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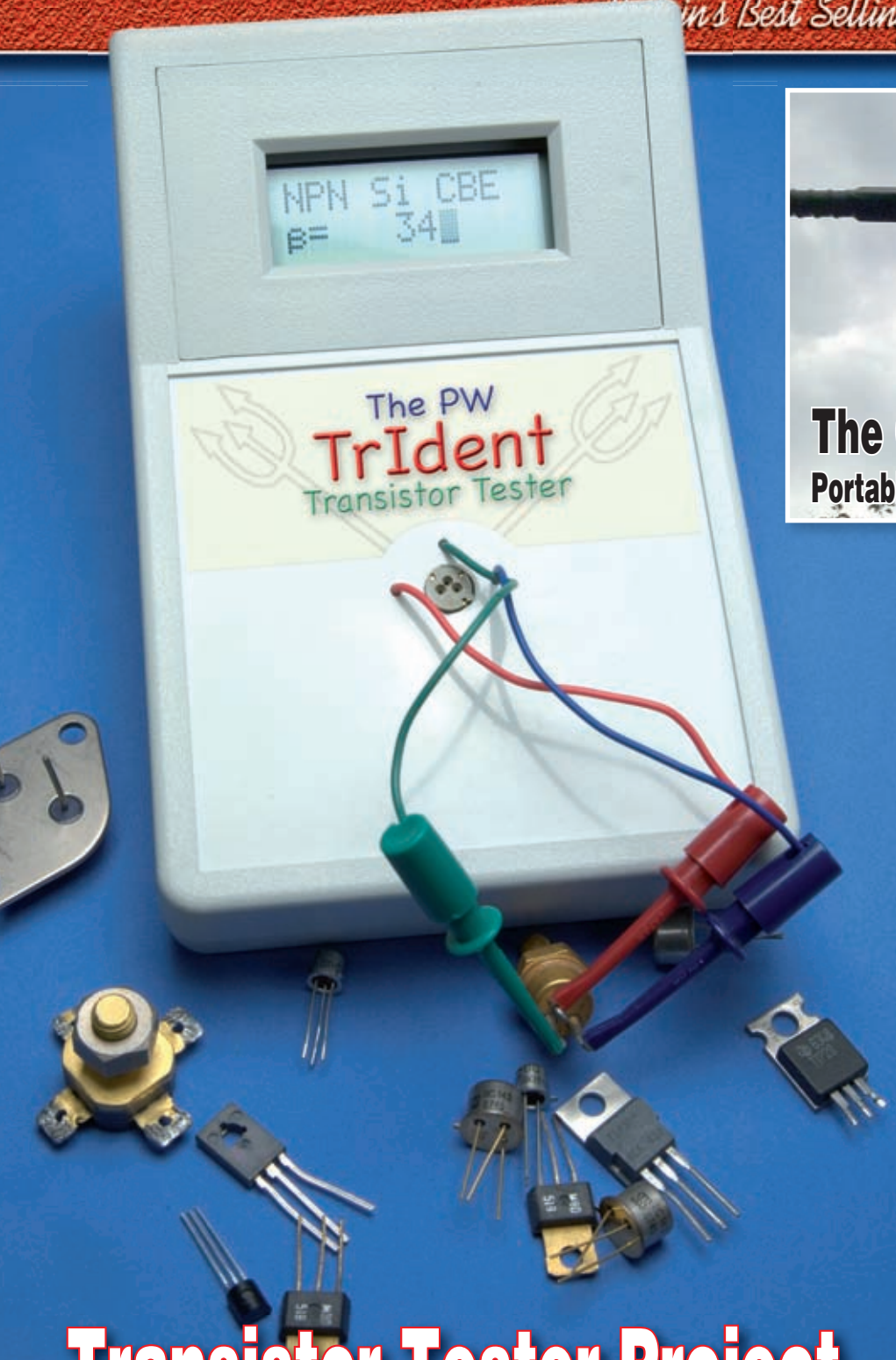

Transistor Tester Project

The G-Whip Backpacker

Portable HF Antenna System Reviewed

In Focus

The Lincoln Short Wave Club

The G5UM Receiver Revisited

Valve & Vintage

The Eddystone S640 Receiver and restoring an HRO NC-100

HF Highlights including Bob G0YYY and Tom G0HUT!

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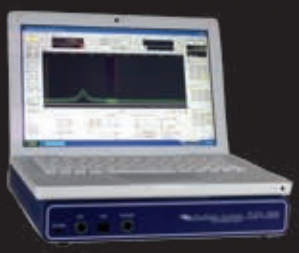

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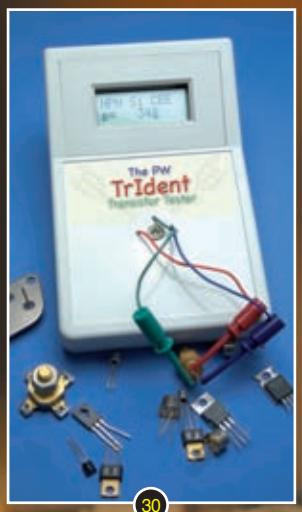

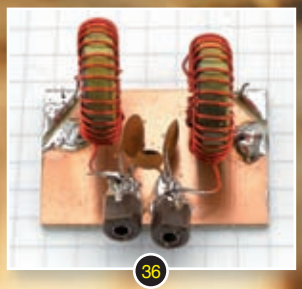

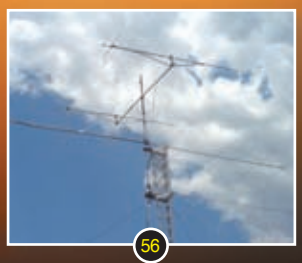

Practical Wireless August 2009

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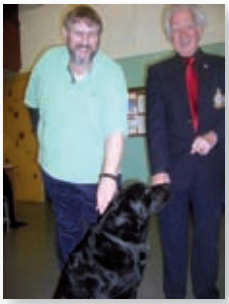
Volume 85. Number 8. Issue 1227. On sale 9 July 2009

Published on the second Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979. Printed in England by Holbrooks Printers Ltd., Portsmouth P03 5HX. Distributed by Seymour, 2 East Poultry Avenue, London EC1A 9PT, Tel: 020 7429 400, Web: http://www.seymour.co.uk. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency. Subscriptions INLAND £38, EUROPE £47, REST OF WORLD £57, payable to PRACTICAL WIRELESS, Subscription Department. PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979. PRACTICAL WIRELESS is sold subject to the following conditions, namely that it shall not, without written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever. Practical Wireless is Published monthly for $50 per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, Royal Mail International, c/o Yellowstone International, 87 Burlews Court, Hackensack, NJ 07601. UK Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/o Yellowstone International, 2375 Pratt Boulevard, Elk Grove Village, IL 60007-5937. The USPS (United States Postal Service) number for Practical Wireless is: 007075.



Rob Mannion's

keylines

Rob G3XFD remembers a very special pair – Brian and Harry!

During my time as Editor of *PW* I've met some wonderful people, including some whose own difficulties in life make my own seem insignificant! **Brian James G3NXJ** was one of these people – although it was the 'other half' of the pair that made up the G3NXJ/D combination I first met at the **Worcester Radio Amateurs Association** (WRAA). In this case the /D stands for 'Stroke Dog' – **Harry** the guide dog!

During my very first visit to the WRAA to provide a *PW* club talk, I met the largest black Labrador I've ever seen – indeed Harry was a truly enormous and loving, friendly soul always searching for biscuits and attention **while off duty**. However, at the first jingle of the bell on his special guide dog harness, Harry would put an enormous paw on Brian's knee to tell him he was there, and patiently await the fitting of the harness ready for work.

The difference between the two dogs – Harry the playful Labrador, with ever thrashing tail and friendly greetings, was in total contrast of the dog on duty! It was an incredible thing to watch taking place. Once on duty, **nothing** would distract Harry and he'd guard and guide Brian, gently sighing while laying at Brian's feet, watching everything as Brian sat down – ever watchful.

Both Brian and Harry became very firm friends with me and it was wonderful when Brian released Harry from duty, so the dog could come and get the biscuits he knew I had! So, it was with very great sorrow that hearing that Brian – at 78 years old – having recently returned from visiting his son **Christopher** in the Caribbean Island of Tobago, had been diagnosed with terminal cancer. Brian was divorced but had two other children, **Dave** in Clearwater Florida and **Carole** in Weston Super Mare, together with a number of grandchildren, and was much loved.

Then, very quickly it seemed to me, the WRAA Chairman **Pete Badham G0WXJ**, who had first alerted me to Brian's illness, was again in contact to say that our friend had passed away at St. Richard's Hospice in Worcester on Saturday June 13th, surrounded by his family and with Harry in attendance of course!

Brian was a Welshman, had served in the RAF and had been licenced for very many years. I feel very proud and extremely privileged to have known Brian – and Harry – who'll now go into retirement with one of Brian's many friends.

Brian leaves a host of Amateur Radio friends – including **Roger Stafford G4ROJ**, who sent me a few personal details of Brian and a fond memory of the keen collector – who had slowly lost his sight in later years. Roger's words seem the best way to sum up Brian G3NXJ/D and wrote, "I joked that he was a pain to take to rallies as we always came back loaded up with "rare" buys! Indeed, on one occasion, the car was so stuffed with junk, poor Harry was squashed up in the back of the estate car with no room to even move his tail! I've known Brian about 35 years and he was responsible for my interest in Amateur Radio, patiently teaching me more. He was a very great friend and we'll all miss him greatly!"

Weekend On VHF!

I'm just recovering from a very busy weekend of the v.h.f. Amateur bands – having thoroughly enjoyed myself! Saturday June 13th saw the very first *PW* 70MHz low power contest and I supported the event from the Purbeck Hills between Swanage and Lulworth Cove. I wasn't too far from where the **Poole Radio Society** was operating G4PRS. It was a great day out and it was gratifying to hear Four Metre enthusiasts from all over the UK and the Irish Republic supporting the hard work by the Adjudicator, **Colin Redwood G6MXL**.

Next day, the annual *PW* 144MHz Contest took place. The weather was truly superb, and despite antenna problems, I joined in after 11am. There was some good DX around and I think that everyone taking part throughly enjoyed the events. I thank everyone who took part for their support and I'm looking forward to seeing the results – good luck to all entrants!

Rob Mannion G3XFD/EI5IW

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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*.

Star Letter

Website For Stolen Equipment?

Dear Rob,
I was very sorry indeed to read in the July *PW Keylines* that you too have suffered from a break-in to your shack. I 'feel' for you because I have also had a break-in and lost several cherished radios, although I have no really visible antennas because I'm a listener, rather than being a transmitting Amateur. I'm writing to suggest an idea that although not being the complete answer, could perhaps make the disposal of stolen equipment even more difficult for the criminals.

From what I read in *Keylines*, your shack is completely outdoors. Despite this, I should mention that radio equipment doesn't seem any safer by being indoors – because mine was taken from our small upstairs box room, which does double duty for my model railway collection (Yes, I'm also afflicted that way too!). So, no matter whether your valuable equipment is kept indoors or outside – if they're determined enough – they'll do their best to get it!

Listening into the 80 metre band during the early hours, I've heard one of the all night 'chat groups' that gather there, discussing the security problems. Some of the group I heard – and others I've heard – blame the various callsign directory listings for highlighting where Radio Amateurs live. Personally though, I think that that the low life that carries out the thieving (we were broken into when both my wife and I were out at work) don't bother with addresses lists. They're just opportunists and if they see a house that's not occupied, they'll have a go and must be surprised at just what they can steal.

None of my stolen equipment was particularly valuable, just an older FRG-7 type receiver, an old scanner and a modern air-band receiver. My two Eddystones – a 750 and an early 888 – were left as they were too heavy!

I'm sure that the person who broke into our house (there was only one apparently) did so quite by chance. The only outdoor antenna I have is a long wire and it's not visible from the street. Also, as we live at the end of a terrace and live in the only house with a proper dedicated driveway – potential thieves can see if we're in or not.

Like you Rob, my wife and I have installed a security system, have double glazing with reinforced double-locking doors, etc., and made it obvious to anyone that the house is protected. However, apart from making our homes like mini-fortresses, I don't think there's a great deal more we can do.

What we can do though, is to make the stolen specialist equipment – such as you and I have had stolen – virtually impossible to dispose of in a legitimate fashion. In fact, (I don't know if this is already been suggested) I think that a dedicated website – or a series of pages on an existing website – could mention all the stolen equipment within the UK.

Obviously, theft victims would have to provide a Crime Number to indicate it had been notified to the police to avoid – unfortunately, this is a necessary precaution – possible fraud. Theft victims would also be required to provide photographs if possible, along with serial numbers. Like you Rob, I hadn't recorded the serial numbers of any of my equipment – but everything I now have, has had the numbers recorded. Everything has also been marked with invisible security numbers in a location on the equipment known only to me.

So, what do you think of the idea Rob? I don't think we'll ever stop a really determined thief – but we could make the disposal of our very specialised – and much treasured equipment – very difficult indeed! Regards to you and Tex, and I hope to meet you both again at the next Leicester Show, which I've just heard is now to be held at Loughborough University!

Steve Wade
Thorneywood
Nottingham
Nottinghamshire

Editor's reply: *Thanks for your E-mails Steve and I also enjoyed chatting to you on the 'phone. Basically, as I mentioned during our chat, I think you have an excellent idea. Please join me on the* Topical Talk *for more discussion.*

July *Keylines*

Dear Rob,
It seems ages since we last exchanged E-mails! However, I'm writing with regard to your *Keylines* editorial in July *PW*, so sorry to hear you have been hit again by Bournemouth's low life. Doesn't sound as though the criminal will get much in the way of cash from the stolen items – trying to sell stolen Amateur Radio gear must be very difficult.

I also really agree with you about translated manuals. Quite often they are next to useless and as you say, Maplin's staff really have not got much clue about their stock!

Incidentally, during the last few weeks I've been re-reading **Colin Redwood G6MXL's** articles about PSK31 (Jan/Feb *PW*). During the 1980s I used to do quite a bit of packet radio on 144MHz. However, I was hoping to use my 13 year-old Toshiba laptop, but while it has a serial socket and Windows 95 the processor

speed is only 120MHz. This is too slow to convert most of the signals. I do have a quite new Sony laptop which has USB sockets although, with a USB/RS232 lead I just can't get any driver program to work it.

I'm now looking at E-bay to get a Dell laptop with serial socket and not too expensive! On that topic, I must say that I have not had many bad experiences on eBay, although several buyers have failed to pay me and I had one complaint from a buyer in Spain that the item I sold him did not work – he sent it back and I refunded him.

Also in the July *PW* in the *Topical Talk* section, I was also very interested to read of your experience in the lay-by on the way to the Otley Amateur Radio Society, and also **Steve Norman's** in Cambridgeshire. It's all rather scary and I think that carrying an Amateur Radio station – whether mobile or a hand-held transceiver – these days seems to almost be in the same situation as carrying a camera (as then you might photo a child!).

A month ago my family and I were at the internationally known Donkey Sanctuary near Sidmouth, in Devon, where they do a lot for Riding for the Disabled. There, the visitors can photo the donkeys but not any children! I hope that both you and Carol are keeping well, best wishes from the Hunts.

Paul Hunt G8CRZ
East Southbourne
Bournemouth
Dorset

Editor's reply: *Nice to hear from you Paul – and it was very enjoyable indeed to work you on 7MHz – our very first QSO! – recently. Hopefully we'll keep you active on h.f. with regular skeds!*

Roy Walker G0TAK's Antenna Idea

Dear Rob,

I thought that **Roy Walker G0TAK's** idea for a compact dipole in the July issue of *PW* was very good and it's the kind of low cost h.f. antenna worth building. I think a useful improvement at little extra cost would be the inclusion of a balun in the box at the centre. This would make the antenna truly balanced, with a consequent reduction of currents on the outside of the coaxial braid. A 1:1 transformer balun wound with 14 or so turns trifiliar wound on a T200-2 toroidal core will fit inside the box and would do the job nicely. This design of balun has appeared in a number of books over the years, and I have made a number of them with good results. Keep up the good work on the excellent magazine.

David Sharp M0XDS
Hoddesdon
Hertfordshire

Roy Walker G0TAK & *Antenna Workshop*

Dear Rob, (and everyone else at *PW*)

I write in response to fellow **Royal Air Force Amateur Radio Society** (RAFARS) member **Roy Walker G0TAK's** *Antenna Workshop* article about dipole construction from the inexpensive 'Outbacker style' wander lead antenna in the July 2009 issue of the magazine.

I noticed from the photographs accompanying the article that Roy operates his antennae with the wander lead flying loose. I use an Outbacker Stealth Plus for mobile operation, and in its instructions (**http://www.outbackerantennas.com/pdf/stealthplus.pdf**) it says the wander lead *"must be wound (counter/clockwise) from the bottom up, with the coils evenly spaced and neither taut, nor hanging loosely."* Could this be a possible cause of the minor s.w.r. discrepancy mentioned?

Roy did mention to me that the "admittedly quite brief" instructions for his and **Mike Collins M1IKE's** antennas do not contain any guidance for employing the wander lead in this fashion. My own logic says the lead would (should?) be wound round, if only to secure it further in a mobile environment; to have a piece of wire flailing about at 70m.p.h. seems peculiar to me! In a coiled configuration, I would expect some inductance to be introduced into the system, which Roy is perhaps missing with his uncoiled wonder lead?

I'm still experimenting with the OB Stealth, and whilst not expecting too much out of such a short antenna, and

Typographer Searches For Typeface!

Dear Rob,

Thanks for your offer to publish my request in *PW* as I search for a way of obtaining the special typeface design used on *PW* circuit diagrams! I remember seeing a stencil that produced the lettering I'm looking for in a Morecambe arts/crafts shop way back in 1975 – but as it was really expensive my mum wouldn't let me have it, and I've never seen another one since!

Hopefully the request'll jog memories of anyone who worked in drawing offices (or even *PW* during the period 1952-1961) who can help! I've attached a small diagram of an example from 1960 illustrating the style I'd like to be able to re-create! Many thanks.

Chris Williams
Flat 75 Elizabeth House
40 Berryfields Road
Sutton Coldfield
West Midlands B76 2UZ
E-mail: **cw012y7003@blueyonder.co.uk**

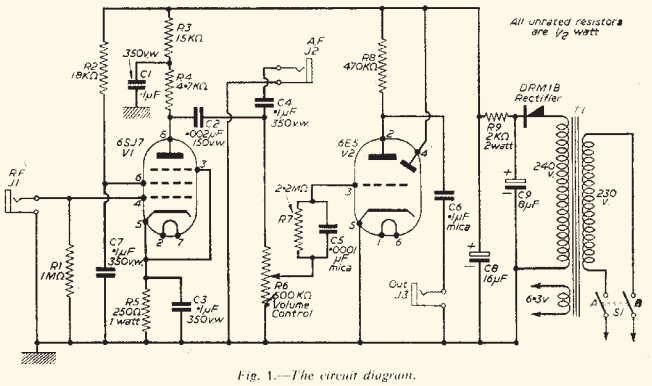

Fig. 1.—The circuit diagram.

No Box – No Sale?

Dear Rob,
Although – thankfully – I have never had anything stolen from my outside shack (your *Keylines* Editorial, July 2009 *PW*) I'm fairly certain that I may have inadvertently purchased a piece of stolen or 'dodgy' equipment in the past. It happened at a rally when, feeling disappointed that I had missed a Yaesu FT-75B (yes, it was that long ago!) valve-transistor hybrid mobile rig, from a Bring & Buy sale at a famous rally, I was approached by a chap who had heard me discussing the 'near miss' with the fortunate buyer.

The FT-75B (slightly higher power output than the ordinary FT-75 I think) sold at the Bring & Buy came complete with its original box, the distinctive blue and white Yaesu manual, together with a very reasonable history from the original owner. The lucky buyer, who I ended up chatting to about our mutual appreciation of Yaesu h.f. equipment, even showed me the original receipt, from an emporium in your part of the world Rob!

However, another chap that approached me, said he'd overheard and he had an older FT-75 and he could go home and collect it, bring it to me and we could discuss terms – although he insisted on cash. As were were in rural Bedfordshire and I was a long way from home, I was a bit concerned that if I did buy the rig, there was unlikely to be any form of support from him if the rig failed.

By the time the seller had arrived back at the rally with the rig, I had been to the cash machine (there weren't so many of them about 20 years ago!) and was ready to part with my money. The seller looked reasonable enough, his car was fairly modern and he said he was a G4 and (at the time) I was satisfied that he would send on the manual when he found it. There wasn't a box and I was told it wasn't passed on by the previous owner.

At the time, I was quite satisfied that the seller was legitimate and handed over my money and drove back to my (then) home in Plymouth, where I was still serving in the Royal Navy. The weeks then went by and I thoroughly enjoyed using the FT-75 very much indeed – proving that I really didn't need high power when operating mobile.

Eventually though, I wrote to the seller at the address in Luton (I think) he'd given me and enclosed a large envelope with enough postage, asking the seller to send me the FT-75 manual as promised. Another few weeks went by before I received an envelope, with my own stamped envelope inside. There was also a letter, from someone using a completely different surname but from the same address. The lady who had kindly returned my letter and envelope explained that she had never heard of the person I had written to. She told me in her letter that she had lived in the same house for many years and knew nothing of the seller I'd written to!

In the end I managed to get a photocopy of the FT-75 thanks to you Rob, after we'd met at the Longleat rally. I knew you had enjoyed using the little hybrid rig as you had commented on it in *PW* on a number of occasions. However, I never did find out if my FT-75 was a legitimate sale. Perhaps it was stolen – but if it was, I had no way of knowing. Perhaps I was being a bit paranoid? But although the FT-75 rig and my original set of G-Whip antennas were passed on to friends many years ago – since then I've never purchased Amateur Radio equipment that doesn't come in the original box or isn't complete with a manual. So, my firm rule is – no box – no sale! (And yes, I do keep the boxes my rigs have arrived in from the manufacturers)!

Mike (Royal Navy retired)
(Full name and address supplied to the Editor)
North Devon

***Editor's comment**: I've agreed to withholding Mike's full name and callsign because he's still embarrassed at the possibility that the original rally-purchased rig was stolen. Personally, as I have met him on many occasions (the last time being at the Tavistock Rally in May 2009), I'm 100% certain of his own honest stance. I also think his 'no box - no sale' is a good idea as legitimate sellers will also have other ways of proving they are the genuine owners.*

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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I'm getting some surprising results on receiving. I haven't managed to hook up the Yaesu FT-857 into the car since my FT-100 'died' but my Kenwood TH-F7E is doing a grand job in the mean time!

Signals on 3.5MHz, when the UK nets are active during the early hours are loud and the other evening was able listen to both sides of a QSO between stations in Oman and Canada. Not bad for a 1m tall antenna close to the ground I thought! I guess the next step is to shoe-horn the '857 into the car – perhaps **Maurice Woolard G7USX** (also *PW* July 2009) can give me some more hints as my current v.h.f./u.h.f. installation is very messy!

73 to everyone.

Tony Corbett G0WFV (RAFARS 4662)
Lincoln
Lincolnshire

Birds Like Microwave Antennas!

Dear Rob,
Having seen the 10GHz set-up used by **Richard Newstead G3CWI** – front cover and Richard's article in the July 2009 issue of *PW*), I thought I would write just to let you know I still use the dish I made and then wrote about in *PW* in the 1970s – it was also featured later in *Wires & Waves* and it's still up. However, the mesh has been replaced with a finer type and the feed covers 6, 9, 13 and 23cms and if you look at G4BYV on the web (see **www.g3pho.free-online.co.uk/microwaves/g4byv.html**) you can see it works. As you can see the birds like it! 73 to everyone at the *PW* offices.

John Tye G4BYV
Swanton Morely
Dereham
Norfolk

news & products

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

Leicester Show Now At Loughborough University!

The 2009 Leicester Amateur Radio Show will now take place at at new venue – **Loughborough University**. Show organiser **Geoff Dover G4AFJ** contacted *Newsdesk* reporting, "Following the uncertainty surrounding the Donington venue due to the re-development taking place to host the 2010 British Grand Prix, it has been decided to move the show.

"To be accommodated at the new venue it has been necessary to move from the traditional Friday and Saturday show to a **Saturday and Sunday** event and also to move the date to the following weekend. Because of this **the 38th Leicester Amateur Radio Show** will be held at Loughborough University, Leicestershire on **Saturday and Sunday September 12th and 13th, from 9.30 each day, closing at 5pm on Saturday and 4pm on Sunday**.

"The Show will feature as usual a Bring & Buy, Club stands, Convention, Flea Market and demonstration Amateur Radio stations as well as many electronic, radio and computer stands. Loughborough University is situated 1 mile from junction 23 M1 motorway, 8 miles from East Midlands Airport and 1 mile from Loughborough Midland mainline railway station." Further information is available by contacting Geoff Dover G4AFJ, telephone (**01455**) **823344**, FAX (**01455**) **828273** or via E-mail to **geoffg4afj@aol.com**

Lincoln Club & RSGB Newark Hamfest

The **Lincoln Short Wave Club** have announced that a joint venture – **The National Hamfest** – is to be held at the **Newark Showground** in Nottinghamshire in association with the **Radio Society of Great Britain** (RSGB) **on October 2nd and 3rd 2009**. This replaces the LSWC's original rally date. The Newark Showground **www.newarkshowground.com** – is five minutes from the A1, with extensive parking and is set in quiet countryside. The rally is being held in the **George Stephenson Exhibition Hall** – a great exhibition space – with plenty of room to host the trade stands and offers a large meeting and refreshment area. Show features will include: RSGB stand, full range of national traders, specialist traders, club stands, special interest groups, Bring & Buy Stand, with **GB4FUN** outside the hall, local companies, static military vehicle display and a Car Boot sale (non trade). There'll also be hot and cold refreshments – including a licenced bar, a large meeting/seating area adjacent to the catering facilities. The Lincoln Club will provide talk-in facilities on 144MHz and caravan pitches are available (contact the showground).

Trade bookings are being taken now – and advance ticket sales will be available soon (see website)

The Newark Showground can be found at Winthorpe, **Newark NG24 2NY**. Further information from the Event Co-ordinator, **Clive Catton G1BSN**, Tel: **(01522) 826680** E-mail **clive@nationalhamfest.org.uk** or **Pam Rose G4STO** Lincoln Short Wave Club Secretary**, Pinchbeck Farmhouse, Mill Lane Sturton by Stow, Lincoln LN1 2AS, Tel: (01427) 788356,** E-mail: **pamelagrose@tiscali.co.uk**. Website: **www.g5fz.co.uk**

Forest of Dean Amateur Radio Interest

Following a meeting on Friday June 5th organised by **Adrian Lane M3TVF**, at the Coleford Community Centre, Bank Street, Coleford in Gloucester, enough interest has been demonstrated for further meetings to be held. Adrian Lane writes, "The purpose of the June 5th meeting was to discuss the formation of either the **Forest of Dean Amateur Radio Group** or to decide if we should reform the **Forest of Dean Amateur Radio Society**. We had a good attendance at the first meeting and I'm planning to organise another meeting so we can decide how to go forward. So, I look forward to hearing from you anyone who needs further information and they are welcome to contact me on mobile telephone **07902 989344** or by E-mail via **adrian@m3tvf.com** or see the website at **www.fodarg.com**/ You can be sure you"ll be welcomed, whether you are a Radio Amateur, s.w.l. or one of the famous Forest of Dean 'Free (coal) Miners!" **Adrian**.

Tour of Pembrokeshire Cycle Ride 2009

Pembrokeshire RAYNET once again assisted in communications for the Tour of Pembrokeshire Cycle Ride on June 7th with their Headquarters at Folly Farm, Begelly. There were two courses, 185km (115 miles) and 103km (64 miles) and cyclists were expected to average 20kph (12.5 mph). There were RAYNET members at five key points, which were also watering stations, reporting back to **Bryan Jones** and his staff and also to Commissioner **Nigel Lewis** of the **St. John Ambulance Brigade**. A repeater in the Presseli Mountains which enabled the group to communicate to areas that might otherwise have been difficult. Information was passed all day with reference to numbers of riders, accidents, messages from course marshals, breakdowns, etc.

Manning the Repeater in the Presselis was **Peter Hyams GW4OZU**; at Goodwich there were **Julie** and **Roy Cobb MW0COB**; Newgale Beach was manned by **Tim Vlismas GW0TMV**; at Castlemartin **Richard Snape MW0XDT** was on duty and at the Pembroke Rugby Club end was **Ian Baker MW0IBZ**. The Control Station, at Folly Farm was operated by RAYNET Chairman **Alan Dicker GW3VEN**, RAYNET, ably assisted by his Deputy **Ray Richards GW3CR**.

Further information on Pembrokeshire RAYNET by E-mail via **raygw3cr@googlemail.com**

Oldham Radio Club Treasurer Killed In Motorway Crash

Geoff Oliver G0BJR, President of the **Oldham Amateur Radio Club**, reports on a tragedy involving two club members, leaving one dead and one seriously injured.

Send all your news to:
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Dorset BH18 8PW
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Geoff writes, "**Peter Rushton G7PMZ** was tragically taken from us on Sunday May 24th in a road traffic incident on the M61 motorway near Bolton, aged 64 years. Peter joined OARC in the early 1990s, passed the RAE with us after taking our training course and he continued his membership for the rest of his life. He was a keen member and one who supported our club through almost every Special Event, Contest and Rally which we were involved with. Whenever we did anything at all, Peter would be there to help out in any way possible, from setting up to brewing up, from operating to clearing up. Very often Peter would be first man in and last man out. He was the kind of person who would be a huge asset to any club, society or organisation and we were blessed to have had him with us.

"Over the years Peter served on our committee from time to time and four years ago became our Treasurer, a position he still held when he died. For his work on behalf of the club he was presented with the Fred Lees Memorial Trophy in 2006.

"Peter was a quiet man; some would say that he was perhaps a mite shy. He always appeared to prefer to be in the background rather than in the limelight. During his working career Peter was a Male Nurse and worked for many years at Crumpsall Hospital (now renamed North Manchester General Hospital), later he specialised in Community Psychiatric Nursing. He retired aged 59 and spent some of his retirement travelling the world having visited America, Canada, Egypt and China.

"He would often come to club meetings wearing a sweatshirt bearing the name of a place he had recently visited. Later he settled down and visited more local places and Llandudno was the place he chose to spend much of his holiday time.

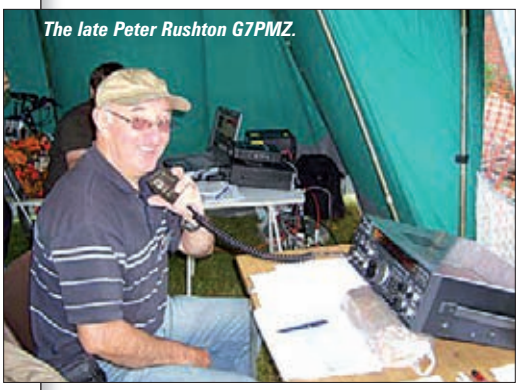
"Peter was a Methodist Church Lay Preacher and sometimes his arrangements would clash as his preaching would conflict with a radio club event – but somehow he'd find a way to do both things! Such was his level of commitment.

"Although he had no children of his own Peter seemed to have a knack with kids. His easy going nature meant that at Thinking Day on the Air there would always be a queue of brownies and guides at Peter's table waiting patiently for him to help them make their contact with a distant pack.

"Peter was also our main exam invigilator. He always joked that he was ideal for the post because he knew nothing about the technical side of radio. He officiated at a Foundation exam on the Thursday before his death.

" I can't write this tribute without mentioning Peter's long term friendship with **Ian Firby G7VCG**, our present Chairman. When Peter first joined our club Ian joined as well and everything that's written above could be written verbatim for Ian because wherever Peter was, Ian was not far away and vice versa. The two of them were pals long before they came to OARC and it was really no surprise that when I heard of the tragedy that the two of them were together. Thankfully, Ian survived and his physical injuries will heal, given time, but I'm sure that the recovery from the loss of his friend will be much more difficult, painful and long term.

"Of all the Silent Key articles I have had to write over the years, this one has been the hardest. Anyone who was acquainted with Peter in whatever aspect of life will have been enriched by the experience. Our lives and our club are much the richer for Peter's involvement. To say he will be missed is a gross understatement. Many members have said since Peter's death, "You'll never meet a nicer man" – absolutely true. Peter died in extremely traumatic circumstances but now may he rest in peace." **Geoff**.



The late Peter Rushton G7PMZ.

Ian Firby G7VCG.

News up-date: The incident that claimed P**eter Rushton G7PMZ's** life and seriously injured **Ian Firby G7VCG**, occurred on the M61 near Bolton. Tragically, Peter died at the scene and Ian suffered injuries serious enough for him to be taken to Wythenshawe Hospital by Air Ambulance. A 28 year-old man was arrested at the scene of the incident and has been charged with serious motoring offences. Various sources – including the BBC News – reported that the van involved in the accident was carrying players to a cricket match. To be continued. **Editor**.

Waters & Stanton Product News

Jeff Stanton G6XYU of Essex-based W&S contacted *Newsdesk* to report: "At the Dayton Hamvention we had a meeting with **Salvador Falcon** of **Falcon Radio** in Spain, whom we have known for many years. He has a thriving radio business in both Spain and Italy. He appointed us as UK distributors for his new range of v.h.f. and u.h.f. high power linear amplifiers under the **Telecoms** brand name.

There are four models in the range which are suitable for the UK market. All have built-in mains power supplies and use top quality components. The range includes:

Model 2M-HK 144-146MHz 2m band, producing up to 500W output.
Model 64-HK 50-70MHz 4 and 6m band, producing up to 500W output.
Model 70CM-HK , covering the 430MHz band, producing up to 500W output.
Model 23CM150 1296MHz, 23cm band producing up to 150W output.
All models have CE approval but the prices are not yet fixed.

For further information, contact Jeff Stanton G6XYU at **Waters & Stanton PLC**, ***Spa House***, **22 Main Road**, **Hockley**, **Essex SS5 4QS**.
Tel: (**01702**) **206835**, FAX: **01702 205843**, E-mail **jeff.stanton@wsplc.com**

Barlow Carnival GB0OCT On The Air!

The **Chesterfield Rally Group M0OCT** – are looking forward to working *PW* readers on **Saturday August 15th 2009**. The station will be on the air from 1200 until 1700 hours using the h.f., v.h.f. and u.h.f. bands and all modes from the Derbyshire town that's internationally famous for the *St. Marys & All Saints* Church – the church with the ancient twisted spire!

This year will see the Chesterfield team broadening out their activities with a full calendar from June through to October, which culminates with the **Chesterfield Rally on October 10th 2009**.

During July 2009 there are several major events within the Chesterfield Area. Sunday July 19th sees the team at Cutthorpe Carnival, a few miles north west of Chesterfield. Here they'll be manning an h.f. station together with operations on the v.h.f. and u.h.f. bands. And – take note – for Four Metre fans – the group also planning to add operation on the 70MHz band to their busy station.

Saturday and Sunday 25th-26th July will be the group's first 'HF Weekend' covering a 24-hour long operating period. They're hoping to operate on all bands from their special private camp site, which is close to Chesterfield and over 305m (1000ft) a.s.l. and from where they are hoping to achieve 1000 contacts within the 24 hours.

On Saturday August 15th, the Group will be at **Barlow Carnival** (the next village along from Cutthorpe) where we are hoping to operate all bands once again. Full updated details are on the group's web site **www.chesterfieldrally.com** or by ringing **Martin Briddon M1ANW** (**01246**) **250 680** or via E-mail to **m0oct@chesterfieldrally.com**

Saturday October 10th is the date for the next Chesterfield Rally, to held at Hasland Village Hall near Chesterfield. All details are available via the web site.

Members of the Chesterfield Rally Team have recently been approved for holding courses at The Foundation, Intermediate and Advanced levels as well has holding the exams at our approved Centre at Clay Cross. Away from all distractions! The group be holding and evening course for newcomers with the Foundation Course and Exam over an evening for a maximum of eight weeks including the exam. So, if you live in the area you're sure to be made welcome!

Spectrum Sources The Future!

Dorchester-based **Spectrum Communications** has been finding increasing difficulty obtaining specialised components due to natural obsolescence. Over the past ten years, **Tony Nailer G4CFY** reports he's been making strenuous efforts to source essential components to allow Spectrum products to be manufactured for many years to come – with a lifetime supply of parts being accumulated to help the business and individual constructors.

Tony told *Newsdesk* that, "For several years we have stocked the **3N201** dual gate m.o.s.f.e.t., which is a suitable alternative to the **40673** and **3SK51** series of m.o.s.f.e.t.s. Further supplies are available so that designs going back to the 1970s can continue to be built by constructors."

Another component that's rapidly disappearing is the **TOKO 10E** and **10K** series of 10mm coil. Previously, an enormous range of these were available. Manufacturers and end-users need to be able to obtain these products at reasonable prices, so now Spectrum Communications has found a supplier in the Far East who can provide identical formers and cans. Samples have been received and proved successful.

The first batch of **3335R** compatible coils is now available. Stocks of other useful inductors such as **3333R, 3334R, 3337R**, and **6184A** compatible coils will be added to the range. These will be available individually to constructors and with trade discounts for multiples of 100 items.

Spectrum now also manufactures the **G2DYM/G4CFY Trapped Dipole**, which is claimed to be very much quieter than the comparable sized **G5RV** antenna, and less prone to cause TVI. Tony G4CFY states that, "The factor responsible for this is the low impedance twin feeder all the way from the feed point down to the shack, where a 1:1 Balun is used to convert it to low impedance unbalanced."

The Spectrum press release states that the, "The two (*balanced feeder*) wires are identical in size and are so close together that there is virtually no differential noise pick up, indeed the cable is 0.5dB quieter than coaxial cable or 300Ω ribbon feeder. Likewise, the field generated when power is carried also has no differential to cause emissions and TVI. It can be strapped to metal support poles or against stonework without degraded performance."

" For many years there was a lightweight type suitable for 150W and a heavier grade feeder capable of carrying 1kW. However, in November 2006 when G4CFY purchased the antenna business from G2DYM, stocks of the heavy grade were gone and stocks of the light-weight feeder were running low."

Tony G4CFY has now designed a new feeder using two cores, each of 24 strands of 0.2mm wire, in individual polyethylene sheaths,which is then moulded within an outer sheath of polyethylene. Tony says that there's no opportunity for water ingress and just slicing the outer sheath gives access to the two individually sheathed wires without further work. The multi-strand construction makes it much more resistant to fracture through repeated bending and twisting.

Describing the new cable Tony said, "The gap between the two wires is 1mm with a dielectric strength in excess of

Lucky Mark Walker M6MGW Wins Alinco Hand-Held!

Keen Radio Amateur **Mark Walker M6MGW**, who lives in South Yorkshire, was the lucky winner of the new Alinco DJ-175 144MHz hand-held transceiver, kindly donated as the prize in the May 2009 issue of *PW by* Nevada Radio Managing Director, **Mike Devereux G3SED**. With a good choice of high ground in Yorkshire, Mark first tried the area around the magnificent Emley Moor TV transmitter tower to get a good photograph of himself on the air – "An ideal QTH" he says! – but he's had many QSOs in less spectacular locations since! Well done Mark we had a very large number of entries for the competition – and good luck with your Intermediate Examination studies! **Editor**.

Tony Nailer G4CFY, the proprietor of Spectrum Communications busy at his designer's desk. *Photo by Jean Nailer.*

18kV. This cable is capable of withstanding continuous power in excess of 2kW. The characteristic impedance is a little higher than would have been preferred, at around 100Ω, but that is the feed-point impedance of a dipole at 0.35 wavelength anyway.

There seems to be a minimum length for the cancellation property of the cable to work, and on 3.5MHz – 80 metres – 70 feet is known to work but 35 feet is too short. Maybe 50 or 60 feet would work okay, and customers who have tried these lengths haven't had problems. Fortunately, it can be rolled up into a coil without causing a transformer action as does coaxial cable."

The G4CFY designed cable has been manufactured in England, reducing shipping costs and making the new feeder favourably priced in comparison to the lightweight feeder. The manufacturer has agreed that the cable design is that of Spectrum Communications and all requests to supply will be referred to Spectrum. Over 5000 metres of this cable are now in stock and is available retail and with trade discount for quantity.

Suitable **1:1 Baluns** to work with the twin feeder are manufactured by Spectrum using trifilar wires on a *pvc* former. Power rating is 1kW over the range 1.8-40MHz with a loss of under 1dB.

For further information on these products contact **Tony Nailer G4CFY, Spectrum Communications, 12 Weatherbury Way, Dorchester, Dorset, DT1 2EF. Tel 01305 262250**. E-mail: **tony@spectrumcomms.co.uk** Website: **www.spectrumcomms.co.uk**

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August Durham 'Train The Trainers' Session

Ray Kelly G3ZRK, writes, "A **Radio Society of Great Britain** (RSGB) Region 4 'Train The Trainers' session, to be held on August 1st 2009, is being hosted by the **Great Lumley Amateur Radio and Electronics Society** at Great Lumley Community Centre, Front Street, Great Lumley, near Chester le Street, County Durham DH3 4JD. The event will be starting at 10am and finishing at approximately 5pm. The venue is, of course, also the home of 'Lumley Rally'. The session will be lead by **David Wilson M0OBW**, the RSGB President elect for 2010, and will probably be the last one in this region this year although it's hoped that another will be held in the early part of 2010.

Those wishing to attend please contact myself, **Ray Kelly G3ZRK**, Deputy Regional Manager for Northumberland, Durham, Tyne & Wear and Cleveland. Telephone: 07747 615456 or Email: **g3zrk@aol.com**

The closing date for candidates wishing to attend is July 12th 2009. I hope to see you all there! **Ray G3ZRK**.

Icom Supports Nick Power's £10,000 RNLI Challenge

Nick on board the RNLI's fleet relief vessel RNLB Margaret Joan and Fred Nye.

Nick Power a Public Relations Officer from the Royal National Lifeboat Institute (RNLI) will be attempting a charity fundraising trip involving fishing from 44 RNLI Lifeboat locations around the UK in 30 days, with an added challenge from the locals to complete at every stop. His ambitious aim is to raise £10,000 for the RNLI along the way. **Icom UK** have supported Nick with an IC-M33 v.h.f. marine transceiver as a fundraising prize and challenged him to make 10 radio contacts from Icom UK's Amateur Radio shack.

Nick began his epic journey at St Mary's RNLI lifeboat station on the Isles of Scilly and hopes to end it at Teddington Weir in London by his 30th birthday in late June. Along his planned route Nick will taking part in a series of sea-fishing matches and challenges set up by the online fishing community. Amongst his many tasks, Icom UK have challenged Nick to make 10 QSOs from Icom UK's in-house Shack for the Whitstable leg of his trip and will be helped by an Icom member of staff in doing so. To commemorate the contacts a special QSL card has been designed for any Amateur who managed to work **G4ICM** in June. Further information from **Ian Turner, Marketing Manager, Icom UK Ltd, Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 7414741.** E-mail **marketing@icomuk.co.uk**

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

July

July 12th

The Barford Radio Rally
The Norfolk Amateur Radio Club will hold the Barford Radio Rally in Barford, which is nine miles southwest of Norwich, close to the A11 and the A47. Doors will open at 9.00am (8.00am for traders) and there will be a car park, Talk-in on S22, a Bring & Buy, a car boot sale, catering and trade stands.
David G7URP
Tel: 01953 457322
E-mail: radio@dcpmicro.com
www.norfolkamateurradio.org

July 12th

The Cornish Mobile Rally
The Cornish Radio Amateur Club will hold their 46th Mobile Rally at Penair School, Truro, Cornwall TR1 1TN. Doors will open at 10.30am (10.15am for disabled) and there will be parking, trade stands, a Bring & Buy, catering and talk-in.
Ken G0FIC
Tel: 01209 821073
E-mail: ken@jtarry.freeserve.co.uk
www.cornishamateurradioclub.org.uk

July 12th

The McMichael Rally & Boot Sale
The McMichael Rally & Boot Sale will be held at the Reading Rugby Club, Holme Park Farm Lane (SU 753 747 for GPS users), Sonning Lane (the B4446), Sonning on Thames, Reading RG4 6ST, just off the A4, east of Reading. Doors will open at 9.30am (8.30am for traders), admission will be £2.00 and there will be talk-in, car parking, special interest groups, trade stands, a licensed bar, catering, a raffle, a car boot sale and a Bring & Buy.
Min G0JMS.
Tel: 01189 723504
E-mail: g0jms@radarc.org
www.McMichaelRally.org.uk

July 19th

The MacMillan (Northampton) Rally
The MacMillan (Northampton) Rally will be held in Roade Village, Northants. There is no entry fee for visitors or traders but all donations offered will go to MacMillan, as will all refreshment monies.
G6NYH. Tel: 01604 234333
www.tetra2000.com

July 26th

The Horncastle Summer Rally
The Horncastle Summer Rally will be held at the Horncastle Youth Centre, Horncastle, Lincolnshire LN9 6DZ. Admission will be £1 and there will be facilities for the disabled and catering.
Tony G3ZPU
Tel: 01507 527835.
E-mail: G3ZPU@yahoo.co.uk

August

August 2nd

The King's Lynn Rally
The King's Lynn Amateur Radio Club Rally and Car Boot Sale will be held at the Gaywood Community Centre, Cemetery Drive (off Gayton Road), King's Lynn PE30 4DZ. The doors will open at 10.00am and admission will be £1.50. Talk in will be via G3XYZ on 145.550MHz. There will be trade stands, catering and a car boot sale.
Ray G3RSV
Tel: 0155 367 1307 or 07899938304
E-mail: ray-g3rsv@supanet.com
www.klarc.org.uk

August 2nd

The Lorne Radio Amateurs' Rally
The Lorne Radio Amateur Club will be holding its rally at the Crianlarich Village Hall, which is at the junction of the A85 and the A82. Doors open 10.30 and entry will be £1.00.
www.gm0lra.freeuk.com

August 2nd

The West Somerset Boot Sale
The West Somerset Amateur Radio Club will be holding their fourth Amateur Radio Boot Sale at the Allerford Community Hall and Recreation Ground, Allerford, Minehead, Somerset TA24 8HL. Doors will open at 10.00am and the cost will be £1.00 for buyers and £5.00 for sellers (under 16s free).
Bob Bonar G1ONV
Tel: 01643 820265 (dedicated phone number)
E-mail: bob.g1onv@btinternet.com

August 9th

The Flight Refuelling Hamfest*
The Flight Refuelling Amateur Radio Society Hamfest will be held at the Cobham Sports and Social Club Ground, Merley, Nr. Wimborne, Dorset BH21 3AA. Doors will open at 10.00am and there will be talk-in on S22 and V44, car parking, catering with a licensed bar, trade stands and a car boot sale.
Mike M0MJS
Tel: 01202 883479
E-mail: hamfest@frars.org.uk
www.frars.org.uk

August 29th

The Rugby Radio Rally
The Rugby Amateur Transmitting Society's Radio Rally will be held at Stanford Hall, Lutterworth LE17 6DH (approximately 5 miles from Junction 20 on the M1 – it is signposted from there). Admission will be £2.00. Doors will open at 10.00am and there will be talk-in on S22.
Tel: 07759 684411
www.rugbyats.co.uk

August 30th

The Milton Keynes Rally & Boot Sale
The Milton Keynes Annual Rally & Boot Sale will be held at Holne Chase School, Buckingham Road, Bletchley MK3 5HP.
www.mkars.org.uk/rally.html

August 31st

The Huntingdonshire Rally
The Huntingdonshire Amateur Radio Society Bank Holiday Monday Rally will be held in St Neots Community College, Barford Rd, St. Neots PE19 2SH. Doors will open at 10.00am, admission will be £2.00 and there will be talk-in, car parking, a car boot sale, trade stands, catering and a Bring & Buy.
Julie M1JUL. Tel: 07905 052127
E-mail: hunts.hams@yahoo.co.uk
www.hunts-hams.co.uk

September

NEW DATE September 6th

The Telford Hamfest
The Telford Hamfest will take place at the Enginuity Technology Centre in Telford, Shropshire TF8 7DU. There will the usual mix of traders and exhibitors along with family attractions.
Martyn G3UKV
Tel: 01952 255416
E-mail: info@telfordhamfest.co.uk
www.telfordhamfest.co.ukl

NEW DATE AND VENUE September 12th/13th

The Leicester Amateur Radio Show*
The Leicester Amateur Radio Show will now take place at Loughborough University.
Geoff G4AFJ. Tel: 01455 823344
E-mail geoffg4afj@aol.com

September 13th

The Torbay Annual Communications Fair
The Torbay Annual Communications Fair will take place at Newton Abbot Racecourse, Newton Abbot, Devon TQ12 3AF. Doors will open at 10.30am (10.00am for disabled) and admission will be £2.00. There will be trade stands, a Bring & Buy, a raffle, catering and facilities for the disabled.
E-mail: rally@tars.org.uk

September 20th

The Hornsea Rally
The Hornsea Amateur Radio Club Rally will take place in the Floral Hall, 7 The Esplanade, Hornsea, East Yorkshire HU18 1NQ. Doors will open at 10.30am, admission will be £2.00 and there will be car parking, trade stands, catering with a licensed bar, special interest groups, a Bring & Buy and facilities for the disabled.
Rick M0CZR. E-mail: R106221@aol.com
Duncan G3TLI. E-mail: g3tli@hotmail.co.uk
www.hornseaarc.co.uk

September 27th

The West London Radio & Electronics Show
The West London Radio & Electronics Show will take place at Kempton Park Racecourse, Sunbury-on-Thames, Surrey. The will be free car parking, the doors will open at 10.00am and there will be talk-in on S22 & V44, trade stands, a Bring & Buy, a flea market, catering, special interest groups and facilities for the disabled.
Paul. Tel: 0845 1650351
E-mail: paul@radiofairs.co.uk
www.radiofairs.co.uk

October

NEW RALLY October 2nd & 3rd

The National Hamfest*
The Newark Showground, Winthorpe, Newark NG24 2NY. This replaces the LSWC's original rally date. Show features will include: RSGB stand, full range of national traders, specialist traders, club stands, special interest groups, Bring & Buy Stand, with GB4FUN outside the hall, local companies, static military vehicle display and a Car Boot sale (non trade).
Clive Catton G1BSN. Tel: (01522) 826680
E-mail: **clive@nationalhamfest.org.uk or**
Pam Rose G4STO. Tel: (01427) 788356,
E-mail: pamelagrose@tiscali.co.uk.
Website: www.g5fz.co.uk

October 4th

The Autumn Hangar Sale
The Autumn Militaria, Electronics and Radio Amateur Hangar Sale will take place at the Hack Green Secret Nuclear Bunker, French Lane, Nantwich, Cheshire CW5 8AL. The Bunker is situated just off the A530 Whitchurch Road, a few miles outside Nantwich, 30 minutes from Chester. From Junction 16 on the M6 motorway, follow the signs to Nantwich, then Whitchurch on the A530 (follow the brown Secret Bunker signs). The doors will open at 10.00am and admission will be £2.50.
Rod Siebert. Tel: 01270 623353
E-mail: coldwar@hackgreen.co.uk
www.hackgreen.co.uk

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The Yaesu FT-2000 with PEP "Performance Enhancement Program" Upgrade.

The Yaesu FT-2000 has been a bestselling HF Transceiver since its introduction almost three years ago. The ability of downloadable firmware up-grades by the Yaesu Factory make this 100 or 200 Watt HF & 6M rig one of the most up to date pieces of equipment available to the Radio Amateur.

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.

Peter hart said in the May issue of RadCom "The changes introduced by this latest firmware are particularly significant and well worth having, with the overall receiver & transmitter sounding cleaner & improves the operating experience.

In fact it's so impressive, even Mr Henry Lewis G3GIQ uses one. And we all know how demanding the big signal from Ealing West London is.

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".

FT-2000 Accessories

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Add a DMU-2000 Data Management Unit

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Yaesu FT-60R. ML&S £142.95 Latest twin band handie complete and ready to go.

Yaesu VX-6R. ML&S £199.95 Yet another 2/70 handie from Yaesu.

Yaesu VX-7R. ML&S £234.95 The UKs best selling Triple Band Handie.

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

Yaesu FT-8800. ML&S £289.95 Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

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

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FT-950 HF Base Transceiver

Only £1099 Available from stock

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!

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

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The only full feature all-mode, all band Mobile/ Base Transceiver with full colour TFT display.

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

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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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Palstar See Web for the LOWEST prices!

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Covering 160 to 6 Meters, the AT-500 features a differential tuning capacitor with 2 stators and 1 rotor, a precision ceramic body roller inductor, and a 4:1 ferrite current balun for balanced line feeds.

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AT-5K (3.5kW) Antenna Tuner	£1079.95
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AT-100pro	Desktop tuner covering all frequencies from 1.8-54 MHz	£189.95
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AT-1000Pro	1kw 160m-6m (1.8-54MHz) High speed Auto ATU, tuning range 6-1000Ohms	£499.95
AT-897	Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too!	£179.95
IT-100	New version of the AT-7000	£149.95
YT-100	NEW AUTO ATU for FT-897/857 or FT-100 with additional Cat Port Control	£169.95
Z-817	Ultimate autotuner for QRP radios, including the Yaesu FT-817D	£119.95
Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£139.95
Z-11Pro	Portable compact & tunes 100mW to 125W	£154.95
RCA-14	4-way DC Breakout Box	£49.95
KT-100	Dedicated tuner for Kenwood radios	£169.95
RBA-1:1	Probably the best 1:1balun out there	£34.95
RBA 4:1	Probably the best 4:1 balun out there	£34.95
TW-1 & TW-2	Talking Wattmeters! TW-1 HF 0-2kW TW-2 6/2/70 250W	£129.95 each
DTS-4 + 4R & DTS-6 + 6R	Remote Antenna Switchers. 1.5kW 1-54MHz. Either 4 or 6 way	£69.95 + £34.95 / £87.95 + £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**

MyDEL CG-3000

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

MyDEL Power Supplies

SPS-8250	25A continuous, fully metered power supply	£79.95
MP-9626	120A, 13.8V DC power supply	£ 299.95
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 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

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.

ML&S: £259.95

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

The G-Whip Backpacker Portable HF Antenna System

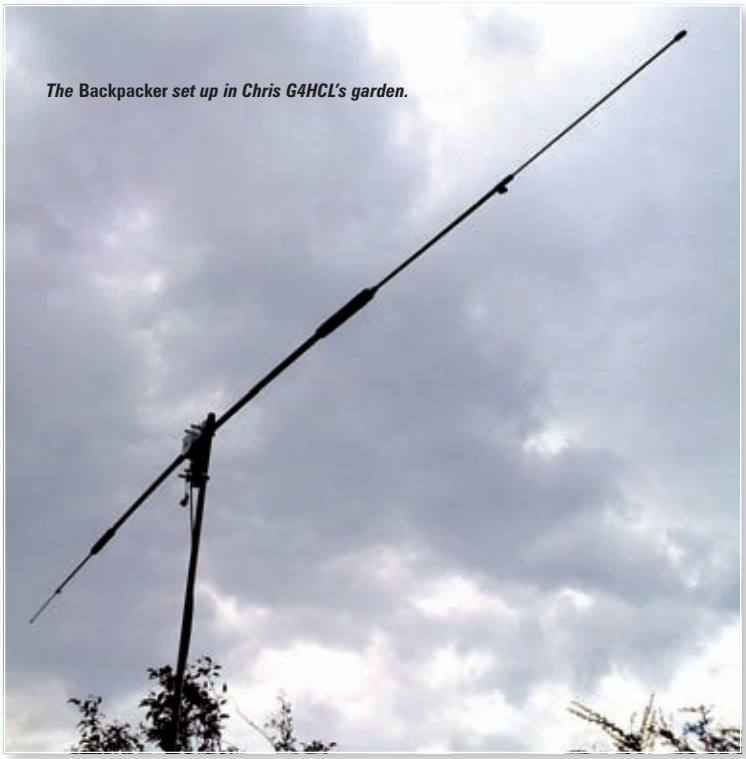
Company: G-Whip UK

Pros: I was very impressed with both the quality of construction and the on-air performance. The supplied lightweight carry tube was very handy! The antenna took just a few minutes to assemble and tune the antenna ready for on-air operation.

Cons: Preparation of a tuning chart recommended to save time tuning up on assembly.

Price: £199 plus £10 UK p&p.

Supplier: My thanks for the loan of the review antenna go to **Geoff Brown G4ICD,**
17 Grove Gardens,
Southampton,
Hampshire SO19 9QZ.
Tel. (mobile) **07971077317.**
E-mail (Sales) **janetdbrown@btinternet.com**
E-mail (Technical help) **g4icd@btinternet.com**
Website **www.gwhip.co.uk**



The* Backpacker *set up in Chris G4HCL's garden.

In the February 2009 issue of *PW* I took a look at the new British-made GWB G-Whip base station compact high frequency (h.f.) dipole system – finding it to work extremely well on air as well as being superbly made. Besides using the antenna system from home I also popped it into the boot of my car and even used it on some of my trips away from home. I also operated out and about at temporary locations, such as by a riverside and even in a relative's back garden. Again I found it to work very well.

However, there's another obvious use for an antenna system such as this, and that's for carry-around portable operating. The GWB uses a substantial centre unit, this is naturally fairly heavy but it's still ideal for base use, along with well-built elements. So, with portable operation in mind, the manufacturer has come up with a lightweight version.

The G-Whip *Backpacker* is a compact, portable, dual-element centre-loaded antenna that's intended for use on the various h.f. bands between 3.5 and 30MHz. The maximum power rating is 100W peak envelope power (p.e.p.), and because it's a resonant antenna there's no need for an antenna tuner. It's basically made up from two helically-wound centre-loaded quarter wavelengths, which are each resonant on the operating frequency and these essentially make up a resonant dipole.

There are no resistive loads in the antenna system, so the transmit power isn't 'dumped' and wasted – instead it's radiated as best fashion as possible for such a small antenna. In conjunction with the helically-wound elements, individual loading coils are used for each band together with adjustable tuning whips to make up its small physical size.

Chris Lorek G4HCL has been busy enjoying evaluating another new product from G-Whip – just in time for summer portable work!

Everything fits neatly in the lightweight carrying tube.

Physical & Electrical Features

The *Backpacker* is built to the same standards as the G-Whip base antenna, but uses a lightweight and waterproofed potted centre box along with an aluminium mounting plate. Mounting clamps for a 32mm (1.25in) diameter tube are provided, and washers and wing nuts are used for easily tightening a support pole to the plate by hand.

An SO-239 coaxial cable socket, to mate with a PL-259 plug fitted to the end of the coaxial cable for feeding to the transceiver, is fitted to the waterproof junction box. There's even a removable waterproof cover fitted to this to keep the rain out when its not in use and the cover is attached to the assembly so it doesn't get lost!

Although the antenna itself will cover a wide frequency range, the centre loading coils on each element do need to be changed to suit the band you're using at the time, and the tuning whip lengths adjusted for the frequency segment you're using on that band. Depending on which band you're on, the overall length is typically just over 3.6m long, with a maximum length of 4.25m, which means it'll fit into quite a small space.

The antenna system comes with a selection of elements, which provide operation on the 3.5MHz (80m), 7MHz (40m), 14MHz (20m) and 28MHz (10m) Amateur bands, you simply use the appropriate elements for the band you wish to operate on at the time. Coils for other bands, including commercial frequencies, are also available.

If you didn't see my original GWB review, then briefly the antenna that forms the resonant dipole system is made up from two elements and the centre junction box. Each element, forming a mechanically shortened quarter-wavelength element, uses a 660mm long helically wound wire element on a fibreglass former. This is waterproofed with a double heatshrink cover, followed by a loading coil for the band in use which again is waterproofed with a double heatshrink cover, followed by an adjustable straight element. The coils and stems use brass ferrules, with stainless steel tuneable resonators (as in the sister G-Whip Base design).

All the elements are fitted in a sturdy but lightweight 'carry around' tube that's just over a metre long. It has a screw-on end cap and an adjustable shoulder strap, and the centre plate with its junction box can be attached to the shoulder strap for carrying. This makes it ideal for portable use along with one of the many self-contained portable h.f. rigs on the market right now.

Because of its compact size, unlike many full sized dipoles the system can be easily rotated to give maximum radiation in the direction you're interested in. Alternatively, you can also rotate it to reduce interference, either electrical noise or from other stronger stations while you're DX chasing. To get the best performance though you'll need to position it reasonably well away from surrounding objects and at least, say, 3m or more above ground if you can. Ideally it should be at 6m or higher.

Bands & Coverage

The supplied antenna isn't just limited only to the 3.5, 7, 14 and 28MHz bands, this is because – by using the three different lengths of the supplied whips – the approximate overall frequency coverage is as shown in **Table 1**. Note: Additional loading coils are also available as options for other h.f. bands for other frequency ranges.

Table 1 – Approximate frequency coverage of the supplied system

Band	Min Freq	Centre Freq	Max Freq
80m	2.75MHz	3.5MHz	4.5MHz
40m	5.25MHz	7.0MHz	7.70MHz
20m	10.60MHz	14.20MHz	16.00MHz
10m	22.20MHz	28.50MHz	33.00MHz

What's In The Box?

Overall, the antenna system comes with the following parts;
Centre dipole case with stainless steel mounting hardware,
Two heat shrink covered helically-wound stems,
Two stainless steel telescopic adjusting elements,
Two short, two medium, and two long whips for above,
Six coil set (two coils for 3.5MHz, two coils for 7MHz, and two coils for 14MHz),
Laminated instruction sheets,
Carry tube and strap.

Optional accessories include a 10m length of coaxial cable with PL-259 terminations at each end and a strain relief. There's also a handheld antenna analyser to help

with tuning, a portable quick-deployment tripod for mounting the antenna and coils for other frequency ranges besides those supplied as standard.

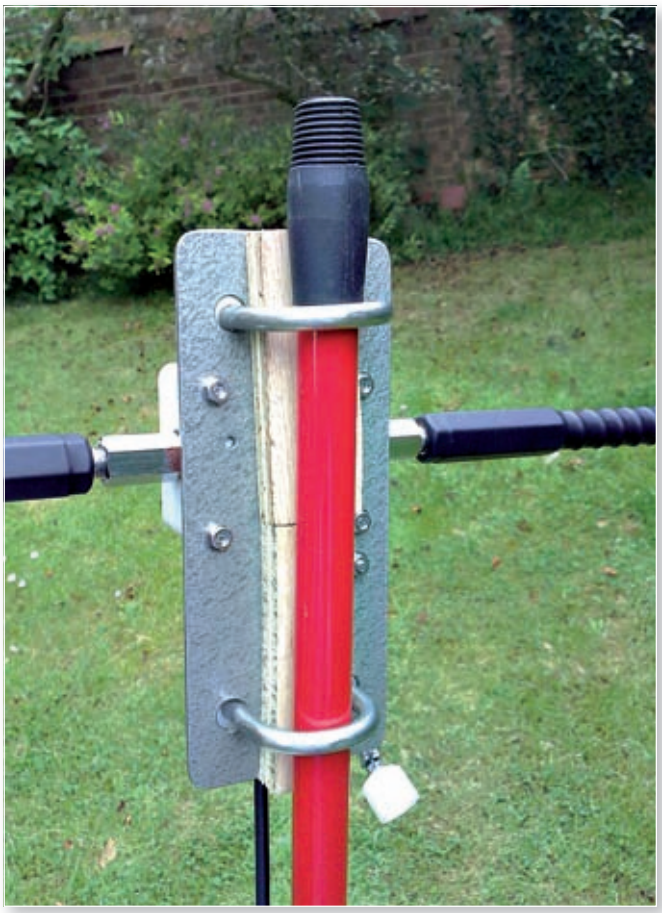
Quick Check

To begin the on the air tests, and after unpacking the elements from the tube and to have a quick check of how they assemble together, I went into my back garden for the initial test of the antenna system. Here I used my battery-powered AIM4170 antenna analyser coupled to my laptop PC to see how the G-Whip Backpacker system worked frequency-wise.

After some initial tuning and a few rounds of lengthening, shortening and swapping around the adjustable whip elements, I found the antenna bandwidth, to the 3:1 voltage standing wave ratio (v.s.w.r.) points, to be around 30kHz on the 80m band, 105kHz on the 40m band, 345kHz on the 20m band and 3.46MHz on the 10m band. In other words, the entire 28 and 14MHz bands were covered with one setting, and over half of the 'new' 200kHz wide 40m band, and a narrower section of the 80m band.

Adjusting the whip element lengths, of course, also adjusted the section of the band was covered. To help me in re-setting these length for subsequent on-air use, I used a small 1m long tape measure and made a quick note of the various lengths needed for each band and band section, and carried this chart and tape measure along with me with the antenna elements in the portable carry tube.

A point of interest is that, because the system is essentially made up of two resonant mobile whips, by using one of these assembled sections together with a mobile mount, you also have a very efficient h.f. mobile antenna, which you can use on your way to and from your portable location.



A closer look at the packing needed to allow Chris' preferred support pole to work.

Out & About

The centre mounting block clamps are, as I mentioned earlier, designed for a 32mm (1.25in) diameter tube and I found that I had to use this diameter, nothing smaller nor much larger. But for portable use away from home I wanted to use a lightweight extendable pole, in fact it's the one I use with a sponge attachment for washing the upstairs windows in my house, and this had a smaller diameter of around 18mm at its end!

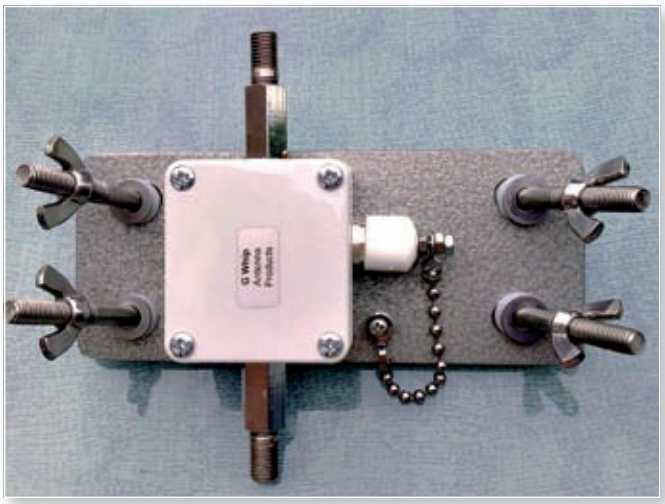
No problem here though, as I simply used a small block of wood as 'padding' between my thinner pole and the mounting plate. I used a couple of sturdy rubber bands to secure my lightweight pole to the carry tube, and this resulted in a very handy and quick to deploy portable antenna.

I used my 12V d.c. powered Yaesu h.f./v.h.f./u.h.f. transceiver together with the *Backpacker* antenna over the review period. On arrival at whatever location I wanted to operate from, I simply unpacked the elements, fitted the centre mount to my portable mast using the U bolts with their attached wing nuts (no tools needed here) and my wooden blocks as spacers, then screwed each helically wound stem to the centre dipole case, and then the two telescopic adjusting elements with the appropriate whip elements.

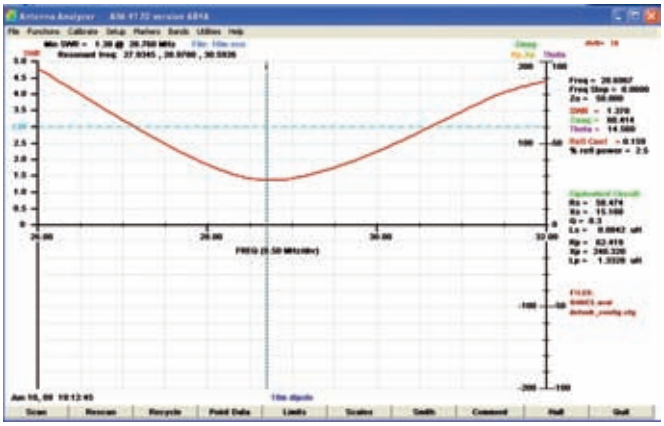
Then I simply connected my coaxial cable, did a quick check of the v.s.w.r., and I was ready to go. The element length chart I'd made at home was invaluable, allowing me to get the antenna pre-set to the frequency segment I was interested in. In fact it only took just a minute or so and it was ready for any slight re-tuning if needed (for example on 3.5MHz), rather than the much longer trial-and-error tests each time.

The actual antenna location, and the antenna height above ground, did of course. make some difference to the precise 'resonance', particularly on 3.5MHz, but my home-made chart always gave me a good starting point!

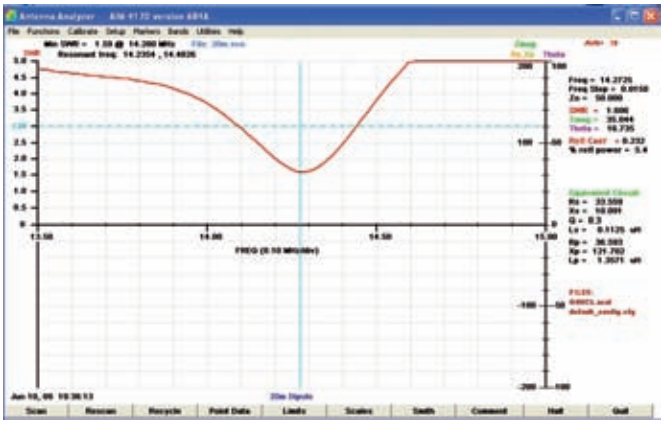
All I then needed to do was prop the pole against something suitable when I was out 'on location'. For this I often used a stone wall or a wooden fence pole but



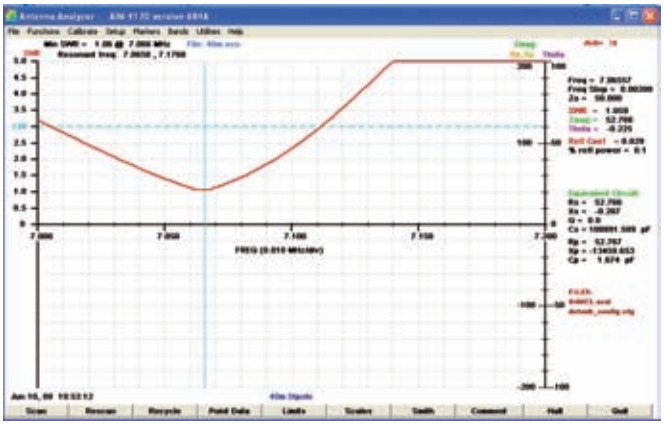
The well made waterproofed centre box can be used in most cases without an a.t.u.



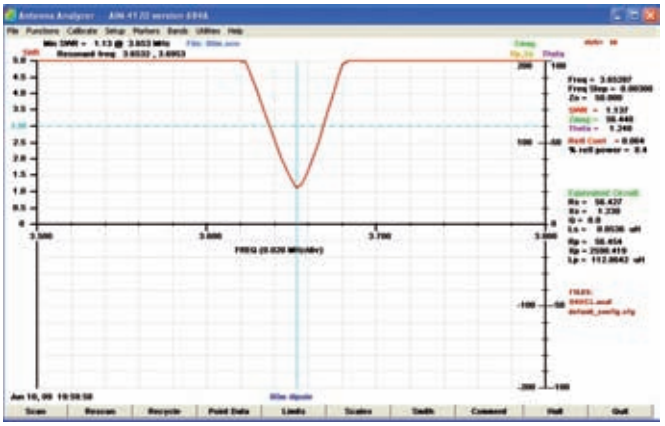
Measured bandwidth on 28-29.7MHz.



Measured bandwidth on the 14MHz band.



Measured bandwidth on the 7MHz band.



A narrower bandwidth is found on the 3.5MHz band.

eventually I also took my camera tripod along in the boot of my car and used this as a support, resting the pole base on the ground and tying the side of the pole to the top section of the tripod. Of course there's an optional tripod available from G-Whip themselves.

As with the GWB base station version, I found the on-air performance to be extremely good. As always it's very hard to quantify performance as h.f. conditions do affect communication. A list of stations worked or heard over just a short review period can often sound impressive but in reality is often totally meaningless, and it's usually only experience which gives a 'gut feeling' of whether something is working well or not.

On air, testing the system in my back garden with the antenna round 6m above ground, I naturally found it to be a little 'down' on my full-size dipole arrays, although on 40m and 20m usually by no more than an S-point or so, and on 3.5MHz (where a full dipole is nearly ten times the length of the *Backpacker*) a couple or so S-points down at the most.

But this still allowed me to work plenty of stations, including several east and west European stations on 7MHz, mainly inter-UK (as would be expected) on 3.5MHz, and into a few other continents on 14MHz. During the review period 28MHz wasn't 'open' so I can't really comment here. But it wasn't just 14MHz that got me contacts 'across the pond', as I also managed a couple of 7MHz grey-line path (i.e. the sunlight-darkness 'terminator') contacts into the USA. I heard a some Australian Amateurs once or twice also on grey-line in the early morning but my 100W transmit power obviously wasn't enough to make the distance there!

Using the antenna out portable by a riverside, with a good moist 'earth plane', certainly helped my transmit signals, especially on 3.5 and 7MHz, and here's where the advantage of a portable antenna comes in if you're limited in what you can get up at your home. Just go out to a good spot with your h.f. rig and get operating, no domestic TV or audio equipment breakthrough problems either!

Maybe I'm getting rather long in the tooth, but 30+ years worth of using an original G-Whip antenna (yes, I still have it and it still works well!) has shown me this new revitalised one works just as well, and in fact rather better than many other compact antenna systems I've used in the past and present.

Very Impressed

I was very impressed with both the quality of construction and the on-air performance of the G-Whip B*ackpacker*. The supplied lightweight carry tube was very handy in transporting the antenna, and in use it took just a few minutes to assemble and tune the antenna ready for on-air operation.

●

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PL259 type..... **£5.95**
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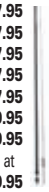

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Tarheel 200A HP 3.4-28MHz 1.5Kw max length 12ft..... **£479.95**
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SPX-300 ★ Mobile 9 band Plug 'n Go HF mobile antenna ★ Freq: 6/10/12/15/17/20/30/40/80m ★ Length: 165cm ★ Power: 200w ★ Fitting: 3/8 Thread..... **£59.95**
SPX-300S ★ Mobile 9 band Plug 'n Go HF mobile antenna ★ Freq: 6/10/12/15/17/20/30/40/80m ★ Length:165cm ★ Power:200w ★ Fitting: PL259..... **£64.95**

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SQBM110 Mk.2 Dual Bander (Radial FREE!)... **£59.95**
(2m 3dBd) (70cm 6dBd) (RX:25-2000 MHz) (Length 39")
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technical for the terrified

Tony Nailer G4CFY revisits some practical band-pass filter configurations

This article builds on the work done, on parallel resonance configurations, that featured in *Technical for the Terrified* (*T4T*) in *PW* back in August 2005 and in August 2007, dealing with band-pass coupled circuits. It seems like a good idea to revisit this topic every two years and address the issue from a different perspective.

I was stimulated to re-address the issues, following communications with the **Rev. George Dobbs G3RJV**, on the subject of the scarcity of TOKO coils. He sent me via E-mail, a chart and circuit of ready designed dual-tuned circuit band-pass filters, using the TOKO 10k series of coils.

The band-pass coupled parallel tuned circuit using transformers is shown in **Fig. 1**. The coils used were from the TOKO 10K series BKANK3333R (45μH) at 1.8 and 3.5MHz; The BKANK3334R (5.5μH) at 7, 10.1, and 14MHz and the BKANK3335R version at 18, 21, and 28MHz. In general, this series of coils is known by just the final number part of their part identification, the 'BKANK' part is usually ignored.

Having recently been designing my own series of 10mm coils for production to replace the rapidly vanishing TOKO parts, I immediately spotted that the band-pass filters in the chart were a hopeless match to 50Ω in and out. The reason for this is that very few of the TOKO coils had taps on the primary, or secondary windings that are suitable for very low impedances.

In a situation like this it's better to ignore the taps and just use the coil as a single inductor, and achieve input and output matching by means of capacitive taps. The circuit for this arrangement is shown in **Fig. 2**.

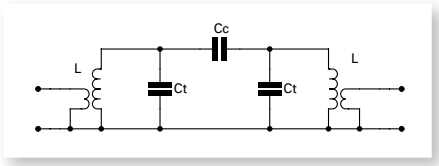

Fig. 1: A typical transformer coupled band-pass filter, but it may be difficult to achieve using some TOKO coils.

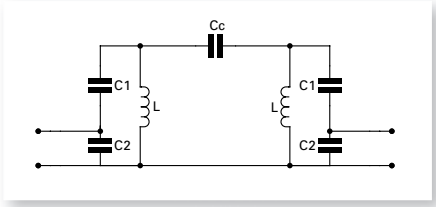

Fig. 2: Using a capacitive tapping system for band-pass filters may give better impedance matching.

Relationships of L,C, & F

The relationship between frequency F, inductance L, and capacitance C is:

$F = 1/(2*Pi*\sqrt{(L*C)})$.

Now to the mathematician and engineer it is clear that both the L and the C would have to double for the frequency to reduce by a factor of 2. That's because F is proportional to the square root of the change in L and C.

In the case where F & L are known and it's necessary to find the value of C, the formula has to be transposed. So if both sides of the equation are squared, then $F^2 = 1/(4*Pi^2*L*C)$, then transpose the equation by swapping the positions of F^2 and C. The swap, gives a formula to find the value of $C = 1/(4*Pi^2*F^2*L)$.

To make life a little easier (though slightly less accurate), the constant of Pi^2 can be rounded to 9.87 and $4* Pi^2$ is almost 39.5.

So, $C = 1/(39.5*F^2*L)$ μF (where F is MHz and L is μH), **Equation 1.**

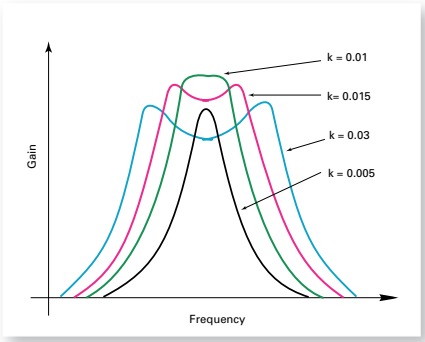

Fig. 3: The pass-band response and bandwidth related to the coupling factor k. Note the dip at mid-band as k becomes bigger.

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Band Calculations

The 28-29.7MHz band will be considered first. I choose the popular '3335R TOKO variable coil with a nominal inductance of 1.2μH. The capacitor to resonate this at 28MHz is $C = 1/(39.5*28*28*1.2)\mu$F.

Better still to calculate the capacitance in picofarads, where C (pF) = 1000000/(39.5*28*28*1.2)pF = 26.9pF

By the same method at 29.7MHz the capacitance neede for resonance is 23.9pF, and at mid-band it is 25.3pF. The capacitance tuning range is 6pF.

The logical steps then for other harmonically related frequencies can be found by doubling both L and C, which gives 2.4μH and 54pF at 14MHz, 4.8μH and 108pF at 7MHz, 9.6μH and 216pF at 3.5MHz, and 19.2μH and 432pF at 1.75MHz.

The closest values of coils that are available in the TOKO series are the '3893 at 2.6μH, the '3337R at 5.0μH, the '2027 at 9μH and the '32696 at 23μH. The majority of the 10.7MHz intermediate frequency coils have a value of 2.6μH for their inductance. So, if you want this value of inductance, just break up the tiny tubular ceramic capacitor in the base of almost any of the 10.7MHz coils.

The '3335R coil with its inductance value of 1.2μH, can also be used for the 24.9MHz band, the '4612 coil, at 1.7μH is ideal for 21MHz and 18MHz, and the 2.6μH still with its internal capacitor plus an external one is ideal for 10.1MHz.

Coupling Factor

When two parallel resonant circuits are coupled together, the response is affected mainly by the unloaded *Q* of each tuned circuit and the

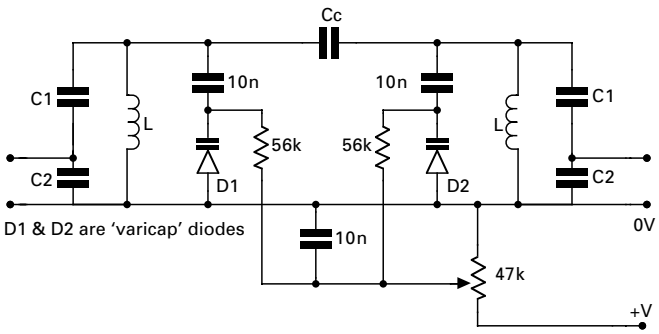

Fig. 4: A tunable band-pass filter would be more suited to the 28MHz band, which would otherwise need an unacceptably high k factor to cover the whole band.

coupling between them, provided by the capacitor, shown as Cc in the diagrams Fig. 1 and Fig. 2. The various responses related to the coupling factor 'k' are shown in **Fig. 3**.

The value of k is 0.84 times the bandwidth, Bw, divided by the centre frequency F. So k = 0.84*Bw/F. **Equation 2.**

Considering the 28-29.7MHz band, k = 0.84*1.7/28.85 = 0.0495. By referring to Fig. 3 it should be clear that a 'k' value of 0.05 would have peaks much further separated than the curve for k = 0.03, and with a much greater dip in the centre.

So, really unless a significant loss in the centre of the band could be tolerated, then it would perhaps be better to critically couple the two tuned circuits and tune them simultaneously across the band.

As we've seen, the capacitance value to tune 28 – 29.7MHz is 26.9 to 23.9pF. Such a small range could be achieved using a varicap diode designed for v.h.f. tuning, or maybe even a reverse connected rectifier diode from the 1N4000 series.

Each of the coils has a specified unloaded *Q* value (Qu) between 60 and 85. This dictates the bandwidth of a single tuned circuit, provided the losses in the resonating capacitor are negligible. Then Bw = F/Qu. Similarly Qu = F/Bw, and then k = 0.84/Qu.

The '3335R is shown as having an unloaded *Q* of 85, so at 28MHz, k = 0.84/85 = 0.00988, call it 0.01. A quick look again at Fig. 3 shows that this is **critical coupling**. In this case then the ideal band-pass filter for the 28-29.7MHz band with varicap tuning will be similar as shown in **Fig. 4** (though actual component values aren't shown).

Capacitive Tapping

The values of capacitive tap components are found using the following procedure. The input and output resistances Rin both selected to be 50Ω. The dynamic resistance Rd across the tuned circuit at resonance is the inductive reactance multiplied by the unloaded *Q* factor. So Rd = 2*Pi*F*L*Qu, (where F is MHz and L is μH), **Equation 3.**

With the '3335R at 28.85MHz this gives:

Rd = 2*Pi*28.85*1.2*85 = 18490Ω.

The ratio of C2/C1 is given the symbol N and is the square root of Rd/Rin minus 1.

So N = √(Rd/Rin) – 1, **Equation 4.**

N = √(18490/50) – 1

N = 19.23 – 1 = 18.23.

When the total capacitance Ct is known, then from the formula for capacitors in series C1 = CT*(1+N)/N, (where N = C2/C1), **Equation 5.**

C1 = 25.3*(1+18.23)/18.23 = 26.7pF

C2 = N*C1, **Equation 6.**

So, C2 becomes:

C2 = 18.23*26.7pF = 487pF.

Use 27pF for C1 and 470pF for C2.

Coupling Capacitor

The value of the coupling capacitor is found from Cc = k*Ct/(1-k), **Equation 7.**

The '3335R coil at 28MHz with a Qu of 85 has coupling factor 'k' of 0.01.

Ct is 25.3pF, so Cc = (0.01*25.3)/(1-0.01) = 0.25pF. This is too small for a practical capacitor, but it could be created by having a length of 0.92mm (20s.w.g.) wire from the top connection of each coil and brought into close proximity with each other.

Table 1:

Equation 1: Ct = 1/(39.5*F²*L),	Ct = 1/(39.5*21.225²*1.7) = 33pF.
Equation 2: k = 0.84*Bw/F,	k = 0.84*0.45/21.225 = 0.018.
Equation 3: Rd = 2*Pi*F*L*Qu,	Rd = 6.28*21.225*1.7*80 = 18128Ω.
Equation 4: N = √(Rd/Rin) – 1,	N = √(18128/50) – 1 = 18.04.
Equation 5: C1 = Ct*(1+N)/N,	C1 = 33*(1+18.04)/18.04 = 34.8pF
Equation 6: C2 = N*C1,	C2 = 18.04*34.8pF = 628pF.
Equation 7: Cc = k*Ct/(1-k),	Cc = 0.018*33/(1-.018) = 0.6pF.

Calculations for 21MHz

Use TOKO coil '4612. Now L = 1.7μH, Qu = 80, Rin = 50Ω, F = 21.225MHz, Bw = 0.45MHz. I've laid out the calculations in **Table 1**.

Use C1 = 33pF, C2 = 680pF, and Cc 1pF in series with 1.5pF. The circuit is as shown in Fig. 2 earlier.

In **Table 2**, there are similar calculations for the other high frequency amateur bands:

Low-Impedance Tap

It is of course possible to make a coil with the necessary primary to secondary turns ratio to provide a good match for an antenna input. To this end, with my 'Spectrum Communications hat' on, I'm looking into having a series of coils specially made in the Far East suitable for amateur radio construction.

One of these is the 5u30L, which has a primary inductance of 5.3μH a *Q* of 85 and a 20:1 primary to secondary turns ratio. Using this coil it is possible to make a 20 and 80 metre preselector of the type used in the Poundbury SSB Receiver that featured in *PW's* July edition.

Similar calculations have been done for this coil and the results are shown in Table 1.

Fig. 5: With careful choice of coil and capacitor values it's possible to create a dual-band band-pass filter, with a fixed higher band-pass and a tunable lower band-pass configuration.

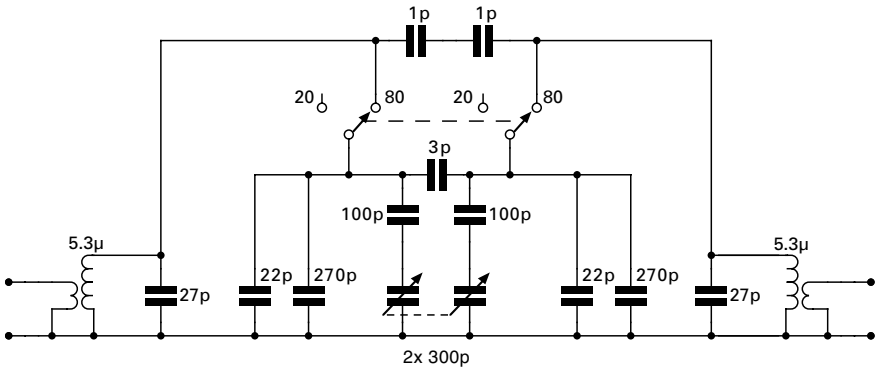

Table 2:
TOKO coils with capacitive tap in & out

F(MHz)	TOKO	L µH	Qu	Bw	Ct	K	Rin	Rd	N	C1	C2
29.7	3335R	1.2	85	0.33	23.9	0.009	50	19034	18.51	25.21	467
28	3335R	1.2	85	0.33	26.9	0.01	50	17945	17.94	28.41	510
21	4612	1.7	80	0.45	33.8	0.018	50	17945	17.94	35.65	640
14	3893	2.6	85	0.35	49.7	0.021	50	19440	18.72	52.33	980
7	3337R	5	85	0.2	103.3	0.024	50	18693	18.34	109	1998
3.8	2027	9	80	0.044	194.8	0.01	50	17191	17.54	205.9	3612
3.5	2027	9	80	0.044	229.6	0.011	50	15834	16.8	243.3	4086
2	32696	23	60	0.3	275.2	0.126	50	17342	17.62	290.8	5125
1.8	32696	23	60	0.3	339.7	0.14	50	15607	16.67	360.1	6002
2	3333R	45	60	0.3	140.6	0.126	50	33929	25.05	146.3	3664
1.8	3333R	45	60	0.3	173.6	0.14	50	30536	23.71	181	4291

Table 3:
3.5/14MHz Preselector, coil with low Z link

F(MHz)	Coil	L(µH)	Qu	Bw	Ct	K	Rin	Rd	Cc
14.175	5u30L	5.3	85	0.35	24.4	0.021	50	39628	0.523
3.8	5u30L	5.3	85	0.04	330.8	0.009	50	10756	2.951
3.5	5u30L	5.3	85	0.04	389.9	0.01	50	9907	3.78

For the 20/80metre Preselector on 14MHz use two 1pF capacitors in series for Cc. If C2 is 22pF then L will need to 5.7µH, which might be out of range. If Ct is 27pF then L will need to be 4.8µH.

On 3.5-3.8MHz use a dual gang 18-300pF polyvaricon in series with 100pF to give 15-75pF a change of 60pF. In parallel with this is 270pF and 22pF, together with the 27pF already across the inductor, giving totals of 334-394pF.

The practical application is shown in **Fig. 5** with some typical bands and components values shown in **Table 3**.

Very Useful

The procedure outlined here for the capacitive tap matching, together with a table of coils and capacitors for the principal HF bands, should be very useful for radio constructors. When the new range of coils is available from Spectrum Communications, it is likely a similar table will be available for the main amateur bands using link coupling for input and output.

●

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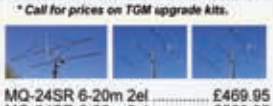

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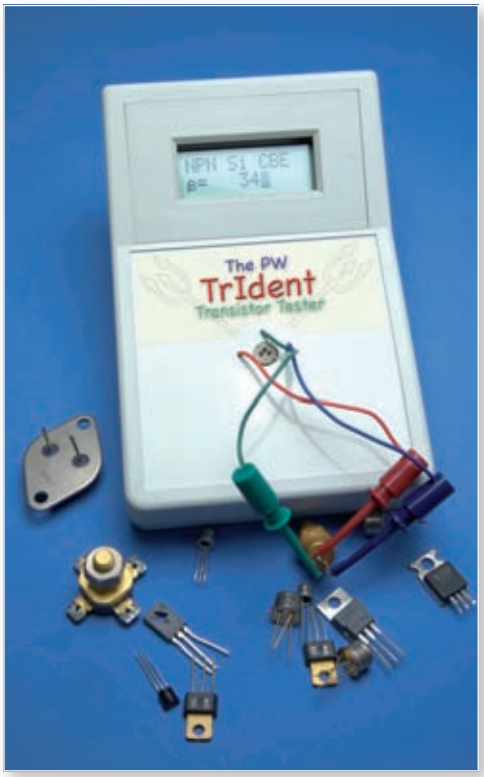
Project

The PW TrIdent

A bipolar transistor pin-out identifier and tester



Like many Radio Amateurs I have collected a large number of transistors over the years. Many have been bought at radio rallies, others de-soldered from scrap p.c.b.s. They accumulated in a variety of boxes and plastic drawers, until the time finally came when I knew that I needed to sort them out. That's when this project was born.

TrIdent Overview

The *PW TrIdent* (Transistor Identifier) shown in the heading photograph is implemented using a Microchip PIC™ microcontroller carrying out the testing and showing the results on a liquid crystal display (l.c.d.), There's also the facility to dispense with the l.c.d. output and to display the pin identification only on optional light emitting diodes l.e.d.s.

There are three test channels to be connected to the pins of the unknown transistor. The TrIdent makes a number of measurements and if the transistor is found to be good, it identifies the type: *npn* or *pnp*, the transistor material, as either silicon or germanium, the pin-out corresponding to the test channels, and finally displays a value for the gain (β).

This version of the *PW TrIdent* identifies bipolar transistors of small signal and power transistors only. Other devices, such as f.e.t.s and even darlington transistors are not recognised, and the display indicates 'Unknown'.

The final version was constructed using a p.c.b. and was housed in a plastic case. Power comes from a standard 9V PP3 battery. The transistor can either be plugged into a normal transistor socket or the three coloured fly leads can be used. Information is presented on the two line l.c.d.

The *PW Trident* uses very few components, and is easily built on stripboard. With some shopping around using the Internet (if postage is ignored) it's possible to purchase all components for less than £15.

The heart of the *PW TrIdent* is a PIC microcontroller chip. The prototype used a 40-pin PIC16F877 device, a member of the 16F family that has become very popular with hobbyists. This device contains flash ROM (used to store the software which controls the PIC), a small amount of random access memory (RAM), an eight channel analogue to digital converter (ADC), and various other useful features not needed for this project.

The PIC16F877 i.c. is quite large and many of the pins were not used, so I searched for a more suitable device. I settled on the PIC16F876, which is in effect a cut down vesion of the PIC16F877. The cut-down device comes in a 28 pin narrow 'skinny-DIP' package, that's available from many sources, including Maplin Electronics. As it's a common device type, it should be supported by most PIC programmers. The only drawback appears to be that it's one of the more pricey members of the family!

Analogue To Digital Converter

The key feature of the chosen PIC device type is that it contains an analogue to digital converter (ADC). The PIC's ADC measures a voltage between 0V and 5V and generates a 10-bit digital value, where 00 0000 0000 (binary) represents 0V, and 11 1111 1111 (again binary) represents 5V. This allows voltages to be measured to a resolution of $5/2^{10} = 5/1024 = 5$mV. This is the smallest change in voltage which can be measured, and is not too different to the resolution of many cheaper digital multi-meters.

The PIC itself uses 22 of the 28 pins available on the package, which can be used as general purpose digital input and output ports, however up to five of these pins can be assigned as analogue input pins, and the ADC can be programmed to connect to any of these pins. Three of these analogue pins are used in this project. To make it easier, they may be thought of as digital voltmeters.

Gary Morton M1GRY had lots of unmarked transistors to sort out – here's his solution – the *PW TrIdent!*

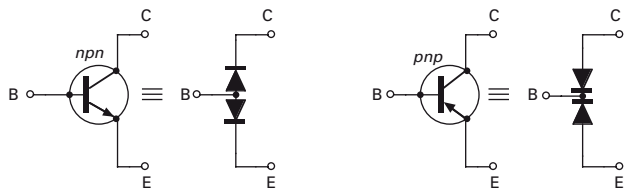


Fig. 1: A transistor, which can be thought of structurally as two back-to-back diodes, with the base being the common terminal.

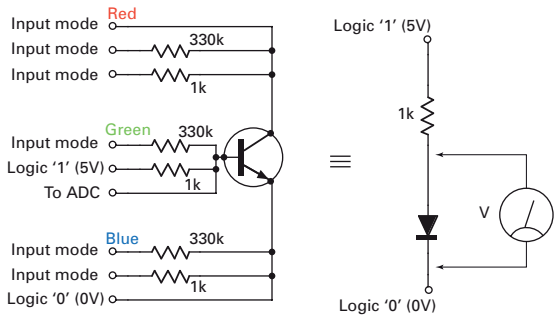


Fig. 2 How the test channels are configured to look for the diode junctions of an unknown transistor. This identifies the base connection and the semiconductor material type.

Test Connections

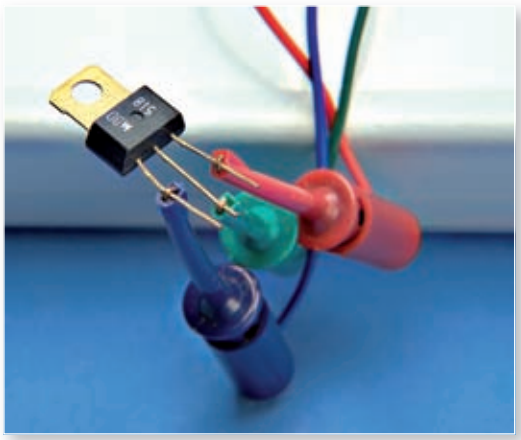
There are three connections (test channels) to the device under test (DUT), since a transistor has three pins. It doesn't matter which way around they're connected as the TrIdent will figure things out in software. In the source code of the software I identify the three test channels as: red; green and blue, since RGB is a commonly used term. For the flying leads I used wires of the same colour. Each test channel is connected to the PIC in an identical fashion.

There is one connection from a PIC pin to a test channel through a 330kΩ resistor. This is used to supply base current. There is one connection from a PIC pin to a test channel through a 1kΩ resistor. This is used as a collector load. And there is one final connection from a PIC pin directly to a test channel. This test channel is set either to 0V to connect to the emitter if the transistor is *npn*, or to 5V to connect to the emitter if the transistor is *pnp*. Alternatively, the pin can be used to make a voltage measurement.

Transistor Structure

First a quick resumé about the structure of a transistor, which can be thought of structurally as two back-to-back diodes, with the base being the common terminal, **Fig. 1**. If you use a multi-meter set to the ohms range, you can probe pairs of pins of an unknown transistor looking to see whether there is very high or low resistance.

When set to the ohms range a multi-meter actually puts a voltage on the probes to try to force current through the resistor being measured. If connected to a diode this voltage will forward bias the diode, causing a current to flow. This is registered as a low resistance on the meter. If the voltage on the probes reverse biases the diode then no current will flow.



Many modern digital multimeters have a dedicated diode measurement function. My own multi-meter has a feature beeping when a conducting diode is found, which makes the search for the diode junctions of a transistor very easy.

The *PW TrIdent* makes six measurements to figure out which is the base connection (just like a human would). The emitter-collector test will indicate open circuit with the connections each way around. The base-emitter and base-collector junctions will register as conducting in one direction and as open circuit in the other.

Any other result means that the transistor is broken (perhaps a shorted base-emitter, or open collector due to excessive current). Of course the three pin device under test just might not be a transistor!

Diode Junction Test

The illustration of **Fig. 2** shows how the test channels are configured to look for the diode junctions of an unknown transistor. The green channel (for example) sets the I/O port connected to the 1kΩ resistor to be an output and programs a '1' value, which results in 5V (or very close) being applied to the end of the 1kΩ resistor.

The blue channel sets the I/O port of the direct connection to be an output and programs a '0' value, which results in 0V (or very close) being applied to the pin of the transistor. The green channel also programs the I/O port of the direct connection to connect to the ADC, allowing us to measure the voltage across the 1kΩ resistor.

All other I/O ports are programmed to be in input mode, which makes them behave as if they were totally disconnected. If the junction being tested is either a reverse biased diode or the emitter-collector pair, then there will be no current flow and the voltage measured by the ADC will be around 5V (in the example shown).

If the voltage measures around 0.6V then there must be a silicon diode junction. Likewise if the voltage measures around 0.3V then there must be a germanium diode junction.

Finally, a voltage of near 0V suggests that the green and blue channels are shorted together, and the transistor is broken. The software programs the test channels to make the six possible measurements, analyses the results and then displays the transistor type: *npn* or *pnp*, the transistor material: showing Si for silicon or Ge for germanium, and a three digit code, either: B??; ?B?; or ??B, where the position of the B character indicates the base of the transistor corresponding to the red, green and blue channels respectively.

Emitter & Collector Identification

The illustrations of **Fig.**s **3** and **4** show the final measurement configurations. Using the 330kΩ resistor the PIC I/O port can be set to 5V if the transistor is *npn* or 0V if the transistor is *pnp.* The emitter and collector are not yet known, and so the transistor is connected both ways around. The 1kΩ resistor is used as a collector load and so, the PIC I/O port is set to 5V if the transistor is *npn* or 0V if the transistor is *pnp*

The voltage on the 1kΩ collector load is measured by the ADC (I'll call this Vc). The voltage on the (known) base is also measured (call it Vb). Assuming an *npn* transistor, the base current Ib=((5-Vb)/330kΩ)mA, and the collector current Ic=((5-Vc)/1kΩ)mA. The gain is calculated simply as Ic/Ib.

It may not be generally known that a transistor – with the collector and emitter reversed – will often still work like a correctly connected transistor, albeit with much reduced gain. The software compares the calculated gain in both configurations and assumes that the greater gain corresponds to the correct configuration.

On the l.c.d. the display now reads npn/pnp and Si/Ge (as before), followed by thee-characters, for example 'ECB'. This is read as: red channel is attached to the emitter; The blue channel is the collector; and green channel attached to the base. On the second line of the l.c.d. the transistor's gain is displayed.

The software is continuously making the diode measurements, and starts again once per second. Once the software detects two diode junctions it continues to the gain measurement stage. The final measurements are held for one second and then the software starts all over again. There's no button to press to start the measurement.

Display Details

Many readers may not be familiar with the l.c.d. used in this project so, I'll skeleton out a few details. The display I've used – and similar units – are now quite common and readily available. They come in several configurations, commonly displaying one, two or four lines, with varying line lengths. The characters are made up from a matrix of pixels, just the same as on a computer screen.

All the normal characters of the alphabet, both upper and lower case can be displayed, as can digits and the other characters found on a keyboard. I found the other 128 uncommon characters that can be displayed less useful, however, I was able to find and use the beta (β) symbol to represent the gain.

These displays themselves are powered with 5V and have one pin which is used to adjust the contrast. Preset potentiometer R12 is connected across the 5V supply and generates the contrast voltage. Be aware that some older displays require a negative contrast voltage, so make sure that the l.c.d. purchased is suitable. It may not be a wise move to buy an unknown display from a rally.

Unfortunately these l.c.d.s don't have a common naming convention, unlike normal i.c.s. They're commonly referred to as being 'HD44780 compatible'. This Hitachi chip was built into many early Hitachi l.c.d. displays and became a de-facto standard. An Internet search using this term will find many projects and much detailed information for the curious.

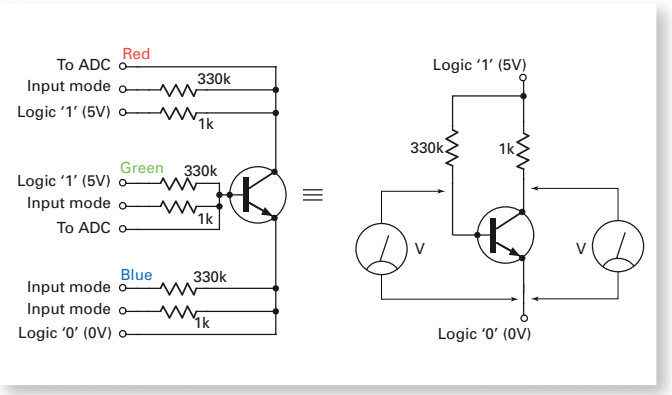


Fig. 3: Starting to identify the connection configuration after discovering which channel is connected to the transistor's base.

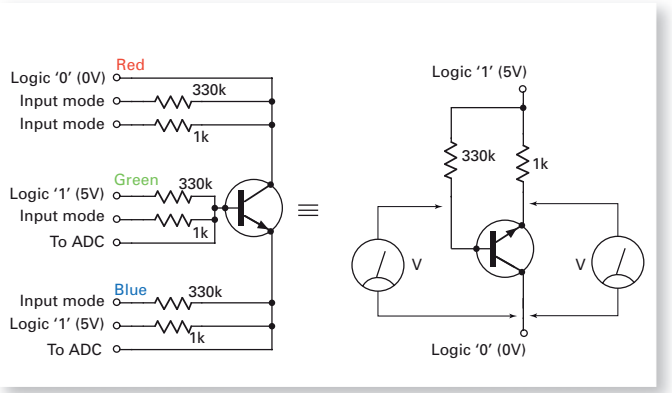


Fig. 4: Reversing the Collector and Emitter channels helps to identify the polarity of the device under test.

The l.c.d. display should have either a 14 or 16 pins on with a straight 0.1 inch pitch connector. Pins 15 and 16 (if present) are for the backlight, and are not used in this project. The l.c.d. is controlled by means of three control pins: **E**; **R/W**; and **RS** and eight data pins. The *PW Trident* uses the l.c.d. in its '4-bit mode', which necessitates only the connection of DB4 to DB7. The software is little more complicated, but it only requires seven signal connections to the PIC. Pins labelled 'RC2' to 'RC7' are used for this purpose.

It should be possible to buy a suitable display for less than £10. The Maplin N25AZ at £6.99 (at the time of writing) seems suitable, however I have not tried this specific l.c.d. Incedentally, the Maplin N27AZ was recommended in the *PW IBP Beacon Clock* project – it's a little more expensive and is yellow/green as compared to the silver/grey of the cheaper l.c.d. Searching on eBay uncovered a suitable l.c.d. with a £3.50 'Buy It Now' price, but you take your chances with this approach!

PIC Support Components

The PIC requires other support components, such as a clock source and thanks to an on-chip oscillator circuit it's only necessary to add an external crystal. The exact value is not at all critical. A 4MHz crystal appears in the component list, however any value between 2 and 4MHz will be okay. A good choice would be the commonly available 3.57MHz colour burst crystal.

Please be aware that the PIC16F876 PIC chip comes in

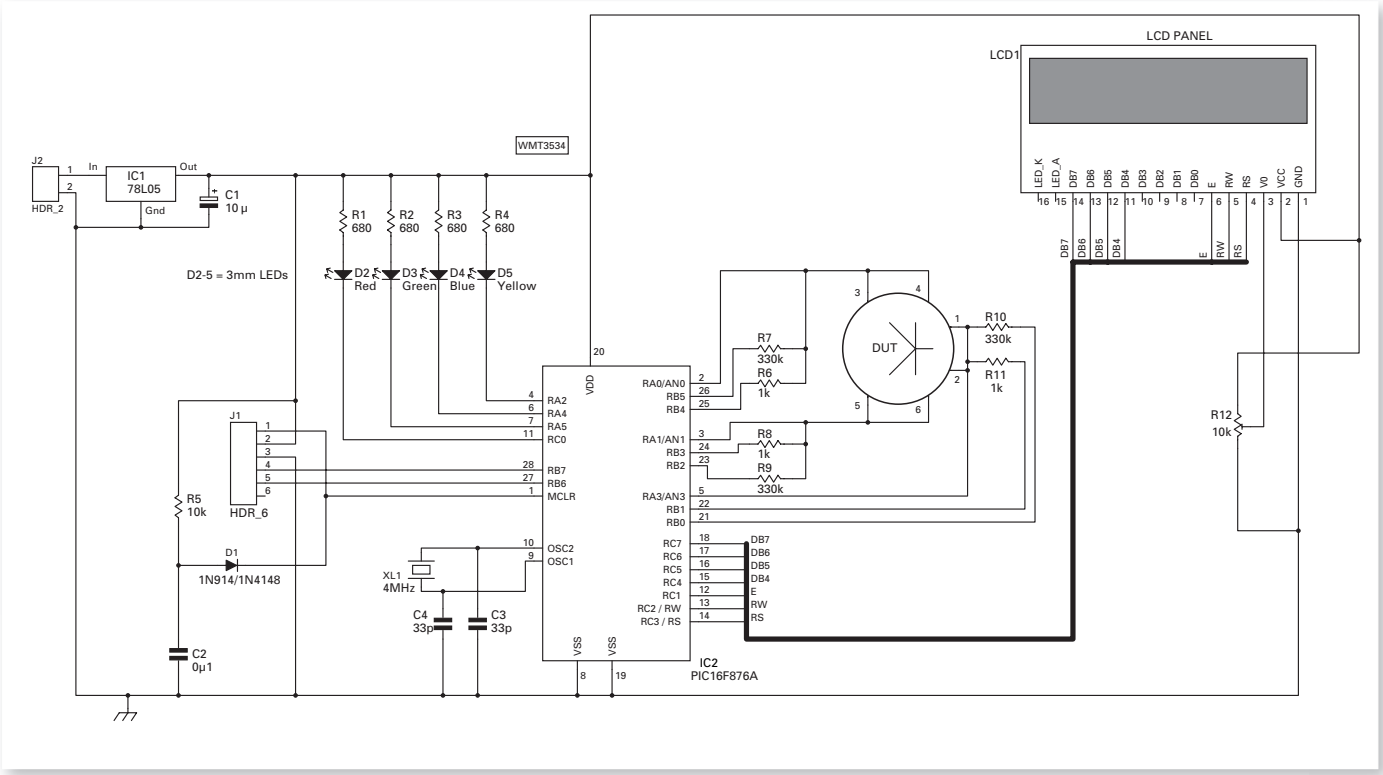


Fig. 5: The final circuit diagram of the PW TrIdent project. Note the heavy line from PIC to LCD1 represent multiple connections.

a number of confusing variations, some of which are only specified to operate at a maximum of 4MHz. Check with your supplier if unsure.

The schematic is shown in **Fig. 5**. An RC network (R5 and C2) connects to the PIC reset pin (MCLR) via diode D1, to provide power-on reset. The item J1 is a six-pin header which I used to program the PIC in-circuit using the Microchip PICKit-2 programmer.

Many PIC programmers support the in-circuit programming of PICs, but the order of the connections may vary. This was particularly useful during software development, as it saved time, having not to take the PIC out of the socket on the p.c.b. to put it into my other programmer socket.

Status LEDs

Once all the pins of the PIC had been allocated there were four spare I/O pins. I decided to add some status l.e.d.s. These are used by the software to indicate pass (green) and fail (red), and *npn* (blue) or *pnp* (yellow). They are completely optional, and although mounted on the p.c.b., I didn't bother to mount the l.e.d.s on the front of the plastic case.

Finally, the l.c.d. and PIC both require a 5V voltage supply. A three-pin 78L05 low power TO92 package 5V regulator device has been used. The *PW TrIdent* is powered from a 9V PP3 battery, but any d.c. supply of more than 7V can be used. With two l.e.d.s illuminated, the current drain is around 20mA.

Plastic Case

Most of my projects never see the inside of a case, but for this project, I decided to use a case. I've seen the specific plastic case used here, both in magazines and on the Internet. I finally tracked it down to an Australian company – **Jaycar Electronics**. They ship to the UK and have a UK website **www.jaycarelectronics.co.uk** so, it's possible to order in sterling. The code for the case is HB6090 and it costs around £3.50.

The case comes with a moulded 'cut-out' for the screen, however it isn't quite wide enough to allow all 16 characters to be seen. So, rather than hack the plastic and make a mess of it, I re-coded the software to use the 12 characters that are visible. This still allows enough room to display the final transistor identification information.

Both the p.c.b. and l.c.d. module sit on four plastic spacers and I used a hot melt glue gun to secure them to the case. The p.c.b. and l.c.d. slot down onto the spacers and are held in place with four M3 nuts each, as can be seen in photo 3. A hole was drilled in the front of the case for a transistor socket and this too was glued into place.

Three small holes were drilled to allow the wires for the coloured fly leads to pass through. I have never found a satisfactory method to connect an l.c.d. module to a p.c.b., so I used 10 individual multi-stranded wires. I tried some thin wire wrap wire which I had to hand. However, I can't recommend this, as it broke much too easily as I tried to mount the boards in the case.

The PCB

A layout of a simpe single-sided p.c.b. layout is given in **Fig. 6**, along with the component layout. Four wire links are needed on the component side. it's strongly recommended to socket the relatively expensive PIC, as it's possible to re-use it in the future. As an option the crystal (X1) and capacitors (C3, C4) can be replaced with an

oscillator module, shown dotted on the overlay.

Crystal oscillator modules come in two sizes and provision has been made on the p.c.b. to support either size. For each test channel there are two solder pads: one intended for the coloured fly leads; and the other intended to connect to a transistor socket. Construction should be otherwise straightforward.

Choice Of PIC

After the initial choice of the PIC chip and since the project was completed, I've tested both the PIC16F870 and PIC16F872 to verify that either of these device types can be used instead of the PIC16F876. The main difference is that they have a smaller amount of flash (program storage) memory, but still just enough to hold the code for the *PW Trident*. The good news is that these parts are less than half the cost of a PIC16F876 device!

Programming Software

If you have the facility to program the PIC yourself, then the compiled 'Hexadecimal' – 'hex' code(numbers to a base of 16 rather than the normal 10) to program the PIC directly, are available. For those with both software and programmer, then the source code of the *PW Trident* is available via E-mail. Simply E-mail a request to the E-mail address of: **m1gry@alma.demon.co.uk** with subject "*PW Trident*". Please indicate the PIC type that it's intended for.

For those constructors with no programmer, I'm able to send a pre-programmed PIC. The estimated cost for a programmed PIC16F870 PIC and P&P is presently £6.

My Thanks

Finally my thanks to **Mat Adlard G7FBD**, for creating my original schematic, designing, etching and populating the p.c.b. used for my prototype. ●

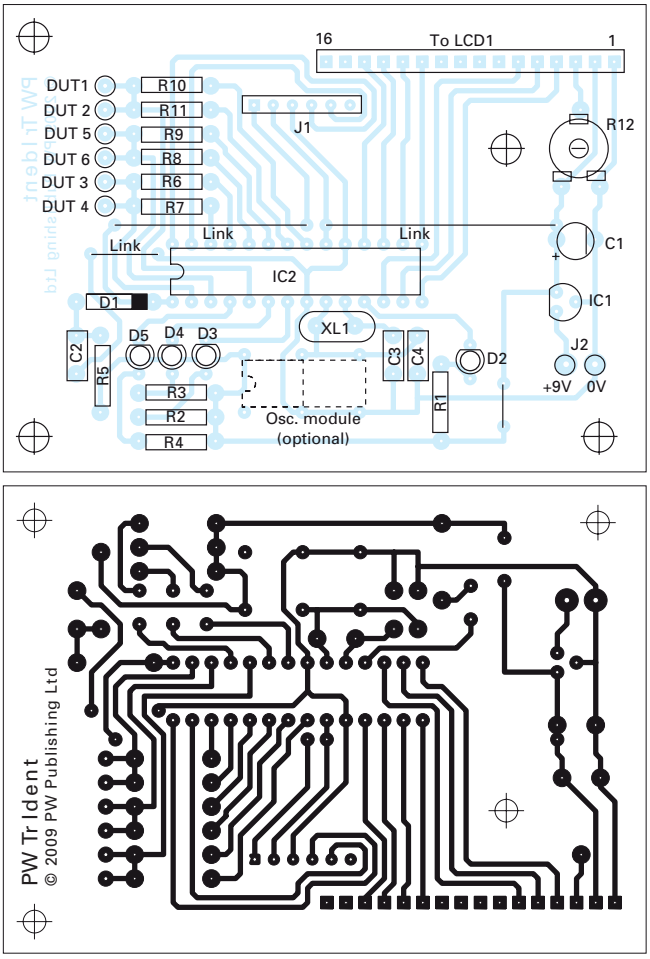
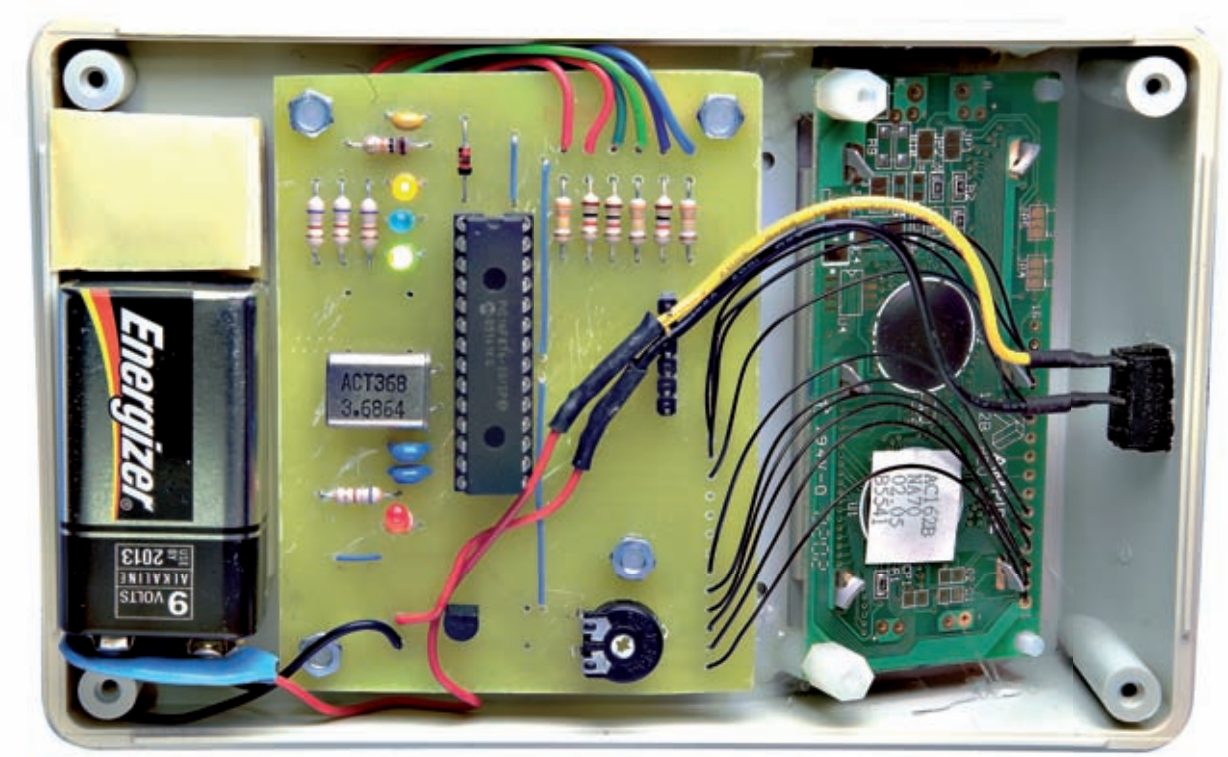


Fig. 6: The p.c.b. pattern and component overlay of the project.



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The Rev. George Dobbs'

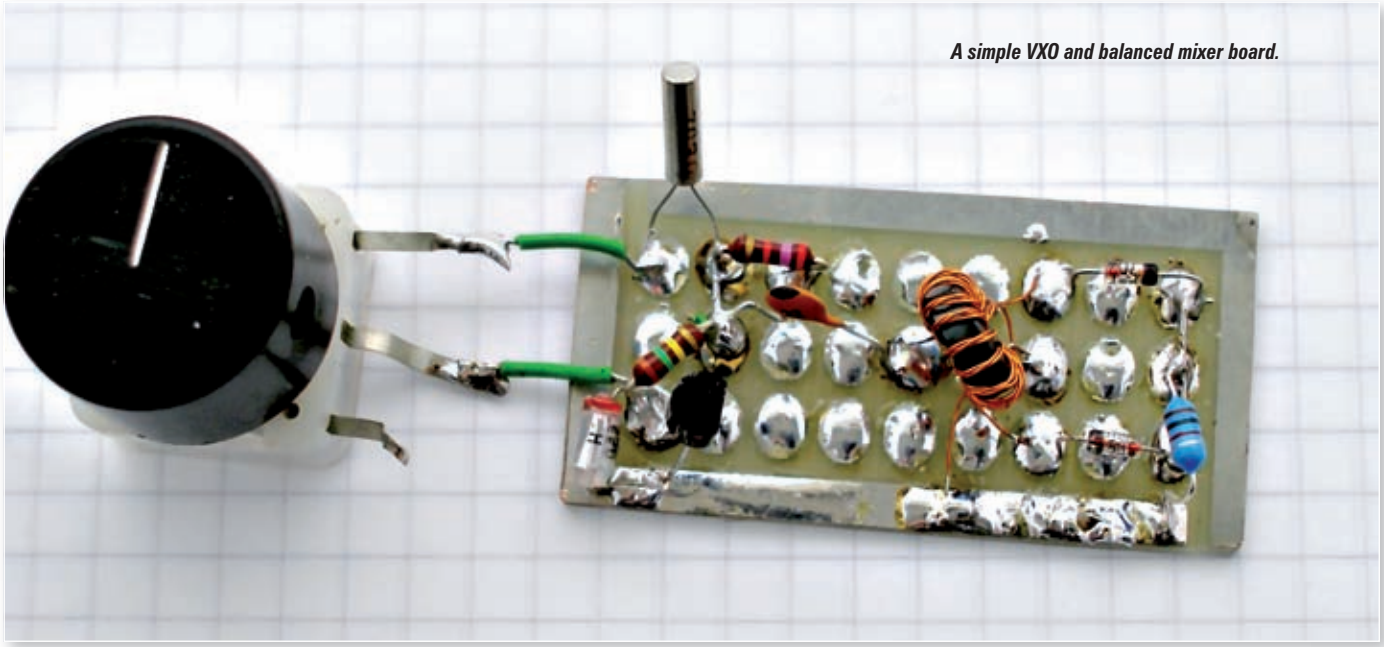
carrying on the practical way

The Rev. George Dobbs G3RJV reflects on the impact of retirement and some practical applications.

"I do not think the wireless waves I have discovered will have any practical application"
Heinrich (How wrong he was!) Rudolf Hertz

Welcome to *Carrying On the Practical Way* (*COTPW*), where I'm finding that retirement has been more difficult than I had imagined! Although it gives me much more free time as opposed to stealing it, I loved my work and the things about it that sometimes annoyed me, I now miss it! But one of the advantages is that I can now do things that were difficult during my working life and for many years it had been difficult to attend events arranged during weekends.

This year I was able to attend the **Yeovil QRP Convention**; an event I



A simple VXO and balanced mixer board.

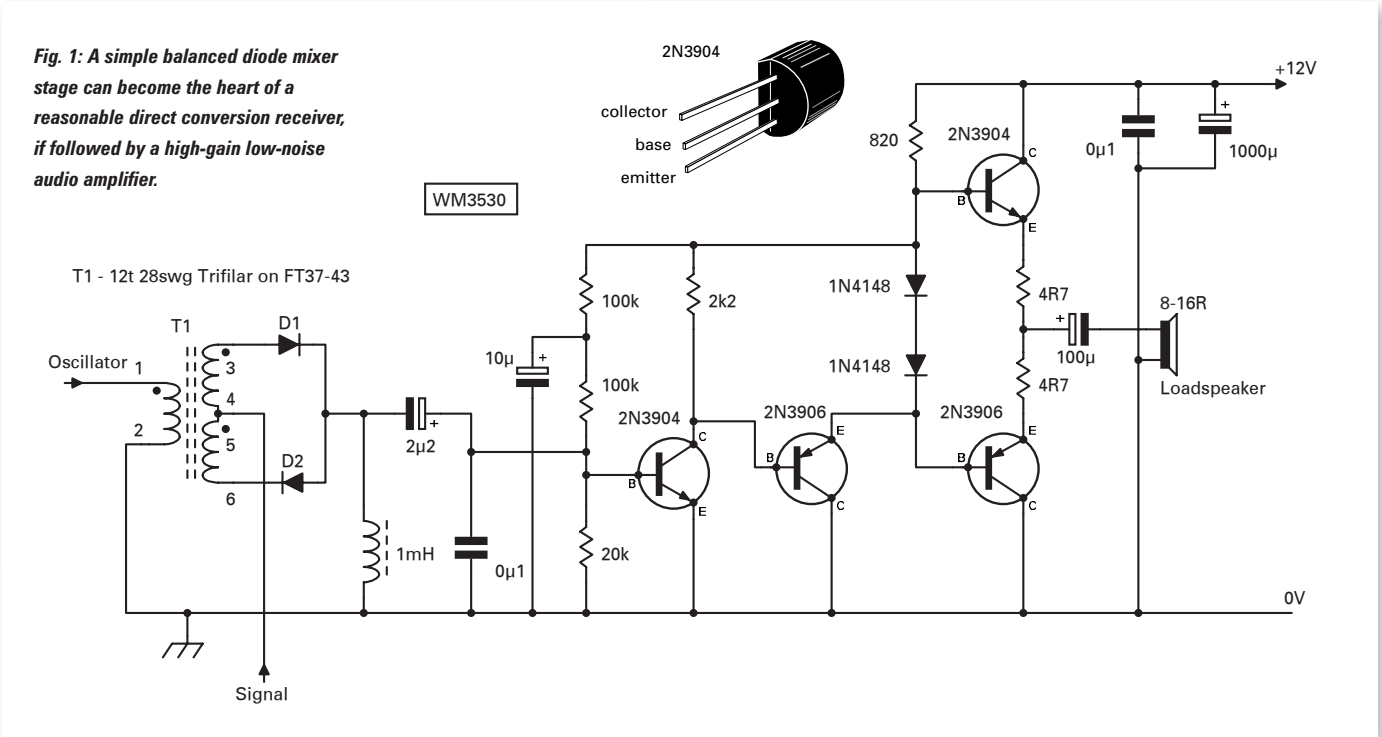


Fig. 1: A simple balanced diode mixer stage can become the heart of a reasonable direct conversion receiver, if followed by a high-gain low-noise audio amplifier.

Rev. George Dobbs G3RJV
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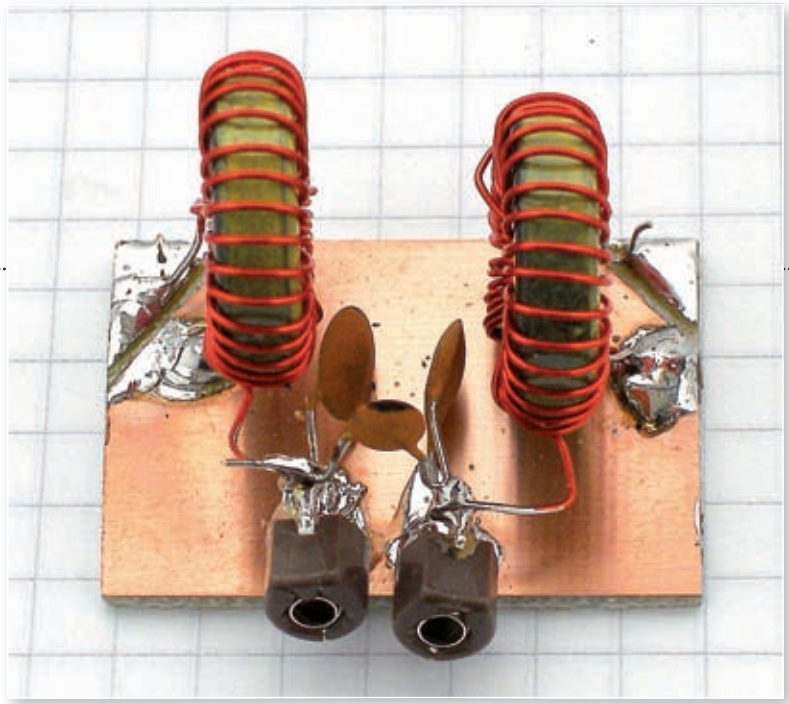


A bandpass filter suitable for low power operation.

can commend to *PW* readers. At the convention I even managed to meet up with the Editor, **Rob G3XFD**, and Technical editor, **Tex Swann G1TEX**. It was also an opportunity to meet some *PW* readers from the south of England and – thankfully – all the readers I spoke to appeared to enjoy this column!

However, one of the happy readers I met suggested that sometimes I appeared to offer 'circuit snippets' rather than complete projects to build. In reply I pointed out that such was the nature and available space in this column that it lended itself more to little circuit ideas rather than complete Amateur Radio projects. After all even the most demanding reader could hardly expect me to turn out 12 full-blown projects each year!

Converting Projects

Musing upon what the reader had said when I returned home, I looked back on some of my more recent *PW* offerings to see if I could convert them into more complete projects to build. Perhaps some readers may even have little boards they've already built than can be turned into a fuller project? (I have a box full of them!).

So, I rummaged in the box to sort out some of the more recent *PW* boards. I was amazed at how many little *COTPW* projects were resting there, unused but ready to go. One of the obvious boards for development was the little audio amplifier, inspired by **Johnny Apell SM7UCZ** and based on the Sziklai pair.

Regular readers will recall that in the May edition of this column I described how Johnny SM7UCZ had been experimenting with a simple discrete audio amplifier that would be capable of providing enough gain to be used after a passive diode ring mixer. Such mixers perform very well in direct conversion (DC) receiver but they attenuate the signal in the mixing process. So, the audio amplifier not only provides the overall gain for the receiver but also has to overcome mixer losses.

Johnny turned to the Sziklai pair configuration which is a complementary version of the well known Darlington pair in that it uses a *pnp* transistor with an *npn* transistor and opposed to a pair of *npn* devices. I described two versions of the SM7UCZ Sziklai pair audio amplifier. One was a very simple amplifier using just two transistors with good gain but diminutive output and a larger version that used a Sziklai pair pre-amplifier to drive a pair of complementary (*npn)* and *pnp*) transistors in an output stage.

The latter amplifier not only offered excellent gain, in the order of 50dB, but also offered some 150mW of audio output. So, I thought I would offer readers a complete receiver based on this audio amplifier.

Receiver Basis

The diagram, **Fig. 1**, shows the mixer and audio amplifier that form the basis of this receiver. The audio amplifier is exactly as described in the May issue and the mixer is a single balanced diode mixer. Although SM7UCZ had intended the amplifier to follow a double balanced mixer, I chose this simpler option for ease of construction. A double balanced mixer entails some fairly tricky transformer winding, with critical lead placements that are quite easy to get wrong.

Indeed, when I described how to make a double balanced diode mixer in this column some years ago, several readers wrote to complain that the circuit didn't work! However, in every case it was a problem with the home-wound transformers, so to avoid disappointment and complicated correspondence with readers I've opted for the single balanced version!

The single balanced mixer uses two diodes (D1 and 2) and a phasing transformer (T1). It has a signal loss between the input and output of about 8dB – but this depends upon the components used and the winding of the transformer. Ideally, the diodes should be matched as nearly as possible and the windings on the transformer closely balanced.

The choice of diode is reasonably important. Many experienced receiver constructors suggest the use of hot carrier or Schottky diodes as they have a lower forward resistance. I think this is sound advice but I have always had good results using cheap silicon diodes such as the 1N914 or 1N4148. What is very helpful in a single balance diode mixer is to use a pair of well matched diodes. Thankfully, matching diodes is a simple process!

Diode Matching

Diode matching involves measuring the forward resistance of the diodes using an appropriate resistance scale on a multi-meter. When a diode is placed across the probes of a resistance meter, one way around it shows a very high reading (the

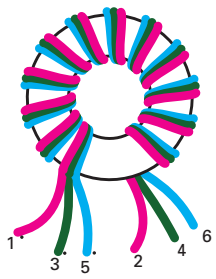


Fig. 2: Winding and identifying the trifilliar windings of the toroidal transformer, T1, of Fig. 1.

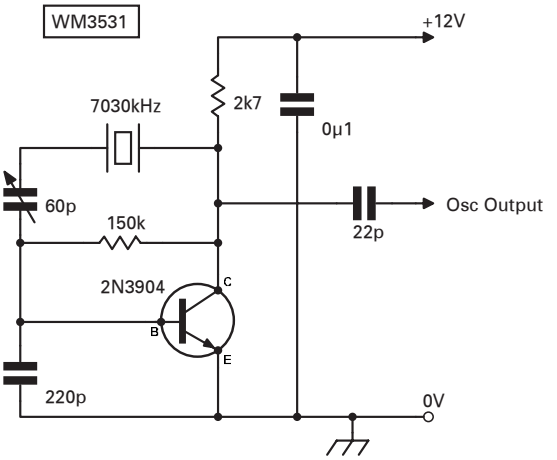


Fig 3: This simple variable crystal oscillator should work on most of the h.f. Amateur bands without much modification.

reverse resistance) and the other way around it shows a low reading (the forward resistance). That's because of what a diode does; it allows current to flow one way only.

The forward resistance will probably be in the range 5 to 20Ω. The idea is to measure a batch of diodes and find two (as closely as possible) with the same forward resistance. The back (reverse) resistance is not important. Then I lay the diodes with the best match aside for use in the mixer. When I've done this in the past, I have laid aside any other well matched pair and put them back in the component box, joined as a pair by twisting their leads. This saves future diode matching.

The transformer (T1) is trifilar wound on an FT37-43 ferrite core, a core with an outer diameter of 0.37 of an inch and a permeability of 850. Many similar ferrite cores would serve the purpose and if the FT37-43 is not available, readers could try a surplus ferrite core of similar size. It would probably work – but I could not promise how well it would work. Winding a trifilar transformer does require some care but it's really quite simple.

There are three windings, which are put on the core at the same time. They're of the same length and lightly twisted together to be treated as the same wire for the purpose of winding the transformer. The diagram, Fig. 1, shows a black dot at one end of each of the three windings, also marked as 1, 3 and 5. The dots indicate the start of each of the three windings.

Begin the winding process by taking three lengths of 28s.w.g enamelled copper wire about 450mm long and tie a knot close to each end to keep the wires together. Secure one end of the three wire bundle in a vice or clamp. Insert a pencil through the wire bundle just inside the knot at the free end and slowly rotate the pencil to twist the wires together. **Note:** It often helps to stoke the twists towards the secured end to keep them even.

When there are about five twists per every 20mm release the wires and run them between the thumb mail and forefinger to even out the twists. The twisted wires will then act as one wire as 12 turns are added to the core. Every pass through the centre of the core is one turn. Trim the wires to leave about 30mm at each end of the winding. Finally, scrape the enamel off about 10mm of each wire and apply solder to the bare wires to tin them with plenty of solder. Then the fun begins!

Splay out the ends of the windings as shown in **Fig. 2**. Use a multi-meter ohms range as a continuity checker to find out which is the beginning and end of the three windings. Arrange the wires as shown: 1 opposite 2, 3 opposite 4, and 5 opposite 6. This will enable the correct placements of the windings. Wire 1 is the oscillator input, wire 2 is connected to ground, wire 3 goes to D1, wires 4 and 5 are joined for the signal input port and wire 6 goes to D2.

Place them with care because if any wire is in the wrong place the mixer will not work. Also note the polarity of D1 and 2; they face opposite directions. To make my mixer easy to sort out I used an old piece of 'blob board', a board with a matrix of solder islands. I'm not sure if blob boards are available these days – but ugly type construction over a copper clad board would also be a good way to wire the mixer.

The diode diodes D1 and 2 are connected to a 1mH r.f. choke acting as a simple filter and thence to the amplifier. The diagram Fig. 1 represents the heart of a very useful DC receiver that could be used on any h.f. band with the addition of a suitable local oscillator and input (band-pass) filter for the required band.

First Version

My first version of such a receiver used a very simple variable frequency crystal oscillator (VXO). The crystal chosen was on 7.030MHz; QRP calling frequency. This basic VXO circuit, **Fig. 3,** should work with almost any h.f. band crystal. The variable capacitor in series with the crystal allows the frequency to be altered a little to facilitate tuning around the crystal frequency.

The amount of frequency adjustment depends upon the frequency of the crystal (the higher the frequency the greater the variation) and upon individual samples of crystal. A swing of a few kilohertz can be expected. The VXO provides enough signal injection for the diode mixer to function well. The 2N3904 transistor could be substituted with a 2N2222A or similar generic transistor and I added the VXO to some spare 'blobs' on the mixer blob board.

The receiver requires input filtering to provide the selectivity to sort out signals on the required band. I built the 40 metre bandpass filter shown in **Fig. 4a** This is the familiar arrangement of two tuned circuits, loosely top coupled by a small value capacitor. Unfortunately, the very useful Toko 10K series of inductors with a tunable core are now very difficult to obtain so trimmer capacitors are used to adjust

the tuned circuits on to the desired frequency.

The input and output inductors in the filter (T1 and 2) have small link windings to match the tuned circuits to the 50Ω required for the antenna input and the mixer output. The main windings are 27 turns of 26s.w.g. wire and the five turn link is wound over the grounded end of the main winding. I actually interleaved the link winding with the bottom five turns on the main winding.

Readers may have noticed that Fig. 1 does not include an audio gain (volume) control. This is because the overall gain of this receiver is controlled by a variable attenuator control at the antenna input. In such a simple receiver, the signal input control method is the best way to adjust the total receiver gain.

Powerful short wave broadcast stations can break through the much weaker Amateur Radio signals and input attenuation helps to reduce this problem. In fact the first Amateur Radio signal I heard on this receiver was a QRP station running 3W of r.f. output. The circuit for the input attenuator is shown in **Fig. 4b** With a suitable local oscillator and input filter, the receiver should work well on any Amateur band.

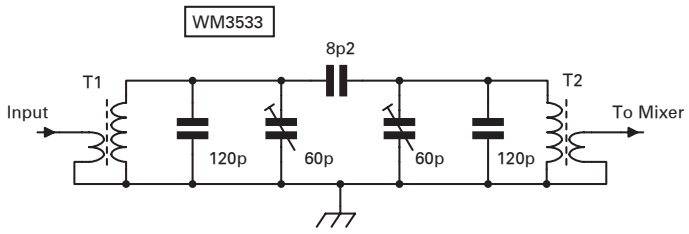


Fig. 4a: A simple band-pass filter should ideally precede the mixer of Fig. 1.

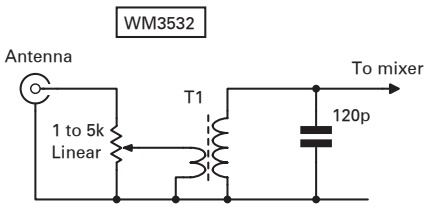


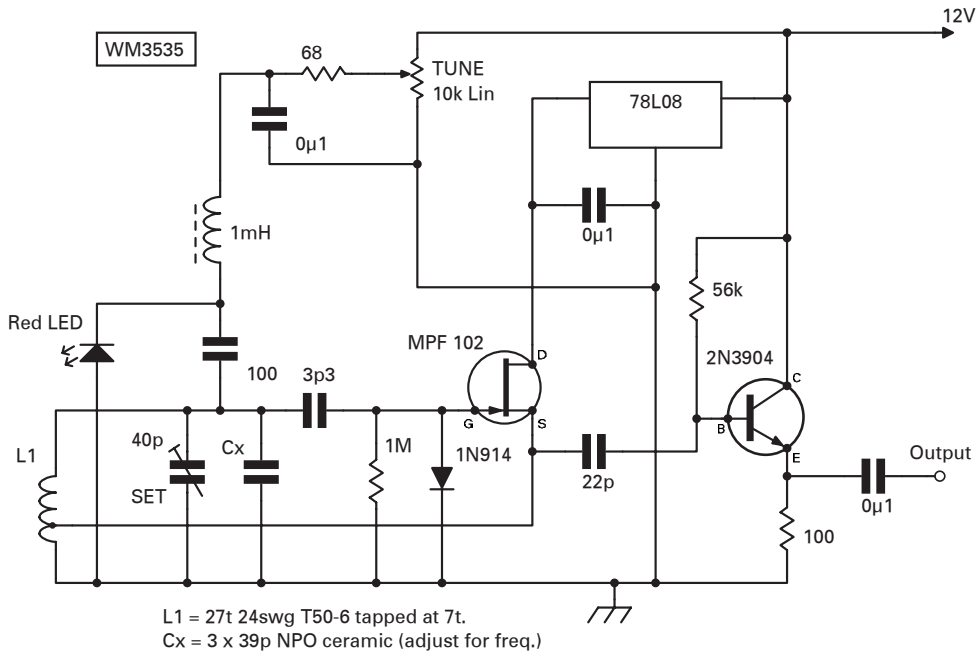
Fig. 4b: Adding an input signal attenuator to the band-pass filter can improve signal handling.

The VFO

As a final 'making use of what I had' idea, I turned to the variable frequency oscillator (v.f.o.) I described in last month's column. It was unusual in that I use bipolar transistors to serve as a voltage regulator and varactor tuning diode.

Another one of my contacts at the Yeovil Convention, *PW* author **Richard Booth G0TTL**, told me he had good results using a red light emitting diode (l.e.d.) as a varactor diode. Rather oddly perhaps, Richard found that common red l.e.d.s worked better than larger l.e.d.s and almost any other colour of l.e.d!

I thought I must try Richard's suggestion for myself and modified the v.f.o. to the version shown in **Fig. 5** Here I have replaced the transistor varactor with a red l.e.d. and reverted to using a three terminal regulator chip for voltage stabilisation. The results were very good. The l.e.d. enables me to tune the whole of the 7MHz band. Substituting this v.f.o. for the simple VXO gave me a more than useful receiver for the whole band. So there we are, a worthwhile and practical receiver project from bits of circuitry I've described in the past!



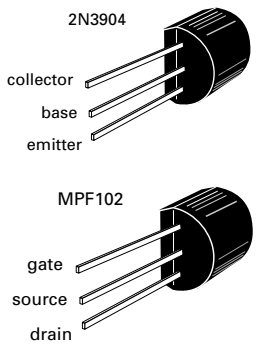


Fig. 5: Using a red l.e.d. in place of the variable capacitance diode as suggested by Richard Booth G0TTL.

Amateur Radio

in focus

This month we feature The Lincoln Short Wave Club

Chris Jones G0PIO, the Lincoln Club historian, shares a few snippets and issues an invitation to readers to join them!

What do the science fiction TV programme *Star Trek* and the **Lincoln Short Wave Club** (LSWC) have in common? Is it something to do with Amateur Radio satellites? Maybe something to do with data transmission? All those answers could be right, but in the year that *Star Trek* creator **Gene Roddenberry** was born – 1921 – so was the **Lincoln and District Amateur Wireless and Scientific Society.**

In 1921 there was a growing interest in 'wireless', with many people interested in the reception of broadcast signals for entertainment purposes. There were also a small number of people who were interested in developing transmitters and receivers for communication. February 10th of that year saw the first meeting of the club at the *Spread Eagle* Hotel, now the site of a shopping centre, between Lincoln's historic Guildhall and the High Bridge (said to be the only remaining bridge with mediaeval buildings on it).

In those early days, Radio Amateurs were only allowed 'Artificial Aerial' licences which allowed them to experiment with transmitters but not radiate via an antenna The callsigns issued to them were a number and two (or later three) letters. Early club member **C. W. Cottam** had the call **2UL**, **C. H. Friskney 5NT** and **Ralph Bates 5ON**. The club applied for its own licence and was issued with 5FZ. Records show that early 'talks' were given on 'simple circuits', 'aerials', 'insulators and insulation' and 'thermionic valves'. Morse classes were held twice a week.

Outbreak Of War

The club continued to meet until the outbreak of the Second World War when all Amateur Radio licences were revoked for security reasons. Club member **Jeff Sadler G2FHM** (then 2FHM), remembers his equipment being seized by Post Office officials while he was out at work. His landlady suspected that he might have been a spy!

Fig. 1: Roger Hunt G3PVU in the Lancaster* Just Jane *being filmed for a documentary by an uncomfortable cameraman. He is sitting in front of the T1154 and R1155 wartime transmitter and receiver.

Fig. 2: The Bishop of Lincoln, The Right Rev. John Saxbee, meets the club's youngest member Jeremy Catton M6JSC at the opening of the club shack.

Wartime Lincoln was a lively place with a large number of heavy engineering plants working on the war effort. The City was surrounded by RAF airfields, most famously at Scampton, where **617 Squadron** – the ***Dambusters*** – began their historic mission to breach the German dams and stifle the German war effort.

Several members of the Lincoln Club were able to use their radio communication skills during their service in the armed forces. After the war radio licences were restored and there were many newcomers to the hobby as a result of their wartime experience.

The availability of government surplus electronic and communications equipment provided a relatively cheap means of setting up a radio station. Service qualifications were sometimes allowed instead of having to sit the Radio Amateurs Examination (RAE) so there was a quick increase in the issue of callsigns around Lincoln. Forunately, Jeff G2FHM was also able to collect his seized equipment from the Main Telephone Exchange in Sheffield!

Regular Meetings 1948

It wasn't until the first of September 1948 that the Lincoln club was able to reconvene on a regular basis. After a notice in the *Lincolnshire Echo* newspaper invited interested parties to attend, around 30 people turned up at a meeting at Lincoln branch of the

Fig. 3: One of the club's founders, Ralph Bates 5ON with his transmitter and receiver in 1923.

Young Mens' Christian Association (YMCA). It wasn't long before the club was offered the chance to hold meetings at the Lincoln Technical College.

In the 1950s the club went from strength to strength and held it's first Hamfest. This is believed to be the first time that an event such as this was held. The tradition was revived in 1980. In recent years **Roger Hunt G3PVU** was the Hamfest Manager. He's also the club's longest serving member, having joined in 1958.

Roger remembers meetings in Room 19 at the 'Tech' College. Afterwards the members used to adjourn first to *Percolator Coffee Bar* then later to the nearby *Cattle Market* pub. Being underage then he had to go home but he's made up for it ever since!

Various Homes

The club had various homes in the 1960s and 1970s. However, it was 1980 before the club managed to secure a re-issue of the old 5FZ licence, since then the club has regularly used G5FZ on the air.

After 85 years in the city, the club had something of a crisis in 2006 when we were forced to move because of the development of a new Holiday Inn on the site of their old headquarters. It was particularly disappointing as the club had equipped a shack there.

Various methods were tried to secure a new home to the club and an article about the club's plight in the *Lincolnshire Echo* newspaper caught the eye of **Alan Wiles G4GDC**, who lives in Aisthorpe, a small village approximately 10km (6 miles) north of the city. Alan suggested that the club try the local social club in his village as a possible venue and as a result LSWC now has a full programme of talks and lectures in a room at the social club.

Shortly after moving to Aisthorpe negotiations started to erect a custom-built shack. Members spent many hours insulating the shack, wiring electricity, running antenna feeds and cables for a computer network and installing a 20 metre lattice mast. The shack now consists of separate operating areas for high frequency (h.f.) and very high frequency (v.h.f.) and ultra high frequencies (u.h.f.) stations. The club holds the callsign **G6COL** (City of Lincoln) for v.h.f. use and continues to use G5FZ for h.f. activity. Also inside the shack is a small meeting area and upstairs workshop.

After much hard work the new shack was ready for dedication by the Bishop of Lincoln the **Right Reverend John Saxbee**. He cut the ribbon to officially open the facility in June 2008.

Part of the club's activities includes training for the foundation course examination. A number of applicants have already passed and gained their licences including **Jeremy Catton M6JSC**, the club's youngest member. Recently the club has become a testing centre for Morse tests, and is proud to be the first in the country to be given that role and **'Ant' Freeman M0HAZ** was the first to take his test at the club shack in March 2009.

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Lincolnshire Aviation Heritage Centre

Being in Lincolnshire, many of the club members have an interest in aviation and we are pleased to be associated with the Lincolnshire Aviation Heritage Centre, which is sited at the former RAF station at East Kirkby. The centre has a Second World World War control tower and many exhibitions of life in the RAF during that period.

You can get a nice mug of tea and some home-made cake at the **Navy Army & Airforce Insitute** (NAAFI) too! The star of the centre is the Lancaster Bomber *Just Jane*, which now often does taxi runs on the airfield following its extensive renovation.

Lincoln Short Wave Club regularly operates a permanent special event station from the radio museum on the site. The station was opened by actor **Richard Todd OBE**, who played **Guy Gibson** in the film *The Dambusters*. It contains a T1154 and R1155 installation, which is sometimes put on air by club members.

The aviation centre is owned by **Fred** and **Harold Panton** as a permanent memorial to aircrew who lost their lives on operational duty – including their brother **Christopher Whitton Panton**. Incidentally, the

Fig. 4: The RAF Red Arrows aerobatic team overhead the club's new headquarters.

Fig. 5: A vintage – 1939 – Field Day using the callsign G5XL/P. This was the callsign of Harold Townhill (on right), who was a founder member of the club in 1921.

club has taken his initials for a special callsign and operates **GB2CWP** regularly from East Kirkby mainly during the summer months. When the station is on the air it creates a great deal of interest amongst visitors young and old and many of the older visitors recalling their wartime RAF service.

Cathedral Repeaters

The four Lincoln repeaters **GB3LN** (R5) and **GB3LS** (RB2) plus ATV repeaters **GB3VL** 23cm and **GB3LX** on 10cm are operated by the club and are located within the central tower of Lincoln Cathedral. This gives excellent coverage in Lincolnshire and into east Nottinghamshire. They are believed to be the only amateur repeaters housed in a medieval Cathedral.

After early Hamfests in the 1950s, the club decided to organise them again and for the last 29 years the club has run a Hamfest, which attracts visitors and traders from a wide area.

They are held in September at the Newark Showground, just off the A1/A46 junction.

Back at their new base in Aisthorpe, LSWC is just a mile away from RAF Scampton where the *Dambusters* raid began. Today it's home to the world-famous *Red Arrows* aerobatic team – who can often be seen practising overhead the shack!

Just like local people are used to 'the Reds' activities, they are getting used to LSWC too. They don't bat an eyelid now when temporary masts are being erected for contests. The club's van and mast are often on the move to various fetes, galas and open days around the area. Villagers did view the club's activities as somewhat eccentric when the shack was first built. Now club members play an active part in the social club and enjoy many of the activities that take place there along with local villagers.

The club continues to go from strength and hopes to continue spreading the word about Amateur Radio in this community for many years to come. So, come along and join in the fun – you'll be made very welcome! ●

Fig. 6: Repeater antennas on the top of Lincoln Cathedral.

Fig. 7: Former chairman Peter Kendall M0EJL with actor Richard Todd OBE (right) at the opening of the East Kirkby Heritage Centre Radio Museum.

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Ben Nock's

valve & vintage

This month Ben Nock G4BXD looks at a well known Eddystone receiver, and starts restoring an HRO NC-100.

Once again it's my turn at opening up the *Valve & Vintage* (*V&V*) shop and it's very nice to be here as usual. We should be well into summer now though at the time of writing this there hasn't been much sun to speak of! Hopefully I can get to a few rallies this year and locate new examples for the 'Kidderminster Kollection' but not to worry, I've still found some new items for this edition.

Eddystone Magic

A recent arrival at the Kollection was another example of Eddystone's very popular receiver of the late 1940s and early 1950s, the S640 general coverage set. This receiver tunes 1.7 to 31MHz in three bands and it employs nine octal-based valves with a superhet design. It features a 1.6MHz intermediate frequency (i.f.) and interestingly provides a good band-spread facility for the Amateur bands.

There were something like 4000 of the 640 receivers produced by Eddystone between 1947 and 1949 at an initial cost of a staggering £42. This included the then equivalent of VAT called Purchase Tax. However, in 1948 the receiver, and all receivers with a beat frequency oscillator (b.f.o.), became tax exempt and the price of the receiver fell to a mere £27 and 10 Shillings. Incidentally, a quick search on the web for a price comparison gave £42 in 1948 as equal to just over £1000 in today's money!

As with many of the sets on sale today the 'optional' extra was also available at a price and included the famous round loudspeaker and the small plug-in S-meter unit. Both these items are much sought after by collectors today to finish off the appearance of these sets.

On arrival the set, **Fig. 1**, was placed on the bench and I connected it to the mains via a variable transformer, the voltage being increased slowly while the high tension (h.t.) was monitored on a test meter and a watchful eye kept on things. All seemed quite well as noise was coming from the loudspeaker, although several controls were quite noisy, in that they crackled when operated (obviously the set had not been used for some time).

I connecting a short length of wire as an antenna and while tuning around signals across the three bands were heard – but the operation of the radio frequency (r.f.) gain control produced some very weird effects. It was as if the set was a regeneration type receiver, advancing the r.f. gain increased the gain and the set then suddenly burst into self-oscillation with whistles and squeals. Faults of this nature are usually indicative of de-coupling problems, faulty capacitors or earth connections.

I then proceeded to waste two days chasing the fault, which was as it turned out, was non existent capacitor problem! So, I changed all the de-couplers around the i.f. stages, checked the earth connection and the screened cables with no solution. I then noticed that as I placed a finger

Fig. 1: The S640 in its distinctive Eddystone styling.

Fig. 2: The foil wrapped i.f. valves, now quietly doing their jobs!

near to the grid top cap of the 2nd i.f. amplifier valve, a strange change in the self-oscillating frequency occurred.

Further investigation led me to the conclusion it was not a capacitor fault directly but one of stray capacitance. The valves used in the i.f. stages are EF39 types, these have a red outer coating on the glass, which is in fact an earth screen. Wrapping the two valves in tin foil, **Fig. 2**, and securely grounding it to earth stopped the self-oscillation completely, the r.f. gain control works as it should and peace has been restored. New, old stock (NOS) valves would had the same effect but I didn't have any in my stores.

I then gave the receiver a quick tweak on the alignment of the r.f. and mixer tuned circuits and it's performing quite well now. The dial plate, though, has the odd effect of what looks like a varnish covering actually lifting and peeling away. The lettering looks to be okay, so once I find out how to get the front off I can clean it up. Another nice example for the 'Kollection'.

Fig. 3: The NC-100 receiver, with the very familiar tuning knob.

National Radio

Another recent purchase for the Kollection was a National receiver, a company better known for producing the HRO receiver that many readers will be familiar with. This set, the NC-100 was produced from 1936 onwards and has many similarities with the HRO with the exception of the band change. As most readers will know the HRO uses plug-in coil packs. The NC-100 actually carries all the coils it needs internally but its band switching is quite different to normal.

The receiver, **Fig. 3**, uses 12 valves in a single conversion superheterodyne design. The NC-100 is a general coverage receiver covering from 540kHz to 30MHz in five bands. There was another model, the NC-101X, which only covered the Amateur bands.

One stage of r.f. amplification and two stages of i.f. amplification are used with low-loss insulation and high-*Q* coils. These were said to give the set ample sensitivity and selectivity while a 6E5 tuning indicator valve, with provision for signal strength measurement and provides an added convenience.

The NC-100 tuning ranges are in fact: 0.54 - 1.3MHz, 1.3 - 2.8MHz, 2.7 - 6.4MHz, 5.9 - 14.4MHz and 13.5 - 30MHz. While the NC-100 was available with or without a crystal filter the NC-101X was built and designed strictly for the Amateur bands and covered the 1.8, 3.5, 7.0, 14.0 and 28MHz amateur bands and had the crystal filter fitted as standard.

The method of band switching on this receiver uses a tray of coils, **Fig. 4**, which is mounted on a rail and moved using a rack and pinion gear system. The coils are in effect plug-in and as the tray is moved the coil pins engage in sockets fixed to the set's chassis. The tray holds five sets of three coils, for the r.f., mixer and oscillator circuits and the knob has a positive 'locked' feeling when they are correctly engaged. Additionally, the screen voltage to the receiver's r.f. and i.f. valves is also connected when the tray is in the correct position by an extra set of contacts.

When I received the set it was apparent that quite a few modifications had already been done to the set, see **Fig. 5**. The i.f. transformers (i.f.t.s). had been changed, from the nicely canned NC stamped ones to some rather inferior Maxi-*Q* types. The audio driver

Fig. 4: The NC-100's unusual coil switching arrangement.

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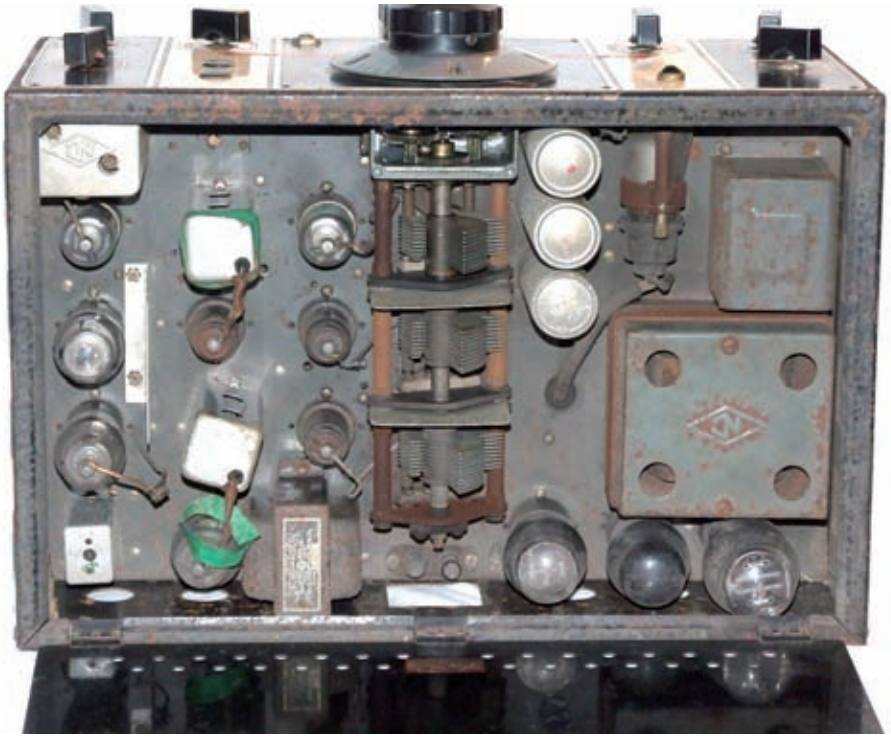

Fig. 5: The internal view of the NC-100 as the set arrived on Ben's bench.

transformer had been replaced and an electrical examination revealed the mains transformer was dead as were all the on/off toggle switches used in the set. Obviously it was going to be a demanding restoration project!

At the time of writing this column I've managed to complete quite a lot of work on the set. I purchased a new set of valves for the receiver, amazingly, even in these dire economic times, I was able to buy the valves from the USA, and pay postage, more cheaply than I could find them in the UK! I have changed all the old capacitors as a matter of course and after a couple of web-based collector group postings, I managed to purchase a set of i.f. transformers and the crystal filter unit from an HRO someone was breaking up.

From photographs in the NC-100 manual its i.f.t.s appeared to be the same as used in the HRO. These I have fitted, **Fig. 6**, and the set is working very well. There was a slight problem with the crystal filter unit though. In the HRO the actual crystal sits on top of the filter box. In the NC-100 there's not enough headroom and the photo in the manual shows the crystal mounted on the side of the box. So, I had to drill and mount a holder to the side wall and after a little persuasion the crystal is now in place.

The audio side of the set is a 6C5 detector, which drives a pair of 6F6 valves in push-pull via a coupling transformer. This transformer had already been changed previously and tests to it made me feel it was also faulty. As finding a suitable replacement was unlikely, I decided to replace one of the 6F6 output valves with another 6C5 wired as an audio pre-amplifier and simply use the remaining 6F6 as a single ended output stage. This proved an excellent solution and the audio output and the gain is more than adequate.

I have still to find a replacement mains transformer, find out why the automatic gain control (a.g.c.) is not functioning and change a further two special on/off toggle switches. I then need to give the set a full alignment and touch-up the paint job but all in all I am very pleased with the results. So far, it should prove to be a worthwhile job.

And Finally

Well that's about it for my latest stint at the V&V shop. I hope you've enjoyed the selection I have bought you and there are more pictures at **www.qsl.net/g4bxd**

As always I can be contacted at my E-mail address **military1944@aol.com**
Cheerio for now! ●

Fig. 6: Part way through internal restoration, although Ben thinks there's still much more to be done!

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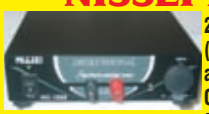
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PL-259 - PL-259	4m	£14.99
PL-259 - PL-259	20m	£49.99
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A fully adjustable deluxe desktop stand for hand-helds. Includes BNC to SO-239 lead.

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

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

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No tuning required

2m/5 element	No tuning required	SO-239 feed..... £39.99
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Q-TEK COLINEARS (VHF/UHF)

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X-300 GF 144/70,6.5/9dB (3m)..... £69.95
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4-way guy ring £6.99
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PL-259 (small of large entry) £1.50
N-type plugs (high quality) £4.50
1¼" 6 foot ally poles..... £13.00
1¼" 6 foot "cranked" ally pole..... £14.99

Feature

The G5UM Receiver Revisited

The (then) state of the art EF50 valve featured an all-glass B9G-based valve, within an aluminium screening can.

The August 1946 issue of the *Short Wave Magazine* carried an article by **Jack Hum G5UM** for a three-valved straight receiver. This receiver covered 1.8MHz to the old 56MHz band and used the then readily available very high gain EF50 very high frequency (v.h.f.) valve, **Fig. 1**. It was obviously a popular project as a follow up article appeared in the July 1947 issue of *SWM*.

Recently a friend of mine, who is an experienced constructor, made this receiver but owing to family problems was unable to complete the project. He gave it to me with the comment, "It's sort of working but the r.f. amplifier oscillates – have some fun!"

Getting The G5UM Working

My friend had built the G5UM design receiver for 1.8 and 3.5MHz (160/80m) and had made an excellent job. As is to be expected nowadays, he had made a few minor changes to use what was in his junk box but these didn't appear to be the cause of the oscillating radio frequency (r.f.) stage.

Jack G5UM's article did not give a layout, but did stress the need for good screening. From my own dim past, I remembered that it was a good idea to put an earthed screen across the base of an EF50 r.f. amplifier (pins 4, 8 and the central pin) and this hadn't been done. The r.f. amplifier ceased oscillating when this screen was fitted. I also decided to use the receiver on 3.5MHz only and wanted to take advantage of my dipole. So, I made a new coil for the r.f. amplifier to give a better match to the dipole.

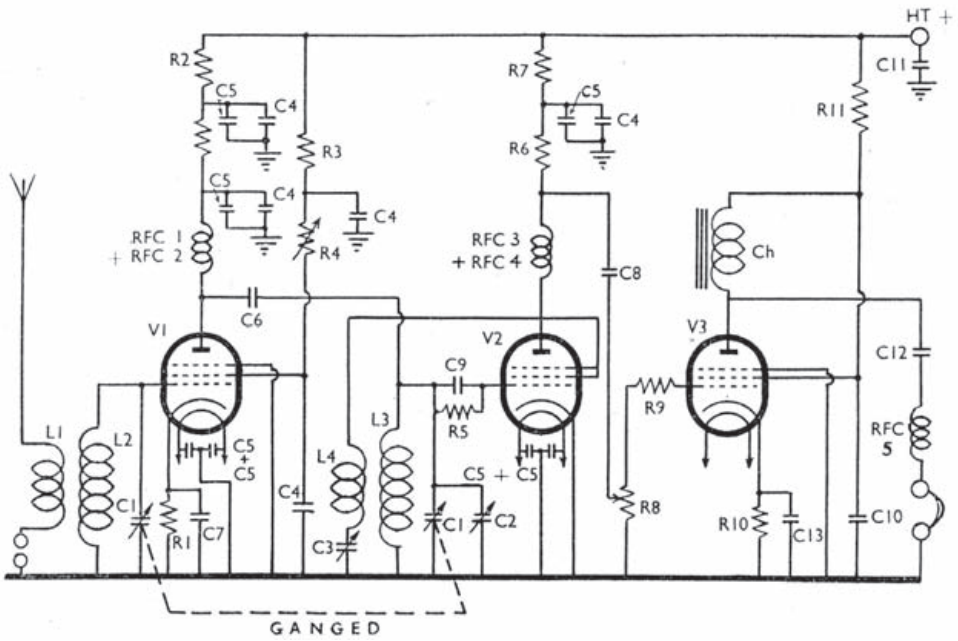


Fig. 1: The circuit of the original EF50 receiver by Jack Hum G5UM, that appeared in the July 1947 issue of* Short Wave Magazine *(reprints of the original article are available from the editorial offices – see the PW Book Service pages).

Gerald Stancey G3MCK takes another look at a receiver design by Jack – 'Uncle Mike' Hum G5UM that became a classic.

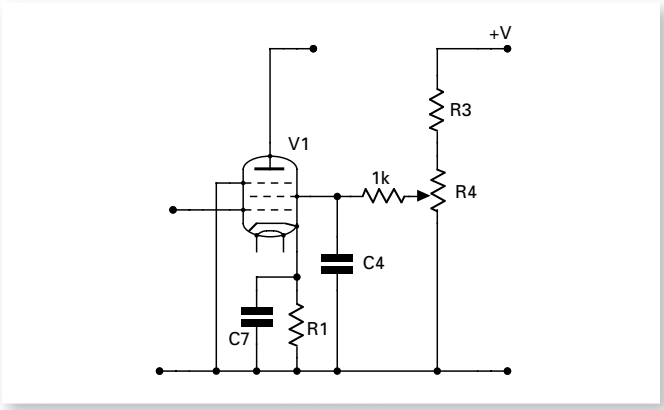


Fig. 2: Gerald changed the r.f. gain circuit to this one, and that improved the control.

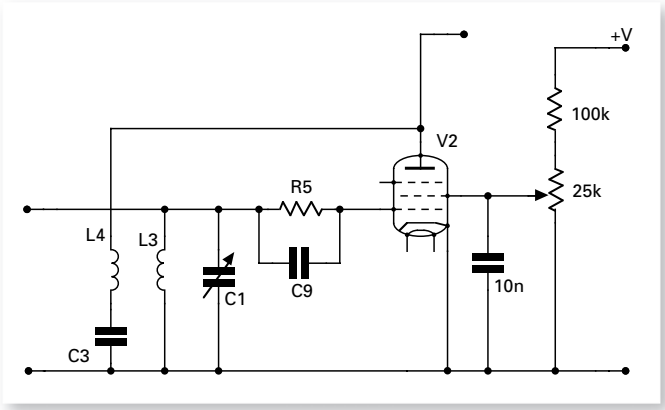
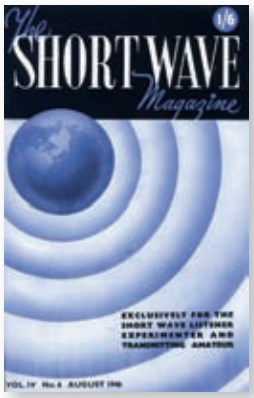


Fig. 3: Similar changes to the detector stage, improved control over the regeneration control.

The receiver then worked but only after 40-70dB of attenuation was inserted into the feeder and the r.f. gain control didn't work either. The circuit as shown in the original article had always puzzled me and I now believe that it was wrongly printed, because changing it to the more conventional potentiometer arrangement cured the problem. To aid stability, the capacitor C4 was mounted on the valve base and a 1kΩ resistor was added to improve the decoupling, **Fig. 2**.

With plenty of gain in hand I reduced the loading on the detector by changing C6 to 2.2 pF. I also changed C9 to 56 pF and made R5 4.7MΩ. However, I am not sure that these changes made much difference! The reaction wasn't too smooth, so I altered the circuit to that shown in **Fig. 3**. Incidentally, the values of C3 and the resistor network were chosen by trial and error.



Evaluating The Receiver

So, how does the G5UM receiver perform 60 years later? The answer is very well! It's amazingly quiet, at times when testing with a signal generator I've had to check that it was switched on!

On the air amplitude modulation (a.m.), c.w. (Morse telegraphy) and single sideband (s.s.b.) are easily resolved. However, it's on c.w. where it really shines and I would be happy to use it for normal 3.5MHz operating. The c.w. signals have a clarity that you do not get with modern receivers – and while many signals can be heard at the same time the wanted one seems to stand out in front of the rest – a sort of audio three dimensional (3D) effect.

When appraising an older design not only should the reviewer say how it performs today, but they should also try to understand the circumstances when it was made. For example, 60 years ago the EF50 was freely available and very cheap, the junk shops had tea-chests full of them from which you helped yourself – indeed they practically paid you to take them away!

Not all the Amateur bands (the modern WARC bands of 10, 18, and 24MHz hadn't been thought of!) had been released and 28MHz (10m) was **the band** to operate on! I suspect that Jack G5UM optimised the design for 28 and 56MHz and obviously made full use of the wonderful EF50, the likes of which had never been seen before in Amateur circles. Today, if I was making a tuned radio frequency (t.r.f.) receiver from for the low frequency (l.f.) bands I would use a 6K7 for the r.f. amplifier. It has enough gain and being doubled-ended makes screening the input and output circuits very easy.

Article Acknowledgements

I would like to acknowledge and thank **Don Bullett G3EAO**, **Colin Turner G3VTT** and **Michael Lee G3VYF** for their help and encouragement – but stress that the views expressed in this article are mine – and mine alone. ●

Colin Redwood's

what next?

Colin Redwood G6MXL takes a look at the various factors that can effect antenna performance and make or break them!

Last month I looked at one of the most important aspects of an effective antenna system, namely resonance. This month I'm going to look at a few more factors that contribute to an effective antenna system. These are the height above the ground, feeder loss, polarisation and orientation.

Let's look at height above ground first. From a safety point of view, antennas should be mounted at least above head height. It's generally unsafe from both a physical and an electrical point of view, for someone to be able to walk-into and touch an antenna. In addition height is an important consideration at high frequency (h.f.) and very high frequency/ultra high frequency (v.h.f./u.h.f.) but for slightly different reasons.

Height Above Ground

At h.f. the height above the ground will affect the angle of radiation, which in turn will affect how far we can work. However, h.f. antennas that are mounted low to the ground (well below a quarter wave above the ground) will send most of their signals almost vertically up into the ionosphere, from where it will be refracted back down to earth almost vertically. This is fine for making contacts with stations within a few 100km, **Fig. 1**.

To make contacts with stations further afield, the height of the antenna needs to be increased so that more of the signal leaves almost horizontally, so that it will be refracted by the ionosphere many more hundreds of kilometres further from our station. Getting the antenna mounted at least a quarter wavelength above the ground will give some useful amounts of low angle radiation.

At 14MHz (20m) this means getting the antenna 5m (about 16 feet) or higher above the ground, which is quite feasible for most amateurs. On the lower frequency bands such as 3.5MHz (80m), getting an antenna a quarter wave up at 20m (66 feet) is not feasible for most amateurs, who consequently have to settle for working stations on 3.5MHz much closer to home than on 14MHz.

Fig. 2: An aluminium pole that has the end 'swaged' or reduced to allow it to fit inside a similar diameter pole.

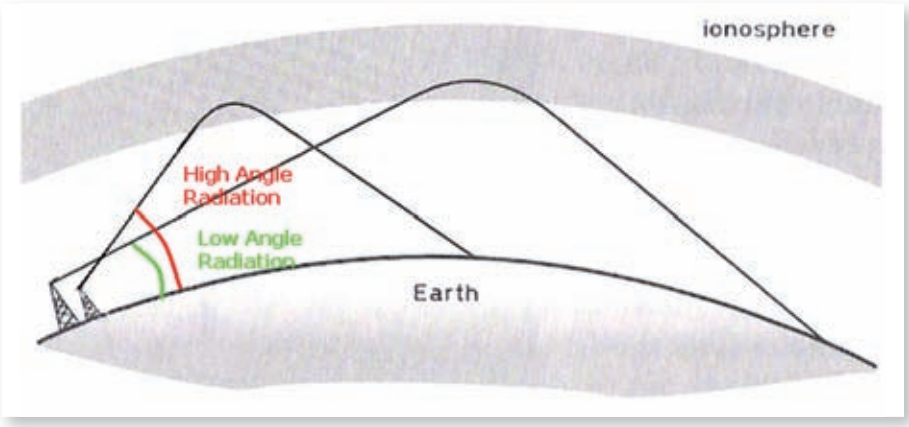


Fig. 1: A diagram showing high and low angles of radiation.

Experiments With Height

Readers who built the 14MHz dipole from last month's *What Next?*, might like to experiment with it at different heights. Try the dipole at say 1m above the ground and see what stations you can work, and then try it at a height of 5m or higher above the ground and see if you can work more distant stations. Be careful when operating the antenna at low heights that nobody trips over the antenna or touches it.

At v.h.f. and u.h.f. the height is also important, but for somewhat different reasons to h.f. Local obstructions like the neighbours shed, houses and local vegetation will all attenuate signals at v.h.f. Raising the height of the antenna will start to clear these local obstructions. The higher the antenna, the more obstructions are cleared and hence the transmitted signal locally is stronger.

The small back garden of my QTH is barely 10m by 10m. So, if I had permission to put in a large mast or tower, this structure would totally dominate the space, and the neighbours' properties too! However, I was determined to get on the air as best I could.

At a local rally, I purchased a set of 4 x 1.5m (5ft) aluminium swaged poles which slot into each other. These I hoped would support either the middle or the end of an h.f. dipole for 14MHz (20m). I also bought the smallest triple-band vertical I could find that operates on 50MHz (6m), 145MHz (2m) and 433 MHz (70cm) bands. This was mounted on top.

Maximum & Minimum

If as a *What Next?* reader, you're thinking of doing the same as I did with pole, you should check the pole

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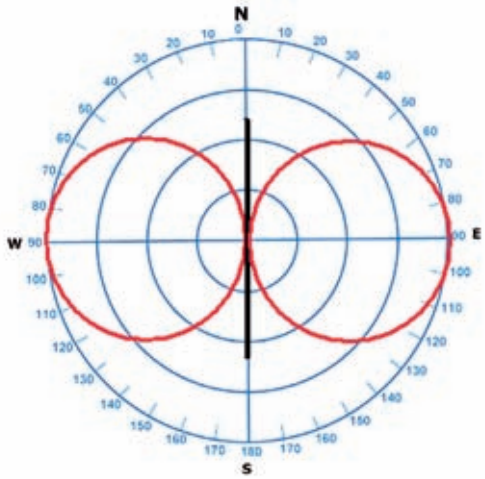

Fig. 3: East-west maximum radiation directions with a dipole mounted north-south (black line).

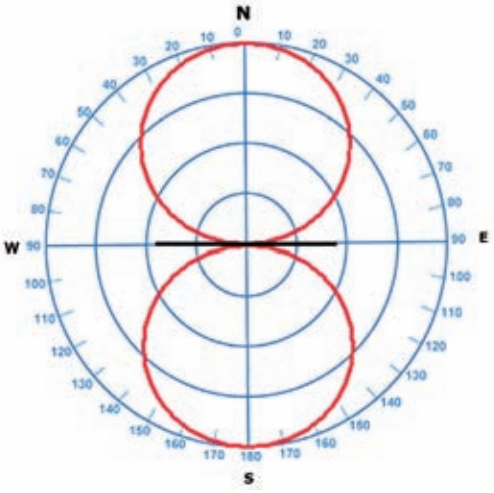

Fig. 4: North-south radiation pattern (red lobes) with a dipole mounted east-west (black line).

minimum and maximum diameter that's suitable for the antenna clamps. Most antenna clamps require a minimum pole size of about 32mm (1.25 inches) as shown in **Fig. 2**.

Initially I installed antenna on the top of just two of the poles and fed it with 20m of RG58 coaxial feeder. On connecting this to an old 433MHz (70cm) f.m. transceiver I was quite disappointed with the results. I could just get into the **GB3SD** repeater between Dorchester and Weymouth some 40km away, and I couldn't even hear **GB3SZ** in Bournemouth about 12km away.

I decided to raise the height of the antenna by installing a third section. This enabled me to hear and get into GB3SZ, but it was very noisy with me. Raising the antenna again by installing a fourth section helped – I could now reliably get into both repeaters, but they were still not fully quieting (there was still some noise).

I lived with this set up for some weeks, until I did some checks on the feeder loss. In good condition, 20m of RG58 has a feeder loss of 8dB, so only about 15% of the power that the transmitter produced was getting to the antenna. I used 10W in the shack, so only about 1.5W would get to the antenna.

Likewise, only about 15% of the signal received by the antenna could be getting to the receiver. By replacing the RG58 feeder with the thicker UR67 feeder, the losses dropped from around 8dB to about 3dB, so that 50% of the power of the transmitter now gets to the antenna and 50% of the signal received at the antenna gets to the receiver.

Lower Loss Feeder

Using the lower loss feeder, the improvements are quite dramatic. Both repeaters are both fully quieting. In addition, I can open both repeaters reliably.

Incidentally, don't forget that as you reduce the loss due to the feeder, you may find that the s.w.r. appears to increase. High feeder loss can mask a high s.w.r. in the antenna. Less of the forward power actually gets to the antenna (due to the feeder loss), and any that is reflected back down the feeder is also attenuated by the feeder loss. A double Whammy!

Antenna polarisation is also an important consideration on the v.h.f. bands. If you are using a vertically polarised antenna, and the station you want to work is using a horizontally polarised antenna, then you will find that you will both be very weak signals with each other. If you both use the same antenna polarisation, then the signal strengths will be much stronger.

You can easily prove this apparent loss of signal strength, by making a 145MHz (2m) dipole. Try mounting it horizontally and trying to get into your local 145MHz repeater (which all use vertical polarisation). Even if you can get into it, you will find that it is much weaker with you than if you mount the dipole vertically.

Over the years the almost universally accepted practice on the v.h.f. and u.h.f. bands is that local f.m. contacts are made using vertically polarised antennas, and that s.s.b. and c.w. contacts are made using horizontally polarised antennas.

Not As Important On HF

Antenna polarisation is less important on the h.f. bands than it is on the v.h.f. and u.h.f. bands. The main reason for this is that at h.f. the polarisation of the signal is twisted once a signal has been refracted by the ionosphere.

There is one further aspect to many antennas that is worth considering – orientation. A horizontally polarised dipole will radiate strongly at right angles to the wire. However the radiation in the direction along the length of the wire can be quite weak. Thus a dipole running North-South will generally not give good results to the North and South.

So *What Next?* readers in the South of England for example wanting to make contacts with Scotland should mount their dipole in an East-West orientation **Fig. 3**. Conversely, readers who wish to make contacts with stations in Eastern Europe should mount their dipole North-South **Fig. 4**.

To help orientate antennas (whether they be simple dipoles or large multi-element arrays), Great Circle maps are produced. These show the world

with a given location in the centre. It is important to appreciate that the direction to many places may not be as many of us would expect.

For example, I expect that many of us would think that Alaska is in a broadly North West direction form the UK, whereas in reality the shortest route to Alaska from the UK is actually directly North over the North Pole, **Fig. 5**.

If you find that the only way you can fit a dipole in your garden is in the 'wrong' orientation, you may find that by sloping it, so that one end is much higher than the other, will help, **Fig. 6**.

To sum up then, a resonant antenna, mounted high up, and orientated optimally is a very good start for h.f. For the v.h.f. and u.h.f. bands, polarisation and low loss feeder are also important considerations.

Actually, I'm sure that for many *What Next?* readers, it will not be possible to mount a dipole for the 3.5 MHz (80m) band at a height of 20m! Nevertheless, I think it is useful to at least have an understanding of the key factors so that a balance of compromises can be arrived at.

Next month I will be looking at some practical considerations for a more permanent antenna installation, including waterproofing connections and how to get the feeder from outside back into the shack. Then *What Next?* readers should be able to get plenty of contacts if there is propagation and activity on their chosen bands.

Whatever you are doing with antennas, please remember to carry out your work safely. You should certainly have someone else to hold any ladders you are using. Have a read through the safety sections of the Foundation, Intermediate and Advanced Licence courses – I certainly don't want to lose any *What Next?* readers! ●

Fig. 5: Great Circle Map centred on the UK as may be found and created on the Internet.

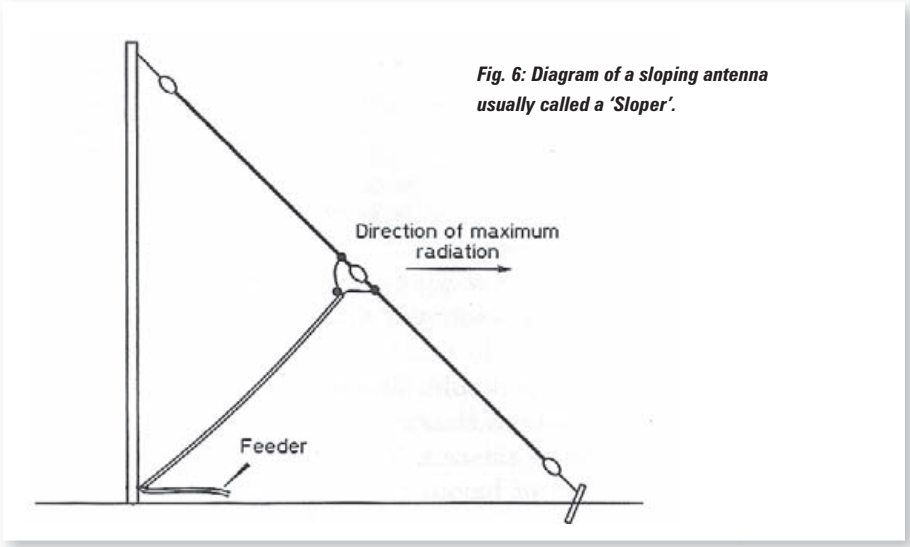

Fig. 6: Diagram of a sloping antenna usually called a 'Sloper'.

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

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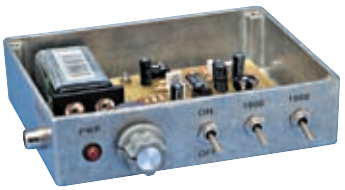

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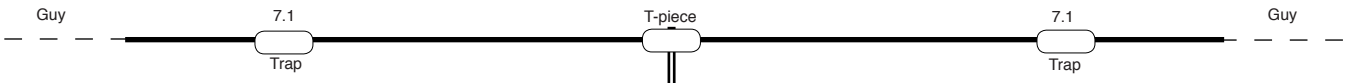

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David Butler G4ASR
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Lower Maescoed
Herefordshire HR2 0HP
Tel: (01873) 860679
E-mail: g4asr@btinternet.com

This month David Butler G4ASR has reports of numerous DX contacts being made on the 50, 70 and 144MHz bands.

It was really surprising to observe such a dramatic change in v.h.f. propagation during the transition from April to May. Propagation, up until April 30th was fairly quiet, but come 1st of May this all completely changed. It really was just as if an ionospheric switch had been thrown. There were Sporadic-E (Sp-E) openings on the 50MHz band every day during May (except for four days) with contacts being made extensively throughout Europe and into Africa, Asia, North and South America.

One UK station even reported a contact with Peru over 10,000km away. Propagation was also very good on the 70MHz band with Sp-E openings being reported during 11 days in May. At times the conditions were excellent, enabling contacts to be made over paths approaching 2700km. And it didn't stop at the 'Four-metre' band either, many DX operators reported a Sp-E opening on the 144MHz band with contacts being made over 2300km away! Interestingly there were even further distances to be worked via the regular marine path to the Azores and Canary Islands with tropospheric (tropo) contacts being made on the 144MHz band to stations over 2600km distant.

The 50MHz Band

Apart from four days (5th, 6th, 7th and 27th) there were Sp-E openings reported every day on the 50MHz band during the month of May and my records show that over 60 DXCC countries were worked by UK stations. The vast majority of contacts were single-hop paths throughout Europe but there were occasions when stations a bit further afield could be contacted. On May 21st the station of TN5SN (Congo JI75) put in an appearance, presumably via multi-hop Sp-E.

A somewhat similar occurrence was reported on May 28th, when the station of TR8CA (Gabon JJ40) was worked by a few stations in southern England. Most unusual was a report that the 50MHz station of OA4TT (Peru FH16) had made a few c.w. contacts into the UK during the evenings of May 28th and 29th. I'm not sure what the propagation mode would have been but at over 10,000km it is most unlikely to have been multi-hop Sp-E for the entirety of the path.

The first transatlantic opening of the 2009 season was reported on May 30th for the two hours between 1200-1400UTC and then later in the day between 1730-1900UTC. Stations in G, GI, GM and GW reported making c.w. and s.s.b. contacts with HI3TEJ (Dominican Republic), KP3PT, KP3RE, KP4BJB, KP4EIT, KP4SQ, NP3CW, WP3UX, WP4G, WP4U (Puerto Rico), WP2B (Virgin Islands) and AA4W, AC4TO, KE4WBO, W4SO, W4VQ and W9DR (USA).

Chris Hore G6GWX (Cornwall IO70) mentions that he has been off the air for 20 years but returned to the 50MHz band to find it alive and kicking with signals! His system consists of a Yaesu FT-767GX transceiver with a transverter running 10W into a vertical dipole. During May he managed to work 14 countries with s.s.b. contacts that included the stations of CN8KD (Morocco), DJ6OI (Germany), E77DX (Bosnia-Herzegovina), EA7AHA (Spain), EA8YT (Canary Islands), HA6NL (Hungary), HE8HLM (Switzerland), IW0SAF (Italy), LA5YJ (Norway), OE9MON (Austria), OZ6PI (Denmark), S53CC (Slovenia), 7S6W (Sweden) and 9A2QG (Croatia).

The 70MHz Band

The first 70MHz Sp-E opening of 2009 occurred for a short period between 0830-0900UTC on Wednesday May 13th. Stations in Wales (GW) contacted OK1MAC (Czech Republic JN79) and stations in Scotland (GM) contacted 9A4QV (Croatia JN75). Surprisingly the first summer 70MHz Sp-E opening in 2008 also occurred on May 13th! (*Perhaps, that's because it wasn't a Friday!* Ed.)

Although the first opening of the season on May 13th was quite brief there were nine other days of 70MHz openings that occurred on 15th, 16th, 17th, 22nd, 24th, 25th, 28th, 29th and 31st. Of these the best openings were reported as being those taking place on May 17th and 25th. The event on May 17th occurred between 1500-1900UTC and up until the final hour was an almost exclusive 'Greek' affair.

Contacts on the 70MHz were made over paths in excess of 2000km to the stations of SV1DH (KM18), SV2DCD (KM00), whose antenna system is shown in the photograph, **Fig. 1** and SV3BSF (KM08). The SV1FOUR (KM27) beacon operating on 70.040MHz was also heard by many stations. During the last hour of the opening the stations of S51DI (Slovenia JN76), 9A1Z (Croatia JN86) and 9A6R (JN83) were also active and heard making s.s.b. contacts with many UK operators.

The 70MHz opening on May 25th was quite extensive lasting for five hours between 1500-2000UTC. Stations over much of the UK (apart from Northern Ireland) were reported to have made QSOs into Croatia (9A), Czech Republic (OK), Greece (SV), Slovenia (S5) and Portugal (CT). Amongst the stations worked were CT1FJC, CT1HZE, OK1DO, OK1KT, OK1MAC, OK1TEH, OK2POI, SV1DH, SV2RM, SV3BSF, S51DI, S57A, 9A2D, 9A2SB, 9A2WA, 9A2ZH, 9A3LN, 9A6R and 9A6Z.

Alastair Campbell GM3NKG in the IO85 square of Lanarkshire, reports that he caught 70MHz Sp-E openings on May 13th when he contacted the

Fig. 1: The v.h.f. antennas at the QTH of SV2DCD.

station of 9A4QV and on May 25th, when he worked stations in Croatia, Czech Republic, Greece and Slovenia. Earlier in the month he made a meteor scatter contact with the portable station of LX/PA5DD/P (Luxembourg JO20) to bring his 70MHz locator squares to a total to 62 since March 2008.

The 144MHz Band

A favourable amount of activity was reported on the 144MHz band during May. Operators mentioned making DX contacts via tropospheric propagation into Scandinavia and the nearer reaches of continental Europe and the regular marine ducting into the Azores and Canary Islands. Conditions, higher up in the ionosphere for the the summer modes of Sporadic-E, Ionospheric-scatter and field-aligned irregularities (f.a.i.) were also reported, as were contacts via meteor scatter (m.s.), moonbounce (e.m.e.) and a variety of low-earth orbiting (l.e.o.) amateur satellites.

Conventional tropo openings during May were not particularly extensive, but nevertheless if you were prepared to dig around a bit into the noise, there was always some long-distance stations (DX) to be found.

On the May 1st and 2nd, there was an IARU Region-1 144MHz contest and this created a reasonable amount of activity. Some of the stations contacted from the UK during this 24-hour event included DR1H (Germany JN59), DR2X (JN40), DR9A (JO48), EA1DDU (Spain IN73), EA1FDI/P (IN52), EA2DR/1 (IN83), HB9CQL (Switzerland JN37), HB9G/P (JN36), HB9TTY (JN46), LX/PA3GVI/P (Luxembourg JN39), OK1AY/P (Czech Republic JN69) and OL3Y/P (JN69).

There were also, at other times during the month, a few tropo openings that lasted only a matter of hours. Your reports mention contacts being made on c.w. and s.s.b. with the 144MHz stations of EA1MX (Spain IN73), EB1EHO (IN73), EB1LA (IN63), OK1TEH (Czech Republic JO70), OZ5AGQ (Denmark JO65), SK7MW (Sweden JO65), SM7FMX (JO65), SM7GVF (JO77) and SP1FJZ (Poland JO84). On May 13th the station of OY4TN (Faroe Islands IP62) reported working the stations of GM0HTT, GM4ILS, GM4IPD/P and MM3LSO over the 600km sea path.

Dave Bowen 2W0ZJA reports that on May 2nd he operated his portable 144MHz station from a location near Brecon (IO81), South Wales. He was using a Yaesu FT-857D transceiver running 50W into a 7-element Yagi and was thrilled to make s.s.b. contacts with the stations of DF0MU (JO32), F5SGT/P (IN88), F6KCP/P (IN87), F8KTH/P (JN18), ON4MCL (JO21), ON4WY (JO11), OQ4U (JO20) and PI4GN (JO33).

Tropo propagation was also very good on higher frequency bands. **Jeremy Smith M0XVF** (County Durham IO94) mentions that on May 30th, after putting out a number of 'CQ' calls on 433.500MHz f.m. he received a reply from LA5ZO/P on an oil platform in the North Sea! Both stations then moved to 433.525MHz to conduct a 59+ contact for over 15-minutes before the propagation suddenly faded away. Jeremy reports that although he has had contacts all over the world on h.f., that f.m. contact counts as his best ever.

Marine Tropo

I've mentioned on numerous occasions that v.h.f. operators located in the UK are very fortunate, as the British Isles are surrounded by water (of course) and at certain times during the summer months specific tropo paths can, and do form, enabling

contacts to be made over, what would be otherwise quite unimaginable distances.

The path that produces the longest distance tropo contacts from the UK is associated with the 'Azores High'. The Azores High (also known as the Azores anticyclone) is a semi-permanent anti-cyclonic region with relatively consistent high pressure of subsiding air over the Atlantic Ocean. In the summer it moves northwards and has a major impact upon the climate of Europe.

The pressure centre of the Azores High shifts towards the Iberian Peninsula and a ridge of higher pressure may build across France, northern Germany and even the south-eastern UK. When the pressure ridge forms, that's when stations in southern England, Wales and Ireland often make contact with stations in the Azores (CU) and Canary Islands (EA8) over distances of 3000km. During the winter months, the Azores High moves to the south of the Azores and fluctuations in pressure result in more variable weather and disruption to this long-distance propagation path.

On May 4th and 5th, the conditions were just right to allow 144MHz propagation to the Azores. The station of **Tim Fern G4LOH** (Cornwall IO70) first heard the CU8DUB beacon (HM49) at 1305UTC on 4th May. The beacon operating on 144.420MHz was peaking 529 over a path length of 2344km. A few minutes later the CU2VHF beacon (HM77) was also heard. This was operating on 144.401MHz and was copied at 539 over the 2123km path. A number of CQ calls were put out and at 1332UTC a two-way contact with the station of CU3EQ (HM68) was established on c.w. at 529 over a path of 2145km.

The two beacons continued to be copied over the following three hours before fading out. On 5th May between 1515-1715UTC the CU2VHF beacon was copied by the station of **Dave Edwards G7RAU** (Isle of Wight IO90). It was very weak, just popping out of the noise at 329, over the 2400km path. The CU8DUB beacon, at 2630km, was much stronger peaking 559 but unfortunately no other activity was heard from the Azores at this time. Tim G4LOH mentions that at the end of the month the marine path opened up this time to the Canary Islands. On May 27th at 1820UTC he worked the 144MHz s.s.b. station of EA8TX (IL18) at 2604km and a few days later on May 31st at 1115UTC he contacted EA8AVI (IL28) on c.w over a 2600km path.

Sporadic-E on 144MHz

The first Sporadic-E opening of 2009 to reach the 144MHz band, occurred on Sunday May 17th between 1715-1800UTC. The 50MHz band had been open since 0630UTC that day, extensively to the south-east of the UK. And at around 1500UTC the 70MHz band had opened up in a similar direction. The rise in the maximum usable frequency (m.u.f.) continued and by 1600UTC stations were reporting hearing Greek f.m. broadcast stations around 106MHz. The 144MHz opening to Bulgaria (LZ), Romania (YO) and Serbia (YU) favoured stations located in southern England and Wales as shown in the diagram, **Fig. 2.**

Dave G7RAU using a Yaesu FT-757 transceiver with a Mutek replacement front-end, a 400W amplifier and a 12-element Yagi contacted the s.s.b. stations of YU1EV (1745km), YU1IO (1772km), LZ2ZY (1993km), YO9FXQ (2097km), LZ2RBB (2207km), LZ1ZX (2306km) and best DX of the event LZ3GM at 2365km. **Jamie Ashford GW7SMV** (Gwent IO81) comments that it was great to catch his first Sp-E opening of the year although he did suffer somewhat from S9 rain static. Jamie, running an Icom IC-910H transceiver and a 12-element Yagi, was pleased to contact LZ1AG (KN22) at 2336km for a new locator square.

The 144MHz station of **Angel Nestorov LZ1AG** (Bulgaria KN22) consists of an Icom IC-706Mk2 transceiver, 200W and a 12-element Yagi. He made a total of 33 s.s.b. contacts with the UK stations of 2E0RCV, G0JJG, G0PQF, G3YDY, G4AEP, G4CLA, G4EAT, G4KIL, G4PCS, G4RGK, G4ZFJ, G6DKS, G6HKS, G8XIR, M0BPQ and GW7SMV. He also made contacts with stations in Belgium, Germany and the Netherlands.

Deadlines

That's it again for this month. The summer Sporadic-E season is in full flow and you can expect daily openings on both the 50MHz and 70MHz band to all parts of Europe and beyond. Openings on the 144MHz band can also be anticipated during July but are far more unpredictable. Keeping your receiver tuned to 144.300MHz s.s.b. is probably one of the easiest ways of catching an opening at this frequency. Alternatively you can log into the DX Cluster and let other operators do the listening for you! When 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

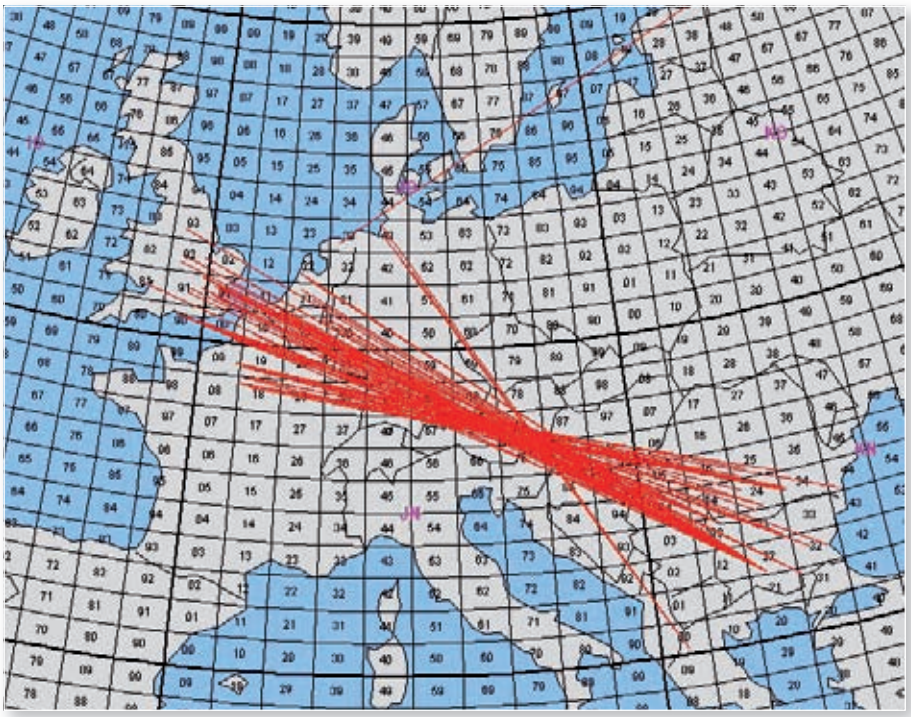
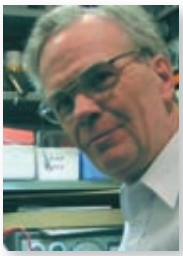


Fig. 2: Path details of the 144MHz Sporadic-E opening on May 17th.



Harry Leeming's

in the shop

Harry Leeming G3LLL discusses tuning up a typical 100W valved power amplifier stage and travels down memory lane.

Welcome to *In The Shop* (*ITS*), where I'm aiming to answer the often asked question – "Just How do you tune up a typical 100W valved p.a. stage?" When valved p.a. equipped rigs were designed many of the valves used were cheap and of better quality than those now available! Some valves are now difficult to obtain, and as the price has escalated, extreme care should be taken to avoid damaging them.

The instruction in the older manuals tend to advise tuning up at full power for up to ten seconds, but this is just asking for expensive trouble! Many new operators like the idea of operating older equipment, but aren't familiar with valves. They find the tuning up operation rather frightening, and a few even end up E-mailing me for advice. So, to help let's now look at the correct techniques of how to tune up safely.

First the theory – whatever power goes into a valve (or transistor for that matter) will be dissipated as heat, **unless** it is converted into some sort of signal! The pair of output valves in a typical Amateur Radio rig will only be rated at about 25W heat dissipation each. In the continuous wave (c.w.) mode with the key down at maximum drive the direct current (d.c.) input will be around 200W, and the radio frequency (r.f.) output just over 100W. The difference, (70-100W), will heat up the valves, overrunning them by up to 100%.

Fortunately neither c.w. or single sideband (s.s.b.) is a continuous duty mode. So whilst strictly speaking the valves are being overrun, providing that only intermittent modes – and not modes such as slow scan TV (SSTV), frequency modulation (f.m.) or amplitude modulation (a.m.) – are used at full power, and that excessive 'key down time' is avoided, the average heat dissipation inside the valves will be just about within limits.

However, if you run full input power when the output **is not correctly tuned**, this will result in little or no output and nearly 200W of heat will be dissipated inside the valves. Indeed, I've seen plenty of valves that have had this treatment and some have become so hot that the glass melted and was pushed in towards the electrodes by atmospheric pressure, dimple fashion – quite disastrous for the poor old valve!

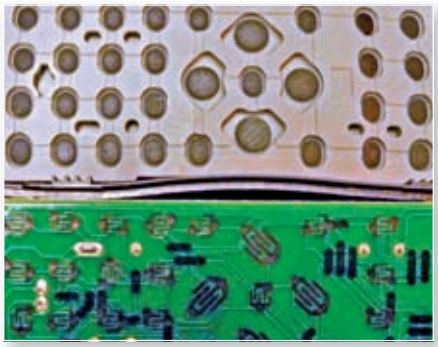


Fig. 1: Inside of a typical VCR remote control.

Dummy Load Required!

The first thing to do is to invest in a dummy load! Once you have had some practice you may be able to manage without one, but for fault tracing, and experimenting, quite apart from reducing interference to others, they are invaluable. Trying to save money and tuning up at first without one can be quite expensive!

Most of the older transceivers are fitted with a 3-way front panel meter switch to monitor the power amplifier (p.a.) cathode current and this is usually marked as **IC**; the p.a. automatic level control feedback is indicated as **ALC**; and the relative r.f. power output as **PO**. However, in my opinion, the PO position should never be used, (unless that is you want your rig and its valves to burn out during tune up!).

Incidentally, just why Yaesu and Trio ever fitted the PO position to the switch evades me! Its use has only served to line the pockets of service engineers and valve suppliers. (So, why should I complain?).

I suggest that – with a typical 100W rig – you should keep the switch in the IC position whilst transmitting, carefully monitoring the current whilst tuning and that you shouldn't allow it to exceed 100mA. (0.1A) for more than about three seconds.

Follow the maker's instructions as far as possible, **but please don't** monitor the r.f. output by switching to PO, and don't manually switch to transmit on the rig. Instead, you should use a push-to-talk (p.t.t.) microphone or a Morse key for switching, so that you can instantly return to receive if anything goes wrong. You should also monitor your r.f. output by using a separate standing wave ratio (s.w.r.) meter/power meter, or the meter in your antenna tuning unit.

As the rig is peaked up into the dummy load, keep backing off the drive/carrier control to keep the p.a. current below the 100mA mark. When you have correctly set the **pre-selector** or **drive tune**, and the **p.a. tune**, and **load**, for a maximum output of somewhere around 5-15W, with the IC indicating below 100mA, only then is it time to have a quick burst at full power!

Next, set the drive or carrier control at maximum and then give a quick burst of one or two seconds in a full power mode such as c.w.. You should get around a 100 to 120W on your power output meter depending on the rig. If it's much less than this, retune the p.a. and load controls while transmitting in quick bursts of two seconds on, and two off, until full power is obtained.

Finally temporarily switch the meter to read ALC, and speak into the microphone while in the s.s.b. mode. Then adjust the pre-selector/drive tune for maximum ALC, and then set the microphone gain so that the meter is just moving nicely. Then switch back to IC.

Next, switch back to tune or c.w., back off the power to the 100mA mark, and then try transmitting into the antenna, adjusting the a.t.u. as necessary to bring the s.w.r. down to below 2 to 1. Finally, try transmitting short bursts at full power into the

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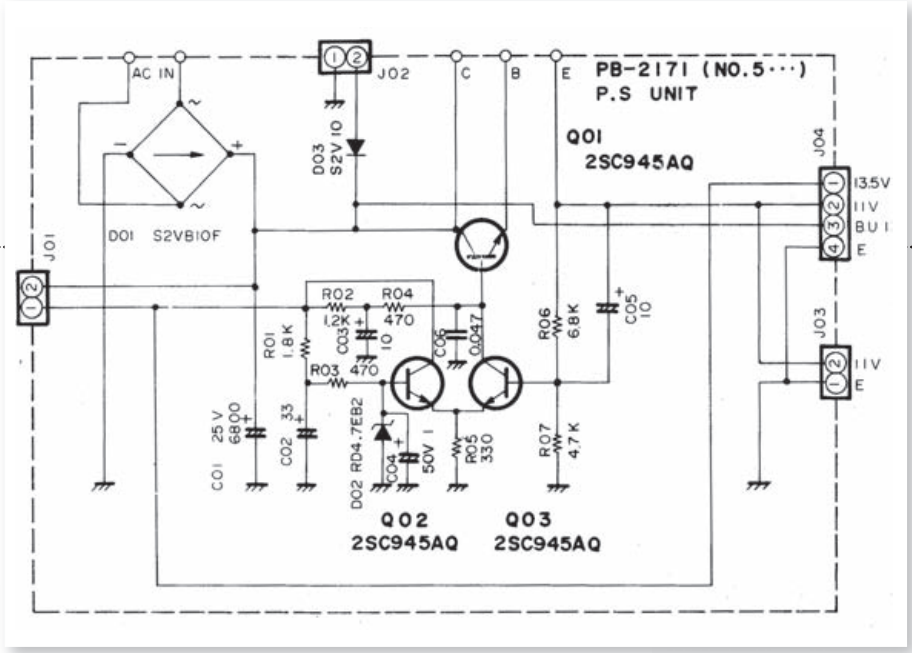


Fig. 2: The FRG-7700 receiver power supply.

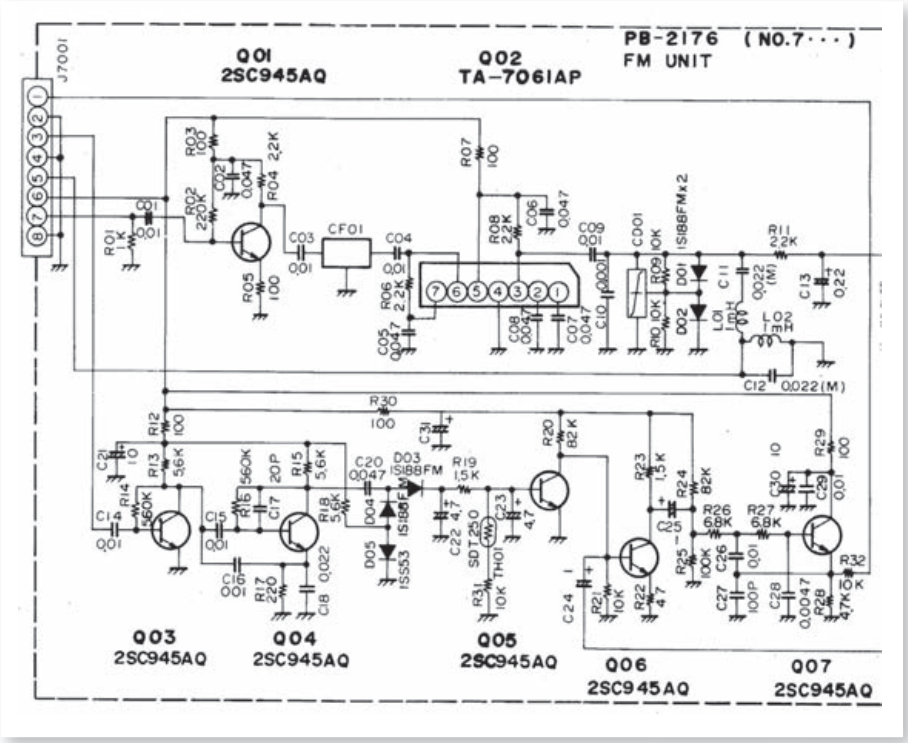


Fig. 3: Improving the audio 'brightness' on the FRG-7700.

antenna and touch up the tune, load, and a.t.u. settings as necessary.

After you've tuned up, at all times while you are transmitting, keep the meter switch in the IC position and keep your eye on it. On some rigs, such as the FT-102, the p.a. current has been known to start creeping up and go into thermal runaway. If this ever happens, switch off quickly to avoid damage, and sort out the problem later. (See *In The Shop* Feb 2007).

Although the process I've described may seem rather long winded, once you have done it a few times and got accustomed to the settings on different bands, you'll find that it comes quite naturally and eventually you'll be able to dispense with the dummy load!

Making Myself Useful

My dear wife **Brenda** puts up with wires and piles of 'junk' gracefully, but I do like to make it clear that my interest in electronics can be useful at times! For example, a few months ago the frequently used buttons such as **Play**, **Stop** and **Rewind** on the remote control for our video recorder started to become unreliable and they had to be pressed a few times before they would operate.

Dismantling the remote control revealed the inside as shown in **Fig 1**. At the top of the picture you can see the reverse side of the push-buttons which consists only of a rubber pad. Exploring with the terminals of an ohm-meter revealed that the pad behind each button is conductive, and that when the button is pressed, it shorts out the terminals shown at the bottom of the photograph.

Further tests with the meter, established that the buttons that were used most, showed a much higher resistance from one side of the pad to the other, compared to those that had not had much use – whatever made the rubber conductive was obviously wearing off.

Early radio experimenters 'constructed' high value resistors by drawing them with a pencil, as the graphite in a pencil is conductive and so I wondered if I could use the technique to repair the remote control? Brenda managed to find me a soft-leaded pencil, which I then used to scribble on the faulty pads. Testing with the meter showed that the resistance across these pads was now much lower, I then re-assembled the gun and all was well. Hopefully, it will now last until the coming of digital TV forces me to purchase a new recorder!

The FT-480 Again

As I have mentioned the FT-480 rig a couple of times recently, so **'Terry'** decided that I might be able to answer a query about the sample that had recently come his way. "It's great, lovely audio but the receiver sensitivity and the power output seems to alter a lot as it warms up." he wrote. "When the rig is cold the local repeater comes in at 'S6' but after half an hour it reads well over 'S9', also at the same time the power output seems to increase – so what's going on Harry?"

I then set about answering the question! The receive sensitivity and power don't normally vary, but the indicator on the FT-480, which consists of a row of light emitting diodes (l.e.d.s) of different colours, does. Unfortunately, the arrangement is heat sensitive and the effect Terry mentioned is perfectly normal and – as far as I know – there's no simple cure. The display – in my opinion – really is pretty useless, except as a relative indication. In fact, when I lived at Blackburn I often heard a local user giving reports on the lines of, "You're coming through at five cherries one apple and an orange!"

The FRG-7700 Receivers

'Jack' brought an FRG-7700 receivers to me with the complaint that the quality of sound on s.s.b. was intermittently poor. He reported, "It sometimes sounds like there's a gurgling noise superimposed on the voice, and any c.w. signals become about T7."

However, once it was on my work bench I could find nothing wrong with the receiver and so I phoned 'Jack' for more details and to ask as to when the fault occurred. He advised me that it could occur at any time, but that he had noticed that even though the room it was kept in was warm, the problem seemed worse on cold days. His comments made me think about the possibility that the trouble was linked to the mains voltage and so I tried running the receiver from a variable transformer. Sure enough, once the mains dropped below about 225V, hum was heard superimposed on any s.s.b. or c.w. signal.

The diagram, **Fig. 2**, shows the circuit of the built-in power supply unit (p.s.u.), all the oscillators and critical circuits being fed from the rail labelled '11V'. Yaesu never seem to fuss about exactly marking their voltage rails and this one is stabilised at about 10V, the exact voltage not mattering too much – provided that it's really stable.

I noticed that the rail remained at 10V until the mains voltage dropped below 230V and then it started to fall, with the the hum appearing. Fortunately, the fault could be 'cured' by re-setting the mains selector on the receiver to 220V, but as the units normally work okay set at 234V, this wasn't considered to be advisable.

A voltage stabiliser, quite apart from holding the voltage at a constant level, has the property of filtering out noise and hum on the supply line. However, for a stabiliser to function correctly the input voltage has to be a few volts higher than the output.

With an FRG-7700 in good working order I would expect to find about 14 to 15V across C01 – and this gives an output of around 10V on pin 2 of JO4. In this case with the mains adjustment correctly set, and with around 225V mains input, there was under 13V across C01, which wasn't sufficient. The faulty component turned out to be the rectifier diode bridge D01, and once this was replaced the voltage across C01 increased, with the 10V rail remaining stable within the normal range of mains voltages.

Sometime later, another FRG-7700 came in with exactly the same complaint and of course I replaced the rectifier full of confidence that I had cured the fault! This time my efforts made not a scrap of difference and the faulty part turned out to be the reservoir capacitor (C01) which was low in capacity! Once this had been replaced the input voltage to the regulator transistors increased and the fault was really cured.

Frequency Modulation & The FRG-7700

When the FRG-7700 receiver was introduced it was one of the few high frequency (h.f.) receivers that was equipped with frequency modulation (f.m.) and so it could be used in the mode with a suitable converter on the v.h.f. and u.h.f. bands. It was however, even worse in this mode, than the f.m. mobile transceivers I mentioned recently. They were very much lacking in h.f. response and terribly muffled, even with the tone control set for maximum 'top'. The cure for the problem was to remove C13 (middle to top right) in the f.m. de-emphasis circuit, **Fig 3**. This made the sound appear to become very much 'brighter' and can then be adjusted to taste by the front panel tone control.

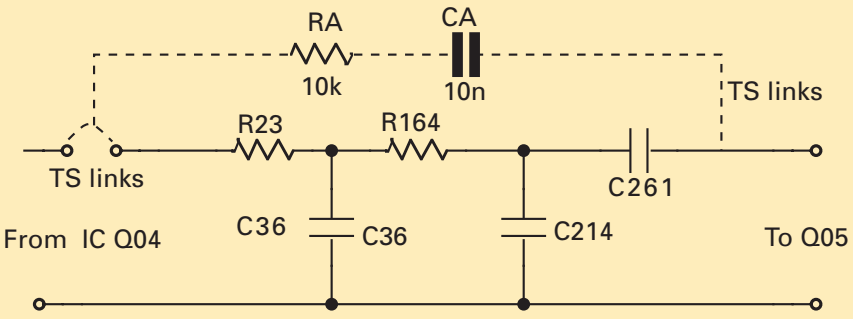
One point – not advertised – was that when it was operating in the f.m. mode, the FRG-7700 could be used to listen into analogue cordless phones, many of which operated just below, (and sometimes in) the 1.8MHz Amateur band. Of course, the 'phone manufacturers didn't mention to purchasers that their next door neighbours – and anyone within a few hundred yards – would be able to eavesdrop on everything they said on the 'phone, instead relying upon it being "illegal to intercept communications".

As certain members of the Royal family found out, this kind of prohibition isn't particularly effective. However, would you – as a technically aware reader – live in the equivalent of a bungalow with plain glass windows and no curtains and then complain about 'peeping toms'? I don't think so! See you next month! ●

The gremlins were at work in the July 2009 issue of *PW*, when the *In The Shop* column, had a drawing that was missed out.

The diagram, shown here, should have appeared under the label of **Fig. 4** in the July issue to be referenced in the paragraph that started "There are of course many other rigs that similar modifications can be carried out on, and as an example the circuit of the FT-230 is shown..." that appeared in the middle column of page 70 of the July issue of *PW*.

(My apologies for the omission. Editor)



Circuit of the audio filter of an FT-230 shown with the components to 'brighten' up the audio.

Carl Mason's

hf highlights

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

This month Carl Mason GW0VSW brings you news of Mills On The Air weekend, a new Prefix Award, and details some of your logs.

During one weekend in May each year, Radio Amateurs from all over the country set up special event stations at various wind or watermills. The event is known collectively as **Mills on the Air Weekend** and the objects are: to help promote both the site itself and also Amateur Radio since members of the public can see the stations at work. The event is organised in conjunction with The Society for the Protection of Ancient Buildings (SPAB) which was founded in 1877 to help prevent the highly destructive 'restoration' of medieval buildings being practiced at the time by many Victorian architects.

The event was started nine years ago by **Jasmine Marshall G4KFP** who was a member of **Denby Dale Amateur Radio Society** (DDARS). Jasmine responded to a request published by the **RSGB** asking if any Radio Amateur would be willing to operate an Amateur Radio station from the site of a wind or watermill. Initially it was agreed that a small group of Amateurs would operate at six different sites, but word quickly spread and this numbers soon grew to 30.

With the increased awareness in the scheme, DDARS then designed some log books and QSL cards for the event and also came up with an award certificate, which would be given to anyone who worked or heard at least ten stations. The rest as they say is history!

One group that took part in this year's event was the **Farnborough and District Radio Society** who joined in with the special event call **GB2EM** from Elstead Mill near Farnham in Surrey. The original mill was occupied by Oliver Cromwell's 'Roundhead' army during the English Civil War, but was subsequently burned down.

It's thought that the present structure on the site, which is now a pub and restaurant complete with working waterwheel, dates back to the seventeenth century. The Farnborough society's first entry into the activity was organised by their chairman **John Hardy G3KND**, **Graham Roff G3TJI** and **Colin Boys G8BCO** and proved very successful with over 300 contacts being made using a Yaesu FT-107 and 100W into a long-wire antenna.

Next year's event is expected to be even more popular as the number of stations involved is likely to increase again. If you or your group are interested in taking part you can register at **www.g4cdd.net/registration1.php** Further details about the Mills on the Air Weekend can be found at **www.g4cdd.net/mills.html** and **www.nationalmillsweekend.co.uk/**

Also, the Farnborough and District Radio Society would be delighted to see any visitors at their club which meets at 7:30 on the 2nd and 4th Wednesday of the month at the **Farnborough Community Centre, Meudon Avenue, Farnborough**. Check out their website at **www.fdrs.org.uk/**

New Prefix Award

There's new prefix award from Portugal called **The CTWPX Award** and it's issued for contacting 10 different callsign prefixes assigned to Portugal or Portuguese territories or possessions: including both Madeira and the Azores Archipelago. Any difference in the letters and numbers in the first part of a call denotes a new prefix, for example CT1, CT14, CT98, CT500 all count as different prefixes. Separate awards are available for s.s.b., c.w., RTTY and mixed-modes.

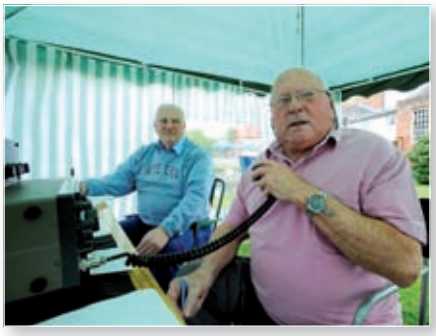
The awards may be claimed by either licensed operators or short wave listeners and applications with log details must be signed by two licensed Radio Amateurs or any official of your local radio club. You don't need to hold the QSL cards to make a claim. Further details can be found at **www.geocities.com/ct1bww/ctwpxaward.htm**

The DX News

On to this month's DX news now and to the Glorioso Islands AF-011, which are a group of French islands and rocks in the northern Mozambique Channel about 160 kilometres (100miles) northwest of Madagascar, totalling five square kilometres. The islands are nature reserves and are occupied by a meteorological station, that's maintained by the The French Foreign Legion. It is from that station island that the long awaited DXpedition to Glorioso is now expected to take place this month.

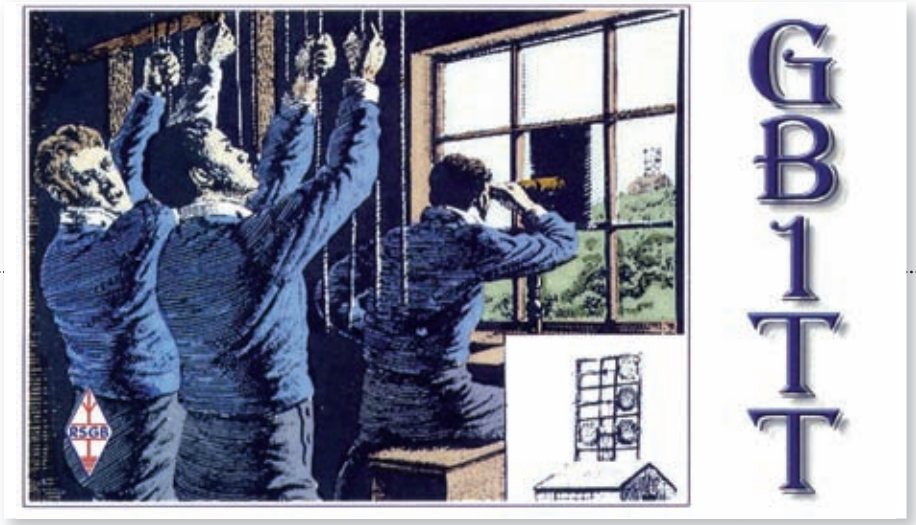
Three or four Radio Amateurs, who are in the military, along with two film-makers from the Defence Press Service will be on the island until July

Martyn Medcalf M3VAM, Nezda Leigh (Community Fundraising co-ordinator and John Bowen G8DET (Chairman of CARS) handing over a cheque for £500 to Essex Air Ambulance.



Bob Konowicz G0YYY and Tom Hutton G0HUT operating GB2EM.

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



GB1TT (Toothill) QSL Card.

Portuguese CTWPX award sample.

28th. The team will be active with three stations on 1.8 to 28MHz will use as many modes as possible. As I write this column, the callsigns are yet to be announced, but the QSL route will be via **F5OGL** and a log search will be available and updated on a daily basis at **http://glorieuses2008.free.fr**

Norfolk Island OC-005 is a small island in the Pacific Ocean located between Australia, New Zealand and New Caledonia and will be activated by a group of operators from the Hellenic Amateur Radio Association of Australia as VK9AAA from July 22nd to 29th including the IOTA Contest. They plan to be active with several stations on all the h.f. bands using c.w., s.s.b and RTTY. Further information can be found at **http://vk9aaa.blogspot.com** and the QSL is good via **W3HNK**.

In the Bahamas **Edwin Seeble K3IXD**, **James Hargenrader K4QO**, **Peter Radding W2GJ** and **Dallas Carter W3PP** will be active from Crooked Island NA-113, which lies in a shallow lagoon called the Bight of Acklins, from July 23rd to 27th. They will participate in the IOTA Contest as **C6APR** while both before and after the IOTA Contest C6APR will be active on 3.5 to 28MHz using c.w. and s.s.b. while the team will sign **C6AXD** with RTTY. The calls are good for Bird Rock Lighthouse (ARLHS BAH-005) and all QSLs go via K3IXD.

In Denmark **Harry Horstman PA1H** and **Nico Smit PA7PA** will be active as OZ/homecall from Lango Island EU-172 located between the Great Belt and Bay of Kie fromJuly 25th to August 1st and will participate in the IOTA Contest. They will operate c.w. and s.s.b. with some digital modes on 1.8 to 28MHz and you can QSL via their home calls.

Finally, closer to home, there are two special event stations to look out for, the first of which is **GB5LB** on the Isle of Man EU-116. This station is to promote and increase awareness of the activities of the **Royal National Lifeboat Institute** (RNLI). Look for activity to take place from **Port Erin** on July 12th. The second station is to be at Port St. Mary on July 26th. The QSL should go direct to **Port St. Mary Lifeboat, The Boat House, Lime Street, Port St. Mary, Isle of Man, IM9 5EF**.

The second special event is **GB1TT** being run by **John Wakefield M0XIG** and **Shaun Jarvis M0BJL** from Toothill in Romsey, Hampshire from Thursday to Saturday July 16th to 18th. The call commemorates the shutter telegraph first operated over 200 years ago. This was a telegraph system for conveying information by means of visual signals using devices with pivoting shutters or blades on towers.

During the Napoleonic wars there was a telegraph system in place, as a communication link, between London and Portsmouth for the Admiralty. In 1805 a new line was started to connect London with Plymouth. Toothill Shutter Telegraph, built at Upper Toothill Farm, is one of a number that operated along this new route. Activity from Toothill can be expected on 7/14MHz and full details are available at **www.qrz.com** and you can QSL via the bureau.

Your Reports

Now on to your reports this month, the first of which comes from **Martin Addison 2E0MCA** in East Finchley, London who used his Yaesu FT-2000 and 50W s.s.b. into his half size G5RV on 7MHz to work PE5TS (Netherlands) 0936, DF5LR (Germany) 0939, EI4IB (Ireland) EU-115 at 0946, OZ7TM (Denmark) 0949, LA0HK (Norway) 1009, F/G6SFP/P (France) Nigel Ramsey operating SOTA on Sommet de Nibles F/AM-362 at 1042, HE8DLO/P (Switzerland) operating from the Schloss Moutier at 1103, 5P4MG (Denmark) on Nordjylland Island EU-171 at 1421 QSL via DJ4MG, OE3DIA (Austria) 1656, SQ9HZM (Poland) 1854 and IW3SOX (Italy) at 1952UTC.

The 14 & 18MHz Bands

On 14MHz the log of **Martyn Medcalf M3VAM** in Chelmsford keeps growing as he continues to evaluate his new Comet CHA-250BX vertical antenna. So far he is very pleased with it and even though other things have taken priority this month found time to work S0AM (Poland) 1312, LZ1ANA (Bulgaria) 1850, SV9GPV (Crete) 1906, EU-015, EY8T (Tajikistan) 2020, RX6AM (European Russia) 2038 and UU7J (Ukraine) at 2042UTC using a Icom IC-746, SGC-237 auto tuner.

IW9HII QSL worked by Eric G0KRT on 28MHz SSB.

SQ9HZM worked by Martin Addison 2E0MCA 7MHz.

TS7C received by Martin Addison for a SSB QSO on 14MHz.

Some time ago Martyn set up the **Chelmsford Award** which was open to all Radio Amateurs or Short Wave Listeners and was sponsored by The **Chelmsford Amateur Radio Society**. The idea was to use the suffix letter from 30 different stations worked or heard to spell out 'Chelmsford, the birthplace of radio' and applications soon came in from as far away as Australia.

The Chelmsford Award was issued to commemorate the Centenary of Marconi's first Trans-Atlantic radio transmission on December 12th 1901. The award finally ended in December last year, with all money collected going to help fund the Essex Air Ambulance. Incidentally, it was in 1902 that Marconi started his first radio factory for the design and production of equipment in Chelmsford. Originally based in a converted Silk Factory, 10 years later it was replaced with a purpose-built factory.

John Wakefield M0XIG in Romsey, Hampshire enjoyed some DX this month working s.s.b. stations UN7MMM (Kazakhstan) 0558, VK7XX (Australia) OC-001 in Turners Marsh, Tasmania at 0614, RZ9OO (Asiatic Russia) 0712, KL7JT/1 (Alaska) 0750, VO1SA (Canada) 1311, EY7AD (Tajikistan) 1917 and PY6HD (Brazil) 1937UTC. The equipment used included a Yaesu FT-1000MkV with an Acom 1000 amplifier running between 300 and 400W. The antenna is the Comet H422 which John has used for the pas three years "with good results" mounted on a speaker tripod stand between 12 and 15ft high in the 'V' configuration.

In Worcester Park, Surrey **Eric Masters G0KRT** used 5W QRP to work LZ2NG (Bulgaria) at 1809 on c.w. while 100W s.s.b. found RZ6AST (European Russia) at 1901UTC using a Kenwood TS-570D and W3EDP tuned with an SG-230 Smartuner.

Owen Williams G0PHY in Biggleswade, Bedfordshire used a Yaesu FT-747 with a dipole antenna and used 50W s.s.b. to find ID9N (Italy) on Vulcano Island EU-017 operated by the Noantri DX Contest Team at 1743UTC QSL via IZ0GKN.

Also spending some time here on the bands was Martin 2E0MCA who logged RU3ZG (European Russia) 1319, UR7EP (Ukraine) 1341, VA2PW (Canada) 1521, 7X4AN (Algeria) 1811, W2YP (U.S.A.) in New York at 1854, CN8YE (Morocco) 1909, EA4/M3IDQ (Spain) 1928, LZ1GRI (Bulgaria) 1952, YO6OGJ/QRP (Romania) 2018 and EA8TH (Canary Islands) AF-004 at 2020UTC.

The 18 & 21MHz Bands

Moving to 18MHz Eric G0KRT worked 4Z4DX (Israel) at 1505 while Owen G0PHY logged TL0A (Central Africa Republic) at 1800 with both reporters using s.s.b. and 100W. There were no reported contacts on the 21MHz band this month!

The 28MHz Band

Finally, Eric G0KRT has been monitoring 28MHz where there have been one or two openings during the mid to late afternoon. The **DK0TEN beacon** on **28.257.5MHz** was heard "loud and clear" at 1445 so Eric put out a few calls and got IW9HII (Italy) (s.s.b.), 1453 OM3TPN (Romania) (c.w.) 1521 and EA5/DL5EO (Spain) (s.s.b.) at 1601UTC.

Signing Off

Well that's it for another month and a quiet one it has been. The bands have not been in great shape and any openings have been mainly to Europe and only for brief periods. However, there are openings and there are signs that the higher bands are showing some activity once again which hopefully will mean more activity over the coming months!. As usual my thanks 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

As usual, information, reports and photographs to me by the 15th of each month please.

club news

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

Send all your club info to

PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: newsdesk@pwpublishing.ltd.uk

AYRSHIRE (Scotland)
Kilmarnock & Loudoun ARC
Graham MM0GHM: (0780) 2954 739
E-mail: mm0gdc@btinternet.com
www.klarc.org
We meet every 2nd and 4th Tuesdays at the clubhouse at E. Ayrshire Internal Transport, 36a Main St., Crookedholm, Kilmarnock KA3 6JS

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

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

CAMBRIDGESHIRE
Huntingdonshire ARS
Gerald G8AKL. Tel: (01487) 740794
E-mail: hunts.hams@yahoo.co.uk
www.hunts-hams.co.uk
Huntingdonshire ARS meets at the Medway Centre, Medway Road, Huntingdon PE29 1SF. Meetings are from 7.30pm until 10pm on the 2nd & 4th Thursday of the month.

Petrborough & DARC
G4EHW.
www.radioclubs.net/padarc
Meets on 4th Wednesday of the month at Southfields Community Centre, Stanground, Peterborough. PE2 8RZ. Directions and full details on website.

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

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

Macclesfield & DRS
Adie Dodd. Tel: 0795 7765511
www.gx4mws.com
The Macclesfield & District Radio Society meets every Monday at the Pack Horse Bowling Club, Westminster Road, Macclesfield SK10 3AT at 8pm. Licence courses are run year round and visitors are always welcome.

Stockport RS
David Simcock. Tel: 0161 456 7832
E-mail: secretary@gx4mws.com
www.stockportradiosociety.co.uk
The Stockport Radio Society meets on the first and third Tuesdays at their new location of: Walthew House, Shaw Heath, Stockport SK2 6QS

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

CORNWALL
Cornish RAC
Contact: Steven G7VOH
Tel: (01209)844939
E-mail: g7voh@btinternet.com
www.cornishradioamateurclub.org.uk
The Cornish Radio Amateur Club meets at the Church Hall, Church Road, Perranarworthal, Truro TR3 7QE on the first Wednesday of every month at 7.30pm. There is also a Computer Section that meets at the same venue and time on the second Monday of every month, except December.

Newquay and District ARS
Joe Bell. Tel: (01726) 891557
E-mail: joe_bell@btinternet.com
www.btinternet.com/~kevin.francks/index.html
The Newquay and District ARS meets every other Thursday at Treviglas Community College, Bradley Road, Newquay. TR7 3JA with either arranged talks on the evening or just a general chit chat amongst members. Also the club offers training towards the Foundation Exam on club nights and then the opportunity to take the Foundation Exam.

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

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

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

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

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

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

Exeter ARS
Contact: Phil 2E0PCJ
Tel: (01392) 877413
E-mail: philcjays@aol.com
The Exeter Amateur Radio Society meets on the 2nd and the 4th Monday at 7.30pm in the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter EX2 5RP. Tuition for Foundation, Intermediate and Advanced licence is available. The club is registered as an RSGB examination centre.

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

DORSET
Blackmore Vale ARS (BVARS)
Nick Perrin. Tel: (01747) 838936
E-Mail: bnperrin@theiet.org
www.radioclubs.net/bvars/
BVARS meets in The Youth Club, Coppice Street, Shaftesbury Dorset SP7-8PF each Tuesday evening at 7.30pm. The Club callsign is G4RBV. The main meeting is the second Tuesday of the month and details of events and full details of the Club can be found on the website.

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

Poole Radio Society G4PRS
'Tex' G1TEX. Tel: 07966 460 552
www.g4prs.org.uk
Meetings are every Friday at 19:30 for 20:00 at the The Old Chapel Hall, Cabot Lane, Creekmoor, Poole BH17 7BX, the second meeting of each month is the formal evening, all others are basically shack and Natter nights. After the recent successful Intermediate course, training begins again in September.

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

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

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

ESSEX
Braintree & DARC
Keith. Tel: (01376) 329279
www.badars.org.uk
The Braintree & District Amateur Radio Society meets on the first and third Monday of the month in The Clubhouse, Braintree Hockey Club, Church Street, Bocking CM7 5LJ.

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

Chelmsford ARS
Martyn Medcalf. Tel: (01245) 469008
E-mail: info2007@g0mwt.org.uk
www.g0mwt.org.uk
The Chelmsford Amateur Radio Society meets on the first Tuesday of each month in the Marconi Sports & Social Centre, Beehive Lane, Great Baddow, Chelmsford, Essex CM2 9RX at 7.30pm. - All welcome. August 4th "Where do our wavelengths come from?" - The work of the IARU by Peter Chadwick G3RZP. Sep. 1st "D Star" by Murray Niman G6JYB and Clive Ward G1EUC.

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

South Essex Amateur Radio Society
Contact: Dave (G4UVJ)
Tel: (01268) 697978
E-mail: southessex.ars@btinternet.com
www.southessex.ars.btinternet.co.uk
Local Network: 145.225MHz
Meets: Meet at 8pm on the second wednesdays of each month at South Benfleet Primary School, High Rd, South Benfleet, Essex SS7 5HA. (Entrance: 51°33'10.45N 0°33'39.65E), (Opp. Smiths Wood Yard). All welcome. Meetings are: July 26th we're holding the Waterside Farm Railway Special Event Station.

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

GLOUSCESTERSHIRE
Cheltenham ARC G5BK (CARA)
Derek G3NKS.
Tel: 01242 241 099
E-mail: g3nks@blueyonder.co.uk
www.caranet.co.uk
The club meetings are held on the first Friday of each month, starting at 8p.m. at Prestbury Library, The Burgage, Cheltenham, Gloucestershire, GL52 3DN.

Gloucester Amateur Radio and Electronics Society
Anne 2E1GKY/M3GKY
Tel: (01452) 548478 (After 10am)
E-mail:
hamreed@blueyonder.co.uk
www.g4aym.org.uk
Meet at Churchdown School, Winston Road, Glos. GL3 2RB, every monday evening at 7-30pm until 10pm except for Bank Holidays when we operate from a local escarpment.

GWNEDD (Mid-Wales)
Merion ARS
Tel: John (07824) 562656
Email : tawelfan@talk21.com
http://meirionars.multiply.com/
Meirion amateur radio society meet on the first Thursday of each month at The Royal Ship Hotel in Dolgellau Gwynedd LL40 1AR at 19.30. Visitors and new members are very welcome. Regular talks, all the details for meetings and special events can be seen on the club website. July 10th BUNKERS on the AIR –Meriden, Haseley Knob & Church Lawford, 17th 3rd Round G2FDC Trophy
24th Video night 31st Radio workshop VHF/UHF Operating 6m, 4m, satellites. 8.30 p.m. for 8.45 p.m. start

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

Fareham & District ARC
Alastair Sinclair.
Tel: 01329 235397
E-mail: secretary@fareham-darc.co.uk
www.fareham-darc.co.uk/
The Fareham & District Amateur Radio Club meets on Wednesdays evenings from 7.30pm in the Fareham Sailing & Motor Boat Club, The Boathouse, Lower Quay, Fareham. PO16 0RA

Farnborough & District Radio Society (FDRS)
Derek G3OFA
E-mail: mail@fdrs.org.uk
www.fdrs.org.uk
Meets every 2nd and 4th Wednesday in the month at 7:30 for 8:00 pm in the Farnborough Community Centre, Meudon Avenue, Farnborough, Hampshire, GU14 7LE Visitors and new members are always most welcome. July 22nd Construction Contest and Junk Sale.

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

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

Itchen Valley ARC
Contact: Charlie M0WYM
Tel: (02380) 439560
E-mail: secretary@ivarc.org.uk
www.ivarc.org.uk
The Itchen Valley ARC meets on the second and fourth Friday of each month at The Scout Hut, Brickfield Lane, Chandlers Ford, SO53 4DP, doors open 7.30 pm. See website for our programme, visitors welcome. Join our club net on 145.550, Thursday evenings at 8.30 pm. The club is a registered as an RSGB examination centre.

Lymington Community Association Radio Club
Keith G8MZF Tel:(01590) 672337 (work)
(02380) 849395 (evenings)
Email: lymcomass@aol.com
The club meets at Lymington Community Centre, New Street/Cannon Street, Lymington SO41 9BQ, on friday nights. Talk-in on the night on or near 145.550 club call M0LCC. All are welcome. Start time hopefully 7.30pm bar open from 7.00pm. Plenty of free parking nearby.

HERTFORDSHIRE

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

Stevanage & District ARS
John. Tel: (01462) 459254
Secretary E-mail:
jmccutcheon@freeuk.com
www.sadars.org/
The Stevenage and District Amateur Radio Society meet every Tuesday 7.30pm, at the Stevenage Resource Centre, Chells Way, Stevenage, SG2 0LT. Regular talks and demonstrations. Registered centre for Foundation/Intermediate/Advanced exam courses (40+ passes last year). Club Net last Friday of month 7.30pm on 145.450MHz. All welcome, see website for further details.

HUMBERSIDE

Hull & District ARS
Contact: Keith Shaw.
Tel: 01482 217776
E-mail m3shw@yahoo.co.uk
raymond penny Tel: 01482 376835
E-mail penibs@penibs.karoo.co.uk
Hull & DARS meet every friday night at 1930 – 2200 at the walton street leisure centre, goathland close, walton street hull, East Yorks HU3 6NG.

JERSEY

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

KENT

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

Hilderstone Radio & Electronics Club
Mike Howland
E-mail: g4mix@waitrose.com
www.g0hrs.org.uk
Meetings now at The Science Block, Chatham House School, Chatham Street, Ramsgate, CT11 7PP on 2nd and 4th Friday of the month at 7-30pm.

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

LANARKSHIRE (Scotland)

Mid-Lanark ARS
Dennis. Tel: 07505529335
Email: mm0dnx@yahoo.co.uk
www.mlars.org.uk/
The Mid-Lanark ARS meets on Friday evenings at the Newarthill Community Education Centre, 288 High Street, Newarthill, Motherwell ML1 5JU. Visitors and new members are very welcome. The club has HF and VHF shacks for use on club evenings. Courses for foundation, intermediate and full licences are also run at the club. See web site for details of our upcoming meetings.

LANCASHIRE

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

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

Morecambe Bay ARS
Martin Hazel. Tel: (01524) 848193
Email: martin@mbars.internationalham.com
www.mbars.internationalham.com
Morecambe Bay Amateur Radio Society meet at the Trimpell Sports and Leisure Club, Out Moss Lane Morecambe, every Tuesday evening from 1930. They also have a new website at all of their events calendar for the next year is to be found there.

Thornton Cleveleys ARS (G4ATH, & G6GMW)
John. Tel: (01253) 399377,
E-mail: m3waz@hotmail.co.uk
www.tcars.org.uk
Meet monday evenings at the Frank Townend Center, Kensington road, Cleveleys, Lancashire FY5 1ER startring from around 7.30pm.

LEICESTERSHIRE

Loughborough & District ARC
Chris Walker. Tel: (01509) 504319
Email g1etz@aol.com
www.radioclubs.net/ladarc
Loughborough & District Amateur Radio Club meets at the Glenmore Community Centre, Thorpe Road, Shepshed, LE12 9LU on a Tuesday evening from 7.30pm. The clubs programme of events can be found on our websites. Visitors and new members most welcome.

LINCOLNSHIRE

Franklin ARC
Contact: Brendan.
Tel: (01754) 820204
E-mail: bren.sykes@btinternet.com
We meet the last Wednesday of every month at the Victoria Inn Wainfleet Road Skegness Lincolnshire PE25 3RG. @19:30hrs. We also have regular nets, on the 1st and 3rd Tuesday of every month on 145.550± @20:00hrs. Registered as an RSGB examination center for courses run by G0OTH Robert. We are organizing special events, field days and our own rally (See Rallies Section) this year so listen out for us, our call sign is M0FRC.

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

Stenigot "Chainhome" Amateur Radio Club
Steve Burke M5ZZZ.
Tel: (01507) 600202
E-mail m5zzz@btinternet.com
www.stenigotchainhomearc.co.uk
Meetings are held on the third Friday of the month commencing 19.30 at Gayton le Marsh Village Hall, Gayton le Marsh, Lincolnshire. LN130NW.

LONDON

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

Edgware & District Radio Society
Michael G4RNW.
Tel: 020 8950 0658
E-mail: michael.stewart5@ntlworld.com
Edgeware &District radio Society meet at the Watling Community Centre, 145 Orange Hill Road, Burnt oak, Edgware HA8 0TR.

Radio Society Harrow
Linda Casey Tel: 020 8386 8586
Email: lcasey@imperial.ac.uk
www.g3efx.org.uk
The Society meets on friday at 20.00 on the 2nd and 4th weeks of every month, at The Elsie Fisher Room, St Lawrence Centre, St. Lawrence Church, 2, Bridle Road, Eastcote, Pinner HA5 2SJ. All welcome! We also run exam courses - see website for details

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

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

THE LOTHIANS (Scotland)

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

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

MERSEYSIDE

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

NORFOLK

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

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

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

NORTHAMPTONSHIRE

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

SHROPSHIRE

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

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

NOTINGHAMSHIRE

Worksop Amateur Radio Society
(W.A.R.S.)
'Daz' Spence. Tel: (01623) 747314
Email- g3rcw@qsl.net
www.qsl.net/g3rcw/
Meets every Tuesday at 7:00 pm. Our cubhouse is located at 59 - 61 west street, Worksop, Nottinghamshire. S80 1JP. Exams and courses run frequently for all licence levels. Licensed bar & hot food available on club meet nights. Membership fee for the year is £10.

SOMERSET

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

South Bristol ARC
Len Baker. Tel: (01275) 834282
E-mail: g4rzy@msn.com
www.sbarc.co.uk
The South Bristol Amateur Radio Club meets every Wednesday evening at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol BS14 0LN.

Yeovil ARC
Steve
E-mail: steve@g7ahp.co.uk
www.yeovil-arc.com/
The Yeovil Amateur Radio Club meets at the Red Cross Centre, Grove Avenue, Yeovil BA20 2BE (on the corner where Grove Avenue meets Preston Road).

Weston-super-Mare Radio Society (WSMRS)
Kirstie M3UWI (01934) 613094
Email:- Kirstiejones1@msn.com
www.radioclubs.net/wsmrs/
Meets every Monday at the Devonshire Road social club BS23 4LG at 8pm. Main meeting including talks/Guest speakers every 3rd Monday of the month.Training in all levels of Licence available.

SOUTH GLOUCESTERSHIRE

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

SOUTH WALES

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

SOUTH YORKSHIRE

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

Sheffield ARC
Trevor Wood. Tel: 0114 2216947
E-mail: trevorwood6@yahoo.co.uk

www.sheffieldarc.org.uk
The Sheffield Amateur Radio Club meets at the SYPTE Social Club, Greenhill Main Road, Sheffield S8 7RH every Monday at 7.15pm. All three types of classes are held for the Foundation, Intermediate and Advance levels of licensing.

STAFFORDSHIRE

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

SUFFOLK

Bury St Edmund's ARS
George Woods G3LPT.
Tel:01359 259518
Darren Coe G7SDC
Tel: (01284) 701732
storno@yahoo.co.uk
www.radioclubs.net/bsears/
The Club meets on the third Wednesday of the month (except August and December) at the Culford school, Culford, Bury St. Edmunds, Suffolk IP28 6TX at 7.30PM. Visitors are welcome. Please see our web site for further details.

SURREY

Coulsden Amateur Transmitting Society
Steve Conway G7SYO
Tel: (01737) 353517
E-mail: steve.conway@landg.com
www.sthost.co.uk/webspace/cats/
Regular meetings are held on the second Monday in each month at-: St. Swithun's Church Hall, Grovelands Road, Purley, Surrey CR8 4LA at 20:00 to 22:00hrs. On the first Saturday of month at 1715 Crescenta Valley / CATS Net on Echolink Normally via MB7IPL node on 145.2875 MHz.

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

TYNE & WEAR

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

Tynemouth ARC
Tony Regnart G8YFA.
Tel: 0191 280 1981
E-mail: mail@g0nwm.com
www.g0nwm.co.uk
The Tynemouth Amateur Radio Club meets each Friday from 7 to 9pm at St. Hilda's Church, Stanton Rd, North Shields, Tyne & Wear NE29 9QB. It's known locally as 'the church near the fire station'.

WARWICKSHIRE

Coventry Amateur Radio Society
Contact: John Beech G8SEQ.
Tel: 079 58777 363
www.coventryradio.org.uk
Coventry Amateur Radio Society meets most Fridays at 2030hrs in St Bartholomew's Church Hall, Brinklow Road, Binley, Coventry CV3 2DT. Further details on CARS activities can be obtained from the Secretary – John G8SEQ

WEST MIDLANDS

Aldridge & Barr Beacon ARC
Ted Roberts. Tel:(01922) 614169
E-mail: albertg0kfs@raynet-uk.net
www.radioclubs.net/aldridgearc
The Aldridge & Barr Beacon Amateur Radio Club is a daytime club and meets at the Aldridge Community Centre, Middlemore Lane, Aldridge, Walsall WS9 8AN on the first and third Monday of every month at 2pm to 4pm. They have a long wire and a v.h.f. antenna for radio operation using the club callsign M0GRX.

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

South Midlands RS
Don. Tel: 0121 458 1603
South Midlands RS meet in the West Heath Community Centre, Condover Rd., West Heath Birmingham B31 3QY. macrh 13th and 20th are construction evenings. 223rd is a 'ragchewing' evening.

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

Sutton Coldfield RS
Rob 2E0ZAP: (01827) 288 483
E-mail: spirit.guide@hotmail.co.uk
www.hamradio.piczo.com
The Sutton Coldfield Radio Society Meets on the second and fourth Monday of the month at 7.30pm (no meeting on bank holiday Mondays) in the Sutton Coldfield Rugby Club, 160 Walmley Road, Sutton Coldfield, West Midlands B762QA.

Wythall Radio Club
Chris Pettitt. Tel: (07710) 412 819
E-mail: g0eyo@wythallradioclub.co.uk
www.wythallradioclub.co.uk
The Wythall Radio Club is based at Wythall House, Silver Street, Wythall, near Birmingham B47 6LZ. They meet every Tuesday at 8pm and meetings are informal and friendly.

WEST SUSSEX

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

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

WEST YORKSHIRE

Denby Dale Amateur Radio Club
Gerald, G3SDY.
Tel: (01484) 602905
www.g4cdd.net/
The Denby Dale club meat at Pie Hall, Denby Dale, Huddersfield HD8 8RX. On Wednesday April 1st the club holds its spring mini-rally and grand auction of surplus items. Doors open at 7pm.

Pontefract & District Radio Club
Colin. Tel: (01977) 677006
E-mail:
info@pontefractradioclub.org
www.pdars.com
The Pontefract & District Radio Club meets every Tuesday from 7pm and Thursday from 8pm at the Carleton Centre, Carleton Grange, Carleton Road, Pontefract, West Yorkshire WF8 3RJ.

WIGTOWNSHIRE (s.w. Scotland)

Ellis Gaston 01776 820413
www.gm4riv.co.uk
Wigtownshire ARC meet weekly at The Aird Unit, Stranraer Academy, Stranraer DG9 8BQ. Visitors always most welcome

WILTSHIRE

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

WORCESTERSHIRE

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

Club Secretaries

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

Graham Hankin's in vision

Graham Hankins G8EMX
84 Shirley Road
Acocks Green
Birmingham B27 7NA
E-mail: g8emx@tiscali.co.uk

Graham Hankins G8EMX with news of a new repeater and some of the points arising from with the switchover to digital TV.

At the Donington Rally last year a visitor to the **British Amateur Television Club**'s table asked if I was still looking for a site for a 1.2GHz (24cm) ATV repeater. His radio club had exclusive use of a radio mast, complete with screened radio 'shack' and mains power. This was all on farm land and he gave me the details of the location, so we agreed to arrange a site visit.

At this point I should also acknowledge Gloucester Repeater Group's offer of space on its masts; chairman **Nick Negus G6AWT** says: "From the site, you can link to the ATV repeaters operated by the Severnside TV Repeater group if appropriate." Thanks Nick but the site first offered is over 100km away, which is far enough to travel for me. But, I recommend that anyone else who is seeking a site should get in contact with you.

So, a couple of months ago, I drove to a sleepy little village near Oxford and met two of the local lads, **Colin Desborough G3NNG** and **Ray Evans G3LQC**, at the foot of the mast. Now this was a real, professional, square section radio tower, with built-in step ladder to reach the highest levels and I challenge anyone to stand at the bottom, look up to the top for the first time and not experience a touch of vertigo!

Professional Antennas

Thick feeders that were previously terminated in professional antennas were still in place and the club had h.f. and v.h.f. antennas already on the mast at various heights. After gazing at this lot in sheer amazement, we went into the shack for a drink and a chat. One of the lads was a member of the BATC and knew about ATV, the other did not, so there was a 'learning curve' ahead for him. I had taken an Alford Slot antenna to show, there was plenty of room in the shack for extra equipment so we had a long chat about ATV, the BATC and the world in general!

After some flasks of tea and biscuits, it was time to come to some decision as to a way forward. Obviously the antenna needed to be mounted as high on the mast as possible, but would feeder losses be too high? Perhaps the transmitter and receiver could be mounted up with the antenna? I agreed that this was the ideal arrangement, but it involved weather protection, power feeding and other issues.

So, for simplicity at this stage, the antenna was left with the lads to arrange for its mounting at some high point then to run a length of feeder into the shack, terminate it with an N-type plug and to call me to visit again!

The 60th Anniversary Dinner

It would have been good to be able to write about the British Amateur Television Club's brilliantly successful 60th Anniversary Dinner and Rally in June, mentioned in the previous 'In Vision', but it was still a fortnight away at the time of writing this. However, BATC Treasurer **Brian Summers G8GQS** had published the accounts on the club's web site prior to the event and reported: "The club has made a modest surplus last year and is in a financially strong position.

"After a number of years of slow reductions in membership, I am pleased to report that numbers are on the increase again. We feel that this is due to the new 'cyber' membership rate (£4) and the new streaming facilities at **www.batc.tv**

"A few members have questioned if this is an area that we should be involved in? In answer to that I can state that it is an overwhelming success, it is a service available to all, licensed or not and it has world wide penetration bringing your club to the forefront of ATV in the 21st century."

Cyber Membership

The 'Cyber' form of membership, just means that BATC members receive their 'CQ-TV' magazine by E-mail instead of a paper copy and I am probably one of those 'few members' who have questioned the **batc.tv** facility. If it has raised the 'profile' of the BATC, brought in more members and been an overwhelming success, okay, so be it. Meanwhile the r.f. side of ATV continues to have its problems – lack of available equipment and repeater site costs escalating. To me, the BATC as a club should be doing much more to support its r.f. 'roots' if you like! There's a statement for comment perhaps!

Meanwhile, the closedown of the analogue broadcast television service continues towards 2012 and more new digital channels occasionally appear on the various 'platforms' – Freeview, Freesat, SKY and the rest. Now, I am sure you will have noticed that some channels specialise in replaying programmes from the 1960s, 70s and 80s and excellent they still are too. But – wait a minute – they were all made in the days of analogue TV; have they been converted to digital formats?

Several years ago I went to a public Open Day at the BBC Research Laboratories at Kingswood Warren – south Greater London and just inside the M25. One of the most memorable lectures was the development of an 'Improved PAL Decoder'. The term 'PAL' is an acronym of Phase Alternate Line' and it was the method adopted by the U.K. for transmitting the colour picture information without the major errors of some other systems.

The PAL system did its job well for the domestic viewer, but for the broadcasters there were always errors in resolving fine colour details and we all remember the 'strobing' and 'cross-colour' effects on presenters' striped clothing, which producers had to avoid if possible!

So BBC Research had developed a 'super' decoder which **almost** eliminated all of these errors. There were vast libraries of analogue recorded material and the best possible decoding was needed to transfer these to a digital format and preserve the highest possible quality. I don't know whether that 'super decoder' was actually used, but the programmes look Okay to me!

TRADERS TABLE

The equipment for sale on this page is secondhand or ex-demonstration

Disclaimer

Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K, will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

SHORTWAVE SHOP LTD

01202 490099

TRANCEIVERS

ICOM IC718 Ex Demo £399
ICOM T8 TriBand £100
ICOM IC-701 inc Matching PSU £295
TRIO TS-700G 2m Multi mode £135
YAESU FT 730R £95
YAESU FT 225 ..... £210
ALINCO DJ-V5 ..... £200
ALINCO DJ-195 ..... £100
ALINCO DJ-S11 ..... £75
ICOM M11 Marine H/H £75
ICOM PMR 446x2Water Resist/w.charg £200
STANDARD HX260E Marine H/H New £99

RECEIVERS

ICOM IC-R10 with ACC £190
ICOM IC-R20 Ex Demo £275
ICOM IC R-8500 ..... £695
YAESU FRG7700M £225
YAESU VR500 ..... £145
YAESU VR5000 ..... £395
AOR AR8600 Mk II INC EM8200 ..... £495
BEARCAT UBC 278 BASE EX DEM £139
UNIDEN 180XLT £99
AMI DIGI SAT RX ASR WS201 ..... £129
SANGEAN AT818 ..... £85
GRE PSR 225 ..... £159
GRE PSR 216 ..... £75
ALINCO DJX3 ..... £70

ACCESSORIES

ICOM AH7000 DISCONE £85
ICOM SP-23 ..... £95
GLOBAL AT1000 ATU £60
KPC-2 TNC £85
PACCOMM TINY-2 ..... £85
TNC 320 ..... £POA
AEA PK-88 PACKET CONTROLLER £35
MFJ 1278B DATA CONTROLLER £55
WATSON W25SM PSU £59
DATONG ANF NOTCH FILTER £55
DAIWA CN620A 1kw POWER/SWR £65
DAIWA PS-120M 10A PSU £50
MFJ 948 TUNER £75
MFJ 1020C ACTIVE ANT £69
KENWOOD MB11 MOUNT ..... £POA
MFJ 986 3k TUNER £185
WELZ SP-220 SWR/PWR METER £65
PM-2000 2Kw Pwr Meter £70
SAKA 8" TFT LCD TV Ex Dem Reduced £75
KENWOOD LF 30A LOW PASS FILTER £30
ICOM BC133 (2 of) Drop In Charger inc PSU ..... £OFFERS

NEVADA

023-9231 3090

TRANSCEIVERS

ICOM 718 HF TRANSCEIVER £349
ICOM 756PROII HF & 6M BASE £1299
ICOM 756PROIII HF & 6 BASE £1499
YAESU FT8100 DUAL BAND MOB £179

HANDHELD SCANNERS

ALINCO DJX2 AM/FM/WFM RADIO £79
ALINCO DJX3 ALL MODE SCANNER £85
BEARCAT 120XLT 100MEM AM/FM £79
BEARCAT 860XLT SCANNER £99
ICOM R3 HANDHELD SCANNER £299

BASE SCANNERS

AOR AR8600MK II BASE SCANNER £399
BEARCAT 785XLT BASE SCANNER £149

RECEIVERS

SANYO WS1000 WORLDSPACE RADIO £85
YAESU FRG7000 HF RECEIVER £199
YAESU VR5000D RECEIVER WITH DSP £435

PORTABLE RADIOS

NEVADA ND01 PORTABLE DAB £25
PANASONIC RFD3 DAB RADIO £29

CB RADIOS

INTEC M490CB TRANSCEIVER £89

ACCESSORIES

BENCHER KEYER £59
BNOS 144 LINEAR AMPLIFIER £159
BNOS 50 LINEAR AMPLIFIER £99
DIAMOND CX210 2WAY ANT SWITCH £15
DIAMOND CX401 4WAY ANT SWITCH £32
ERA MICROREADER DISPLAY £50
JIM M75 SCANNER PREAMPLIFIER £54
KENWOOD PS30M 20A POWER SUPPLY £110
PALSTAR PS04 POWER SUPPLY £14
PALSTAR PS15 12-15A POWER SUPPLY £40
TIMEWAVE 59+ DIGITAL NOISE FILTER £159
TOKYO HL120U LINEAR AMPLIFIER £199
TOYO SA450 ANTENNA SWITCH £17
UNIROSS CHARGER & BATTERIES £12
WATSON SP180A POWERED SPEAKER £15
YAESU MH35A2B SPEAKER MIC £19

B-GRADE ITEMS

ALINCO DJX30 HANDHELD SCANNER £99
BEARCAT 92XLT HANDHELD SCANNER £89
BPL CELESTE WORLDSPACE/FM RADIO £29
ETON SOUND 102 DAB/FM W/iPod DOCK £99
GENUS GEO DAB/ALARM RADIO £29
ICOM R5 HANDHELD SCANNER £165
MAYCOM AR108 AIRBAND/MARINE H/H £54
MIDLAND 98PLUS CB RADIO £59
NEVADA SINFONIE DAB (WHITE) £49
NEVADA SINFONIE DAB (BLUE) £49
PURE EVOKE 1XT DAB RADIO £75
PURE TEMPUS 1XT DAB RADIO £49
ROBERTS RD41 DAB RADIO £99
TEAM ROADCOM CB RADIO £89

WATERS & STANTON

01702 206835

Uniden UBC-60XLT 66-512MHz (with gaps) FM Hand Held Receiver 80Ch. 4 x AA cells....£55
Revex P-300E 12V 30A (max) Over Volts/Current Protected PSU....£79
WinRadio WR-G313i 9kHz-30MHz All Mode PCI Internal Computer Controlled Communications Receiver....£479
Kenwood IF-232C RS 232 Interface for Kenwood transceivers....£59
Microset PT-1012 13.5V 10A (12A max) Stabilized PSU with Cigar Lighter Socket....£49
Yaesu FP-700 13.5V Matching PSU with Extension Speaker....£89
Yaesu FT-726R 2m,70cm + 10m All Mode Base Transceiver 10W Mains....£399
Yaesu CT-58 Quadra Lead interface cable for FT-100....£19
Icom IC-A22E Airband H/Held + NAV/COM....£199
Timewave DSP-599 Audio Noise Reduction Unit....£149
Alinco EDX-1 1.8-30MHz Manual ATU for DX-70, DX-77...£115
Uniden UBC-120XLT 66-512MHz (with gaps) AM, FM Hand Held Receiver 100Ch. + NiCad....£65
Icom IC-A3E Airband H/Held + NAV/COM 50ch Alphanumeric & Headset Adapter....£180
Diamond SX-100 1.6-60MHZ SWR,PWR meter 3kW....£69
Aiwa WR-A100 Analogue FM,MW & 7-band SW Portable Radio....£29
Eton Mini-300 AM, FM-stereo and 6 shortwave bands (49, 41, 31, 25, 19 and 16 meters)....£35
Roberts R-862 HF/VHF receiver AM/WFM 0.15-0.281 / 0.522-1.62 / 4.6-21.95 / 87.5-108 MHz 3 VDC (2*R6 / AA)....£49
AOR AR-3000A 100kHz-2036MHz All Mode Communications Receiver 400Ch. 12V + psu....£499
Maycom AR-108 108-180MHz AM,FM 99Ch. Mini Hand Held Receiver 2 x AA or 3V DC....£49
Yaesu MH-31 Dynamic Microphone For FT-897....£21
WinRadio WR-G313i 9kHz-30MHz All Mode PCI Internal Computer Controlled Communications Receiver....£479
Icom IC-E90 6m,2m,70cm FM + DTMF keypad CTCSS & wide RX....£194
MFJ MFJ-903 6m ATU 200W SSB (100W FM)....£49
Ameritron ARB-704 Universal Transceiver to Linear Amplifier Interface Unit....£45
Watson W-620 1.6-200, 118-530MHz SWR/PWR meter 200W....£69
Optoelectronics Optolinx TTL to RS-232 Interface (supports 4 devices)....£65
Kenwood MB-11 Mounting Brackets for the TM-731E as new....£15
Kenwood MB-11 Mounting Brackets for the TM-731E AS NEW....£15
Yaesu FL-2025 2m clip-on 25W Linear (for FT-290R II)....£99
Icom MB-58 Mounting bracket for the IC-207....£10
Icom IC-R2500 10kHz-3300MHz All Mode PC Controlled Dualwatch Receiver with Control Head USB 12V + psu .£349
Kenwood TH-F7E 2m,70cm FM Palm Held Transceiver + 0.1-1300MHz All Mode RX....£149
Trio TM-211E 2m FM Mobile Transceiver with Adjustable Head 1750Hz 25W....£69
Kenwood MC-60 Electret Desk Mic with Dual Impedence....£79
Kenwood MC-60 Electret Desk Mic with Dual Impedence....£79
Kenwood TM-732E 2m,70cm FM Mobile Transceiver with Remote Head 50W,35W....£99
GRE PSR-255 26-512MHz (with gaps) FM only Hand Held Receiver 50Ch. 6 x AA cells....£39
GRE PSR-282 66-512MHz (with gaps) AM, FM Hand Held Receiver + 8.33MHz 200Ch. 4 x AA cells....£45
Samlex RPS-1206HQ 12V Regulated 6A PSU....£15
Yaesu VX-6E 2m,70cm FM Waterproof Micro Hand Held Transceiver 5W + Full CTCSS & Wide RX....£129
Icom IC-E90 6m,2m,70cm FM + DTMF keypad CTCSS & wide RX....£194
Icom IC-T81E 6m,2m,70cm & 23cm FM Transceiver + wide RX & DTMF keypad....£199
Yaesu FT-790R 70cm All Mode Portable Transceiver 1W 8x C Cells or 12V DC with MMB-11 Mount....£149
Icom IC-E90 6m,2m,70cm FM + DTMF keypad CTCSS & wide RX....£149
Midland Alan-48 80ch 4w UK/CEPT CB Mobile Transceiver....£59
Albercht AE-485-S 10M Fm/Am/Usb/Lsb mobile + repeater shift + 1750Hz Tone....£139
Yaesu TS-480HX HF + 6m All Mode Base/Mobile Transceiver with Gen.Cov. RX & DSP Filter 200W 12V....£529
Sangean ATS-818 Portable Communications Receiver + FM stereo & SSB via BFO Dual Time batteries or 6V....£69
Roberts RD-59 Digital radio FM, Portable Radio....£45
Ameritron AL-82 10-160m 1.5kW Linear Valve Amplifier with 2x 3-500 Tubes....£1,699
Kenwood TM-V71E VHF/UHF Mobile transceiver....£229
Yupiteru MVT-7300 521kHz-1320MHz All Mode Hand Held Receiver 1000Ch. + 8.33kHz step....£139
MFJ MFJ-993B 1.8-30MHz Auto ATU + meter, Balun & Display 300W....£209
Icom IC-PCR1500 10kHz-3300MHz All Mode PC Controlled Receiver with USB, CDROM 12V + psu....£319
Kenwood TS-2000E HF,6m,2m,70cm All Mode Transceiver + Gen.Cov., Auto ATU & DSP....£1,199
Icom IC-T81E 6m,2m,70cm & 23cm FM Transceiver + wide RX, DTMF keypad & Cigar Lead....£199
ADI AT-200 2m FM Hand Held Transceiver with NiCd Battery, Charger & Speaker Mic....£59
Yaesu FT-897 HF,6m,2m,70cm All Mode Transceiver, DSP, Gen.Cov.RX + optional 2x FNB-78 & CD-24....£560
Yaesu FT-857 HF,6m,2m,70cm All Mode Transceiver + Gen. Cov.RX 12V + optional YSK-857....£440
Diamond BB7V 2-30MHz HF Ground Plane Antenna 6.7m Long with No Radials....£125
Icom IC-R3 0.5-2450MHz AM,FM,WFM Hand Held Receiver 450Ch. + 2" TFT colour TV....£149
Kenwood TH-75E 2m / 70cm H/Held Transceiver....£65
AOR AR-5000A 10kHz-3GHz All Mode Communications Receiver with TXCO 2000Ch. 12V + psu....£1,049

RADIOWORLD

01922 414796

Trio R-1000 HF RX....£170
Kenwood AT-50 ATU....£175
Kenwood VC-20 VHF Converter....£175
ICOM IC-2200H 144–146....£175
8-BAND W2IHY Audio Processor....£189
AOR AR-8000....£189
IC-E208 2m / 70cm FM Mobile....£189
ATAS-120A Active Tuning Antenna System for FT-897, F....£199
Yaesu FV-101DM Digital Memory VFO....£199
AOR AR-2002 Receiver....£199
Yaesu FT-8800E Dual Band Mobile Transceiver....£199
FT-90R - Transceiver....£199
Alinco EDX-2 Auto ATU....£219
AOR 8200 Mk I....£220
Kenwood TR-9000 2m Multi mode....£220
Yaesu FT-480R 2m Transceiver....£220
ICOM IC-290D - 2M MULTIMODE TRANSCEIVER....£220
Yaesu FRG-7700 HF Receiver....£225
Yaesu FT-8900 Quad Band Mobile Transceiver....£229
Icom IC-R3 Hand held Scanner....£250
Icom IC-490E 70cms Mobile....£250
Yaesu FT-290MkII 2m Multi-mode transceiver....£250
PT-50A Microset 50A 13.5V PSU....£272.13
Kenwood TR-751E 2m Multi-mode transceiver....£275
Yaesu FT-690R II 6m transceiver....£275
Kenwood TR-751E VHF Transceiver....£275
MFJ-989D 1500W ATU....£279
Kenwood TS-140S HF Transceiver....£299
Icom IC-735 HF all mode transceiver....£299
Icom IC-R70 HF Rx....£299
Yaesu FRG-100 HF Receiver....£299
Kenwood TM-255E 2m Mobile....£329
Yaesu FT-817ND HF 6m VHF UHF 5W Transceiver....£329
Palstar AT-1KP Antenna Tuner....£339
Icom IC-R1500 Receiver....£349
AOR AR-3000 Wide Band Receiver....£350
Icom IC-718 HF Transceiver....£359
Alinco DX-77E HF Transceiver....£379
Alinco DX-77E HF Transceiver....£379
Icom IC-718 HF All Band Transceiver....£389
Yaesu VR-5000 Scanning Receiver....£389
Alinco DX-70TH HF & 6m transceiver....£399
Icom IC-R72 Receiver....£399
Yaesu VR-5000....£399
Drake R8E HF Receiver....£425
Kenwood TS-690S HF -6m Transceiver....£449
AOR AR-3000A Wideband Receiver....£450
Kenwood R-5000 Communications Receiver HF....£450
Yaesu FT-897D Multiband Portable Transceiver....£459
AOR AR-8600MkII....£499
Kenwood TS-570DG/E....£549
AOR AR-3000A+ Wide Band Receiver....£549
Rode Classic 1 studio condenser microphone....£550
Kenwood TS-570DG/E....£575
TS-480HX....£599
Yaesu FT-736R 2m/70cm Base Multimode....£599
Icom IC-756....£699
Kenwood TS-850S /AT....£699
Kenwood TS-850S /AT....£699
Yaesu FT-920....£799
Kenwood TS-870S HF Transceiver....£799
Yaesu FT-736R 6m, 2m & 70cm Base....£799
Kenwood TS-790E Dual-Band Base / Mobile Transceiver....£799
Yaesu FT-920AF HF / 6M Base....£899
Icom IC-756Pro HF / 6m Transceiver....£899
Kenwood TS-870S HF Transceiver....£899
Yaesu FT-847 HF-6-2-70 Base....£899
Icom IC-R8500 Receiver....£999
Kenwood TS-2000 HF, 6m , 2m & 70cm Transceiver....£999
Yaesu FT-1000MP Mark -V Field....£1,199
OptoElectronics X Sweeper....£1,199
Kenwood TS-950SDX HF Transceiver....£1,399
Yaesu FT-1000 "CLASSIC" HF Transceiver....£1,399
IC-756PRO-MKIII Icom HF + 6m Trx....£1,499
IC-7800 Icom HF + 6m Trx....£4,995
Icom IC-7800 mk 2 with roofing filters....£5,395

Classified Ads

To advertise on this page see the booking form below. **DISCLAIMER** Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. ***Practical Wireless*** advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of ***Practical Wireless*** wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

Aerials

GAREX ELECTRONICS VHF/UHF accessories and aerials, PMR equipment and spares. Tel: 0771 4198 374
www.garex.co.uk
PO Box 52, Exeter EX4 5FD.

G2DYM/G4CFY AERIALS Custom made low noise, low TVI dipoles and trap dipoles. PVC covered stranded wire and 75 ohm feeder properly made-off. Epoxy potted traps. Centre piece and dog-bone insulators included.
Spectrum Communications.
Tel 01305 262 250.
www.spectrumcomms.co.uk

HELIKITE - THE WORLD'S HIGHEST ANTENNA
Don't be stuck in the mud. Set your radio waves free! Ideal for QPR.
Exclusively from Allsopp Helikites Ltd.
Tel: 01725 518750.
E-Mail: helikites@yahoo.com
www.helikites.com
www.allsopphelikites.com

G-WHIP ANTENNAS Mobile, base, backpacker and commercial models. WWW.gwhip.co.uk or telephone 02380 445212 after 6pm.

Valves

VALVES AND ALLIED COMPONENTS IN STOCK Ring for free list. Valves/books/magazines wanted. Geoff Davies (Radio). Tel: 01788 574774.

TOP PRICES PAID
for all your valves, tubes, semi-conductors and ICs.
Langrex
Unit 4, Daux Road, Billingshurst, W. Sussex RH14 9SJ
TEL: 01403 785600. FAX: 01403 785656.
www.langrex.co.uk

QSL cards

FULL COLOUR QSL CARDS for all your QSL needs. Shirts and caps with callsigns and also ham cartoons by GW3COI. For free samples contact Chris M0DOL.
E-mail: qslers@aol.com
P.O. Box 184 Northampton NN3 9JH.

For sale

Qtz x-tals 455kHz to 150MHz Std 10.106, 10.245, 10.7, 11.155MHz £1.00/unit. Callg 3.56, 7.030, 21.06, 28.06 £1.00/unit. 1.4MHz fltrs £14.00. 10.7MHz 10kHz fltrs £3.25 P&P £1.00 + VAT. IQ Electo
Tel: 0208 391 0545.
E-mail: vincent@jakomin.fsnet.co.uk

Repairs

REPAIRS TO ALL AMATEUR AND VINTAGE Rx/Tx Cost effective service. Phone or call in for details. Kent Rigs, 52 Salisbury Road, Chatham, Kent ME4 5NN.
Tel: 07903 023437.

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Tel: 01807 580376.
E-mail: radiorepairs@btconnect.com

Wanted

UK SUPPLIER of Calogic SD-8901 quad-fet DBM. IC supplier of JB style air-spaced variable capacitors 10pF min. 50 to 350pF (Max). Box No. 809, PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

ORDER FORM FOR CLASSIFIED ADS

PLEASE WRITE IN BLOCK CAPITALS

The prepaid rate for classified advertisements is 42 pence per word (minimum 12 words), box number 70p extra. Semi-display setting £13.90 per single column centimetre (minimum 3cm). Please add 15% VAT to the total. All cheques, postal orders, etc., to be made payable to PW Publishing Ltd. Advertisements, together with remittance, should be sent to the Classified Advertisement Dept., Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979, Fax: 01202 659950.

Please insert this advertisement in the ..... **issue of *Practical Wireless*** (if you do not specify an issue we will insert it in the next available issue of *PW*) for ..... insertion/s. I enclose Cheque/P.O. for £.....(42p per word, 12 minimum, please add 15% VAT to total).

Name: .....

Address:.....

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Telephone No.:.....

Box Number @ 70p: Tick if appropriate

Category heading:.....

Please photocopy this form or write on a separate sheet if you prefer

BARGAIN BASEMENT

SEND YOUR ADVERT TO:-

PRACTICAL WIRELESS, BARGAIN BASEMENT, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW

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

10X CRYSTALS old, in 5MHz to 8MHz range, £2 each plus post. E-mail for frequency list. E-mail: G4LEG@blueyonder.co.uk

ALA-1530 LOOP ANTENNA less antenna interface and power unit, plus AR300XL rotator and remote control. Garden mounted on 6ft post. Free if you will dismantle. Tel: Norman 01202 747223 (Poole).

AVO VALVE TESTER MkIV Good condition, all leads and hand books, £450. Tel: Jim G4MH 01484 654607 (Huddersfield).

EDDYSTONE 880/4 VCG , £350. Eddystone 880/Z, VGC, £200. Racal RA-17L, VGC, £150. Kenwood TS-430, spares/repair, £40. Tel: 01279 815020 (Essex).

HALF POUND BAGS ASSORTED CAPACITORS £5 + P&P. Calscope super six scope, £10 + P&P. Harvard H-410T hand-held CB, £20. Two National Panasonic walkie-talkie circuit boards, working, £10 each. Radiation monitor, £15. Tel: Mike 0794 803 4850 (Canterbury).

HAMEG 203-4 SCOPE 20MHz, dual-channel component tester, £100, £20 P&P. Tel: 01457 762799 (Cheshire).

KENWOOD TS-570DGE like, new, £450. TenTec Argonaught II, model 535 like new, £350. Yaesu FRG-770 receiver, £100. Tel: John G4XYY 01937 844197 (Bramham).

TRIO R-5000 with VHF converter, £375. Yaesu FRG-7700, £150. AOR AR8000 hand-held, £125. Global 2000 ATU, £60. Tel: David MM1CFC 01382 528236 (Dundee).

WANTED

CODAR AT-5 transmitter. T-28 receive power supply would be nice. Any condition. Also, top band mobile whip and HF multi-band vertical. Can collect Midlands area (or small top band rig). Tel: Roy G0BZT 0121 523 8400 or 01902 678792.
Mobile: 07836 348945 (W.Mids).

MANUAL for Racal RA-17 receiver. Tel: S Wright 07531 517139 (Stoke-on-Trent).

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 10pm (Sheffield).

WW2 Army Wireless set such as WS19, WS53, WS52 WS22 and any other ex WD radio's ie T1154 R1155 at reasonable costs for newly retired person with renewed interest in WW2 Radio's
Tel: Anthony 01908 373114.E-mail: howard.anthony@tesco.net

Please make any cheques for Bargain Basement adverts made payable to PW Publishing Ltd.

Bargain Basement order form

Please insert this advertisement in the next available issue of Practical Wireless.

☐ For Sale ☐ Wanted ☐ Exchange

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

Name .....

Address .....

.....

..... Post code .....

Telephone Number .....

PLEASE WRITE IN BLOCK CAPITALS

CARD NUMBER

Signature ..... Security number

LAST THREE DIGITS ON THE BACK OF THE CARD

Switch issue number (if on card) .....

Start date of card ..... Expiry date of card .....

My Subs Number is .....(or mailer label) .....

		(30)	

CONTACT DETAILS FOR ADVERT. Please only write in the contact details you wish to be published with your advert, ie. do you want your name & address, or just your telephone number? Your advert, you decide! **PLEASE - No FAXed Ads!** (12)

B.B. Aug '09

THE PW PUBLISHING RADIO BOOKSTORE

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

THE UK & IRELAND FLIGHT ROUTES SUMMER 2009

NEW FORMAT EASIER TO READ

Lists around 11,000 flights which originate or terminate in the UK,N I. and the Rep. of Ireland. In excess of 170 Airline Companies are listed together with Airport of departure and arrival with approximate times of operation. Types of aircraft in use on a given route are included as are both ATC (where available) and company flight numbers. The trend towards the unpredictable use of Alpha/numeric non airline flight numbers has been addressed. Example THOMSON FLIGHT TOM 4XK is revealed as TOM1753 from Zakinthos to Glasgow. Thomson are the most prolific but many many others are shown, Ryanair, EasyJet, FlyBe to name but three, many other airlines seem to be also using this type of radio callsign.
The 200 plus pages are A5 wire "lay flat" bound

£12.95

PASSPORT TO WORLD BAND RADIO 2009

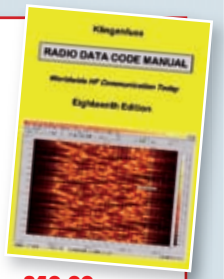
SORRY - CONTINUED DELAY FROM THE PUBLISHERS.

RADIO DATA CODE MANUAL

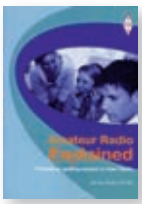
Worldwide HF Communication Today

The totally revised new edition has, again, more than 600 pages with 131 new graphics and screenshots.

This is the standard international reference book for COMINT ELINT MASINT SIGINT and considered indispensable for the identification of really exotic HF radio stations. This manual is used worldwide by intelligence and radio monitoring services for training and operation.



£40.00



AMATEUR RADIO EXPLAINED

Written by well-known author and radio amateur Ian Poole, G3YWX, this book provides the ideal introduction to the wonderful world of amateur radio. Amateur Radio Explained is for people first taking an interest in amateur radio and those ready to move on from Foundation level. Written in a readable and easy-to-understand fashion, Amateur Radio Explained is the perfect introduction to the exciting world of amateur radio. 80 pages.

£5.79

AIRWAVES 2009

The UK's most comprehensive and up to date airband frequency directory. For the first time, Airwaves 2009 includes a new European section containing the air traffic control centre and airfield frequencies for 18 European countries.

This is the 16th published edition of AIRWAVES. As always, the frequencies, maps and other information have been fully updated for 2009. There has been an above average number of frequency changes in the past year, with a significant number of new frequencies added.

£11.50

CALLSIGN 2009

The new 15th edition of our very popular Civil and Military Aviation Callsign Directory. Fully updated for 2009 with a large number of additions, amendments, confirmations and deletions. There has been a full overhaul of the two databases in the past year to ensure that all the information is as current as possible.

NEW IN STOCK NOW

Produced in A5 size, it is wire spiral bound for ease of use and contains thousands of Civil and Military Aviation Callsigns. As far as we are aware this is the most comprehensive Aviation Callsign Directory available in Europe.

£11.50

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● NEW **CIVIL AIRCRAFT MARKINGS 2009** Alan S Wright. (abc)	432	£9.99
● NEW **MILITARY AIRCRAFT MARKINGS 2009** Howard Curtis. (abc)	224	£9.99
● NEW **AIRWAVES 2009** (Photavia)	144	£11.50
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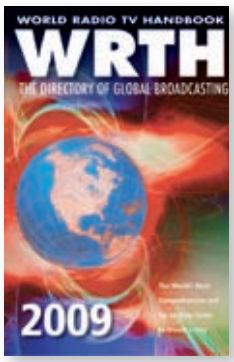

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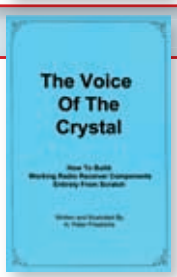

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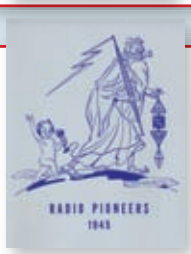

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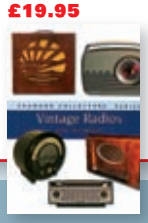

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Rob Mannion's

topical talk

Different ideas to make the disposal of stolen equipment more difficult.

After his original E-mail to me, **Steve Wade** (Star letter this month) and I ended up chatting on the telephone about a dedicated web site – or a section of a website – where victims of Amateur Radio equipment thefts could widely publicise the details. The Dorset Police officers who attended my own shack break-in were of the opinion that the vast majority of similar crimes they attend are 'spur of the moment', 'the time is right' actions. In other words, if the thieves see there's no car in a driveway and there's easy access – it's worth their risk.

Apparently – and I really sympathise with Steve here! – being fundamentally lazy types, the criminally-minded who specialise in stealing from unoccupied houses during the day far prefer corner, or end of terrace housing. Like Steve, my home is also an 'end house' and the security measures I've taken now incorporate all the tips from the Crime Prevention Officer.

However, in effect I have – in a similar fashion to Steve Wade – 'bolted the stable door after the horse has bolted'! So, as we've lost our equipment, all we can do is to make selling it very difficult for the thieves!

Personally, I think the web site idea is an excellent idea as it could be viewed by anyone, anywhere, unlike if the theft was only publicised in *PW*. However, certain precautions would have to be taken because – unfortunately – there are cases of individual reporting of thefts and claiming on insurance for items that have not been stolen. So, as Steve suggests, an official Crime Number (issued automatically by the Police) would be a prerequisite for inclusion on the web site.

Additionally, the Crime Prevention Officer I spoke to strongly advised against publishing full names, addresses and even callsigns on the web site. This is because potential thieves could use this information to target unfortunate victims again!

In other words, we have to be extremely careful indeed, especially as I was told that statistics indicate that once a property has been broken into, there's a high probability of it happening again. And, although I'm often unimpressed with the reams of statistics the various media outlets bombard us with, I can confirm that in my case they've have been proved very accurate!

Careful Publicity

Although the vast majority of individuals looking at a particular website will be decent, honest folk, to get the 'message over' regarding stolen equipment we would have to provide carefully prepared publicity. To this end, I think that the most straightforward method would be to arrange – with the agreement of the Police Force involved – to provide all the details about the missing equipment, including serial numbers where possible, and town and County – without giving the address and other details of the theft victim. Instead, the website would detail the Crime Number, the Police Force involved, the full contact address of the Police Station involved and the name of the Officer handling the case.

Any up-dates on the progress (if any) could be posted on the website, either by the Officer involved (preferably) or by the theft victim. Also, I feel sure that with many thousands of radio enthusiasts keeping an eagle-eyed look out for stolen gear, I'm sure that we could make the disposal of our very specialised equipment **very difficult** for the thief or their 'middle-men', who are often known in the criminal underworld as 'Fences'.

Although I have never purchased Amateur Radio equipment at (non-Amateur Radio organised) car boot sales, I have friends who have purchased bargain priced transceivers and accessory equipment and sold them in this way and have been very satisfied. It's in that sort of situation where the suggestion from **Mike** (Letters this month) comes into play because – quite rightly in my opinion – the majority of legitimate equipment owners will have the requisite manual to pass on to new owners, together with the original boxes.

Finally, I must admit that preparing *Topical Talk* has been very difficult this time, mainly because I fully realise that there are only a very few villains about! But, let's hope by working together we can make this minority's way of life very difficult indeed!

Rob Mannion G3XFD/EI5IW

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