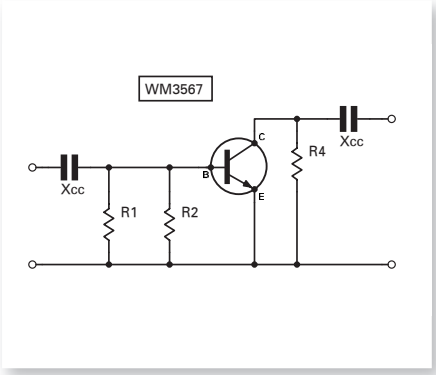

Fig. 6: The a.c. equivalent circuit of Fig. 4.

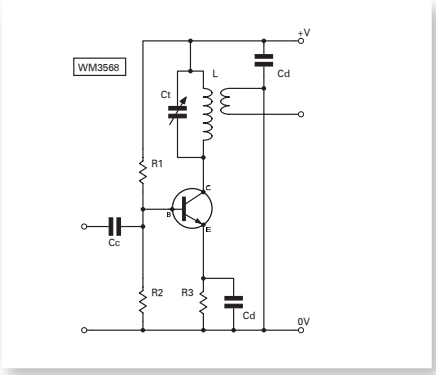

Fig. 7: A radio frequency (r.f.) or intermediate frequency amplifier.

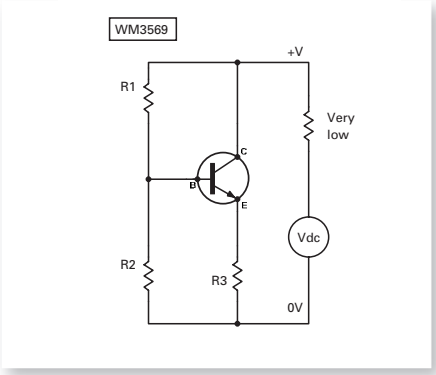

Fig. 8: The d.c. equivalent circuit of Fig. 7.

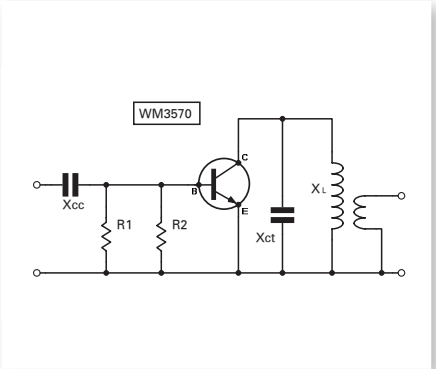

Fig. 9: The a.c. equivalent circuit of Fig. 7.

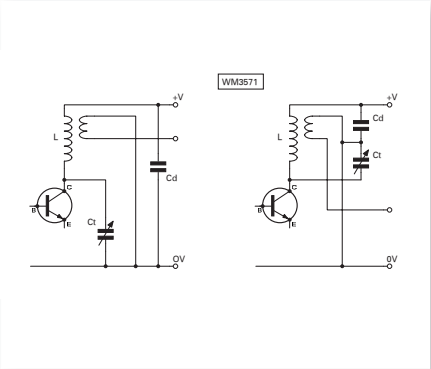

Fig. 10: The circuit of Fig. 7 can also be redrawn as shown in these two examples.

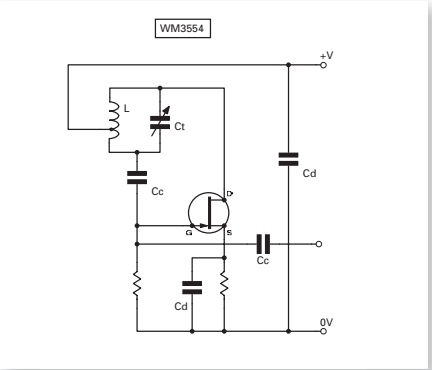

Fig. 11: A typical arrangement of the Hartley oscillator.

this will give a high pass characteristic above 300Hz.

Intermediate & Radio Frequencies

A common emitter intermediate frequency (i.f.) or radio frequency (r.f.) amplifier is shown in **Fig. 7**. By virtue of the resonant circuit made up of Ct and L as a collector load, this circuit has maximum amplification at a single frequency. The amplification falls off rapidly as you move away from, above and below, the centre frequency.

The alternating voltage at the collector will be a sine wave with a centre voltage equal to the supply rail. The secondary winding has one side connected to 0V, which means the transformed output voltage will now be a sine wave alternating about 0V at its centre.

The d.c. equivalent circuit is shown in **Fig. 8** and is notable that the inductor L1 appears as a d.c. short circuit. This has the advantage that the collector current can be set to any required level to achieve the required maximum gain of the transistor.

I'll now consider the a.c. equivalent circuit shown in **Fig. 9**. At a frequency where the capacitive reactance equals the inductive reactance, resonance occurs. This is a condition where the r.f. current passing back and forth between Ct and L is increased up by a factor equal to the combined *Q* of both.

The reactive currents are anti-phase so cancel each other out, and the circuit appears to be a resistor with a value *Q* times the reactance. This is termed the dynamic resistance and it presents a very high value to the collector of the transistor. The high dynamic resistance allows a very high gain to be achieved, but at the resonant frequency only.

At frequencies below resonance the coil appears as a progressively lower reactance, thereby reducing the gain and shunting out those frequencies. Above resonance the capacitor appears progressively as a lower reactance, again reducing the gain and shunting out those frequencies.

Table 2. 1kHz to 2MHz

C (nF)	F (Khz)	Xc (Ω)
470	1	338.63
470	10	33.86
470	100	3.39
470	500	0.68
100	1	1591.55
100	10	159.16
100	100	15.92
100	500	3.18
100	1000	1.59
100	2000	0.80

A guide to suitable coupling and de-coupling capacitors is given in **Table 3**. Notable also from Table 2 is that 100nF (0.1μF) is an ideal capacitor to de-couple supply line and bias points for stages operating at 455kHz.

Alternative Circuits

The capacitor Ct in the circuit of Fig. 7 can also be connected from collector to ground, provided that decoupler Cd is suitably chosen to present a low reactance at the operating frequency. Consequently Fig. 7 can also be redrawn as in **Fig. 10a** and **10b**. They are all electrically the same when viewed as an a.c. equivalent circuit.

Variable frequency oscillators (v.f.o) can be configured in a variety of ways, and it's often unclear what type of oscillator is being used, unless the circuit is considered in an a.c. equivalent circuit.

The Hartley VFO

The Hartley variable frequency oscillator (v.f.o.) uses a transformer or a tapped inductor as the feedback component. The original used a coil with a tap at one-quarter of the total number of turns, which is connected to the supply rail. The greater part of the coil connected to the anode of the valve and the small part of the winding feeds the grid of the valve, thereby providing the required anti-phase feedback signal.

Table 3. 1MHz to 150MHz

C (nF)	F (MHz)	Xc (Ω)
47	1	3.39
47	3	1.13
22	3	2.41
22	10	0.72
10	1	15.92
10	3	5.31
10	10	1.59
4.7	3	11.29
4.7	10	3.39
4.7	30	1.13
3.3	30	1.61
3.3	50	0.96
2.2	50	1.45
2.2	70	1.03
1	100	1.59
1	150	1.0

The same arrangement can be used with a transistor or an f.e.t. provided the bias is suitably set up. A typical arrangement would be as shown in **Fig. 11**.

A transistor in common collector (also known as 'emitter follower') mode has the base and emitter in-phase. Likewise an f.e.t. in source follower mode has gate and source in-phase. To use a device in this mode as a Hartley oscillator requires the feedback signal now to be in-phase. Tapped coil Hartley oscillators for a transistor and f.e.t. are shown in **Fig. 12**, and a transformer coupled Hartley is shown in **Fig. 13**.

It is even quite practical to have a grounded base Hartley with an in-phase feedback signal from the

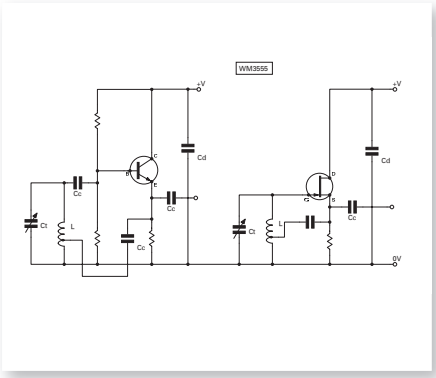

Fig. 12: Tapped coil version of Hartley oscillators.

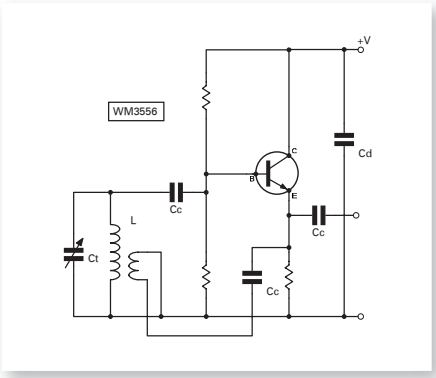

Fig. 13: A transformer coupled version of the Hartley oscillator.

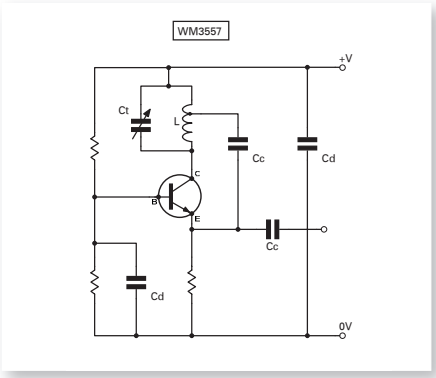

Fig. 14: A grounded base Hartley with an in-phase feedback signal from the collector to the emitter.

collector to the emitter as shown in **Fig. 14**.

Colpitts VFO

The Colpitts v.f.o. is probably the most commonly used variable frequency oscillator circuit, and it relies on capacitive tap feedback. This simplest form of this is shown in **Fig. 15**. The feedback capacitors annotated Cc1 and Cc2 also form part of the resonant circuit and therefore limit the relative capacitance change that may be obtained.

Capacitor Cc1 can equal in value with Cc2 or as low as one-quarter the value of Cc2. All that is required is a sufficient feedback proportion to maintain oscillation.

A variant of the Colpitts with the tuning capacitor apparently in series with the inductor was devised by **G. C. Gouriet** of the BBC, and later made better known by the writings of **James K. Clapp** in the proceedings of the Institute of Radio Engineers in the USA The circuit arrangement is shown in **Fig. 16**.

In **Fig. 16**, if L is transposed with Ct1 and Ct2 as shown in the equivalent

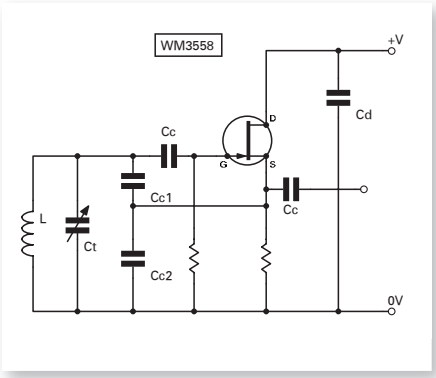

Fig. 15: Colpitts v.f.o. circuit relies on capacitive tap feedback.

circuit of **Fig. 17**, it becomes clear that L is in fact in parallel with a series combination of capacitors. This arrangement massively increases the effect of any change of Ct1 on the frequency, but when its value is reduced below a certain point there is insufficient coupling to the feedback capacitors, and oscillation ceases.

Further information on this oscillator can be found on page 6.14 of the fourth and fifth editions of the RSGB's *Radio Communications Handbook*.

Synthetic Rock

The technique of multiple capacitive tap of the Colpitts oscillator was further perfected by **W3JHR** for use with a *pnp* transistor for which circuit he coined the name 'synthetic rock'. This oscillator, especially when used with an f.e.t. is really 'rock stable', which is why I used it in the Portland v.f.o. This circuit is included on page 6.19 of the fifth edition of the *Radio Communications Handbook*.

I have found that W3JHR's circuit works really well using equal values for Cc1 and Cc2, and making Cc3 half of this value. This gives the total contribution of Cc1, Cc2, and Cc3 as only half the value of Cc3 and maximises the percentage frequency change due to Ct.

There are obviously a great number of other types of oscillators, but the explanation of these two popular types I hope will have aided in the understanding of a.c. and d.c equivalent circuits, coupling and de-coupling.

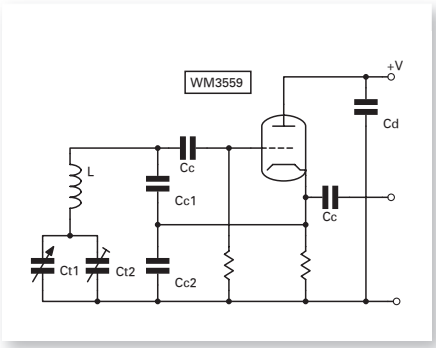

Fig. 16: The oscillator devised originally by G.C. Gouriet of the BBC, and made better known by the later writings of James K. Clapp.

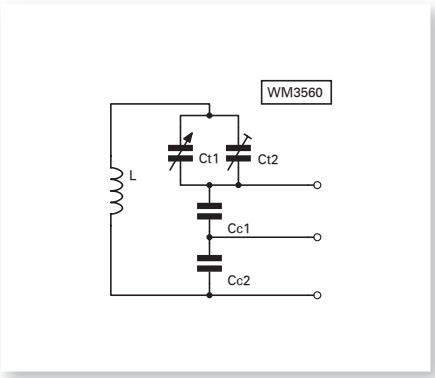

Fig. 17: Transposing L with Ct1 and Ct2 to show the equivalent circuit of Fig. 16.

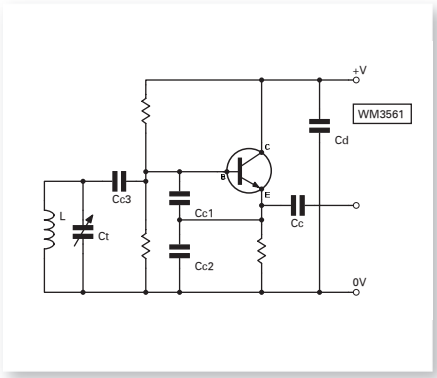

Fig. 18: A semiconductor version of the Gouriet-Clapp oscillator.

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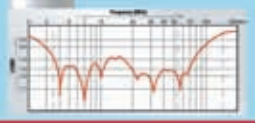

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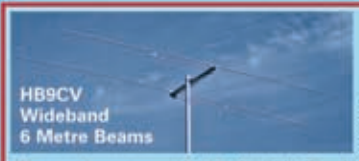

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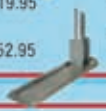

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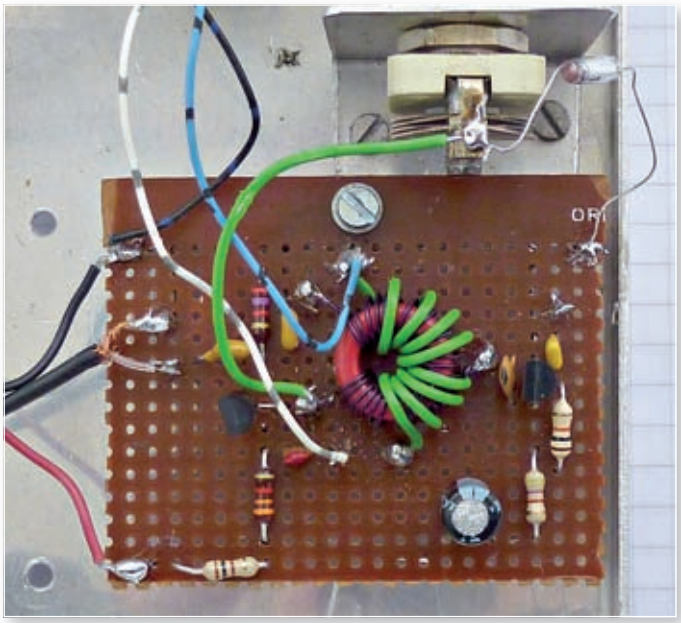
The Rev. George Dobbs G3RJV has another regenerative receiver idea and knows just how effective they can be.



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"Most of the fundamental ideas of science are essentially simple, and may, as a rule, be expressed in a language comprehensible to everyone." **Albert Einstein**

For many years I have extolled the virtues of regenerative receivers. In fact, my last such offering in this column was a mere two months ago, when I described a receiver based on a Colpitts oscillator. Perhaps it was not my best offering because a couple of people were kind enough to point out a some errors!

Thankfully there was nothing that reduced the usefulness of the suggested circuit but rather errors in my theoretical explanation. Unfortunately, I think that's what comes of being a Vicar (or rather a retired Vicar) with an active soldering iron – but no formal theoretical training in electronics.

One of the correspondents was **Rob Rose-Round M0BOL** who also pointed out that my 1970s *Ladybird* transistor radio book set him off on a career in electronics. The other one was *PW*'s own **Tony Nailer G4CFY** whose *Doing it by Design* column is compulsory reading for me. Both pointed out that the oscillator circuit used in the receiver is not series tuned, the inductor (L1) being grounded through a capacitor.

Tony also pointed out that I was incorrect in my analysis of the capacitive feedback ratios in my explanation of the Colpitts oscillator. I'll take this up again in a future column as I'm working on a project involving Colpitts oscillators and stability. So, we'll draw the confessional curtain aside and turn to yet more regenerative receiver fun! But first let me mention another interesting comment on that article.

Jack McKinney GI3TZB pointed out something I did not know about the Clapp Oscillator. It turns out that while **James K. Clapp** published his version of the oscillator design in 1948, it had been developed by **G. G. Gouriet** of the BBC some years earlier. Thanks, Jack, it's interesting to know that the BBC did it first!

You'll gather by now, that what I thought to a be harmless, but worthwhile, article yielded a lot of reader comment! I also had three E-mails on the general topic of regenerative receivers all of which praised the designs of **Keith Ranger G0KJK**, that have appeared in the G QRP Club journal *Sprat*. I have been in touch with Keith over many years and, like me, he's a retired clergyman who enjoys building radio equipment.

What's really special about Keith is that his entire Amateur Radio operating is done using the simplest of homemade equipment. One of the issues of *Sprat* featured a complete station by Keith using a simple variable crystal oscillator (VXO) transmitter called the *Mongrel* alongside a regenerative receiver called the *HF9*. The station could work over a range of Amateur bands by changing the crystal and filter in the transmitter and the tuned circuit values in the receiver.

Keith's Projects In *PW*

I contacted Keith and asked if I could explore some of his regenerative receiver ideas with *PW* readers and he kindly agreed. I looked at three of the G0KJK designs: The *HF9* t.r.f. short wave receiver, the *MB4* portable receiver and *A Telescopic Antenna DX Receiver*. These simple, but very effective, circuits have all appeared in *Sprat* in recent years.

Although many regenerative receivers are designed for the broadcast bands, Keith's designs are capable of good results on the Amateur bands, a more testing application for a regenerative receiver. The amateur bands are narrow in frequency, crowded and full of low-strength signals. An Amateur bands receiver must be stable enough for resolving c.w. (Morse) and single sideband (s.s.b.) stations.

As I suggested in my article on the Colpitts regenerative receiver, the heart of such a receiver is the careful control of an oscillator circuit. The secret of a good regenerative receiver is carefully controlled positive feedback – by applying some of the output signal back to the input, in phase with the input signal. This gives much higher gain within the circuit and that gain peaks at the tuned

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frequency of the oscillator resulting in a sensitive and selective receiver.

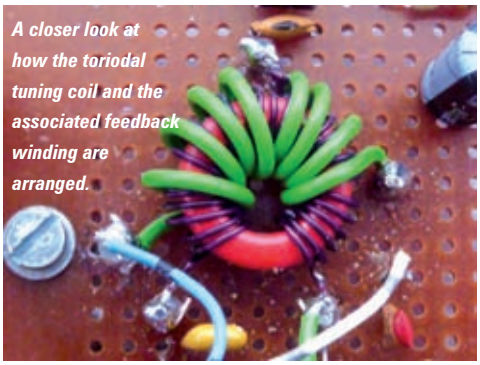
Regeneration, in principle is a simple, but sophisticated idea. The invention is usually attributed to that great American radio pioneer **Edwin Armstrong**. Armstrong patented the idea in 1914, only to be followed by **Lee De Forest** who also patented it in 1916. Twelve years of legal wrangling followed with a final victory to De Forest, due to to the Supreme Court failing to understand the technicalities of the invention some say. However, most people still credit the idea to Armstrong.

Control Crucial

The control of the regenerative feedback is crucial. Over the years several ways have been devised for controlling the feedback. Often there's a small winding (appropriately called the 'tickler winding') to couple the output signal to the input tuned circuit coil. This is a version of the Hartley oscillator. The amount of feedback can be altered by capacitive or resistive coupling.

The G0KJK regenerative receivers use the 'tickler' winding method controlled by resistive coupling. This saves the use of an expensive variable capacitor as the feedback control and is capable of careful feedback adjustment.

Using 'ugly' type construction techniques, I set about 'breadboarding' the G0KJK receivers. As they're simple to make and I was able to build three receivers in two evenings, although I admit to cheating with the coils! True to what his fans had suggested, all of Keith's receivers were capable of good results. So I decided to build one decent version using the 'perfboard' technique that I've used many times for projects in this column.



A closer look at how the toriodal tuning coil and the associated feedback winding are arranged.

Perfboard is an insulated synthetic resin paper board (s.r.p.b.) material that comes ready drilled with a matrix of holes spaced 0.1in apart. This is the standard pitch for integrated circuit (i.c.) pins and is suitable for a whole variety of other electronic components. The component leads are pushed through the holes, the excess wire of the lead is used to make the component interconnections. The excess lead acts in the same way as a track on a printed circuit board (p.c.b.). If there's not enough spare lead length, suitable tinned copper wire can be used for the interconnections.

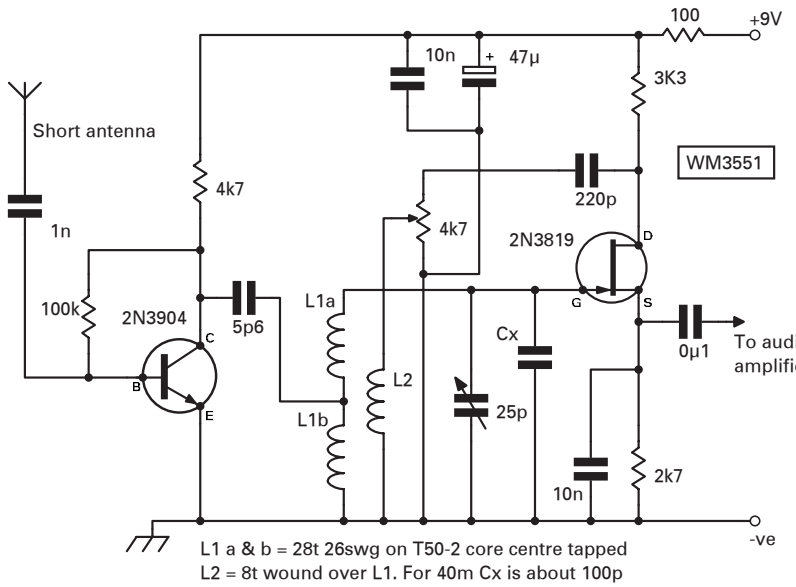


Fig. 1: George G3RJV's version of the MB4 receiver was built using perfboard. The value of Cx sets the tuning range of the receiver.

The Circuit

The circuit of my perfboard version is shown in **Fig. 1**. It's mainly based on the circuit of the MB4 receiver with a few alterations. The heart of the circuit is the 2N3819 field effect transistor (f.e.t.) detector however, I think an MPF102 f.e.t. would work just as well in this application – but take care to check its rather odd lead configuration.

The most crucial part of the detector is the tuning coil (L1a and b) and the associated tickler winding (L2). I used the winding method suggested by Keith for the *Telescopic Antenna DX Receiver*.

The toroidal style coils are wound on a T50-2 core; counting each pass through the hole of the core as one turn. The tuning winding is 28 turns of 26s.w.g. enamelled copper wire with a tapping point in the centre. This is carried out by winding 14 turns (L1a) and then drawing out about 20mm of wire to form a loop. The loop is twisted to secure the wire and a further 14 turns (L1b) are then added to the core.

The enamel is then removed from each end of the wire and the tapping loop and the bare copper is tinned with solder. The tickler coil is wound with *pvc* covered hook-up wire – I used solid wire but stranded wire would also work. The coil is eight turns wound over the centre of L1 – four turns each side of the tapping point.

To enable the necessary positive feedback L2 needs to be the 'other way around' from L1. So the end of the core from which the ground lead of L1 emerges is the place to pick up the top end of L2 which goes to the potentiometer. (If this sounds confusing wait until you test the receiver). If it refuses to oscillate at any setting, just reverse the connection on L2.

The 4.7kΩ linear potentiometer provides the means of controlling the amount of feedback reaching the input and its usually called the 'reaction control'. By varying this control, the position of maximum gain – before the transistor enters into oscillation – can be found. In essence the potentiometer acts as a

simple potential divider controlling the voltage feedback from the output, via the 220pF capacitor, to the input of the f.e.t. **Note:** The resistor needs to have a linear track.

The tuned circuit uses a 25pF variable capacitor; the better the quality, the better the stability. This has a parallel capacitor 'Cx' that sets the required frequency range of the receiver. For the 7MHz (40m) band I found that a value of 100pF for Cx brought the band within tuning range. It's possible to switch the values of Cx as shown in **Fig. 2**, to enable the tuning of other Amateur bands.

Hand-wound coils with the same number of turns will vary slightly in inductance value. My L1 measured 4.3µH (microhenries) so covering 7MHz with about 120pF of capacitance. If I were building the circuit of Fig. 1 again, I would probably reduce the number of turns on L1 to give better bandspread on the higher frequency bands. For the 14MHz (20m) band my example of L1 requires about 30pF. The whole band would occupy only a small portion of the variable capacitance range.

When building the receiver, you will have to experiment with values for Cx, or with the number of turns for L1 to achieve their desired frequency coverage. But that's part of the fun of regenerative receivers!

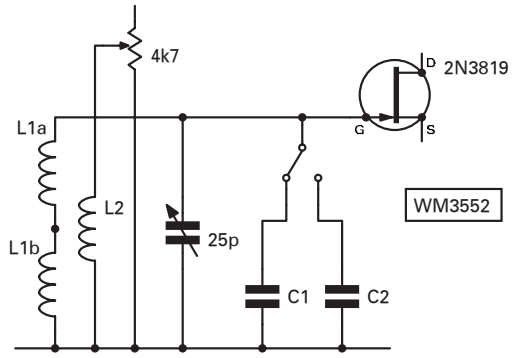


Fig. 2: The values of capacitors C1 and C2 are important as they set the tuning range of the receiver.

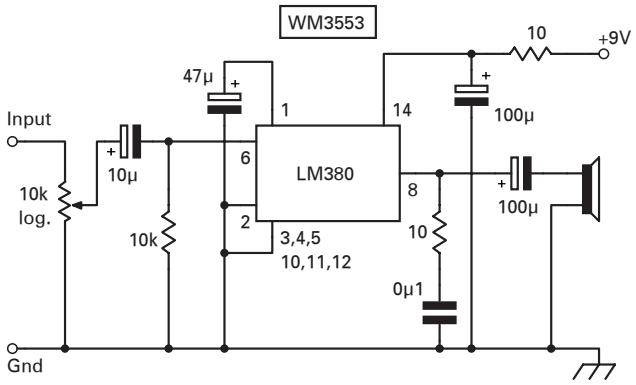


Fig. 3: George G3RJV isn't quite sure what design he used for his pre-built test amplifier, but thinks it's probably the same as shown here!

Simple RF Amplifier

Returning to Fig. 1, the input to L1 comes from a very simple radio frequency (r.f.) amplifier that uses the common 2N3904 transistor. Almost any similar n.p.n. bipolar device would work in this circuit. Adding this stage gives two advantages. It enables the receiver to produce good results from a very modest antenna and also it isolates the antenna from the regenerative stage.

The antenna can dampen the tuned circuit and make the receiver less selective – the extra stage helps overcome this possible problem. Also, a regenerative stage directly coupled to an antenna will radiate a signal when the stage oscillates. Not much of a signal perhaps but it's better isolated from the antenna. Incidentally, it's usually possible to hear this signal on a nearby receiver and this can be used to calibrate the regenerative receiver.

The audio output signal is taken from the source of the f.e.t. to an audio amplifier. Keith used a variety of audio amplifiers for the three receivers I tested – but I was too idle! I have a few ready-built little audio amplifiers in my junk box, including a small test-bench amplifier that I keep for this purpose. So, rather than built yet another amplifier I used my test-bench amplifier.

I couldn't remember what's was in **that particular version**! But when I lifted the lid I saw an LM380 integrated amplifier chip, so the circuit is probably that shown in **Fig. 3**. Of course, you're free to use an amplifier of your own choice.

Like all regenerative receivers, this one is fun to use. Part of the charm of 'regens' is that they require 'real' operating skills. Success doesn't just rely on pressing of the correct button – but in careful use of analogue controls. And to add to the fun – those controls interact between themselves.

Get Some Practice!

When you've built your version and it's tested, you'll be ready to get some practice. To start, switch on and advance the 4.7kΩ reaction control until the typical 'rushing' sound is heard.

The point at which the rushing sound begins is the most sensitive and selective point for the detector. To resolve c.w. or s.s.b. signals the reaction control is carefully advanced just beyond the point of oscillation. The best point for receiving broadcast stations using amplitude modulation (a.m.) stations requires the reaction control to be set just below the point of oscillation.

Re-tuning may require re-adjustment of the reaction control, as will any changes in the strength of the input signal. It's a two-handed operation and careful use of the reaction control can enable a form of fine tuning with slight variations in signal pitch and that can be useful in resolving s.s.b. signals. A regenerative receiver really lives!

Have a go at one of these receivers. Building one requires very few parts and only little time to build. You can then join the ranks of those who have enjoyed the G0KJK receiver designs and get a taste of the simple pleasures of the regenerative receiver. Finally – don't imagine that this is going to be my last word on regenerative receivers in *PW*!

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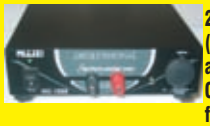
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● 1.8-30MHz 300W ATU ● Large cross needle meter ● 30/300W PEP power meter ● VSWR ● 3-way antenna selector ● Internal balun + dummy load.

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Fully automatic (1.8-30MHz). 300W SSB.
Easy to use ATU.
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A superb performance all mode synthesized world receiver with true SSB and 40Hz tunning for ultra clean reception. Other features include RDS facility, 306 memories and WFM. Incl's case/earphones/wind-out antenna. A truly remarkable receiver, especially on SSB – you'll be amazed.
IDEAL FOR NAVTEX RECEPTION
Includes free 240V PSU **£169.99**
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10m PNEUMATIC MAST
LIMITED STOCK

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40m guy kit pack.....£49.99
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(Can be hand operated or by compressor/foot pump)
SALE PRICE **£999.99** Del £40.00.

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A superb (diamond quality) 6 band trap verticle antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m (15ft tall).

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Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

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80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain. Superb Japanese quality antenna system.

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80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end).....£34.99 P&P £4.00 (a pair)

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Baluns 1:1 or 4:1 or 6:1 .....£34.99 each P&P £4

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A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £12.00 P&P £4.00

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True military spec real UK coax

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£49.99 or 2 for £90.00

Coax stripping tool (for RG-58).....£4.99

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Very heavy duty. Available:- SO-259 or 3/8 – specify.

£44.99

W-8681 PROFESSIONAL WEATHER STATION

● No cable connection needed ● Touch LCD screen ● Atomic locked Date & Time ● Indoor/ Outdoor Temperature (C or F) ● Wind Speed & Direction (mph or kmph) ● Rain gauge (inches or mm) self emptying ● Indoor/Outdoor Humidity ● Barometer Pressure with trends ● Forecaster & Weather Alarm ● USB connection to PC ● PC "EASYWEATHER" software programme ● Historic data storage & display ● LCD panel wall mounts or desk mounts ● Batteries last over 12 months

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NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc.

Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

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New extra heavy duty 2" mast set. 4 sections x 5½ foot slot together.

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NEW SWAGED MAST SETS

20 foot mast. 1½" – 4 x 5 foot sections. (Swaged) **£43.99**

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18 foot (1½" dia).

18 foot – 6 x 3 foot (1½") slot together ally sections.

£43.99 each. TWO FOR £79.99 DEL DEL £13.00

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Superb 18 foot (6 x 3 foot sections) that slot together.

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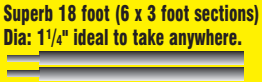

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Heavy duty die-cast hanging pulley. Hook and go!

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A simple to fit but very handy mast pulley with rope guides to avoid tangling.

(Fits up to 2" mast) **£12.99** + P&P £4.50

30m pack (4.4mm) nylon guy rope £12.50

132m roll 4.4m nylon guy (480Kg b/f) .....£40.00 Del £7.50

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Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

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500kg brake winch. BARGAIN PRICE

£79.99 Del £10.00

(Now includes cable grip)

Winch wall bracket.....£22.99

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Connectors	Length	Price
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PL-259 - PL-259	1m	£11.99
PL-259 - PL-259	4m	£14.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£9.99

EP-300

Over the ear earpiece.

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P&P £3.00

DB-770H (BNC)

2m/70cm Tx + wide Rx. High gain up to 5.5dB.

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Heavy duty universal mount.

Includes 5m cable **£29.99**

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Heavy duty rotator for HF beams, etc. Supplied with circular display control box and 25m of rotator cable.

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GS-065 thrust bearing.....	£54.99
GC-038 lower mast clamps	£32.99
G-250 lightweight rotator.....	£95.00

AR788

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable 50p per mtr.

OUR PRICE **£79.99**

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40cm flexible whip for the ultimate in gain. **£29.99** P&P £4.00

Tx:- 2m + 70cm (Rx:- 25MHz-2.9GHz).

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40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm.

Rx:- 25MHz-2.9GHz **£34.99** P&P £4.00

DIAMOND YAGIS No tuning required

2m/5 element	No tuning required	SO-239 feed..... £44.99
2m/10 element	No tuning required	SO-239 feed..... £74.99
70cms/10 element	No tuning required	SO-239 feed..... £48.99
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Q-TEK COLINEARS (VHF/UHF) Del £12.50

X-30 GF 144/70, 3/6dB (1.1m).....	£44.99
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X-300 GF 144/70,6.5/9dB (3m).....	£79.99
X-510H GF 144/70, 8.5/11dB (5.4m)	£139.99
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m)....	£89.99

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MX-72 144/430MHz.....	£34.99
MX-72 "N" 144/430.....	£35.99

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DB-770M 2m/70cm (3.5/5.5dB) 1m (PL-259).....	£24.99
PL-62M 6m/2m 1.4m (PL-259)	£23.99
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DC-1000MHz (400W through power). SO-239 fitting. **£24.95** P&P £3.00

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ALLUMINIUM POLES

20 foot (collection only) 2"	£49.99
10 foot (collection only) 2"	£29.99
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5 foot x 2" pole	£14.99

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Hard drawn (50m roll)	£19.99 P&P £7.50
New: 50m roll 'PTFE' coated, stranded antenna wire.	£19.99 P&P £7.50
Flexweave (H/duty 50 mtrs)	£39.99 P&P £7.50
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2" mast-floor base plate	£14.99
6" stand off brackets (no U-bolts)	£8.99
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18" T & K brackets (pair)	£22.99
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2" extra long U-bolt/clamp	£5.50
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4-way guy ring	£6.99
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Set of 3 powder coated heavy duty fixing spikes (~0.7m long)	£29.99
30m pack (4.4m) 480kg B/F nylon guy	£12.50
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Nylon dog bone insulators	£1.00
Very large nylon insulators	£2.00
PL-259 (small of large entry)	£1.50
N-type plugs (high quality)	£4.50
1¼" 6 foot ally poles	£13.00
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KITS, MODULES & AERIALS

NEW PRODUCT
POUNDBURY 20/80m SSB RECEIVER

Classic superhet receiver for 20 and 80m using a 9MHz IF and a 5.0-5.5MHz VFO (as described opposite). Uses a 6 crystal ladder filter with near symmetrical passband, 2dB insertion loss, 1.8:1 shape factor, and 70dB stopband. Minimum discernable signal 0.2uV. Fixed tuned bandpass preselector on 20m, tunable preselector on 80m. Logarithmic AGC and Signal meter response. Maximum signal handling 1mV. 500mW audio output. Supply requirement 13.5V at up to 250mA. **VFO with its drilled box, preselector and main board PCB's and component kits including crystals £92. Complete kit including box and hardware £147.00. Ready built £240.00.**

NEW TRANSVERTERS for ICOM rigs, supplied with cables. Automatic with no cable switching. IC756Pro & II & III, 775, 781, 7600, 7700, & 7800 use type **TRC4-10L/IC1.** IC735, 761, & 765 use type **TRC4-10L/IC3. Built to order £280.00.**

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**

STATION PREAMPS for 2 or 4 or 6metres. RF & DC switched. Adjustable 0-20dB gain. 100W power handling. **RP2S, RP4S, RP6S, PCB & Hardware kit £35.00, Ready Built £57.00**.

MASTHEAD PREAMPS, for 2 or 4 or 6meters. 20dB gain 1dB NF. 100W through handling. RF switched & DC fed via the coax. Heavy duty waterproof masthead box, and a DC to RF station box with SO239 connectors. **RP2SM, RP4SM, RP6SM, PCB & hardware kit £41.00, Ready Built £65.00**. **Masthead fitting kit £6.00**.

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**.

PORTLAND VFO now available as the classic 5.0-5.5MHz version to suit receivers and transmitters with a 9MHz IF to work on 80m or 20m. Can be supplied with Buffer 1 to suit transistor and IC mixers, or with Buffer 2 to suit a diode ring mixer. This is a development of the VFO which featured in March 2006 PW, and which now uses a 3 terminal regulator to supply the VFO section. There is now no perceptible drift from switch-on. **VFO and Buffer PCB's and components with pre-drilled box £26.00. Ready built £50.00.**

PSK31 INTERFACE KIT, as in PW Feb 2009. PCB £5.00. PCB and components £21.00. Box kit with cables £35.50.

SPEECH PROCESSOR increases the average sideband power of SSB transmitters without driving the PA into clipping. Includes filtering to enhance the higher voice tones to increase intelligibility, and it sounds nice too. Panel control for clip and output level. Supplied with plugs & sockets to suit most popular rigs. Type **SP1000, PCB & Hardware kit £42.50, Ready built £60.00**.

LCR BRIDGE with 5 resistance ranges 100, 1K, 10K, 100K & 1M. 3 capacitance ranges, 100pF, 1nF, 10nF and 3 inductance ranges, 1mH, 10mH & 100mH, plus external reference. Scale calibrated 0.01 to 10 times reference value. Optional drilled and labelled plastic or painted diecast box. **PCB & parts with pot and switch £26.00. With plastic box £39.00, with diecast box £44.00.**

OFF-AIR FREQUENCY STANDARD, crystal calibrator unit phase locked to Radio 4 using a two-loop system. Includes a monitor receiver to ensure Radio 4 is being heard loud and clear. Fixed outputs 10MHz at 2V p-p, and 1KHz at 1V p-p as oscilloscope CAL signal. Switched outputs 1MHz, 100KHz, 10KHz, and 1KHz at 6V p-p, into 500 Ohms. Single board design as featured in July & Sept 2008 PW. Background heterodyne whistle at 2KHz confirms lock condition. 12/13.5V DC operation at 65mA. **PCB kit with ferrite rod £50.00, PCB kit + drilled box and hardware complete £86.00. Ready built £131.50.**

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**.

3N201 MOSFET equiv. 40673 £2.25 each, P&P £1.00 any quantity.

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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 takes a look at the recent propagation events that occurred during early autumn period.

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Lower Maescoed
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E-mail: g4asr@btinternet.com

Sporadic-E openings on the 50MHz band continued for a few weeks into September but were far less intense than that experienced during the summer period. However, a very good European opening was reported on September 8th and this event was sufficiently strong to provide DX contacts as high as the 70MHz band. Although, as we headed towards the autumn period the prominent mode reported on the v.h.f., u.h.f. and microwave bands was one of tropospheric propagation.

Conditions were rather good in most directions from the UK with DX contacts being made into central Europe (Czech Republic, Switzerland), Iberia (Spain, Portugal) and Scandinavia (Denmark, Sweden). The144 and 430MHz bands were also open to the Faroe Islands (OY) with contacts being made from the south coast of England and that is most unusual.

The regular marine path to the Canary Islands (EA8) and the Azores (CU) was open yet again for the sixth month running (April-September) with contacts up to 3000km being made by UK stations in southern England and Wales.

Sporadic-E Openings

A total of 11 Sporadic-E (Sp-E) openings were reported during September on the 50MHz band. However, the vast majority of events were simply reports of beacons being heard rather than DX station activity. It seems as if all the casual operators switch off their transceivers as soon as the summer propagation disappears!

Switching off is a great pity as many interesting openings may be missed if few stations are actively listening to the band. Some of the 50MHz stations that were worked from the UK during September included DL4RAN (Germany), EA6BB (Balearic Islands), I0SNY, I0/LZ2OG, IK0FTA, IV3TRK (Italy), IT9CHU (Sicily), SV1OH (Greece) and 9A5CW (Croatia).

The only significant Sp-E opening of the month occurred on September 8th between 0830-1800UTC. In the UK the opening was quite widespread with stations from Guernsey (IN89), through England and Wales and up into Scotland (IO75) working DX over much of Europe.

Some of the contacts reported on the 50MHz band included the stations of DG0JMB (Germany), F4DXU (France), HA8FK (Hungary), HB9FAX (Switzerland), HF70NMW (Scouts Radio Club, Warsaw, Poland), IZ2DQA (Italy), OE9HGV (Austria), OK2HBY (Czech Republic), OM5MZ (Slovakia), S55SL (Slovenia), SA7AGE (Sweden), UR5TO (Ukraine), YO5DAS (Romania), YU1EO (Serbia) and 9A2TO (Croatia)

Between 1400-1700UTC the ionisation increased considerably enabling c.w., f.m. and s.s.b. contacts to be made on the 70MHz band.

Some of the QSOs made by stations in England, Isle of Man, Scotland and Wales included the stations of OK1TEH, OK2POI (Czech Republic), OM3CLS (Slovakia), S51DI, S57A (Slovenia), 9A1Z and 9A2SB (Croatia). The stations of IK1EGC (Italy) and SP9BIF (Poland) were also reported to have been making cross-band contacts, transmitting on the 50MHz band and receiving UK stations on the 70MHz band.

Tropospheric Openings

The autumn period is always a great time for tropospheric propagation on the v.h.f., u.h.f. and microwave bands. That's because high pressure weather systems, that aid long-distance tropo contacts, often sweep in from the Atlantic Ocean region and settle above the UK and continental Europe. This

Fig. 1: The vhf, u.h.f. and microwave antennas at the QTH of Nick Peckett G4KUX.

was the case during September when there were long periods of fine sunny weather.

Propagation was particularly good in many directions from the UK at one time or another. It just depended on the subtlety and lie of the high pressure weather system. Many operators reported making s.s.b. contacts on the 144MHz band with stations that included AO2V (Spain), CT1DHM (Portugal), DF7VX (Germany), F8KTH (France), HA1FV (Hungary), HB9QT (Switzerland), LA4WKA (Norway), LX7I (Luxembourg), OL4A (Czech Republic), ON7GB (Belgium), OY4TN (Faroe Islands) and OY6BEC (beacon 144.403MHz), OZ5TG (Denmark), PA5KM (Netherlands), SM1A (Sweden) and SP1FJZ (Poland).

The superb 3000km marine path to the Canary Islands was also open for the sixth month running, with contacts being made from southern England and Wales with the s.s.b. stations of EA8ACW/P (IL28), EA8AVI (IL28), EA8BPX (IL18) and EB8BRZ (IL27). Also heard were the Azores beacons CU2VHF (144.401MHz) and CU8DUB (144.420MHz).

Jeremy Smith M0XVF (IO94) reports that during the 144MHz contest weekend (September 5-6th) he contacted many s.s.b. stations located around the UK. Interestingly, he only uses 10W output from a Microwave Modules transverter into a 9-element Tonna antenna located in the loft space.

Some of Jeremy's many contest QSOs included the stations of G0KPW (JO02), G8T (JO01), GM0GPZ/P (IO85), GM4AFF (IO86), GM4ZUK (IO86) and GM6MD/P (IO75). A week earlier a contact was made with G4DEZ (JO03) at a distance of 196km. Maybe not the longest of contacts but Jeremy also heard a number of stations in continental Europe at very good strengths.

Jeremy's success is proof that you can enjoy 144MHz s.s.b. even with modest power and an indoor antenna. Maybe this will give some encouragement to new M6/M3 licensees who might think that high powers and massive beam antennas mounted outside are needed to achieve long-distance contacts on the 144MHz band!

Stewart Wilkinson G0LGS reports that on August 22nd he decided to operate portable on the 144MHz band from two local summits, May Hill and Raurdean Hill (Gloucestershire IO81). Both hill tops are quite low and he didn't expect to work any great distances with his Icom IC-706 transceiver running 15W into a 3-element SOTA beam antenna. However a nice surprise came on the second summit when the stations of EB1LA (Spain) and EA8AVI (Canary Islands) were both heard calling very weakly on 144.300MHz.

The station of EA8AVI was 2800km away but unfortunately signals slowly disappeared down into the noise. Several calls were heard from EB1LA and contact was eventually made at 55 both-ways. An hour later a second and much longer s.s.b. contact was established with signals peaking 59.

Stewart also mentions that at his home QTH in Cheltenham he uses an Icom IC-910 transceiver running 100W into a 9-element Yagi. During the summer he managed to make some Sp-E contacts on the 144MHz band that included the s.s.b. stations of CT1ANO, CT1DHM, CT1EWA/P, CT1FBF/P, CT1HZE (Portugal), EA7BYM and EA7TL (Spain). His best DX however was the station of SV9CVY (Crete KM25) who was worked at 59+ over a path some 2845km distant.

Joe Butt G0JJG (Suffolk JO02) mentions that tropo conditions were particularly good at his QTH during August and that the 144MHz station of EB1LA was regularly heard over a path of 1100km. The Norwegian beacons LA5UHF (JO28) operating on 432.442MHz and LA4SHF on 1296.896MHz were also heard very strongly on many occasions but the only notable higher frequency QSO was the 1.3GHz station of OZ2LD (Denmark JO54) at 766km distant.

The 144MHz station of G0JJG runs 300W to an 11-element Yagi and during September the log highlights included s.s.b. contacts with GD8EXI (IO74), GI4SNA (IO64), GM0HTT (Orkney IO89), DL0GTH (JO50), DF0XG (JO51), DF0XX (JO52), DL0HB (JO53), HB9EME (Switzerland JN36), OY4TN (Faroe Islands IP62), SM7GVF (Sweden JO77) and SF7WT (JO65). Joe remarked that he has only heard OY once before in 32 years and that he was really pleased to make the QSO for another new country!

It's good to report that **Nick Peckett G4KUX** (Co. Durham IO94) is again active on the v.h.f., u.h.f. and microwave bands. For a few years he was active as YA4F (Afghanistan) on the h.f. and 50MHz bands but has now returned to his superbly located QTH in the north-east of England.

Nick's 50MHz equipment consists of an Icom IC-756 ProIII transceiver driving a GU-74B tetrode amplifier and on the 70MHz band the same transceiver is used to drive a Microwave Modules transverter. The 70MHz system though is about to be changed for a Yaesu FT-847 transceiver that can be modified to provide circa 85W output on the 4m band. Equipment for the 144MHz band currently runs 100W output into a 19-element Cushcraft Boomer antenna although a GS-35B triode amplifier is nearly ready for service.

Recent contacts by G4KUX on the 144MHz band during September have included the stations of F4ARU/P (JN09), F4CQY/P (JN28), F6HPP/P (JN19), DR2X (JO40), DR5A (JO30), DR9A (JN48), GM0HTT (Orkney Island), HB9EME (JN36), LX/PA1TK/P (JO30), OK1IAS (JN69), OQ4U (JO20), OZ1BEF (JO46), OZ4VW (JO45), OZ5TG (JO45), OY4TN (IP62), PC5T (JO23), SM7GVF (JO77) and TM0W (JN36). The Faroese station of OY4TN was also worked on the 430MHz band with 59 s.s.b. signals both ways.

The power output of the 1.3GHz station at G4KUX is currently 10W although a winter project is expected to bring this up to the 250W level into a 33-element quad-loop Yagi. Contacts on c.w. and s.s.b. have mainly been around the UK with stations such as G3XDY (JO02), G4BRK (IO91), M0GHZ (IO81), GI6ATZ (IO74), GM3SBC (IO85), GM4CXM (IO75) and GM4ZUK (IO86).

Nick is also active from home on the 10GHz band running 8W output into an 800mm diameter dish antenna as shown in the photograph, **Fig. 1**. This microwave system works really well and you may be surprised at the distances that can be achieved from a fixed station QTH.

Nick's recent c.w. and s.s.b. contacts have included the stations of F6DKW (JN18) at 711km, F6DWG/P (JN19) 642km, G4ZXO/P (IO90) 433km, G4EAT (JO01) 365km, G4DDK (JO02) 360km, G3XDY (JO02) 353km, G8DKK (IO91) 316km, G3TKH/P (IO81) 314km, G4BAO (JO02) 298km, G3ZME/P (IO82) 246km, GM4LBV (IO86) 231km, G4PBP (IO82) 228km, G3CWI/P (IO93)

167km, G3PHO/P (IO93) at 109km and local stations G0EHV (IO94) and M0DTS (IO94).

Up & Coming Activity

Two major meteor showers (Leonids and Geminids) occur in the next few weeks and both will create additional activity on the v.h.f. bands. The Leonid meteor shower occurs for seven days from November 14th to the 21st and is expected to be most active in the mornings of November 17th and November 18th.

Please note though that (from central UK) the shower rises above the horizon at 2300UTC and sets around 1300UTC. This year a significant shower is expected as the Earth will pass through two additional patches of dust previously ejected from the comet Tempel-Tuttle.

The Geminid shower is active from December 7th to 15th with maximum activity occurring on Monday December 14th. The shower rises at 1800UTC and sets at 1000UTC with the best path to south-east Europe being around 0500UTC. During both showers you may hear s.s.b. activity between 50.150-50.200MHz and around 144.200MHz. Operators using JT6M can be found on and around 50.230MHz and those using FSK441 around 144.370MHz.

A national RSGB 144MHz contest is being held on Sunday December 6th between 0900-1700UTC. This contest is a great way to pick up new locators squares or counties. The contest exchange is RST, serial number and locator, for example 59028 IO81MX. There's always a great deal of activity especially during Sunday morning so why not enter and join in with the fun.

In previous years there have been some very good tropospheric openings on the 144MHz and 430MHz bands during December. In the period December 6th to 10th 2004 there was a tremendous opening from the UK to Austria (OE), Belarus (EW), Croatia (9A), Czech Republic (OK), Denmark (OZ), Italy (I), Poland (SP), Sweden (SM), Switzerland (HB9) and Ukraine (US). The longest distance 144MHz tropo contact during this opening was established between the stations of G4CBW (IO83) and US5WU (KO20) over a path of 1843km.

In 2005 propagation was quite poor but in 2006 there was a great tropo opening from December 21st to the 26th with stations in Denmark, Finland, Norway, Sweden, Germany, Austria, Czech Republic, Poland, Estonia(ES) and Latvia (YL). The best DX during this opening may well have been the 144MHz QSO between the stations of G4LOH (IO70) and OH1ND (KP00) at 2050km.

On December 19th 2007 many UK stations experienced a very good 144MHz opening into the Baltic States of Belarus (EW) Estonia (ES), Kaliningrad (UA2), Latvia (YL), Lithuania (LY), Russia (UA) and the Ukraine (UR). Sergey UR5LX reports that his c.w. QSO with the station of GM0TGE (IO87) at 2600km was the longest distance tropo contact ever made from Ukraine on the 144MHz band.

Last year from December 21st through to the 25th there was extensive opening to southern France and Spain. Tropo propagation was so good that some stations reported working through the f.m. repeater EA1E (IN72) on 145.725MHz during the evening of December 22nd.

By December 30th the tropospheric propagation had moved towards Scandinavia with 144MHz contacts being made into Denmark (OZ), Norway (LA) and Sweden (SM) by stations located throughout much of England and Scotland. There's no guarantee anything will happen this year but I reckon that it is worthwhile keeping a look out on the 144MHz and 430MHz bands for enhanced tropo conditions during December.

Fig. 2: The v.h.f., u.h.f. and microwave antennas at the QTH of Wolf-Henning Rech DF9IC.

Deadline Time!

That's it again for this month. If you do hear or work any DX stations on the v.h.f., u.h.f. or microwave bands then please send me your reports – or any other news – to reach me before the last Saturday of the month.

73 David G4ASR

Carl Mason's

hf highlights

This month Carl Mason GW0VSW starts with news of a very special 75th birthday. Your reports by 15th of the month please.

I begin this month with news of a very special award. The **Worked All Zones** (WAZ) award is 75 years old, and *CQ Magazine* is going to offer a special 'limited-time' version of this award, which was introduced in the November 1934 issue of *R/9* magazine, a predecessor of today's *CQ Magazine*. To gain this award you will need to make contacts with radio amateurs in each of the 40 zones that divide up the world and a list of these can be found at **www.mapability.com/ei8ic/contest/cqz.php** and a map at **www4.plala.or.jp/nomrax/CQ/index.html**

This is one of the most difficult awards to obtain and it is also believed to be the oldest sponsored in the USA as it predates the ARRL's famous and well known DX Century Club (DXCC) by about a year. The DXCC was first announced in the January 1936 issue of *QST* and the only other 'older' award currently offered to *CQ*'s knowledge is the International Amateur Radio Union's **Worked All Continents** (WAC).

The **CQ Diamond Jubilee Worked All Zones Award** will be given to anyone, Amateur or s.w.l., who sends in log extracts showing two-way contacts with each of the 40 CQ zones of the world made between the November 1st this year and December 31st 2110. Your log extracts must list contacts in zone order from 1 to 40 and show the date, time, band, mode and callsign of the station contacted. There is just one award with no band or mode endorsements available and each will be numbered. Applications for the award will be accepted up until March 31st 2011. For more information look up **www.cq-amateur-radio.com/DiamondWAOct09.pdf**

John Wakefield operating his special event station on 14MHz

Vietnam DXpedition

The **3W6C** RXpedition team members are starting to make the extensive preparations required to launch their April next year 'jaunt' to Con Co Island, AS-185 situated in Vietnam. A large group of operators will be aiming to run four stations 24 hours a day. They plan to operate on as many different bands as possible including 1.8 and 3.5MHz and have set a target of making 60,000 QSOs. As we all know expeditions like these require considerable financial resources and the team are working hard to raise the necessary funds. Detailed information on the expedition and how contribute can be found at **www.3w6c.qrv.ch**

The DX News

On to this months DX news now. And we start in Brazil where Jim Faria PY7XC, Ciro Silva PY7ZY, Andre Sampaio PY0FF, Renner Pedroza PY7RP, Leo Ferreira PP1CZ and Mike McGirr K9AJ will be active as **PW6C** from Coroa Vermelha SA-062, the eighth most wanted IOTA group in South America. Operation will be until the November 16th and the group plan to run three stations around the clock from two operating sites using c.w. and s.s.b. on all the h.f. bands. The IOTA group SA-062 is composed of the two islands – Coroa Vermelha and Corra da barra situated on the coast of Nova Viçosa, State of Bahia. Coroa Vermelha is the largest and is located about 10 nautical miles from the coast.

The main 'island' is made up of sand banks which form small beaches in the middle of the Atlantic Ocean and is surrounded by coral reefs. The second island just one of these coral reefs that appears above the ocean only at certain times of the year. It's called Coroa da Barra or Sebastião Gomes Reefs by some native preople. Further information can be found on the expedition's website at **www.pw6c.com** and an online log is available.

A small team of German operators will be active as **3V3S** from Sousse, Tunisia from November 23rd to December 2nd and will include an entry in the CW WW DX Morse code Contest. They will operate from the QTH of 3V8SS, the Radio Club Station of Tunisian Scouts in Hammam Sousse. After the operation the team will donate their antennas, which include several verticals and a Spiderbeam, to the Scouts. A website is under construction at **www.3V3S.tk** and a QSL is good via DL9USA.

American **Jim DeLoach WU0I** is a US Foreign Service Officer currently stationed in Addis Ababa, the capital of Ethiopia. By the time you read this Jim should be active as **ET3JD** and operate using c.w. Though he says he is a little rusty and asks that those who work him on c.w. to be patient. He hopes also to work some s.s.b. as well as PSK31 and possibly RTTY, though mostly for contests. He says, he'll work on 7, 14 and 21MHz initially plus 10 and 18MHz later using home-made wire antennas.

You can QSL direct to **2030 Addis Ababa Place, Dulles VA 20189-2030, USA** indicating whether you would like his card to come via US or Ethiopian mail. If no preference is stated he will use whichever route is cheapest to your QTH. For updates, have a look at

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The GB1WT QSL card for the Special Event station commemorating the shutter telegraph system.

The QSL from HF900OG, for the contact made by Bill Ward on 7MHz s.s.b.

www.deloach.net/ET3JD.html

During the winter period **Jean Van Nieuwenhoven ON5JV** and **Georgette Abrams ON6AK** will be active as EA8/ homecall from Tijoco Bajo, Tenerife Island AF-004 between November 20th and February 10th 2010. Activity will be on 7–28MHz during the evening using 100W into a vertical Hy-Gain 14-AVQ. The QSL route is via their home calls, or via the bureau.

In Poland the special event station **HF35PEA** will be active on all bands using all modes from October 1st until December 31st celebrating the 35th anniversary of the **Radio Club SP1PEA in Swieszyno**. Your QSLs should go via SP1NQF, direct or through the bureau. Also, **Krzysztof 'Kris' Bieniewski SP6DVP** (SO6V) has been given permission to operate as **SN40DVP** QSL via SP6DVP until November 30th to celebrate his 40 years in Amateur Radio.

Your Reports

On to your reports now and to **Bill Ward 2E0BWX** who lives in Edwinstone, Nottinghamshire spent some while on 7MHz working s.s.b. stations F8DYD (France) 0950, ON5VL (Belgium) 0810, DK4UV (Germany) 0950, LY20X (Lithuania) 1530 and a special call to mark the 'Baltic Chain' an event which occurred on August 23rd, 1989 when approximately two million people joined their hands to form a human chain over 600 kilometres (373 miles) long across the three Baltic states Estonia, Latvia and Lithuania, S50A (Slovenia) 1620, OH0JFP (Aland Islands) EU-002 at 1730 and h.f. 900OG (Poland) 1740UTC commemorating a siege of the city of Głogów in 1109 by the German King Henry-V. Your QSLs should go via SP6TRX and all contacts were made using a Icom IC-7400SRC, 50W to an S65 end-fed wire antenna.

The 7MHz band was also tried by **Eric Masters G0KRT** in Worcester Park, Surrey, first with QRP making one c.w. contact with HB9WH (Switzerland) at 0918 and then with s.s.b. running 100W working IK2JYT (Italy) 1458 and PD1RO (Netherlands) at 2016UTC using a Kenwood TS-570 with a home-brew modified W3EDP antenna tuned with a SG-230 auto tuner. Eric also managed one contact on the 10MHz band LA5MDA (Norway) at 1516 though conditions were poor requiring 100W c.w. to maintain the QSO!

Thee 7MHz band also provided **Geffery Powell M1EDF** in Seckington, Staffordshire with a few stations, such as Z30U (Macedonia) 1940, 4L1UM (Georgia) 2000, AG4T (USA) in Miami, Florida at 2140, CN8NK (Morocco) 2155 and LU7KAT (Argentina) at 2200UTC made his log book using a Icom IC-718 with MFJ-949E tuner, and 60W into doublet antenna.

The 14MHz Band

On to 14MHz now, where Geffery logged 7P8AO (Lesotho) 1150, EX2F (Kyrgyzstan) 1910, W2EZB (USA) at 1959 in New Hartford, NY, PA150SLH (Netherlands) at 2035 the first and only activation of Schokland Island Lighthouse NL0029 so far. (Your QSLs go via **PA0HFT, W5IZ** (USA) in Burleson,Texas) at 2045. He snagged VE1AL (Canada) at 2115, PP5KR (Brazil) at 2130, LW1EUL (Argentina) at 2155 and CO8LY (Cuba) NA-015 at 2215UTC. They were all worked on the key.

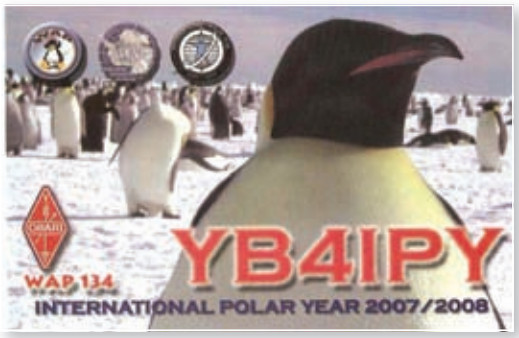
The next log was from **Tom Hutton G0HUT** in Farnborough, Hampshire who found a good number of c.w. stations operating on the band and logged RA1AY (European Russia) 1144, EV1P/P (Belarus) 1324, DF3ZE/P (Germany) on Amrum Island EU-042 at 1352. Next came ES3ROG (Estonia) at 1406, VA3WU (Canada) 1506 in Thorold, Ontario, UT3RS (Ukraine) 1452 and 9H4JB (Malta) on Gozo Island EU-023 at 1617UTC using a Yaesu FT-450AT.

Despite a problem with the back-up memory on his Yaesu FT-747 **Owen Williams G0PHY** in Biggleswade, Bedfordshire got back on the air for a short time and had 100W s.s.b. QSOs with OY/SP6IXF (Faroe Islands) EU-018 at 1523 and VY0O (Canada) at 1717, a DXpedition to Ottawa Islands NA-230 in Hudson Bay and a new activation QSL via VE3LYC both contacts made

using his dipole antenna.

John Wakefield M0XIG was running another 'Shutter Telegraph' special event using the call **GB1WT** from above the cricket ground at Wickham in Hampshire. This event commemorates over 200 years since the the Napoleonic wars when the shutter telegraph first operated from this site. The Wickham Shutter Telegraph was number two in a chain that operated as a communication link for the Admiralty between London and Plymouth. John used his Yaesu FT-1000MP MkV and an Acom amplifier to feed a Comet H-422 antenna in a 'V' configuration.

John used up to 400W during a weekend's operating and had some interesting QSOs including ZG2FX (Gibraltar), VE3XN (Canada), JA1CIA (Japan), LU2DVI/H (Argentina), W1FF (USA) in Trenton, Maine, UN7CC (Kazakhstan). Next came TA6U (Turkey), HS0ZIN (Thailand), 9H5NE (Malta) EU-023, ES7TH (Estonia), 7G2GX (Algeria), EA8DD (Canary Islands) AF-004 and DL2SS/MM (Germany) off the coast of Denmark.



Four QSL cards received by Geoffery Powell M1EDF.

The 18MHz Band

Steve Gillespie lives In Termonbacca, Derry County, Northern Ireland, and has upgraded his call from **MI3ATK** to **MI0GTA**. The 18MHz band provided some contacts this month including ZD7FT (Saint Helena) AF-022 at 0905, 3DA0JK (Swaziland) at 1035 QSL via WB6OJB and JA3JOT (Japan) at 1151UTC, he was using a Kenwood TS-480SAT and 90W into a RadioWorks CW-40 Carolina Windom antenna.

Also on the 18MHz band, Geffery M1EDF, has been following *PW* Reader **Mike Gloistein GM0HCQ/MM** on his travels in the deep ice packs of Antarctica onboard the Royal Research Ship *James Clark Ross*. Mike's adventures have been mentioned in previous columns of *PW* before as he often listens out for the UK calls on h.f. during 'rare' breaks from his duties. Geoff has worked Mike him several times on 10MHz as VP8CMH/MM earlier this year and also on this band using c.w. again at 1445UTC. He later worked VQ9JE (Chagos Islands) AF-006 at 1600, ZS10WES (South Africa) 1735, ZP6CW (Paraguay) 1755, UU5JL (Ukraine) 1800 and CN8YR (Morocco) at 1900UTC.

The 21, 24 & 28MHz Bands

In Spennymoor, County Durham **Jeremy Smith M0XVF** used a Kenwood TS-570 running just 20W s.s.b. to a 10m vertical just 4m off the ground. On 21MHz, he worked RG9A (Asiatic Russia) at 1140 QSL via UA9XC and UA9CLB at 1152UTC.

The 5W c.w. of Eric G0KRT found EA5BLP (Spain) 1030 and RA1QD/P (European Russia) at 1540 while a change to 24MHz added DM2AUO (Germany) on c.w. at 1735UTC.

The 28MHz band had a few short openings over the month and Jeremy M0XVF found one later in the day adding DC3ZAJ (Germany) 1554, SP1QXK (Poland) 1605, IV3YND (Italy) 1611, SP6DSD 1625 and DG1VL at 1627UTC to his log before work called and he had to close down on what he described as a "very lively band" for a change!

Back in Surrey, Eric G0KRT used 100W s.s.b. to get IW0UII (Italy) 0809, OK1AQW (Czech Republic) 0900, EA2DAY (Spain) 0920, CT2IVH (Portugal) 0941, HB9TWU (Switzerland) 1602, and DO4DXA (Germany) 1614UTC.

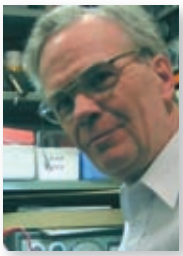
Signing Off

Well that's it for another month so, it's time to sign off. As usual my thanks to all our reporters for their logbooks and to **Mauro Pregliasco I1JQJ/KB2TJM** editor of the *425 DX* Newsletter for all the DX information. Until next time I wish you all good DX.

73 Carl GW0VSW.

The QSL from IZ1MHV recieved by MartinAddison 2E0MCA on 14MHz s.s.b.

The QSL of OJ0B, received by Martin Addison 2E0MCA for a 14MHz s.s.b. contact.



Harry Leeming's

in the shop

Harry Leeming G3LLL

This month Harry G3LLL chats about transverters, technical questions from customers and how electrolytic capacitors brought him good business!

Welcome to *In The Shop (ITS)* where looking back to my own shop days, I was often asked by customers 'What's a transverter?" (they weren't so common in those days). Answering, I told them that a transverter would add extra coverage to their rig. Typically, a 144MHz (2m) transverter will convert their high frequency (h.f.) rig so that, when it's operated between 28 and 30MHz, it's as if they transmits and receive from 144 to 146MHz. The operating mode is determined by the transceiver, and so if you switch your h.f. rig to c.w. on 10m, you'll get c.w. on the 144MHz band.

Many very high frequency (v.h.f.) and ultra high frequency (u.h.f.) rigs are lacking in filters and controls, when compared to a good h.f. rig. With a transverter, all the facilities and features of your h.f. rig, are available at the v.h.f./u.h.f. frequency.

However, not all transverters convert upwards! For example, the Japanese manufacturer Tokyo made a successful unit that converted the FT-290 144MHz multi-mode transceiver, into an h.f. rig.

Popular Transverters

Transverters became very popular in the 1970s, and the Yaesu FT-200, FT-401, FT-101, and several of their other rigs had an 11-pin socket on the rear so that that external equipment could be attached. Most of the early transverters used valves in the power amplifier (p.a.) and driver stages and the socket supplied the necessary heater, bias, 300V and 600V rails. In addition to this, there was also a phono socket on the rear, which was connected to the grid of the p.a. valve via a 5pf capacitor.

A few UK companies obligingly made transverters to match, and other brands and models of h.f. equipment also provided connections for transverters.

There are probably not many valve transverters still in use, but there are certainly many solid-state units made by firms such as **Microwave Modules**, which are still around. Indeed, the respected *PW* author **Tony Nailer G4CFY**, at Spectrum Communications, has been making transverters since the 1980s, and still keeps his XYL **Jean** busy assembling the circuit boards! He tells me that the biggest demand is for the 70MHz (4m) band, as this band seems to be ignored by the 'big names', but he also still makes 50MHz (6m) and 144MHz units.

I've also often been asked, "How much power does the transverter phono socket on the Yaesu FT-101, '101ZD and '902 give out?' Unfortunately, the answer is that the socket **is not** intended to deliver power, instead it just gives a small signal at quite a high impedance via a 5pf capacitor. How much signal the transverter gets depends (to a large extent) to the length and the internal capacity of the connecting cable and the input impedance of the transverter. If for instance, you connect via a one metre length of RG58, this will have a capacity of about 100pf and that's about 20 times the value of the coupling capacitor.

As you will see if you look at **Fig. 1**, the circuit acts as a potential divider, and so the transverter, at the most, will only get 5% of the available drive voltage. In addition to this the reactance of a 5pf capacitor is around 1kΩ at 28MHz, which in some cases will be much higher than the input impedance of the transverter, providing another source of attenuation.

The signal level at the grid connection of the p.a. valves, where the 5pf capacitor is connected, is in the order of 40V, but in practice often less than a hundredth of this arrives at the input of the transverter. So, simply altering the length of the connecting lead provides a very handy way of adjusting the drive level.

Hum & Other Problems

Another question that used to come my way was, "The transverter seems to work okay, but I get complaints of hum, excessive carrier, and poor sideband suppression, in the s.s.b. mode?" To answer this one, if you look at the specification of a typical h.f. transmitter you will find that hum, noise, carrier, and unwanted sideband suppression are stated to be around -40dB, with reference to peak output. So, let's now look at what happens.

When driving a transverter in the s.s.b. mode, many users adjust the drive level by turning down the microphone gain control. If, to avoid overdriving the transverter, you have to set the microphone gain – at let's say 20dB less than you would normally on the h.f. bands – you'll reduce the s.s.b. audio content by 20dB, but you won't reduce the carrier and other unwanted components of the signal. Because of this reduced drive level, the suppression of the hum, noise, and carrier, etc, will be only around 20dB – hence the complaints!

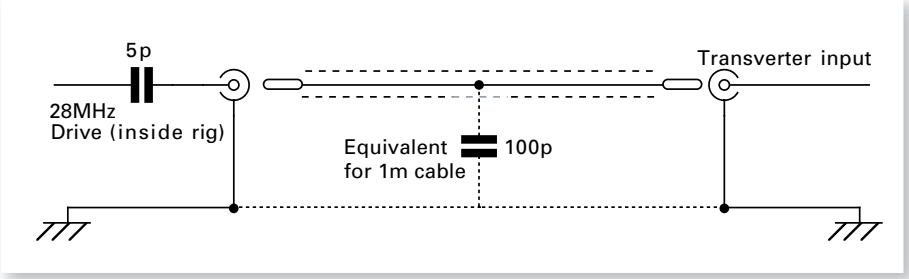


Fig. 1: The circuit actually operates as a potential divider.

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The Yaesu transverter was suitable for most of their older valved h.f. rigs.

FTV-901R
VHF/UHF/OSCAR TRANSVERTER

In another industry first, YAESU brings you a three-band VHF/UHF transverter for your FT-101ZD station. The basic unit comes equipped with 144 MHz capability, and you may add our plug-in modules for 50 or 430 MHz as options. Repeater offset is provided for 6 and 2 meters, and full duplex operation on OSCAR modes A/B/J is possible with an external receiver.

There should be a gain control in the transverter, but if you have lost the instructions and can't find them, the 'trick' is to adjust the length of the connecting cable, so that the transverter has the correct amount of drive. The drive should be set so that correct operation with a clean signal results, when the transverter is used with the microphone gain control on the h.f. rig, at about the same position as you would set it to operate on the h.f. bands.

Distortion On SSB

"My transverter is okay on c.w. and f.m., but I get reports of distortion on s.s.b.?' was another frequently asked question. My answer was usually that the owner should first check that they're not overdriving the unit. If this didn't help, I suggested that the operator should move the transverter a couple of feet away from their rig, operate it into a dummy load, and check the audio quality on a separate a separate v.h.f. or u.h.f. s.s.b. receiver. If it then sounds okay, the problem will have probably been due to r.f. feed-back.

The operator can then either increase the separation between the rig and the v.h.f. or u.h.f. antenna, or make the h.f. rig's microphone amplifier less susceptible to r.f. The simplest modification to try out is to fit a ferrite ring onto the microphone lead near to the plug, but if this doesn't work, it may be necessary to fit suppressor components within the rig.

Distortion when using a transverter was a common problem with all the FT-101s from the Mk1 through to the '101E, but there is a very simple cure. Remove the audio board and locate Q2 in the microphone amplifier circuit, this being clearly indicated in the user manual. The outer pins of Q2 are its base and emitter; wire a small 1000pF (1nF) disc ceramic capacitor, with the shortest possible leads between these terminals on the underside of the board, and the job is done. (using a 1000pF capacitor between base and emitter is also a good way of curing radio frequency interference (r.f.i.) on the older hi-fi amplifiers, but that's another story)

Another question often posed was, "I connected the transverter up after I was operating on 10 metres, and it's now dead on receive?" The answer to this one when you are using a transverter with an older rig, is that the rig's p.a. stage is usually put out of action by removing the heater voltage from the 6JS6C or 6146 p.a. valves. On Yaesu equipment this is normally done when you remove the plug from the 11-pin auxiliary socket to plug in the transverter, or if you're using a Yaesu transverter that's permanently connected, when you switch on the transverter.

Unfortunately, if the rig is already tuned up to transmit on 28MHz and the transverter is activated quickly, the p.a. valve heaters may still be hot. In this case if the push to talk (p.t.t.) is operated, the transmitter will squirt up to 100W of r.f. into the input of the transverter and **they don't like it!**

Make sure to wait a couple of minutes for the p.a. valves to cool after switching from h.f., before transmitting with a transverter. With more modern solid state h.f. rigs this doesn't apply, but if you have a valved rig – do remember to check the rig's instructions, and ensure that you have 'killed' the p.a. stage before operating a transverter.

Driver Troubles

"I seem to have had a lot of trouble with 12BY7A driver valves on my h.f. rig, since I have been using a transverter", was another problem that came my way. The problem can be explained because when operating with the original valve transverters, the current that they took from the auxiliary socket, was more or less equivalent to that that had been used by the p.a. valves, so the heater voltage remained around 12.6V. On the other hand, when using a solid-state transverter, there's a very much-reduced load on the heater supply, and so the heater voltage tends to rise.

Running the 12BY7A at just over 13V won't do any harm in the short term, but if you run it like this for many hours, over a few months you may find that when you go back to h.f. and the voltage falls to 12.6V, that you'll be short of drive. Check the heater voltage when using a transverter, and if it seems rather high, try plugging in a 12V 15W car lamp to the auxiliary socket, to load the heater circuit when you are using a transverter.

Another question that was often asked was, "How do I work through an f.m. repeater?" The simple answer is –You will probably not be able to. Repeater operation requires that you transmit on a different frequency to that on which you receive.

On 144MHz in the UK for instance, you have to transmit 600kHz lower than the frequency you are receiving on and this 'split' varies from band to band, and country to country. Some transverters have provision for 'repeater shift', but many don't and in some cases they're not designed for UK operation. You would also need to incorporate a tone burst, or a CTSS board in your h.f. rig – possibly a bit too much trouble.

An Older Rig?

A question came my way about an old rig, "I have just obtained an FT-902, which has apparently not been switched on for 10 years, have you any suggestions?"

This was an interesting question because there are quite a few points to watch when re-commissioning an old rig. A lot depends on where it has

been stored. For example, if it has been anywhere damp, you should (before switching it on) ensure that it's left in a warm and dry place, such as an airing cupboard, for a couple of days.

Also, when the rig is fitted with valves in the power amplifier stage, it's advisable to replace the capacitor that connects between the anode of the driver valve and the grid of the p.a. valves.Failure of this part is very common and can result in a lot of damage!

At the very least have a glance at the capacitor, and see if it looks like the one shown in **Fig. 2**. If they're fitted to a rig that is brought back into service after several years, and are over 10 years old these capacitors are absolutely reliable. Reliable, in the sense that they **can be relied** upon to go short circuit within weeks, see *In the Shop* in the April 2008 issue of *PW*!

Capacitors of the type shown in Fig. 2, have brought me business worth thousands of pounds in repair charges over the years and I liked them very much indeed! Next, check that a quick-blow fuse is fitted, which

Fig . 2: Harry G3LLL likes capacitors such as this as they've brought him good repair business for many years!

for a 100W rig should be rated at 2.5 or 3A.

Once you have done this, you'll be ready to start reforming the high voltage electrolytic capacitors in the power supply. Electrolytic capacitors aren't fitted with polystyrene or paper insulation and in fact they rely on a layer of corrosion to provided the necessary capacity and this is continually reformed as they are used.

When electrolytics are taken out of service for a long time, the layer degrades and in this condition they tend to short circuit if a large voltage is suddenly applied. The best approach is to bring them up to voltage slowly over an hour or so. You can do this by running the rig from a low voltage a.c. supply using a variable voltage transformer and gradually increasing the voltage over an hour or so.

If you don't have a suitable low power supply, you could use a tip passed on by **Denis Coate G1YHE**. Connect a 25W bulb in series with the mains lead and switch on. Note that with a very old piece of equipment the lamp may glow quite bright to start with. As the electrolytic capacitors reform, the bulb will grow dimmer, so fit a high wattage lamp. Eventually if things seem okay fit a 150W (if available) and the equipment should start to function in some sort of way on receive, without any damage having resulted.

Once you have the rig up and running, the controls and switches will almost certainly need cleaning. Clean rotary switches first with a cleaner **that doesn't** contain lubricant, such as Servisol Aero Klene 50, and then again with Servisol Super 10 cleaner, this includes lubricant. Volume and other resistive controls need a lubricated cleaner. See *In The Shop* from April 2008 for more details.

Valved h.f. rigs such as this FT-902 can have problems if it hasn't been switched on for years!

Google Truth?

Finally for this month, does Google tell the truth? If you have a problem with your computer or your Amateur Radio equipment, it's often worth typing a question into Google, or one of the other internet search engines. You'll get hundreds of answers, some may want you to download a file (which could of course contain a virus, or a request to pay money) but some suggestions will almost certainly carry advice that seems useful.

However, is the information correct, or will following it do your equipment more harm than good? To make your decision, I'll describe the use of the method that historians and *New Testament* Bible scholars use when they're trying to prove that some ancient event actually happened. But more details on this next month!

Harry's waiting to hear from You!

As I am now retired, I like to hear about problems with older equipment, particularly pre-1990 Yaesu rigs. If you want a direct reply please remember to send me your E-mail address or enclose a stamped addressed envelope. Send your letters to the address above.

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.

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tune in: to life

Phil Cadman's

valve & vintage

Phil Cadman G4JCP

This month Phil discusses home-brew TV, prepares for Christmas, remembers construction kits and Morse with Tubular Bells!

Christmas greetings, one and all! Welcome to a festive, fun-filled, feature-packed *Valve & Vintage* (*V&V*) 'shop'. Well, perhaps that's overstating things a little, but I do have some interesting and rather unusual topics to discuss this time!

Some months ago I received a letter from **Johnathan Jones-Robinson** of London. There was no return address, so I wasn't able to say "Thank you!" personally for a most interesting and informative letter. Johnathan asks if all early Cossor *Melody Maker* radios were only available as kits.

In answering Jonathan's question I think **very** early *Melody Makers* **were** sold as kits, but it was also possible to buy them ready-built, albeit from other companies. Later on, Cossor themselves sold ready-built sets. Of course, many of Cossor's sets were sold under the *Melody Maker* label so it does depend on which *Melody Makers* we're taking about.

Johnathan also mentioned that his father was an electrical engineering student in Liverpool in the 1950s and, during the summer, worked at Rediffusion's Blackpool distribution station. Rediffusion distributed the output of certain radio stations to people's homes using a dedicated wired network (at audio, not radio frequencies). This system is hardly ever mentioned today, yet it was common in less affluent urban areas, where the concentration of potential customers made it economically viable.

This is an interesting topic, one which I intend to cover in a future *V&V* column. Similar ideas go back to at least the early 1940s, when none other than **Captain P. P. Eckersley** (the BBC's first Chief Engineer) proposed distributing radio programmes over the mains electricity network. At the time there was strong opposition to the suggestion of a wired broadcast system, and yet Eckersley managed to put forward a sound argument in its favour. If anybody has any information on the Rediffusion or any similar system, or has firsthand experience, then please let me know.

Home-Brew TV Receivers

In my June column I featured a 50year-old photograph of **Roy Harry M0NET** working on his home-brew TV receiver, and I asked if anybody still had a home-brew TV set in their loft. I wasn't optimistic about receiving any replies, so I was both surprised and delighted when **Eric Chardin** from Cambridge wrote to me. Not only did Eric still have a home-brew TV in his loft, he sent photographs to prove it!

The photographs in **Figs. 1** and **2** show the 60year-old set still lurking in his loft. Eric built the set – which was based on a VCR97 cathode ray tube (c.r.t.) – when he was demobbed from the Royal Signals in 1947. It was then used at Wimbledon to receive transmissions from the old Alexandra Palace transmitter. In true amateur style, the set wasn't built from a particular design. It just developed as different circuits were tried.

Briefly, the set was built on a wooden frame holding four chassis, with the c.r.t. and an 8in (203mm) loudspeaker mounted on a wooden front panel. A plastic oil-filled magnifying glass was later added to make the tiny screen look a little larger! The power supply unit (p.s.u.) chassis provides the main 350V h.t. rail and 2kV for the VCR97 tube's final anode. The sound strip has two EF50 r.f. amplifying valves, an EBC33 demodulator/1st audio and a 6C5 for audio output.

The vision side consists of four EF50 wide-band amplifying stages followed by a valve detector and a further EF50 as the video output stage. Timebase functions are handled by a 6J7 synchronisation (sync) separator, SP61 line oscillator and a 6N7 push-pull line output stage.

The frame timebase uses an SP61 followed by a 6A6 push-pull output stage. Programmes on the single BBC channel were viewed for nearly three years, with the little green picture being quite acceptable (for the time). However, when the room lights were turned back on everything looked pink

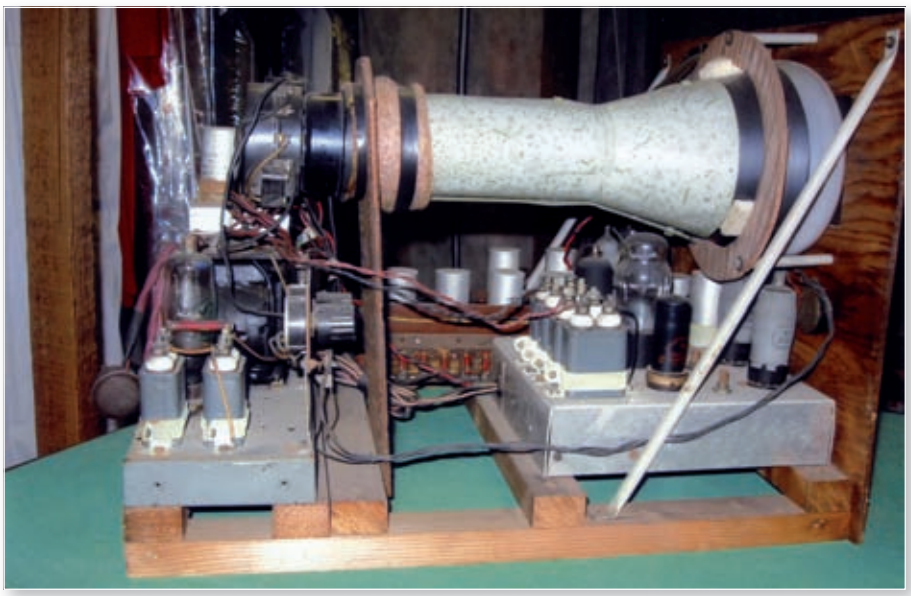

Fig. 1: Eric Chardin's home-brewed vintage TV set.

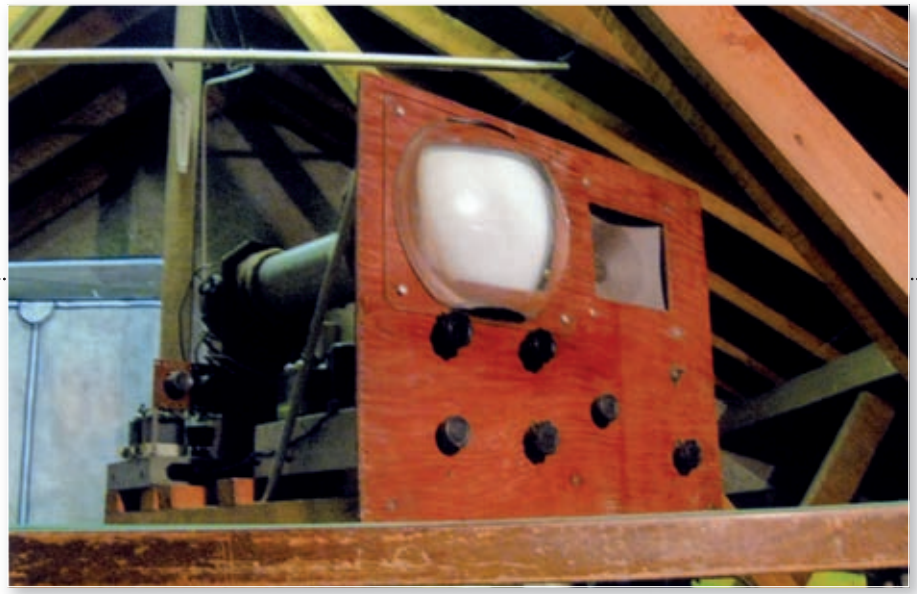

Fig. 2: Eric used an oil-filled lens to magnify the screen!

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for a while. Wonderful! Thanks very much indeed, Eric.

Cossor Velocity Modulation

While on the subject of television, I recently came across a reference to **Cossor Velocity Modulation**. My books revealed nothing about the subject but a search of the Internet produced two patents, one from 1935, the other from 1936. From what I can gather, velocity modulation was a technique invented by engineers at **A.C. Cossor Ltd.** to vary the instantaneous brightness of a television picture.

In all the systems I'm aware of, the intensity of the electron beam (directed at the phosphor screen) is modulated in sympathy with the instantaneous brightness of the picture. In the Cossor velocity modulated system, the electron beam intensity is constant, and instantaneous variations in brightness are caused by increasing or decreasing the scanning speed of the electron beam. At least that's what I think is being described by the patents.

My first reaction was why on earth would you do that? We're used to constant line and frame rates and a varying beam current, whereas here, the beam current is constant and the instantaneous scanning rate varies. That must mean the line and frame frequencies vary, line by line and frame by fame. Very strange indeed. I wonder, does anyone have any information about this system, or any references to relevant literature? The dates of the patents would suggest that any reports in the press would have appeared around the mid 1930s.

A Talking Fireplace!

Next, how about, a talking fireplace? Last time I told you about a talking drainpipe, or at least one that used to pick up a local transmitter. Well, I've now received a letter from **Richard Barrett** of Oxford who – years ago – had experience of a 'talking' fireplace. While working as a TV engineer in Redditch, in Worcestershire, he was called to fix a set belonging to an old gentleman customer.

While working on the set, the old gent asked Richard if he would be distracted by hearing a radio news programme. Richard indicated that he wouldn't, whereupon the old gent began raking the fire. After a short while he settled back into his chair, leaving the poker resting on the fire grate.

Richard thought this odd, but then he became aware of a faint voice coming out of the fire grate and it appeared to be the midday news bulletin! It transpired that this was a regular occurrence and the then *Home Service* on long wave could be heard using this 'receiver' at any time. Of course, Redditch is only a short distance from the powerful Droitwich long wave transmitter and it's likely that the poker and coal were acting as yet another crude detector. The resulting audio frequency currents must have been energising the fire grate or poker somehow!

Thank you for that fascinating tale, Richard. I've also been told about a talking oven, but that'll have to wait until next time. Although these stories may seem to stretch credibility, they do have some things in common: proximity to a transmitter, lots of metal – including magnetic materials – and some form of diode junction or 'cat's whisker'.

We don't seem to hear of such incidents these days, maybe that's because plastic and other non-conductive materials have replaced some metals in buildings. Still, that doesn't mean radio transmissions have ceased to turn up in unexpected places!

Cold War Memories

I ought to apologise for this next item as it's hardly vintage, being from as recently as 1973. But it does echo back to the Cold War and even back to the Second World War. Let me explain – a German Radio amateur **Wolfgang Buescher DL4YHF** – has written an excellent digital signal processing (DSP) program called ***Spectrum Lab***. It's available on the Internet and amongst its many facilities is an option to produce a waterfall display of a digitised audio stream.

While reading through the program's release notes, I came across a reference to radio transmissions 'hidden' in commercial music recordings. One recording in particular was mentioned: ***Tubular Bells*** by **Mike Oldfield**.

Apparently, someone playing with a DSP program used the CD version of *Tubular Bells* as an input audio stream and was surprised to find a weak – but continuous – line at exactly 16kHz on the waterfall display. Ruling out software problems, there was only one likely explanation: the v.l.f. government communications station **GBR** located near **Rugby**!

You see, *Tubular Bells* was one of the first albums recorded at **The Manor Studio**, a converted manor house (owned by Richard Branson) located just north of Oxford. And Oxford isn't that far from Rugby.

Using the capabilities of *Spectrum Lab*, it's possible to filter the 16kHz signal, amplify it, and 'move' it to a lower frequency so as to make it

audible. Once that's done it's possible to make out the Morse characters **VVV GBR** just as the music starts! And throughout most of *Tubular Bells*, fragments of Morse are discernible. However, don't try to hear GBR by simply playing the CD. The signal is at 16kHz and is more than 80dB below peak level (yes, -80dB). Even your dog can't hear it!

Given the consistency of the line at 16kHz, and the fact that at least some of the Morse is readable, it makes me think that GBR somehow got into the final mix. That's when the multitrack master was mixed down – in the spring of 1973 – to produce the stereo master. Interestingly, there are other weak spectral lines between 15kHz and 20kHz, including one at 19.6kHz. Which just happens to be the frequency on which **GBZ Criggion** – Rugby's wartime standby located on the banks of the River Severn near Shrewsbury – operated.

It's also possible that GBR could have been recorded when the stereo master was digitised to make the CD in 1983. If GBR is only on the CD version then that's what must have happened. But if GBR is on the LP as well, then GBR must be on the stereo master tape. I just need a volunteer to check the LP!

Of course, many singles and albums were recorded at The Manor and it has been confirmed that other albums have traces of GBR – and possibly other v.l.f. transmissions – on them. So, what about other (earlier) recordings made in other studios? And recordings made on location? What secrets do they hold?

I find this quite amazing. While GBR Rugby and GBZ Criggion are now only memories, there may be many hours of their transmissions recorded on dozens of LPs and singles. *Tubular Bells* alone eventually sold 13 million copies, so just how many individual LPs, singles and CDs are so graced? Next time you listen to *Tubular Bells* – and some of you must have copies – quietly remember you're also listening to the ghost of GBR!

Christmas Presents

Well, Christmas will soon be here, and that means Christmas presents! Back in the early 1960s, budding radio enthusiasts might have wished for a **Triang Trionic S1** radio kit – see **Fig. 3**. I received one of these kits for Christmas 1963, and although too young to appreciate how the set worked, work it did, picking up several strong stations. Usually all at once!

Fig. 4: The Philips' electronic construction kit add-on kit contained enough components to make a superhet radio.

The set used standard components mounted in little blocks of plastic, which were then plugged into a printed circuit board. A bit like electronic Lego. In the same year, **Philips** - the Dutch electronics company – also began to produce kits for young electronics enthusiasts.

Fast forward three or four years and I became the proud owner of a Philips **Electronic Experimenters Kit**, model **EE1003**. These kits were very popular and quite comprehensive. I liked their method of mounting components, which allowed any circuit (within reason) to be tried, not just the ones in the instruction book. I only had the basic kit (ahhhh!), but add-on kits were available, and a few years ago I managed to get two of them: the **EE1004** and **EE1005**.

The EE1005 is particularly interesting, because although the basic kit allowed several t.r.f. receivers to be constructed, the EE1005 included sufficient additional parts to make a proper superhet receiver – see **Fig. 4**. Those of you who remember these kits can wallow in nostalgia at **http://ee.old.no**, a website crammed with information and documentation about Philips kits. And looking over the site I was surprised to find that Philips electronics kits – some very complex – were in production well into the 1980s.

Fig. 3: The Triang-Tronic S1 kit that a young Phil Cadman received for Christmas.

Sadly, the Triang and Philips kits are now long gone, but there are modern equivalents. They range from inexpensive crystal sets to elaborate kits which allow dozens of different circuits to be built. With Christmas fast approaching and presents to buy, maybe an electronics kit would make the ideal present for some young person?

Last Bit Of Trivia!

Time for one last bit of trivia before I head for my CD collection: *Tubular Bells* isn't the only Mike Oldfield album to contain Morse code! Just over 48 minutes into his album ***Amarok*** there's a bit of Morse, and despite sounding like someone keying a spark transmitter with his foot, the message is perfectly readable. Unfortunately, its content prohibits me from repeating it in *PW*!

Hmm. Better go before I'm censored! So, do have a merry Christmas and a happy New Year. And please remember to send your comments and letters to me, either via E-mail to: **phil@g4jcp.freeserve.co.uk**, or by mail to: **21, Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX**. Happy Christmas! ●

Graham Hankin's

in vision

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Acocks Green
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E-mail: g8emx@tiscali.co.uk

Graham Hankins G8EMX is asked to give a talk, and wonders if a name change might be needed!

Back in August this year, I received a telephone call from **Mike King G8XDX** that was a 'voice from the past' as we'd not met or spoken since working together at a BT calibration centre. The centre was in Birmingham until its closure a little while back. After assuring me that I didn't owe him any money, Mike explained that he was secretary of the **Worcestershire Amateur Radio Society**, going on to say that they'd recovered from the visit by **Rob Mannion G3XFD** so, could I come and give a talk on Amateur Television?

Obviously I agreed to visit, but didn't have a clue what the content of the talk, I was asked to give, would be! Over the years, I've chatted to many radio clubs about ATV, usually taking loads of equipment with me – antennas, transmitters, receivers, overhead slides and projectors indeed, a veritable carload usually.

But as everything I have is no longer obtainable, how could I demonstrate ATV in 2009? Mike then asked for a title that he could put on the club's website. After long thought I suggested *Amateur Television – it has a past, but does it have a future?* Deliberately pessimistic so that it might draw in an audience!

Downbeat Title

My rather downbeat title wasn't just to generate a headline – I believe that there's a case to be discussed. At the British Amateur Television Club's 60th Anniversary, described in September's *In Vision*, **John Lawrence GW3JGA** had brought his Digital ATV Coder; these boards have to be bought from Germany and are very expensive – around £500 (the most recent figure I have heard).

So, I don't think the digital coder boards are likely to appear in the shack of every ATV station, which they need if ATV are to join the coming digital switchover! However, a few of these coders are being used for digital transmission experiments by John and some others, and well done to them of course. Other versions have been provided at a few ATV repeaters to

give a digital output. But I really, really cannot envisage digital ATV as achieved at present becoming the ATV hobby too.

In his *Digital Ramblings* for *CQ-TV* 226, **Brian Kelly GW6BWX** expresses much the same concerns, stating: "It's easy to lose sight of the target when it comes to digital ATV ... the change to digital broadcasting has strengthened our dependency on following the experts. The leap in technology has made it difficult for us to innovate ... we are now blinkered to all but the standards of commercial broadcasters."

Brian continues by acknowledging the complexity and cost of the MPEG encoder and modulator by saying, "These are the high cost and highly complex stages that make home construction impractical and therefore undesirable." In his article, Brian continues by suggesting that the MPEG encoding and decoding could be achieved by modern computers and appropriate software. While I acknowledge that Brian's suggestions may well be feasible, I also think this would leave any newcomer to ATV completely behind. Many established ATV stations too perhaps!

On-line Encyclopaedia

A quote from on-line encyclopaedia Wikipedia, "Amateur television (ATV) is the transmission of broadcast-quality video and audio over radio waves allocated for Amateur Radio using the broadcast standards of NTSC in North America and Japan, and PAL or SECAM elsewhere, using the full refresh rates of those standards. ATV includes the study of building of such transmitters and receivers and the propagation between these two. ATV is an extension of Amateur Radio."

In my report of the BATC's meeting I mentioned putting an 'awkward' question, as did another questioner, about the state of the radio frequency (r.f.) side of the hobby to the Chairman, **Trevor Brown G8CJS**. In reply, I received what I felt was a very dismissive response. Both the other questioner and I chatted afterwards and we agreed that the BATC's streaming service seemed to be dominating the club's attention.

Even though two months have now passed, that chap phoned me recently, saying that a trader in r.f. devices had heard the chairman's comments too and had been equally unimpressed. I have asked my caller, who doesn't wish to be named at the moment, to put his views to me by E-mail for possible inclusion here.

Vintage Television Club?

While many of the 'exhibitors' at the Anniversary were showing vintage and 'museum' television apparatus (there was a comment a few years ago – should the BATC be renamed the Vintage Television Club?) a few were displaying some recently-built ATV devices and circuit boards. But most were reluctant to put these in the BATC's magazine *CQ-TV* because: "we haven't got the time to write about it", or did not want a 'kit' advertised in case there was too much demand!

So, back to my dilemma! What am I going to show to the Worcestershire ARS? My mobile ATV antenna rotator always causes quite a stir, there will be a *PowerPoint* presentation put together probably the night before and take as much hardware as I can, if only to make it obvious how much has disappeared from the hobby! Of course, this is Amateur TV, we can do as we please, nobody has to change to digital, so my 24cm f.m. analogue kit could continue for many years ahead.

●

Colin Redwood's

what next?

Colin Redwood G6MXL presents a step by step guide to getting on the air with a new transceiver.

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Welcome to *What Next?* (*WN?*), where this month I'm going to look at getting on the air for the first time. I'll start by looking at the very high frequency (v.h.f.) and ultra high frequency (u.h.f.) bands using frequency modulation (f.m.) with an internal battery. Next month, I'll continue by looking at operating on both the h.f. and v.h.f./u.h.f. bands using single sideband (s.s.b.) and Morse, otherwise called continuous wave (c.w.) or telegraphy, on all bands using an external power supply.

However, I have no doubt there'll be some readers wondering why I'm doing this! The answer is because transceivers are becoming ever more complex, the gap between the essentials covered as part of a Foundation Course, often using a simple transceiver, and the complexity of most modern transceivers seems to me to be getting ever wider. I think it's no wonder that some newly licensed Amateurs are struggling to get started.

With so many different transceivers on the market, I decided that it would make sense to base the article on a specific transceiver, although the topics covered will also apply to many other transceivers. I've chosen the Yaesu FT-817ND as it can operate on the h.f. and v.h.f./u.h.f. bands and it can use both internal batteries and external power supplies.

So, with one transceiver I can cover most of the topics that I would have had to cover separately if I had chosen a h.f. base station and a v.h.f. hand-held.

Popular With Beginners

The FT-817ND is a very popular transceiver for beginners. It has a maximum power output of 5W, which is comfortably within the Foundation licence maximum power limits. The rig is also popular with h.f. operators for QRP, as a back-up rig and to take portable or on holidays, etc.

The '817ND is also used by many Amateurs to drive transverters for 70MHz and various microwave bands. So, I'm hoping that this *WN?* will also be of some interest to many readers, not only to beginners.

Fig. 1: The Yaesu FT-817ND as supplied brand new in the box.

However, before I go any further, I should make it absolutely clear that **this article is not a review** of the Yaesu FT-817ND. I have no commercial links with Yaesu, their dealers and distributors, other than as a normal private customer and sometime owner of various pieces of their amateur radio equipment (some second-hand).

Incidentally, as far as I'm aware the earlier FT-817 is very similar to the more recent FT-817ND and therefore most of my description and comments will also apply to the FT-817.

The '817ND is supplied with a microphone, flexi-whip antenna, battery and charger as standard. In addition, there's an instruction manual and various other bits of paper including circuit diagrams included in the box. So, off we go!

Box Opened

Having opened the box, it's a good idea to take each item out and check it off against the list in the operating manual which should also be found in the box, **Fig. 1**. Sometimes transceivers supplied for different markets have different accessories. For example, power supplies for re-charging batteries are usually supplied according to the local mains voltage and mains plug standard.

Fig. 2: The battery compartment on the bottom of the FT-817.

Installing The Battery

As with any portable rig, the next step is to install the battery. On the FT-817 this is done by removing the battery cover on the bottom, which is secured by a little plastic clip that you slide towards the front of the rig. Then you can lift the battery cover – quite a fiddley operation – but please resist the temptation to undo either of the cross-point screws, **Fig. 2**.

There are several options you can adopt for batteries. You can install eight AA-sized alkaline batteries into the battery case in the battery compartment. If this option is chosen, there's no need to wait while the batteries charge, but you'll need to replace the batteries when they become exhausted.

Note: With other transceivers, the battery holder for the AA batteries may be an optional extra.

Alternatively, the battery case can be removed and replaced with the Yaesu rechargeable battery that's supplied with the FT-817ND. If you decide to do this, be very careful not to pull on the wires!

The battery case wires are disconnected by unplugging the small in-line plug/socket, **Fig. 3**. I found that my finger nails were helpful to separate the

Fig. 3: The in-line battery connector.

Fig. 4: Charging Display.

white in-line plug from its socket. The rechargeable battery is connected via the small connector and then put in place, and the battery cover replaced.

Charging The Battery

The rig's instruction manual describes the battery charging process quite clearly. Tempting though it may be to try operating whilst still charging the rig, the charger on many rigs, including the FT-817ND, isn't designed to provide enough current to operate the rig – especially on transmit. I have known internal fuses within chargers to blow if excessive current is drawn by trying to transmit whilst charging.

The display on the FT-817ND shows how much time is left before charging is complete, **Fig. 4**. **Note:** While the batteries are charging, which will usually take several hours, it's a good idea to skim through the instruction book to get an idea of what's there for you and to learn something about of the key features of the transceiver.

The Antenna

Having charged the battery for the first time, no doubt you'll be keen to make a first QSO, or at least have a listen around the bands – but before doing so you will need an antenna! With the FT-817ND there are two antenna sockets.

On the front panel there's a BNC socket, **Fig. 5**, which by default is enabled for just the 50MHz (6m), 144MHz (2m) and 430MHz (70cm) bands. **Note:** Many modern hand-helds now use an SMA socket.

On the rear panel of the FT-817ND is an SO239 socket, into which a PL-259 plug can be screwed in. This socket is – by default – enabled for just the h.f. bands, which I'm planning to look at next month.

Initially, I'm going to cover a few basics without doing any configuration. So connect with the flexi-whip antenna that came with the rig into the front panel. Unlike most portable rigs, the '817ND comes with three sections of antenna. The longest has a BNC plug on the base, and this connects with the BNC socket on the front panel of the rig.

You can then choose which of the two top sections to use. For portable operation on the 6m (50MHz) the longer of the two top sections must be used. For 2m (144/145MHz) and 70cm (430MHz) the shorter of the top sections can be used. The instruction book describes this in more detail.

Switch On

These days, most portable rigs are switched on and off by pressing and holding a button in for about a second. On the FT-817ND this is the blue button on the top right-hand corner of the front panel, **Fig. 6**.

After switching-on, the '817ND initially displays the frequency and mode that it was last used on. Then, using the Band **Up** and **Down** buttons above the display it's possible to cycle up and down to the various bands.

Next, by press the **Up** button until the display shows a frequency in the 144/145MHz band. Then by using the Mode arrow buttons (also situated above the display) it's possible to cycle through the various modes until you come to **FM**.

If you live in an area not covered by a 144MHz repeater, but is covered by a 430MHz (70cm) repeater, you could press the **Band Up** button once more and tune to the output frequency of your local repeater.

Next, use the **SEL** (**Fig. 5**) control which is the rotary switch, to the left of the display (not the main tuning control) to tune to the **output frequency** of the local repeater. Then adjust the squelch by rotating the outer of the two rotary controls on the bottom right-hand corner of the front panel (**Fig. 6**) so that it's open, and adjust the volume control (the inner of the same rotary control as the squelch), to a comfortable listening level.

Finally, adjust the squelch so that it just mutes the sound. Leave the transceiver like this for a few minutes and wait for your local repeater to send its beacon transmission.

If you don't heard anything, you may be out of range of the repeater, so I suggest trying a better location. If you've been indoors, try moving out of doors, to a location with a relatively clear take-off in the direction of the repeater. However, if you've been successful and have received the local repeater, the next step in the voyage of discovery is to transmit into it.

Repeater Shift

Not all transceivers are fully 'aware' of the UK's 144 and 430MHz band-plan and it will be necessary to enable repeater shift. On the 144MHz band this is -600kHz. For most UK 430MHz band repeaters, with outputs between 433.000MHz and 433.375MHz, the shift is +1.6MHz, although for some with outputs in the range 430.825MHz to 430.975MHz the shift is +7.6MHz.

Either a 1750Hz tone burst or a Continuous Tone Coded Squelch System (CTCSS) tone is needed to 'open' a repeater. Some transceivers will require the tone burst frequency to be configured. If CTCSS is to be used, then I suggest visiting the Radio Society of Great Britain (RSGB) Emerging

Fig. 5: Part of the front panel of the FT-817 showing the BNC socket and rotary SEL control.

Technology Co-ordination Committee's web site at **www.ukrepeater.net**/ to determine the correct CTCSS for the geographical area (county) in which you are situated. With some handhelds using the older tone-burst system is more complex than using CTCSS.

For the models of the FT-817ND sold in the UK, the correct tone burst and repeater shift is automatically engaged for the relevant part of the 144MHz band (repeaters with outputs between 145.600MHz and 145.775MHz). On the 70cm band, this happens only on repeaters with outputs between 433 and 433.375MHz. Repeaters with outputs between 430.825 to 430.975MHz will require a bit of configuration.

Hint: I think the best approach with these is to use split-frequency memories – a technique that I found useful on other transceivers if they don't automatically handle any repeater shifts.

The Microphone

Almost ready to start! – but we need to make sure the microphone is attached. The microphone plugs into the side of the FT-817ND, using a plug such as you may have found as part of a computer network and a slightly larger than standard UK telephone plug. We're now ready to go on the air!

To start, you should first listen to make sure that there isn't a QSO already taking place on the repeater. If not, you can then put out a call. I suggest something like, "This is G6MXL, Golf Six Mike X-Ray Lima, checking access to GB3SC" (GB3SC is my local 144MHz repeater, located in Bournemouth).

Obviously you will need to replace 'G6MXL' with your own callsign, and replace 'GB3SC' with your local repeater's callsign. Don't talk too fast, and don't whisper, as some repeaters require a few seconds of well modulated audio to 'latch up' following your initial call.

Note: While transmitting, check that the display frequency has changed to the repeater's input frequency. If it hasn't, then you'll need to re-check that you have enabled the repeater shift correctly.

Assuming that your signals are being received by the repeater, you can expect to hear it respond with some Morse code. If you're lucky, another station may come back to give you a report. Once you have finished, the repeater will send some more Morse, before closing down. Either way, you can be pretty certain that your transceiver is working.

Fig. 6: Part of the front panel of the FT-817 with the blue On-Off button marked PWR and the volume (inner) and squelch (outer) dual concentric controls below.

If you weren't successful, it's worth checking that you're using a high enough power setting on your transceiver and the correct CTCSS for the area you're in.

Power Output

To check the power output on the FT-817ND you should look at the bottom line of the display, **Fig. 7**. This shows 'L' and one, two or three bars to represent 500mW, 1W and 2.5W respectively. If the display is flashing, it's indicating that the power has been set to 5W.

Changing the power is quite simple. Press the **F** key briefly, and then rotate the dial knob until the **PWR MTR** is displayed. Then press the **A** button immediately below the display to toggle through the four power settings. To save on batteries, I suggest using lower power where possible and remember to keep within the terms of your licence.

A Simplex Contact?

Having checked out the transceiver through the local repeater, why not try a simplex contact? If your transceiver doesn't automatically switch to simplex (no repeater shift), you'll need to switch off the repeater shift. Then tune to either 145.500MHz or 433.500MHz and try calling "CQ" several times along with your callsign.

If you get a reply, then agree on a frequency to move to (perhaps 145.450 or 433.450MHz) **and after checking** that it's free, you could have a QSO without tying up the local repeater. I suggest referring to the band plan Datacards that came with *Practical Wireless* (144MHz in March 2009 and for 430MHz in May 2009). Back numbers are available from the *PW* offices in Broadstone.

An external vertically polarised antenna mounted high up and fed with low-loss feeder will certainly increase the range you can hear and be heard. Good luck on the air!

Next Month

I'm planning to move on to look at operating the FT-817ND using s.s.b. and c.w. on the h.f. and v.h.f./u.h.f. bands, and use of an external power supply. In the meantime, I hope you enjoy using your new f.m. transceiver on v.h.f. and u.h.f!

Operating Techniques

I'm also planning to devote a future *WN?* to operating practices, procedures and techniques. If readers have any particular techniques that they find work, or that don't work for them, I would really like to hear from about it, so that I can incorporate them in the article. Please drop me a line or an e-mail to **what.next@pwpublishing.ltd.uk**

Fig. 7: The main display of the FT-817 with the Power Output display at the bottom.

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For your advert in Bargain Basement please remember to include your dated, coloured corner flash from this page along with your entry.

BARGAIN BASEMENT RULES - £4 per advert

Please write your advert **clearly** in **BLOCK CAPITALS** up to a maximum of **30 words**, plus **12 words f**or your contact details on the form provided and send -it together with the dated corner flash and your **payment of £4** (**subscribers** can place their advert **free of charge** as long as they provide their **subs number and corner flash**), cheques should be made payable to **PW Publishing Ltd.**, credit card payments also accepted.

Send your advert to **Bargain Basement, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** or E-mail your advert to **peter@pwpublishing.ltd.uk** (If you don't want to include your credit card details on your E-mail, just 'phone us on **0845 803 1979**.

Please help us to help you by preparing your advert carefully. Any advert which contains **??** marks indicates that the advertiseing dept. could not read/interpret the wording.

Please avoid FAXing your advert - it could delay publication.

Advertisements from traders or for equipment that it is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. **No responsibility will be taken for errors and no correspondence will be entered into on any decision taken by the Editor on any of these conditions.**

You should state clearly in your advert whether equipment is professionally built, home-brewed or modified.

The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

FOR SALE

CLASSIC DRAKE TRANSCEIVER 200 watt T-4XC. 160-10m filters, CW, SSB, 1.5-2.4 up to 200W PEP on voice peaks AM. Notch filter in good working condition plus circuit manuals. Moving house forces sale. Tel: Roy 01282 866181 (Colne, Lancs).

ETON E5 FM/AMshort wave SSB, 700 memories, battery/ mains and PS unit. Leather case. In good condition, £50 o.n.o. plus postage. Also, 9th edition UK Scanning Directory, as new, £10 plus postage. Tel: Keith 0775 7952 703 (Kendal, Cumbria).

ICOM IC-2820 D-STAR fitted. Purchased 27.08.09 as new, 2 hours use in box. Cost £539, sale £439. Alinco DJ-596, 2-70 with desk charger spar h/d battery, speaker, microphone, very good condition, £85. Tel: 07522 574408 (Havant).

KENWOOD TM-G707E dual-bander with extended listening and voice chip. One lady owner, none smoker, £170. Standard C-501E 1/4 wave antenna, dual band handy, £50. Both rigs £200. Tel: Chris 01745 825327 (Conwy).

MAINTENANCE TECHNICAL HAND-BOOKS and instruction manuals for sale. Send SAE for list to Jim Fish G4MH 28 Banks Avenue, Golcar, Huddersfield, Yorks HD7 4LZ. Tel: 01484 654607.

MILITARY ITEMS FOR SALE Tele/D MkV field telephone. Spares offers. MOD Gieger Counter with knapsack, instructions 1959, £20. Metal end pipe locator 1960s, £20. Large wooden cased meter 0-150DC, 0-300DC, £15. Tel: Mike 079545 76683 (Canterbury).

RACAL RA-17 with manual, £120. Tel: 01491 612736 (Oxon).

TWO JASON FM TUNERS one is mains powered,£25. Mains and U/L O/P transformers ex-Mullard 510 type amplifier, £25. Tel: 01591 620747 (Mid Wales).

US NAVY SPARK PROOF MORSE key, £20. KW E-ZEE match, £25. 112 pF wide space V. cap, £10. Cash and collect, please. Tel: Syd G3AIO 01892 822836. 28 Gimble Way, Pembury, Kent TN2 4BX.

YAESU FT-860 HF rig, 100W, 1.8-30MHz. General coverage, Rx complete with power lead, manual and mic. In very good working order, £350 plus carriage at cost to purchaser. Icom IC-740 complete repairs spares, £150. Tel; John 01256 465126 (Basingstoke).

YAESU FT-847 in mint condition, boxed, £700. Icom filters FL-53A, FL-223 and FL-100, £100 the set. Kenwood TS-570DGE with matching speaker, £450. Tel: 01937 844197 (Bramham).

WANTED

LISTENERS TO LOG wideband HF slow pulse interface. Mainly 7MHz. Requires low noise location, UK or abroad. Head as 5Hz regular pulse on clear channels, even to 24MHz plus. Tel: Des Walsh EI5CD QTHR text to 0035 387 9360052.

MINI HF BEAM similar to MA-5B Cushcraft for very restricted turning circle. Tel: 01933 624933 (Northants).

OLD HALF INCH FERRITE RODS must be half inch, 12.7mm, in diameter and be six inches long or more. Will pay very good money for the rods. Tel: Peter Tankard 0114 2316321 between 9am and 9pm (Sheffield).

PM-6300 RCL BRIDGE CIRCUIT diagram or service manual to enable repair. Can copy if required and return. All expenses paid. Tel: Les 01922 691646 (Walsall). E-mail: leslie137@btinternet.com

TAPE RECORDER Stella ST-458 or similar. Philips or Cossor 4-track. Also, drive belts for mine. Also, 1922 radio cabinet with Marconi image. Offers for this item. Tel: Arthur 01268 780190 (Rayleigh, Essex). E-mail boyd.barton@googlemail.com

EXCHANGE

YAESU VR-5000 all-mode receiver. MLP-62 log periodic antenna. Wellbrook ALA-153 loop 2mtr amp 2mtr antenna. Z-50N Racal RA-17W with stand. First class condition and performance. Ex GCHQ set of new valves spar, offers or may P/X. Tel: Barry 079447 05667 (West Midlands).

Bargain Basement order form

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☐ For Sale ☐ Wanted ☐ Exchange

PLEASE NOTE: as a security measure, you must include your house number and postcode.

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CARD NUMBER

VISA SWITCH AMERICAN EXPRESS MasterCard

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B.B. Dec '09

THE PW PUBLISHING
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mail order...huge range in stock...fast delivery

NEW IN STOCK NOW

RSGB COMMUNICATIONS HANDBOOK

10th edition

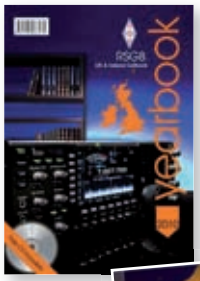
Following a major revision the RSGB Radio Communication Handbook is now the biggest edition ever and even better than before! 64 pages bigger than the previous edition, the 10th edition of the RSGB Radio Communication Handbook is now packed with even more material than ever before. The contents have also had the biggest revision ever and to make way for all the new material some chapters have even been moved onto the accompanying CD.

* Biggest Handbook ever - 864 A4 pages
* 26 chapters and two appendices
* 600,000 words!
* Over 1700 illustrations
* Bonus CD
* New "Great Outdoors" Chapter
* LF including the use of higher power limit on 500kHz
* Rewritten "Digital Communications" Chapter
* Surface Mount Technology
* Software Defined Radio
* Projects for 136kHz to 76GHz

If you only ever buy one book on amateur radio, this should be the one!

£29.95

RSGB YEARBOOK 2010



Bigger and better than ever before!

The newly expanded RSGB Yearbook 2010 contains 528 pages and over 1.25 million words. Now with over 200 pages of information it remains the most comprehensive guide to amateur radio in the UK and worldwide.

FREE CD

Packed with bonus material the RSGB Yearbook CD is a great extra benefit of buying this great book.

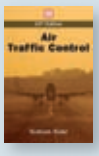
£18.99

The CD-ROM version of the RSGB Yearbook 2010, but with a lot more besides!

£15.99

Features:
* Nearly 70,000 active callsigns from UK
* Irish callsigns and UK calls sorted by name and postcode
* Licensing Information UK and International
* A full colour Review of the Year
* National and Featured Club Information
* Exam Licence and Course Information
* Prefix Lists
* Latest Band Plans
* Award and Contest Information
* Technical Help
* 864 pages

NEW IN STOCK NOW



AIR TRAFFIC CONTROL 10th EDITION

Since the last edition of abc Air Traffic Control in 2005, there have been many changes in the air traffic control industry in the UK and UK-related airways.

IN STOCK NOW

SCANNERS 6

The Scanners books, originally created by Peter Rouse, have been consistent best sellers. They are the UK's leading guides to the short wave radio equipment employed by enthusiasts to monitor the VHF/UHF frequencies used by airfields, the maritime and emergency services and many other users. Scanners 6, the sixth revised and updated edition, includes up-to-date frequency listings and information on the latest digital technologies, mobile radio, using PCs (home, laptop and palm) with radio receivers, shareware/freeware software for monitoring and decoding and radar-style displays on palmtop computers.

NEW IN STOCK NOW

£9.95

Originally to be published in June and it's now in stock at last! Please accept our apologies if you have ordered this book and you have been waiting.

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● **UK & IRELAND AIRBAND FREQUENCY GUIDE** (Seldec)	146	£8.99
● **HF AIRBAND FREQUENCY GUIDE** (Seldec)	225	£14.75
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● **25 SIMPLE TROPICAL & MW BAND AERIALS** E.M. Noll (Babani)	54	£1.75
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You can see full descriptions of all these books & order securely on-line at www.mysubcare.com see the magazine's related products section. Also, see www.pwpublishing.ltd.uk/bookstore/books.html for full descriptions of all these books.

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● **AMATEUR RADIO EXAM SECRETS** Alan Betts G0HIQ (RSGB)	104	£12.99
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● **GREAT CIRCLE MAP** (PWP)	400 x 400mm	£1.50

NEW!

ARRL HANDBOOK 2010

87th Edition. **The BIGGEST ARRL Handbook EVER!**

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SPECIAL OFFER - Whilst stocks last! Purchasers of this book will recieve the hardback version of this book at no extra charge.

At over 1250 pages, the 87th edition of the ARRL handbook is the biggest since it was first published in 1926. More than 60 authors and reviewers contributed over 70% NEW or completely revised content to this edition.

The ARRL Handbook 2010 is both reference book and tutorial, woven together with practical applications and solutions. The Handbook provides both a useful introduction to radio communication and features the most current material on electronics and Amateur Radio.

This edition has been reorganised into five major sections, making it easier than ever to find exactly what you are searching for: Fundamental Theory, Practical Design and Principles, Antenna Systems and Radio Propagation, Equipment Construction and Maintenance and Station Assembly and Management. Each chapter has been designed to be either an encyclopaedia of current practices and technology or focuses on techniques, designs and projects.

CD-ROM

The book's accompanying CD-ROM inside the back cover once again includes a searchable PDF version of the entire book, including graphics. Construction information and PC board templates for all projects are included, as are the original QST articles. There is a powerful filter design and analysis software, Elsie, as well as other useful applications.

NEW!

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Before entering the subject of airband radio and other monitoring systems, an overview of the processes involved in handling air traffic may help to give a better understanding of how it all works

Contents include; The UK airspace system, The legal position, How the System works, What can I hear?, Choosing a scanner, Antennas, High frequency radio, Virtual radar systems, VHF and UHF receivers, Airline callsigns, Airfield directory, En route frequencies, Worldwide high frequency coverage, Weather broadcasts and Useful addresses.

THE UK & IRELAND AIRBAND FREQUENCY GUIDE 13th Edition

Includes ALL Airports in England, Scotland, Wales, Channel Island, Northern Ireland and the Republic of Ireland, ACARS Frequencies, Alphabetical Airfields & Airport Frequencies with Company Frequencies, Numerical Frequency Listing, ICAO Airfield Designator Decodes, Radio Call signs, 2 & 3 Letter airline Prefixes, Civil Aircraft HF (SSB) Frequencies, OACC HF (SSB) & VHF Frequencies, Abbreviation List, Phonetic Alphabet & Morse Code. VOLMET frequencies.
INCLUDES REPUBLIC OF IRELAND

146 pages A5 spiral bound "Lay Flat"

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FOUNDATION LICENCE NOW!

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INTERMEDIATE LICENCE. BUILDING ON THE FOUNDATION.

The second course book in the RSGB's series is structured to progressively obtaining an Amateur Intermediate Licence. It contains practical exercises, broken down into half-hour worksheets. The ideal companion book for all Amateur Radio Intermediate Licence students. **£6.99.**

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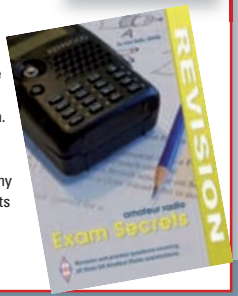
NEW AMATEUR RADIO EXAM SECRETS

For those who are studying for the UK amateur radio examinations and want more information, then this is the book. Covering all three levels of amateur radio licence, Amateur Radio Exam Secrets is designed to extend knowledge and test candidates' comprehension.

Amateur Radio Exam Secrets provides the ideal training course companion for both candidates and tutors. If you are studying for any level of the amateur radio examination, Amateur Radio Exam Secrets provides the ideal revision aid and quick reference book.
104 pages, **£12.99**



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RADIO BOOKSTORE

mail order...huge range in stock...fast delivery...

RADIO LISTENER'S GUIDE 2009

Frequencies and transmitter information for all BBC and commercial radio stations, plus DAB digital transmitter details.
Radio Reviews, Independent reviews of analogue and DAB digital radios.
News from BBC and commercial radio stations. The latest news and information about Digital Radio (DAB). Sky and Freeview radio information and channel lists.
Advice on how to get the best from your radio.
160 pages.

£5.95

NEW! POCKET UK & IRELAND AIRBAND FREQUENCY GUIDE 14th Edition

The 14th Edition of this popular "POCKET FREQUENCY GUIDE" is now available, the contents represent the most comprehensive and up to date frequency listing currently available.
128 pages A6 (10.5 x 15 cm) Spiral Bound with Colour Cover. **£5.75**

The Pocket UK & Ireland VHF Marine Frequency Guide

This handy, small, ring-bound book lists the frequencies and channel numbers for marinas and ports all around the UK and Ireland. The list runs alphabetically by region, with separate lists for ports, marinas and inland waterways. There are also helpful sections on both the HM and Irish Coastguard, including when to listen to weather forecasts. At the back of the book is the complete list of channel numbers, their equivalent frequency and notes on their use, which means it doesn't matter whether you are using a scanner or a marine receiver you can find the stations you are looking for. 108 pages.

£4.99

HF AIRBAND BAND FREQUENCY GUIDE

The book is intended to enhance the enjoyment in listening to civil, military and government aircraft on short wave throughout the world. In addition to an extensive frequency list, covering from 2MHz to 30MHz, plus ACARS frequencies, the book includes sections on Antennas, Receivers, including DX Tuners (www.dxtuners.com) with information and guidance on decoding ACARS, HFDL, SELCALS, FAX, RTTY and CW. Listings of Major World Air Route Areas (MWARA), Regional and Domestic Air Route Areas (RDARA), and Long Distance Operational Control frequencies (LDOC) are included. A section is devoted to suppliers of Radio equipment, with their addresses and telephone numbers.
225 pages, wire spiral "lay-flat" bound with colour cover.

£14.75

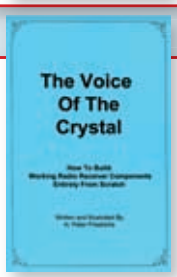
HF MARINE BAND FREQUENCY LIST

The new HF Marine Band Frequency List is our latest publication for listeners with a general interest or a particular interest in Marine Radio. Listed are frequencies of Civil, Military & Government shipping on the HF bands throughout the world. In addition to an extensive frequency list covering from 1.5 - 30MHz (with MF shipping, yes the 500kHz band is still in use!) the book includes sections on antennas, receivers, including DX tuners, with chapters on decoding RTTY, SITOR, CW, FAX and other modes.
225 pages, wire spiral "lay-flat" bound with colour covers.

INSTRUMENTS OF AMPLIFICATION

Rob Mannion G3XFD writes: Peter Friedrichs has written a truly superb book but has chosen a title that really hides its 'light' under the proverbial bushel! Armed with the book an interested constructor can literally build a radio from scratch anywhere! Perhaps a better title could have been *Desert Island Radio for the Shipwrecked* because everything from simple earphones, detectors and mechanical amplifier to home made valves (tubes) and transistors. If you enjoy Rough Science on BBC2 you'll love this book! **Very highly recommended**.

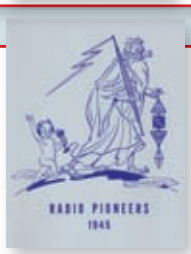
£14.95



VOICE OF THE CRYSTAL

185 pages of practical information on the fabrication of electronic components suitable for use in building crystal radio sets. Basic theory and simple analysis is combined with dozens of examples of historical practice, work by contemporary experimenters, and construction details for many instruments fabricated by the author himself.

£11.95



RADIO PIONEERS 1945

Discover the history of the Veteran Wireless Operators Association and the Amateur Radio Relay League. See some of the early wireless catalogues and amateur stations. Get a brief but to-the-point chronology of radio developments to 1925. You get pictures of early tubes, Poulsen in his lab, Marconi parabolic reflectors, a Fessenden alternator and more. The history is brief, fast reading, but informative. You'll read about the personalities and discover what they did.

£7.95

VINTAGE RADIOS

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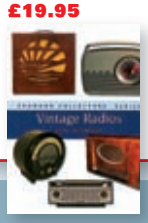

This book tells the collector and the armchair wireless enthusiast everything there is to know about classic radios from the 1920s to the end of the 1960s. All the important makes and models are discussed and the author also covers buying and selling, care and restoration and many other topics, including foreign radios and radio-related ephemera. Illustrated with many colour photographs, this is the perfect collector's companion to the fascinating hobby.
208 pages.

	Pages	Price
LF TODAY - GUIDE TO SUCCESS 136kHz M Dennison. (RSGB)	128	£11.95
LOW PROFILE AMATEUR RADIO 2nd edition. (ARRL)	64	£14.99
RADIO AMATEURS WORLD ATLAS (A4)	23	£12.00
RSGB AMATEUR RADIO OPERATING MANUAL (RSGB)	224	£19.95
RSGB PREFIX GUIDE. 8th edition. (RSGB)	34	£8.95

QRP

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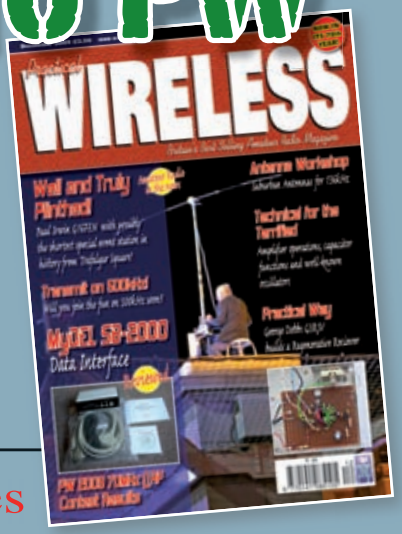

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Rob Mannion's

topical talk

Rob Mannion G3XFD discusses encouraging newcomers to the hobby and remembers friends who helped him into Amateur Radio.

The letter (*Letters* this month) from keen newcomer **Steven Scott MM6TMS** made me think a bit! It made me think, "We've got to help keep his enthusiasm going" and to be honest, it also made me realise I'm a bit of a dinosaur. Not quite fossilised yet perhaps – although some may consider me to be well on the way to extinction when compared to the new (sometimes young) blood that's making its mark on Amateur Radio!

I suggest this because for all intents and purposes my 'traditional entry' into the hobby – via a long 'apprenticeship' as a short wave listener and radio construction has been rendered obsolete by the now well established Licence structure. Many newer readers to *PW* are being introduced into the hobby by the much faster new exam structures.

However, there are many *PW* readers – some of whom have supported the magazine for 50 or more years – who have chosen, because of their specalised interests, to remain as constructors and listeners – and they must certainly not be forgotten. As far as I'm concerned we don't need to be transmitting Radio Amateurs to be involved in Amateur Radio!

In fact, I'm always pleased at the interest and the fascinating correspondence that comes into *PW* from readers who are busily working on construction projects, listening in on the bands but who hold no form of transmitting licence. In fact, some even provide their opinions to me by post, using what dear old **John Worthington G3COI** called his 'tripewriter.' Like John, they avoid the Internet but still manage to get their point over to me – although they often have to wait for me to find time to reply by letter!

One of the topics raised by one such correspondent recently mentioned how he thought Foundation Licence holders at his club were 'losing out' in some respects. In particular he considers that the comparatively 'instant' introduction to the hobby has left them without the background and support of long term friendships that many of us had from experienced Radio Amateurs and club members in our own past.

However, my correspondent then made the important point that he wasn't advocating the return to the old system where many would-be Amateurs fell by the wayside. Instead, this long-time *PW* reader – not a transmitting Amateur but someone with enormous experience in the hobby – said that he had taken several new Foundation Licence holders 'under his wing' after they'd shown interest in his construction work at their club.

The 'mentoring' idea had then 'taken off' in the club involved and the natural interest shown by newcomers went in all directions! Some newcomers were drawn to data modes, others to portable field work and so on. Fortunately, the club involved has many different interests and skills and I'm delighted that another 'old timer' in the hobby has been able to share his experiences with his new friends. Remember, even partially fossilised older friends can teach us something new!

Ding Coombes & Other Friends

I know 'mentoring' works because I have a very great debt to Silents Keys such as **'Ding' Coombes**, **Tom Martin G3CTM** (a professional horticulturist and smallholder who grew the most wonderful strawberries and was a superb c.w. operator on 21MHz) and **Don Watson GW3RJY**. Don's speciality was building complete QRP valved transceivers into three inch cube chassis!

'Ding' Coombes was a railway electrician and I first met him when he was installing electric lighting at my local station. Each day throughout the school holidays he brought me books, old radios, chassis and components. He gave up his lunch breaks to patiently help an 11 year-old schoolboy – nothing was too much for him.

Tom G3CTM and Don GW3RJY passed much of their transmitting expertise to me and I think we should be prepared to help pass on our own. After I became G3XFD, Tom and Don **were there**, ready to willing to help when I needed their expertise overcoming TVI and other problems. I feel that many of us could do the same for newcomers and help keep their flame of enthusiasm burning brightly!

Rob Mannion G3XFD/EI5IW

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