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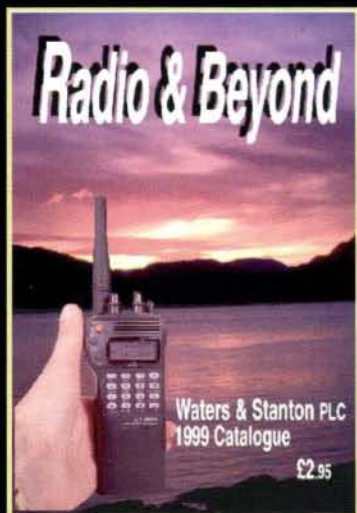
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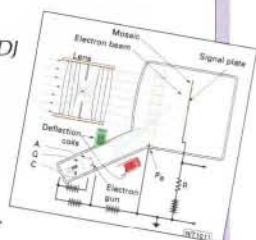
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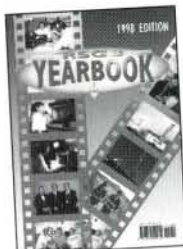
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Edited by Brett Rider, G4FLQ

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Edited by Dick Biddulph, G8DPS

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By Colin Redwood, G6MXL

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Keylines



I'm pleased to welcome **Jo Williams** to the PW Editorial team. Jo joined us on 1st September as News & Production Editor following **Donna G7TZB's** departure to *Scuba World* magazine.

Born in Auckland, in the North Island of New Zealand, Jo made the short journey across the offices here in Broadstone from our sister publication *Short Wave Magazine* where she worked as Editorial Assistant. She gained her Degree in English from Portsmouth University and at 22 years old is 'raring to go'! Already Jo is making her mark and is (to use a modern phrase) 'unfazed' at whatever comes her way!

It's perhaps natural that Jo returned to this area of Dorset from the far side of the World - as her parents and family come from the Poole area. I feel sure that readers - along with everyone here at PW Publishing wish her well as she takes up the demanding and intensely busy role of organising, co-ordinating and supervising the somewhat older ('somewhat' really is an understatement) technical members of the team in the form of **Tex Swann G1TEX** and myself.

So, on behalf of the team, publishers and readers...welcome to the PW team Jo. And I've no doubt you'll soon get to understand the jargon and special terms we (often subconsciously) use all the time - and as I've already noticed she doesn't ask the same question twice (unlike me!)...she's obviously settling in very fast. Good luck Jo - and again...welcome!

Caring CARA

I ran out of space in the last 'Keylines' - and as I wanted to pay tribute in a full fashion - I've left it to this issue to say a big 'Thank You' to the **Cheltenham Amateur Radio Association (CARA)** in Gloucestershire following the wonderful welcome they extended to me on Friday 7th of August.

Not only did we all have a wonderful evening - somewhat delayed because I got caught up with holiday traffic - but CARA also raised £50 on behalf of the **Radio Amateur Invalid & Blind Club**. Well done CARA, I've passed the cheque on to the RAIBC and have no doubt it will be very useful indeed!

Also useful was the kind offer (gratefully accepted) of beautifully made fresh sandwiches for me to eat when homeward bound. Made specially for me by kind friend **Patricia Thom G1NKS** - Wife of **Derek G3NKS** of *Four Metres*

News magazine fame...which is well worth reading if you're keen on 70MHz!

Knowing I was in for a late night trip home (the sandwiches were marvellous) I thought at least I should bake Patricia one of my 'home-brewed' loaves in exchange. She survived the tasting - and the photograph shows Patricia and I, accompanied by **John Clayton G4PDQ**, Chairman of CARA, still laughing from the surprise presentation of the loaf! So, thank you all - I look forward to meeting you again in the future.

Data Cards

This issue carries the first of our new series of up-dated and redesigned Data Cards. And as we've had **very many** requests to up-date the popular h.f. Amateur Band chart we're launching the new series with the latest version - The Lo-Bands Data Card. Thanks to the

support of our publishers it will be followed by a v.h.f., u.h.f., s.h.f. and microwaves version - the Hi-Bands Data Card next month (December).

As a keen h.f. bands operator I'm particularly pleased with the design that Tex Swann G1TEX has come up with. It's particularly useful because (try as I might) I can never seem to remember the band edges for the WARC Bands. But armed with the new card I'm going to be very happy with the information that's now available in such a useful format and I feel sure you will be just as pleased!

Hopefully, our new cards will also encourage operators and s.w.l.s to listen for the h.f. beacons - making use of the helpful guide to propagation conditions they provide in such an effective and simple fashion. The information on beacons will appear on the back of the card, as will the beacon information on the Hi-Bands Data Card.

Perhaps - with more interest being taken in the beacon service on the bands - more people will react (particularly with regards to the h.f. service) when unnecessary interference appears on the allocated frequencies. By acting together - we may even discourage thoughtless QRM from packet radio transmissions directly on or very near 14.100MHz and the s.s.b. transmissions on 18.110MHz thus enabling the beacons to operate for the benefit of Amateur Radio throughout the World.



So, along with providing you with as much good radio reading as we can in the magazine - there's a bonus this month with the free Data Card - plus a 16-page catalogue from **Waters & Stanton Electronics PLC**. Altogether a good read - with lots more in the pipeline as we stride together towards the future.

Finally, I'm pleased to announce that the internal E-mail problem has now been overcome and I'm 'back on the net'. My apologies to the (unfortunately!) great number of readers waiting for a reply - and I promise I'll do my best to catch up with the 'electronic post' as soon as I can.

So, good reading, and I look forward to chatting to you next month.

Rob Mannion G3XD

Letters

COMPILED BY JO WILLIAMS & ROB MANNION



Valve & Vintage

Dear Sir

I found **Charles Miller's** article on valves (*PW* October 98) extremely interesting. The multiplicity of types must have been a headache for any servicing person, civil or military.

The German army from 1936 onwards, had receivers each using one valve type only throughout, being designed for military use. They were the RV2P800; RV2.4P700; RV12P2000; RV12P4000, according to low tension supplies of 2, 2.4 or 12V.

The valves were all pentodes and the beauty of a pentode is that by joining electrodes together, one can make a triode or diode. At least one receiver used a pentode as a double diode-triode! That's what I call ingenuity!

Walter Farrar G3ESP
Pontefract

Editor's comment: I've always had the impression Walter that the multiplicity of valve types came about because manufacturers designed their sets then had a valve specifically made to 'fit the bill' for their design! And although I don't know if I'm being unfair to the designers of years past - surely with many very similar designs using different specified valves - there must be some truth in my theory?

Unwelcome Comments

Dear Sir

Thank you for publishing **Leigh M1CZK's** letter (October *PW*), it was one of the most entertaining letters I have ever read. I too have heard unwelcome comments from other amateurs, usually about novice licensees and M1 operators.

Some of the comments are said in jest but, nevertheless, can be annoying, especially when the offenders have no knowledge of your background, be it radio related or otherwise. If it weren't for fresh blood coming into the hobby, they would have very few people to speak to, wouldn't they?

As for the Morse debate, I learned it up to a speed of 12wpm in less

Great Hobby!

Dear Sir

What a great hobby I am finding Amateur Radio to be. Luckily, when I received my licence (July 30), we were in the middle of an excellent Tropo lift on two metres and, as well as working local stations, I managed to work stations on the Continent and across the country to Wales, Cornwall (Newquay, Taunton), etc.

However, with regards to the soon to be implemented 12.5kHz spacing of simplex channels on 144MHz....does this mean that, for those of us who own old 25kHz equipment such as my Icom IC-290E, our radios will become redundant? I know that for some radios a conversion is available, but at what cost? However for many, this is not a viable option. Will our radios just become worthless pieces of junk that cannot even be sold on the second-hand market due to incorrect channel spacing, etc?

I, like many others I am sure, cannot afford brand new multi-mode (or even just f.m.) equipment and so did the best I could. Now it seems that I may have to buy a new radio, without the back-up of a 'trade in', just so we can be the same as other European countries. I mean, I know that I will not be using f.m. Simplex to work into Europe!

Nigel Booth M1DKN
Norfolk

Irrelevant Radio

Dear Sir

I wholeheartedly agree with **GM4PGL's** letter (August *PW*) that radio is now irrelevant to a great many people. I well remember on BBC TV's 'Blue Peter' programme a couple of years ago, seeing the then Young Radio Amateur of the Year being coerced by the producer into claiming a false transatlantic contact in order to spice up a rather flat, dull and uninteresting feature.

For the last three years, I have been visiting my local library on two nights per week for a one hour internet session. I have access to world-wide communications (not subject to the vagaries of propagation), can print anything I want to read at home (within reason) and all for the princely sum of £2. Yes, that's right, £2! In view of this, why would any young person in their right mind struggle through the RAE

and the Morse test, neither of which have any professional value in these days of high unemployment?

We would do well to remember that we are members of a hobby, not the cutting edge of scientific research.

G R Wilkie GMORMT.
Scotland.

Whinging Poms?

Dear Sir

Your letter pages in the October issue make me want to throw up! No wonder the 'Australians' call us 'whinging Poms'!

I think you should read the various '.. cannot learn the Morse code' statements as 'will not and do not want to learn the Morse code because I will have to put some time and effort into doing so'. If you want something badly enough, you put yourself out, give up time to attain that object and **that** is what these people just will not do.

Having been a Morse teacher for over 40 of my 46 years on the air, it is only since the 1980s that I have found this attitude has prevailed. In the 1980s, a society evolved which taught the young (and some not so young) that money was the be all and end all of life, that attitude is now prevailing in our hobby.

I still have many dedicated pupils from amongst the novices and v.h.f. only licensees (I also do not like the term Class 'B'), some who were CB operators, who are getting their heads down and learning the Morse code successfully. Some are young, but many are very mature (like myself) and the older you become, the more difficult it becomes to absorb the code. But it's not impossible, it just needs a bit of dedication.

One hour a week with your tutor is just not enough. You also have to listen to others using the bands and there are many, many stations who send slowly.

When I was being taught by my mentor, **G2DUP** who is now unfortunately a Silent Key, it was half an hour per day on top of a trolleybus during my lunch break. Then, at least an hour every evening listening on my home-brew OV1 receiver - oh, the thrill when I began to copy callsigns, names and QTHs.

Les got me up to 18wpm before he permitted me to go GPO HQ for my test and those GPO professionals were tough cookies, compared to us voluntary

than six weeks in the Royal Navy. I never used it and I never want to. Why should I have to get up to speed just to use h.f.? It's not a hardship, but nor should it be a means to an end.

Well done on the extra page of letters. It's one of the best sections of the magazine. I'm sure that most would agree.

Gordon MW1CLS
Denbighshire

Editor's comment: Our pleasure Gordon! We could fill half *PW* with letters at times...but occasionally we HAVE to make space for the times when the post-bag threatens to burst when there's a big response to a particular topic!

Callsign Number Plates

Dear Sir

with reference to the 'G' series of callsign number plates recently auctioned off by the DVLA. I cannot help feeling that British Amateurs have been 'ripped off'.

Let's look at the facts. If these series of registrations didn't happen to coincide with the callsigns of Amateur Radio licence holders, hardly anyone else would have given them a second glance (unless they corresponded with an individual's initials, for example), whereby the DVLA would have sold them for a much lower price.

But no! As soon as they discovered the potential market for them, they auctioned them off at, what I personally feel is an exorbitant price.

For those amateurs who may feel the same way, I have found what I consider to be a much more attractive, but far cheaper, alternative to the callsign number plate.

I recently contacted a local firm who specialise in vinyl signs and asked them to make my callsign out of white self-adhesive lettering. They made the callsign within the hour and fixed it inside the rear window of my car.

Positioned close to the top, it does not obscure my view through my rear view mirror. I have also made and fitted G-QRP-Club and RSGB Badges too. I enclose a photo showing the final result. What do you think?

The total cost - less than £5!

Duncan Walters G4DFV, Mansfield



Editor's comment: I'm going to do the same Duncan!

examiners of today. He nearly failed me - because I sent it too fast! He really read the riot act and made me send the passage he had chosen more slowly.

Despite some persons believing that I was a Royal Navy operator, I was not and had to sit both the RAE (written, not multiple choice) and the Morse test. We did not receive a certificate from the City and Guilds, London Institute in those days, just a tiny yellow pass slip marked 'P' or 'F'. So, if I ever allow my license to lapse, I would have to do everything again! I can now send at 35wpm and receive the same. Declining years and ill health has not impaired those abilities.

I have absolutely no objection to all who pass the RAE being let loose on all the h.f. bands, but I would like to see a measure of competency shown, a knowledge of operating procedures, better use of phonetics and the ability to read callsigns in difficult conditions, a knowledge of antennas and propagation.

Most h.f. bands do not possess repeaters, so the ability to copy signals in difficult conditions, i.e. a signal of S3 with a band noise of S7 is important. It can be done, especially on c.w. I learnt much as an s.w.l. long before I was let loose on the air.

All I ask, as a dedicated c.w. operator, is that the band plan is made enforceable like it is in the USA and other countries. Slowly but surely, Packet and other digital modes are straying into the lower portions of the c.w. bands.

The band plan on 10MHz says narrow band modes only but, oh, the number UK stations who use s.s.b. on that band is countless and when told, they just reply that it is only a gentlemen's agreement, just like those old timers who used to use a.m. in the c.w. end of 3.5MHz when I was first licensed

I would also propose that existing h.f. licensees sit an operating exam to

retain their present privileges because some are completely incompetent! (I will get some flak for that remark!).

One other thing, is the ability to net, even those with all singing and dancing rigs often come up as much as one kHz high or low, I have often found s.s.b. nets on 3.5MHz that spread over 3kHz because people leave their RIT in instead of switching it off before joining a net.

So my test for any operator would include: familiarity with their equipment, knowledge of the band plans, an ability to recognise some other languages than English, knowledge and use of the phonetic alphabet, to be able to speak clearly and distinctively, to be able to net correctly, politeness and good behaviour.

From another loyal reader and a member of the RSGB and many other clubs.

Don Walmesley G3HZL, EI4HM, Stoke-on-Trent

Keen Collector Seeks Help!

Dear Sir

May I ask for help from your readers in the letters column?

Over a period of time, I have bought radios from various car boot sales, a Pye Cambridge transceiver for £1 (it does receive), Kolster-Brandes Rhapsody Deluxe for 50p. Plus others all in various states of disrepair.

I am slowly renovating them but due to problems with certain radios, I have come to a stop. Can anyone help?

Vidor Personal Attaché Battery Portable Model CN434 (four valves) - the i.f. transformer feeding the valve DF96 is open circuit, does anyone have a replacement i.f. or scrap chassis?

National AU 375 (five valves) mains radio - circuit diagram needed.

Pye Cambridge transceiver (valve and transistor) 12V d.c., serial No. 5881D, receiver frequency 167.25MHz. Does anyone have information on how

to get it to work on 144MHz and maybe the circuit diagram would help? A knob is missing which I think is the 'function knob', what instructions are on the knob?

Kolster-Brandes 'Rhapsody Deluxe' (four valves) mains/battery. A chunk is missing from the dark brown case (is it plastic?), the material thickness is approximately 2.5mm. How can it be repaired?

Perdio 'Town and Country' (transistor) missing carrying handle. Finally, is there such a thing as a wall chart of old battery types giving sizes, voltages and plug connections?

**I G Bennett
44 Haig Avenue
Whitley Bay
Tyne & Wear NE25 8JG**

Editor's comment: We've provided the full address so that readers who can help - can do so directly. I'm also passing the letter onto Phil Cadman G4JCP - as it will be of interest in his 'Valve & Vintage' column. I've no doubt readers - and Phil himself - will help. Converting p.m.r. transceivers (such as the Pye 'Cambridge' is dealt with in the RSGB's PMR Conversion Handbook.

Letters Received Via The 'Internet'



Many letters intended for 'Receiving You' now arrive via the 'Internet'. And although there's no problem in general with E-Mail, 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 don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! All letters intended for publication on this page must be clearly marked 'For Publication'.

Editor

A LETTER PUBLISHED IN PM WINS YOU A VOUCHER TO SPEND ON ANY PM SERVICE

news

COMPILED BY JO WILLIAMS

Radiocommunications Takes To The Road

From Friday September 25th, the **Radiocommunications Agency** will be taking to the road as their 'roadshow' gets under way. When you read this, they will already have done two stops - one in Manchester on September 25th and one at Belfast on October 2nd.

The aim of the roadshow is to offer businesses and organisations who depend on radio a chance to discuss the implications of the **Wireless Telegraphy Act 1998**, which reached the statute book in March this year. Chief Executive **David Hendon** and other senior staff will also be available for any questions and concerns that Radio Amateurs may have concerning the Act.

The opportunity for people who are involved in, or affected by, radio to air their concerns face-to-face very rarely comes along and *Practical Wireless* suggests that if you do have any questions about how the new act will affect you or your company, then you should really try to make it to one of the roadshows.

Roadshow '98 is free of charge but if you want to attend one, you must make a reservation. In order to do so, please get in touch with the Event Office on the Reservations Hotline. **Tel: 0171-223 9006, FAX: 0171-924 3964, or E-mail: abra102092@aol.com**

As from October 9th the roadshow will be going to **Gatwick (October 9th); Milton Keynes (October 30th); Perth (November 6th); Leeds (November 13th); Bath (November 27th)** and **Cardiff (December 4th).**

Transmitting Thoughts of Sympathy

King Hussein of Jordan, JY1, has recently been attending the Mayo Clinic in Rochester, Minnesota and is undergoing chemotherapy for lymphatic cancer. He is a Radio Amateur and, as we know that he does see a copy of *Practical Wireless*, all here would like to extend to him our best wishes for a speedy recovery.

Press reports have suggested that the King is responding well to early treatment and is showing signs of an early recovery. **Editor**

RAE Courses - Late Listings

Ron & Shirley Ray will be holding RAE and Morse classes at the **White Hill Centre, Chesham, Buckinghamshire**. The RAE classes will take place from Tuesday **September 15th** at 7:30pm, c.w. (all speeds) from Thursday September 17th at 8pm. You can Tel/FAX: Shirley G4HES or Ron G3NCL (01494) 776420 for more information.

Bury Radio Society are running a course leading to the RAE in May 1999. It will be held every Tuesday, starting in September from 7-8:30pm. There isn't a fee for the course, but candidates will be expected to join the society (at a reduced charge). For further details, please telephone the secretary, **Mike Bainbridge on 0161-761 5083**.

Maplin Electronics Goes Electronic!

September 1st saw the launch of the updated **Maplin Electronics** catalogue. Together with the traditional printed version is the new and improved **double CD-ROM**.

The CD-ROM has all of the features that comes in the traditional written form, including the new semiconductor guide listing an additional 17000 new products, price reductions on over 2000 products and an additional 1000 new lines due to range extensions. As well as that, there are a number of unique features: a **free** copy of **MacAfee** anti virus software, a **free** 30 day Internet trial with **Demon** (including software) and over 1000 datasheets.

Maplin claim that the beauty of the CD-ROM is that not only can you browse through the catalogue with ease, but ordering is very easy. When you find a product which you require, all you need to do is press the 'add to order' button and the CD will place the item in your 'shopping basket'.

Available in PC and Macintosh versions, the new CD-ROM can be ordered from Maplin Electronics and from any of their stores. You can also telephone **(01702) 554000** to order your catalogue or obtain further information. Maplin Electronics also have a Website address: **http://www.maplin.co.uk**



Kenwood SM-230 Discontinued

Kenwood have informed us that their **SM-230 Station Monitor** was discontinued a while ago. Do not panic, however! **AOR** are said to have a similar product - the **SDU-5000** and they have also evaluated the **TS-870S** for use with the **SDU-5000** and Kenwood are pleased to announce that **AOR** feel that the two models are compatible.

Kenwood are, therefore very happy to be promoting the **SDU-5000** as a suitable accessory for the **TS-870S**. On the technical side of things, **AOR** have modified the **TS-870S** which will increase the **TS-870S's** level

of i.f. output. Owners of the TS-870S should be warned that the modification involves work which may affect the warranty, so please check with Kenwood before doing any modifications on radios under one year old. You can telephone **Dave Wilkins G5HY at Kenwood Electronics** on (01923) 655284 or **Richard at AOR** on (01773) 880788 for more information.

And More...

News also of new products from **Optoelectronics** with the release of the new **Mini Scout** (see fig. 2) which carries on the very good work of the previous Scout frequency finder. Priced at **£199**, Optoelectronics say that it is bound to be 'a hit'.

Still with Optoelectronics, there's news of the new **Opto Trakker** (see Fig. 3) multi-mode decoder at **£299** complete with software, which will be music to the ears of some Radio Amateurs.

The MQ-1, MQ-2, Watson mobile h.f. antenna, MFJ-1048, Mini Scout and Opto Trakker are all available from **Waters & Stanton**.



The new Mini Scout from Optoelectronics



The new Opto Trakker from Optoelectronics

A Good Sport!

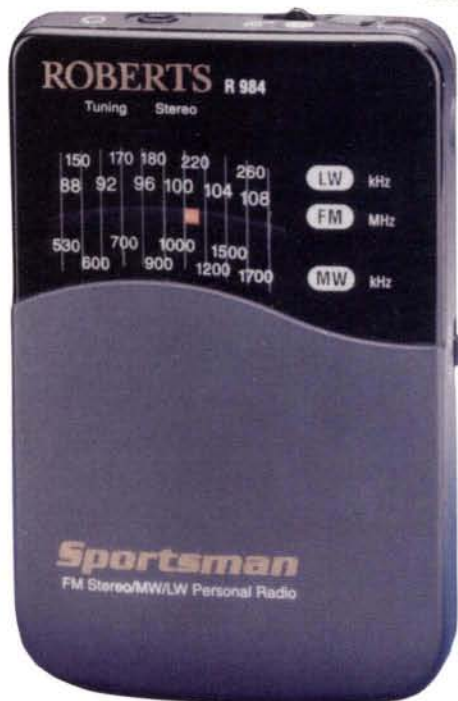
Roberts Radio have just released a personal stereo with a difference. Roberts say that it will be a sports fanatic's dream, the new

Sportsman has everything you would need to listen to all your favourites - and apparently, it's smaller than a pack of cards!

The new radio has l.w. as well as m.w. and f.m. stereo so you should be able to pick up the latest from Radio 5 Live and Test Match Special on Radio 4 long wave.

The Sportsman comes with stereo earphones

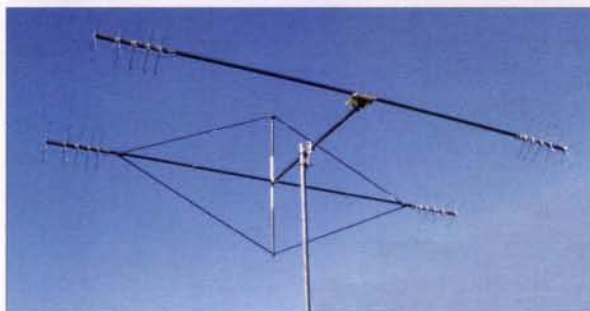
and costs **£29.99**. For details of where you can buy it, telephone (01709) 571722.



Waters & Stanton Re-releasing

Waters & Stanton are releasing the **MQ-1** and **MQ-2 Mini Beams** (see below) after a period of about 20 years. First sold in the mid 1970s by a company which is now extinct, they were such a hit that they are being brought back to life by a Canadian company. The beams are extremely compact and Waters & Stanton feel that they have great potential considering the improvements in the sun-spot cycle.

The Essex-based company also bring me news of the



The new MQ-2 Mini Beam from Waters & Stanton

new **Watson** range of **mobile h.f. antennas** and the new **MFJ-1048** both of which are expected to fill a gap in the market. The MFJ costs **£119.95** and is a pre-selector suitable for use with receivers and transceivers.

Walford Electronics Make Three Additions

Walford Electronics of Somerset are designers and suppliers of kits for radio enthusiasts and have announced three new major projects: the **Langport** - a two band c.w. and s.s.b. 'phone superhet transceiver for 3.5 and 14MHz; the **Wellington** - a 5W c.w. transceiver for any single or pair of bands from 1.8-28MHz and the **QRP Booster** - produces 20W on a 13.8V supply with around 1.5W drive



over the range 1.8-14MHz with direct or r.f. sensing control.

Tim Walford says that all three projects are based on 100x160mm double sided high quality p.c.b.s and supplied complete with all parts and hardware for building (see photo).

You can send an **SAE** for further details to **Tim G3PCJ at Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ**.

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Hopefully you've now got all the bits and pieces you need and a car radio to use with the converter. So - let's get started!

The circuit for the converter project is shown in **Fig. 1**. As usual, I've based the project on one type of transistor, the MPF102 field effect (f.e.t.) type for simplicity and a pin-out diagram for this device is also provided.

One MPF102 acts as the r.f. amplifier - it's the same circuit as we used in the tuned radio frequency (t.r.f.) receiver. This amplifies the incoming 3.5MHz signal which is tuned by the coil L1 and capacitor C1.

Coil L1 is wound on a paper tube wound over a pencil. (All coils are wound using 0.3mm diameter enamelled copper wire in the same fashion as all the t.r.f. receiver).

The coil is made up from 80 turns of wire, with a tapping at 40 turns. It will resonate within the 3.5MHz Amateur Radio band with a 100pF fixed capacitor. However, if you have a 100pF trimmer capacitor this will allow for adjustment.

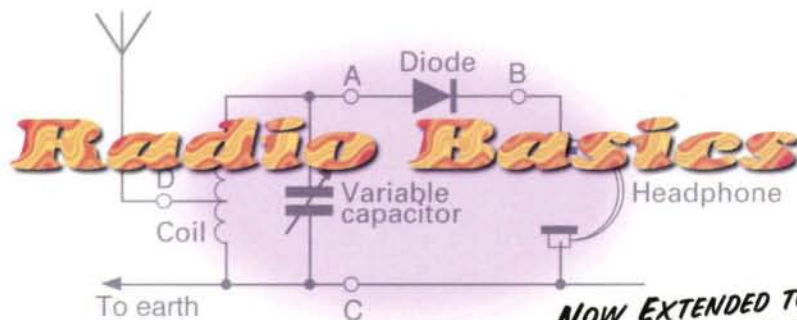
The amplified 3.5MHz signal is fed via C4 to the coil L2a via L2b. Be prepared to experiment with the value of C4 for best results. The value can be anywhere between 100 and 700pF.

Wind L2a first onto the paper tube you've already prepared. It should be of 80 turns. Again, the resonating capacitor can be a 100pF fixed type or a 100pF trimmer type. When you wind L2b **over the main winding** (spread the winding - 20 turns - over two thirds of the main coil) and make sure you can identify the separate windings.

Be especially careful that you connect the start of both windings to the chassis (0V) end and the tops (the ends you finish up holding after you've completed the coils) to the end of C4 and to the gate of the mixer MPF102 respectively.

The type of mixer used is called a 'gate injected' type. The oscillator uses another MPF102 and the crystal is usually employed as the colour reference source for the PAL

Fig. 2: A prototype converter unit (see text). Coil L1 is mounted (using wax) just above p.c.b. Other coils are fixed upright also using wax or adhesive, with windings sealed with melted wax (carefully 'dripped on' using a hot soldering iron bit - old waxed capacitors being an ideal source of beeswax).



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television system - chosen because it produces a useful 'difference' signal and it's cheap!

Take care to only use the 'gimmick' capacitor (GC) specified. This is formed by two short pieces of pvc insulated wired twisted tightly together over approximately 15mm, providing a very low capacitance.

Amongst other 'mixer' products our wanted medium wave intermediate frequency (i.f.) signal appears at the drain end of the mixer transistor. Again the necessary coil is wound onto a rolled paper tube. Wind 160 turns for L3a (to 'peak' at around 800kHz) and 30 turns for L3b.

You can get away with just a 500pF fixed capacitor across L3a

- or even nothing...as indicated on the circuit. But using one of the 1250pF trimmers I suggested last month - provides useful adjustment and it will 'peak' nicely.

One end of L3b goes to earth (0V) and the other - via the printed circuit board track to the

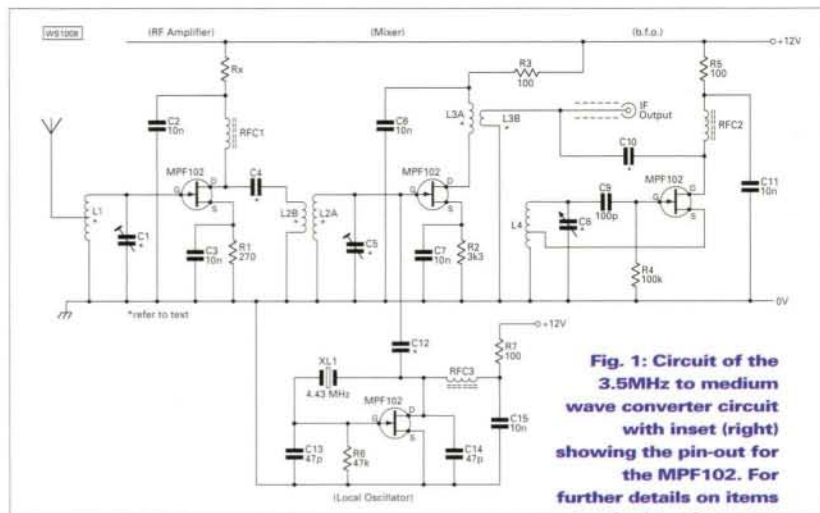
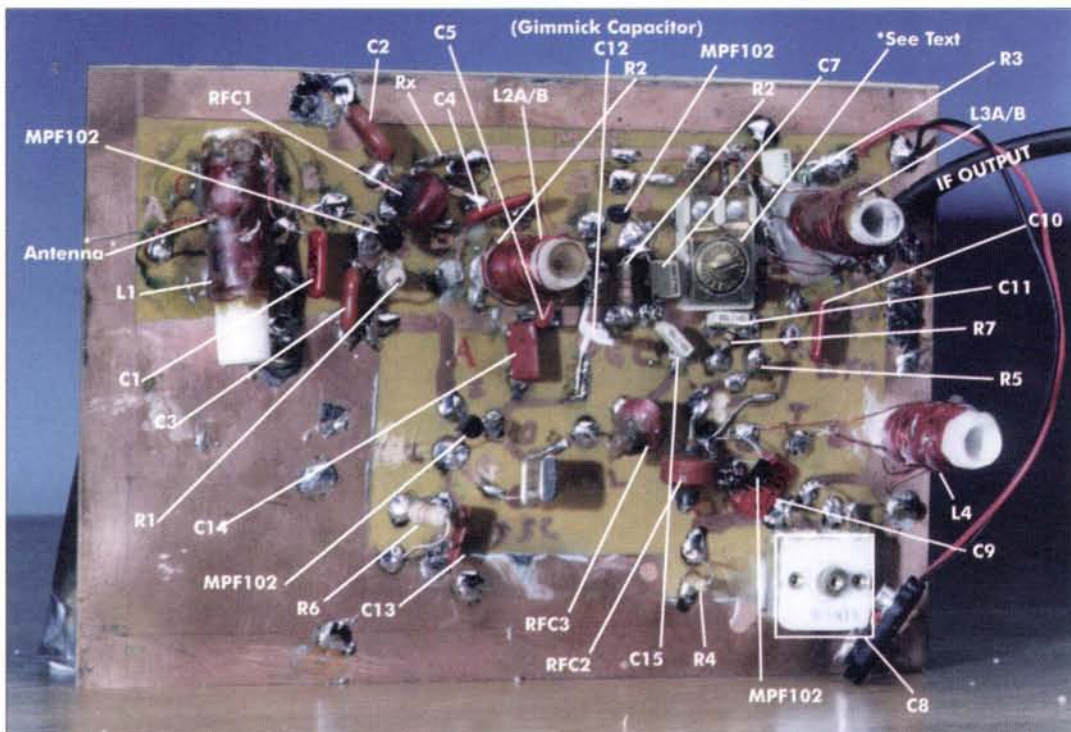


Fig. 1: Circuit of the 3.5MHz to medium wave converter circuit with inset (right) showing the pin-out for the MPF102. For further details on items marked * - please see the text. (The Resistor Rx is 100Ω).



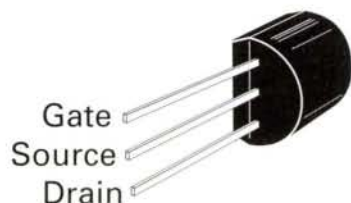
This month Rob Mannion G3XFD describes the construction stages of the 'Radio Basics' 3.5MHz to medium wave converter.

coaxial cable feed to the receiver.

The beat frequency oscillator (b.f.o.) is the only 'hit and miss' part of the circuitry. So as to minimise any 'tinkering' inside an otherwise working radio, I found the best results were obtained by injecting the 'beat' note via C10 (experiment with a value between 100 to 500pF or more) with an oscillator covering from around 600 to approximately 900kHz.

The variable capacitor, C8, is a standard Polyvaricon (both halves are automatically paralleled with the p.c.b. track design). Coil L4 is wound on a paper tube. For the smaller type of polyvaricon (as in Fig. 2), it should have 300 turns, tapped at 100 turns on a paper former. Be prepared to experiment - larger size polyvaricons only require 200 or so turns (tapped at 80 turns) to cover the required frequency.

Injecting the b.f.o. signal at



the antenna input of the car radio **will effect** the automatic gain control (a.g.c.) to a certain extent. But in practice I found it worked very well indeed

Building The Project

Now it's time to build the project - using the recommended 'no drilling p.c.b.' method adopted for this series.

One of my prototypes (for component placement guidance

only) is shown in **Fig. 2**. The final design is shown in **Fig. 3**, and it's the lay-out you should follow when making your own board.

The board itself measures 180 x 122.5mm and is cut from the surplus Synthetic Resin Bonded Paper Boards (s.r.b.p.) suggested last month. There's a 10mm border around the edge of the p.c.b. (to allow for mounting into a box or to build up a casing using sections of p.c.b. material).

Copy the design out onto your p.c.b. with a Dalo pen. But whatever you do - **do not use any form of abrasive cleaner on the board before drawing the design on**. If you do the etch resist will 'run' in the minute scratches, become fuzzy and distorted and you'll have to start again!

All the f.e.t. drains are marked with a **D**, sources with **S** and gates with a **G**. (These are a great help in assembly).

The hole (surrounded by a rectangle marking) is for the 1250pF trimmer if it's to be used. One terminal of the trimmer and the **start** of L3a should be soldered at the position marked "Drain end of L3a" on the design. The final etched 'pad' directly opposite (marked see text) is for the other terminal of the trimmer.

The other end of L3a goes to 'R3 end of L3a' as marked. Connect the start of L3 to the 'common' connection as indicated, with the 'end' to 'L3B see text' end as marked on the design.

Note that there's a wire link to provide 12V for the b.f.o. and crystal oscillator stage - indicated as such on the board. The rectangle marked around the b.f.o. indicates the position of the Polyvaricon. Note that the two outer connections are connected to the same track,

with the centre (common) going to earth and that in Fig. 2, the control knob for C8 is removed for clarity.

The letters **S**, **T** and **E** refer to the b.f.o. coil connections. The beginning of the winding is marked **S** for start, **T** is for the tap and **E** is for the end of the coil winding.

The large un-etched area of copper on the design was achieved by using pvc tape as a 'mask', as was the 10mm border. It saves etch resist, time and looks neater!

After checking your design, wait for the etch resist to dry and then place in the ferric chloride - agitating it occasionally by rocking the container gently. When etching is complete (pale yellow s.r.p.b. material exposed where not protected by etch resist and tape) thoroughly wash and rinse in fresh water, then dry and remove remaining etch resist with switch cleaner, before soldering and assembling.

I suggest you build the oscillator first, followed by the mixer. You should hear signals on 3.5MHz on the lower section of medium wave with the antenna temporarily connected to L2b end of C4. If all is well

complete the r.f. and b.f.o. stages and you should resolve c.w. and s.s.b. transmissions by adjusting C8.

Using The Converter

Using the converter is simplicity itself. As the 4.43MHz oscillator is above the 3.55MHz band all you have to do is to **tune downwards** from 930kHz (**the difference between 4.43 and 3.55MHz**) to 630kHz (**the difference between 3.8 and 4.43MHz**). When you find an Amateur radio transmission, adjust the trimmer on L3a for maximum signal - and that's all you have to do apart from adjusting the b.f.o. frequency!

Knowing where you are in frequency terms will be simple if you're using a receiver with digital read-out. But for most of us, depending on how well the radio is calibrated on medium waves - you may have to 'feel' your way! There will be a little bit of 'break through' from medium waves - but even on the 'bread board' version I did not find it to be much of a problem.

It's a great little project, both sensitive and selective bearing in mind the simplicity of the idea. You'll soon get used to adjusting the b.f.o. to read s.s.b. transmissions. At night, and with strong signals - you can reduce 'overload' by using a small value capacitor in series with the antenna.

We've now come as far as we can without the aid of simple test equipment and from now on we'll need the very basic of test equipment. I'll introduce the first of these - the incredibly useful 'dip' meter - next time.

Cheerio for now!

Interested? Want to join in and 'have a go yourself'? You can....by just sending a large s.a.e. (with 50p stamp) asking for the free 'Radio Basics' Guide - Issue 1 & 2.

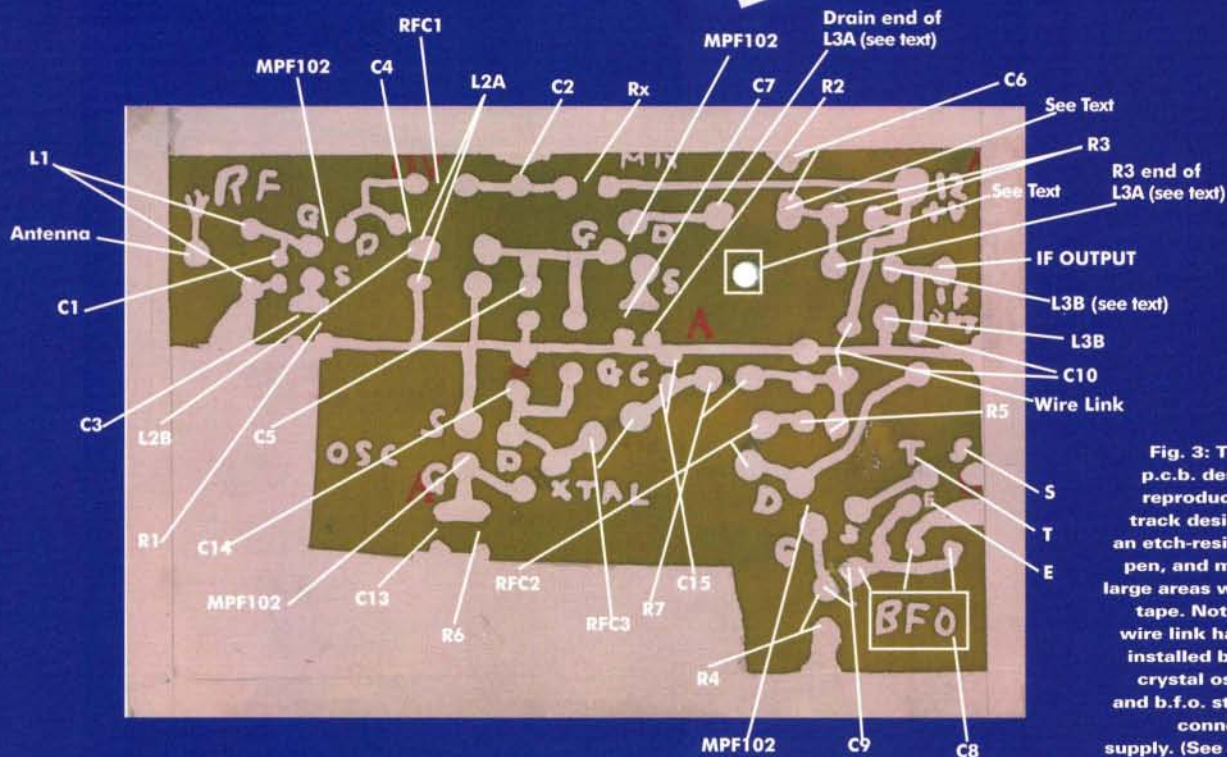


Fig. 3: The final p.c.b. design. To reproduce, copy track design with an etch-resist filled pen, and mask off large areas with pvc tape. Note that a wire link has to be installed between crystal oscillator and b.f.o. stages to connect 12V supply. (See text for details).

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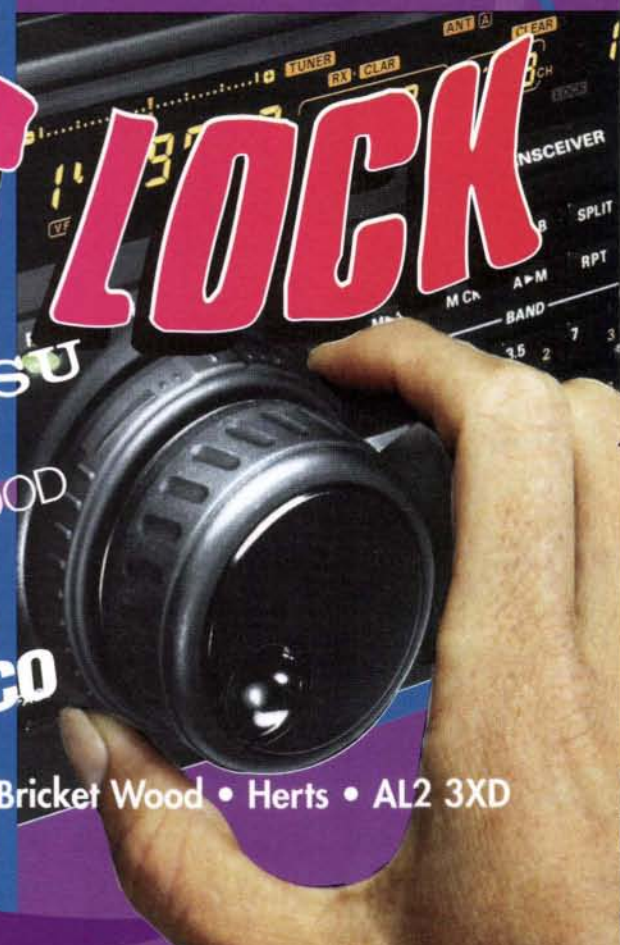
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Valve & Vintage

Our military 'vintage' specialist Ben Nock G4BX says he's "stepping out of uniform" (albeit briefly!) to look at some very interesting receivers and ends with a suggestion for your Christmas gift list.

Hello once again! And I hope you all had an enjoyable summer at all the rallies and shows. I did...and it was very nice to meet those who came over and had a chat.

Stepping out of my uniform this time, I'm starting with an interesting combination that found its way onto my operating table. The arrivals consisted of the GEC BRT-402 receiver and the Heath DX-20 transmitter. So, let's take a look at them.

The GEC BRT-400 series of receivers were very popular in the 1970s. In fact, I remember that the late **Tom Douglas G3BA** used to operate with one of these sets and I was always in awe of it. Eventually, later on, I acquired one and found that although **it is a nice set**, it's not really anything special.

Recently I was very kindly given two of the BRT sets, both in need of restoration. However, after a short period of work on one, a few open resistors and leaky capacitors later, it was coaxed back into life.

Single Conversion

The receiver is an 11 valve single conversion superhet with an i.f. of 455kHz. It has two r.f. amplification stages and two i.f. amplification stages with a variable selectivity at 6dB down from 13kHz to 50Hz in six steps using a crystal filter for the last three.

The sensitivity is quoted as less than 1µV at 30% modulation to give 1.5W of audio out. (This may have been true when the set was new but certainly in my previous set and the latest acquisition, the claim seems a bit optimistic).

Incidentally, the desk top model with a case is called the BRT-400D, and the rack mounted version is classified as the BRT-402D. The BRT-400E or 402E are identical but with the addition of a crystal calibrator, a BRT-403 (with the addition of an N, i.e. 400EN or 402DN) means it has a 9kHz audio rejection filter fitted in place of the normal 1kHz audio filter.

A Heath Kit?

The Heath (note Heathkit was the normal UK

way of marketing) DX-20 transmitter is the smaller brother to the more usual UK version, the DX-40. Unlike the 40 though, the DX-20 was c.w. only, still crystal controlled and provided between 25 and 30W output on the old 3.5 to 28MHz (80 to 10 metre) bands.

The quoted dates of manufacture by the Heath Company of Benton Harbor (American spelling of harbour!), Michigan in the USA are from 1957 to 1960 and was sold as a kit for just under US\$36. The manual, a copy kindly supplied by **Rob Login AA8A**, states that this transmitter is ideal as an emergency transmitter as well as a good field day set.

It may well have been that the DX-20 was never marketed in the UK, as this particular set has the standard USA 115V a.c. p.s.u. The two valved set uses a 6CL6 as a Colpitts oscillator and a 6DQ6A as the power amplifier (p.a.) stage output. A standard Pi network allows the set to be matched into a 50 to 1000Ω load.

Although I found the DX-20 still works well and the c.w. note is not too bad (well at least it is **now**...after I removed someone's weird modification to the oscillator!) there's a slightly annoying feature in that the crystal plugs into the set through a small hole in the side of the casing.

The location and size of the hole make it very difficult to change crystals quickly and there's only the one socket. A front mounted holder or even several holders with a switch would have proved more versatile.

However, the only other problem I noticed is with the cheap meter fitted to the front panel that can be switched to read either p.a. stage grid current or anode current. It's so 'bouncy and springy' action that on every press of the key the needle 'pings' the stops and (seems to anyway!) takes hours to come to a rest. This makes tuning up quite a laugh!

Biscuit Tin Radio

How about a radio in a biscuit tin? That's how the MCR1 (Miniature Communications Receiver) was described due to the box it was issued in which resembled a biscuit tin of the time. This clandestine radio (I'll not call it a Spy set as it's only a receiver) was in great use throughout Europe during the Second World War.

In action the MRC1 was used by resistance



Fig. 1: The Heathkit DX-20 transmitter photographed in place above the GEC BRT-402 receiver, with the Morse key ready for action. (see text).

Ben G4BXD - briefly out of uniform - looks at some interesting vintage receivers

workers to receive messages confirming drops of supplies, etc., always shown in films by the weird little agreed code phrases broadcast by the BBC after the nightly news such as "The cow jumps high tonight", extracts from poetry and similar.

The five valved set covered 100kHz to 15MHz in four ranges using small plug in coil packs. It could run off either a battery pack or a universal a.c./d.c. mains power supply.

Although used during the Second World War, I noticed in another radio publication recently that a Belgian post-war produced version is available. This raises the question of just how long these sets were in use.

Looking Abroad

Just time to go 'looking abroad' now by mentioning a couple of sets not likely to be seen in the UK. The first is an American low band v.h.f. set (left), a BC-322 (or SCR-195) that's a very close equivalent of our No.17 Set.

Tuning from 52 to 65MHz the BC-322 was used for very close infantry or gun battery communication. Using just two valves the set had a quoted range of 8km but as it has a self-oscillating detector I would imagine the receiver could have been heard as far as that!

Next, I have another French set, from the Second World War which was used by the occupying Germans. It was kindly supplied by **Mr Loustau**, the helpful gentleman who provided the R87 and the SARAM receiver seen in previous editions of my 'Valve & Vintage'.

The latest receiver sent by Mr Loustra, the R30, has one or two interesting features. It covers 4000 to 12 metres on the dial, which if we do the conversion of f divided by 460 plus the number first thought of (all divided by the speed of light. etc.!!) gives us a coverage of long waves to 25MHz (I think).

The R30 then has continuous coverage by the clever use of a twin i.f. system (135 and 475kHz, switched in by cams on the wavechange switch.

Even the beat frequency oscillator (b.f.o.) is switched using the same cam system so that it will match the i.f. frequency.

Additionally, a pull on the tuning knob drops in a further



Fig. 2: The MCR1 receiver with power supply and coil packs.

small gear which reduces the tuning rate giving a very nice fine tuning facility. In use the set is very good considering it's only a six valve single-conversion superhet. (Two sockets, just below the right of the tuning dial, allow a long or short antenna to be used.

Reading & Reference

Some interesting reading and reference now. The book I'm suggesting will

perhaps be added to those Christmas Present lists!

The third edition of *Shortwave Receivers Past & Present, Communication Receivers 1942 - 1997* by Fred Osterman which is now available. This popular receiver index goes much further in the number of receivers described, the number of illustrations and the number of pages.

With 473 pages Fred Osterman's book details over 770 receivers manufactured between 1942 and 1997, from numerous manufactures in many countries. American produced sets dominate the book, but British, Japanese, German, Norwegian, Dutch and various others are also covered.

Amateur, military and commercial sets are shown, British sets covered include Eddystone, Racal, Marconi, KW and Murphy. Also included are such Japanese sets as Trio, Kenwood and Yaesu.

Each receiver has a black and white photograph and a detailed description of specifications. The book is a treasure of information, an ideal reference book and a very enjoyable read regardless of being a collector or not and is available from the *PW* Book Service.

And finally

Just to prove that this column has other qualities apart from great pictures (yes, we agree your photographs are good Ben! Editor). I featured a letter a while back from **Keith Soutter**. It seems **John Collins GODHU** spotted the name and wondered if it was the same person he knew years ago. After making contact via yours truly it turned out Keith was the long lost friend and they have now restored contact and friendship! (All part of the service chaps!).

During subsequent meetings John twisted Keith's arm to have a go for the RAE and I

can now happily report that

Keith is indeed M1CCE, well done John, well done Keith.

As always, I can be contacted at 62 Cobden St, Kidderminster, DY11 6RP, or E-mail on G4BXD@compuserve.com or via the *PW* offices. So best regards till the next time.

PW

Fig. 3: The American made BC-322 v.h.f. transceiver in use the battery pack would be mounted on the base of the unit. (see text).



Fig. 4 (right): The French produced Second World War R30 receiver. Note the tuning dial, marked in Metres, and the antenna socket on the right (see text).



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Practical Wireless 144MHz QRP Contest

It's time once again for long serving adjudicator Neill Taylor G4HLX to present the results of the 144MHz QRP contest.

A midsummer Sunday saw 144MHz enthusiasts taking to the hills for the 16th annual **PW 144MHz QRP Contest**, and by all accounts those taking part had a most enjoyable day. Although in most areas, neither weather nor propagation conditions were particularly good, many exceptional contacts were made using just 3W of output power.

The group achieving the best performance and winning the **PW QRP Contest Winner's Cup** is the **Oldham Radio Club, G1ORC/P**. This club have been entering the contest for many years, and have gradually climbed the results table.

After reaching second place last year, Oldham's well-deserved win was achieved by operators **G7OOD, G1GKR, G0KUY** and **G0WPO**, plus five other club members helping to carry all the equipment and antennas up to their portable site on top of Kinder Low. Their first place also wins them the special prize of an Alinco DJ-190 144MHz hand-held transceiver, kindly donated by **Mike Devereux G3SED of Nevada**

Communications.

The Oldham Club's result pushes last year's winners, the **North Wales Wafflers GWONWR/P**, into second place, winning them the special prize of either a portable battery pack or a portable solar cell equipment, kindly donated by **Bob Keyes GW4IED of Key Solar Products**.

The leading single operator is again **Dave**

Hewitt GW8ZRE/P, with his impressive one-man operated and transported station high up on Halkyn Mountain, near Flint.

Amongst the Scottish stations, the leaders are again the **Cockenzie and Port Seton**

Amateur Radio Club, GMOCLN/P, who for the fourth successive year win the **Tennamast Trophy in Memoriam to Frank Hall**

GM8BZX, donated and sponsored annually by **Norrie Brown GM4VHZ of Tennamast (Scotland) Ltd.**

A closely fought contest in Eire and Northern Ireland resulted in three stations within 150 points of each other. After careful scrutiny of the logs, **Peter Lowrie G17JYK/P** comes out just on top, to win the **PW EI/GI Trophy Clock** sponsored by **Rob G3XFD**.

Congratulations to all groups and individuals in the 'Leading Stations' table, who each receive a **PW QRP Contest Certificate**, as do all stations in the table of locator square leaders.

In addition to the summary results tables presented here, a full detailed results list will be automatically sent to all who submitted an s.a.e. with their entries (or if you send an s.a.e. now to the **PW** offices at Broadstone). The full results list will also be available on the contest Web site soon after this issue is published, the address is <http://home.neill.org/contest>.

Propagation Conditions

In the majority of areas, propagation conditions seem to have been 'flat' for most of the day. The main exception to this was in the south of England, where several stations enjoyed a period in the middle of the day with very good contacts far south into France.

One operator making the most of the good conditions was **Peter Thompson, G8DDY/P**, on the Isle of Wight (IO90). His impressive list of 35 locator squares worked includes all squares directly south of him as far as IN93 (excepting IN95), and seven JN squares including JN03.

Elsewhere, a lift in conditions was spotted very early in the contest, or even just before the start. Tony **G0OVA/P**, for example notes "great conditions at the start of the contest to the south of France, regret not a lot of them showed up during the contest time".

Arthur GW3LNR/P also writes: "at the beginning of the contest for about 15 minutes I heard DL, F, ON and PA, but after that no Europeans were heard". (This has also happened frequently in previous contests: is there a lesson for operators here? **Maybe ferreting out continental DX in the first hour of operation** would be more profitable than the mad rush to accumulate a high tally of G stations worked? Or perhaps we should consider starting the contest one hour earlier? Comments welcomed!).



High up above Ventnor on the Isle of Wight, Peter Thompson G8DDY/P operated from St. Boniface Down and enjoyed the famous Island climate too!

But at many locations in the British Isles, there was no enhancement in propagation. **David G3NPB**, for example describes the: "appalling flat conditions" at his location, "there were three of us in Cornwall operating for the full seven hours, and we enjoyed calling each other from time to time to commiserate on the lack of contacts"!

Alastair G4RUL/P (JO00) writes "despite our closeness to the continent there were very few contacts with French stations" - which is strange considering the successes of stations a little further to the west - maybe this was something to do with his new "larger home-built antenna (10 metres long), finished on Saturday night and tested for the first time 15 minutes before the contest"?

Commenting on the level of activity, **Peter G17JYK/P** writes "it was good to see more stations on from this side of the water". This was a remark echoed by **Dave GW8ZRE/P**, who said it was "nice to see more EI/GI stations on the air".

Dave GW8ZRE/P was also pleased: "to work IO88 square for the first time ever (GM8LFB)". His comment proving that even for a seasoned contesteer there's always something new to be achieved. He also says that "EI/G7ANV/P in IO53EQ deserves a mention for giving away this valuable multiplier".

Whilst continuing to provide a challenge for regular contest operators like Dave GW8ZRE, the QRP contest of course provides the ideal introduction to those having a first taste of v.h.f. contests.

"This was the first contest that I have entered and I have to say that it was very enjoyable", writes **Colin M1BUU/P**. With an FT-290R and five-element yagi he says "I was very surprised at what could be achieved with such a simple set-up of borrowed equipment. I had never done any v.h.f. s.s.b. work before today and was amazed that I was able to contact amateurs in Scotland, Wales, Northern Ireland and the Republic of Ireland".

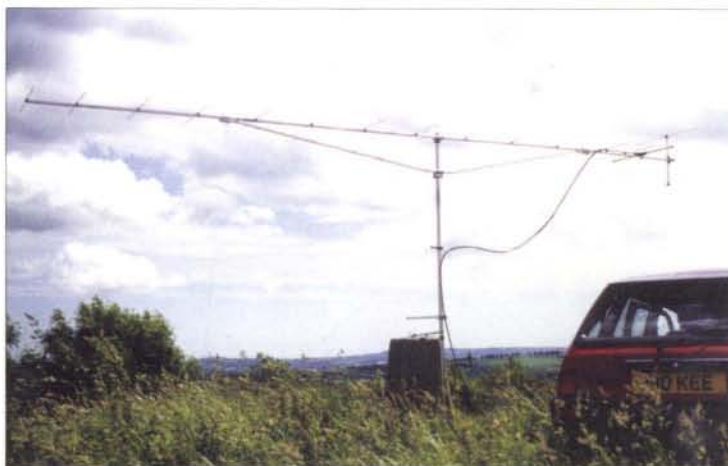
Novice Radio Amateurs

Novices were amongst the operators at several stations. For example at **GW0PZO/P**, **Sue 2E1GMA** shared the operating with Colin G0PZO to reach a very creditable eighth place in the results table.

Three novices, **Martin 2E1GRL**, **Chris 2E1GMW** and **Dominic 2E1GPG**, had their first experience of v.h.f. contests at **Youlbury Scout and Guide Amateur Radio Station, G0REL/P**. This station is established at the Youlbury International Scout Campsite, near Oxford, where operation is usually as **GB4YOU**. A number of visiting Cub Scouts were interested to observe the Amateur Radio activity, and of course introducing the hobby to young people is the main purpose of this station.

Visitors Welcome

Other portable stations found that they had visitors, too. At **"Dr. Jazz" G1JGE/P**, visitors were particularly welcome. "I forgot my teabags so I had to drink hot water"



Ashley Edwards
MOBAO/P's BIG
antenna

until a local CB enthusiast visited the station to see what was going on. After about an hour he went away, but then came back with a 2 litre bottle of cola, and a kettle which plugged into a cigar lighter socket, and proceeded to make two mugs of hot coffee!

(If the CB enthusiast reads this I'd like him to write, identifying himself so I can provide a further inter-hobby 'thankyou'. **Editor**).

While visitors came bearing beverages to **G1JGE/P**, it was the opposite story at the Oldham Radio Club portable site, **G1ORC/PI Steve G0KUY** writes "we were visited by the usual procession of park rangers all asking to see our letter of permission... we think that this is just an act over the years so that we will give them a can of ale to make them feel better!"

Sixteen Years

Over the 16 years that the PW QRP Contest has been running, some aspects of Amateur Radio operation have changed. For instance, there has been a gradual but steady decline in the number of entrants since the peak of 234 in 1984.

The decline in entrants has been paralleled in other v.h.f. contests and can probably be blamed on various factors reflecting the popularity of Amateur Radio in general as a hobby. That's why I think the efforts at promotions such as the Youlbury station already mentioned are important. But perhaps the time is ripe to take another look at the format of the PW QRP Contest to see if it's still providing what we want.

To start off - it's worth first recalling the two main aims of the Contest as originally conceived. These were to provide a contest for the serious v.h.f. QRP enthusiast, and to offer the newcomer to v.h.f. contests a friendly fun event as an introduction. The 3W output power limit satisfies both these, and the simple scoring system was intended to make it easy for logs to be entered.

Secondly, there are no 'sections' in the contest, because we did not want to



Fig. 2: Triangulation points also make useful antenna anchors! Neil Ashley Edwards, M0BAO/P operated from Combe Beacon near Chard in Somerset and even though perspectives can sometimes play optical tricks...that's a BIG antenna!

THIS YEAR'S RESULT TABLES APPEAR ON PAGE 23

Thankyou Neill!

On behalf of everyone on the *PW* Editorial team and the many enthusiasts who enter the contest every year I would like to pay tribute to Dr. Neill Taylor G4HLX's continuing hard work organising, adjudicating and overseeing the event. It's a truly year-round effort and Neill manages despite tremendous international commitments ranging from the USA to Geneva. (Last year's results were 'couriered' over the Atlantic by his son to California when he was on his way to join Dad for the summer holidays!). So, thank you Neill - for all your many years hard work. Here's to the future and the 17th event!

Rob Mannion G3XFD, Editor *PW*.

discourage people from getting together with friends to form a multi-operator station, which they might have avoided if they thought they could do better in a single-operator section. Nevertheless, we have always tabulated the top 10 single as well as multi-operator stations, recognising the greater

effort required for a truly 'one-person' entry.

Recently, some people have suggested that there should be an **antenna size restriction** as well as the power restriction, or **two sections for single and multiple antennas**. However, this runs contrary to the first original aim of the Contest, since the one thing that a serious QRP operator should do is to optimise the antenna system, which means putting up the biggest array possible!

An example of a group working hard at the 'biggest array possible' approach is the **Worthing & District Amateur Radio Club, G1WOR/P**. They constructed a novel 30-element array, a stack of five 6-element beams, each rather like two 3-element yagis side-by-side, according to a design by F5OAU (*Radio Communication*, March/April 1994).

Recognising that a simple station generally means one antenna, for many years we have also tabulated the top ten stations using a single antenna. But notice that this year, that list is just the top 12 stations of the overall results list, apart from the first and second place (actually the Worthing club with their 30-element stack are in joint 12th place).

Since many stations further down the results are using multiple antenna arrays, this shows once again what we have learnt many times in this contest: that **often, a simple station can compete effectively with the 'big' well-equipped groups**.

Nevertheless, there seems to remain some sort of feeling that we should have something like league divisions 1 and 2, i.e. two sections, but it is not clear what should be the criteria to separate them.

Some things however, have changed little over the years. For example although there's a greater variety of transceivers in use, 41% of this year's entrants were using a Yaesu FT-290R, compared with 60% in the first contest back in 1983, or 50% ten years ago in 1988.

Other things have changed a great deal! For instance, back in 1983 almost all entrants used a pen and paper, or in some cases a typewriter, to prepare their logs for submission as an entry. But this year, 72% seem to have used a computer to help them in some way with this!

Logging Software

An increasing number of stations are making use of logging software to keep and/or score and print the log. **Unfortunately this led to one entry being completely disallowed, the first time this has happened in a *PW* QRP Contest, because the wrong type of print-out had been requested from the software, which did not list contact serial numbers or locators.**

However, if so many stations are using computers these days, perhaps we should review the scoring system used for the contest. I suggest this because the present simple scheme was devised to make it easy in the days when very few people had access to computing facilities.

Of course, over the years many entrants have given me their comments along with their logs which have let me know that most people seem content with the contest format as it is. At the same time, some have suggested changes.

Because so many people have been happy with the complete contest formula the way that it is, I have been reluctant to change anything. But now I would like to invite debate on all the issues mentioned above (and any others that you may like to raise).

Please let me have your views (preferably by E-mail) to ntaylor@rmplc.co.uk, or by post to: **Neill Taylor G4HLX, 46 Hunters Field, Stanford in the Vale, Faringdon, Oxfordshire SN7 8LX**, or better still by visiting the Web site at <http://home.neill.org/contest>, where you will find an online forum to discuss these issues.

Please do write to me, even if all you want to say is that the present contest rules continue to be acceptable. I will consider all the views submitted, and if a consensus emerges we might see some changes to the rules in 1999.

Third Sunday In June

One thing that will not change, however, is the scheduling on the **third Sunday of June**. And although some clash with other events is inevitable, this date has long proved suitable for the QRP Contest, within the calendar of other VHF and UHF contests, and the co-ordination with the second session of the **RSGB 144MHz Backpacker's Contest** has also worked well.

Furthermore, it's the Sunday closest to the longest day, giving maximum daylight for those with a long climb to mountain-top portable sites. What's more...the date often coincides with another important event, as **Mike GW7LQD/P** remarks:

"Father's Day! - What a treat, allowed out to play radio all day!"

So the 17th *PW* 144MHz QRP Contest will take place on Sunday 20th June 1999. It's never too soon to start preparing, so mark your diary and start planning now...and good luck everyone! **PW**

Practical Wireless 144 MHz QRP Contest 1998 Result Tables

Practical Wireless 144MHz QRP Contest 1998

Pos.	Callsign	Points	Pos.	Callsign	Points
1	G3CKR/P	12160	41	G/DJ2QV/P	1406
2	GW0NWR/P	9108	42	G3MAE/P	1387
3	G1ORC/P	6989	43	GW0SYG/P	1386
4	GW1VDF/P	6132	44	G0TYM/P	1260
5	GW8ZRE/P	5122	45	G0TAR	1216
6	G8NJA/P	5010	46	G1JDP/P	1200
7	G7OCI/P	4611	47	GW0VJS/P	1185
8	G4SRS/P	4446	48	G0RRC	1173
9	G0BPS	4396	49	G0RFC/P	1168
10	G0OGS	4350	50	GM4YEQ/P	1156
11	G17JYK/P	4266	51	GM7SXI/P	1140
12	G4RSE/P	3950	52	G7AXE/P	1026
13	GW7LQD/P	3888	53	GW4SZV/P	975
14	G7AQU	3657	54	GM0AYR/P	954
15	G0OVA/P	3458	55	G8WYR	900
16	G4HRS/P	3129	56	G0LJD/P	900
17	G0LBO/P	3048	57	G0LAR/P	893
18	GW4IDF/P	3013	58	G7MWP/P	852
19	G0PJY/P	2668	59	G8AWO/P	848
20	GM0CLN/P	2530	60	GW1CXK/P	738
21	G3BPK/P	2415	61	G3LRS/P	715
22	G0GRI/P	2232	62	G0JVR/P	675
23	G4NVM/P	2200	63	G7OMO/P	598
2	G6WIR/P	2200	64	G8NJQ	585
25	G8DDY/P	2121	65	G0TOU/P	576
26	EI9HQ	2047	66	PE1EWR	564
27	G4RUL/P	1805	66	G7NRO/P	564
28	G0CRW/P	1767	68	G0DLR	495
29	G7NPH/P	1764	69	G7KNQ	492
30	G0TMT	1672	70	G0VYJ/P	456
31	G0WXQ/P	1656	71	G7MMQ	429
32	G0ADH/P	1653	72	GM4VVX/P	378
33	GM0IXN/P	1602	73	G2HRP	376
34	G1WKS/P	1548	74	EI2HV/P	372
35	G7SPT/P	1513	75	GW7EVG	338
35	ON1BCJ	1513	76	GW0VPR/P	168
37	G7WFM/P	1496	77	GM4VYQ/P	112
38	G6OI	1479	78	G7RVM/P	105
39	G5ZG/P	1463	79	GM0HLV/P	88
40	G0SRC/P	1411	80	G7UJU/P	80
			81	G3XBM/P	12

Leading stations in each locator square

Square	Name	Callsign	No. entrants in square
IO52	Pat Keogh and Michael Kiely	EI2HV/P	1
IO63	Declan Lennon	EI9HQ	1
IO70	Cornish Branch RAFARS	G0RFC/P	3
IO71	Cleddail ARS	GW0SYG/P	2
IO72	Aberporth ARC	GW4SZV/P	1
IO74	Peter Lowrie	G17JYK/P	1
IO75	Ayr Amateur Radio Group	GM0AYR/P	1
IO76	Mid Argyll ARS	GM4VYQ/P	1
IO78	Scottish Welsh Alliance	GM4VVX/P	2
IO80	Torbay ARS	G8NJA/P	2
IO81	Stroud Radio Society	G4SRS/P	5
IO82	North Wales Wafflers	GW0NWR/P	7
IO83	Dave Hewitt	GW8ZRE/P	6
IO84	Julian Ross	G0LBO/P	1
IO85	Cockenzie & Port Seton ARC	GM0CLN/P	3
IO86	Menstrie Morse Group	GM0IXN/P	1
IO90	Horsham ARC	G4HRS/P	3
IO91	Tony Crake	G0OVA/P	5
IO92	John Rudd & Kevin Porter	G7OCI/P	8
IO93	Warrington Contest Group	G3CKR/P	7
IO94	Hambleton ARS & Bi Group	G3MAE/P	4
JO00	Alastair Turner & Peter Hutchison	G4RUL/P	1
JO01	Dragonslayers QRP Club	G0BPS	12
JO02	Mark Tuttle	G0TMT	3
JO11	Jan Claerhout	ON1BCJ	2

Leading stations using a single antenna

Pos	Name	Callsign	Antenna
5	Dave Hewitt	GW8ZRE/P	ZL-special 7-element
6	Torbay ARS	G8NJA/P	Tonna 17-element
7	John Rudd & Kevin Porter	G7OCI/P	Maspro 10-element
10	S.J. Malpass & A.R. Cooper	G0OGS	14-element Parabeam
11	Peter Lowrie	G17JYK/P	Cushcraft 13B2 Boomer
12	South Essex ARS	G4RSE/P	MET 19-element
14	Frank Carter	G7AQU	19-element
15	Tony Crake	G0OVA/P	Tonna 13-element
16	Horsham ARC	G4HRS/P	15-element
17	Julian Ross	G0LBO/P	Tonna 9-element

Leading multi-operator stations

Pos	Name	Call	Score	QSO	Squ	Loc	Ant	a.s.l.(m)	TX/RX
1	Warrington Contest Group	G3CKR/P	12160	320	38	IO93	4x17Y +2x18Y	455	LTS2+ TS930S
2	North Wales Wafflers	GW0NWR/P	9108	253	36	IO82	2x17Y	560	FT480R
3	Oldham Radio Club	G1ORC/P	6989	241	29	IO93	2x9Y	635	FT290R
4	Hereford VHF Contest Group	GW1VDF/P	6132	219	28	IO82	13x10Y	610	FT290R
6	Torbay ARS	G8NJA/P	5010	167	30	IO80	17Y	350	TS711
7	John Rudd & Kevin Porter	G7OCI/P	4611	159	29	IO92	10Y	140	FT290R2
8	Stroud Radio Society	G4SRS/P	4446	171	26	IO81	2x16Y	315	FT221R
9	Dragonslayers QRP Club	G0BPS	4396	157	28	JO01	2x9Y	200	R2 CW
10	S.J. Malpass & A.R. Cooper	G0OGS	4350	179	27	IO82	14Y	250	FT290R
12	South Essex ARS	G4RSE/P	3950	158	25	JO01	19Y	55	IC271E

Leading single operator stations

Pos	Name	Call	Score	QSO	Squ	Loc	Ant	a.s.l.(m)	TX/RX
5	Dave Hewitt	GW8ZRE/P	5122	197	26	IO83	7Z	275	TR751E
11	Peter Lowrie	G17JYK/P	4266	158	27	IO74	13Y	150	FT290R
13	Mike Baguley	GW7LQD/P	3888	162	24	IO82	2x9Y	360	FT290R2
14	Frank Carter	G7AQU	3657	159	23	IO92	19Y	90	TR9000
15	Tony Crake	G0OVA/P	3458	133	26	IO91	13Y	295	TR751E
17	Julian Ross	G0LBO/P	3048	127	24	IO84	9Y	800	TR751E
25	Peter Thompson	G8DDY/P	2121	101	21	IO90	2x11Y	240	FT221R
26	Declan Lennon	EI9HQ	2047	89	23	IO63	13Y	300	FT290R
30	Mark Tuttle	G0TMT	1672	76	22	JO02	4x5Q	40	FTV250
32	Bob Razey	G0ADH/P	1653	87	19	IO91	9Y	180	FT221R

Leading Stations

Overall Winners	Warrington Contest Group	G3CKR/P
Runners Up	North Wales Wafflers	GW0NWR/P
Leading Single Operator	Dave Hewitt	GW8ZRE/P
Runner-up Single Op.	Peter Lowrie	G17JYK/P
Leading Fixed Station	Dragonslayers QRP Club	G0BPS
Leading English Station	Warrington Contest Group	G3CKR/P
Leading Welsh Station	North Wales Wafflers	GW1VDF/P
Leading Scottish Station	Cockenzie & Port Seton ARC	GM0CLN/P
Leading N. Ireland Station	Peter Lowrie	G17JYK/P
Leading Eire Station	Declan Lennon	EI9HQ

Just a reminder that the 17th *PW* 144MHz QRP Contest will take place on **Sunday 20th June 1999.**

The MFJ HF & 50MHz

Versa Tuner II

**John Goodall
GOSKR takes a
look at the MFJ
HF & 50MHz
Versa Tuner II -
and enjoys
himself 'on the
air' using what
he considers to
be a truly
versatile
antenna tuning
unit!**

Disneyland has several, Alton Towers has a few and Blackpool has an enormous one....what on earth (you may ask) am I talking about? Well hang on to your hats...as the answer is a Roller Coaster but of course it's a 'radio type' rather than a fun ride!

The MFJ-969 is an extremely versatile 'roller coaster' type tuning unit. It operates a 'T' matching network and the manufacturers claim it will tune almost any known antenna from 1.8 to 50MHz.

Designed for the modern shack the a.t.u. can operate from three separate antenna inputs. Two 50Ω coaxial feeds and one separate wire feed can be connected to the tuner. It also has within its 250mm x 265mm x 90mm case, a useful dummy load. (Almost a legal requirement within the station...but how many actually own one?).

The front panel, as you would expect from the MFJ stable carry the essential controls for the unit. In the centre of the front panel, two rotary tuning capacitor controls for transmitter and antenna, together with the multi-way switch for the various antenna selection.

Additionally, towards the lower edge of the front panel there are three push on/push off buttons. One red button, to the extreme left being the main **On/Off** control for the unit. Another button controls the power levels settings of, 30/300W and a **PEP/Average** button.

To the left of the front panel, there's a large easy-to-read, 65mm x 45mm dual cross needle **SWR/Power** meter. Also on the right hand of the front panel can be found the large diameter rotary control for the roller coaster.

Above the rotary control can be found the three digit mechanical numerical display for the number of turns counted on the roller coaster. Fully clockwise being identified as 000 and fully counter clockwise as 118.

Operation of the unit couldn't be simpler. Once you have whatever antenna you desire connected to the rear connections, coupled the unit to 13.8V d.c. - the 'world's your oyster'! (An internally mounted PP3 provides power for the 'peak power' measuring circuitry when an external supply is not available. This must be disconnected

when the external supply is used).

Incidentally...I do wish MFJ would include a suitable external d.c. plug and lead with this and other units...which they don't!

In Use

In use, the operator selects the **Dummy Load** through the tuner, via the multi position switch on the front panel, and then sets up the rotary transmitter and antenna controls, roughly as per the supplied instructions. Next, setting the rotary inductor control (again roughly as per the instructions) everything will be ready to fine tune the system.

With a low power setting on the transceiver, the next stage is to put a c.w. carrier into the tuner's dummy load. Then, by watching the twin cross needle meter, the rotary transmitter and antenna controls are adjusted until the lowest v.s.w.r. and highest power readings are obtained.

If the v.s.w.r. is found to be still a little high, the rotary inductor control can be adjusted and the v.s.w.r. will go to almost zero. Next, the antenna selector switch is turned to the antenna required and the simple instructions previously mentioned are repeated.

When happy with the results, the settings should be noted for future use, including of course the Band, Transmitter, Antenna and Roller Coaster Inductor positions.

The settings I used for 1.8 through to 28MHz with my end fed long wire, I have kept - **just in case** (you never know!) - I may just own one some day. The Roller-Coaster position is simply read off the digital display.

On The Air

On the air - using my 'long wire' antenna and concentrating on h.f. (as nothing was happening on 50MHz) I had great fun. Normally, using such a simple form of antenna on the h.f. bands (particularly the higher frequency allocations) when it comes to working the DX you'll be competing against beam antennas. But despite this I did very well indeed - particularly to the USA.

On 18MHz I found that the excellent matching provided by the unit enabled me to squeeze every last drop of r.f. 'up the spout'. This resulted in many good long QSOs with North American stations with consistent reports of '5&8' (both ways) being given. And I was often using less power than the other end!

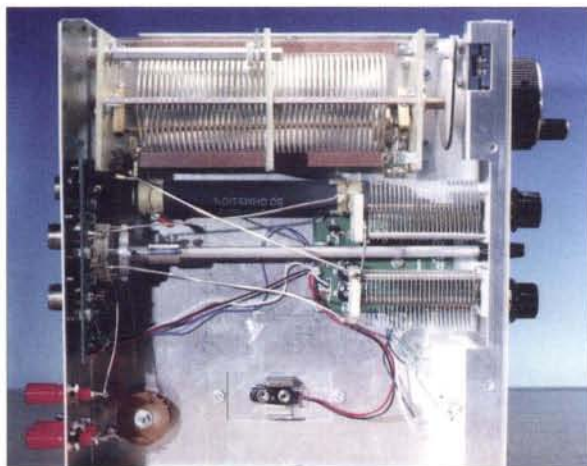
So....I've no doubt you're asking 'what's his opinion'? And in reply and to answer the question I've got to say the Versa Tuner is a very powerful and useful unit, and at the supplied price, I feel it's a snip. And again....I'm wondering - do I really have to send it back?

My thanks go to **Waters & Stanton PLC, of 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX (01702) 205843**, for supplying the review unit. The **MFJ Versa Tuner II (model No. 969) costs £139 plus £4 p&p.**

PW



Fig. 1: Internal view of the 'Versatuner' a.t.u. with the 'roller coaster' inductor unit at the top and the built-in 50Ω dummy load mounted directly below. The PP3 battery holder is to power the 'peak power level' circuitry and is only required when an external supply is not available (perhaps during portable operation).



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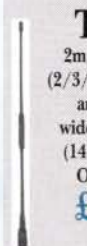
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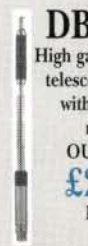


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The Rev. George Dobbs G3RJV has something up his sleeve for short wave listening this month. It comes in the form of an 'active antenna' or as George says: "...A useful little box for the listener" - accompanied by the compulsory quote of course!

Carrying on the Practical Way

One of my favourite little receivers is my Sony ICF-SW100. It's a diminutive little radio which offers a host of facilities.

It has travelled many miles with me, offering anything from World Service in far off places to the 'Test Match Special' in the church vestry!

I can receive a surprising amount on the built-in telescopic aerial (antenna in *PW*'s style!) but it



This month's project...an 'Active Antenna'.

"aerial: adj. belonging to the air: existing in the air: ethereal - n. [often aerial] any exposed wire capable of radiating or receiving an electromagnetic wave. [L. aer, air]"

Chamber's Etymological Dictionary

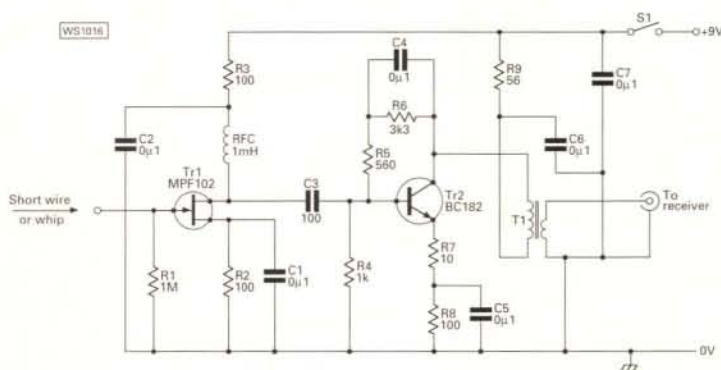


Fig. 1: Circuit of G3RJV's 'Active Antenna' project.

also comes with a reel-out wire version to help secure those weaker stations on the short wave bands. I did not opt to buy the matching AN-100A Active Antenna because I thought it rather expensive.

On one of my visits to the Dayton HamVention, Roy Lewellen W7EL, admired the little radio playing World Service in my Hotel room. So much so, that he bought one at a discount booth at the HamVention!

The following year, Roy and his wife came to stay with us here in Rochdale, prior to travelling to the Friedrichshafen radio exhibition. Roy and Beth arrived bearing gifts and my gift was the AN-100A Active Antenna and it has been put to useful service in more recent trips away from home.

Useful Antenna

It occurred to me that it might be useful to have a small general purpose active antenna for times when I might have a receiver and be without an antenna. The requirements seemed to be for a small whip antenna, or similar, to feed a radio frequency (r.f.) amplifier capable of around 20 to 30 dB of gain.

Too much gain and local noise, or even internal amplifier noise, becomes a problem and too little gain and it will serve little purpose. The short antenna will offer a high input impedance and the output will probably need to be low impedance to suit most receiver inputs.

Just before his untimely death last year,

Doug DeMaw W1FB, and I often

discussed circuits via E-mail. An active antenna was one of the topics we discussed and the little circuit here owes much to Doug's ideas.

(Incidentally...I have a whole folder of such exchanges and I hope to give them an airing in this column from time to time).

The Circuit

The circuit of the Active Antenna is shown in Fig. 1. It's a two-stage amplifier using a field effect transistor (f.e.t.) followed by a bipolar transistor.

The f.e.t. stage offers a high impedance to the small antenna. I chose not to use the usual telescopic whip but mounted a socket for a short wire antenna. Apart from saving the cost of a telescopic whip, this has several advantages: for example the length of wire can be varied according to the desired amount of signal pick-up, the wire can be moved around for best reception and the unit is smaller.

The f.e.t., Tr1, is an MPF102 but the common 2N3819 would also do the job. Be careful about the lead-out placement, that of the MPF102 is rather odd, but readers following G3XFD's 'Radio Basics' series in *PW* will already be familiar with this budget-priced 'old favourite' device!

In the circuit, Tr1 is biased by choice of the source resistor and a 1mH r.f. choke which provides a load at the f.e.t.'s drain. Although no large signals are involved here, it's wise practice with these f.e.t. amplifiers to keep the input physically away from the output.

The bipolar r.f. amplifier, Tr2, uses shunt

feedback between the base and collector and the non by-passed emitter resistor also provides some degenerative feedback. Most common transistors will serve for Tr1 although it should have a fairly high frequency gain.

Matching Output

A small r.f. transformer provides the matching for the output of Tr2 to the typically low impedance found in receiver input circuits. I opted for a very simple choice, a transformer wound on a small 'pig nose' ferrite former.

The ferrite formers are those little things with two holes that look rather like a pig's nose when viewed end on (often referred to as 'binocular ferrite cores'). Mine was out of the junk box collection but if you have to buy one, JAB Electronics sell small Fair-Rite two hole beads, which should serve the purpose.

The diagram, **Fig. 2** (above), shows the winding of the transformer. The primary is 12 turns of 30s.w.g. enamelled copper wire and the secondary is 2 turns wound from the opposite end. The diagram also shows how the connections are made to the transformer. (More sophisticated constructors might like to make a trifilar wound 4:1 r.f. transformer but the simple arrangement I used appears to work well).

Ugly Style

My prototype was built 'ugly' style, as you can see from the photograph in **Fig. 3**. The circuit was made up on a small piece of blank printed circuit board (p.c.b.) material.

The transistors are mounted 'legs-up' (in 'dead bug' fashion) and they, with the decoupling capacitors, provide the anchor points for the other components. Point-to-point wiring and short leads follow the rules of good radio frequency (r.f.) practice.

The board is soldered to the bottom of a tobacco or other suitable tin, with 3mm socket for the antenna wire and a phono socket for the output. There is room inside my box for a PP3 battery with a small on-off switch. (I bent some copper wire and soldered it in place to hold the battery away from the electronics).

I tried the Active Antenna, with success, on several receivers....some of them quite interesting. (I like unusual receivers).

First Test

My first test was with the Atlas RX110, an unusual but interesting receiver of the late 1970s. Quite advanced for its age, it has a diode ring first mixer and excellent bandpass filtering on the input. Incidentally...I came by mine in a rather odd manner!

The RX110 has a matching TX110 Transmitter Converter, a small add-on which converts it into a c.w. and s.s.b. transceiver running about 15W output. I found one of the TX110 units on a stall at a radio rally and bought it for the power amplifier.

After buying it I then wondered if I could get the matching receiver and a request on the Internet yielded three people who were willing to sell one - odd because not a lot were made. I managed to obtain a good one at a very reasonable price and it works remarkably well for its age.

My second test was done on my Davco DR-30 Receiver, an exceptionally beautiful receiver of around the same vintage. It was the first receiver to use f.e.t.s and it's built into a beautiful compact case with the band-switching arrangement mounted in milled aluminium.

The DR-30 sold for over \$300 in the 1970s and I coveted them at the time. Again they are quite

rare beasts but I managed to find one a few years ago.

Rick Campbell, KK7B, says of his DR-30 that it confirms his father's advice about women: "the most beautiful are not always the best"!

I think the performance of the DR-30 is inferior to many receivers I have owned. However, it certainly is a fine piece of machinery and it seemed to like the Active Antenna.

Recently I acquired a very well built valve tuned radio frequency (t.r.f.) receiver from a 'Silent Key' sale. It was 'The real thing': a 1-v-2 well built in a handsome steel case with Denco plug-in coils. I bought it for old times sake and it's great fun to use. And although t.r.f. receivers can be very fussy about what they have attached to their inputs...the Active Antenna yielded amateur signals on 3.5MHz and a good range of broadcast stations.

So this simple little circuit appears to be at home with a variety of receivers and is a useful extra item to have for casual listening without resort to a larger antenna. By following my success...by getting busy with that soldering iron you too could have your own 'Active Antenna'. Good listening!

PW

Fig. 3: Internal view of the project illustrating the 'Ugly' style of construction adopted by G3RJV (see text).



Component Sources

JAB Electronic Components,
PO Box 5774, Great Barr, Birmingham B44 8PJ.
Tel: 0121-682-7045.

Syon Trading of 16 the Ridgeway, Fetcham,
Leatherhead, Surrey KT22 9AZ: (see their advert on page 19 in this issue) can supply the MPF102 f.e.t.s for 45p each, and the BC182 transistors for 10p each plus postage (usually 35p or so for six MP102s). Suitable ferrite cores are also stocked.

(Please mention you saw the reference in **PW**. Editor).

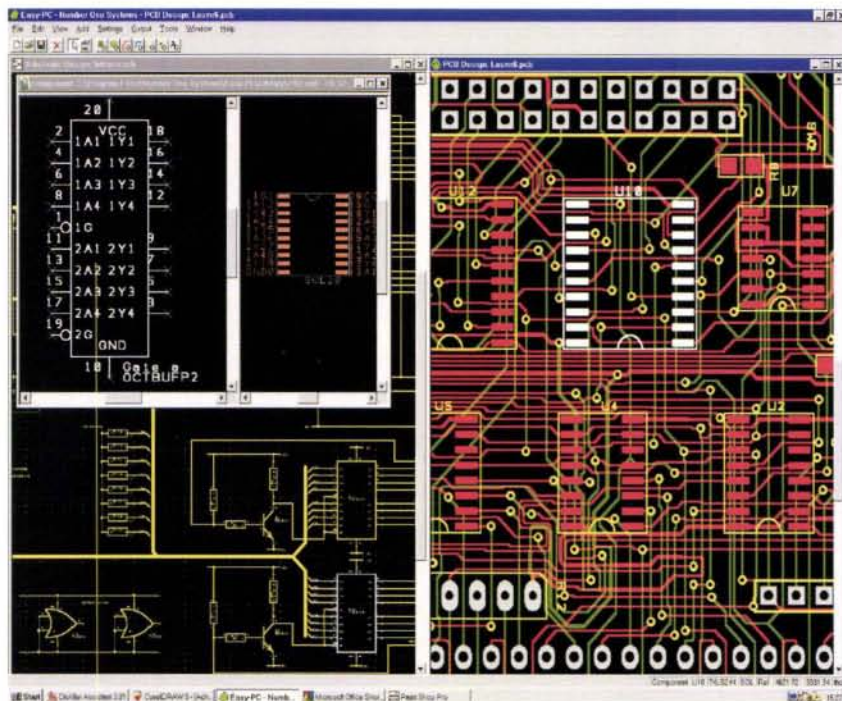
Fig. 2 (left): Details for preparing the r.f. transformer (T1) for use in the project. (See 'Component Suppliers' for information on obtaining 'pig nose' ferrite cores).

George Says "Get Busy & Build this month's 'Active Antenna' Project"!

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TX2000 QRP Transmitter Kit

5W CW RF output (adjustable) on 160 to 20M bands, about 1W on 10M. Plug-in band filter. Very clean signal. Use with Rx and linking module for transceiver. TX2000 Kit: £24.90 (with one band filter). Extra band filter kits: £6.90 each. HA23R hardware pack (pictured lower left): £16.90.

LM2000 Linking Module

Fits in receiver to link to transmitter. Side-tone, muting, IRT, CW filter. Kit: £16.30

Total to build this QRP Station: £99.90 (plus postage)



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DXR20. Covers SSB and CW on 20, 40 & 80M bands as standard. Optional extra plug-in band modules available. Can link to TX2000 or AT160 for transceiver (by adding LM2000 linking module). Versatile and popular, with great performance!

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AB118	118 to 137MHz Active Antenna	£18.80	SPA4	Scanner Preamp. 4 to 1300MHz	£15.90
ASU8	RX Antenna Selector/Attenuator	£27.90	ST2	Morse Side-tone/Practice Oscillator	£9.80
CSL4	Internal SSB & CW Filter for our RXs	£10.50	SWB30	SWR/Power Indicator. 30W 1-200MHz	£13.90
DCS2	"S Meter" for direct conversion RXs	£10.90	XM1	Crystal Calibrator, 8 intervals + ident	£16.90
CBA2	Counter Buffer (fit to Rx to feed DFD5)	£5.90		(optional hardware packs are available to suit many of the above kits, please enquire)	



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73 from Dave G4KQH, Technical Manager.

More Versatile & More Powerful

The Icom IC-746 HF & VHF Transceiver

Richard Newton
GORSN, PW's
resident 'hand-
held' and
'mobile'
reviewer takes
a look at the
Icom IC-746 h.f.
and v.h.f. all-
mode
transceiver.

The now well established Icom IC-706 has long been the topic of conversation in radio stores, at rallies and in many radio clubs across the land. And I'm pleased to say that GORSN is the proud owner of an IC-706 Mark I and has had the pleasure of reviewing both the Mark 1 & 2 for PW.

So, my interest was more than stirred when I heard people talking about the 'base station' version of the IC-706. A few carefully placed questions revealed that the radio they were referring to was the Icom IC-746.

The IC-746 was said to have the versatility of the IC-706 but more functions and more power on 144MHz. Could this be true...I asked myself? Fortunately, the statement turned out to be true and I was also asked to review the new transceiver for PW!

The Icom IC-746 is a very promising bit of kit. It boasts transmit capability on Amateur Radio bands from 1.8MHz to 144MHz (including 50MHz, **but excluding** 70MHz). It receives from 300kHz to 60MHz and 144-146MHz.

Also on offer from the IC-746 is a completely adjustable power output from 5 to 100W on all bands and modes, except amplitude modulation (a.m.) where the highest output that can be achieved is 40W! It also has digital signal processing (DSP) and an automatic antenna tuning unit (a.a.t.u.) built in. After reading the details... I could not wait to get it out of the box and see if it lived up to my expectations!

Base Station Version

The Icom IC-746 is referred to as the base station version of the IC-706. It's powered by 12V d.c. and measures 287mm wide by 120mm high by 316.5mm deep, thus retaining a certain portability and even has a built-in carrying handle.

The first thing that struck me when I opened the packaging was just how good the transceiver looks. The display is huge, the frequency read-out is very clearly and plainly displayed and I thought that information provided on the display was well set out.

I think that the transceiver's front panel is also well thought out and controls are clearly labelled and spaced to allow easy operation. Owners and/or operators of the IC-706 will definitely see some similarities here, as the way in which frequency steps and fast tuning is achieved, memory writing and retrieval and menu operation are all basically the same.

However, for those unfamiliar with the use of

the IC-706 the controls are easy to get to grips with. The radio is certainly in the very 'user friendly' class.

The rear panel carries the power socket and several sockets for accessories such as linear amplifiers and external a.a.t.u. It also has three SO239



type antenna connections, and one of these is a dedicated 145MHz

(v.h.f.) antenna.

The other two antenna sockets are both h.f. and 50MHz connections. They are labelled '1' and '2' respectively and can be switched from the front panel by the touch of a button. (The a.a.t.u. will work on either of the h.f./50MHz sockets but does not work on the 145MHz socket.

Digital Signal Processing

Let's now look at the digital signal processing facilities on the radio. The DSP function digitally transposes receive audio components in all modes of operation, and is done at the 'digital i.f.' stage of the radio.

Included in the IC-746 are the following DSP functions:

Noise reduction: This automatically reduces various different types of background /white noise and at the same time identifies and enhances

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received signal.

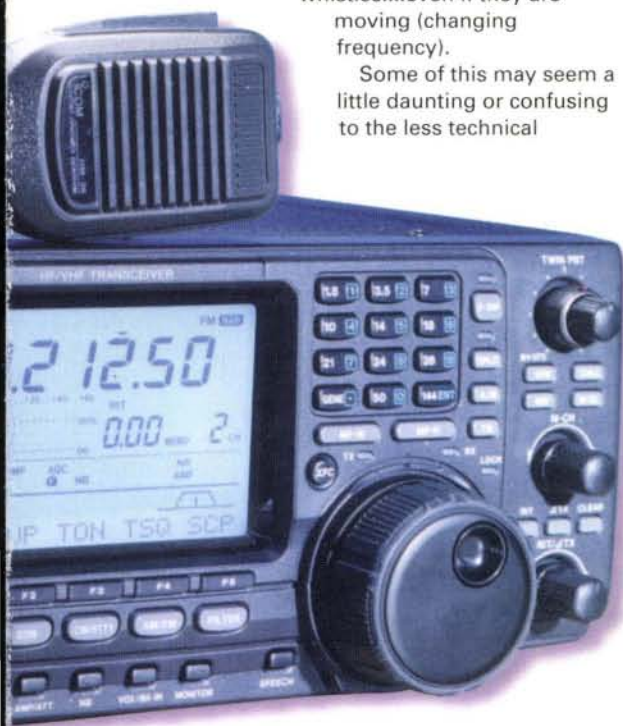
Audio Peak Filter/Auto Notch Filter (APF):

The APF is used in the c.w. mode only. It changes the receive frequency response by boosting a particular frequency for better reception. Using this function, three 'booster' pass bands are selectable, these are 80/160/320Hz. The actual centre peak frequency is fully adjustable from 300 to 900Hz manually.

The Automatic Noise Filter (ANF) is used in s.s.b., f.m and a.m. modes.

It will eliminate three beat tones, such as tuning whistles....even if they are moving (changing frequency).

Some of this may seem a little daunting or confusing to the less technical



operator...however, in simple terms DSP functions, when mastered are fantastic! And from experience I can tell you that both of these functions proved to be wonderful when operating.

Another 'interference busting' weapon in the IC-746 armoury is the Twin Pass Band Tuning (PBT) facility. This adjusts the bandwidth on both of the receiver's i.f. filters, and when both are used in separate directions the pass band can be shifted to move away from a close but undesired signal. When used both in the same direction it acts as an i.f.s shift. (Incidentally, there's a rather useful visible graphic representation of how the filter is working on the front panel display).

Where To Start?

It's so difficult to decide where to start a review with radios like the IC-746. It offers the operator so much...for example there's VOX, voice compression and electronic keying, a monitor switch so that you can monitor your own transmitted audio or c.w. and shifted transmit/receive.

There is of course the a.a.t.u., pre-amplifier and signal attenuation. However, to mention all the Practical Wireless, November 1998

controls would be very near impossible and frankly quite boring so I will concentrate on the ones that caught my eye.

The meter on the front panel simultaneously

shows output power, s.w.r. and automatic level control (ALC) readings. On other transceivers I've owned and operated it was

necessary to select them individually, so in this case I found it useful to be able to monitor all three at once.

It's very simple to move to an amateur band on the IC-746. All of the bands are pre-programmed into a keypad on the front panel. But Icom do not stop there and apart from giving the operator 99 memory channels, one call channel and two scan edge memories, the manufacturers have also assigned three memories to each band that they call 'stacking registers'. They are overwritten on a rotational basis, remembering the last three operation frequencies and modes in each band.

An example of using the stacking registers took place when I selected the 14MHz band by pressing the band button. The frequency of 14.325MHz u.s.b. was then displayed.

There was an interesting station but I wanted to quickly tune the band so I pressed the same button a second time. I used this setting to tune around, before pressing it for a third time I checked 14.150 in RTTY mode, for any RTTY activity.

Having found nothing I pressed the same button again, this took me directly to 14.350MHz u.s.b. It sounds rather like a mouthful, but it really is super if (like me) you do more listening than talking. (Although some of my listeners may not agree!)

The IC-746 also has a Band Scope. Icom describe it as "a simple band scope". This description is accurate. It's a bit of fun and can be set to continuously sweep a given width of frequencies using different steps, or to do one complete sweep and then stop. It gives a visible representation of the activity found. However it cuts off the received audio while it is sweeping, thus its practical use is, in my opinion, greatly reduced.

The automatic a.t.u.s has got to be the next thing I mention in detail. These things never cease to amaze me!

Although there is a certain satisfaction in twiddling and tuning, it can be rather frustrating. Especially when that really interesting station says ".... Now going QRT" just as you have managed to tune the antenna system, having been locked in mortal combat with it for over 10 minutes!

With the IC-746 you touch a button, which is followed by a whirr, a click and then a few moments later you're in business!

Here in my Bournemouth QTH I have a long wire of about 22m long, fed with 50Ω coaxial cable via a balun. The a.a.t.u successfully tuned this from 1.8 to 29MHz, although it did struggle at 29MHz...but since I never achieved a match using my manual a.t.u. I'm not complaining!

On The Air

When I went on the air I was more than a little surprised that the a.a.t.u tuned my bit of wire on 1.8MHz. I enjoy 'Top Band' but have never really had the time, space or patience to erect a decent

"It also has digital signal processing (DSP) and an automatic antenna tuning unit (a.a.t.u.) built in".

RICHARD NEWTON GORSN TAKES A LOOK AT "A VERY PROMISING BIT OF HIT"

Fig. 1: Close up of the comprehensive, front panel display while working on v.h.f. (See text)

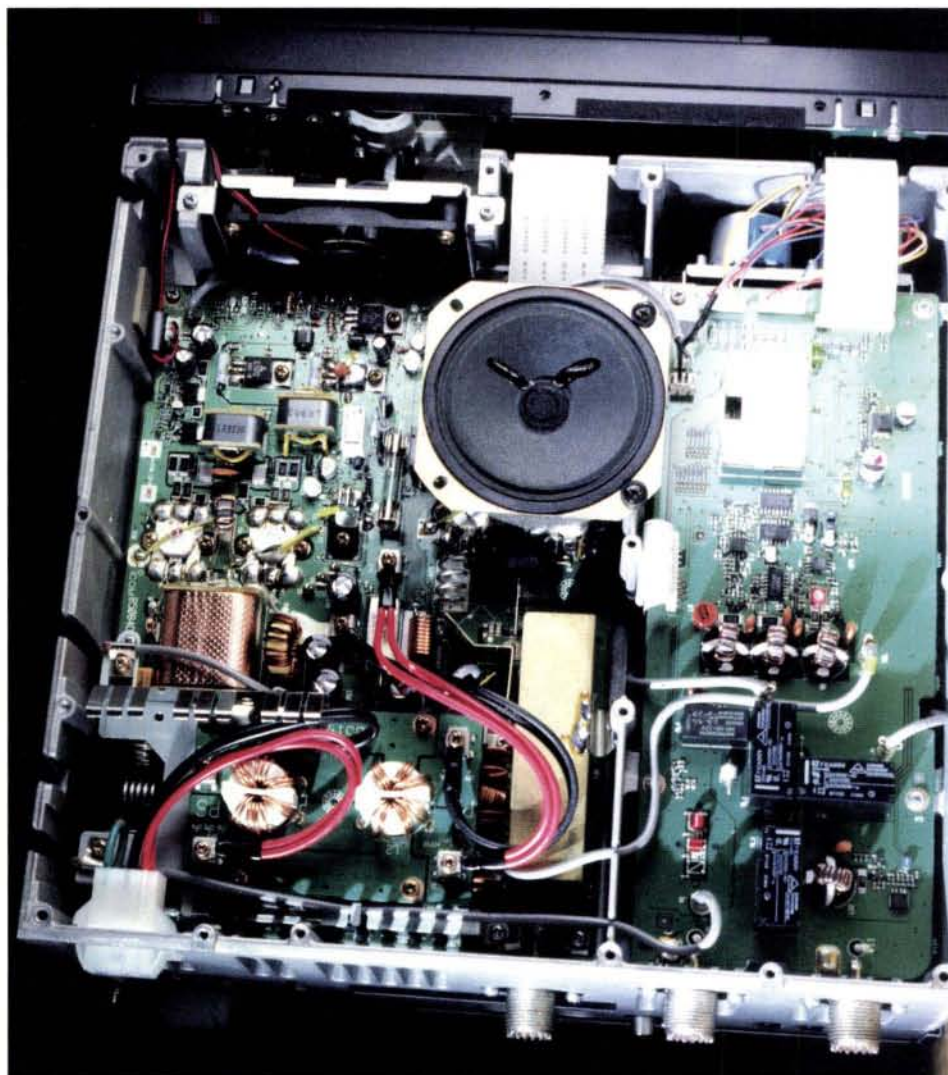
antenna system for the band. Still, as the transceiver's a.a.t.u. had kindly matched my antenna I felt obliged to at least give it a go!

So, I listened around 1.960MHz and found two very strong signals, **Mike GM0CME**, and **Philip G4FBG**. I called 'Break' (a little difficult to do with my tongue in my cheek...but I managed it!). To my amazement, Mike gave me an excellent report from Fraserburgh in the Grampian Region, in the north east of Scotland and Phillip was also able to give me a good report from Stockport.

Both Mike and Philip were complementary about the audio from the IC-746. I was pleased with this result considering I am situated in Bournemouth on the South Coast and I was running about 10W!

I also had some fun on 7MHz. Here I worked **GB2HWG, the International Girl Guide station...**'real DX' at Foxlease in the New Forest near Lyndhurst (approximately 20km away). I also received a 5 and 9 report from **Alan G13WWM**, in

Fig. 2: Internal view of Icom IC-746.



Belfast and had a very nice chat with **Mickey** who was operating **GB4FCF**, which was a special event station for Fingringhoe Church Fete near to Colchester. Mickey told me that my audio was "very nice indeed".

While operating on the 7MHz band I encountered a QRM problem. This is when c.w. stations move up the band into the s.s.b. portion. It's a very crowded band and when you are talking to a marginal station a huge c.w. signal is perhaps not what you want when you're in the s.s.b. section.

So, I decided to put the Auto Notch Filter (ANF) to the test. I pushed the button and the 599+ 18w.p.m. c.w. station that had been there had gone! Thinking he had just stopped transmitting I switched the ANF off, there it was again.

The ANF worked extremely well and, when I had mastered all the DSP features and used them together, operating on 7MHz s.s.b. was almost like working n.b.f.m. on 144MHz!

On 14MHz I worked further afield, working **Dave W3KDD**, and then **Bill W4CSV** in West Virginia. Bill was very kind, as the contact was not too easy.

The long wire was struggling so for a bit of fun I connected my log periodic antenna that covers from about 50 to 1.3GHz. I did this because **John G0SKR** and I had been chatting and he had told me that he had accidentally got his IC-746 to load his log periodic on 14MHz!

So I pointed my log periodic in the general direction of the USA. The antenna loaded and I got the contact with Bill and he came up about 2 'S' points on the S-meter! A fluke, a mystery or divine intervention? Who knows - who cares? But, I got the contact and not wishing to push my luck I did not try it again!

I also had good success on 18 and 21MHz and decided it was then time to try some v.h.f. contacts.

Switching To VHF

Switching to v.h.f., and starting on 50MHz, I got two contacts, a feat in itself in my area! **Alan M0BKW** in Southampton and **Gordon G7BCR** Practical Wireless, November 1998

both gave me good reports and everyone I spoke to passed comment on the good, clean audio. Southampton is not a great distance away, some 60km. but the contact was good and it was a nice chat.

On 144MHz I managed to speak to several stations engaged in a contest on s.s.b. It was during this period that I discovered that it was best to switch the voice compression off on v.h.f. unless it was really necessary. It was not needed as much on the 144MHz band as it's not as busy and noisy as the h.f. bands.

I also manage a contact with my father, **John G8EAM** in Minehead on 144MHz s.s.b. We can't usually work each other on v.h.f. due to the difficult pathway between us, so the successful contact was a good indication of the receiver on the IC-746 and illustrates that on the odd occasion 100W does help.

Next, I had a little 'play' on the local repeater, **GB3SC (in Bournemouth)** and got a good report from **Steve G1YNY**.

Incidentally, I've heard people say that they are disappointed with the protracted way the IC-746 is put in repeater mode and, although I concede that it's not the easiest radio I have ever used in this respect...don't forget it's not a dedicated v.h.f. mobile n.b.f.m. transceiver, frankly I would have been a little disappointed if Icom had given this aspect of its operation priority.

Any problem setting up for repeater operation is easily overcome by programming all the repeater frequencies with their offsets into memories. (Every memory on the IC-746 can be given an alphanumeric name).

Side By Side

I put the IC-746 side by side with my Icom IC-706 Mk1. The 746 (imagine - if you will - my gritted teeth) outperformed the 706 on h.f., and it was more selective and more sensitive.

When I employed the DSP features on the IC-746, something my IC-706 does not have of course, the '746 'blew the 706 out of the water' performance wise.

On v.h.f., both transceivers were comparable

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Manufacturer's Specifications

General

Frequency coverage

Receive	300kHz to 60MHz (except some ranges) 144 to 146MHz (except some ranges)
Transmit	1.8 to 1.99MHz (depending on version) 3.5 to 3.99MHz (depending on version) 7 to 7.3MHz (depending on version) 10.100 to 10.150MHz 14 to 14.35MHz 18.068 to 18.168MHz 21 to 21.45MHz 24.89 to 24.99MHz 28 to 29.7MHz 50 to 54MHz (depending on version) 144 to 146MHz
Modes:	l.s.b., u.s.b., c.w., a.m., f.m. and RTTY.
Memories:	99 regular, two scan edge and one call
Antenna:	Three SO239 connectors, 50Ω impedance
Usable temp range:	-10°C to 60°C
Frequency stability:	Less than ±200Hz from 1 to 60 min after power on.
Frequency resolution:	1Hz
Power supply:	13.8V DC (± 15%) negative ground
Current drain:	Transmit = (max. power) 20A Receive = Standby 1.8A (Max. audio 2A)
Dimensions:	287 x 120 x 316.5 (w x h x d)
Weight:	8.5kg
Transmitter:	
Output power:	h.f./50MHz 5 to 100W (a.m. 5 to 40W)) 144MHz 5 to 100W (typical) and a.m. 5 to 40W)

Balanced modulation	a.m., l.s.b., u.s.b.
Variable reactance modulation:	n.b.f.m.
Spurious emissions:	Less than -50dB (h.f.)

Carrier suppression:	40dB
Unwanted sideband:	55dB
Microphone impedance:	600Ω

Receiver

Sensitivity:
Modes l.s.b., u.s.b., a.m., RTTY:
0.16 μ V (1.8 to 29.9MHz)
(10 dB S/N) with pre-amplifier on:
0.13 μ V (50 MHz)
0.11 μ V (144MHz)
AM (10 dB S/N): 13 μ V (0.5 – 1.79MHz)
2. μ V (1.8 – 29.9MHz)
1 μ V (50/144MHz)
FM (12 dB SINAD): 0.5 μ V (28-29.9MHz)
0.25 μ V (50MHz)
0.18 μ V (144MHz)

Selectivity

Modes l.s.b., u.s.b., c.w., RTTY: More than 2.1kHz @-6dB
 Less than 4kHz @-60 dB
Modes a.m. and f.m.(narrow):
 More than 9kHz @-6dB
 Less than 20kHz @-40 dB
Mode f.m.: More than 12kHz @-6dB
 Less than 30kHz @-50dB
Squelch sensitivity
Mode: USB
LSB CW RTTY: Less than 5.6µV
Mode: f.m.: Less than 1µV
Spurious image rejection ratio (Except i.f. through on 50MHz)
 More than 70dB
 More than 60dB (144MHz)
Audio Power output: More than 2W (@ 13.8V d.c. into 8Ω)

on the 144MHz band. However the IC-746 provided a very good account of itself when receiving v.h.f. Air Band and Marine Band transmissions.

In my opinion the Icom IC-746 is not a mobile radio by modern standards. However, when I first started working h.f. mobile I used a Trio TS-120V, not dissimilar in size to the IC-746. The IC-746 is quite definitely a portable radio.

The 12V d.c. supply, coupled with the fact the IC-746 is small and light and has an extremely versatile a.a.t.u., makes it just as ideal for camping and caravanning, together with sitting proudly in any shack.

I think the IC-746 is a well-made and versatile radio with excellent transmitted and received audio. But give yourself time to get used to and get the best out of the DSP. **It is different ...but 'by George'....it is very, very good!**

My thanks go to **Icom (UK) Ltd of Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742**, for the loan of the review unit, the selling price of which is £1695, including VAT.

PW

October 10: The Ballymena Amateur Radio Club G13FFF will hold its Annual Rally at the Ballee High School from 1200 until 1700. More information from **Jeffrey Clarke G14HCN** on (01266) 659769.

October 18: The North Monaghan Hobby Radio & Computer Exhibition will be held in the Four Seasons Hotel, Monaghan (function room and not the disco), Ireland. Doors open at 1130 and the rally finishes at 1630. All the usual retailers will be in attendance including large displays of computer equipment and a Bring & Buy. Refreshments are available in the hotel along with full facilities for QSLing via the bureau. **Stephen Hand** on (Irish Republic number) (01365) 751479 evenings or E-mail: **Stephen.hand@virgin.net** or **Ken O'Reilly** on (01365) 738981 or E-mail: **kenoreilly@enterprise.net**

October 18: The Hornsea Amateur Radio Club Rally is to be held at the Floral Hall, Hornsea, East Yorkshire at 1100 (1030 for disabled visitors). There will be trade stands, B&B, restaurant and a licensed bar, entrance £1, talk-in, S22. Tel: (01964) 532588.

October 24: The Carrickfergus Amateur Radio Group welcome everyone to their annual rally, which takes place at 1200 at the usual venue which is Downshire School, Carrickfergus, Northern Ireland. Talk-in on 145.550MHz (V44 (S22)).

November 1: The Tir Conaill Amateur Radio Society Annual Radio Rally, at Jackson's Hotel, Ballybofey, County Donegal. Attractions will include trade stalls and a Bring & Buy. There will be refreshments available all day with a bar in the hall. Doors open at 1200 and will end at about 1600 with an auction at the Bring & Buy stall. Tel: (072) 52598 (Irish republic calls) or from Northern Ireland by calling 01035372 52598.

November 1: The Great Northern Hamfest takes place at the Metrodome Leisure Complex, Queens Road, Barnsley, S. Yorkshire. A five minute walk from the centre of Barnsley bus and train, less than two miles from the M1 junction 37, follow the large brown Metrodome signs. Doors open 1000. The venue is all on one level with excellent disabled facilities and plenty of free parking. There will be the usual trade stands, components and kits with specialist interest groups and the RSGB will be present. Morse tests on demand available from 1000 till 1500. There will also be a large Bring & Buy. Talk-in on 145.550. **Ernie G4LUE** on (01226) 716339 and (0836) 748958 6-8pm.

November 4: The Bangor & DARS are holding a Surplus Sale at the Clandeboyne

Lodge Hotel, Bangor in Northern Ireland, at 2000 (1945 for disabled visitors). Free parking and bar services available. Admission is just £1. Talk-in on Ch. 22. **Roy G10WVN** on (01247) 460716.

***November 7/8:** The Twelfth North Wales Radio & Electronics Show is to be held at Aberconwy Conference Centre & New Theatre, Llandudno Promenade. The shows opens at 1000 each day and the entrance fee is £1.50 for adults, children under 14 free. **M. Mee GW7NFY** on Tel/FAX: (01745) 591704 or the Secretary **Greg Robbins GW7NAU** on (01492) 878288.

November 8: The Midland Amateur Radio Society (MARS - Birmingham) are holding their 10th Radio & Computer Rally at Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open at 1000 and admission is £1. There will be a large free car park, a free hamper draw plus many trade stands, local clubs and special interest exhibits. For trader details contact **Norman G8BHE** on 0121-422 9787 or for general information, contact **Peter G6DRN** on 0121-443 1189.

November 14: The SAMS '98 Computer & Electronics Show is to be held in the Bingley Hall, Staffordshire Showground, Weston Road, Stafford (A518 Stafford-Uttoxeter Road), signposted from junction 14 on M6, (bus shuttle from Stafford Railway Station). Doors open 1000 to 1600. Admission for adults is £3, children under 14, 50p. Concessions, OAPs, RSGB Members, Student Card, UB40, £2, (Advance Tickets £2 plus s.a.e.). There will be masses of free parking, a licensed bar from 1100 and refreshments, meals and a cafeteria. A great day out! **Sharon Alward, Sharward Promotions, Knightsdale Business Centre, 30 Knightsdale Road, Ipswich, Suffolk IP1 4JJ**, Tel: (01473) 741533, FAX: (01473) 741361 or E-mail: **services@sharward.co.uk**

November 22: The Bishop Auckland Radio Amateurs Club (BARAC) Rally will

take place at Spennymoor Leisure Centre. **Please note that this is a new venue**, ideally suited for both trader and disabled as it boasts good parking and easy access to large ground floor hall. There will be the usual radio, computer, electronics and Bring & Buy stalls as well as catering and bar facilities. Morse tests will be available on demand. As you can imagine, there is lots to do for all the family within the confines of the leisure centre for those of the family not quite interested in radio. Doors open at 1100 (1030 for any disabled visitors). Admission is £1, and under 14s go free of charge, if accompanied by an adult. Talk-in on S22. **Keith M0BLN** on (01388) 601401 or (0374) 417660.

November 28/29: The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9 0AS. Doors open 1000 until 1700 each day. Admission is £3 for adults, £2 for OAPs and under 14s. There will be free parking for 2000 cars, a large trade show, Bring & Buy, catering, licensed bar, on-site camping, special interest groups, disabled facilities, cloakroom, Morse tests on demand, a talk in on 2m and 70cm and family attractions. **Steve Blayer G4UKR**.

December 5: The Rochdale & District Amateur Radio Society are holding their traditional radio rally at a **new venue**, two miles NW of Rochdale Town Centre on the A680 Rochdale to Edenfield Road at Cutgate. Look for the orange arrows. Talk-in on S22. There will be components, vintage radio and junk. More information from Rochdale & DARS, **John G7OAI** on (01706) 376204 or (0973) 689077 or E-mail: **john70ai@which.net**

December 13: The Leeds & District Amateur Radio Society is to be held at the Pudsey Civic Centre (Dawsons Corner). There will be all the usual traders. Doors open at 1100 (1030 for any disabled visitors). There will be a talk-in, a licensed bar, etc. **John Mortimer M1CAI** on (01943) 874650 or **Malcolm Robertson G7VCK** on Leeds 0113-225 3379.

***December 13:** The Verulam Amateur Radio Club will hold its annual rally at the Watford Leisure Centre, Horseshoe Lane, Garston, Watford, Hertfordshire. **Ian Forsyth G0PAU** on (01923) 265572.

1999

January 17: The Oldham ARC Mobile Rally is to be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 1100 (1030 for disabled visitors). The event features the usual traders and a Bring & Buy stall. Morse tests are available on demand. Talk-in on S22 via GB4ORC commencing at 0730. There will be refreshments and free parking. (01706) 846143 or 0161-652 4164.

February 7: The 14th South Essex Amateur Radio Society Radio Rally is to be held at the Paddocks, Long Road, Canvey Island, Essex. The Paddocks is situated at the end of the A130. Doors open at 1030. Features include Amateur Radio, computer and electronic component exhibitors, Bring & Buy, RSGB Morse testing on demand (two passport photos required), home-made refreshments, free car parking with space outside main doors for disabled visitors. **David G4UVJ** on (01268) 697978.

February 14: The 14th Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield. There is one large hall, just out of town on the Horbury Road. Easy access from M1 junctions 39 & 40 - well signposted and with a talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). **Roy G0TBY** on (01924) 893321 or packet **G0TBY@GB7WRG**, E-mail **rally@waveg.demon.co.uk** or visit the web page at <http://www.waveg.demon.co.uk/rally/>

February 21: The Barry Amateur Radio Society Radio & Computer Fair has changed its venue. **The new and improved venue** will be held at the Holmview Leisure Centre, Skomer Road, Barry. Facilities include lounge bar, catering and parking. Admission is £1.50 and doors open at 1000 for disabled visitors and 1030 for general public. **Brian GW0PUP** on (01222) 832253 combined telephone and FAX number.

May 9: The Drayton Manor Radio & Computer Rally is to be held at Drayton Manor Park, Fazeley, Tamworth, Staffs on the A4091. The main traders will be in four marquees with a large outside traders flea market. There will also be a Bring & Buy stall, local clubs and special interest stands. Open from 1000 onwards. Trader information from **Norman** on 0121-422 9787, other information from **Peter G6DRN** on 0121-443 1189 evenings please.



If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.
The Editorial Staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. Editor

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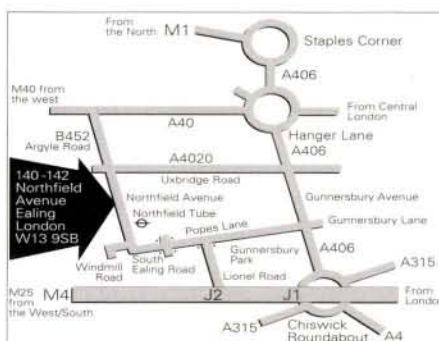
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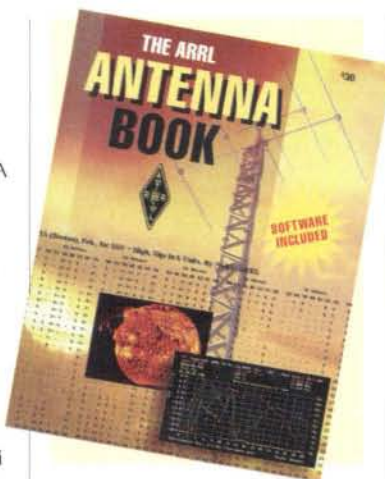
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Book At Bedtime

I find nothing more effective to help me relax after a hectic day, than sitting down and reading a book. What more topical in A-i-A than to mention the **ARRL Antenna Book** (18th Edition) in this context. I find that at least one of the 28 chapters has most, if not all, of the answers to any problem that I may be 'mulling' over.

The topics covered include antenna fundamentals, loops, low frequency antennas, multi-band as well as multi-element antennas, broadband arrays, Yagi antennas, log periodic and quad loop antennas, long wire and travelling wave antennas as well as antennas for portable and direction finding work. Those are in the 'front half' of the book. In the 'back half' are chapters dealing with masts and supporting systems, materials and accessories, propagation, transmission lines and matching to the transmitter.

As an aide-memoir, there's a glossary of terms that sets out most of those terms which everyone uses and that we sometimes abuse. As Christmas is 'almost' upon us, why not buy one for your Xmas stocking? To help you 'make up your mind', Michael, in the Book Department, has a special offer



for you. His special price, to be held up to Christmas, is just £20 inclusive of post and packaging - a saving of £5 over the normal price.

'Phone Home

I have an apology to make to G2DYM, the supplier of traps and antennas. In the news section of A-i-A (September 1998), I gave the wrong 'phone number for G2DYM after the items about his new 'E2 series' of antennas. For those who had difficulties contacting him about antennas or traps he that he can supply, the 'phone number is

(01398) 361215. Or by mail to R.Benham-Holman G2DYM, 'Cobhamden', Beerdown, Uplowman, Tiverton, Devon EX16 7PH.

Static AKD

Recently, I had to contact AKD to verify the price of band-pass filter, shown in their list dated 1996. I was pleasantly surprised to find that their prices had been held static ever since then. The list contains a series of ten filters covers most of the problems of TVI and interference that may be encountered by Radio Amateurs and their neighbours. Test equipment manufactured by AKD includes the 'WA' series of wavemeters covering h.f. to u.h.f. For instance, the WA3 covers from 1.8-92MHz, the WA1 covers 120-450MHz while the WA2 covers 50 and 70MHz. For more details of these items and their receivers and transceivers, contact AKD at Unit 5, Parsons Green Estate, Boulton Road, Stevenage, Herts SG1 4QG. Tel: (01483) 351710.

Can You Help?

Do you know of a supplier of roof mounting mast support? Christophe Pierre F6IVT is looking to mount an antenna on

his roof, but is stumped because he cannot find the type of mounting system he's looking for. In his letter asking for help, Christophe mentions a 'tripod' to mount an antenna on his roof, but that isn't the only method that may be used. I've seen 'folding plate' mounting systems in American and Japanese magazines, but not in European ones. With this 'folding plate' system two heavy frames fold down over the ridge of the roof, forming a stable mounting point for a short stub mast. Do you know of a similar system, or who supplies anything like this? Answers please to 'Antennas in Action' at the editorial address and I'll pass them on to Christophe. G1TEX

Editorial comment: I have seen this sort of arrangement a great deal in The Netherlands during my many visits. Many Dutch Radio Amateurs seem to use roof mounted antenna-masts, supports and even small towers and there's even a useful 'through the roof' system for supporting h.f. beam antennas that also seems very popular. So, perhaps some of our readers in Holland could help? (Photographs and information would be very helpful). G3XFD.

welcome to AiA!



In Antennas-in-Action (A-i-A) this month, we have an important 'grounding' topic from John Heys G3BDQ, a dipole antenna covering the whole 50MHz band and two topics of conversation in 'Tex Topics'. As I write this, it feels like it's nearly winter and Christmas is just around the corner, although we haven't had

much of a summer this year. Many of my antenna projects have progressed slowly due to lack of time and reasonable weather to carry them out. No doubt it's been the same for many of you. The weather (though more typically English) seems to have affected my post bag as well. By the reduced number of letters that I've had, I think that many of you must have been away over the summer (?). Certainly the weather hasn't been that favourable for extended work on antenna systems. Let's hope that next year will be better. It remains only for me to wish you a happy Xmas (a little early I know) and I'll see you again in the 'New Year's' issue of Antennas-in-Action.

G1TEX

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antenna workshop

Going To Ground

Station earthing is often low in the order of priorities for many Radio Amateurs. But, for that so important protection against lightning strikes, outdoors earthing is essential. The only exception might be at the home of the chap who only uses indoor antennas. A good earth system is also a must when using Marconi type antennas, i.e. those antennas that are single conductors under a half wave in length, which rely upon the conductivity of the ground.

In this article I shall not be discussing ground plane antennas, for they rely upon resonant elevated radials and not ground systems. If you just operate on the higher frequency bands using Yagi or cubical quad beam antennas, dipoles or other Hertzian based designs, then a low resistance earthing arrangement is then not necessary.

Earth Rods

An earth rod will be useless as the image of the 'missing' quarter wave of a Marconi antenna, but it will certainly help to protect, you, your family and your property from those Megavolts in the storm clouds. The illustration of Fig. 1, shows a typical earth rod arrangement. The rod must be positioned not more than five metres from the house.

The rod should penetrate at least one metre into the ground and have a very low resistance heavy connection to the operating position. Two lengths of the wide woven copper braid used for earthing electrical installations are ideal as connecting wires. Similar connecting braids can be made from the outer screening conductor of old heavy duty coaxial cable. It can be flattened and at the earth rod end soldered and drilled to fit the earth rod's connecting bolt.

Using a pair of such leads will lower the overall resistance and

allow the conduction to earth of heavier 'strike' currents should they unfortunately take place. Churches and other high buildings use heavy solid copper straps as conductor down leads. I recently noticed similar conductors when fuel tanks were being installed at a new filling station.

The earth rod may be of solid copper (expensive) or of copper plated steel rod, or perhaps the stout Dural tubing used for scaffolding. I use Dural tubes, as they're cheap and strong.

Aluminium 'greenhouse' nuts bolts and washers should be used to minimise corrosion due to dissimilar metal contact at the connection points. To help reduce corrosion, all the junctions are liberally coated with silicone sealant. Some of the connections made in this way have remained in fine condition for more than ten years at my QTH.

Some writers have suggested 'watering' around earth rods with saline (salt) solutions. My advice is not to bother, for the soil resistance will be lowered just around area of the rod, and it will not reduce the overall ground resistance much. Also a salty patch in the ground can give rise to corrosion, not to mention destroying plant and other soil life in the vicinity.

Simple Measurements

Before writing this article I carried out some simple earth resistance measurements in my garden. Two

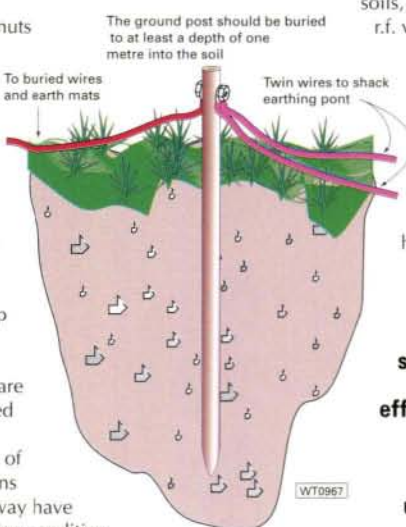
copper plates (actually two pieces of double-sided printed circuit board material) each with a surface area of 140mm square, were pushed into the moist loam of my vegetable plot and separated by 100mm.

My first measurement indicated a resistance of 650Ω and a second made a metre away showed a resistance of 850Ω. Use a non-polarised meter for this work. The very high voltages around at the time of a lightning strike have no difficulty in penetrating normal

soils, but the 'puny' r.f. voltages and currents from an antenna system cannot be conducted very far.

A commonly held fallacy, is

Fig. 1: A simple earth spike, whilst it may be an effective ground for mains protection, is practically useless for r.f. grounding purposes.



of half wave antennas up at their most effective heights (full 1/2 wavelength) is often not possible. So, shorter inverted 'Ls', end fed wires or verticals are most often considered instead. An ideal Marconi antenna would have a quarter wave vertical wire or mast centred upon a horizontal disc of copper (or other good conductor) with a diameter of at least a half wavelength.

Ships, whilst at sea, use the ocean as a very effective substitute for the half-wave horizontal disc. As do those very few amateurs who may be resident in the middle of a salt marsh. If such souls exist they need read no further! A Marconi antenna, in the simplest terms, is a dipole with the ground taking the place (by reflection) of one dipole leg.

To be effective a Marconi antenna must have a very low resistance earth return back to the antenna base. Any resistance to these earth return currents will lower the system efficiency. It would be something like having one leg of a half wave dipole made with resistance wire.

In the real world, we must compromise and accept that our ground arrangements will never be the equal of the salt marsh or the metal ground plate. Instead we must lay down as much wire as possible over, or under, the available garden area. A temporary arrangement used by many a DX-pedition station on a distant island might include many lengths of aluminium kitchen foil held down by stones and sand.

Such a kitchen foil earth should perform very well on the lower bands and, when operations cease, may be screwed up and disposed of. Some overseas 'Top-Band' DXers are reputed to have several kilometres of ground wires. But the vast majority of us may not have the space to lay out such lengths of wire.

the idea that fresh water is a good conductor. **It's not!** and connections to streams, ponds or wells show no better conduction than that of average soils. On the other hand, salt water is some 500 times better as an electrical conductor than fresh water. Very poor high resistance soils include those largely made up from limestone, sand, stones and gravel.

Operating On 1.8 and 3.5MHz

When contemplating operations on the 1.8 or 3.5MHz bands, the use

antennas in action

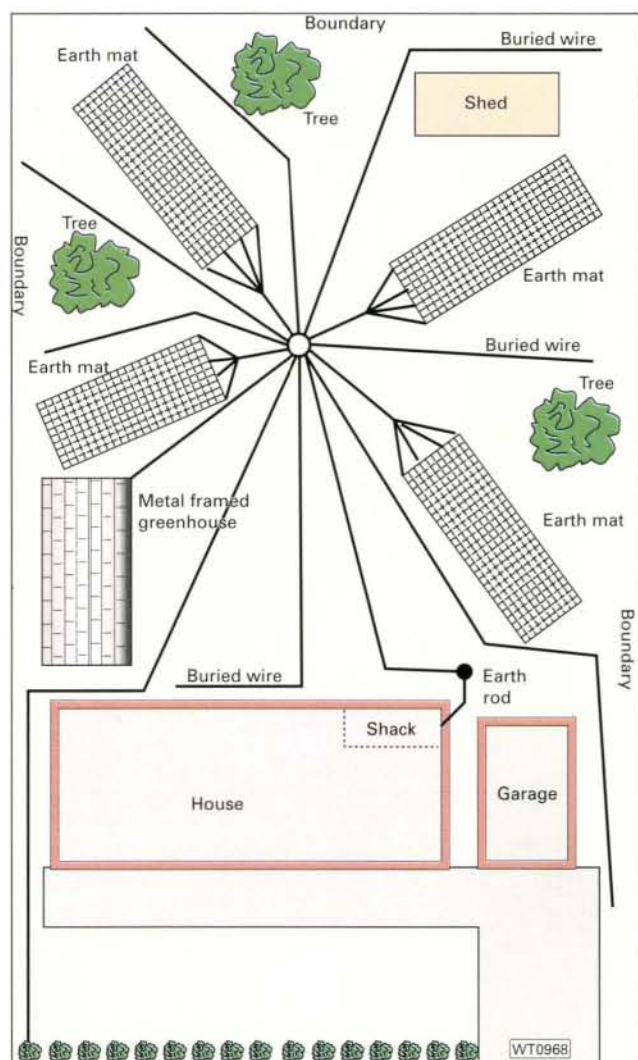


Fig. 2: A much more effective r.f. earthing system, must consist of as many radial wires as possible, coupled with one, or more, earth-mats to lower the ground resistance at r.f.

So, how can we maximise our laid-out earth system? The plan of a 'typical' suburban garden is shown in Fig. 2. Some gardens may be larger or smaller than the one illustrated, but whatever size garden you have, the concept stays the same when planning a ground wire system.

Convenient Length

The wires can be of any convenient length and either bare or insulated wire can be used. Many short wires will be more effective than a few long ones. A radial ring of 50 or 60

wires, each no longer than eight metres will be better than a few wires several times that length. When the layout of the wires is decided, slots made with a spade

can be made in either the soil or the lawn and the wires pushed down into the slot using a flat thin piece of wood.

Some judicious jumping and stamping will close the slots up again and they will soon disappear. The common central earth point can be an earth rod, or a copper ring about 100mm diameter. This point can then be connected to the main station earthing rod near the house. Any lumps of metal can be connected to the system, I once used an old galvanised water tank.

Another common item, found in many gardens, is an aluminium framed greenhouse. As with the one in my garden it can also be connected to the earth wires. The wires can be above ground, but of course they are then a hazard to both people and pets, but often there are ways of running wires above ground in most gardens. I have such wires running in my boundary hedges.

More Effective

An 'earth-mat' is more effective than a layout of radial wires, and at its simplest, is a criss-cross series of interconnected wires covering an area. A cheap, but effective earth-mat, can be made with galvanised mesh fencing (sometimes known as 'Chicken wire'). Even quite a large mesh will appear as a solid metal mat at our amateur frequencies, for the holes are tiny in terms of wavelength. New netting can be soldered into position, and if the matting is tinned before laying it down, soldering the earth wires to the earth-mat will be quite easy.

As usual I personally coat any joints with sealant. The wire will eventually rust but I have had earth-mats down for more than ten years and they are still in good condition. The soil in my garden is quite benign, but some soils may

be acid and this will quicken corrosion of the mesh if this is the case. The lengths of newly laid galvanised netting may look odd lying on top of the turf, but the grass grows quickly and the accumulation of grass cuttings, together with worm action results in the 'disappearance' of the netting quite quickly.

If it is only possible to arrange buried wires or earth-mats, running in one direction away from the antenna base, you may find that signals are stronger to-and-from that direction. In my location, I find little in the way of directional effects and I can manage to work stations in the 'wrong' direction quite easily.

Looking Ahead

I have always been fascinated by new ideas and technologies so, on reading recent reports of an electrically conductive concrete[‡] my imagination was stirred. It seems that the Flare Group, a London company, seem to be marketing this new material which can be arranged to have a pre-determined conductivity (i.e. resistance). Applications include heated airport runways, heated Underground station platforms and as a building material to provide electromagnetically screened rooms or buildings to house sensitive apparatus or computers. Perhaps we will soon be able to lay down driveways, paths or patios around our homes which will then be perfect r.f. grounds and obviate the need to lay down buried wires and metal earth mats!



[‡] A search of the Internet using the 'Yahoo' search engine and the key words 'concrete, conductive' found the following page reference:

<http://www.usherb.ca/CENTRES/beton/bulletin/mai97/ecc-e.html>

On reading the page, it would appear that the concrete is a Canadian idea developed by **Jim Beaudoin** and **Ping Xie**. If you do not have internet access, but would like to see a copy of the web page, send a self-addressed label (marked 'Concrete') and a stamp to me at the editorial address, marking your envelope 'Concrete' as well. G1TEX

Mighty - Wide on

Every single loft mounted 50MHz (6m) antenna that I've tried invariably had one frustrating problem - lack of bandwidth. The best performance I could get was a usable bandwidth of about 50-51 or 51-52MHz using the 'double coaxial' dipole arrangement featured in my ancient copy of **Pat Hawker G3VA's** book *Amateur Radio Techniques*.

Either of the two choices mentioned works well on only half the band space available to United Kingdom amateurs. This situation left me with a choice of the c.w. section of the band or the frequency modulated (f.m.) portion, but not both. Not wanting to be restricted to only one portion of the band, I continued searching for a suitable wide-band antenna.

An intriguing design was eventually found in the Amateur Radio Relay League (ARRL) *Antenna Handbook*, (Chapter 15 - 1). I rescaled the antenna for use on the 50MHz band and also modified the tuning arrangement. The results were excellent so I have detailed them in

this article. Anyone who wants to try 'six metres' will find this a superb utility antenna.

The Mighty-Wide antenna offers the benefit of folded dipole construction, and its wider bandwidth, with the convenience of ubiquitous 50Ω coaxial cable feed. Other positive points of the antenna are:

- 1 - Simple 50Ω coaxial feed design
- 2 - No antenna tuning unit required
- 3 - Wide Bandwidth - 50-52MHz
- 4 - Lightweight - ideal for portable or indoor use

The difference between the Mighty - Wide dipole and its nearest rival makes an interesting comparison. There have been many arguments over what

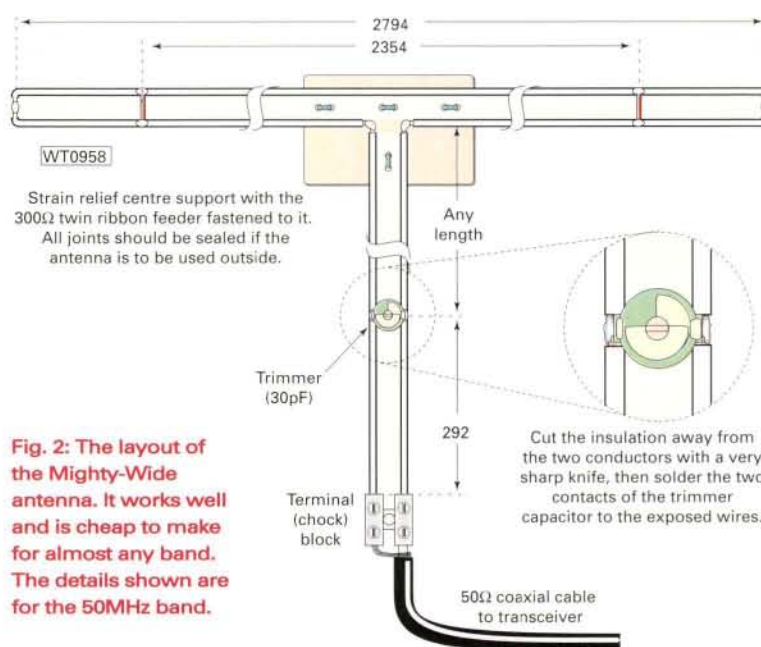


Fig. 2: The layout of the Mighty-Wide antenna. It works well and is cheap to make for almost any band. The details shown are for the 50MHz band.

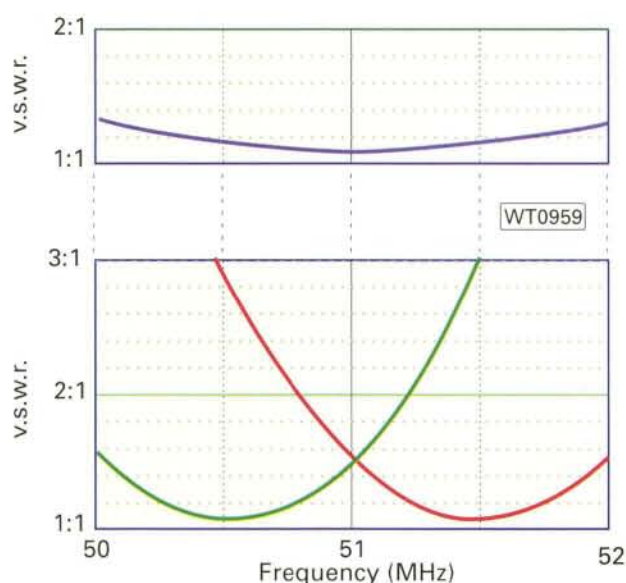


Fig. 1: Standing wave ratio (s.w.r.) plots of two antennas, a dual coaxial dipole and the Mighty-Wide 6 (see text for detail).

may be considered as a maximum usable s.w.r. of any antenna. But for the purposes of this article, let me assume that the maximum s.w.r. is a 2:1 ratio and that a 'just usable' ratio is 1.5:1. (An argument that we will not get involved with here, although it may - or may not have any real validity. Ed.)

I have plotted the standing wave ratio (s.w.r.) of the antenna and that of the coaxial cable dipole. The results are shown in **Fig. 1**, which might need a little explanation. The lower graph shows two s.w.r. curves - the red curve is the indicated s.w.r. of the double coaxial dipole when centred on the upper half of the band. The green plot is the same antenna with the tuning centred on the lower end of the band range. Above these two plots is the s.w.r. curve of the Mighty-Wide Antenna - it's an improvement over the comparison antenna, don't you think?

Construction of the Mighty-Wide dipole is simple. My antenna is loft mounted so the constructional details given here can be considered for an indoor or

portable version of the antenna. The whole dipole is made from ribbon cable of the 300Ω type.

Details of the device are shown in **Fig. 2**. I used the non-slotted variety of ribbon cable, which is available cheaply from the Maplin or other suppliers. The radiating element of the antenna has a total length of 2794 millimetres. The antenna feedpoint is connected to a section of the same ribbon feeder. This section can be of any length, which is most convenient for siting the antenna.

Two shorting links are placed across the ribbon cable radiating element. The links are placed at distance of 220 millimetres from each end of the antenna. I soldered the shorting link wires across the ribbon cable by first paring away excess cable sheathing with a sharp modelling knife. **Do be careful if you try the same technique, or you may need to add Elastoplast to the component list!** A 30pF ceramic trimmer capacitor will be required.

The trimmer is used as a capacitive reactance element. This transforms

Six

the antenna feedpoint impedance (at the junction of the 50Ω coaxial cable and the 300Ω feeder) down to 50Ω. I had a ceramic trimmer capacitor in the junk box (*these items are very useful and I feel you should always add a few to your order when you're leafing through the Cirkit or other electronic supplier's catalogue Ed.*).

The trimmer capacitor is soldered across the ribbon cable as shown in the inset diagram of Fig. 2. I used the same paring technique detailed earlier to expose the ribbon cable conductor. Remember to leave a length of ribbon cable below the trimmer capacitor. The 50Ω coaxial cable from the transceiver is attached to the ribbon cable at a point 292mm below the trimmer capacitor connection point.

I've found that a two-connector section of 'choc-block' (more properly known as electrician's terminal block) makes an ideal connector for attaching the coaxial cable to the ribbon cable. After building the Mighty Wide dipole I mounted the completed unit in the loft.

I adjusted the trimmer capacitor for

the best standing wave ratio with the transceiver tuned to 51MHz. I was delighted to find that after adjustment the s.w.r. hardly varied across the whole of the UK and European 50MHz band allocation of 50-52MHz. I tried the antenna in several positions. This included using an inverted-V mounting. The trimmer capacitor did not need to be re-adjusted for any of the positions tried.

Within Loftspace

The photograph of Fig. 3 shows the Mighty-Wide dipole mounted within the loftspace. The radiating element is partially visible running parallel with the roof ridge. The downlead can be any length but the 30pF trimmer capacitor must be attached at a point 292 millimetres above the ribbon to coaxial cable connection.

The trimmer capacitor may not be visible in the photograph, but it's about half way up the vertical section of ribbon cable. In the background on the left-hand side, can be seen the *Practical Wireless* 'Suspend-a-Loop' antenna for the 144-146MHz band - this excellent

antenna design, featured in the September 1996 edition of *PW*!

All in all I've found it to be an extremely useful antenna. I can now cover the whole band with no antenna tuning unit required. In fact I think it's such a good antenna I'm now considering rescaling the device for use on the WARC bands of 18MHz (12m) and 24MHz (17m). I may even put one up for use on 'ten' (28MHz) when things improve! Have fun building the antenna and see you on six metres chaps!



Fig. 3: With the dipole elements taped to the beams in the loftspace, the feed line can drop vertically down, free of any other object in the loft (see text for photograph information).

aa

■ A CASE OF TVI, ON CHANGING TO A ZL SPECIAL AND AN UPDATE TO THE DX-BUSTER ANTENNA

tex topics

A TVI Problem

I've had a letter from **Graham M1CMF**, saying that he has built a 144MHz band 'ZL Special' antenna (designed by the late **Fred Judd G2BCX**). Graham says that although the antenna works well, a neighbour is now suffering TVI as a result of this new antenna. He asked if I thought

that a balun would cure this TVI. In my reply I said, that I felt that a balun wasn't the definitive answer to the problem, although it might help. I feel that the TVI was a result of the greater field strength due to the forward gain of the new antenna. I have a few 'rules' to follow to find the true cause of TVI so, let me point them out

again here (assuming you have a neighbour with a TVI problem.)

Under what conditions does your neighbour suffer TVI? Is it all the time? Is it when your antenna is 'pointing' at his antenna? Is it on v.h.f. f.m. radio or on his TV? Does he have a video recorder in-line? (most likely) What happens

when the video recorder isn't in-line - does the interference still happen? Does the TVI 'go away' when you use f.m. or is it constant when you transmit?

If you have changed or improved your antenna, I would expect that the increased field strength from your transmission is the major

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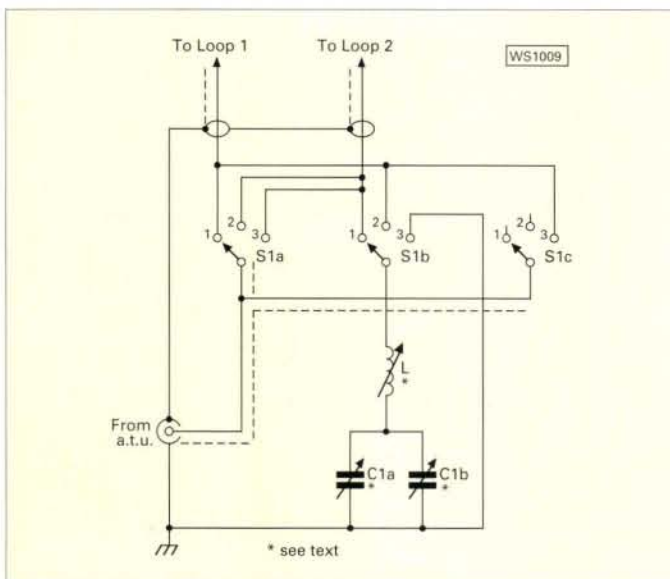


Fig. 1: The switching arrangement used by Roy GW3KZW to control his 'DX-Buster' antenna. See text for more detail.

problem, and that your neighbour's set-up is the most likely main culprit, the likely scenario. To estimate your field strength, in the August 1996 issue of *Practical Wireless*, **Gordon King G4VFX** wrote an article on this topic (*Invisible Power*), and in it he showed the signal field strengths that a transmitting station can create.

I think the most effective answer may be a 144-146MHz filter in the TV(?) download (before the video recorder) of your neighbour's system. The equipment suppliers **AKD** can supply suitable filters, it might be worth contacting them and asking about their '**HPFS**' filter. This unit would be fitted at the point where the download from the TV antenna goes into the TV system (Video recorder / distribution amplifier or cable system input etc.). At a little over £10 including post and packing this might be the best, and fastest, answer. Please let me know how you and your neighbour get on with the TVI.

Bemoaned The Loss

In the September 1998 issue of

Antenna-in-Action (A-i-A) **Roy Ratcliffe GW3KZW** bemoaned the loss of his 'DX-Buster Antenna' which he described. This really was a 'brute' of an antenna, in that it consisted of two full-wave delta loops for the 3.5MHz band. Roy has sent me a letter, with some additional information, and to correct what he said was "possibly in translation from the original Swahili".

The major problem that Roy has highlighted, was that the information about the capacitor coil combination (to alter the electrical length of the reflector loop) could have been a little more expansive. He has provided a circuit diagram of the switching unit that he used, **Fig. 1**, to change the direction of transmission of his antenna.

In an extension of the original article Roy wrote "To 'lengthen' one element some inductance needs to be added to that element to achieve the desired effect. In practice I found that it was not possible to 'hit' the exact amount of 'L' accurately enough to get the result I was looking for. Had I had a roller inductor

available, this would probably have been used, but I didn't."

So, Roy opted for a fixed amount of 'L' (positive reactance) and then, by means of a series connected variable capacitor, introduced a variable amount of negative reactance (capacitance) to offset the inductor (so, effectively vary the amount of 'L'). This variable inductance then reflects to the feedpoint of the antenna via the electrical half-wave of coaxial cable.

Roy mentioned that the technique he had developed for tuning the system for front-back ratio, was to listen on position three of S1, then switch to either position one or two of S1, and tune the capacitor C1a/b for a minimum signal. On switching to the other operating position (positions two or one on S1) you should now find the signal has become a maximum.

In the final words in his letter, Roy says "For goodness sake don't let the 'experts' take over the magazine and start 'improving' it. In particular producing long boring list of people that took part in the 'World Wide Pickled Onion Producers Contest'. We like it as it is". I have to admit to liking the magazine myself too Roy (well I wouldn't I?). And remember - too many pickled onions give a warm southerly wind that is, in spite of its warmth, still obnoxious! So we aim for a good all-round 'diet' to suit almost everyone.

Well I'm afraid that's all there's space for this month so I'll take my leave of you and I look forward to our next meeting in the January 1999 issue of A-i-A.

Tex



Further reading

'The DX-Buster' by Roy Ratcliffe GW3KZW (A-i-A) September 1998 issue of *Practical Wireless*.

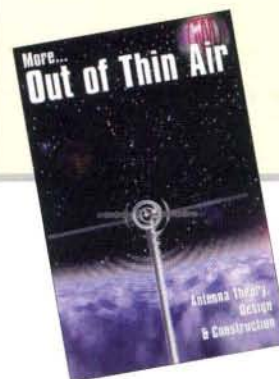
'Invisible Power' by Gordon King G4VFX, August 1996 issue of *Practical Wireless*.

'ZL Special 144MHz Antenna' by Fred Judd G2BCX appeared, along with many other antenna and related projects in *More Out Of Thin Air*.

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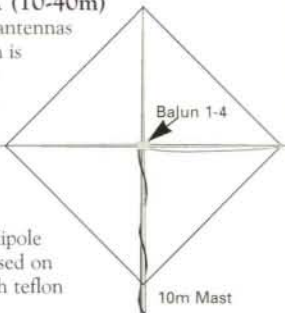
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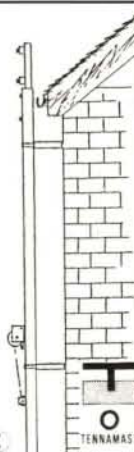
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International Global

Ben Clegg G7RER gives his in-depth account of a project which was deemed impossible to begin with but turned out to be a major success for everyone involved. It resulted in one of the biggest international global link-ups ever and took place on the Isle of Wight in December 1997.

At 0800, the winds hit force nine, sweeping in from the Needles Headland, driving the rain horizontally into the faces of a damage control party led by Dave Cramp G7RSD. (See Fig.1). He had commandeered members of the public to assist him in his attempts to make major repairs to a triband beam antenna that was spinning like a rotor blade atop a 12m Clark mast, sited less than three metres from the edge of a 83m cliff.

A G5RV antenna had broken away. Whipped up by the wind, it thrashed like a snake as valiant attempts were made to regain its mooring point. Coaxial feeders had snagged in trees which, as they swayed, tore them away from their fixings. A long line had become three short lines.

The rain turned the entrance walkway into a sea of mud. And this was how Saturday 6th December 1997 ushered in the centenary of the establishment of what Marconi called the "The World's First Permanent Wireless Station".

The **Needles Wireless Telegraph station** at Alum Bay was built in 1897, in the grounds of the Royal Needles Hotel. This was situated on the Western tip of the Isle of Wight and had long since disappeared into the sea.

Close As Possible

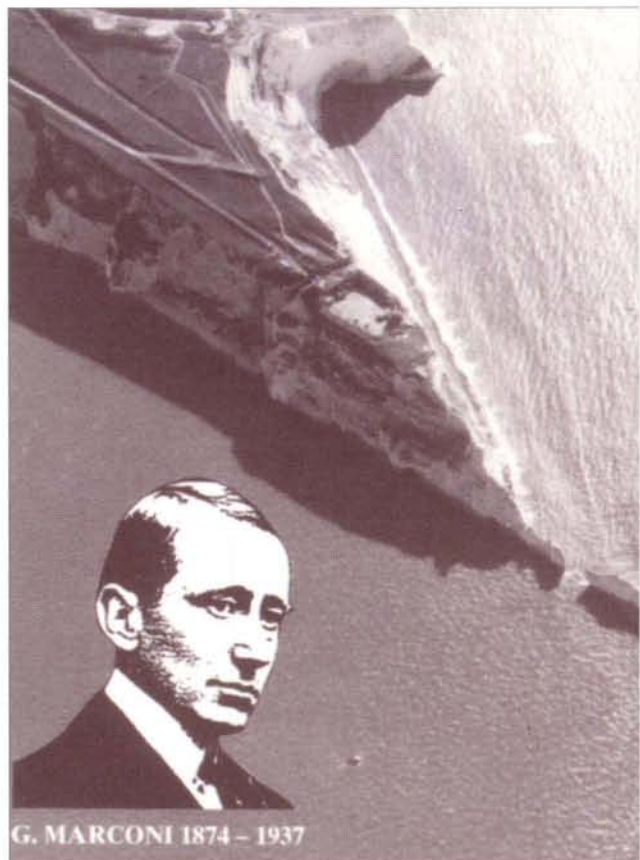
The **West Wight Radio Society (WWRS)**, Fig. 2, has its clubhouse in two rooms of a large derelict bungalow situated on cliff tops as close as possible to the original site, overlooking the famous coloured sands. It holds the permanent special event call sign **GB2GMM**. This International Heritage site is owned by Leisure Great Britain PLC, trading as The Needles Pleasure Park.

By mid October 1997, it was apparent that this significant date in communications history might go unrecognised. This left the six active members of the WWRS with both the moral and historical duty to celebrate their club station's 100th birthday.

The fine weather of the previous day had seen the work of the first combined operations by the WWRS, Binstead ARS, and the Essex based Dengie 100 ARS come to fruition. It had taken only a week by volunteers from the two Island clubs to complete the transformation of this abandoned building into the world's most modern amateur radio station.

It was this background effort, especially by members of Binstead ARS who had travelled 80 kilometres a day, that I was particularly thankful for. Without their commitment the event would have been a non-starter.

The Operations Room, directed by **Mark G0ZGN**, incorporated six h.f. sets. The primary transceiver was the very rare 200W Icom IC-775, fed



G. MARCONI 1874 - 1937

into 100m of Nevada's Low Loss Coaxial to a 31m Clark Mast located in the car park. This loaded a steerable Jaybeam Triband.

The other five Icom IC-756s, had individual masts and various antennas sited near the cliff edge. These were all switchable to 1.2kW output from a £1600 Linear Amps (UK) Explorer 1200. With another two IC-751s as back up, we had the capacity to monitor a frequency on every amateur band.

The v.h.f. room had three Icom IC-821Hs running 144 and 430MHz, with the 144MHz SSTV linked into an Isle of Wight College computer, one of their six Pentiums was located in another room displaying exhibits donated to the club's museum.

We had no idea how many of the general public would turn up, but expected around 30-40 visitors throughout the day. By 1100, a staggering 400 visitors had braved the elements to see us and we had only been open for an hour! Although mainly locals, some had travelled from Luton, Oxford, and parts of Kent after hearing the National broadcasts on Radios Two and Four that morning.

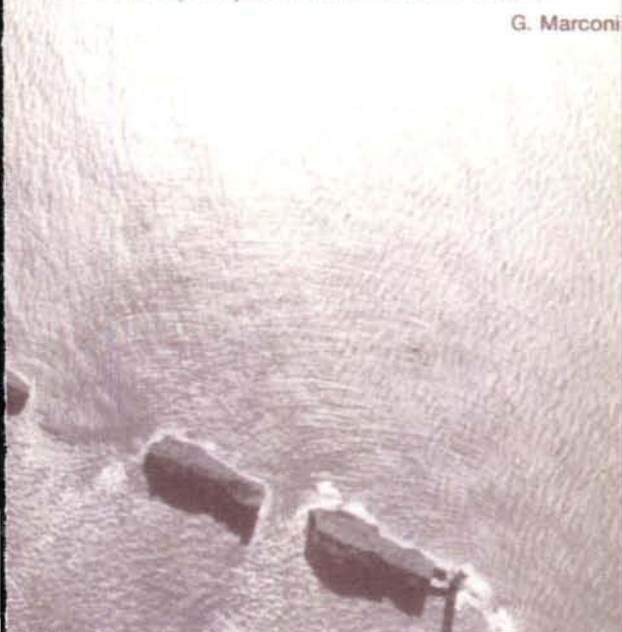
This amazing response from the public, although very welcome, caused chaos to repair crews and the timetable. At 1200, a BBC TV film crew joined the operators and the 69 members of the public crushed into the h.f. room! We had no option but to temporarily vacate the station of all but vital personnel.

I Wireless Link-up

GB100 IOW Alum Bay

"The worlds first permanent wireless station"

G. Marconi



This breathing space enabled repair teams, now swelled by volunteer amateurs from all over the country, the opportunity to relay new feeders and construct temporary antennas. Their previous attempts of running the now shortened coaxial feeders along corridors crammed with people queuing to enter had been impossible.

Reception Rooms

Everyone was steered towards the large reception rooms kindly set aside for our use. Here, Mr **Tim Wander C.Eng.** Head of Engineering, Telematics and Advanced Systems at GEC Marconi, delivered a fine talk about Marconi's work at Alum Bay.

Radio and TV personality Mr **Shaw Taylor** of 'Police Five' fame gave an entertaining dissertation

Practical Wireless, November 1998

relating to the importance of wireless in the arrest of the infamous Dr Crippen and his accomplice. He presented to the WWRS, a framed copy of the Telegram from the SS *Montrose* to Scotland Yard, advising of their arrest.

After a "Thank you" address by myself to the sponsors, the Park's General Manager Mr **Tim Belgrove**, opened a superb buffet, donated by site owners Leisure Great Britain PLC, for all in attendance.

Now fed and watered and filming completed, the station building was again mobbed by the public. It became so difficult to transmit by voice because of the background noise and chatter, that operators had no alternative but to switch to Morse. (Who says it's dead? And I'm a G7I!)

By 1450, the station was heaving with reporters, cameramen and enthusiasts, all waiting in anticipation for the final transmission from the Royal Yacht to GB100 IOW. (See **Fig.3**). Three attempts failed to lay extension speakers to the outside of the building so that everyone could hear. The crowds were so dense that the cabling became fouled.

At 1500, Mr **Jim Barlow G3VOU**, Chief Radio Operator from the *QE2* and with the co-ordination by Communications officer: Warrant Officer **Mark Sabin RN**, made contact with **HMY Britannia** using her own callsign GQXC on 3.56Mhz. A greetings message from the Queen's Naval Commodore stated that after 43 years of service, *Britannia* was shortly to be decommissioned and that this was to be her final transmission. This was without doubt the climax of the day. Everyone was swept up in an atmosphere of nostalgia and pride.

At 1505, Mr **John Francis G3LWI MBE**, Senior Morse examiner for the Isle of Wight, repeated on

Main Photo:
Alum Bay, Isle of
Wight GB100.
"The World's
first permanent
wireless station"

Fig. 1: The
Needles
Headland
(courtesy of
RSGB)



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all amateur bands, the first transmissions of 1897 of George Kemp from the Royal Needles Hotel at Alum Bay, to Marconi aboard a tugboat located five kilometres away in the Solent.

Then the DX piled in. Rare stations from Afghanistan, The Ukraine, Yakutsk, Kamchatka and the Russian Polar Ice Cap all came up on c.w. The wall-mounted world map became covered in coloured stars.

Tribute To Operators

I must now pay tribute to all the operators who worked h.f. throughout that weekend. It needed (and we had) the best 'professional' amateurs able to cope under intense pressure, in a unique environment with unfamiliar state of the art equipment and with antennas crashing down about them. Swamped by an inquisitive public, who crushed in and bombarded them with questions under the ever-watchful eye of the media. No one was prepared for this invasion and as such, operations became shambolic.

We had the top five operators from the Dengie 100 ARS, who had travelled down at their own expense, combined with the best from the Island, Cunard, and the Royal Navy. I defy anyone to have done better in those circumstances. On one occasion, Jim Barlow was talking to some visitors and inquiring upon why he was playing with the 'flapping thing' (paddle). He replied that he was communicating in c.w. to a mobile unit in Hawaii! How he could hold a conversation in that noise, with three people and take and send Morse in his head at the same time truly staggered me.

As the day drew to a close and while contact with Concorde, Cunard, P&O and Royal Naval Warships was attempted with renewed vigour, I reflected on how we had come so far. Six weeks earlier, the South of England regional officer for the RadioCommunications Agency, Mr **Roger Schofield**, had sat at my kitchen table. His rule book open and his face aghast as I had outlined my plans.

"Forget it Ben, there's no way they'll let you do it." He then spent the next hour working out how it could be done! It was this attitude that pervaded the whole event. It was agreed that a modern day global link up would be either impossible on a practical basis, or so expensive in equipment, time and effort, that no one would consider it.

Personal Challenge

I then took the event on as a personal challenge, which triggered a telephone and FAX marathon, overtaking my family and life. Working days and often through the night, I sent over 250

Practical Wireless, November 1998



Fig. 2: The West Wight Radio Society clubhouse (photo courtesy of RSGB)

letters, 180 E-mails, some 2100 pages of FAX and made over 800 telephone calls.

The work resulted in the help of over 60 companies and many hundreds of their employees. All went out of their way to donate time and money, in true Marconi spirit, to participate in a unique special event which had begun as an attempt to replicate his first experiment and which snowballed to become a world-wide land, sea and air multi-band radio link-up.

At sea were the Royal Naval Aircraft Carriers **HMS Illustrious**, (Portsmouth) and the **HMS Invincible** (Mediterranean). The Warships **HMS Nottingham** (Far East), **HMS Brave** (Falklands), **HMS Newcastle** (Barbados), **HMS Monmouth** (South Africa), **RFA Fort Grange** (Adriatic), and vitally **HMV Britannia** (Portsmouth).

The Luxury Cruise liners from Cunard, RMS

Fig. 3: Getting Busy! Just what was Dennis Goodwin G4SOT (far right) so interested in?



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2 metre (Length 52")	£20 ⁹⁵
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6 metre (Length 126")	£44 ⁹⁵

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Dual-Bander SQBM200*	£49 ⁹⁵
(2 mts 4.5dB) (70cms 7.5dB) (Length 62")	
Dual-Bander BM100	£29 ⁹⁵
(2 mts 3dB) (70cms 6dB) (Length 39")	
Dual-Bander SQBM100*	£39 ⁹⁵
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*SQBM1000/200/100 are Stainless Steel, Chromed and Poly Coated. Full 2 year Warranty on these Antennas.

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4 metre 5 Element (Boom 128") (Gain 10dBd)	£54 ⁹⁵
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70 cms 13 Element (Boom 83") (Gain 1.5dBd)	£49 ⁹⁵

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2 metre 5 Element (Boom 54") (Gain 9.5dBd)	£31 ⁹⁵
2 metre 7 Element (Boom 60") (Gain 12dBd)	£39 ⁹⁵
2 metre 12 Element (Boom 126") (Gain 14dBd)	£65 ⁹⁵
70 cms 7 Element (Boom 28") (Gain 11.5dBd)	£24 ⁹⁵
70 cms 12 Element (Boom 48") (Gain 14dBd)	£39 ⁹⁵

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AMPRO 20 metre (Length 7' approx)	£15 ⁹⁵
AMPRO 17 metre (Length 7' approx)	£15 ⁹⁵
AMPRO 15 metre (Length 7' approx)	£15 ⁹⁵
AMPRO 12 metre (Length 7' approx)	£15 ⁹⁵
AMPRO 10 metre (Length 7' approx)	£15 ⁹⁵
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The P&O Cruise Liners **MV Oriana** (Lisbon enroute Bahamas), and the **MV Victoria** (Antigua, Caribbean).

Numerous land-based stations contacted, included the **RMS Queen Mary International Complex** (Longbeach); The **Marconi stations GB2GM** Poldhu, Cornwall. The **GEC Marconi GB2MWT** station at Chelmsford, Essex, and our experimental predecessors at the Marconi site at Lavernock Point **GB100LP**, South Wales.

Mr Schofield's diligence in going around, over, under and, if necessary, through the layers of bureaucracy and red tape was rewarded with the issue of all the required licence exemptions from the R.A.

A Success

As an attempt at a project, priced at some £200,000, requiring the liaison of many multinational companies and individual bodies, on a budget of just 80p, I consider that the event was a success!

Despite the early scepticism, cynicism, and some disbelief amongst the Amateur Radio fraternity and the total failure of information to reach amateurs in time for the event, even though the Press received the full details well in advance, the aim of the project was achieved. This was solely because of the unbelievable support from all the sponsors and everyone who said they would come and help actually turning up!

It was a shame that we missed a lot of the prime targets, but other stations globally recorded quite high tallies and our contact with HMS *Brave* down in the Falklands was a veritable achievement. Our score of 1571 QSOs was a station record.

Despite the damage early on, repairs were carried out in extreme weather conditions with the public both helping and hampering operations. As a Public Relations exercise, Amateur Radio and Marconi were featured in live and recorded interviews on 21 different radio stations including Radios Two, Four and Five. A full page in *The Southern Daily Press* Practical Wireless, November 1998



Fig. 4: HMS *Brave* - one of the many vessels contacted by the station on the day (Crown Copyright)

(11/12/97) and write-ups in *The Times* and *The Guardian*, pre-empted a full exposure on the BBC National news at 2230 (6/12/97) featuring Icom's **Dennis Goodwin G4SOT**. (Since this article was written Dennis G4SOT has of course left Icom to form his own company, **Universal Radio Communications**, in Partnership with **Andy Rudd G6RMI**. Editor). This broadcast was relayed globally and seen in Australia by **John Miller VK3DJM** (ex G3WIT).

The support of the Royal Navy and the enthusiasm of their Public Relations Officer Lt. Heather Tuppen RNR, underpinned the event. The £1000 worth of marvellous QSL cards and programmes printed free for us by West Island Printers. The local hotels, *The Lismore*, *The Highdown*, and *The Sandpipers* that gave £450 worth of free board & lodgings to our guests from Cunard and Essex.

There was also the back up support of Nevada Communications, who saved us at the last minute by stepping in to supply vital equipment at a moment's notice. The loan and professional rigging of £60,000 worth of masts by Clark Masts Texam and who, with Icom UK Ltd £25,000 worth of radios, combined to make an impressive sight. The visit by the Chairman and Directors of the board of LGB PLC who allowed the full use of The Needles Pleasure Park complex, which had been given over to us in its entirety for the day, and permitted free car and coach parking.

Even though not all aims were achieved, I feel we raised the level of public awareness in Amateur Radio and its general perception of the hobby. It was a marvellous forging of links between Amateur Radio and commercial business, and everybody enjoyed themselves.

PW

Television Nostalgia

**Larry Coalston
G7TDJ, takes a
walk down
memory lane
with his
account of
studio
operations and
maintenance in
the BBC.
Having just
retired from
the business,
he is more
than qualified
to uncover the
finer details of
BBC
Engineering.**



Photo of John Logie Baird and Ben Clapp at Baird's amateur radio station G2KZ which was used to transmit television across the Atlantic in February 1928. Reprinted from *Seeing by Wireless – The Story of Baird Television* by Ray Herbert.

It's over 60 years since the BBC began high definition television transmissions and my memories were jogged by the death, early this year, of T. H. Bridgewater OBE, a former assistant to John Logie Baird, aged 88. He joined the BBC in 1932 and during his distinguished career was in charge of Television Outside Broadcasts and later appointed Chief Engineer BBC Television.

I was privileged to work under 'Bridgey', as he was affectionately called. He was the doyen of British Television and a true pioneer and I am pleased to devote this story to his memory.

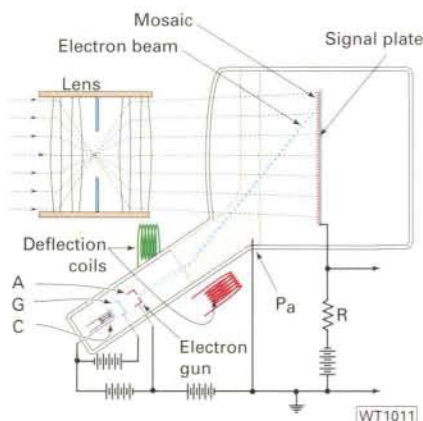


Fig. 1: Simplified 'Emitron' Pick-up camera tube.

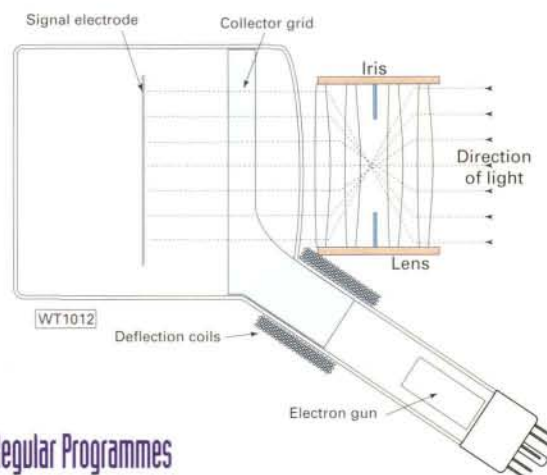


Fig. 2: Simplified diagram of 'Emitron'.

Regular Programmes

Regular television programmes began in November 1936 from Alexandra Palace in North London. For the first week, all programmes went out on the Baird 240 line mechanical system using an intermediate film scanner, any pictures and sound were delayed by four minutes.

The second week's transmissions were from electronic cameras in a second studio using the EMI 405 line interlaced system. This studio alternation continued until February 1937 when the Postmaster General announced that the EMI pictures had been judged superior and so the use of the Baird apparatus would be discontinued.

Because German aircraft could home in on the v.h.f. transmissions from Alexandra Palace, the television service shut down in 1939 for the duration of the Second World War. When the service re-opened in June 1946, I was ready to view on a home brew TV set put together from ex-RAF radar units.

The sensitivity of the Emitron pick up tubes (see **Fig. 1**) varied due to production methods and this often meant a difference of about two *F* stops in the iris setting of each camera lens. (**Fig. 2 & 3**). Any uneven lighting also gave rise to secondary emission.

Secondary emission appeared as a spurious brightness on the right and bottom of the picture - viewers often phoned to complain that the "footlights are too bright"! To cancel this 'fuzz', a saw-tooth and parabolic wave form known as 'Tilt and Bend' was added to the output. I once tried the 'Tilt and Bend' controls during the showing of an excerpt from a play called *Journeys End* and didn't find them very easy to operate.

In 1948 new Pye Photicon cameras were supplied to Television Outside Broadcasts and Lime Grove studios. I remember that the Photicons also required a high level of light for good pictures.

Image Orthicons

It was not until the mid 1950s that more sensitive tubes using a low velocity electron beam came into use. These were known as Image Orthicons. Two senior

Fig. 3: Diagram of an 'Emitron' television camera.

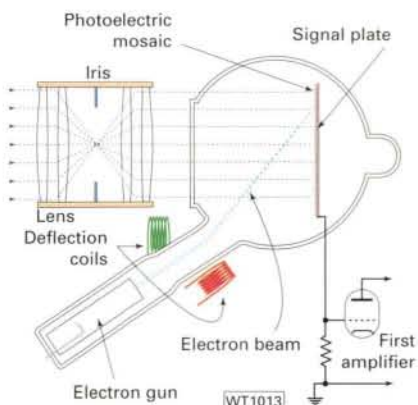


Fig. 4: Simplified diagram of Image Orthicon tube.

BBC engineers: **Don Brothers and Ben Palmer**, devised a detailed camera line up procedure. The cameras had to be modified for remote control of the lens iris. Parameters for 'lift and gain' (Lift = Black level [0.3v] = brightness. Gain = Contrast Peak white [1V]) were specified together with a sensitivity requiring the lens aperture to be within one *F* stop. (See **Fig. 4**).

All operational controls were grouped on a panel in front of high grade 14in Pye monitors. At that time I was a vision engineer at Bristol and returned several out of spec. tubes to the English Electric Valve Co. The Image Orthicons were on hire and charged for each hour of use. They cost £1000 to buy - a tidy sum in the 1950s.

In 1960, Studio Three Television Centre opened with new 4in image Orthicon cameras. After a number of co-ordinated studio tests using the new line up, it became known as "One Man Vision Control".

Eager for promotion, I applied for a job in London studios as Vision Operator. At Riverside studios in Hammersmith where I went to work, there was another innovation as well as "One Man Vision Control".

The intensity of each studio light could be adjusted from a central console. All Studio control areas eventually used this arrangement. In the late 60s, TV pictures could be compared favourably with black and white films and photographs.

When colour came about in 1970, I transferred to installation work on EMI 2001 Colour Cameras at Pebble Mill Birmingham. However, it was some time before a standard line up could be devised for the plumbicon photo conductive tubes used in these cameras.

There was a problem with the prism used for filtering the image into primary RGB colours. This problem was referred to BBC Research Department. The result was that many of the colour wedges had to be returned to EMI for modification.

Those were the days... brought back to the forefront of my memory by the recent death of Tony Bridgewater OBE.

PW

Seeing by
Wireless – The
Story of Baird
Television
by Ray Herbert.
Is available
from the PW
Book Store.
See page 74.



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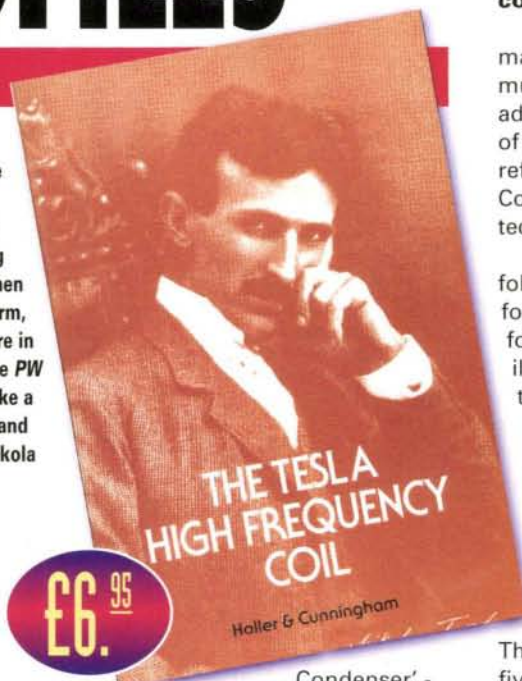
Book PROFILES

By now, you should be getting used to the longer, colder nights and are probably dreaming of the "good old days" when we had hot, or at least warm, summers! So, while you are in the mood for nostalgia, the PW team suggests that you take a step back in time with us and remember the works of Nikola Tesla.

The Tesla High Frequency Coil
George F Haller & Elmer Tiling Cunningham

This book covers the construction and uses of the Tesla Coil and aims to offer a "practical working manual on the construction of high frequency coils" for the more advanced, historically minded amateurs among you. Not one for the faint-hearted this book is, in actual fact, a reprint of a rare Tesla coil construction manual, which was first published way back in 1910.

The Tesla High Frequency Coil was rediscovered by **George F Haller** and **Elmer Tiling Cunningham** when they got their hands on the seven inch standard coil which is covered in the final chapter of the book. There are various illustrations including diagrams, circuits and photographs. Chapters include: 'Theory of the Coil'; 'Uses of the Coil'; 'The Transformer'; 'The



Condenser' - to name just a few.

An interesting read if you feel confident enough to tackle it. **Recommended to those of you who have a particular interest in historical features.**

Tesla Coil (Third Edition)
George Trinkaus

A small pamphlet of 24 pages, this book is a good basic



introduction to the subject of Nikola Tesla and building Tesla coils. It features instructions for building a good sized coil using a neon transformer and a spark gap to drive the primary. **But not for use on the air of course!**

As the size of the book may indicate, there is not much detail but it is an adequate source for those of you interested in a quick reference source on Tesla Coils and most aspects and techniques of coil building.

George Trinkaus' book follows a clear, concise format and hence, is easy to follow with plenty of illustrations from diagrams to black and white photographs.

Recommended.

Double Tesla-Oudin Coil
Various Authors

This book is a collection of five articles from *The Experimenter Magazine* and its derivatives of First World War vintage.

The first article is 'Seeing the Unseen' by **Joseph B Branch** (1925). It describes the building of a double coil high voltage generator which was a **cross between a Tesla coil and an Oudin coil.**

The second article is 'Wireless Transmission of Power Now Possible' by **Thomas W Benson** (1925) and is a well illustrated article about the developments at that time in wireless transmissions of power.

'Home-Made Geisler Tubes'



(1925) by **F Castro** is the third, 'Testing High Voltages With Spark Gaps' (1917) the fourth and 'US Blows Up Tesla Radio Tower.' (1917) is the last article. They are all fairly rare and make interesting reading. **Recommended.**

Tesla - The Lost Inventions **George Trinkaus**

This book follows George Trinkaus' usual style. It is only 33 pages long yet it is an adequate information source on Tesla's later inventions which were

£4.75
patented between 1890 and 1921. As he mentions in his preface to the book: "This work is, simply one

person's distillation of the existing Tesla literature". He states that he drew on Tesla's patents, published notes and lectures, his magazine articles and biographies. Some of the inventions discussed are the disk-turbine rotary engine, the Tesla-coil electric energy magnifier, high frequency lighting systems, the magnifying transmitter and the free-energy receiver.

As it is such a small booklet, be warned that it might not answer, in full, all

of your questions regarding these lost inventions, **but it's recommended nonetheless.**

Radio Tesla - The secret of Tesla's radio and wireless power. **George Trinkaus**

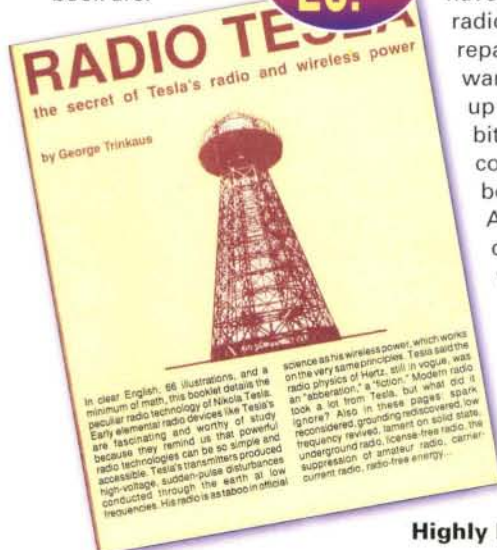
This book, again in a similar format to his other books mentioned on this page, is a short (37 page), soft cover format publication detailing the "peculiar radio

technology of Nikola Tesla" - in the words of the author himself.

The author uncovers the secrets behind a topic that is taboo in official science. All aspects of Tesla's

work in the field of radio and wireless power are discussed in this booklet.

Some examples of what you will find beneath the covers of this book are:



'High Voltage, Sudden Pulse'; 'Low Frequency', 'Conduction Through The Ground', 'Resonance' and 'Aerial Capacity'. All chapters are, once again, well illustrated. **Good information source.**

How To Build Your Radio Receiver. **Edited by Kendall Banning & L M Cockaday**

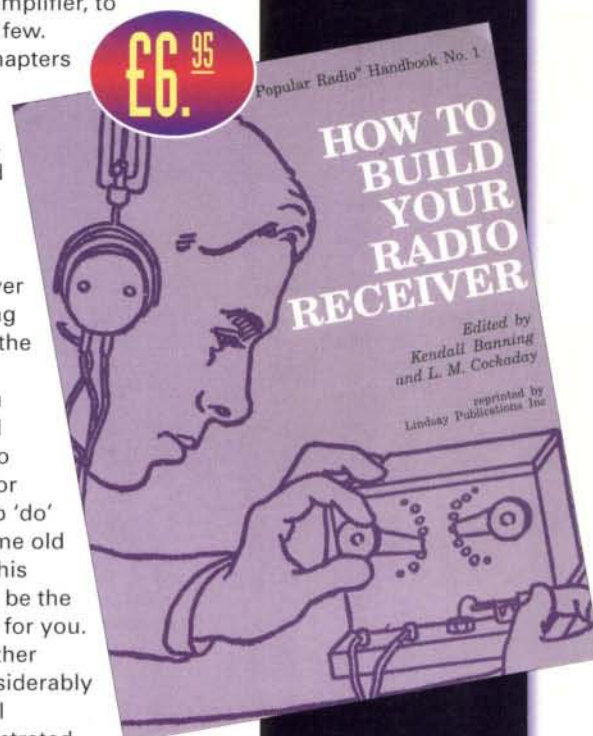
This particular book, was initially a 'freebie' from *Popular Radio* (circa 1924!) and carries the sub title: *Popular Radio Handbook No. 1*. It contains some of the best construction articles from that magazine.

Eight various receivers are covered: a Haynes DX receiver; a crystal receiver; and a two-stage audio-frequency amplifier, to name but a few.

Other chapters cover: putting up an antenna, how to read radio diagrams and about 50W and over Broadcasting stations in the USA.

If you have old radios to repair, or want to 'do' up some old bits, this could be the book for you. Another considerably well illustrated book, it uses circuits, diagrams, drawings and photograph to enrich the wealth of knowledge that it contains.

Highly Recommended.



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Yaesu FT-290R 2m All Mode Portable£199
Yaesu FT-3000M 2m FM Mobile 70W£275
Yaesu FT-726R 2m, 70cm All Mode Base Mains£499

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Alinco DJ-480 70cm FM H/Held£109
Alinco DJ-560 x2 2m/70cm FM H/Held£169
Alinco DJ-580 2m/70cm FM H/Held£175
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Icom IC-24ET 2m/70cm FM H/Held£179
Icom IC-P4E 70cm FM H/Held£169
Icom IC-W2E 2m/70cm FM H/Held (with sp. mic)£199
Kenwood TH-48E 70cm FM H/Held£225
Standard C-508 2m/70cm FM Micro H/Held£179
Standard C-528 2m/70cm FM H/Held with Rapid Desk Charger£225
Standard C-558 2m/70cm FM Handheld£299
Yaesu FT-811 70cm FM H/Held with DC adapter£189

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Grundig YB-206 Portable Receiver with FM£69
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Lowe HF-150 x3 30kHz-30MHz All Mode Rx 12V£250
Lowe HF-225 30kHz-30MHz All Mode Rx 12V£299
Lowe HF-250 x2 30kHz-30MHz Rx 12V PC Compatible£399
Realistic DX-394 150kHz-30MHz AM,CW,SSB 160Ch. Mains/12V£115
Roberts R-876 Portable Receiver with FM stereo£99
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Sony ICF-SW100E Pocket Receiver with FM stereo and SSB£135
Sony ICF-SW7600G Portable Receiver with FM stereo and SSB£135

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Fairmate HP-2000 0.5-1300MHz AM,FM,WFM 1000Ch.£145
Icom IC-R1 0.1-1300MHz AM,FM,WFM£199
Icom IC-R1 0.1-1300MHz AM,FM,WFM 100Ch.£205
Realistic Pro-30 68-512MHz (with gaps) AM,FM 16Ch.£59
Realistic Pro-43 68-999MHz (with gaps) AM,FM 200Ch.£129
Realistic Pro-62 68-960MHz (with gaps) AM,FM 200Ch. Hyperscan£139
Sony Air-7 FM, MW, LW, SW with 108-137,144-174MHz£95
Yupiter MVT-5000 25-550,800-1300MHz AM,FM 100Ch.£119
Yupiter VT-125 II 108-142MHz Airband 20Ch.£135
Yupiter VT-225 x2 108-142,150-160,220-391MHz AM,FM 100Ch.£169

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Icom IC706 mk1 with PSU£649
Kenwood TS50S boxed as new£549
Kenwood TS680S HF+6m£549
Yaesu FT920AF Demo£1225
Yaesu FT990DC auto ATU£999

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Kenwood TM255E 2m multimode£499
Kenwood TM455E 70cm multimode£499
Alinco DR605 2m/70cm mobile£299
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Yaesu FT50R mil spec 2m/70cm£219

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JRC NRD535 as new£749
Sony ICF SW7600 boxed£99
AKD HF3£99
Lowe HF150 with keypad£275
Lowe HF225E with PSU£299
Sony ICF SW55£169
Trio R600 base receiver£199
Yaesu FRG100 mint£349
Yaesu FT7000 mint£149

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AOR 3000A 0-2036mhz£575
Yupiter MVT9000 top handheld£249
AOR 8000 0-1900mhz charger etc£229
Icom PCR1000 demo£199
Icom IC7000HF 0-2000mhz£699
Alinco DX10 drop in charger£199
Yupiter MVT7100 0-1650mhz£179
Realistic Pro 2006 base/mobile mint£179
Realistic Pro62 inc nicads 66-956mhz£109

STATION ACCESSORIES

Opto Electronics scout boxed mint£239
Diawa PS304 30amp PSU£89
Mirage B-34-G amp£89
Garmin GP12XL handheld GPS£149
Garmin GP45XL handheld GPS£169
Garmin GPS2 handheld GPS£169
MFJ 949E 300watt ATU, dummy load£99
MFJ 259 antenna analyzer£169
MFJ 962D 1.5KW antenna Tuner£209
Momentum 1100 multimode decoder£249
Datong Tutor D70£39
Watson multimode decoder£49

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TEN TEC CORSAIR II£450.00
ATLAS 350XL HF 100W TX£245.00
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ICOM IC765 HF 100W TX£995.00
KENWOOD TS-49S HF 100W TX£599.00
KENWOOD TS-820S HF 100W TX£299.00
KENWOOD TS-450 SAT HF 100W TX£1199.00
KENWOOD TS-930S HF 100W TX£699.00
KENWOOD TS-680S 100W HF + 10W 6M£599.00
TRIO TS120S 100W HF TX£275.00
YAESU FT-107M HF 100W TX£399.00
YAESU FT-707...CW MATCHING PSU 100W HF£425.00
YAESU FT-77 + PSU HF 100W TX£499.00
YAESU FT-767GX HF + 6M BASE£699.00

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ALINCO DR606T AM 10W MOBILE£145.00
ALINCO DR606TH AM 20W MOBILE£199.00
DENPA M-22 2MTR MOBILE TX£129.00
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ICOM IC-2350H DUAL BAND MOBILE£339.00
ICOM M56 MARINE MOBILE£225.00
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KENWOOD TM-201 2MTR MOBILE£189.00
KENWOOD TM-451E 70CMS MOBILE TX£265.00
SHAKESPEAR SE250S 2W MARINE TX£249.00
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STANDARD C-5200 DUAL BAND MOBILE£299.00
STANDARD C-8900 2M MOBILE£185.00
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YAESU FT-290 MK II 2MTR M/MODE + AMP£399.00
YAESU FT-726R HF2CM/70CMS BASE TX£699.00
YAESU FT-5100 DUAL BAND MOBILE£299.00

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AOR AR-3000A HF RECEIVER£599.00
AOR AR-7030 BASE SCANNING RECEIVER£499.00
AOR AR-8000 HANDHELD SCANNER£225.00
DRAKE R-8A HF RX + VHF£899.00
DRAKE R-8E HF RECEIVER£599.00
ICOM R-72 HF RX + ACC£599.00
IRC 525 QUALITY RECEIVER£675.00
KENWOOD R2000 + VHF CONVERTER£359.00
LOWE 225 FM/AM + NICAD PACK£399.00
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YAESU FRG 7000 HF RECEIVER£149.00

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ALINCO DI-F1 2m H/H + AIRBAND£149.00
ICOM IC-4E 70CMS EX DEMO£155.00
KENWOOD TH-21E 2MTR H/Held TX£99.00
KENWOOD TH-36 2MTR H/Held TX£95.00
KENWOOD TH-24E 2MTR H/H TX-70CM RX£169.00
KENWOOD TH-45E 70CMS H/Held TX£145.00
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YAESU FT-208R + BASE UNIT/ACCS£179.00
YAESU FT-530 2M/70CMS H/H TX£199.00
YAESU FT-911 70CMS HANDIE£299.00

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ICOM PS-55 20 AMP PSU - BOXED£159.00
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KENWOOD DFC-230 FREQ CONTROLLER£65.00
KENWOOD TL-120 100W HF AMP£185.00
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ICOM 751A Fully Filtered£575
ICOM IC 706 Mk1£599
ICOM IC 737£600
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KENWOOD PS 430 20A Power Supply£100
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KENWOOD TM 241E 2Metre 50W£160
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KENWOOD TS 850 SAT (X2)£850
KENWOOD TS 790E Dual Band Base£995
KENWOOD TS 950 SD£1,395
KENWOOD TS 870 DSP mint condition£1,400
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YAESU FC 700 Tuner£95
YAESU FC757 Auto Tuner£175
YAESU FT 5100 Dual Band£250
YAESU FT 290 Mk Multi-Mode£275
YAESU FT 8500 Dual Band£325
YAESU FL 2100Z Linear Amp£395
YAESU FT757 Gx II (Mint Condition)£495
YAESU FT 890 HF Gen "as new"£600
YAESU FT 890AT HF Gen£650
YAESU FT 890AT HF Gen£675
YAESU FT 726R 2-70-6 & HF£700
YAESU FT 990AC with 2K Filter£900
YAESU FT736R 2/70-6M Late Model£975

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Yaesu FT-980	£799
Yaesu FT-101ZD MkIII + FC-902/FCV-901R incl 2m/6m	£799
Yaesu FT-102	£375
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Kenwood TS-520	£200
Kenwood TS-930 vgc	£750
Kenwood TS-120S	£TEL
FL-21002 HF linear	£495
Kenwood TS-830M	£TEL
Kenwood TS-440SAT boxed	£625
Yaesu FT-9020M + SP-901 & FC-902	£599

MOBILE/BASE VHF/UHF TRANSCEIVERS

Kenwood TS-711E + SP430 boxed	£TEL
Alinco DR-112 + book/microphone	£115
Navico AMR-1000 2m mobile	£160
Yaesu FT-480R boxed	£250
Icom IC-229 - boxed	£199
Icom IC-290D	£300
Yaesu FT-230	£175
Yaesu FT-290RII boxed	£325
Yaesu FL-2025	£99
Kenwood TR-9130	£275
Trio TS-770E	£TEL
TR-9000 & mic/book/lead	£275
TM-401A boxed (10 watt output)	£175
IC-821H immaculate condition	£TEL
AKD-6001 boxed	£100
Yaesu FT-700R boxed	£225
Trio TR-2400	£90
Trio TR-7500 boxed	£TEL

RECEIVERS/SCANNERS

Yaesu FRG-8800 + FRT-7700	£499
Drake R-8E - vgc	£650
Icom IC-R71E boxed	£599
Regency MX-7000	£TEL
Lowe HF-225	£299
Yaesu FRG-7700M + ATU	£325
Realistic DX-394	£TEL
Icom IC-R7100 + book	£TEL
Trio R-600	£TEL
Roberts R-876	£85
AOR AR8000	£210
Icom IC-R7100 + book	£800
Realistic PRO-59	£75
Standard AX-700 book & box	£299
AOR AR1000 hand-held	£125
Yupiter MVT-7100 boxed	£150
Roberts R-861 + book & box	£125
Realistic PRO-2005 boxed	£150

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Icom IC-4E	£115
Kenwood TH-27 - boxed	£125
IC-W2E + extras	£150
IC-X21ET & CTCSS fitted	£225

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MFJ-784 boxed	£175
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CAP Co SPC-300 ATU boxed	£150
Yaesu SP-901 speaker	£30

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Trio TS130V HF & WARC 10W QRP + VFO120	£295
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Yaesu FT77 Basic HF with FM Board	£325
Yaesu FT77 Basic HF	£275

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Icom IC281H 2M Wide RX FM 50W Mobile	£275
Icom IC229E 2M 25W FM Mobile	£159
Icom ICW32E Deluxe Dual Band H/Held Mint!	£250
Icom IC02E 2M Handheld with Keypad	£95
Kenwood TM751E 2M Multimode Mobile 25W	£345
Trio TR9130 2M Mobile Multimode 25W	£295
Trio TR2500 2M FM Handheld	£75
Yaesu FT480R 2M Multimode Base 10W	£225
Yaesu FT290RII - 2M M/Mode Bracket & Amp	£300
Yaesu FT208 + FT708 H/Helds + NC8 Charger	£135
Yaesu FT73R Rugged 70cm H/Held	£95

RECEIVERS

B40 Marine HF Receiver VGC	£85
Drake SW8 HF Gen Cov Rx with VHF Air	£399
FDK-TM56B VHF FM Crystallised Receiver	£35
Heathkit SB301 Ham Band RX	£75
Lowe HF150 Complete Station c/w SP150 PR150 Rack and Keypad	£550
Lowe HF150 Compact Gen Cov Rx with Keypad	£295
Lowe HF150 Compact Gen Cov Rx with Keypad	£325
Lowe HF250 Deluxe Gen Cov RX with Options	£450
MFJ8100 Regenerative Receiver (New)	£65
Racal 1218 Military Spec HF Receiver	£275
Realistic DX394 HF Gen Cov RX with features	£99
Trio R2000 HF Gen Cov RX with VHF	£325
Trio R1000 Basic Spec M/Mode HF Gen Cov RX	£195
Yaesu FRG9600 VHF/UHF Receiver	£235
Yaesu FRG8800 Gen Cov RX with VHF	£275
Yaesu FRG7700 Gen Cov RX with Mem Unit	£275
Yaesu FRG7700 Gen Cov RX with Mem Unit	£225
Yaesu FRG7700 Gen Cov RX	£195
Yaesu FR101 Basic HF RX (Specific Bands)	£100
Yaesu FRG100 c/w Narrow CW, FM & PSU	£450

SCANNERS

Fairmate HP100E 1000Ch H/Held Scanner	£115
Lowe PS10 10Ch Marine Scanner	£75
Realistic Pro60 200CH VHF/UHF/AIR Scanner	£125
Realistic Pro50 20Ch FM H/Held Scanner	£55
Realistic Pro38 10Ch FM H/Held Scanner	£45
Realistic Pro37 200CH VHF/UHF/AIR Scanner	£75
Realistic Pro28 30Ch FM H/Held Scanner	£85
Trident TR2400 Wide Band Scanner	£175
Yupiter MVT125H Civil Airband Scanner	£99

MISCELLANEOUS

AEA PK232MBX M/Mode Data Terminal	£149
Diamond SX-400 VHF/UHF 200W SWR Meter	£59
Diawa CNA1001 - Auto ATU	£145
Diawa AF606K Active Audio Filter	£75
Kent CW Key	£25
Microset R432-90 - 90W 70cm Amplifier	£349
Microwave Modules 100W 2M Amplifier	£95
Microwave Modules 30W 70cm Amplifier	£95
Scopes 456 6MHz Scope - As New	£65
Shure 444 Base Microphone	£35
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Yaesu FRV8800 Internal VHF for FRG-8800	£99
Yaesu FRV7700 HF RX ATU	£39
Yaesu FRV7700 HF->VHF Transverter	£39
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Icom IC-761 100W mains powered.	
General Coverage transceiver/internal auto ATU all modes	£799
JRC JST-135 100W HF General Coverage transceiver all modes, Bandwidth Control Unit complete with matching power supply. Excellent condition	£799
Alinco DX-70TH, 100W HF & 6m all mode mobile transceiver. This unit is a demo model and complete as new!	£525

VHF/UHF TRANSCEIVERS

Yaesu FT-736R, 2m/70cm/6m all mode base station complete with built-in power supply. Excellent condition	£725
Kenwood TM-251E 45W 2m FM mobile transceiver, complete. As new	£190
Trio TM-411E 25W 70cm FM mobile transceiver, complete with box, manual and bracket	£125
Yaesu FT-4700 2m/70cm dual-band mobile. (Case marked and no user manual)	£179
Kenwood TM-701E 2m/70cm dual-band FM mobile	£179
Alinco DJ-180E 2m FM hand-held complete (as new)	£129
Alinco DJ-190E 2m FM hand-held complete (as new)	£149
Kenwood TM-431E 70cm FM mobile transceiver (mint condition)	£179

RECEIVERS & ACCESSORIES

AOR AR3000 500kHz-2300MHz wide-band all mode scanning receiver	£350
AOR AR7030 30kHz-30MHz all mode receiver. This unit is complete and as new	£425
Yaesu FRG-100 30kHz-30MHz receiver	£275
Trio R-600 100kHz-30MHz USB/LSB/AM receiver	£125
Nevada MS-1000 500kHz-1300MHz AM/FM-WFM receiver	£99
Datong FL-3 audio filter	£70
200W dummy load	£20
AKD HF-3 short wave receiver (Brand new)	£90
AOR AR8000 100kHz-1800MHz all mode hand-held scanner. Complete with case, nicads, charger, manual and box	£150
Yupiter MVT-7100 100kHz-1650MHz. All mode hand-held scanner, complete with nicads, charger, aerial, box and manual	£145
Alinco DJ-580E 2m/70cm dual-band hand-held complete with battery pack, charger and antenna	£179
BNOS 20 amp power supply	£79

MULTICOMM 2000 01480 406770

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ICOM IC-706 BOXED AS NEW	£590
ICOM IC-706 BOXED AS NEW	£585
ICOM IC-706 MK-1 BOXED AS NEW	£580
ICOM IC-725 AS NEW	£479
ICOM IC-726 HF+6 AS NEW	£590
ICOM IC-729 HF+6 AS NEW, BOXED	£625
ICOM IC-735 BOXED AS NEW	£499
ICOM IC-736 AS NEW	£910
ICOM IC-737A BOXED	£699
ICOM IC-740 AS NEW	£380
ICOM IC-746 (UNWANTED GIFT)	£1300
ICOM IC-756 EX-DEMO	£1299
KENWOOD TS-180 WITH MC80 MIC	£340
KENWOOD TS-430 GREAT VALUE	£385
KENWOOD TS-440SAT WITH ALL FILTERS	£559
KENWOOD TS-440SAT WITH FILTERS	£560
KENWOOD TS-530S IN A1 CONDITION	£299
KENWOOD TS-680S HF + 6 METERS	£525
KENWOOD TS-680S HF + 6 METERS	£659
KENWOOD TS-850SAT AS NEW, BOXED	£859
KENWOOD TS-850SAT AS NEW, BOXED	£869
KENWOOD TS-850SAT AVERAGE CONDITION	£799
KENWOOD TS-850SAT BOXED	£799
KENWOOD TS-940S AS NEW GREAT VALUE	£799
KENWOOD TS-940SAT IMMACULATE	£825
KENWOOD TS-940SAT AS NEW GREAT VALUE	£899
KENWOOD TS-950 SD WITH ALL FILTERS	£1599
TENTEC CORSAIR MK-II GREAT CONDITION	£499
TENTEC CORSAIR MK-II IN GREAT CONDITION	£499
TENTEC PARAGON ALL FILTERS GEN COV RX	£699
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It came as quite a surprise when I discovered it is nearly two years since I had the Kenwood TS-570D on loan from Kenwood. In fact it was just after the October 1996 Leicester Show that I had the chance to evaluate what I immediately referred to as the 'friendly' rig.

I had the rare privilege (for the Editor of an independent Amateur Radio magazine) of being the first journalist to get his 'hands on' the new transceiver. And, as often happens with new equipment...at first I didn't have access to the manual and instructions!

Writing the original review I said that in addition to being 'friendly' I thought the TS-570 was also a very 'visible' transceiver - in all senses of the word. The large, very clear display was uncluttered and easy to read in all lighting and operating conditions. Altogether it was a very nice rig indeed. It was also very easy to get on the air without the manual - surely a good indication of just how 'friendly' it is?

Now that Kenwood are producing a new version of the TS-570D I thought it best to provide an 'up-date'. Especially as quite a few friends bought the transceiver following my review - and one person in particular comes to mind...**Brian Tansey EI5HV** from Middleton in County Cork. When not busy working in the local distillery (A very rare job that Brian!) - he was often to be heard telling me and others he bought the TS-570 on my recommendation. So, I feel duty bound to provide the 'up date'!

What's On Offer?

So, what's on offer with the new version of the transceiver? Well for a start, the designation for the new model is the TS-570DG and Kenwood inform me that there's quite a list of additions and improvements.

One of the main new features is a new Central Processor Unit (CPU) i.c. and a new Digital Signal Processing (DSP) software EPROM. Together, Kenwood say that these provide nine new or revised function and all future shipments will be of



the new DG model.

New features also include a transmit sound quality monitor. The nine step monitor provides comprehensive control over voice quality.

There's also an operator adjustable Noise Reduction System - the NR1 - available on s.s.b. The new NR1 system can be controlled in nine step increments and input signal strength can also be tracked automatically.

The original model had nine DSP c.w. filters - this has now been increased to a total of 11 - with 80, 150 and 50Hz.

Settings of the NR1 and NR2 'track' with mode changes. The noise reduction settings can be re-configured automatically when changing mode groups (for example...s.s.b./a.m./f.m. to c.w./f.s.k.). There's also an equaliser function on transmit and receive - so the operator can equalise the receive signal and use different settings for both transmit and receive.

Another - (extremely useful in my opinion) facility is the 'one touch DSP filter wide mode' control. This literally allows the operator to 'resurface' from the filtering and check surrounding band conditions around the frequency of operation while the receiver is working in narrow mode. And once you've had a quick look around - you can 'submerge' into the DSP again. All done by a single touch of a button.

Nice one Kenwood!

Another change is the

modifications to the built-in electronic keyer. The operator now has manual control over setting the 'weighting' setting (the relative length of the dots and dashes) which can now be set in 16 steps ranging from 1:2.5 and 1:4.0 by turning off the 'automatic weighting' function.

On The Air

In my original tests I'd been most impressed with the Kenwood TS-570D and I was keen to try the new version on the air. I wasn't disappointed!

As I'm an active QRP c.w. operator I found the additional DSP narrow filters to be extremely helpful on c.w. Additionally - although no modification is mentioned by Kenwood - I noticed that 'close in' strong c.w. transmissions did not cause the automatic gain control (a.g.c.) 'pumping' which seems to occur with some DSP equipped transceivers.

As I've already briefly mentioned - I found the 'One Touch' filter wide mode control to be a delight to use. It's such a clever little idea - and very useful when operating on a cluttered frequency or to see if that incredibly powerful S-9 c.w. signal has gone elsewhere - confirming that the station you're working will be finding it easier to copy.

On s.s.b. I found that the receiver seemed to be just as sensitive - but quieter when operating in DSP mode.

Whether or not this effect has come about because of the change to the DSP software - I don't know but it does seem to have made some difference.

However, I should point out that even though I heard reports - **after I'd written the first review in the January 1997 PW** - that some operators had noticed a faint audible 'warbling' coming from the speaker (due to some problem in the DSP stages) I can honestly state I did not hear them myself.

Tex Swann G1TEX, our Technical Projects Sub-Editor, noticed the warbling and one or two readers and owners of TS-570D transceivers wrote to me. However, the vast majority of operators did not notice the problem - which certainly seems to have been overcome on the new version. I know - I checked by having six pairs of different ears listen to the receiver in action!

Much of my operating during the 'second look' was on 7MHz, with some action taking place on 14 and 18MHz. On '40' the performance on 'close in' s.s.b. reception was exceptional and was - in my opinion - absolutely superb on c.w. Kenwood improved this aspect so much I thought for a moment I was using a TS-870! The new 'beat cancel' function also worked well - it cancels intermittent beat QRM extremely effectively, ideal for s.s.b. use of course, and the c.w. 'auto tune' mode links only with the RIT facility without changing the transmit frequency. Very

convenient for working traffic that's slightly off frequency - a common occurrence!

One challenge for any receiver is to listen to the international beacon frequency on 14.100MHz. Here, packet radio transmissions are often very close (and sometimes right on) to the beacon frequency. However, the new DSP software filtering really helps and despite

the often very strong packet transmissions I could listen to the beacons. Try it for yourself - and you'll find that listening to the beacons on 14.100MHz can be very difficult sometimes!

A Better Buy?

So, is the new version TS-570DG a better buy? In reply, I've got to say very firmly - YES! It's a superb value-for-money transceiver. Especially when you consider it first cost around the £1500 mark and now only costs around £995 - complete with new software and additions. Real value for money I think!



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THIS MONTH DAVID BUTLER
G4ASR TAKES A LOOK AT DX
WORKED RECENTLY ON THE
144MHZ BAND.

Although v.h.f. propagation was very good during July, it appears that events during August were even better. On the 144MHz band, for example, the 3000km tropospheric path from the UK to the Canary Islands (EA8) was open on a number of days, with contacts being made from as far north as Scotland. Also on the 144MHz band there were Sporadic-E (Sp-E) openings to eastern Europe and the Mediterranean area whilst the Perseids meteor shower produced predictably good results with contacts being made with stations up to 2000 kilometres away.

In the dying days of August an excellent aurora occurred allowing contacts to be made on the 144MHz band into northern Europe and the Baltic Republics. There's also been more activity from Slovenia (S5) on the 70MHz band with the stations of S51DI, S51UF, S51UUD, S53X, S57A and S58Q all being worked during August. Conditions on the 50MHz band were also very good and I've got reports of all continents (except Australasia) being worked in a single day! Some of the stations reported included CX6AW, KP3A, KP4EIT, LU3EMK, N5JHV, OD5RAK, PY5CC, TZ6VV, Z22JE, 1AOKM, 3C5I, 4X1IF and 7Q7RM. DX conditions on the v.h.f. bands are definitely improving.

Turning first to your reports of contacts made between the UK and the Canary Islands on

the 144MHz band. As explained last time, this 3000km path normally opens up once or twice every summer. This year however has been particularly good with openings in both July and August.

Although openings to the north coast of Spain are relatively frequent (being only 1000km from central England) this sea path was open on a total of nine days between August 5-10 and August 15-17. On four days during the period (August 7, 8, 9 and 15) the marine ducting extended even further to the south-west to encompass the Canary Islands. A number of EA8 stations were logged in the UK, all of them being v.h.f. class licensees. These included the stations of EB8ALZ, EB8BEB, EB8BTR, EB8BTV, EB8BTZ and EB8BYR.

Jeremy Kewn G7TBJ (IO70) located near Penzance, Cornwall has written in for the first time. Welcome to the column Jeremy! He mentions that he uses a Kenwood TR751E transceiver modified to run 3W into a Jaybeam 8-element Yagi. Under normal conditions Jeremy has difficulty working anything outside of the county, but during the period August 6-10 some very good s.s.b. contacts were made on the 144MHz band. His QRP contacts included EA1CBY and EA1CNO (both in IN52), EA1DKV (IN53), EA1DDU, EA1EBJ, EA1KE, EA1YO and EB1EHO (all situated in IN73), EA2LY (IN93) and maritime mobile station EA2AWD/MM (IN75 and IN84). His best contact though was over a 2600km path to EB8BTV (IL18).

Jeremy contacted this station on two occasions, at 1053UTC on August 7 and at 1125UTC on August 9. Although signals were quite weak, Jeremy receiving 51 and 52 reports, it just shows what can be worked with low power when the band is open.

Stations located in the southern part of the Irish Republic (EI) are always in a good position to benefit from this type of sea duct. John Desmond EI7GL (IO51) reports that the stations of EA8AK, EA8BPV, EB8CME and EC8AUZ were all heard working through the Cork repeater on 145.750MHz. Several local stations could also hear the EA8 stations on the repeater input frequency. Note that very modest equipment was used, typically 10-20W into a vertical

antenna. Not bad for a 2700km path!

Many of the contacts between the UK and Canary Islands took place in the period August 7-8 with QSOs being made on and off throughout each day. On August 7, for example, the first reported contact took place at 0930UTC and the last at 1815UTC. Similarly the first record I have of a contact being made on August 8 was at 0635UTC by GW3ZTH/P (IO81) and the last around 1800UTC by GM4JJJ (IO86).

The opening in the UK was fairly widespread but generally favoured stations located to the west of the country. Your reports show that contacts were made from locator squares IO70, IO72, IO80, IO81, IO82, IO83 and IO93. The longest distance contact however was made by the station of David Anderson GM4JJJ located in Fife, Scotland. During the afternoon of August 8 he heard the EA1VHF beacon, 1464km away, peaking 519. Some hours later, at 1754UTC, he heard EB8BTV calling the station of GW0PLP (IO72) and making a short contact.

David waited for the QSO to be completed before calling the station on Tenerife. Reports of 51 were exchanged on s.s.b. over a path of some 3253km! Unfortunately this QSO was 11km short of the existing Region 1 tropo record made on September 9 1988 between GM0KAE (IO86) and EA8BML (IL27) at 3264km. Nevertheless it was an exceedingly long contact for the 144MHz band.

The long distance tropo contacts have provided further impetus for attempting the first transatlantic contact on the 144MHz band. John EI7GL thinks that if the Atlantic path is going to be broken then it will be via marine ducting and will occur when a large high pressure weather system is present over the North Atlantic Ocean. He doesn't think it will be accomplished via Sp-E, aurora or meteor scatter and mentions that when the station of G4CQM (IO70) claims to have heard the VE1SMU/H beacon on July 6 a suitable weather pattern existed at the time.

John thinks that possible tropo paths will be between EI/G/GM/GW to VE/VO or modest equipment was used, typically 10-20W into a vertical

puts forward an alternative view. He states (quite correctly) that G4CQM only possibly heard the Canadian beacon and that no positive identification had been made. Furthermore Sp-E contacts equal (if not further) in distance to these tropo contacts have also been made this year.

Stations in south-east England reported hearing and working Israeli stations (4X4) up to 3500km away in June and Geoff mentions that he made a 2850km contact into Crete (SV9) in the same period. Admittedly these Sp-E contacts were in the wrong direction but so are the tropo contacts to the south. The question is, which is more likely, a high pressure system developing over the North Atlantic (like the regular Azores high which creates the G-EA8 path) or a multi-hop transatlantic Sp-E event (quite frequent on 50MHz) reaching to the 144MHz band. Geoff reckons he'll plumb for the latter, even if it will be brief.

LAST OF SEASON?

No sooner had I written last time that the Sp-E event on July 15 was the last of the 1998 season then up pops another event on the 144MHz band exactly one month later. From reports received there were three separate events on August 15, the first mid-morning between 0935-1000UTC with the other openings later in the day between 1658-1700UTC and 1815-1819UTC.

The morning event produced S9 signals from stations located in Bulgaria, Greece, Romania and Yugoslavia but you had to be situated in southern England (IO90, IO91, IO92, JO01, JO02) to catch any of the action. Some of the stations known to have been worked from the UK included LZ1FG (KN12), LZ1KJ (KN31), SV0EC, YU1EV (KN04), YU1MI (KN03) and YU7DP (KN05).

Dave Dibley G4RGK (IO91) was listening on the s.s.b. calling frequency 144.300MHz at 0940UTC when LZ1AG (KN22) suddenly appeared putting in a very strong signal. Dave then went on to work YU7KB (JN94), YU7ON and YZ7NOU (JN95). Ten other YU station were heard on s.s.b. before the band faded out at 1000UTC. Located on the south coast near Bournemouth Jim Smith G0OFE (IO90) contacted YO7VS (KN14) and YU7EW (KN05) and heard an LZ station. The 144MHz band was open with him between 0940-0957UTC.

Pista YU7EW reports that at his QTH there were four discrete events during the Sp-E opening on August 15. Between 0845-0903UTC he worked seven stations in Norway (LA) and Sweden (SM). At 0934UTC

another opening to LA and SM occurred lasting for 4 minutes. At 0943UTC propagation had moved towards the UK with contacts being made with the stations of G0OFE and G7RAU (both in IO90) and with F1UVN/P (JO10). This event faded out at 0947UTC but re-appeared again at 0952UTC having swung round to the north again. Contacts were then made with four Danish stations before the Sp-E finally faded out at 0957UTC.

The afternoon events were rather brief and as a consequence I have received very few reports. All I can gather is that the band was open to Spain and Portugal and that the stations of EH7ALL (IM87) and CT1FOH (IN50) were worked by operators in both the north (IO93) and south (JO01) of England.

PERSEIDS METEOR SHOWER

The Perseids meteor shower is an annual event with maximum activity in the period August 12-13. Because of its predictability many v.h.f. DXers rate it as one of the better of the major showers that occur throughout the year. This year was no exception and many meteor scatter (m.s.) contacts were made primarily on the 144MHz band and to a lesser extent on the 50MHz and 430MHz bands. I missed this year's shower (being in the Algarve was a much better alternative!) so I'm relying on reports of the event from the DX Cluster and the packet radio network.

Ray James GM4CXM (IO75) mentions that he had little time to operate in this year's shower and that he concentrated on s.s.b. random for most of the time. He uses an 3CX800-A7 amplifier running 400W into two 16-element Yagis at 25m above ground. During the morning of August 12 he contacted the stations of DA0ND (JO34), F/G8MBI (NO4), F6DRO (JO3) and SP2OFW (JO93). Ray noted that unlike previous years the shower didn't produce any really long bursts. However he did manage to receive m.s. signals from ES2NA, EA7AJ, HA5KDQ, HG1VHF I2FAK, IZ5EME, OH1XT, OK2MWR and 9A2AE.

Three Hungarian stations, HG9MDP, HG9MET and HG9OZD, decided to pool their resources and operate from locator square KN08 during the Perseids shower. Taking it in one hour sessions, the group made a total of 21 contacts, HG9MDP working UK stations GM4AFF and MS0ACG/P and HG9MET contacting G1WPF, G3IMV and MS0ACG/P.

Also in Hungary, the station of HG1DLZ reported working 11 stations in the period August 12-13. His contacts included

G0CUZ (twice!), GM4AFF and GM4YXI. From Belarus the stations of EU6MS, EW6AL and EW6DI operated a mini-expedition during the peak of the Perseids shower. Using the call sign EW6AL (KO46) the group made 106 m.s. QSOs including the UK stations of G3IMV, G4AEP, G4FUF, G4YTL and GM4YXI.

Rytis LY2BIL passes on the excellent news that after five previous unsuccessful attempts the stations of LY2WR (KO24) and UA9FAD (LO88) finally made a complete QSO via m.s. on the 430MHz band. The test was carried out during the peak of the shower on August 12 and took 3.5 hours to complete. At the station of LY2WR a total of four reflections were received (7 seconds, 6 seconds and two at 0.5 seconds) with signal strength around S4-5. The distance of 1935km also broke the existing IARU Region 1 430MHz m.s. record (some 1869km set by the stations of PA3DZL and SM2CEW on August 12 1989) and may also be a new world record. Congratulations to both stations.

LEONIDS METEOR SHOWER

If you want to join in the m.s. action, you can't do better than try your hand during the forthcoming Leonids meteor shower. Past observations of the Leonids meteor shower have shown that approximately every 33 years the shower reaches storm proportions. The last peak was in 1966 and for the past few years each succeeding year has seen the zenith hourly rate (z.h.r.) of the shower steadily increasing. Although we are not due for the 33 year cyclic maximum until 1999, the shower, which will peak on Tuesday November 17, is likely to produce some excellent DX contacts on all the v.h.f. bands.

Last year many stations operating on the 144MHz band reported receiving bursts of signals of up to 3 minutes duration and this went on for a number of hours throughout the morning. At my QTH (IO81) in Herefordshire the activity on the meteor scatter s.s.b. calling frequency (144.200MHz) was really amazing and the best I've heard in any meteor shower for a long, long time.

Between 0657-1129UTC I made 27 contacts with stations located in DL, EA, F, HA, HB9, I, LA, OE, S5, YU and 9A. My best DX contacts were with YU7EW (1859km), I8MPO (1829km) and I8TWK (1827km). Many bursts were between 2 to 3 minutes long with signal strengths peaking S9 on numerous occasions. However, operating on 144.200MHz during a major shower is not for the faint hearted. It can be absolute

bedlam and unless you have some real muscle you're not going to work much around that frequency.

This point was picked up by Ray GM4CXM following last year's shower. He reckons it would help if stations spread themselves out more to reduce the interference level. On the 144MHz band there are actually THREE allocated centres of activity for m.s. work. The most popular is the 'traditional' s.s.b. sub-band 144.195-144.205MHz. It's very busy here but with 10kHz of bandwidth there's just enough room to get out of the way of the larger stations.

The other s.s.b. sub-band lies between 144.390-144.400MHz. This is a very much underused part of the band but in major showers, such as the Leonids, it may be worthwhile putting out some calls up there. By the way, this sub-band used to be centred on 144.400MHz but following the recent move of beacons to 144.400-144.490MHz, it was shifted 10kHz down with the centre of m.s. activity on 144.395MHz. The third allocated area for m.s. work lies between 144.100-144.126MHz and is intended for c.w. usage. The nominal calling frequency is 144.100MHz and operation can take place up to 26kHz higher than the reference frequency.

Although not a working frequency, you'll probably hear (and possibly work) DX stations on 144.300MHz during large bursts. If the Leonid shower lives up to expectations then it's quite possible to work stations anywhere in the band, so calling or listening between 144.200-144.300MHz might be rewarding.

I don't intend to give a full treatise on m.s. operation suffice to say that on c.w. you must use two and a half minute periods and on s.s.b. you use one minute periods. In the UK you transmit s.s.b. in the second period. That is minutes 01-02, 03-04, 05-06 past the hour. On c.w. that equates to minutes 2.5-5, 7.5-10, 12.5-15 and so on. You'll

find it very useful to write all these down to keep track of where you are and to also have a copy of the reporting system in front of you. However, I guarantee you'll get tongue-tied during your first m.s. QSO!

I mentioned earlier that the shower will peak on Tuesday November 17 but determining the best time is always more problematical. Will it be after midnight, during the day or later in the evening? If you look at all the predictions (mostly based on the visual peak) you will see many alternatives. I like to use the method based on the actual peak time of the previous years shower. As the earth intercepts the shower orbit every 365.25 days, you simply add six hours to the date and time of the previous year's radio peak. (For leap years you must subtract one day for all shower dates after February 29).

Last year in Europe, the maximum activity was noted to be between 0700-1100UTC. Adding six hours to these figures gives a theoretical maximum from 1300UTC to 1700UTC. However, there's a problem insofar that the shower radiant is actually below the horizon at these times! What this means in practice is that Europe may not experience the full fury of the shower this year. Nevertheless meteor rates will be very much enhanced especially during the time when the shower radiant is well above the horizon. For the UK this will be in the period 0100-1200UTC. Sorry but I can't be more accurate than that!

AURORAL OPENING

Now, turning to the auroral opening on August 27. This was not totally unexpected to Internet and Packet observers as warnings of a major coronal mass ejection had been posted a few days beforehand.

Reports from Scotland that the SK4MPI (JP70) beacon was being heard via aurora at 0800UTC on August 27 was also a very good sign! The main event in the UK took place between 1300-1800UTC with a

The station of LY3GM is active on meteor scatter mode.

BCC MS Contest 1997

LY3GM

LOC: KO14LL QTH: Graziskiai, LITHUANIA



Meteor-Scatter

To Radio	Date	UTC	Report	2-way	MHz
G4ASR	13.12.97	10.00	27	HSCW	144

Operators: LY2BIL, Rytis LY2SA, Vidas LY3BF, Arvydas
 QSO confirmed by Vidas QSL px via bureau
 73! Good reflection!

RadioScene

much smaller phase between 2015-2130UTC. Beam-heading from central England on the 144MHz band ranged between 40-70° (signifying a good aurora) with contacts being made with stations located in DL, HA, HB9, I, LY, OK, OZ, SM, SP and 9A.

Some of the c.w. DX worked by **David Johnson G4DHF** (IO92) included HA5AB (JN97), HA5KF/1 (JN87), HA8BI/7 (JN97), HA8CE (KN06), HA5MO/P (JN91), HA8MV/P (KN06), HG6Z (JN97), YU1EW (KN05), 9A1CAL (JN86), 9A2SB (JN95) and 9A3VD (JN75). David used 400W and eight 11-element Yagis to make these auroral contacts. On the east coast **John Regnault G4SWX** (JO02) reported the stations of 11JTQ (JN35), LY2MW (KO24), LY2SA (KO14), SP1NQN (JO84), SP8UFT (KO11) and 9A2AE (JN86). I only managed to catch

20 minutes of the event between 1640-1700UTC working 14 stations in GM, DL, HA and PA. Best DX was HA6VV/P (JN97) at 1690km.

DEADLINES

That's it again for another month. Sorry, no room this time for all your 50MHz reports. I'll try to squeeze them in next time. Please forward any news, views, comments and especially photographs to the address and by the date given at the top of the column. Alternatively a simple telephone call is all it takes.

THANKS FOR YOUR LETTERS AND GOOD LUCK WITH THE DX. SEE YOU AGAIN NEXT MONTH.

73 David G4ASR.

HF FAR & WIDE

LEIGHTON SMART GW0LBI
33 NANT GWYN
TRELEWIS
MID GLAMORGAN
CF46 6DB
WALES
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LEIGHTON'S COMPILATION OF YOUR HF ACTIVITIES REALLY DOES SHOW THINGS ARE HOTTING UP! BUT YOU CAN HELP EVEN MORE BY SENDING PHOTOGRAPHS OF YOURSELF ON AIR OR LISTENING TO BE FEATURED IN THE COLUMN

I'm writing this month's column during the latter part of the month of August and our reporters generally agree that propagation conditions have been pretty reliable over the past four weeks.

Indeed, all have commented on the marked improvement in both short-haul Sporadic 'E' and long-range 'F' layer propagation on the 24 and 28MHz band, not to mention the increased activity and good propagation conditions on the 21MHz band.

Those of us who were active on the bands during the last sunspot peak, will I imagine (like me) be rubbing their hands with glee at the prospect of the coming good DX on the higher bands - especially 28MHz.

For the relative newcomers to the hobby, in other words, those licensed over the past couple of years, the coming increase in sunspot numbers should provide something to look forward to on the higher bands!

The 28MHz band in particular is a band that's full of surprises. When conditions are favourable it's possible to work all parts of the globe regularly with very low powers and some of the simplest antennas imaginable.

I was licensed in 1989, just prior to the last peak and consequently, spent most of my early years as an amateur operating on 28MHz. All my antennas for this band have consisted of simple home brew dipoles, ground mounted and loft mounted verticals.

At one point, even the aluminium guttering of my house was 'loaded up' via the station a.t.u. to work DX very effectively on the band! Antennas for 28MHz can be easily constructed and used virtually anywhere, and it **really is amazing** just what you can get away with up on 'ten' metres!

The 28MHz allocation is also the widest of our high frequency bands, being 1.7MHz wide. So there's plenty of room compared to the crowded lower frequency bands.

Included within 28MHz is an array of different sub-allocations, such as the frequency modulation (f.m.) section and the 'all mode' slot

on 29MHz, the satellite downlinks, the beacon allocations, the repeater inputs and their related outputs (in the USA) et al.

'Ten' is also a very good 'local' chat band. Although it must be said that 28MHz is much more widely used in this respect in other countries than compared to the UK, which is a great pity. However, there's already a marked increase in band occupancy as conditions are improving, which is a good thing in itself I reckon!

NEWS SNIPPETS

Now it's over to the RSGB's *DX Newsheet* for some DX snippets. And to start, there's news that Steve NE4Z, is regularly active from Chile as CE3/NE4Z using s.s.b. between the hours of 2200 - 0000 on 21.340 and 28.340MHz, and also at 0345 on 14.188MHz. (QSLs should go to AJ4Y, at PO Box 1207, Highland City, FL38846 -1207, USA).

From the Solomon Islands, **Norried H44NC** is operational until the year 2001, while working on New Georgia Island. He operates on 3.5 - 28MHz (no WARC bands though) with 50W and a dipole antenna. (QSL to PO Box 168, New Georgia Island, Munda, Western Province, Solomon Islands).

On Fox Island (KL7), **Tim NO7F**, will be active "for some time to come as my work allows" as KL7/NO7F. (QSLs to Tim Tilleman NO7F, PO Box 921194, Dutch Harbour, AK 99692, USA).

Peter V63PD, is now active from Micronesia (Chuuk Island) often at 1100 on 10MHz c.w. (QSL via VK4AAR).

Meanwhile, from the Marshall Islands, **Dave V73UX** says that the following stations are now active: Tim V73AT on 28MHz, and JA3FGA operating as V73ZO on Bikini Islands on 21MHz s.s.b.

YOUR REPORTS

On to your reports now, starting with the 7 and 10MHz bands. It seems our reporters have, not surprisingly, spent most of their radio time on the higher frequency bands, and judging by conditions, who can blame them?

However all - our 'c.w.' man **Ted Trowell G2HKU** on the Isle of Sheppey in Kent (A 'vintage' shot of his station appears in **Fig. 1** this month) offers a couple of contacts on the 7MHz band, in the form of EA8/CT3FN (Canary Islands) and 9M2TO (Western Malaysia) at around 2100 using around 70W and a HF6 vertical antenna. Operating on the 10MHz band, Ted reports working SO1DX/P (Wolvin Island) at 1500, and HF0POL

(Antarctica) at 2100UTC.

A single 7MHz report comes from **Sean Gilbert G4UCJ** of Milton Keynes in Buckinghamshire, who lists a two-way QRP contact with FP/W8MV (St. Pierre Island) at 0007.

Down in Wales **Carl Mason GW0VSW** from Skewen in West Glamorgan used a massive 4W to hook up with ZL4SEA (New Zealand) at 0520 (just **how does he do it?**) who himself was using a slightly less massive 3W, plus a contact with ZB4AZ (Gibraltar) at 0545UTC. Carl uses a vertical antenna for this band.

THE 14MHz BAND

Conditions on the 14MHz band have been relatively solid recently, apart from a few days where they dipped slightly. The band is remaining open later and later into the night and early morning these days, which is of course a good thing for those amateurs who are constantly burning the midnight oil!

I'll start the 14MHz report with the log from **John Constance G0VGD** who hails from the town of Aylesford in Kent. He says he's: "lapsed into radio silence" recently, due to a blown power amplifier stage, but is now glad to be back on the air. John uses a Kenwood/Trio TS-530S transceiver and a simple G5RV dipole on the band, and this month used the c.w. mode to hook up with LU4GO (Argentina) at 1135, VE2GNW (Canada) at 2000, KC8JIE (Michigan, USA) at 0015, and UR5SK (Ukraine Republic) at 1815, along with SV9/P/14UFH (Crete) at 1324UTC.

Next up is low power 'addict' **Eric Masters G0KRT** of Worcester Park in Surrey, who is as pleased as punch this month, after working Ron VK3OM in Australia, with just 5W of s.s.b. and his W3EDP wire antenna! This was a new country and a new continent for Eric, and he's rightly pleased with the achievement. Well done Eric, that's one to be proud of!

Eric also noted that VK3OM is active on a regular basis around 14110 to 14120 around 0600 to 0645UTC. Ron is regularly trying to work QRPers from the British countries, so it may be worthwhile you low power buffs having a listen out there! Eric's other contacts on the 14MHz band are listed as YT7A (Yugoslavia) at 2206, and W9KRH (USA) at 0645UTC.

Meanwhile, **Charlie Blake M0AII** of Milton Keynes, has been busy with his mobile station on 14MHz, using 100W and a Comet mobile antenna on the roof of the car, cranking up contacts with Chris V2/GM0UKZ (Antigua Island) at



Ted Trowell G2HKU's station as featured in a 'vintage' copy of Short Wave Magazine in 1947. He's still going strong...but what happened to the 'utility' chair?

2006, 5B4ACG (Cyprus) at 1944, and CT98EXPO (Exposition Centre, Lisbon, Portugal) at 1014UTC.

At home Charlie used a Yaesu FT-920 and a nest of dipoles to work TI7DBS (Costa Rica) at 0611, N4QO (USA) at 0702, OY/DL9YBY/P (Eysturoy Island) at 0939, and 3Z0I (Wolin Island) at 1012UTC.

THE 18 & 21MHz BANDS

Bev West GW0OSQ in Pontypool says he thinks that holidays get in the way of radio...but I wouldn't advise you telling the XYL that Bev! On the 18MHz band, Bev has notched up DX contacts using s.s.b. with SU1SK (Cairo, Egypt) at 1800, JA1JRK (Japan) at 1520, along with BV5BG (Taiwan) and HZ1AB (Saudi Arabia).

Next came WH0AV (Saipan Island) and SV8/ONSCT (Samos Island) at 1800, V73RF/MM (in the Red Sea), SV9/DL4HS (Crete), VP5/CX4CR (Turks & Caicos Islands), 5X1T (Uganda), and finally K1IED in the USA. And all this on a homebrew cubical-quad antenna and less than 10W of sideband! Not bad eh?

The 18MHz band provided **John Wheeler G0IUE** of Melksham in Wiltshire with some nice DX this month. Using just a rotary dipole and 100W of s.s.b. from a Yaesu FT-920 transceiver, John lists contacts with JA2ANA (Japan) at 0755, K6JOX (San Francisco, West Coast USA) at 2204,

ER1BF (Moldova) at 2043, J69B (St. Lucia Island) at 2120, VK2CLB (Australia) at 2206, VP5/CX4CR (Turks & Caicos Islands) at 2300, 8R1AK (Guyana) at 2100, and finally DU1DK (Philippines) at 1503, and D44BC (Cape Verde Islands) at 1800UTC.

Sean G4UCJ hooked up with KG4TO (Guantanamo Bay - on the island of Cuba) at 2000 and KP2/AG8L (US Virgin Islands) using just 5W of c.w., and with just 30W also worked 7Q7LA (Malawi) at 2022, YV1NX (Venezuela) at 2230UTC.

Ted G2HKU has been making his mark on 18MHz too, using c.w. at 70W at around 1500 to hook up with SV5/G4OBK (Rhodes Island), SV9G4ZFE (Crete), 1A0KM (Sovereign Military Order of Malta in Rome), CU2/DL1HRE (Azores Islands), plus UN7PCZ (Kazakhstan).

Switching to 21MHz, Ted's log shows contacts with HF0POL (Antarctica), BV4HB (Taiwan), 4Z5FW (Israel), OD5/9K2MU (Lebanon), and EP2MKO (Islamic Republic of Iran), all at around 1500UTC.

Carl GW0VSW had a good go at 21MHz too, and using 70W of c.w. and a vertical antenna on the band worked TU2XZ (Turkey) at 0900, EP2MKO (Iran) at 1140, KG4OX (Guantanamo Bay) at 1315, D2BB (Angola) at 1940, along with YN9/TI4SU (Nicaragua) at 2200. Carl also made contact with 7X4AN

(Algeria) although this time with a pretty effective 2W!

THE 24 & 28MHz BANDS

Sean G4UCJ warns us to watch out for pirates! He says "the 26MHz pirates are using the 24MHz band now. I've found a few Italian pirate stations openly chatting away right in the middle of the band!"

But despite the problems, Sean lists two contacts on 24MHz with OJ0AU (Market Reef) at 0840, and OD5/F5LMG (Lebanon) at 1522, while 28MHz provided a chat with JY9QJ (Jordan) at 1449UTC.

Incidentally, I've had a listen to the 24MHz band Sean, and during just one afternoon, I heard no less than 19 stations using non-amateur callsigns! Let's hope this doesn't become a habit, as 24MHz is only 100kHz wide, and there's not enough room for legitimate Amateur Radio operation, without having pirates to contend with!

Editorial note: European CB radio users - mostly Italian and French operators - are also very active on 28MHz using s.s.b., particularly on or around the International beacon frequency of 28.200MHz. **G3XFD.**

John G0VGD spent a bit of time on the 24 and 28MHz bands this month, and offers 24MHz s.s.b. contacts with 9A3LE (Croatia), and 3Z0AIR (Poland) at 1800, while 28MHz saw a contact with 4X6UO (Tel Aviv, Israel) at 1400UTC.

Yours truly GW0LBI spent quite some time this month both monitoring and transmitting on the 28MHz band, using a wire dipole and 20W s.s.b. I managed to work LU4EF (Argentina) at 1453, XE1JK (Mexico) at 1430, K4GGH (USA) at 1400, ZS6FRV (South Africa) at 1304, and 9G2AS (Ghana) at 1539UTC.

Argentina was the only 28MHz s.s.b. DX contact for John G0IUE, in the shape of LU5MAD (Mendoza, Argentina), while Ted G2HKU tried 24MHz c.w. and came up with PY2XB (Brazil), and 4Z5LF (Israel) at 1500, while the 28MHz band provided PY2XB (Brazil) at 1500 and LU1EWL (Argentina) at 1800UTC.

SIGNING OFF

Well that's it for this month folks...it's signing off time! Keep a keen eye (or ear!) on the higher bands as we approach the winter, as they should be producing some decent DX over the next couple of months. Mind you, having said that, don't neglect the lower bands either!

Thanks to all reporters for your time and effort for the column, keep up the good work, and good operating! As usual, reports and information

(and photos PLEASE as I'm desperate for photographs of our reporters!) by the 15th of each month as usual. Cheerio until next time.

73 Leighton GW0LBI

PW Listening & Operating Watch List All times in UTC

Charlie Blake M0AIJ listens and operates: 0500 - 0700 on 7.061MHz s.s.b. with an NRD 525 receiver & sloping Wire antenna and is also busy with his mobile rig (see text).

Steve Locke GW0SGL operates: 1100 - 1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940.

George Woods G3LPT (Suffolk) operates: an open net on 29.570MHz n.b.f.m. every weekday morning except Monday at 0930.

Don McLean G3NOF operates: 1030 Saturdays on 3.685MHz on the ISWL Net, or 1030 Sundays on the Yeovil ARC Net 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

John Wheeler G0IUE monitors: 28.5MHz s.s.b. every evening between 1700 and 2200 regardless of conditions using an Icom IC-706 and a 2-element TET triband beam antenna.

Leighton Smart GW0LBI operates: Some weekday evenings at around 2100 - 2330 on 1.949MHz s.s.b. using a Yaesu FT-747 transceiver at 5/30W and a long wire Marconi antenna.

Rob Mannion G3XFD listens and operates: (weekdays & weekends) 1800 - 1830 on 3.7MHz 100W s.s.b., & 3.530 or 3.560MHz and 18.105MHz QRP c.w. using an Alinco DX-70 transceiver and a long wire antenna. Also at 2300 on either 3.560, 7.025MHz (c.w.) or 3.7MHz s.s.b. (All operation dependent on PW workload!).

Sean Gilbert G4UCJ operates: around 0700 to 1100 and 2100 to 0000 seven days a week on 14MHz and 7MHz using an FT-307 and Alinco DX-70 transceivers at 5/25W output and a G5RV dipole antenna in the loft space.

T Ibbittson G0VTI operates: each evening between 1900 - 2000 on or around 7.020MHz c.w., or 14.035MHz c.w. using a Ten-Tec Scout at 50W.

RadioScene

RADIO 'SCAPE

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THIS MONTH, MIKE RICHARDS G4WNC, WILL BE TAKING AN IN-DEPTH LOOK AT SOME INTERESTING WEB SITES.

Whilst just about every Internet Service Provider (ISP) provides free Web space, making use of this space can be quite a challenge. (I've covered setting up your own web page in another column, but the trick is to use a graphical web editing package).

One of the best packages for this, in my view, is *Netscape Communicator* or *Netscape Gold* if you have a Windows 3.11 based machine. Using this system, you can pinch interesting backgrounds and graphics from other people's Web sites and very quickly create an interesting personal Web site.

When it comes to adding information to the site, generally the best plan is to concentrate on information



related to your slant on the radio hobby. It's also worth creating a page of useful links containing all your favourite sites - this can be very popular with other Web surfers.

Once you have your Web site, there are a number of different ways to make your site easily visible to the rest of the world. You register your site with a number of Internet search engines to get the widest possible cover. Up-to-date instructions for doing this are usually provided by

your ISP. The only snag with this option is that it does tend to result in your receiving lots of junk mail.

The other way of becoming known to a specialist group is to announce your site on the appropriate radio news group. The only problem here is that there's such a huge volume of messages around, that yours may only be seen by a few people. Probably the best method is to make use of the **Amateur Radio WebRing**.

The Amateur Radio WebRing is an easy to use Web organisation that was set-up in 1997 specifically to provide a way of communicating and collating Amateur Radio Web sites. To join your site to the ring all you have to do is download the WebRing graphics and code from their site and build it into one of your main Web pages. Once this is done you simply E-mail the Ringmaster with your site details and he will add you to the ring.

There is a degree of checking to ensure your site meets the rules for the ring, but that's all there is to it really. Once this is done, not only can other amateurs easily find you, but you can use the ring yourself to find lots of useful sites.

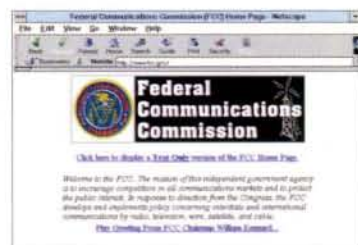
If you want to have a go and join-in, the Web address for full details is: <http://www.digdez.com/amateur/>

GET THE RULES

If you want to find out what's going on with the major regulatory bodies that influence our hobby then the **International Telecommunications Union** site in Switzerland has got to be worth a visit. This can be found at <http://www.itu.ch> and contains a wealth of useful data. There's even a search engine and typing in 'amateur radio' will take you straight to loads of data containing all manner of proposals and recommendations for our hobby.



Another really good site is the **American Federal Communications Commission**. Again, there's loads of information on a very wide range of communications related issues. They can be found at <http://www.fcc.gov/>



STAR GAZING

If you want to try something completely different, take a look at the main **Joderel Bank site** at Manchester University. It appears the Joderel Bank radio telescope (now called the



Lovell telescope) is still going strong and is packed with lots of information and data. You can even go into their live site and see exactly what all the antennas are up to - I wonder if



they'd let me borrow one for some moonbounce! The site details are

<http://www.jb.man.ac.uk/>

There's also a very good visitor centre, so if you find yourself in the area why not drop in and see what they get up to. The story of how the first antenna was built is fascinating.

WEATHER EYE

It seems that weather watching is always popular in the UK, probably due to our highly variable weather patterns. Anyway, if you want to know what's going on, there's loads of data on the Web. For quickly checking the current weather around the world you'd have a job to beat **Weather Underground**. They can be found at

<http://www.underground.com>

Here you will find detailed current weather reports from around the world. You just select your area and you can get details right down to individual towns - providing there's an observation site there.

The other vital site for UK

listeners is the **Met Office**. They can be found at <http://www.meto.govt.uk> If you want to get straight to the latest satellite pictures you need to add **/satpics** to the address and you can get the very latest infrared and visual Meteostat images.

REALLY FAST INTERNET

Just as I expected, the delivery of high speed data to you and I is really starting to heat-up. The latest to arrive is **BT's Home Highway**

that provides ISDN2 access specifically designed for home users. What you get with this is a really flexible and easy-to-use digital communications link. Your existing phone line is converted to an ISDN2 line and the box of tricks that's fitted gives you four possible links of which any two can be used at the same time.

For example, you get two ordinary phone lines and two digital phone/computer lines. You could therefore connect your computer to one and get Internet access at a real 64kbs and use the other for your ordinary phone calls. Of course, when the rest of the household go out you can hook into both digital lines to get really fast 128kbs access to the Internet!

In addition to the conversion to HomeHighway, you will also need a terminal adapter to take advantage of the ISDN connection - these cost from around £100.

FAREWELL

I've finally decided to hang-up my PC and stop writing the Radio 'Scape column. The reasons are simply too many interests, a very busy job and a demanding young family! So the time has come to leave this particular task to someone else.

I would like to thank those readers that have supported me with valuable contributions and ideas and wish you lots of



happy hours surfing the ever expanding Web.

READER'S SPECIAL OFFERS

If you'd like a copy of *Hamcomm/JVFX*, etc. I've arranged a very special offer with the **Public Domain and Shareware Library (PDSL)**. They have put together a library set of all five disks for just **£12**, all inclusive.

Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by phone - you don't even have to write a letter.

Please direct all orders and enquiries about this disk set to **PDSL Winscombe House, Beacon Road, Crowborough,**

Sussex TN6 1UL. Tel. 01892 663298 and request library volume: **H008739abcde**. IBM PC Software (1.44Mb disks): **Disk A** - JVFX 7.1, HAMCOMM 3.1 and WJFX 3.2; **Disk B** - DSP Starter plus Texas device selection software; **Disk C** - NuMorse 1.3; **Disk D** - UltraPak 4.0; **Disk E** - Mscan 1.3 and 2.0.

73 Mike G4WNC

Editor's comment: We're very sorry indeed to lose Mike G4WNC as a regular contributor. Please see next month's 'Keylines' editorial for further comments. G3XFD.

BROADCAST

REPORTS AND INFORMATION TO ME PLEASE.

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THIS MONTH PETER SHORE TAKES A LOOK AT MORE OF YOUR FINDINGS AND BRINGS NEWS OF NEW STATIONS THAT CAN BE FOUND ON THE BROADCAST BAND.

The Broadcast column in the September edition of *PW*, spurred **Paul Price** in Penydarren near Merthyr Tydfil in South Wales to tune his radio in search of **Radio Kudirat**, one of the stations beaming pro-democracy programmes

towards Nigeria. He has heard the station on 11.54MHz at 1930UTC with a good signal of SINPO 54545. Paul reports that he has also logged the state-run **Voice of Nigeria** on 15.12MHz at a number of points in the day, including 1030, 1530 and 1920UTC. Paul's receiver is a Yaesu FRG-7 with a 15m long wire antenna.

Paul sent me his August log (**Table 1**) and I've included some of the most interesting finds here which should encourage some good knob-twiddling in search of world-wide broadcasts in English.

Paul concludes by saying that he is having difficulty finding **Radio Bras**, **RAE** from Argentina, **Radio Georgia** and one or two others. I'll try and publish some frequencies for these elusive stations in the next couple of months. Meanwhile, I recommend you order a copy of the twice-yearly *Global Radio Guide* published by the Association for International Broadcasting. This lists all the world's English-language stations with their times and frequencies, together with comprehensive contact information. The book is available through the *PW* Book Service.

Radio Belarus, one of the stations which Paul Price logged, has announced that it is beaming in English, Belarussian, German and Russian daily to Europe on 7.21 and 11.96MHz between 1900 and 2100, and between 0100 and 0300 on 7.21 and 11.67MHz for

Table 1: Paul Price's August Log

Station	Time (UTC)	Frequency (MHz)
Voice of America	1700	15.41, 15.445
	1900	15.18
	1930	4.95
	2000	17.725
Voice of Armenia	2015	9.965
	1030	17.385
All India Radio	1745	7.41, 9.95, 11.62
	2200	9.95, 9.648, 11.62
Channel Africa	1700	15.24
Radio Belarus Int.	1930	7.21 (Tuesdays)
Radio Bulgaria	1100	15.175, 15.585
	1900	9.70
Radio Cairo	2300	11.72 (for North America)
	2200	9.90
Radio Damascus	2005	12.085, 13.61
Kol Israel	1030	15.64, 15.65
	1900	9.435, 11.605, 15.65
Merlin Network One	0900	9.915
Radio Moldova	2130	7.52
Sunrise Radio (UK)	1700	5.85 (via Deutsche Telekom site in Germany)
Radio Taipei Int.	2200	15.60
	1300	9.71
WEWN	1200	15.745
WYFR	1700	15.695, 17.555

the Americas. Radio Belarus' national first programme is also available on a number of short wave frequencies including 17.805, 11.96, 11.67, 7.265, 7.21, 7.145, 6.115, 6.08 and 5.965MHz. At times these channels carry the Mayak second programme from Moscow.

GOOD OR BAD NEWS?

The time change in Europe due at the end of October means frequency changes too, some news which may please broadcast listeners in the USA, while disappointing some in Europe. The latest agreement between **Radio Netherlands** and **Radio Vlaanderen Internationaal** means that the Belgian station secures a prime-time short wave transmission from Radio Netherlands' Bonaire site (see **Fig. 1**) in exchange for a whole hour of medium wave for Radio Netherlands on RVI's 1512kHz transmitter. As a result, the 1730UTC English broadcast will no longer be available on medium wave, although the two later transmissions at 1830 and 2100 will both be on 1512kHz.

PIRATES IN OUR MIDST?

A brand new US short wave broadcaster was due on the air in late September. The **WBCQ** station is owned by sometime pirate broadcaster and entrepreneur **Allan Weiner**. He has secured permission from the US authorities to build a new 50kW transmitter at Montecello in Maine.

The new broadcaster has ordered a log periodic antenna which will beam the programmes towards Mexico, Central and South America. Initially programmes will be in English although Spanish output may be added in time. There is also, according to Weiner interviewed on Voice of America's *Communications World* programme, the possibility of broadcasting in native American dialects. Tune to 7.415MHz which is the frequency America's FCC has agreed WBCQ should use - let me know if you hear anything!

OTHER FREQUENCY NEWS

Greek Radio's international service is now carried on medium wave from transmitters which used to broadcast local ERA programmes. A total of six channels are now in use for Greek international programmes, including 765, 927, 1008, 1404, 1494 and

Radio Netherlands QSL card - 1969-89

1512kHz. The three highest frequencies are radiated from 50kW transmitters.

Other frequency news now. French-financed pop music station **Africa No. 1** in Gabon can be heard 0500 to 0700 on 9.58MHz, 0700 to 1600 on 17.63 and 9.58MHz, 1600 to 2100 on 15.475 and 9.58MHz and 2100 to 2300 on 9.58MHz.

Radio Singapore International has a daily English-language programme for Asia at 1100 to 1400 on 6.015 and 6.15MHz.

Radio Pyongyang has English: 0000-0100 on 11.845, 13.65 and 15.23MHz, 0500-0600 on 11.71 and 13.79MHz, 1100-1200 on 3.56, 9.975, 11.335, 13.65 and 15.23MHz, 1500-1600 on 3.56, 9.64, 9.975, 11.335, 11.735 and 13.65MHz, 1800-1900 on 4.405, 6.575, 9.335, 11.71 and 13.76MHz, 1900-2000 on 6.52, 9.60 and 9.975MHz, 2100-2200 on 4.405, 6.575, 9.335, 11.71 and 13.76MHz, 2300-2400 on 11.335, 13.76 and 15.13MHz.

The Irish National Broadcasting Corporation (RTE) in Dublin uses transmitters in Germany, Singapore, Ascension Island and the USA to beam programmes in English, including: 0900-0930 weekdays on 5.07MHz (via USA), 1000-1030 weekends on 5.07MHz (via USA), 1000-1030 daily on 11.74MHz (via Singapore), 1730-1800 daily on 17.885MHz (via Ascension), 1830-1900 weekdays on 12.16MHz (via USA), 1900-1930 weekends on 12.16MHz (via USA).

Finally, a UK-based short wave broadcaster, the **Voice of Hope** based in Hereford, is hiring time on a transmitter in Germany to broadcast daily to Asia at 1330 to 1530 on 15.715MHz to Asia and at 1800 to 2200 on 6.015MHz for Europe.

That's all for this month. Keep me up-to-date with what you hear so that all readers of *PW* can share in the broadcast listening experience.

73! Peter

FREE ADVERTS

Now's your chance to send in a photograph of your equipment (a good idea if it's really unusual) to accompany your advert. Please note that all photos will only be published at our discretion and are non-returnable.

When sending in your advert, please write clearly in BLOCK CAPITALS up to a maximum of 30 words, plus state your contact details. Please use the order form provided.

Bargain Basement

Advertisements from traders or for equipment that is illegal to possess, use or which cannot be licensed in the UK, will not be accepted.

No responsibility will be taken for errors.

You should state clearly in your advert whether the 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

Absolute mint condition, as new, Yaesu VX-1R, £180 o.v.n.o., no time wasters. Tel: Don (07957) 928734, anytime or on East London 0181-924 1491.

Ailco DJG5TE, v.h.f./u.h.f. twin band f.m., hand-held transceiver with charger extend receive a.m., extend receive u.h.f., boxed, as new, £170 o.n.o. or swap for 2m (144MHz) base/mobile. Tel: Vince (01487) 823879.

Ailco DR-590E twin-band f.m. mobile, service, mobile mounting bracket, boxed, service, manual, excellent condition, never used mobile, £280. Tel: John GOFIK (01707) 872772 after 6pm, answer phone and FAX.

Ailco DX70 CTCSS board fitted, £450. Tel: GOWMEX, QTHR on Kent (01322) 406368.

Amateur television colour testcard generator, 16 patterns, complete with customised EPROM, boxed, 12V operation, £45, plus carriage. Tel: Bob G8VOI QTHR on Waterloo (01705) 250830 after 6pm.

Amp Sagra 600, two 4C250Bs, 400W plus v.h.f., excellent condition, £500. IC-255E f.m., £100. Tel: Mike (01372) 810612.

AOR 3000A, mint and boxed, £450. Tandy 2042 with VOX-record fitted, £160 or may part exchange for Fairhaven RD 500VX or quality h.f./u.h.f. set, cash either way. Tel: Vic on Stoke-on-Trent (0973) 538502.

AR-88D, excellent condition, manual, spare valves, £85. Heathkit h.f. transceiver, extras, v.g.c., RX fault, £95. OS2 Scope oscilloscope, £25. Codar AT5 transceiver, £25. Hohner full size midi keyboard, voice fault, £25. Tel: Ken on Gloucester (01453) 845013.

AR40 rotator, ideal for v.h.f./u.h.f. and h.f. minibeams, £40. Three element version of G4MH minibeam, £40. Tel: John G3EGC QTHR on (01204) 301502.

Bremi p/s 13.5V, 5/7A, £15. Yaesu p/s FR-757GM, 20A for 100W s.s.b. with connectors for Yaesu and Kenwood, £60. Vintage Trio speaker, £10. Mike Kenwood MC80A, mint, boxed, £60. Tel: Max G3VWM, Herts. Tel: (01920) 463564.

Clark 40ft pump up mast with legs and accessories, one leaky seal hence £100. Seals available. Cushcraft RS vertical, needs tuning, £40, two spare traps, £10 each. Tel: Gloucester (01452) 741036 for details.

Collins TCS6, two Eddystone R770R, (three offers), Rascal RA17L and RA117E, g.w.o., Kenwood R21. Tel: Lancashire (01254) 705454 or (01254) 760300.

Comet CD160H 2kW s.w.r./p.w.r. meter, 1.6-60MHz, £40. 2m Packet transceiver, 144.650MHz, h/b, £25. Audio notch/bandpass h/b filter (LMF 90), p.c.b. and instructions. *Radcom* Jan 1991, £18. Speech Processor (kit - h/b) cables, circuit instructions, £12. All plus P&P. Tel: Derek G00EW on Nantwich (01270) 668111.

D100 deluxe version DXTV with scan and instructions, receiver bands 1,2, and 3, £45. Addonis AM503G, base microphone, £20. Buyer collects or pays postage. Tel: M1CWW QTHR (01332) 741564.

Eddystone 840A communications receiver, in very good condition, working, £110 o.v.n.o. Also, Philips Lamps Ltd. communications receiver, type PCR, spares or repair, offers. Tel: East Sussex (01323) 894226, evenings.

Eddystone EC10, re-aligned, serviced three years ago, mains p.s.u., nice condition, £80. Telequip D61 double-beam 'scope, £30. Regency scanner NX7000, 25-550MHz, 800-1.3GHz, with Gould mast head pre-amplifier, £55. Tel: Doug on Crewkerne, Somerset (01460) 75838.

Eddystone receiver 730/4, £40 o.n.o. Lafayette receiver HE-30, £20. Grundig Satellite 600, £60. Plus loads of valves or £100 for the lot. Buyer collects or exchange for small transistor with b.f.o. s.s.b. Tel: 0171-791 0628.

Elektor Electronics Magazines, all issues from 1978-1998, first offer over £30 secures, buyer to collect. Tel: Bob G8VOI QTHR on Waterloo (01705) 250830.

Ex-WD headphones, £5. Voltage reducer 20W variable to 10W. Tel: John (01283) 221870.

FT-1012D MkIII, f.m., £200. FRG-100 f.m. and p.s.u., £250. IC-207H, £250. IC-07E, £140. Buyer collects. Tel: GM4DHJ on Scotland 0141-885 2022.

FT-690 MkII, multi-mode with CTCSS and low dev. box, manual, mic, v.g.c., £375. 6m (50MHz), 100W amp/pre-amplifier, as new, £75 P&P extra. Tel: (01206) 396946 (daytime), (01255) 880858 (evenings). Cash, cheque or credit card.

FT-77 transceiver, 10-80m (28-3.5MHz), manual, mic, f.m. board, c.w. filter, £200 plus P&P. Tel: G4GXU on Stourport (01299) 828487.

FT7 plus top band, £160. FT7, £160. FL110 linear, £160. KW 2000B, £90. Alan Handy CT145, £100. Howes a.t.u., new, £40. Ten-Tec a.t.u. 228, £40. Tel: Falmouth (01326) 250232.

Goldstar OS9020A Maplin, two channel, boxed, new, £275. Oscilloscope accessories to match, operating, repair, manuals, £12. MFJ-451 Morse key, board complete, new, £75. Tel: Colin G0POS on Gillingham, Kent (01634) 379140.

Heathkit collection, v.g.c., with manuals, laboratory h.f. signal generator IG-42, £25. Multi speed servo chart recorder IR-18M, £30. Transistor tester IT-7400, £20. Tel: (01705) 255459.

Heathkit HR-10B receiver, 80-10 amateur bands, plus Heath DX-20 transceiver, 80-10 amateur bands, 30W r.f., £60 pair. German WWII key, £20. 19 set, working, £150. ET-4336 h.f. 350W transceiver, £200. Tel: Ben (01562) 743253. Or E-mail: 106312.1035@compuserve.com

Heathkit HW9 QRP transceiver, fitted WARC bands with matching tuner and

s.w.r. meter, £250 o.n.o. Realistic Digital Readout Communications Receiver, 0-30MHz, £50. PRO-2024, 60 channel base scanner, £50. All with manuals. Tel: G3KMY (01246) 862099.

High gain TH6DXX tri-band, six element beam, fantastic performer, also three element mono-band beam for 17m (18MHz), both in daily use, try before you buy, absolute bargain, £300 pair. Tel: GOWXP QTHR on Doncaster (01302) 729131 or (01302) 874224.

Icom 751A, 100W all mode h.f. transceiver, boxed, £450, o.n.o. Icom IC-2350H dual band, v.h.f./u.h.f., boxed, £320, will pay postage. (UK). Tel: (01294) 550688.

Icom IC-32E, 2m/70cm (144/430MHz), hand-held, new NiCad battery pack, d.c. converter, charger, handbook, speaker, microphone, leather case, Rubber Duck antenna, excellent condition, postage paid, bargain at £150. Tel: George on South Wales (01443) 437345.

Icom IC-740 with internal p.s.u., 12/240V f.m. fitted, manuals, £340. Hansen FS210 automatic s.w.r. power meter, £30. Original handbook, New Zealand wireless set ZC1 MkII, offers. Graham G0LEH, 7 Tongue House, Royal Circus, West Norwood, London SE27 0BL.

Icom IC-R71 receiver, fitted FL32 250Hz c.w. filter, f.m. demodulator board, as new condition, £520 o.n.o. Tel: Bill on Cambridge (01223) 292941.

Icom R71E receiver in mint condition with f.m. and manual, £450. Also Yaesu FRG-9600 with Raycom mods, mint with manual and boxed, £200 plus postage or delivered within 25 miles. Tel: 0151-625 5501.

Icom T7E, 2m/70cm (144/430MHz), with NiCads, charger, dry cell pack, leather case, boxed and manual, v.g.c., £190. Tel: Oliver (01524) 736817 after 5pm.

JRC NRD-525 h.f. g.c. communications receiver, 09-34MHz, g.w.o. and clean appearance, offers around £450. Tel: South Birmingham 0121-430 2929.

JRC NRD-533 BWC & RTTY, like new, £750. NRD-525, mint condition, £550. Icom 71E, first class, £450. Grundig 700, like new, £200. Eddystone 1837/2, digital, five filters, excellent RX, £350. HF-150, almost new, £200. Grundig Satellit reception 6000, s.s.b., world-wide multi-band, £150. Tel: London 0181-813 9193, from first week of October.

Kenwood 690S, boxed, in excellent condition, £700. PR150 pre-selector by Lowe, £70 o.n.o. Vectronics mobile a.t.u., new, £75. Tel: Colyn (01624) 801592.

Kenwood h.f. transceiver, 440 s.a.t. with internal a.t.u., desk mike and voice option, very good condition, £495 o.v.n.o. Tel: Sheffield 0114-258 8415.

Kenwood R-2000 communications receiver, all modes with VC10, fitted NB, a.g.c., three speed tuner, clocks, ten memories, scan, dimmer, plus *RadCom* magazines, *Airband* book, *Short Wave* Book, boxed, like new, £280. Tel: (01608) 662488.

Kenwood R-5000 receiver, boxed, reliable and in excellent condition, £450. HRO receiver with ten coils and p.s.u., £150. Exchange Technics electronic keyboard KN90 for good transceiver, value £500. Tel: Lincolnshire (01507) 588392.

Kenwood TM-251E transceiver, £260, o.n.o. Kenwood TH-28E hand-held, £210, o.n.o. Also s.w.r. metres, h.f. and v.h.f., £25 each, o.n.o. Tel: G4TZZ on Gloucester (01453) 511140.

Lafayette HE30 multi-band h.f. receiver for enthusiast s.w.l. Phone for info. Tel: Alan G0HBC on 0121-745 1000.

Linear amp: 23cm (1296MHz), L-wave, 24W with remote power meter and relay unit, £150. Microwave modules MML432/100, 70cm (430MHz). Linear amp, 100W, boxed with details, £200. Tokyo 6m (50MHz) Hypower HL-66V 60W linear amp, boxed with details, £75. 70cm, s.s.b. MV432S Masthead pre-amplifier and DCW15A sequence controller, boxed with details, £150. Carriage at cost. Tel: G8HPD QTHR on Delabole, Cornwall (01840) 212835.

Log Periodic 50-1300MHz dummy loads, variable p.s.u., two-way 70cm (430MHz) splitter, many items very cheap, otherwise going in skip, wanting clear shack, send for list. Tel: (01623) 643355.

MFJ 451 Morse keyboard, £85. Kenpro K722 2m (144MHz) portable, £85. Post included. Write to Dave Logan G4EZF, 27 Shaw Street, Mottram, Ches. Tel: (01457) 762799.

Microwave modules MML 432/100, 432MHz, 100W PA, 10W input, £220. Yaesu mobile antenna RSM-2, 2m (144MHz), with whips for 10, 15, 20, and 80m (28, 21, 14 and 3.5MHz), £50. Tel: Adrian G4ROA on Coventry (01203) 412201.

Military s.s.b. station, complete, C11 s.s.b. transceiver, R210 receiver, a.t.u., p.s.u., headset, interconnecting cables, junction boxes, v.g.c. £130. Rascal RA-17L, 500kHz-30MHz, in cabinet, bargain, £130. RCA AR-88, cabinet, manual, v.g.c., £95. Realistic DX-160 receiver, 15-30MHz, £50. Tel: (01482) 887938.

Old radio spares: transformers; condensers; resistors; valves; trans amps, etc. Tel: 0113-240 3496.

Outbacker Junior mobile h.f. antenna, 10/80m (28/3.5MHz), all-bands. Moonraker 6m (50MHz) mobile whip and Diamond DBEL??? 770/H, 2/70 mobile whip, all excellent condition, £120 the lot. P&P extra. Tel: (01287) 653708, evenings or weekends.

Philips push button car radio, type 22, 520-160kHz, 150-285kHz, 12V 1960s Motorola push button car radio BL527YS, 530-1600kHz, 150-280kHz, 12V 1960s noise generator, 100-600MHz, CT207 oscilloscope, No.11 AA predictor MkI. MOD wireless manuals. Send for list to R Wildey, 2 Granthams, Lambourn, Nr Hungerford, Berkshire. Tel: (01488) 71325.

Pocom decoder, c.w., RTTY, all mode

p.s.u. and monitor, £150. Tel: Peter on Essex (01255) 502195.

Practical Wireless: Jan 1938, Jan '39, Jan '40, Feb '40, May '40, Oct '40, July '44, June '57, *Amateur Wireless* Aug '32, *Wireless World* April '76, *Practical Television* April '50-July '60, offers, buyer to collect. Tel: Coventry (01203) 460000.

Pulse Generators: Nagard 5002 and 5101, Advance SG21. Oscilloscopes: Marconi TRF-2210. Telegroup: S51A (modified), anyone interested? Buyer collects. Tel: Phil (01737) 351214.

Pye ex-p.m.r. rigs, M290 series with information for modification, £10 including postage. Tel: 0141-632 5408.

R1155 plus p.s.u. and speaker, v.g.c., £120. Eddystone S880 plus speaker and manual, £245. Large selection of 19 sets and accessories from £80. Larkspur boxes and leads from £2.50. Yaesu FT-101ZD, in box, £285. Tektronix scope 524AD and manual, £25. Farnell p.s.u., £20. Tel: West Yorkshire (01274) 824816.

R210/C11 mains p.s.u., £100 plus P&P. Tel: (01726) 70919.

Rascal 1795 receiver, £795. Eddystone 1650, £995. WJ-340A, £395. WJ-373A, £395. WJ-RSIII, £395. WJ-9477, £795. Anritsu ML522 measuring receiver, £2995. Tel/FAX: (01908) 365726 or E-mail: phil@two-way.demon.co.uk

Rascal equipment and Murphy h.f./m.f. receiver, for details send an s.a.e. to Madeley Smith, 48 Sherbourne Crescent, Coundon, Coventry CV5 8LE or E-mail: madeleysmith@zetnet.co.uk

Rascal RA17 h.f. receiver, g.w.o., £110 o.v.n.o. Collins R390 h.f. receiver, working, £100 o.v.n.o. BC221, £20. Buyer to collect by arrangement. Tel: (01935) 813097.

Rascal RA17L, mint condition, £150 no offers. Trio s/state stereo amplifier, £10. Akai four track stereo, three head, reel-to-reel, £20. The lot £170. Buyer collects Tel: (01535) 630361 after 5.30pm.

Radio Shack receiver DX394, 150kHz-30MHz a.m., c.w., u.s.b./l.s.b. signal strength meter, digital frequency read-out, bought June '98, guaranteed until June '99, boxed, instructions, £110 o.n.o. Tel/FAX: (01234) 720591.

Realistic PRO-2035 hyperscan, 1000 channel, 50 steps per second scan, £180. Radioshack DX394 communications receiver, digital readout, £100. Both v.g.c. 'Phone for further details. Tel: John on Lancashire (01995) 606621.

Robot 400 SSTV clone, eight second, b/w scan converter, offers. Epson LX850 nine pin dot matrix PC printer, £30. Collect or carriage extra. Tel: Bob G8VOI QTHR on Waterloo (01705) 250830 after 6pm.

Scanners: Realistic PRO-2006 base set, a.m./f.m./w.t.m., 25-1300MHz, boxed, excellent condition, £175. Realistic PRO-43, a.m./f.m., hand-held, 68-1000MHz, £150. Can also provide frequencies (offers accepted). Tel: Mark on Edinburgh 0131-556 6186.

Star Masterkey memory keyer, £50. Paddle key, £40. Ezitune antenna tuning bridge, £40. MFJ-945C, £50. Heathkit four way coaxial switch, £30. All excellent condition, carriage extra. Tel: Gloucester (01594) 833234.

Strumek ground post with safety luffing winch, 40ft lattice tower, top cage, with Ham rotator, TH3 tribander 4E1 6m (50MHz) Yagi, 11E1 2m (144MHz), coaxial, cable, SS shrouds, £350. Tel: Roy GW4KGD, QTHR on (01758) 712108.

SX400 scanning receiver, ex-MOD, unused, 26-520MHz, all mode, in sturdy aluminium transit case, 12V d.c., handbook, antenna, £225. Yaesu FRG-7700 g.c. receiver, c.w., manual, v.g.c., £150. Marine band receiver sailor, £175. Tel: (01202) 668446.

Ten-Tec Scout 80m (3.5MHz) module, new, £20. Tel: Leicester (01455) 273042.

TRIO AT-230 a.t.u., good condition, £130 o.n.o. All offers considered. Tel: (01246) 236496.

Trio R-1000 receiver, very good performance, £125. Realistic scanner PRO-2006, as new, £150. Mobile headset for Yaesu FT-8000, unused, £25. Tel: London SW15 0181-785 7314.

TS-700, £200. Turner expander desk mic, £30. 5-ele tri-band Yagi, £250. Hi-fi pre-amplifier and p.s.u., £200. 4CX 1000A tube, £100. Satellite recorder and decoder, pace, £40. All v.g.c. Tel: (01974) 251420.

Two 1155 receivers, one working, one with no power pack. Also, German tank receiver, v.h.f. Empfänger, type E No. 1094, g.w.o., buyer collect, £120. Also, Eagle RX 60N, g.w.o., £50. Tel: (01203) 440637.

Two and six all mode transverter, 6m (50MHz), 2m (144MHz), 2.5W input, 25W output, with Yaesu FT-290 Mk1 plus power lead and mic, soft case, shoulder strap, rubber duck antenna, mobile mount and manual, sold as one lot, £310 o.v.n.o. Tel: Martin on East Somerset (01963) 32241.

Two boxed Kenwood TK-715 v.h.f./f.m. transceivers for sale, good condition, to include mics, aerials, leads, power supplies, best offer around £100 for the pair. Tel: Jim on Coventry (01203) 673894.

Williamson amplifier in g.w.o., eight valves, twin rectifiers including Partridge transformer, as specified, also 40 page construction manual, heavy gauge cast, aluminium chassis, £75. Tel: New Forest (01425) 403416.

Yaesu 1012D in excellent condition with fan, matching SP901 speaker and FC-902 a.t.u., with Morse key and manuals, £350. Yaesu FRG-7, in excellent condition with manual, £120. Tel: Chris on South Yorkshire (01909) 567448.

Yaesu 8800 plus Caps, boxed, manual, £225. Global a.t.u. 1000, boxed, manual, £35. MFJ active antenna, boxed, manual, new, £35, will pay carriage. Tel: 0191-526 6230.

Yaesu FRG-7, v.g.c., with manual, £150 (may be able to deliver England or Wales). Tel: John G8ILG (01733) 237681.

Yaesu FRG-7700 h.f. receiver complete with matching FRT-7700 a.t.u., excellent condition, £250 o.n.o., buyer collects. Tel: Alistair G1HMN, Guildford (01483) 233991.

Yaesu FRG-9600, excellent condition but it never gets used, includes power supply and handbook, 60-905MHz, £275. Tel: G3FLJ on Southampton (01703) 737715.

Yaesu FT-1012D h.f. transceiver, fan fitted, YD148 desk mic and Yaesu FC-902 a.t.u. with manuals, one owner from new, £425. Tel: Stoke-on-Trent (01270) 872788.

Yaesu FT-102 transceiver, FT-102 a.t.u. speaker unit, Yaesu MD base mic, all manuals, original boxes, £550. Hewlett Packard oscilloscope, v.g.c., £80 o.n.o. Keithley 179 multimeter, £40. 43 Dordon

Road, Dordon, Tamworth B78 1QW. Tel: (01827) 704200.

Yaesu FT-200 h.f. transceiver, unused on transmit for several months as no aerial, £150. Tel: Dave (01442) 884348 in office hours.

Yaesu FT-290 2m (144MHz) multi-mode, dash mount, manual, £150. 2m 7-ele beam, £10. Watson W-30 a.m., p.s.u., 35A peak, £70. Hirschmann rotator plus top bearing, £70. Tel: Nohm 0115-911 8130.

Yaesu FT-290R, 2m (144MHz) multi-mode transceiver, NiCads, p.s.u., carry case, YM38 mic and manual, £260. Microwave modules, 30W linear amplifier MML144/30, £35. Tel: Stoke-on-Trent (01270) 872788.

Yaesu FT-290RII 144MHz multi-mode, boxed, with matching FL-2025 25W linear amplifier, the lot for £270. Tel: John on Norfolk (01366) 384968.

Yaesu FT-290RII with mobile mount, £250 o.n.o. Three bound volumes of *Wireless World*: January - June 1934; July - December 1934 and January - June 1935, offers. Graham G0LEH, 7 Tongue House, Royal Circus, West Norwood, London SE27 0BL.

Yaesu FT-690 all mode, 6m transceiver, as new, also valves of different value, please 'phone for details. Tel: JP on Telford (01952) 410662, evenings and weekends.

Yaesu FT-707, FP-707, FC-707, mobile mount, all cables in g.w.o., manuals and info, £375. Price includes faulty FV-707, all original packaging. Tel: Mike on Isle Of Man (01624) 832037 after 6pm.

Yaesu FT-747GX in good condition, 100W, all bands, 150-30MHz, with mic, £300. 27MHz CB transceiver Fidelity 1000, £20. 27MHz CB transceiver Audioline, £5, needs a mic. Tel: Russ on South London 0181-308 1704.

Yaesu FT-757 Mk1, in very good condition, recent v.f.o., receipts, must sell, any test, £350. Tel: Stoke-On-Trent (01782) 255330.

Yaesu FT-8000R dual-band mobile transceiver, radio as new, seen working, £250 o.v.n.o., buyer collects. Would exchange for new Yaesu FT-8500R under warranty, cash adjustment, must be seen working. Tel: Bill on Gloucester (01684) 295770 or (07771) 870611.

Yupiter MVT-8000, 8-1300MHz multi-band receiver, v.g.c., £250. Also DJXI palm size world receiver back pack, needs slight repair or replaced o/v, v.g.c., £100. Interested in good RX/TX. Tel: Jim on Chelmsford (01245) 400760 or E-mail: brecon@lineone.net

Yupiter VT 125II civil air band hand-held, £70. Tel: Rochdale (01706) 645424.

ZX Spectrum plus 48K with RX4 Decode software, c.w. RTTY, AMTOR, £30.

Program and instructions, £5. Zetagi CB s.w.r. meter 202 with M27 matcher, £40. DL60 dummy load, 60W, £8. K40-CB antenna, £20. Tel: Buxton, Derbyshire (01298) 78268.

Exchange

ALBA radiogram, 1964, exchange for a valve communication receiver and cash adjustment, or sell. What offers! Tel: Luton (01582) 754939.

Alinco dual-band mobile DR 599, excellent condition, manual and bracket, 2m/70cm?? (144/430MHz) TX, wideband RX, swap TS-670 or TS-680 or older type 2m/70cm all-mode base or 140S full line up. Tel: Andy M0BGM on Derby 0115-930 8096.

Hammond drawbar controller XMCI plus XM1, (value £600). Will exchange for h.f. transceiver FT-1, or IC-720A, or FT-102. Tel: Brighton (01273) 680307.

HF transceiver with f.m., good condition, any model considered, also 2m+70cm (144+430MHz) base antenna, will pay cash or swap for music recording equipment, computer equipment. Tel: (01884) 257487.

JRC NRD-535 receiver, good condition, in perfect working order, with box and manual, would like to exchange for Racal RA1792 receiver in good condition and working order, preferably with manual. Tel: Dave Jones (01554) 775790. 50 New Dock Street, Llanelli, Dyfed SA15 2HB, or E-mail: daiungood@aol.com

Kenwood G707 dual band transceiver, exchange for 70cm, 2/6m (430, 144/50MHz) modules for Yaesu FT-767GX, two second-hand modules or one new 2m module, Kenwood never used mobile or sell, £200. Tel: (01902) 326182, evenings.

PC Complete with modem, colour inkjet printer, speakers, soundcard and COROM. Will exchange for amateur radio equipment such as IC-706 Mk1 or similar mobile radio which includes 2+6m (144+50MHz), cash adjustment if necessary. Tel: Dave (01993) 212467 after 5pm.

TH29E dual-band transceiver, v.g.c., c.w. speaker, mic, swap for Lowe HF-150 receiver or similar, or h.f. QRP gear or gaps. (01624) 618368.

Wanted

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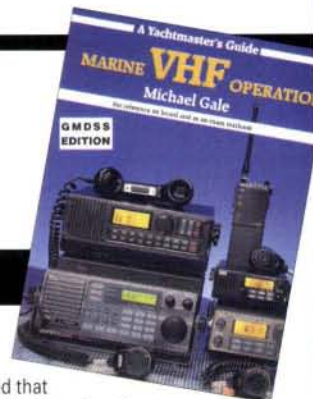
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