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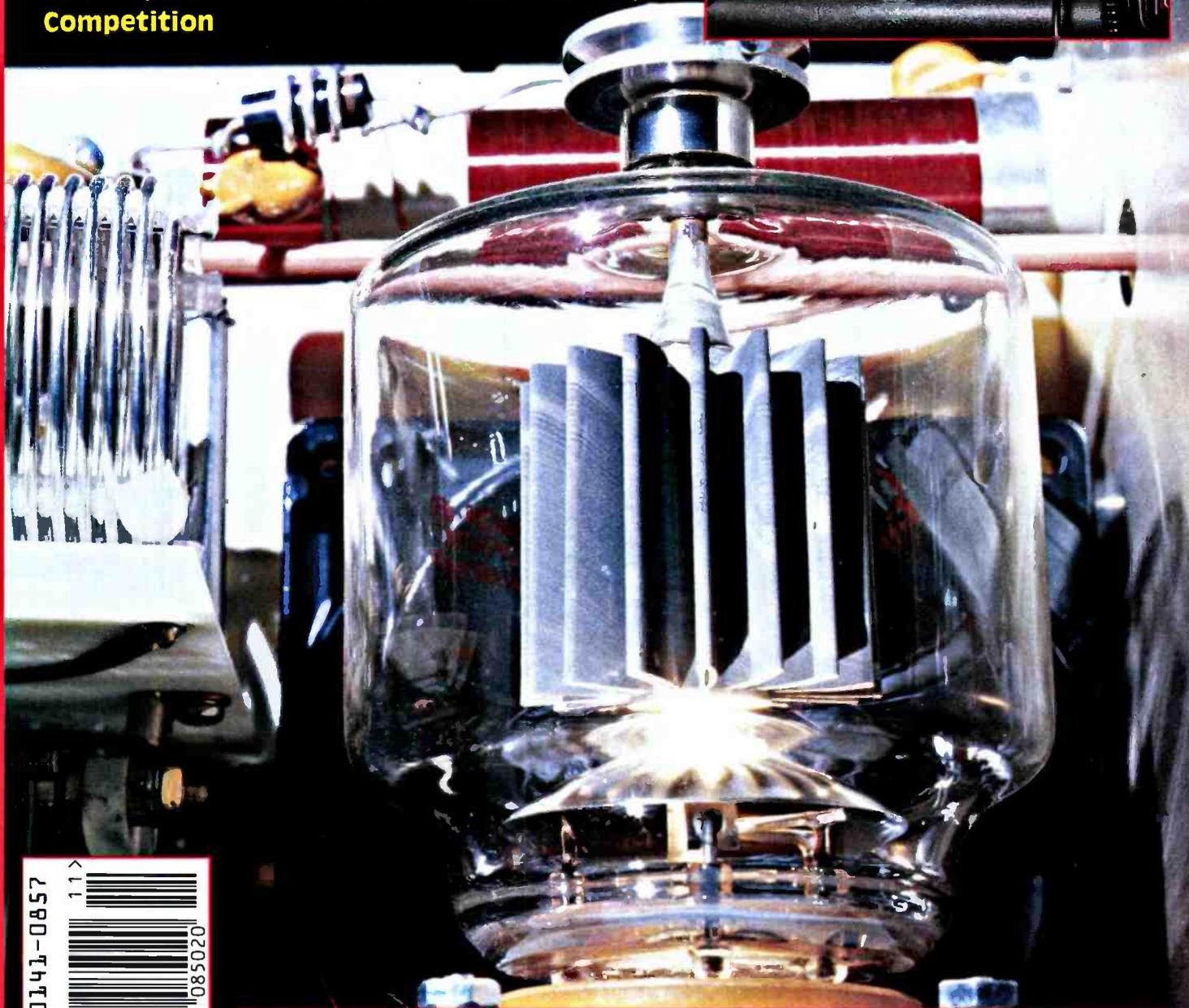
# practical **Wireless**

THE UK'S BEST SELLING MAGAZINE FOR AMATEUR RADIO ENTHUSIASTS

**Bermuda Bound  
Siberia - The Other End Of The DX  
Castles On The Air  
1993 Leicester Show Guide**

**TWO** Free To Enter Prize Competitions!  
**Win The SG-2000 HF Transceiver  
Or A Yupiteru Scanner In Our Reader Survey  
Competition**

**The Ameritron AL-80BX HF  
Linear Amplifier & The SG-2000  
HF Transceiver Reviewed**



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The TS-950SDX is part of a range of HF transceivers priced from around £1000 to £3500. And although quality is never cheap, it's still a small price to pay to have the world of radio communications at your command.

**KENWOOD**

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### FRONT COVER ACKNOWLEDGEMENT

Photographs of the valve on the Ameritron AL-80BX linear amplifier and the SG-2000 h.f. transceiver by Tex Swann G1TEX.

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SG-230

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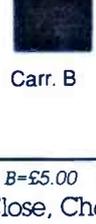
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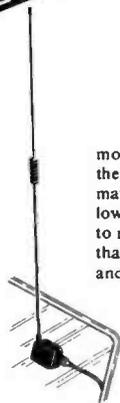
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G0GBY



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2M/70cms



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- Full Duplex

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### DJ-180E

2m Budget Class Rig

- 10 memories (Expandable)
- Auto Power Off
- Scanning & wide-band Rx
- Rotary Control
- Ni-cads & Charger



You won't purchase a better quality rig at this price. Derived from their commercial design, this rig is tough and reliable. Ideal as a second rig or/and appealing to those who don't want all the frills (and the expense). Get the adaptor and you can make it into a 5 Watt mobile! And if 2 metres gets boring or goes quiet, you can always listen between 130MHz and 174MHz to pass the time. Get the full details now.

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- 20 Memories
- CTCSS Encoder
- Time Out Feature
- Channel or Freq. Display
- Compact size

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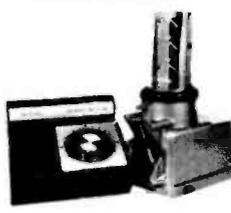
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# BRIGHTEN UP THOSE LONG WINTER EVENINGS WITH A NEW BASE STATION FROM

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**ICOM IC-737** This compact HF transceiver has met with rave reviews (Sept. RadComm) by utilizing state-of-the-art digital technology to introduce for the first time; memo pad, DBSR, auto-antenna selector and quick-split functions. These new functions will excite HF beginners who want to take the next step up and users keen on portable or mobile operations. With a choice of CW filters, the IC-737 is an ideal transceiver for the DX'er.



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**YAESU FT-736R** This transceiver from Yaesu incorporates up to 4 band modules covering the 50, 144, 430 and 1200MHz Ham bands. The standard model provides 25 watts RF power output on the 144 and 430/440MHz bands in SSB, CW and FM modes with any 2 of the remaining 3 bands as options (10 watts output on the 50 and 1200MHz bands). An 8-bit CMOS main micro-processor and 4-bit I/O coprocessor provide exceptional digital integration and control.

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# EDITOR'S *keylines*

My comments in a recent 'Keylines' regarding insurance for amateur radio equipment fitted into cars, etc., seems to have aroused interest and some confusion! Several readers have written letters for publication on the subject and one or two have written personal letters to me outlining their difficulties.

Unfortunately, the only thing we seem to be able to agree on, is that there is a great deal of confusion! So, to help matters I'm hoping to be able to include something of interest on the subject in our next 'Mobile Special' issue of *PW*.

In the meantime, I have had several long conversations regarding the installation and operation of radio equipment in cars with insurance companies. Interestingly, the subject ranged far wider than just the installation: it touched on driving safety and fire hazards too!

The more I researched on the mobile aspect, the more I realised what had to be considered. For example, had you (like me) not considered whether or not your vehicle warranty had been comprised by 'modifications to electrical circuitry'?

The modifications problem, or

so it appears, doesn't just affect new cars or those still under warranty. Alterations to your vehicle wiring could effect liability on insurance if an accident or fire was to occur, for example.

Now, as I'm someone who has often modified his car wiring to accommodate everything from cassette players to h.f. and v.h.f. transceivers...I ended up with much food for thought! So, before you modify your car's wiring to install any equipment, check to see that you're not going to cause yourself any unnecessary problems with the warranty or insurance!

The next area for discussion with my insurance information source, was regarding the use of amateur radio equipment on the move. It's a thorny legal point and like me, I've no doubt that many readers have been overtaken by 'executive' types driving in the motorway fast lane - while speaking

on a hand-held cellular telephone.

The problems of drivers using hand-held microphones/telephones while mobile on the roads, has obviously got the authorities worried. In fact, as I write this column in late September, I've just read of a country in the Middle East who have just banned the use of car telephones in any vehicle on the move. (Just how they intend to enforce it wasn't mentioned!).

Knowing the impressive bureaucracy of the European Economic Community (The 'Common Market' for our many non-European friends!) I wonder how long before we have a directive issued? It's already illegal - so I understand - to use a hand-held microphone/telephone when mobile.

So, perhaps we could end up with having to fit a 'hands free' microphone/headset to comply with the law AND insurance. Personally speaking, I know that generally

speaking, amateur radio enthusiasts are more safety conscious (by using headset/bloom microphones) than mobile cellular car telephone users are. Perhaps 'poser phone' users could take a leaf from our books and help keep insurance premiums down and further legislation at bay!

In closing off 'Keylines' this time, I must again say how much I'm looking forward to meeting friends old and new at the Leicester Show in October.

It's always an enjoyable time and hopefully all our readers will take the opportunity to express their opinions on the Editorial team's work by filling in our reader questionnaire. It's also your opportunity to help plan the *PW* You want to read.

Readers who complete and send in the questionnaire also stand a chance of winning our special prize scanner, donated by Mike Devereux G3SED of Nevada Communications. So, for the price of your opinion, you could help us to help you. Best of luck!

73 DE

*Rob Mannion G3XFD*

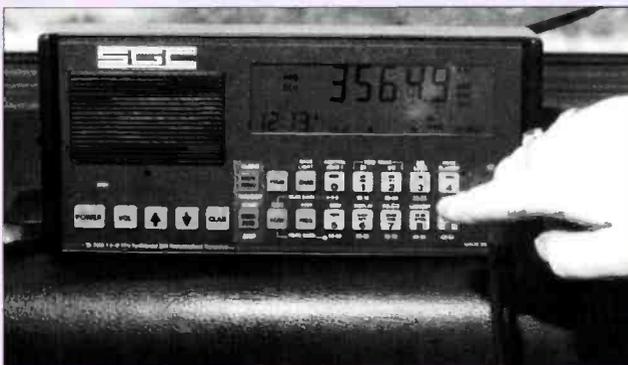
## SPECIAL PRIZE COMPETITION CORNER part 2

### First Prize

**SG-2000 HF Mobile Transceiver Worth Over £1800** Kindly donated by SGC. Inc.

**Second Prize** Jones Morse Key worth £65 Kindly donated by Peter Jones Engineering.

**Third Prize** Two Year Subscription To Practical Wireless



The November Questions (Enter Your Answers On The Special Coupon To Be Published In The December Issue Of *Practical Wireless*.)

**Question 1:** What does G3XFD regard the SG-2000's most striking facility to be?

**Question 2:** What method is used to secure the SG-2000's mobile mounting bracket to the vehicle?

Three special competition corner flash coupons are required for entry to our free competition. Corner flash 1 was published in the October issue of *PW*. Corner flash 2 is published in this issue. Corner flash 3 will be published in our December issue, along with the entry form. When you have answered all six questions and completed a tie-breaker sentence, entries can then be sent (with all three of the corner flashes attached to the form) to the Broadstone Editorial offices by the date to be published in the December issue.

You could win the dedicated SG-2000 h.f. mobile transceiver by answering the two questions opposite which are taken directly from the review by G3XFD of the SGC SG-2000 h.f. transceiver. Make a note of your answers, put them with last month's answers and keep them in a safe place until the December issue when you will be able to enter them on the entry coupon with the other four questions.

Entries received without the three original corner flashes and the final entry coupon will be disqualified. The Editor's decision will be final and no correspondence will be entered into. All winners will be notified by post.

## STAR LETTER

Dear Sir

I collected my copy of Sept 93 PW and I was particularly pleased to note the recognition of Pat Hawker G3VA.

Any hobby relies on, and owes debts to, those who put in effort for the inevitable admin and similar tasks in support of the primary objectives.

Amateur radio should be grateful that Pat G3VA, having 'sheathed the sword' should have taken up the 'pen' to such good effect. 'Technical Topics' is possibly the most read part of *RadCom*, and when you consider that Pat has been doing those pages for 35 years, you can only marvel at the stamina!

Thanks Pat, I hope to be reading and enjoying your work for many years to come. Are there more pages in similar vein coming?

PS: *Old Timer News* got there first! See OTN No 23, page 14 on 'Technical Topics' - A Third Of A Century.

**Dennis Lisney  
G3MNO  
Middlesex**

**Editor's reply:**  
Thank you Dennis, the PW team were pleased you enjoyed the 'Radio Personality' featuring Pat Hawker G3VA. Where credit is due, we should honour it. The editorial team hope to continue the feature whenever it's possible to show how much radio amateurs such as G3VA are appreciated.

# RECEIVING *you*

Dear Sir

I have recently bought a Sony ICF-SW55, primarily to revive an interest in s.w.l. going back over the last thirty years. The performance of the set is excellent and, equally important, the user-interface, the ergonomics are superb.

But, there has to be a catch I hear. Correct!

The broadcast f.m. section includes stereo decoding and a stereo line output. With a decent signal it acquits itself very well as a digital hi-fi tuner.

But why oh why oh why is there no facility to connect an external f.m. aerial? I live in mid-Northumberland where any f.m. reception requires an external aerial.

Is there **any way** I can connect an f.m. aerial to this set, even by devious means?

**Roy Stephenson  
Northumberland**

**Editor's tip:** This was a frequent problem when I lived in the north western Scottish Highlands Roy. An external Band II v.h.f. antenna was a necessity and I used the miniature 'Belling Lee' type angled wall sockets. These can be attached (with an adhesive or bolted/screwed on) near to the telescopic antenna. I found in practice that the outer braiding connection could be left free, while the centre core could be connected via a capacitor of between 25 and 100pF. This technique worked very well even when used on combined u.h.f./v.h.f. cabled systems with high signal levels on the cable. Obviously not a good match, but it worked! Any other suggestion from readers?

Dear Sir

Regarding the August 'Keylines' on rallies. When I first started attending rallies about 12 years ago, I really felt like a small boy let loose in a large toy shop! Everything seemed new and exciting, and of course there was lots of gear that I felt that I needed to get the most out of the hobby, so I was always on the look-

out for a bargain.

Over the years I seem to have amassed large quantities of 'bargains', purchased from under the tables and from the boots of cars. So each subsequent rally I attend, there is less that I really need.

To be honest, I don't really need a lot of what I already have. In short, I suppose my sort of rally is one where there is a

lot of junk and surplus, and my favourites are probably Luton and Newbury.

I went to Longleat this year and although I enjoyed the rally immensely, it is doubtful if I shall go again next year, because of the costs involved. When I last went about three years ago it cost me £1.50 to take the car into the grounds. This year it

cost me £10.00.

My wife, daughter and her friend came along and we were charged £2.50 each. The costs of refreshments seemed very high also.

For me, a good rally is where it does not cost an arm and a leg to get in, and where there are lots of surplus bargains.  
**Phil Gainey GODZM  
Gloucestershire**

Dear Sir

With reference to E. T. Waddington's timetable in the February issue, I would like to highlight my experiences, in my quest to become a Radio Amateur.

**Aug 1992.** Enrol at local college.

**Sept 1992.** Begin course of study (one evening per week).

**May 1993.** Sit Examination.

**June/July 1993.** "Phone and visit college on a regular basis enquiring after results. Not in yet, we are working with a skeleton staff because of holidays".

**July 1993.** Phone City and Guilds. "Yes all results have been released early this year".

**July 23 1993.** Back to college. "No, I'm sorry, not here yet". I then repeat the information I received from City and Guilds. One moment! I am told that a man arrives on the scene and starts to sort through piles of post in the temporary office. Lo and behold, "they're here" he says. Sign here, and he hands me TWO pieces of paper, one of which is a certificate. "Don't let this out of your sight he tells me, of the certificate.

I post of the other piece of paper and a postal

order and application to SSL (So Slow Ltd).

**July 29 1993.** The lot is returned from SSL, with a note explaining that a record of achievement is required. The man at the college had neglected to give me one.

**July 29 1993.** Record of Achievement plus other relevant bits sent back to SSL.

**Aug 10 1993.** Nothing received yet!!

No one who sat the RAE at this college in May 1993 has yet received a licence to operate a radio. I feel that 12 months is a bit extravagant.

**E. Troughton, Lancashire**

**Editor's comment:** A sorry tale indeed Mr Troughton. I hope by now you've got your licence. Readers concerned about the slow administration on all aspects of the amateur radio licence may be interested in my comments in the October PW 'Keylines'. On that page I suggested that amateur radio in the UK could certainly run the RAE courses and examinations in a more accessible fashion. I also suggested the hobby could oversee the issue of licences far more efficiently. I look forward to receiving readers' comments!

**Dear Sir**

The letter from G7OAR in August's *PW*, talked of preventing pirate operating by selling transceivers only to holders of the appropriate licence instead of selling to anyone. This is a nice idea but will not work. I'll explain why.

As readers of BARTG's DATACOM will already know, the sale of amateur band transceivers, (usually 144 or 430MHz), to unlicensed people has a been a point of irritation to me. After all, the shop makes its profit but the purchaser gets the prosecution and the fine.

Indeed, the purchaser may have assumed that any radio on open sale was perfectly okay and might never have thought about licensing or the legitimate users of the radio spectrum.

I visit London regularly and I've kept an eye on high-tech shops in the Tottenham Court Road and Oxford Street areas. Many have scanners on show in their windows and these are being joined by 144 and 430MHz transceivers from most of the well-known makes.

I am particularly concerned by the sales ethics of these shops. When one shop tried to sell me a 144MHz hand-held as 'covering all frequencies' and with 'a range of 100 miles' I knew that they didn't have a clue about the radio. But I did feel sorry for their customers who would be sold radios that didn't do what was claimed of them and could end up in court. The shop also claimed its price of £300 was at least £200 lower than 'the price back in your home town'. Remember that I was being shown a 144MHz hand-held.

I later went into a large high-tech shop on Oxford Street, near Centre Point, and explained that I wanted to buy a walkie-talkie for use on the Yorkshire

Moors. I patiently waited for their walkie-talkie expert, who showed me a well known 144MHz hand-held set. It covered - this expert said - 138 to 170MHz instead of just the usual 144 to 146MHz, (ouch - with no mention of legitimate amateur use!), which I suspect was actually the receive coverage of this hand-held. This expert also unknowingly gave me two big reasons to worry.

Firstly, although the shop may not be known in amateur radio circles, the leaflet about the radio which I was given, carried the imprint of a neighbouring shop which does advertise prominently in the amateur radio press. And I would have expected them to know about the licensing rules and about amateur radio.

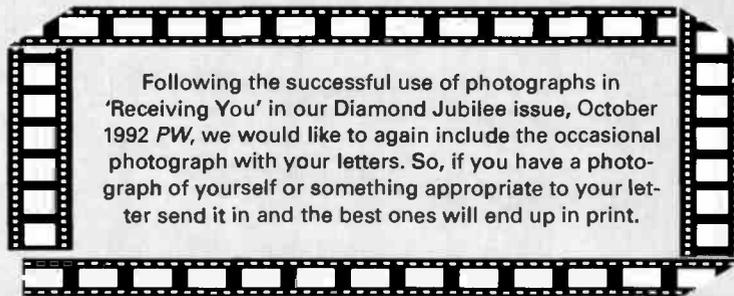
Personally, I find this attitude appalling and irresponsible. Here is the problem with respect to G7OAR's suggestion - how could anyone expect such shops to behave responsible enough to sell amateur band radios only to amateurs? It would appear that the profit is the only thing about which they have any conscience.

Perhaps a scheme along the lines of TV sales is needed. This would call for all sales of transmitters and transceivers to be notified to the licensing authority, who in turn would verify whether the customer held the appropriate licence. Now that amateur radio licensing is computer-based, this would be perfectly feasible and we might find fewer unintentional pirates on the amateur radio bands. In addition, maybe amateur radio transmitters and transceivers should be sold only via shops where staff hold amateur radio licences.

**Ian Brothwell G4EAN Nottingham**



Send your letters to the editorial offices in Broadstone. They must be original, and not duplicated in any other magazine. We reserve the right to edit or shorten any letter. The views expressed in letters are not necessarily those of *Practical Wireless*. The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by *Practical Wireless*. All other letters will receive a £5 voucher.



Following the successful use of photographs in 'Receiving You' in our Diamond Jubilee issue, October 1992 *PW*, we would like to again include the occasional photograph with your letters. So, if you have a photograph of yourself or something appropriate to your letter send it in and the best ones will end up in print.

**Dear Sir**

Just recently, I had occasion to work a Novice station on 3.5MHz c.w. During the QSO, I learned that the operator was just 14 years old, and was enjoying amateur radio immensely. The operator, **Jenny 2E0ABC**, was sending some of the best quality Morse I have heard in a long time. Indeed it was far superior to Morse I have heard from some more experienced operators.

Obviously, Jenny had spent some considerable time and effort learning the code, and this shows the quality of her sending. It's a pity that the anti-code brigade don't follow such an example!

Having since studied the terms of the Novice Licence, I personally would like to see an increase in the privileges allowed to Novices. As a 100% QRP operator, I suggest an increase in power to 5W on all modes, and access to all bands.

This would, I think, encourage even more people to take up amateur radio via the Novice route, and of course, suitably reward those who take time and effort to learn Morse code.

**Leighton Smart GWOLBI South Wales.**

**Editor's reply: Thank you for writing Leighton. And our congratulations go to Jenny 2E0ABC on her c.w. standard. If Jenny likes to send in a photograph of herself on the key which we can publish, she will receive a surprise through the post in reply from *PW*!**

**Dear Sir**

In *Practical Wireless* September 1993 you suggest that a number of insurance companies may not be happy with the permanent installation of amateur radio equipment in the car.

Now, I do not have any such equipment installed in my car, but last year I was intrigued when reading a list of 'exclusions' detailed on the reverse of my 'certificate of motor insurance'. It appears that a possible exclusion was the use of **Two Way Radio** equipment in the car!

When approached, the insurance company, in my case Norwich Union, advised that they had no objection to the presence of amateur radio equipment in the car as long as it was **permanently installed** and used for pleasure only. Yes, they would accept the risk, but **only up to the value of stereo radio equipment.**

If I had installed amateur radio

equipment in my car, then I think I would be tempted to increase my present base station radio insurance cover through 'Amateur Radio Insurance Services'. This company is of course expert in this field and would cover the higher value sets which a conventional insurance company would not understand.  
**Leonard J. L. Davies GORDV Northamptonshire**

**Editor's comment: An interesting variation on a theme Leonard! The insurance companies I contacted did not seem to want to insure amateur radio equipment permanently installed in a car. However, I notice your comment "only up to the value of stereo radio equipment". It's interesting point, because I have seen 'In Car' equipment costing up to £500 recently and surely, that's approaching the price of some new mobile rigs?**

# NEWS

## '93

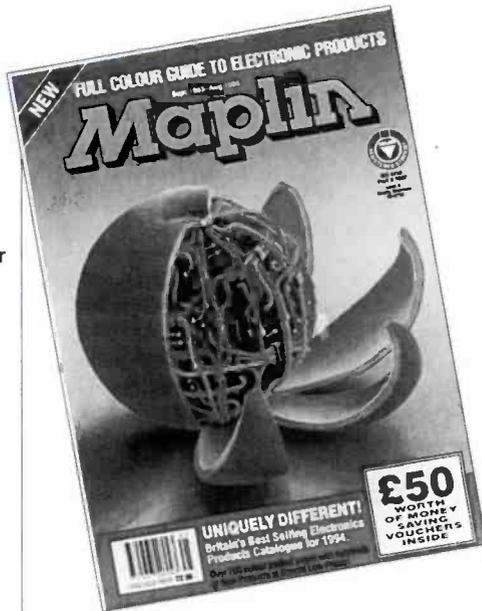
Send in your news, photographs and product information to Donna Vincent at the editorial offices in Broadstone.

### Software Design

Our apologies go to Software Design Ltd., for the omission of their telephone number in the 'Instructor Morse Professional Review', published in the October issue of *Practical Wireless*.

Anyone wishing to contact Software Design Ltd. can do so by writing to them at **Elgin House, 42 Westgate, Sleaford, Lincolnshire NG34 7PN** or by telephoning them on **(0526) 833042** (out of hours answering machine).

We apologise to Software Design and our readers for any inconvenience caused by this.



### New Maplin Electronics Catalogue

The 1994 Maplin Full Colour Guide To Electronic Products Catalogue features hundreds of new products, sourced from Europe as well as the Far East. The 1994 catalogue is in full colour.

The catalogue also contains a new look, user friendly index. In response to customer requests, the reference index is fully comprehensive and now contains sections such as Entertainment & Leisure, Security & Computers.

Among the many new products for this year are the Academy and White Gold Digital Multimeter ranges, tool kits, the latest semiconductors and components, a new range of Goldstar oscilloscopes as well as connectors, cables, in-car audio and many more electronic products. Also included in the catalogue for the first time are FAXes and drawing office equipment, colour TV cameras and a new range of power supplies.

Each copy of the Maplin Full Colour Guide To Electronic Products contains £50 worth of money saving vouchers that can be used to buy a particular product or be redeemed against the total cost of an order. The vouchers are valid until September 30 1994.

**Copies of the Maplin Full Colour Guide To Electronic Products are available from W H Smith stores for £2.95 or by mail order from PO Box 3, Rayleigh, Essex SS6 8LR for £3.45.**

### Martin Lynch Expands

Martin Lynch G4HKS has been operating from his radio shop in 286 Northfield Avenue, Ealing for the past three years. On 1 November 1993 he's on the move to a much larger venue 500 yards up the road from his corner shop.

Martin has been involved in Amateur Radio since the seventies. In 1990 Martin decided to go it alone, now three years later he's on the move again to a much bigger venue.

The 'Lynch Mob' are moving to a building six times the size of 286 Northfield Avenue. The new shop will allow Martin to expand the display areas of equipment for customers to browse at their leisure and to offer an even wider choice. There will be separate work stations for h.f., v.h.f., Packet, Datacomms, short wave receivers and scanners. As well as a wide range of books and magazines relating to amateur radio. Martin G4HKS, Chris Taylor G1FMH and Tony Finley G6RBK will all be on hand to offer demonstrations.

In the new shop there will be separate areas for Customer Care, including a lounge area with a colour television, magazines and even a box of Lego for those visitors who may not be as enthusiastic about the hobby as their friends and relatives. Brian Greenaway G3THQ will be operating a Customer Service Desk to ensure efficient access to equipment repairs for collection or delivery. There will also be a large dispatch area, run by Steve, for mail order and a large workshop facility.

Martin Lynch says there will be many special attractions on offer in the new showroom including late night shopping on Thursdays, Morse tuition on a weekly basis and Novice classes for all age groups. The aim of this new showroom is to offer the ultimate in family shopping for amateur radio and short wave listening and to encourage the growth of husbands, wives, sons and daughters to carry on the hobby.

The opening is on 1 November 1993 with a party on Saturday 6 November which promises a family welcome, lots of food, drink and special opening offers. **Why not pop along to 140-142 Northfield Avenue, Ealing, London W13 and see for yourself the new Lynch Emporium. The telephone and FAX numbers remain the same, Tel: 081-566 1120, FAX: 081-566 1207 for all your mail order enquiries.**

### South Dorset RS Hamfayre '93

Following the success of a similar event in 1992 the South Dorset Radio Society will be holding the SDRS Hamfayre '93 on November 21 1993 at the Portland Heights Hotel on the A354 (road on the summit of Portland), Dorset.

The object of the event is to promote the hobby of amateur radio to all with the overall emphasis on the young. Doors will be open to the public from 10.30am to 4.30pm.

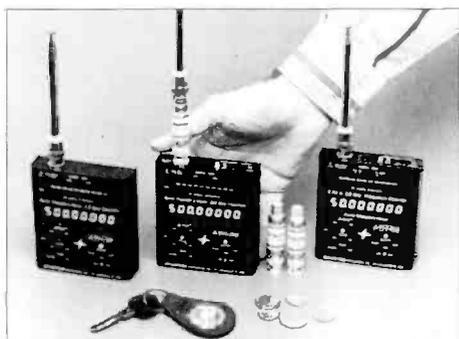
The club are planning to have 50/70MHz stations operating as

well as 144/430MHz. All the club call signs will be on air on h.f., v.h.f., u.h.f. and packet using 'X' greetings facility for non-licensed visitors to the event.

There will be stands in attendance, including *Practical Wireless* & *Short Wave Magazine*, the Scouts, RSGB, local radio/electronics/computer traders as well as a Bring & Buy and a raffle.

More details on SDRS Hamfayre are available from **Mike Lenzi G7HNY** on **(0305) 773860**.

## Startek Hand-Held Frequency Counters



Nevada Communications have recently introduced a new series of hand-held frequency counters to their range. The Startek frequency counters are from Startek, a new company formed by Fred Hufft. Fred was the original founder and owner of Opto Electronics which he left in 1988 to form Startek International Inc.

The ATH-15, 30 and 50 series counters allow hands free operation. Features include easy to use controls, fast response time, bright l.e.d digits and three to

five hour battery operation. All models come with a five year parts and one year labour warranty.

Nevada will be exhibiting the full range of Startek hand-held frequency counters at the Leicester Amateur Radio Show on October 29 & 30. If you can't make it to the show you can find out more about the Startek range by contacting **Nevada Communications, 189 London Road, North End, Portsmouth, Hants. Tel: (0705) 662145.**

## New Transceivers

South Midlands Communications Ltd. have announced that three new transceivers have joined their range of Yaesu products. The FT-2200 144MHz f.m. mobile transceiver is an improved version of the FT-212RH, with the FT-7200 as the 430MHz version. Prices are expected to be around £450.

The newly introduced FT-840 compact transceiver is aimed at being a direct replacement for the long established FT-747GX h.f. transceiver. Offering direct digital frequency synthesis and the traditional smooth tuning preferred by many operators, the FT-840 owner has the choice of two optional automatic antenna tuning units. **For further details of the new products contact: South Midlands Communications Ltd., SM House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY. Tel. (0703) 255111.**



## Marchioness Disaster

Do you remember whether you were monitoring maritime frequencies on August 20 1989, the night of the Marchioness Disaster on the River Thames in London?

If you were and think you may have heard any relevant transmissions from any vessels on the Thames that day Alex Sutherland would like to hear from you. Alex is Producer for a major TV documentary which is to broadcast later this year.

If you think you can help shed some more light on this tragedy, please contact Alex on 071-388 7700 as soon as possible.

## Kenwood Strengthens Dealer Network

Trio-Kenwood have recently strengthened their dealer network with the appointment of QSL Communications as an official amateur radio dealer.

Weston-Super-Mare based QSL Communications is run by Graham Patterson G4TJP. Graham has many years experience in amateur radio and has built his reputation on the range of good quality QSL cards that he prints. From their new premises in Weston-Super-Mare Graham and his wife will be supplying Kenwood products to amateurs in Bristol and the south west of England. They will also be in attendance at many of the rallies up and down the country.

For more information contact **QSL Communications, Unit 6, Whorle Industrial Centre, Coker Road, Worle, Weston-Super-Mare, Bristol BS22 0BX. Tel: (0934) 512757.**

## Revolutionary Sound Meter

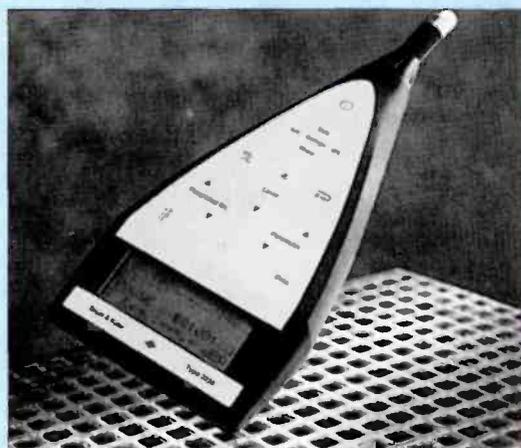
Bruel & Kjaer (UK) Limited based in Middlesex have introduced a new sound level meter, the Type 2236. The Type 2236, is a meter for measurement of noise in the workplace and is the first of a new series of general purpose instruments

The Type 2236 can provide facilities for an accurate assessment of noise levels and can be used as a low cost front-end for tape recorders, transferring signals via an unweighted, calibrated a.c. output for spectrum analysis. There is an internal memory that can store results from up to 40 survey locations and for six hours (expandable to 24 hours) of one second results.

Designed specifically for the UK, the Type 2236 has built-in standards and international parameters for all industrial noise measurement tasks. It can provide peak measurements that are required for comparison to the three action levels that are specified in the Noise at Work Regulations 1989. The measurements are performed in parallel to halve the measurement time and the results can be printed on-site to any standard serial printer.

The display and keys on the Type 2236 are self-explanatory and the two-way dialogue guides the operator through the measurement routine making operation easy.

For more information on the Type 2236 contact **Charles Greene, Bruel & Kjaer (UK) Limited, 92 Uxbridge Road, Harrow, Middlesex HA3 6BZ. Tel: 081-954 9504.**



## Electronics Workbench

Robinson Marshall (Europe) from Staffordshire are the UK agents for the Canadian company Interactive Image Technologies Ltd., who produce Electronics Workbench.

Electronics Workbench is a software program that turns

your computer into an electronics lab, complete with a bread board, an unlimited supply of parts and fully working simulated test equipment. The program allows the user to build and test simulated analog and digital circuits on a computer. Electronics Workbench is available in seven languages, sold in over 20

countries and is widely used for the study of electronics in colleges and universities around the world.

The program is available from **Robinson Marshall (Europe), 17 Middle Entry, Tamworth, Staffordshire B79 7NJ. Tel: (0827) 66212 and costs £238 inc. P&P and VAT.**

# NOVICE *natter*

Welcome to the start of a new, regular column in *Practical Wireless*. The reason for 'Novice Natter' is that the RAE isn't a magical formula - by that I mean once you've studied for it, and maybe passed, it doesn't mean you understand everything.

Where do you turn if you don't understand that technical talk last week at the radio club? What about the conversation you overheard, everyone talking knowledgeably so you didn't join in. Well, now there is somewhere to turn - here!

If there's some aspect of amateur radio you'd like explained, let me know. I can promise you if you don't understand, neither do plenty of others - usually some of those you heard expressing views on the same subject!

Also, if you organise an award, contest or special event station, please drop me a line. Events like this are ideal for encouraging the newcomer to the hobby as they get results quickly. An award or QSL card works wonders, just when you're feeling that perhaps the hobby isn't for you.

## Some Awards

The British Amateur Radio Teledata Group (or BARTG) run some awards that are open to amateurs and s.w.l.s alike. One of the most popular is the Quarter Century Awards - no you don't have to be over 25 to enter either.

If you're licensed you have to make two-way contact with other amateur stations in 25 countries - hence the Quarter Century title. As this is a BARTG award you have to use data comms modes e.g. AMTOR, RTTY or packet. Mind you, it doesn't end there. You can get additional stickers for every extra 25 countries you can work. If you're a s.w.l. then you

*Elaine Richards G4LFM brings you the first of a new regular column designed to introduce you to the fascinating world of amateur radio. Elaine is aiming to answer those queries on all those things you think you should know but don't.*

have to have heard amateur data comms stations in 25 countries. Again, extra stickers are available for the additional 25 countries.

To prove that you've either heard, or worked, all these stations is quite easy. You can either submit QSL cards, or a certified check list from your station log or a contest log from a BARTG sponsored contest.

Obviously, the last method is quite popular as there are plenty of RTTY stations around during a RTTY contest! You never know you could possibly get the award in one sitting.

If you would like some more details on either this or some of the other BARTG awards, contact **Nigel Roberts G4KZZ, 79 Mellowdew Road, Stoke, Coventry CV2 5GP.**

## Equipment Valuable

When you get interested in a specialised hobby, such as amateur radio, you seem to accumulate pieces of equipment. The value of this equipment varies from person to person, but it is usually valuable to the owner.

I wonder how many newcomers think about installing alarms to protect their gear - or is that only for those with a 'showroom' in their shack.

Cirkit Distribution Ltd. have a very reasonably priced alarm system for £45.49. It has a pas-

sive infra-red detector for general coverage with magnetic switches for additional door and window protection.

You've got 2.5 minutes to leave the shack once it's been set and about 15 seconds when you walk in. Oh

yes, it also runs from the mains, with a battery back-up.

If you're interested, and the idea of an alarm should at least be considered by all of us, you can contact **Cirkit Distribution Ltd., Park Lane, Broxbourne, Hertfordshire EN10 7NQ. Tel: (0992) 444111.**

## Licence Changes

Once you've got your shiny new licence, you don't want to lose it again - do you? You must pay your licence renewal fee on time, otherwise you could have your licence cancelled. Then you'll have to go through the rigmarole of producing the RAE certificate and Morse certificate all over again.

Mind you, the renewals are to be sent out six weeks before the expiry date to give you time to get yourself organised.

## Watch That S-Meter!

While listening to a recent QSO on the 3.5MHz band I was reminded of how easy it is to be misled by your receiver's S-meter. In this case, the two amateurs were attempting to measure the performance of a new antenna system using the S-meter at the receiving station. Now this is all very well and good in theory, but there are snags that you should think about. Let's start by considering just what the S-meter readings are supposed to tell you.

In the early days, the signal strength was gauged by ear using a scale from 1 to 9. In this system, a signal strength of 1 is a 'barely perceptible signal', whilst 9 is a 'strong signal'.

Of course, this system is still in use today and can be far more useful than readings obtained from an S-meter. When receivers became sophisticated enough to include S-meters, attempts were made to

give some degree of standardisation. The reference point is that a 50µV signal should give an S-meter reading of S9, with each S point below that being separated by 6dB.

It's also common practice to mark signals above S9 in dB. Typically, markings are made at 20dB intervals. The only snag with these fine ideals is that they are really difficult to achieve in a practical multi-band, multi-mode receiver. The end result is that many S-meters lie!

I've found that it's not uncommon for the difference between S points to be closer to 3 or 4dBs than the standard 6dB, and the readings above S9 can be just as suspect. Having looked through the test results of a wide range of transceivers, published both in books and magazines, it seems that it gets worse when switching to f.m.

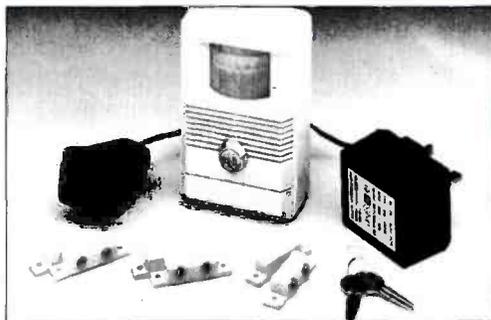
I've seen some high quality rigs, show a 4dB difference between S9 and S9+20dB! This is hopelessly misleading when trying to use the S-meter to measure antenna performance.

To make your S-meter useful, you really need to work out its accuracy. The best way to do this is to get hold of a calibrated signal generator (and someone who knows how to drive it if you don't). You just set the generator to give a reading of S9 then change the generator's output level making notes of the difference in output level at the various meter readings.

If you don't have a good signal generator yourself, then pay a visit to your local radio club. Some good old fashioned begging should solve the problem.

The important readings to take are the differences between the meter markings rather than the absolute levels. Once your meter has been calibrated for the various modes and bands, you can then offer comparison reports to other amateurs with some confidence. At least then you can add something to the conversation and know that your input is valuable.

**That's all I've got room for this month. I hope this first edition of 'Novice Natter' has proved useful. If there is anything you'd like to know about drop me a line at PO Box 1863, Ringwood, Hants BH24 3XD and I'll do my best to help you out.**



Alarm 'bells' for the shack from Cirkit.

# MARTIN LYNCH

G4HKS

THE AMATEUR RADIO EXCHANGE CENTRE

## REMEMBER REMEMBER THE SIXTH OF NOVEMBER!

### MARTIN LYNCH OPENS HIS NEW AMATEUR RADIO SUPERSTORE!

Northfield Avenue really has become a centre for Radio & Electronics. Having had Amateur Radio shops located in the road on and off for over fifteen years, it now boasts the best in a Computer store, at PC Solutions, Ex-PMR equipment at Trade Comms, Vintage and early Radio & electronic equipment at Rupert's and finally the best CAFE in town, the PARK CAFE, run by John & his family across the road from the new showroom! Add to that a good shopping parade including Antique & Bric-a-Brac shops, secondhand TV & Video stores, it's got to be worth a day out.

With far greater stock on show than ever before, Martin & his team can now complete the picture for all your radio requirements.

Over the next few months, separate areas for DataComms, including Packet, decoders for all modes, HF and VHF stations, ShortWave listening, Scanners corner, Accessory counter, Antennas with associated hardware, Books and much more will all be available from one location.

VISIT 140-142 NORTHFIELD AVENUE TODAY and see for yourself the difference in a REAL RADIO SHOP!!



The fireworks are going off a day late this year & GUY FAWKES has nothing to do with it! Officially opening on the 6th of November, Martin Lynch has moved his emporium 500 yards north along Northfield Avenue, to a massive new showroom dedicated to Amateur Radio. With representatives from the RSGB, Practical Wireless & ShortWave Magazines, AOR UK, Kenwood & ICOM UK and many more, this really is a day out for the family!

### OPENING ATTRACTIONS

#### WIN A BRAND NEW YAESU FRG100 WORTH £599!

Raffle Tickets are now available to win a new Yaesu FRG100 receiver. All the profits & proceeds from the raffle will be donated to the Radio Amateur Invalid & Blind Club and the draw will take place during December at a forthcoming Super Sale Weekend! Tickets are only one pound each, send your cheque cash or credit card details to MARTIN LYNCH, making it payable to the RAIBC. Better still, come along to the open day and join in the festivities that day. The winner will be picked from the entries by an RAIBC official in December.

#### MAIL ORDER - A REAL SPECIALITY

Moving into bigger premises has enabled our mail order operation to expand enormously. For any items listed in this magazine, give the Lynch team a phone call. If it's an approved product, we'll have it in stock and you'll get it within days, that's a promise!

#### FREE!!

A copy of our latest USED EQUIPMENT LIST, generated by computer every day is just a phone call away! Hundreds of clean guaranteed items, including rigs and accessories will be posted to you FREE the same day. Get dialling!

#### ANTENNAS

The full range of Tonna antennas is now available from the new shop. Due to more stocking area, antennas from Diamond, DEECOMM, Cushcraft, Comet, Panorama, Sandpiper and many more are now available. Call in during November and save a fortune! Mail Order a pleasure.

#### CABLES GALORE

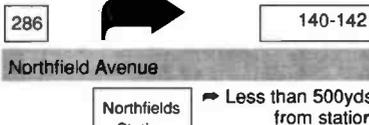
A full range of RF and DC cables are now available on our wall mounted dispenser, including good quality Westflex, Japanese FB Cable, RG-213, Ribbon Cable, plus all the plugs and adapters you'll ever want.

Tel:  
081 566 1120

FAX:  
081 566 1207



### DIRECTIONS!



By Tube, still the same Piccadilly line and get off at Northfields, but turn RIGHT, (instead of left for the old shop), walk less than five hundred yards and the showroom is on your left hand side. For those of you who know RUPERT'S Vintage Wireless shop, we're opposite!

By car, much the same as before, i.e the same road, still between the M4 & the M40 motorways. Phone for precise details.

### JUST LOOK AT THESE CRACKERS!

#### Low deposits from only

TS505	£99.00
FT990	£250.00
FT530	£59.00
TH78E	£49.00
IC737	£150.00
TH28/48E	£35.00
AR3000A	£95.00
TS950SDX	£395.00
FT1000	£395.00
TM732EE	£69.00
TM241E	£39.00
TS450/690S	£150.00

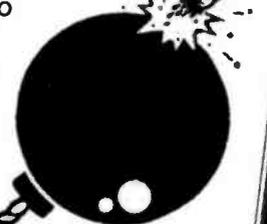


FROM NOVEMBER 1st WE WILL BE TRADING  
FROM: 140-142 NORTHFIELD AVENUE,  
EALING, LONDON W13 9SB

### It Won't Cost You A Bomb Either!

Special LOW prices are on offer all during November on both new & used equipment. Remember, Our FREE FINANCE offers are available on all new or used equipment over £200 and you can part exchange your current gear as a deposit. For visitors to the shop on the 6th of November, an extra special deal will be offered! Good News if you're selling unwanted equipment..

Because of the increase in space, MARTIN LYNCH desperately wants any good clean working AMATEUR RADIO EQUIPMENT. As an additional bonus, if you can't get it along to the shop, during November we'll collect it free of charge, providing you have the original packing, anywhere in the U.K.!!



# CLUB news

## Avon

**Thornbury & DARC.** Wednesdays, 8pm. United Reform Church, Chapel Street, Thornbury. A. Hellon G0RYV on (0454) 415215.

## Bedfordshire

**Shefford & DARS.** Thursdays, 8pm. Church Hall, Ampthill Road, Shefford, Bedfordshire. October 14 - Coopering, 21st - Members Activity Night & CQ World Wide Planning, 28th - Junk Sale, November 4 - Members Activity Night, 11th - A Talk by Nic G4TXG. Paul G1GSN on (0462) 700618.

## Berkshire

**Newbury & DARS.** 4th Wednesdays, 7.30pm. Bucklebury Memorial Hall. October 27 - Visit by Peter Kirby G0TWW, General Manager of the RSGB. Norman on (0635) 863310.

**Reading & DARC.** 2nd & 4th Thursdays, 8pm. The Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. October 16/17 - JOTA. Nick Challacombe GOLGG on (0734) 722489.

## Buckinghamshire

**Milton Keynes & DARS.** 2nd & 4th Mondays, 7.30pm. Drill Hall, Wolverton, Nr. Wolverton Station, Milton Keynes. November 8 - Bring & Buy Night. Dave McQue G4NJU.

## Cheshire

**Mid-Cheshire ARS.** Cotebrook Village Hall, Cotebrook, Nr. Northwich, Cheshire. Mike Baguley G7LDD on (0606) 331210.

**Stockport RS.** 2nd & 4th Wednesdays, 7.45pm. Room 14, Dialstone Centre, Lisburne Lane, Offerton, Stockport, Cheshire. October 27 - Home Built Receivers by Rev. George Dobbs G3RJV, November 10 - Construction Competition. Jim France G3KAF on 061-439 4952.

## Cornwall

**Cornish RAC.** Village Hall, Perranwell Station, Perranwell, Nr. Truro, 7.30pm. Miss T. Warrillow G00OP on (0872) 222605.

## Derbyshire

**Buxton Radio Amateurs.** Lee Wood Hotel, Buxton, 8pm. October 26 - Events 1994, November 9 - AGM. Derek Carson G4IHO on (0298) 25506.

**Derby & DARS.** Wednesdays, 7.30pm. 119 Green Lane, Derby. October 27 - Terminating & Waterproffing Coaxial Cables & Connectors by G6ABU, November 3 - Junk Sale. Hayley Winfield 2E1AJI on (0773) 856904.

## Devon

**Appledore & DARC (Devon).** 3rd Mondays, 7.30pm. Appledore Football Clubroom. October 18 - RNLI by Three members of the Appledore Station. Reg Lyddon G4ETJ, QTHR on (0237) 477301.

**Torbay ARS.** Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. October 22 - Peter Chadwick G3RZP RSGB President. W. Hipwell G3HTX on (0803) 526762.

## Dorset

**South Dorset RS.** 1st Tuesdays, 7.30pm. Wessex Lounge of Weymouth Football Club. Mike Lenzi G7HNY on (0305) 773860.

## East Sussex

**Crowborough & DARS.** Thursdays, 8pm. Plough & Horses, Crowborough. October 21 - Hastings Repeaters by G4BCO. Michael Smith G6UUO on (0892) 661807.

**Hastings Electronics & RC.** 3rd Wednesdays, 7.30pm. 16 Grand Parade, St. Leonards-on-Sea, East Sussex TN35 6DN. October 20 - Junk Sale at West Hill Community Centre. G3YYF on (0424) 830454.

## East Yorkshire

**North Ferriby United ARS.** Fridays, 8pm. North Ferriby Utd., FC Social Club, Church Road, North Ferriby, East Yorkshire. October 15 - Rob Mannion G3XFD Editor of *Practical Wireless*, 22nd - On The Air Night, 29th - RSGB Video, November 5 - On The Air Night. Frank Lee G3YCC on (0482) 650410.

## Essex

**Bishops Stortford ARS.** 3rd Mondays, 8pm. British Legion Club, Windhill, Bishops Stortford. October 18 - AGM. John Dudeney on (0799) 550313.

**Braintree & DARS.** 1st & 3rd Mondays, 8pm. Community Centre, Victoria Street, Braintree. October 18 - Junk Sale, November 1 - Wavemeter - Design & Construction Part 1. J. F. Button G1WQQ c/o G4JXG, 88 Coldnailhurst Avenue, Braintree, Essex CM7 5PY.

**Vange ARS.** Thursdays, 8pm. Barnstaple Community Centre, Long Riding, Basildon, Essex. October 14 - Steam Trains by G7JXJ, 21 - The PX4 Computer, 28 - Construction Contest, November 4 - Junk Sale, 11th - Home-Brew Comms Receiver by Ray G3IOI. Doris on (0268) 552606.

## Greater London

**Acton, Brentford & Chiswick ARC.** 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, London W4. October 19 - Mobile Radio Equipment by G0IIP. Colm Mulvany G0JRY on 081-749 9972.

**Cray Valley RS.** 1st & 3rd Thursdays, 8pm. Progress Hall, Admiral Seymour Road, Eltham SE9. October 21 - The History Of JOTA by G4NOW, November 4 - China a talk by G3DCC. Bob Treacheron 081-850 1386.

**Crystal Palace & DRC.** 3rd Saturdays, 7.30pm. All Saints Parish Rooms, Beulah Hill, London SE19 (opposite junc. Grange Road). October 16 - Club Quiz Night - Radio & General Knowledge. Wilf Taylor G3DSC on 081-699 5732 or Bob Burns G30OU on (0737) 552170.

**Edgware & DRS.** Watling Community Centre, 145 Orange Hill Road, Burnt Oak, 8pm. October 14 - Operating QRP by Wayne Dillon G0JJQ, 28th - Morse Training Evening. Howard Drury G4HMD on (0923) 822776.

**Loughton & DARS.** Room 12 of Loughton Hall, 7.45pm. October 15 - Inter Club Trivia Quiz by John Short G1DJ, 29th - What Is Word Processing by John Short G1DJ, November 12 - National Trust by J. Archer. Ray Padley G0LWF on 081-500 2811.

**Silverthorn RC.** Fridays, 7.30pm. The Chingford Community & Adult Education Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. November 5 - Night On The Air/Social Evening. Andrew Mowbray G0LWS on 081-529 4489 between 5.30 & 6.30pm weekdays only.

**Southgate ARC.** 2nd & 4th Thursdays, 8pm. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. October 14 - Second Great Junk Sale, 28th - The Finer Points Of DXing by Doug Goodison G0LUH, November 11 - Construction Judging For G6QM Trophy. Brian Shelton G0MEE on 081-360 2453.

## Greater Manchester

**Rochdale & DARS.** Mondays, 8pm. The Cemetery Hotel, 470 Bury Road, Rochdale, Lancs. October 18 - Bring & Buy Sale. Brian on 061-653 8316 or Dave (0706) 32502.

## Gwynedd

**Dragon ARC.** 1st & 3rd Mondays, 7.30pm. Four Crosses Hotel, Menai Bridge. October 18 - George Pruess SWL takes the evening, November 1 -

Surplus Sale. Tony Rees GW0FMQ on (0248) 600963.

## Hampshire

**Basingstoke ARC.** 1st Mondays, 7.30pm. Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke. October 31 - 144MHz Direction Finding Competition, November 1 - Make A UHF Reflectometer. (0256) 25517.

**Horndean & DARC.** 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross (off Catherington Lane), Horndean, Hants. November 4 - Video Evening. Stuart Swain G0FYX on (0705) 472846.

**Itchen Valley RC.** 2nd & 4th Fridays, 7.30pm. Scout Hut, Brickfield Lane, Chandlers Ford. October 15, 16 & 17 - JOTA, 22nd - Wild Life Radio Tracking by Brian Cresswell. Les Kennard G3ABA on (0703) 732997.

**Winchester ARC.** 3rd Fridays, 7.30pm. Red Cross Centre, Durngate House. October 15 - Mini Lectures. Peter Simpkins G3MCL on (0962) 865814.

## Hereford & Worcester

**Bromsgrove ARS.** 2nd & 4th Tuesdays, 8pm. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. October 26 - Electromagnetic Waves Video, November 9 - On The Air Night. Mr B. Taylor G0TPG on (0527) 542266.

**Bromsgrove & DARC.** 2nd Fridays. Avoncroft Arts Centre, South Bromsgrove, Worcester. Joe Poole G3MRC on (0562) 710010.

## Hertfordshire

**Dacorum AR & TS.** 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. October 19 - Mike Dennis G3XDV Managing Editor of *Radcom*. Dennis Boast G1AKX, 8 Juniper Green, Warners End, Hemel Hempstead HP1 2NQ.

**Hoddesdon RC.** Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon, Herts. October 14 - The Scheinder Trophy Air Race Film & Talk by Rex G3NQT, 28th - Visit to Hertfordshire Display with John G4VMR. Roy G4UNL on 081-804 5643.

## Humberside

**Goole R & ES.** Fridays, 7.30pm. West Park Pavilion, West Park, Goole, last Fridays at the 'Black Swan Inn', Asseby. October 15 - Microwaves Video, 22nd - Junk Sale, 29th - Social Evening, November 5 - On The Air Night. Steve Price G8VHL on (0405) 769130.

## Kent

**Bromley & DARS.** 3rd Tuesdays, 7.30pm. The Victory Social Club,

Kechill Gardens, Hayes, Kent. October 19 - Junk Sale. **Alan G7GBH** on 081-777 0420

**Medway AR & TS.** Fridays. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. Visitors & new members welcome. October 15 - Interference by Ray Petri G00AT, 28th - Visit to Kingsnorth Power Station with Geoff G3YVF, November 12 - Fish & Chips Supper. **Mrs Gloria Ackerley G70VI**, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. Tel: (0634) 710023.

**Sevenoaks & DARS.** October 18 - Air Crashes by Dick Vance. **The Secretary, c/o Sevenoaks District Council, Council Offices, Argyle Road, Sevenoaks, Kent TN13 1HG.**

**South East Kent ARC.** Wednesdays. Duke Of Yorks School, Guston, Nr. Dover. October 20 - Suplus Equipment Sale, 27th - Icom (UK) Presentation, November 3 - Novice Evening, 10th - G2CJC Inter Club Quiz. **Paul Turvey G1PJJ** on (0304) 214030.

## Lancashire

**Bury RS.** Tuesdays, 8pm. The Mosses Community Centre, Cecil Street, Bury, Lancashire. October 19 - Ragchew & Operating, 26th - Video Evening, November 2 - Committee Meeting, 9th - Junk Sale. **Steve Gilbert G3OAG** on 061-881 1850 or Colin Fox G3HII on (0204) 883212.

**Hesketh ARC.** Every other Tuesday. Birkdale, Southport. October 26 - Logic Gates, November 11 - Rubber Products. **Bernie G7DEM** on (0704) 63344.

**North Sefton ARC.** 2nd Wednesdays, 8pm. Ainsdale, Southport. **Ian Hampson G1DFT**, 57 Cornwall Way, Ainsdale, Southport PR8 3SG on (0704) 579017.

## Leicestershire

**Charnwood AR Contest C.** 1st & 3rd Sundays. The Albion, Loughborough. October 17 - HF Antenna Development Discussions, 24th - AGM, November 7 - Contest Planning. **Phil** on (0509) 232927.

## Lincolnshire

**Grantham RC.** 1st & 3rd Tuesdays, 8pm. Kontak Sports & Social Club, Barrowby Road, Grantham. October 19 - Antennas by Mike G3PJR, November 2 - Trunked Radio Systems by John G8WWJ. **John Kirton G8WWJ** on (0476) 65743.

## Merseyside

**Liverpool & DARS.** Tuesdays, 8pm. Churchill Club, Church Road, Wavertree, Liverpool. October 19 - Construction Contest, 26th - Surplus Sale, November 9 - Club On The Air. **Ian Mant G4WWX** on 051-722 1178.

**Wirral & DARC.** Irby Cricket Club, Mill Hill Road, Irby, Wirral, 8pm. October 20 - Visit to Mersey Tunnel, 27th - The Friedrichshafen Adventure by Ron & Crew of German Rally Explorers, November 3 - O & W at The Bridge Inn, Port Sunlight, 10th - Microwaves

by Mike Dixon G3PFR. **Paul Robinson G0JZP** on 051-648 5892.

## Norfolk

**Dereham ARC.** 2nd Thursdays, 8pm. St. Johns Ambulance Hall, Yaxham Road, Dereham. October 14 - Component Suppliers, November 11 - What Routes To Take. **Mark Taylor G0LGJ** on (0362) 691099.

**Norfolk ARC.** Wednesdays, 7.30pm. University Arms, South Park Avenue, Norwich. October 27 - Construction of 12ft EME Antenna, 29th - Club Outing to Leicester Amateur Radio Show, November 3 - Committee Meeting, 10th - Science For All by Arnold G3PTB, **Dale Simkin** on (0603) 37393.

## Northants

**Kettering ARS.** Tuesdays, 7.30pm. Electricity Sports & Social Club, Eksdale Street, Kettering. November 2 - A Visit from Castle Electronics. **Len GORDV** (but QTHR as G7EHM) on (0536) 514544.

## Nottinghamshire

**Mansfield ARS.** 2nd Mondays, 7.30pm. Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. November 8 - Talk by Pete Garrard Supt. Air Traffic Controller from East Midlands Airport. **Mary GONZA** on (0623) 755288.

**Nottingham ARC.** Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. October 14 - Introduction To Satellite Communication by G4IIO, 21st - G0IXR, G0FDG & G4NZU - An Evening Of Morse, 28th - Doublet & Mini Doublet Antennas by G3WQW. **Simon G0IEG** on (0602) 501733.

**South Notts ARC.** Highbank Community Centre, Farnborough Road, Clifton Estate, Nottingham, or Fairham Community College, Farnborough Road, Clifton Estate. October 15 - Open Forum - Members Only, 22nd - On Air & Construction, 29th - Junk Sale, November 5 - On Air & Construction. **Julie Brown G0SOC**, PO Box 4, Nottingham NG11 9DE.

## Scotland

**Banff & DARC.** 1st & 3rd Fridays. Banff Castle, Castle Street, Banff, Aberdeenshire AB45 1DL. October 22 - What You Missed On Six Metres, November 5 - Computing In Radio. **Martin Andrew G6VXB** on (03465) 82061.

**Dundee ARC.** Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. October 19 - Members Night, 26th - Construction Night, November 2 - All You Want To Know About Packet by Brendan Hynes G6OPQV, 9th - Construction Night. **George Millar G4FSB**, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.

**Lothians RS.** 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, 29 Polwarth Terrace, Edinburgh EH11 1NH. October 27 - Visit to Lothain & Borders Police HQ, Talk & Tour of Operations Centre, November 10 - Junk Sale. **Colin Wright G4HWO.**

**Paisley ARC.** Alternate Wednesdays, 7.30pm. YMCA, 5 New Street, Paisley. October 27 - Early Radar by J McDougall G63CIX, November 10 - Development In Europe Of Personal Communications by J. Hood G4MCOX. **Stuart G67OIG** on (0509) 335195.

## Somerset

**Wincanton ARC.** 1st & 3rd Mondays (except Bank Holidays - 2nd & 4th), 7.30pm. The Community Lounge, King Arthur's Community School, Wincanton, Somerset. October 18 - Open Evening, November 1 - The RSGB by Peter Chadwick G3RZP.

**Yeovil ARC.** Thursdays. Red Cross HQ, Grove Avenue, Yeovil, Somerset. October 14 - Inter Club Quiz with South Dorset Club. October 14 - Inter Club Quiz with South Dorset RC, 21st - RAYNET Within The Club by G3MIZ, 28th - Club Stations On The Air/Committee Meeting, November 4 - Antenna Problems Aired, 11th - Home Brew Yeovil Rigs, On Air G3PCJ. **Cedric White G4JBL** on (0258) 73845.

## South Yorkshire

**Sheffield ARC.** Mondays 7.30pm. Firth Park Pavilion, Firth Park Road, Sheffield. October 18 - Meet The New Committee, 19th - Ten Pin Bowling Competition, 25th - Quiz & HF Operation, 26th - Swimming, November 2 - RAYNET Meeting, 8th - Bring & Buy Sale, 9th - Ten Pin Bowling Competition. (0742) 446282.

## Suffolk

**Felixstowe & DARS.** October 25 - Sausage & Mash Supper, November 8 - Radio Propagation by Jim Bacon G3YLA **Paul Whiting G4YQC** on (0394) 273507.

**Leiston ARC.** 1st Tuesdays, 8pm. Sizewell Visitors Centre, Sizewell Power Station. November 2 - AGM. **Bob Simmons G0HSI** on (0986) 874800.

## Surrey

**Horsham ARC.** Guide Hall, Denne Road, Horsham, West Sussex, 8pm. November 4 - Antenna Modelling by Derek Atter G3GRO. **Peter Stevens G8SUI** on 0737) 842150.

**Surrey RCC.** 'Terra Nova' The Waldrons, Waddon, Croyden, Surrey. October 18 - Natter Night. **Berni G8TB** on 081-660 7517.

**Sutton & Cheam RS.** 3rd Thursdays, 7.30pm. Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter Nights - 1st Thursdays. October 21 - Junk Sale, 26th - Committee Meeting, 28th - Visit To King & Barnes Brewery, November 4 - Natter Night. **John Puttock G0BWV**, 53 Alexandra Avenue, Sutton SM1 2PA.

**The Kingston & DARS.** 3rd Wednesdays, 8pm. Alfriston, 3 Berrylands Road, Surrey KT5 8RB. October 20 - The Novice Training Scheme - Practical Experiences by Tony Fell G7OGW. **Ray Fuller** on 081-398 1128.

**Wimbledon & DARS.** 2nd & last

Fridays. St. Andrews Church Hall, Herbert Road, Wimbledon SW19. October 29 - AGM, November 12 - Meet The Committee. **Chris Frost G0KEB** on 081-397 0427.

## Warwickshire

**Mid-Warwickshire ARS.** 2nd & 4th Tuesdays. November 9 - Programme Discussion. **Don Darkes G8HRI** on (0926) 424465.

**Stratford-Upon-Avon & DRS.** 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Road, Tiddington, Stratford-Upon-Avon, Warwickshire. October 27 - BATC by Mike Wooding G6IQM. **Alan Beasley G0CXJ** on (0608) 82495.

## West Midlands

**Solihull ARS.** 3rd Thursdays. The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. October 21 - AGM. (0827) 53344 daytime.

**South Birmingham RS.** 1st Wednesdays, 8pm. Hampstead House, Fairfax Road, West Heath, South Birmingham. November 3 - AGM. 021-474 3784.

## West Sussex

**Mid-Sussex ARS.** Thursdays, 7.45pm. Marle Place Further Education Centre, Leylands Road, Burgess Hill, West Sussex. October 15 - Bonsai Antennas by Derek Atter G3GRO. **Chris Coward G3YTU** on (0444) 458992.

## West Yorkshire

**Halifax & DARS.** 1st & 3rd Tuesdays, 7.30pm. October 19 - Equipment from Peter Rodmell. **David Moss G0DLM** on (0422) 202306.

**Keighley ARS.** The Ingrow Cricket Club, Ingrow, Keighley, 8pm. October 14 - Cameo Evening, 21st - Natter Night, 28th - Junk Sale, November 4 - Natter Night, 11th - RAYNET by G3RXS. **Kathy Conlon G0RLO** on (0274) 496222.

**Spenn Valley ARS.** Thursdays, 8pm. Old Bank Working Men's Club, Mirfield. Alternate Thursdays - 'Noggin & Natter nights'. October 21 - Packet Radio by Wakefield Packet Group, November 4 - Mischief Night On The Air. **Tony Galvin G0IKD** on (0532) 534437.

## Wiltshire

**Trowbridge & DARC.** 1st & 3rd Wednesdays, 8pm. Southwick Village Hall, 8pm. October 20 - Antenna Systems Matching by G0DAB, November 3 - Natter Night. **Ian G0GRI** on (0225) 864698.

Please send in all of your 'Club News' items to Donna Vincent at the editorial offices in Broadstone.

# NEVADA

EVER

## KENWOOD RADIO

### Kenwood TSS0



Just arrived. This new "micro" 100 watt HF mobile rig is in short supply because of its popularity. We have purchased large quantities - call for info or port exchange price on your old HF rig..... **£999**

### Kenwood Radio

R5000 S/Wave Rec	
1.50kHz - 30MHz	£939.00
TS-950SDX HF Trans	
auto ATU & DSP	£3475.00
TS-850SAT HF with auto ATU	£1695.00
TS-450SAT Mobile HF with auto ATU	£1400.00
TS-690S Mobile HF & 6m	£1400.00
TS-140S Budget HF Transceiver	£845.00
TM-732E 2m/70cm Twin Mobile	£629.00
TR-751E THE BEST 2m M/Mode	£705.00
TH-78E Twin Band Handheld	£440.00
TS-790E Tri-Band Base	
2/70/Op. 23cm	£1690.00

### Kenwood Accessories

PS-52/53 Moins PSU Full Duty	£269.00
TL-922 HF 2kV amp	£1645.00
MA-5 5-Band Mobile HF Ant	£119.00
AT-50 Moching Auto ATU for TSS0s	£279.00
SM-230 Station Spectrum Display	£795.00
HS-5 Deluxe Cams H/Phones	£45.00

### Kenwood Microphones

MC-50 Desk Mic	£84.95
MC-60A Desk Mic (Pre-Amped)	£99.95
MC-80 Electret Desk Mic	£59.95
MC-85 Deluxe Desk Mic	£119.95
MC-43S Dynamic H/Mic	£22.95
MC-44E H/Mic Prog. Func.	£29.95
MC-45E H/Mic Multi Functions	£29.95
MC-44DME H/Mic DTMF	£45.95
MC-45DME H/Mic DTMF	£49.95

## DRAKE



**Drake R8E** - To own one of these receivers is a dream in itself - everything you could ever want in facilities and performance is in the R8E. Drake are no newcomers to radio - they have been No. 1 in the USA since 1943! Unlike other expensive receivers the Drake has all its filters fitted as standard, therefore, there are no hidden extra costs. Its performance is truly staggering! With an excellent dynamic range coupled with superb filtering it takes a lot of beating! Multiple scan facilities, easy use 100ch. memory, all mode coverage and synchronous detector for improved AM reception are just a few of its extensive range of facilities.

**£995**

H Twin VFO's H Selectable AGC  
H Passband Tuning  
H Timer Function H RS232  
Interface H Built-in pre-Amp H Dual Noise  
Blanker H Non-Volatile Memory H 100kHz -  
30MHz Wide Coverage

### Options

Matching Speaker	£49.95
P.C Drive Software	£59.95
Full W/Stop Manual	£29.95
VHF Converter (Internal)	£225.00

## ICOM RADIO

### Icom IC-737

A new full coverage HF transceiver with Auto ATU, Electronic Keyer, good receiver and a host of extras

IC-735 HF all band mobile	£1135.00
IC-728 HF 100w Mobile	£945.00
IC-729 HF Plus 6m Mobile	£1230.00
IC-229E 2m FM Mobile	£369.00
IC-P2ET 2m FM Handie	£303.00
IC-P4ET 70cm FM Handie	£360.00
IC-W21E 2m/70cm Handie	£425.00
R-100 Mobile Receiver	£595.00
R-7100 Wide Band Base RX	£1375.00
R-72E HF S/Wave Receiver	£815.00
IC-R1 Handheld Receiver	£395.00



### ICOM ACCESSORIES

IC-AT150 Auto ATU	£403.00
IC-PS55 Deluxe 20A PSU	£232.00
SP-21 Base Station Speaker	£132.00

### POWER SUPPLIES

Standard 3 Amp UK Spec	£17.95
Standard 7 Amp UK Spec	£29.95
Standard 10 Amp UK Spec	£59.95
HP12S 12 Amp Twin Meters	£79.95
HP1230S 30 Amp Twin Meters	£139.00
HP1250S 50 Amp Twin Meters	£220.00

### ANTENNAS - SAGANT End Fed ZEPP Antennas

Using Vinyl coated annealed copper wire - supplied with matching unit for coax feed - high quality Japanese made.

3.5 MHz (39 mtrs long)	£79.95
7.0 MHz (20 mtrs long)	£79.95
14.0 MHz (9.9 mtrs long)	£79.95
Trap Dipole 40/80	£89.95
Pair 40 mtr Traps	£119.95
2kW Balun 1:1	£29.95

### HARI HIGH QUALITY WIRE ANTENNAS

Constructed using heavy duty multi stranded clear plastic coated wire to professional standards. These Antennas are built to last.

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W3 DZZ (80-40mtrs) 200W	
Trap Dipole	£79.95
W3 DZZ (80-40mtrs) 1kW	
Trap Dipole	£99.95
WARC Trap Dipole (200W)	£79.95
Broadcast RX Antenna (1-30MHz)	£59.95
Windom (80-10mtrs)	
Full size 1kW	£79.95
Windom (80-10mtrs)	
Full size 200W	£59.95
Windom (40-10mtrs)	
1/2 size 1kW	£69.95
Windom (40-10mtrs)	
1/2 size 200W	£49.95
Balun 1:1 1kW	£29.95
Balun 1:1 200W	£24.95

### TONNA VHF BEAMS

2m 9 Ele. Parabolic Beam (13.1dB)	£49.95
2m 9 Ele. Crossed Beam (13.1dB)	£86.95
2m 11 Ele. Beam (14.1dB)	£77.95
70cms 9 Ele. Beam (13dB)	£43.95
70cms 19 Ele. X Beam (16.2dB)	£61.95
2m/70cms Oscar Special (9/19 Ele)	£85.95

### DIAMOND BASE

X50 2m/70cm base vert	£79.95
X300 2m/70cm higher gain vert	£129.95

### Scanning Receivers

We are probably the UK's largest distributor and stockist of scanning receivers - we have listed here a few of the popular models but for full information why not send in £2 for our full colour catalogue.

### Yupiteru

MVF-7100 hand-held	£399.00
MVF-8000 mobile	£389.00
MVF-7000 hand-held	£369.00
MVF-3100 <b>NEW MODEL</b>	£199.00
VT-150 marine	£189.00
VT-125 airband	£189.00
VT-225 civil/military airband	£269.00

### AOR

AR3000A base/mobile	£899.00
AR1500 hand-held	£339.00
AR2500 base	£399.00

### Commtel

COM 102 marine/PMR	£99.95
COM 203 hand-held	£213.00
COM 204 hand-held	£249.95
COM 205 base	£344.00

### Fairmate

HP2000 hand-held	£299.00
MS1000 base	£299.00

### Icom

R1 hand-held	£395.00
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### Black Jaguar

BJ200 MKIV	£239.00
BJ1300 <b>NEW</b>	POA

### Bearcat

BC2500XLT <b>NEW</b> hand-held	£365.00
BC890XLT <b>NEW</b> base	£299.00
BC200XLT	£249.95

### Accessories

JIM M75 pre-amp	£79.95
JIM M100 pre-amp	£89.95
Scanmaster GW2 pre-amp	£59.95
Scanmaster base stand	£19.95
Scanmaster mobile holder	£14.95

### Scanmaster Antennas

Base 500kHz - 1500MHz	£39.95
Discone 25 - 1300MHz	£49.95
Double discone 100 - 1300MHz	£59.95
Mobile 25 - 1000MHz	£29.95



## EXTENDAMAST 10 METRE RETRACTABLE MAST

Suitable for: Dipoles, long Wires, VHF/UHF Beams, G5RV and many other antennas. A new and inexpensive aluminium 10 metre retractable mast that may be used at home or for portable use. Easy to erect in minutes - your antennas can now be independent of trees, buildings and other make shift fixing points! The steel guying rings are corrosion protected to provide years of useful life. Because individual requirements vary guy wires are not included. A base fixing plate is available as an extra.

**Introductory Price £69 Plus £8 Carriage**

## THIS MONTH'S BEST BUY

### Electronics VC3000LP

Canadian-built ATU with a host of features:

- 1.8 - 30MHz
- 150W (300W PEP)
- 4:1 Balun
- 300W dummy load
- Peak/average power
- Dual reading SWR/power meter
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### New ATH™ Series - features include:-

**HANDS FREE** operation to automatically read and hold a signal within 80m/seconds. The counter is super fast because it does not require the additional time for multiple readings like digital filtering techniques.

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A full range of accessories is available - send for our leaflet.

#### Model ATH-50

- 5Hz - 2800MHz
- High speed
- Bar graph reads to 4GHz
- One Shot instant hold and display reading

£289

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- 1 - 2800MHz
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- Bar graph reads to 4GHz
- Extra bright LED display
- One Shot feature

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#### Model ATH-15

- 1 - 1500MHz
- High speed - 6 fast gate times
- Bar graph reads to 4GHz signal strength
- Extra bright LEDs
- Automatic clean dropout

£199

#### Model 1350

- Covers 1 - 1300MHz
- 3 gate times. An entry level counter that offers excellent value for money

£129



## From Australia we introduce... Outbacker

Outstanding new mobile antennas from Australia. A commercial design proven in the Outback for 22 years.

If you are going mobile, this new antenna is all you need. The Outbacker covers from 160 thru' to 10m including all VWARC bands, without the need

for an ATU. Lookout for the reviews which will be coming shortly. We have been running around with these antennas and the new Kenwood TS50 for the last few weeks, working everything in sight. The antenna is constructed of fibreglass with copper helical windings covered with a coating of urethane for strength, durability and protection. Tap points for each amateur band are clearly engraved on the antenna.



<b>OUTBACKER</b> 1.7m long, 300w, 80 thru' 10m.....	<b>£189.95</b>
<b>OUTBACKER (T)</b> As above but including top band.....	<b>£219.00</b>
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<b>PERTH</b> 2.1m long, 300w, 80 thru' 10m.....	<b>£199.95</b>
<b>Perth (T)</b> As above but including top band, 100w.....	<b>£235.00</b>
Heavy duty boss spring.....	<b>£59.95</b>



## TRADING POST

We buy as well as sell new and used radio equipment, please feel free to call Paul or John on our Hotline for an instant quote on either P/X or Buy-Ins.

### Scanning receivers

AOR AR1000 hand-held, 1000 channels.....	£185
Bearcat 200XLT hand-held, c/w 900MHz.....	£165
Fairmate HP100 scanner.....	£175
Icom R1000 mobile scanning RX.....	£425
Kenwood R21 mobile scanner.....	£315
Nevado MS1000 base scanner.....	£199
Sony Air 7 hand-held receiver.....	£185
Standard AX700 base scanner.....	£475
Yaesu FR69600 scanning RX.....	£365

### Shortwave receivers

Drake RBE "as new" condition.....	£750
Icom IC71E shortwave receiver.....	£675
Icom R7000 wideband RX, inc. HF.....	£795
Kenwood R2000 RX+VHF conv.....	£525
Kenwood R5000 S/W receiver.....	£695
Kenwood RB20 base S/W receiver.....	£325
Sangean AT5803A portable RX.....	£70
Trio JR500/S basic S/W RX.....	£95
Trio R1000 general coverage S/W RX.....	£325
Trio R1000 general coverage receiver.....	£295
Yaesu FR67700 digital S/W RX.....	£425
Yaesu FR67700 shortwave RX.....	£395
Yaesu FR68800 c/w ATU and Ant.....	£600

### HF Transceivers

Drake TR7+PS7 PSU/MS7 Spkr.....	£1125
Icom 701 HF and matching PSU.....	£545
Icom IC725 mobile HF.....	£625
Icom IC730 mobile HF TX.....	£495
Icom IC737 ex-demo, as new.....	£1325
JST 135 HF TX/RX 150W PEP.....	£275
Kenwood TS50 display model.....	£875
Kenwood TS530/S HF TX.....	£549
Kenwood TS830S HF TX.....	£585
Kenwood TS940S AM, Mem. (ATU).....	£1495
Sommerkamp FT101ZD.....	£495
Tokyo HF115 1.5m monobander.....	£195
Yaesu FT One HF base TX.....	£1050
Yaesu FT707 HF mobile TX.....	£475
Yaesu FT726 with 2m/70cms mods.....	£895
Yaesu FT747GX c/w mounting bracket.....	£575
Yaesu FT747GX c/w FM and filters.....	£595
Yaesu FT9020M HF base TX.....	£625

### Hand-helds

Ahrco DJ560 dual band hand-held.....	£340
Ahrco DJ580 dual band hand-held.....	£385
Kenpro KT22 2m hand-held, vgr.....	£115
Kenwood H215 2m hand-held.....	£135
Kenwood TH26 2m hand-held, boxed, vgr.....	£155

### Mobile Transceivers

Kenwood TM221E 2m 25W mobile.....	£215
Standard C5800 2m mobile RX/TX.....	£195
Standard C7800 70cm mobile, 25W.....	£185
Yaesu FT227 memoriser 2m mobile.....	£185
Yaesu FT230R 2m mobile, boxed.....	£175
Yaesu FT290 2m port-a-pack.....	£325
Yaesu FT480R 2m multimode.....	£325

### Station Accessories/Microphones/Amps/Speakers

Adonis AM508 desk mic, boxed.....	£75
CTE 8110 2m mobile amp (100W).....	£99
Drac 12 amp power supply.....	£60
Kenwood AT230 ATU, vgr.....	£140
Kenwood SP100 speaker.....	£45
Microwave modules 144/100S.....	£95
Microwave modules 2m transvert.....	£85
Microwave modules 70cms transv.....	£95
Nevado TM1000 high power ATU.....	£75
Tokyo 2m 100W amp, boxed.....	£165
Tokyo HLIK/6 6m high power amp.....	£695
Vectorics VC300 ATU+pmr mtr.....	£85
Yaesu FC902 ATU.....	£145
Yaesu FL2000B HF amplifier.....	£350
Yaesu FL2000B HF amplifier.....	£495
Yaesu FL2100Z HF amp (1kW PEP).....	£525

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Simply divide the price into 3 equal payments. Write 3 cheques dated in consecutive months starting with todays date. Write your telephone number and cheque card number/expiry date on the back of each cheque.

Post them to us enclosing your name & address and we will (subject to status) send your goods immediately.

The hardest part is deciding what to buy!

## LOW LOSS CABLE

Superb Japanese low loss cable with aluminium foil and braid double earth screening, tough weather resistant yet flexible.

Fantastic low loss - suitable for high power and frequencies up to 3GHz.

50-FB (8.1mm - 0.055dB/mtr).....

80-FB (11.1mm - 0.039dB/mtr).....

100-FB (13.1mm - 0.031dB/mtr).....

Losses quoted at 100MHz



## EARTALKER



A completely new concept in microphone technology. The EarTalker is a combination of earphone and microphone which is worn

within the ear. It provides outstanding transmitted audio quality and is suitable for all leading brands of hand-held (Call for details on your particular model). Separate volume, PTT switch and control box.....

£29.95

# The SGC SG-2000 HF Transceiver

*Rob Mannion G3XFD has tried out an unusual h.f. transceiver from the USA, and he found that it's a rig you can take (and fit) almost anywhere!*



**The SG-2000 h.f. bands transceiver from SGC Inc. in the USA reviewed by G3XFD, offers some unusual features. One transceiver can be operated from various locations, enabling the operator to have a full featured station wherever required whether it be shack, workshop or study.**

I first came across the SG-2000 at the Friedrichshafen Hamfest in Germany two years ago. Then it was fitted into a very sporty looking fast car. And, to be honest, it was the very fact that the manufacturers had managed to fit the rig into the car which impressed me.

As readers who know my sheer physical bulk....I'm not exactly of the sports car type or shape! However, this interesting and unusual h.f. transceiver from the USA impressed me from the very beginning by its obvious versatility.

Ever since I first saw the SG-2000 I had been anxious to try one because I could see many uses for such an unusual concept in h.f. amateur radio use. So, just how different is the SG-2000 transceiver?

## Remote Control Head

The most striking facility provided by SGC Inc., the American manufacturers, is that the SG-2000 can be operated remotely from its control head. In fact, when I first saw it I was reminded of my 'old faithful' Pye Ranger (boot-mounting) that I had used for so many years on 70MHz.

Although the remote control head is not a new concept for v.h.f. and u.h.f. operation, as far as I know it's very rare with h.f. transceivers. In fact, I can claim that I've never heard of a commercially built amateur radio h.f. transceiver using this technique.

However, I should point out that the SG-2000 was not primarily designed for the amateur radio service. In fact, one glance will tell you that the transceiver has been specifically designed for dedicated mobile and 'rugged' use for all markets from military to marine users.

The SG-2000 is not built in the same way and doesn't look anything like the usual amateur radio rig. Additionally, the quality of the internal components and the quality of construction is, in my opinion beyond reproach.

And because the SG-2000 transceiver is so different, I think SGC Inc. will have a winner. They'll win because the rig is so obviously versatile.

## What Is The SG-2000?

So, just what is the SG-2000, apart from being presented in an unusual format? To answer my own question, I took the rig on one of my short breaks from the Editor's chair and it joined me on holiday.

In essence, the SG-2000 is a fully synthesised s.s.b. and c.w. transceiver (SGC call it a "radio telephone") covering the h.f. bands from 1.6 to 30MHz. Power output into 50Ω is rated at 150W.

The receiver side of the rig also provides general coverage reception from 500kHz to 30MHz. It's a double

conversion superhet with the first i.f. at 82MHz and the second i.f. at 10.7MHz. Tuning is in 0.1kHz steps and the manufacturers claim a  $\pm 10$ Hz frequency stability.

Control of the transceiver is from the remote head and this is where all the control buttons (21 of them!) are, along with the extremely large clear l.c.d. display. In fact, the multi purpose display even includes a clock and calendar and it's so large it could be helpful for anyone with poor vision.

The 21 resilient plastics buttons on the control head provide the means of controlling the transceiver. They're of the type often referred to as being 'tactile', with the added advantage of being illuminated for night-time use.

The adverts for the SG-2000 often depict the rig's control head covered in ice, or soaked in water! The manufacturers claim it as being "splash proof". So, this is one transceiver suitable for amateur use which could cope with British h.f. field day weather or a boating holiday.

Along with the ability to tune via the multi-purpose Up and Down buttons (marked with arrows pointing in the appropriate directions) the SG-2000 has 100 channel capability, and these can be programmed in the field.

The transceiver can scan up to 100 user definable channels, programmable in 10 groups of 10 channels each. The scan frequency can be in 0.1, 1, 3 or 5kHz steps. There are also 644 pre-programmed channels which include all the international commercial voice and Telex frequencies and amateur band edges.

Protection is important on modern day transceivers. To this end SGC have incorporated circuitry to guard against accidental battery polarity reversal. The all important front end is also protected against possible antenna faults.

Metering, via the giant l.c.d. display is by a 20 segment bar graph. During reception, the bar graph provides an S-meter meter and during transmission it will display forward power or v.s.w.r.

The modes available are A3A, A3H, A3J. The c.w. mode is available using either l.s.b. or u.s.b.

## The Manual

As the SG-2000 is a transceiver with so many features, I was relieved to find that the supplied SGC manual is excellent. I must admit that when it comes to user handbooks, the Americans have very often got it right!

Having said the manual is excellent, I must also say that I wasn't able to find a full written description of the rig itself. However, apart from this omission the manual is packed throughout with literally everything needed by the operator.

The information in the 90-page spirally bound manual ranges from plug and socket wiring connections to extremely comprehensive circuit and wiring diagrams. As

Review

the review went to press, I heard that SGC have now introduced a new 200 page manual which is even more comprehensive!

The manual supplied with the review transceiver also has a comprehensive spare parts list, together with a host of information which could be useful to the owner/operator. And added to this, SGC include some extra information in the form of international frequency guides.

## On The Air

The SG-2000 is versatile, and when it comes to getting on the air using a restricted space....it deserves top marks for its versatility. Also, in addition to the obvious mobile uses, I found that the transceiver solved an immediate problem, and enabled me to enjoy the bands when working at home.

When I'm working at home, using my own Apple Macintosh machine, I don't have a lot of room on my desk for a rig. So, apart from my trusty Eddystone 888A which has to be away from the Apple Mac, because of EMC problems, I'm unable to listen to the h.f. bands as I work. The arrival of the SG-2000 changed all that!

Using the supplied mounting bracket (with sucker feet) I was able to arrange the remote control head for the SG-2000 just where I needed it. I soon found myself listening to some of the many nets found on 3.5MHz. In fact, I so much enjoyed listening to the North West Royal Navy ARS net I found I'd finished sub-editing the feature being worked on much quicker than usual!

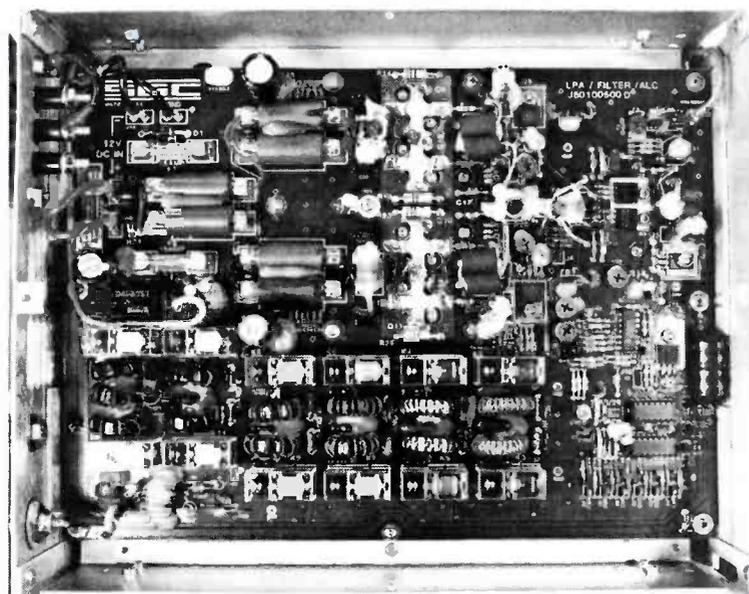


Fig. 1: An internal view of the SG-2000 transceiver.

As the rig itself was actually mounted some four metres away from the computer, there was no 'hash'. The other advantage was that when I transmitted I didn't cause problems to the computer. It proved to be an ideal solution to an on-going problem.

The next location to benefit from the SG-2000's presence was my (extremely) untidy and overcrowded workshop. The only place to mount the control head in there was slightly above my head, hanging down from a shelf.

In the workshop, I tended to leave the receiver running on the QRP c.w. calling frequency or the various Worked All Britain (WAB) nets. It was the nearest I've ever come to having a full feature miniature h.f. rig. Meanwhile, the main rig sat unobtrusively in the corner where it wasn't in the way!

Once on the air, I found the user friendly large display came into its own. Everything you need to know is displayed, and the audio quality was - despite the relatively small speaker - not bad at all.

Although I used the SG-2000 for listening to c.w., I did not have any c.w. QSOs. Personally, I regard this rig as a 'phone job with c.w. capability. Despite this, I found the

sensitivity more than adequate for reception on 3.5 and 7MHz.

Using the SG-2000 over an extended period, I was able to listen and work on all of the h.f. bands. I found the selectivity to be excellent on all bands for s.s.b. purposes. My 'yardstick' for selectivity is 7MHz and if a receiver copes well there, I'm satisfied. The SG-2000 coped very well on 7MHz.

When tuning the transceiver with the Up and Down buttons, I noticed a background 'ticking' as the receiver tuned. It was not objectionable. In professional maritime use, I doubt that the SG-2000 would be tuned up and down the bands in the same way as much as it would be in amateur service. Because of this difference I don't suppose the manufacturers or professional users would worry about the ticking noise.

Reports on the audio quality were good during the test period and I found that tuning (I preferred to tune up and down the band with the panel controls) easy to use. There is a 'clarifier' fitted, but I preferred to use the main tuning controls when listening only, as the clarifier itself operates in discrete steps.

If I were fortunate enough to be the owner of the review model, I would have programmed in all my favourite frequencies. However, I made do with just programming in the QRP channels.

While mentioning channels, I should mention that the SG-2000 reviewed showed its origins by automatically coming up on 2.182MHz when first switched on. Just in case you're not sure of the significance of 2.182MHz, I must mention that it's the international calling and distress frequency for marine craft!

Once the transceiver is switched on, you can then either program in the frequency you require, or call up a channel you've already set. Alternatively, you can select one of the h.f. amateur band edge preset by SGC and tune manually with the Up or Down buttons to where you wish to operate (my preferred option).

## Summing Up

In summing up my opinions of the SGC SG-2000, I must state firmly that it's the most versatile h.f. transceiver I've ever worked with. The versatility has got to be its main selling point as the actual physical design is ruggedised. It's designed for professional

maritime, rather than 'sitting on the shelf' amateur radio use.

Personally, this rig appeals to me very much. The SG-2000 can be used literally anywhere and I would have jumped at the chance of taking it on the canal holiday I had in the English midlands two years ago.

As it was, I used the rig mobile from my car (a five minute job to install it in my Ford Escort) and from various portable locations. I even used it when working in the garden, using the very long extension cable between rig and remote head to the best advantage.

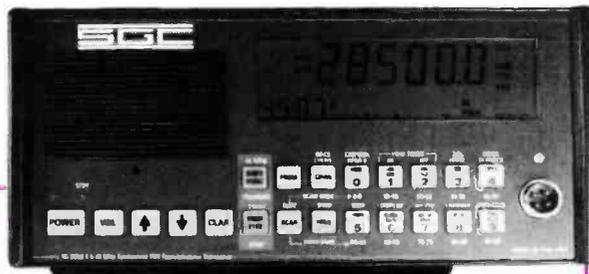
I have no doubt that amateur radio maritime mobile users will find the SG-2000 an attractive proposition. However, there's many more uses that this ruggedly designed transceiver can achieve. The only limiting factor is the operator, and I don't think it will be long before I hear someone on h.f. operating one of these rigs from a hospital bed or from one of the battery-powered golf car type vehicles used by disabled people.

In fact, I think that if a radio requires a multi-purpose transceiver, the SG-2000 could be the answer. It certainly was for my purposes.

# Review

# Review

**Fig. 2: The SG-2000 transceiver comes complete with a mobile mounting bracket fitted with rubber suction feet. The bracket allows the remote control to be mounted wherever it's required.**



## Manufacturers Specifications

### Receiver

Sensitivity	0.5µV produces 500mW of audio with 10dB S/N
Selectivity	2.4kHz at -6dB; 4kHz at -60dB, shape factor better than 2:1)
Intermodulation	+86dB (CCIR specification)
Blocking	+100dB (CCIR specification)
Transmodulation	+95dB (CCIR specification)
Image and i.f. rejection	+90dB
Audio output	4W with less than 10% distortion
Audio distortion	<5% at 3W
Receiver a.g.c. response	<5dB variation at the output for 5µVolt to 1V r.m.s. at the receiver input
Clarifier range	+300Hz in 100Hz steps
Receiver protection	Up to 50V r.m.s. at the receiver input
Squelch	Voice operated with syllabic detection
Speaker	Internal (on removable front panel)

### Transmitter

Power output in 50Ω	150W p.e.p. (+0dB to -.5dB)
Power output reduction	To less than 50W p.e.p.
Maximum stress power output	225W c.w.
Sideband suppression	Better than -50dB at 1500Hz
Harmonic suppression	Better than -63dB
Carrier suppression	Better than -55dB
Noise suppression	Better than -60dB
Distortion (third order)	Better than -32dB at 135W p.e.p.
Audio response	Flat within 6dB between 350 and 2400Hz
VSWR protection	for 4:1 v.s.w.r., power output will reduce below 50W p.e.p.
Thermal protection	For 80°C power output will reduce below 50 watts p.e.p.

### Power Requirement

### Transceiver

Nominal	13.6V d.c.; 0.8A RX, 16A TX (voice)
Full Specification Compliance	11.5V d.c.
Full Operation	10.5 to 18.0V d.c.

### Data Communications

Ready and compatible	RTTY, ARQ, FEC, PACKET and telegraphy
Receive/transmit switching time	10mS nominal
AFSK input/output impedance	600Ω
AFSK input level	minimum required 100mV r.m.s., 2V r.m.s. max
AFSK output level	22mV r.m.s. at 1µV, maximum 100mV r.m.s.

### Computer Control of the Radio Transceiver

Input/Output drive	RS232 (optional)
Access and recall	Of all transceiver functions (optional)
Software	SG-2000 TELEREX, Ver. 1.0 (optional)
System software	DOS Ver. 3.3 for IBM and compatibles (optional)

### Control of Transceiver System

Local	One controller mounted on the radio
Remote	Up to 50m away from the radio (10 wires)
Intercom	On all remotes
Maximum of controllers	8
Telephone remote	Through standard telephone line and modem with telecommunication software and SGC-REMOTE software Ver. 1.0 (optional)

### Dimensions and Weight

Overall dimensions	117 x 254 x 380mm
Weight	5.4kg

### Accessories

To customise and tailor the features of the SG-2000 h.f. s.s.b., SGC offers a complete line of accessory options which complement the standard unit (for full details contact SGC Inc. direct).

My thanks for the loan of the review model SG-2000 go to George Ure of SGC Inc., SGC Building, 13737 SE 26th Street, Bellevue, Washington, 98005 USA. PO Box 3526. From the UK Tel: 0101-206-746-6310, FAX 0101-206-746-6384. The SG-2000 is available for (please contact SGC direct for latest imported price) approximately £1800 in the United Kingdom. PW

# Bermuda Bound

**DX**  
*Special*

For some years now I have been intrigued by the Bermuda Contest. This contest is unique because the winner gets the usual cup and the Radio Society of Bermuda asks you to come and collect it at their annual banquet, all expenses paid!

The idea behind it is that the Bermuda Department of tourism recognises that the visitors to the island are mainly from USA, Canada, UK and Germany. With the object of promoting tourism they fund the flight and hotel expenses.

The Radio Society of Bermuda organises the contest. The winner from each area goes to the island and returns home extolling the virtues of Bermuda.

## CQ Bermuda Contest

So, at 0001 on 17th March 1990, the first "CQ Bermuda Contest" went out from GW3YDX, on 3.5MHz. Stations in W, VE and Bermuda would score QSO points. The multiplier was the number of Bermuda stations worked.

It took five minutes to make the first QSO. Not good enough. A check on the other bands showed that 14MHz was wide open and the scoring rate increased to a respectable 60 contacts per hour.

Not bad at the beginning of a contest when lots of people don't realise that one is taking place. But where were the Bermuda stations though? It took me an hour and a half to work the first one.

It was 48 hours later after 34 hours of the permitted 36 hours of operating that I pulled the plug. I had made about 2400 s.s.b. and 150 c.w. contacts, with a Bermuda multiplier of 80. My claimed score was a pretty respectable 1,040,000 points.

Fortunately, there appeared to be few serious competitors from the UK. However, a GU station gave me a little concern on the Sunday afternoon.

The GU station was going well on 28MHz. With much better propagation from down that far south and west and the rarer GU prefix, he was competition. I would have to wait and see.

## Air Mail

My contest log cost me about £5 to send by registered air mail. Meanwhile, I went back to the realities of everyday life.

Some time in June, Glen VP91D rang to



**Fig. 1: Bermuda shorts are 'rig of the day' on the island for (left to right) Gloria XYL of N3AD, Ron Stone GW3YDX, Alan N3AD, Christoph DL1YAF while Harold VE1JL prefers the longer version!**

congratulate me on winning the Bermuda contest 1990 - details were to follow!

In due course the *Splatter Magazine*, the Radio Society of Bermuda's newsletter, appeared with the official results. The other area winners were N3AD, VE1JL and DL1AF.

Glen had advised me that it was a good idea to bring a 144MHz hand-held. This would help to keep in touch with the locals and the other winners through the local repeater.

At home there is little 144MHz activity, most of the f.m. being on 430MHz. I didn't have a 144MHz rig.

Needless to say, there's no 430MHz on the island so I had to beg or borrow a rig.

The local crew on the GB3LH repeater were marvellous and I had many offers. However, obtaining a transceiver that would transmit above 146MHz (with a 10kHz channel spacing) for the 146.94MHz repeater on Bermuda turned into a saga that deserves an article all to itself!

Fortunately, George G3TUO was willing to lend me his IC2E. He also permitted the 'surgery' to be performed on the rig to extend its frequency coverage. But, had I known what was to follow I wouldn't have bothered!

## Came The Morning

Came the morning of 13th October (are you superstitious too?) I rose at 4am to drive the 200 miles to Gatwick. Needless to say, having allowed hours to get there, I arrived at 7am, a good two hours early!

At about 9am the checking in for BA232 started but I checked in at 9.30 to avoid the initial rush. However, British Airways like all airlines had consolidated the flight (deliberately over-booked to you and I) on the basis of the normal 5% 'no shows' occurring.

British Airways offered me £150 'cash in hand' should I be willing to go on a later flight to New York. The thought of not only going to Bermuda for nothing, but also being paid for it, was too attractive to turn down, so I accepted.

At 11am, BA put out a tannoy announcement for me. Oh dear they had a full aeroplane! I gratefully accepted their kind offer of a free meal (then) and the £150 (later).

It was a challenge to spend the £10 at the restaurant, but it was met by having an extra bottle of wine. I sat down to enjoy the meal and wait until



the 2pm New York flight.

At 11.14 an urgent message went out for Mr Stone to join the flight at Gate 58. Dammit! The temptation to hide in the toilet for 15 minutes went briefly through my mind.

In the end, honesty (and the fact that my luggage was about to take off) got the best of the situation. So, leaving my Danish pastry untouched, I rushed off to be the last person to board. At least I didn't have to wait long for take-off!

On arriving at Bermuda airport, to identify myself to Glen, who would be meeting me, I had a QSL card pinned to my shirt. I went through immigration with no problems but soon found other difficulties!

### Bermuda Customs

The girl at the Bermuda Customs, who appeared to be searching everybody's baggage, asked me what the QSL card was. Innocently, I told her what it was and that I was there as a guest of the Bureau of Tourism.

The Customs official then asked if I was carrying a radio, and proceeded to confiscate the IC-2E, on the basis that I did not have an import permit. My objections were to no avail, so I shot outside to see if Glen was there and to seek his help.

Unfortunately, there had been a delay with the issuing of my VP9 licence. So the transceiver was taken into bond, for recovery when the paperwork was sorted out.

I subsequently learnt that Christoph DL1YAF, suffered the same fate. He had his FT-757, as well as an FT-207 impounded.

Glen, the chief operator of VP91D 'the number one station in Bermuda' then drove me to check in at the White Sands Hotel in Paget parish. This where I would spend the next week (in comfort). The hotel was of a super standard, with air conditioning.

Later, Glen drove me to Hamilton, the capital, to see the sights. No skyscrapers here. Hamilton is a small neat town, catering principally to the tourist trade.

Due to the recession, business wasn't booming. There were no cruise liners moored on the Quay adjacent to the main shops so it was pretty quiet.

Glen dropped me back at the White Sands, where I decided to have a beer to celebrate my arrival. A small can cost me \$3.75 (£2). This was typical of bar prices on the island. However, a six pack from a supermarket worked out at 50p a can, pretty reasonable considering that all beer has to be imported from the USA, 600 miles to the West.

### Civilised Attitude

It was interesting to find that the Bermuda Government has an extremely civilised attitude to the motor car. Up until the Second World War cars were simply not permitted.

Now, each family unit is limited to one car. There's no used car market. When the life of a car is over, it's cut in half to prevent it re-appearing.

There's no car rental. However, there's no limit to the number of motorcycles and mopeds, so there are a lot of them about. Alan N3AD, the winner from the USA solved his transport problems on the island by using a moped!

There's an island-wide speed limit of 25mph which is strictly enforced. And thank goodness, as it's officially a British Dependent Territory you drive on the left!

Most of the visitors to the island are Americans, as the USA is only two hours away by air. All the rental mopeds have yellow number plates to

identify them. Bermudians can therefore take evasive action as appropriate!

Alan N3AD had arrived earlier in the week. He'd been busy helping to erect towers at VP9AD, undoubtedly the best equipped station on the island.

The VP9AD (another Alan) QTH is on a high point and has an outstanding view of Hamilton and the Sound, **Fig. 2**. The antenna tower work at VP9AD was behind schedule, so I had also volunteered to go there and assist.

### Superb View

Working from the tower provided an absolutely superb view. Most of the island was visible as there's not much air pollution in the mid-Atlantic and the air was very clear.

On completion of the tower work on the h.f. beams, I worked about two dozen contacts in the RSGB 21/28MHz 'phone contest. I also worked some Europeans on 7MHz at about 2100UTC.

The 7MHz band opened much earlier than I had expected, at about two hours before sunset in VP9. However, playing radio on 7MHz had to come to an end as I had to attend a barbecue by the Hotel swimming pool. What an awful life.....!

By the Monday, the full contingent of Harold VE1JL, Alan and Gloria N3AD, and Christoph DL1YAF were all there. But what late risers - I was on my own until 8.30.

Harold and I went off to Hamilton by foot. In the heat, it was a mistake. Although Harold is a sprightly youngster of 73, he found it hard going.

We eventually arrived at Hamilton and headed for the nearest air-conditioned clothing store to look for Bermuda shorts. The normal businessman's dress on the island is a suit, as elsewhere, but Bermuda shorts matching the jacket provide quite acceptable dress.

### Bermuda Shorts Essential

Bermuda shorts are not a joke and quite essential in the heat. I bought a pair myself, but in the loudest check pattern I could find. Something to dazzle the folks back home!

I decided to go to the Customs House on Front Street and attempt to repossess my IC-2E. Unfortunately I didn't have the licence to hand and the attitude of the Customs officer was less than helpful. We left empty handed, to return later in the day with the correct paperwork for the release of the gear.

The next day, Tuesday, I rented a moped. Walking around was pleasant, but was wasted beach/cocktail/drinking time. The cheapest on offer was a moped at \$50 (£30) for a four day rental.

The bike was easy to ride and very economical on fuel. Christoph had also rented a moped, so we went into Hamilton with me leading to ensure correct procedure at roundabouts!

We headed off to Coral Beach, just up the road, and I went snorkelling on the reef, about 200 yards off the shore. It was windy and the wave movement was stirring up sand from the bottom.

The snorkelling conditions were far from ideal but nevertheless bright blue, yellow and grey striped and iridescent red fish were there in plenty, totally unafraid. You could stay in the water for over an hour without feeling cold at all.

The next day, Wednesday, despite the forecast and approach of a tropical storm we started with a moped excursion to the naval dockyard at the North East corner of the island. Many years ago, the Royal



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Built in CTCSS and DTMF  
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**ICOM IC-W21E**  
Dual band VHF 144 MHz whisper function, auto repeater  
£449



**STANDARD C528**  
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\*£420



**STANDARD C188-2M C488-70CM**  
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SX300 1.8-900MHz 5/20/200 Watts PL259	£89.95
SX400 140-525MHz 5/20/200 Watts PL259	£104.95
SX600 1.8-525MHz 5/20/200 Watts PL259	£164.95
SX1000 1.8-1300MHz 5/20/200 Watts PL+“N”	£229.95
SX300 automatic 1.8-900MHz 5/20/200 Watts PL259	£129.95
SX900 1.8-160+430-1300MHz 5/20/200 Watts	£259.00

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CP5 10-15-20-40-80 mtr vert. rigid radials	£265.00
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CP22 2 mtr colinear 2x5/8 6.5dB gain	£49.95

**THE NEW STANDARD C408**

The latest in the “standard” range is probably the smallest set yet produced.

It has 230 MW R.F. output from 2 x AA cells – ideal for local Q.S.O's and repeater working. An idea that comes to mind for those of you with dual banders that will act as a repeater, is that you will have a portable microphone anywhere around the house!

We are waiting for full specs and leaflets.

The projected price is just under **£200.**



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See me at the Leicester Show

Stand No S53

# Lee Electronics

Navy had a major dockyard on the island providing much employment for the locals.

A defence cutback severely chopped the number of jobs at the Royal Navy dockyard. This provided the island a further push towards tourism as the main source of income.

During the morning the tropical storm became worse and was heading for Bermuda. It had been officially christened Hurricane *Nana*.

My intention was to find sheltered water for snorkelling before *Nana* arrived. So, I set of to find a calmer place.

The water was starting to get whipped around, but I went in all the same. After being bounced off a couple of reefs by the waves, I gave up bearing 'Coral Rash' made by the coral scraping some skin from my extremities. I also lost my snorkel tube, so that was that!

### Hurricane Strength

And so we came round to Thursday. Hurricane *Nana* was building in strength and predicted to be just 100 miles off Bermuda.

On Saturday we all started to wonder if there would be any flights in or out of the airport for our trips home. It seemed that the airlines were pretty cautious, so we began to look forward to an enforced addition to our stay.

That evening over dinner at his house, Tony VP9HK described to us his experiences during Hurricane *Emily*. This hurricane had caused much damage on the island.

Tony had been apprehended by the police, having been found wandering around the streets talking into his hand-held radio. All the poor chap was trying to do was to get home!

He was lucky. Shortly after arriving at his house, a tornado swept through the garden, demolishing several palm trees and taking the roof off his neighbours house.

The construction of the house roofs in Bermuda is interesting. As there are no rivers or fresh water sources on the island, rainfall is the main source of water. All the houses have roofs made of crushed coral bonded together with cement. The stepped construction, which is designed to catch and direct water to the underground tanks, is unique to the island.

Friday was my last day on the island. I rose at 3am and went up to Christoph's room to use his h.f. radio on 7MHz. I had done this a few times, always envying his ability to sleep through anything! The band was open to Europe but not very well.

At 6.45 Glen VP9ID picked up Alan and myself for a BBC radio interview. Not our BBC of course but the Bermuda Broadcasting Corporation. We went over to the premises of Radio ZGB on 1.465MHz.

During our half hour interview the resident producer asked the usual questions about how we got into amateur radio and what it was all about. The interview provided us an ideal opportunity to



**Fig. 2: A view of Hamilton Sound in Bermuda, taken from the top of one of VP9AD's antenna towers. The tower supports 3-element Yagi antennas for 14 and 21MHz.**

describe the welcome we had from the amateurs on the island.

Hurricane *Nana* was still threatening. Alan VP9AD was away in London on business, so I went over to his house with the other Alan N3AD, to help put up the storm shutters

After breakfast I went off to the beach with Christoph, to be knocked over by the growing waves. *Nana* was due at 4am the next morning and the flight home for all of us began to look very doubtful.

That night was the night of the annual Radio Society of Bermuda banquet so we got ready in plenty of time for the event. The main news was the Hurricane *Nana* had decided to change course and the winds had dropped considerably. So unfortunately there now seemed to be no escape from leaving on schedule.

Glen VP9ID was the compere at the banquet. He was aided in his efforts by a rubber bath plunger, a pair of garden shears and other accessories necessary for his act. I will spare you the details. Take it that we were all 'well oiled' at the end of events and slept well!

### Dragged To Airport

On the Saturday Alan and Gloria were the first to be dragged screaming to the airport. So Christoph and I commiserated over the departure of our new friends by having a drink at the bar.

During my visit I had become a convert to Bermuda 'Rum Swizzle' a most refreshing but powerful rum cocktail. I would need several as an insulator against the departure later in the day.

The dreaded hour came and Tony drove me over to the airport. British Airways was offering a \$400 inducement to those taking a later flight. Temptation arose, but also the thought of missing my wife's birthday, so I said no to BA's kind offer.

In the event, they could not find a seat in Tourist Class for me. I had to travel Club Class with reasonable seats and free champagne for the journey. It was small consolation for being repatriated to the UK.

The return flight was on time, and we touched down to a windy and wet Gatwick. Five hours later I was back home in Wales, with our kids climbing all over me. It had been fun while it had lasted and you can bet I intend to be Bermuda Bound again!



**Godfrey Hands G0FBG/PA3EUS proves that you can return safely from Siberia, he's been there and experienced the other end of the DX.**

# Siberia

## The Other End Of The DX

It was in February 1989 that I first made contact with Serge UA0000. At the time he was operating a club station UZ00WO from Ulan Ude in East Siberia.

We exchanged QSL cards, and Serge requested more information from me about one of the associations I belonged to. This association was the ECRA, or Evangelical Christian Radio Amateurs.

The ECRA Organisation is formed by a group of predominantly Dutch amateurs. It's affiliated to the WACRAL (World Association of Christian Radio Amateurs and Listeners), a larger association, with world-wide membership.

I sent him the information on my associations and it appeared that Serge was also a Christian. We continued to communicate by letter and radio. Eventually at the end of last year, we were unofficially invited to visit him and his family.

### Months Of Planning

It took many months of planning and laborious communication to arrange the visit. A letter takes about three weeks each way if it gets through!

Eventually, we were able to get an official invitation, and on the 8th July 1991, we set off for a four week holiday in Ulan Ude. 'We' being my XYL Rosemary and 11 year old Samuel, our youngest son.

Our adventures in getting to Siberia would make a serial, filling many pages of *PW*. So, I won't bore you with all the details. However, I will mention that the comfort, cleanliness, hygiene and time keeping that we are used to in Europe from the airlines, is something that the then Soviet citizens were prepared to sacrifice for flying at low prices.

### First Weekend

During the first weekend at Ulan Ude, I was invited to visit one of the local club stations. This station was UZ00WS and it's situated high in the mountains about 25km from the city. An apparently ex-military lorry collected myself, UA0000, UA00E, UA00A and away we went.

On arrival at the station, Serge informed me that a letter that I'd written to the Radio Sport Federation, PO Box 88, Moscow in February had got results. The Soviet authorities had issued a amateur radio permit.

The permit allowed PA3EUS to operate within the Buryat Republic of the Soviet Union with Class A privileges and also with my own reciprocal call, UA00/PA3EUS. The weekend was



**Fig 1: From deepest Siberia Godfrey Hands G0FBG/PA3EUS (at the microphone) operated as UA00/PA3EUS and enjoyed making new friends and contacts around the world.**

mine to do what I liked with and the other amateurs were there to support me.

The station was impressive. It was equipped with an UW3DI design of transceiver and 1kW of clean power from a linear amplifier.

Antenna equipment included a 5-element monoband Yagi at 20m above the ground for 14MHz. There was also a 4-element monoband Yagi 10m above the ground for 21MHz.

The beam antennas were enough for my needs. The 'slopers' for 1.8, 3.5 and 7MHz and the 28MHz 4-element monobander antenna at 15m above the ground weren't needed.

### Signal From Shanghai

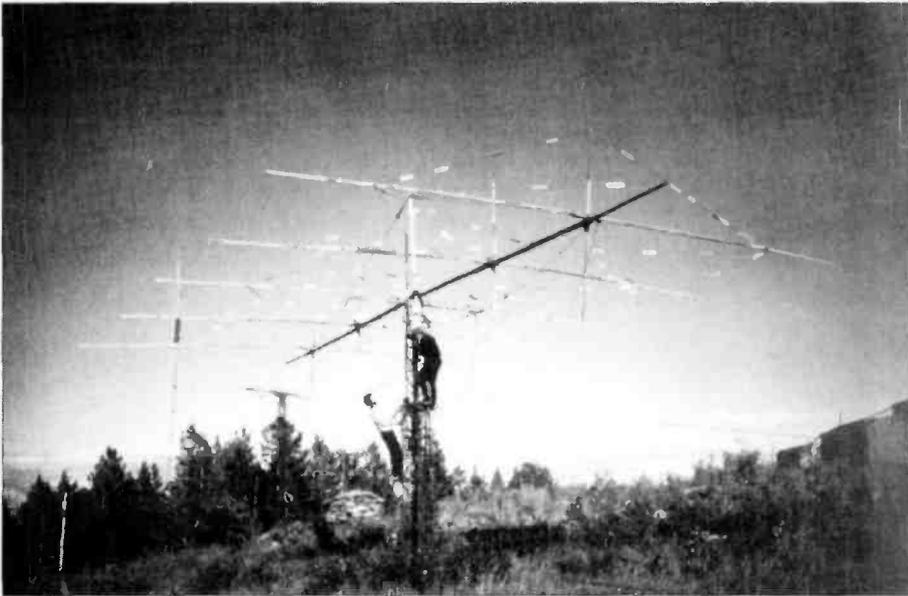
The first CQ from UA00/PA3EUS on 14MHz brought a 5 and 6 signal report from BT4TS in Shanghai. This was immediately followed by a string of VKs, a couple of VU2s and some UA stations.

The Middle East followed when 9K2YA, 9K2KW in Kuwait and A92EV in Bahrain called. They were followed by DU8AN and another 9K2. Then it was time for a Vodka break!

After the Vodka break, we discovered that there was a contest. We decided to give a few points away, and see what DX was available.

The next few hours brought what for most European operators would be a DX dream. Many Japanese stations, Taiwan (BV), Korea (HL), Phillipines, some European stations, 8Q7PJ and Peter PA0CRA on Holiday in the Maldives, and some Pacific stations 9VQ9 and P29.

A meal break with the traditional beverage (Vodka of course) followed, and so the night went on. The 21MHz band didn't bring any DX (perhaps it was the Vodka fumes desensitising the receiver?), but a very enjoyable night was had by all concerned.



**Fig. 2: Siberian club stations don't seem to have planning problems! Just one of the many antennas available for Godfrey Hands DXpedition's use.**



### Tram Ride

We made some further brief excursions to another club station - UZ0OWO - about 15 minutes tram ride away from where we were staying. This added to the excitement during the holiday but we had restricted time operating as the XYL and our 'junior operator' had no interpreter when we were away.

The station UZ0OWO had an EFIR transceiver and a linear amplifier that stood 2m high, 1m wide and about 800mm deep. It was ex-military and provided 300W on 14MHz and 200W on 21MHz. Antennas available included 3-element Yagi for 14MHz and a 2-element cubical quad 21MHz.

During the holiday, a total of 40 DXCC areas were worked during 280 QSOs and 170 different prefixes. All six continents, and a nice opening over the North Pole one evening brought a big pile-up of West Coast USA and VE stations (with the odd VK off the back of the beam).

There were enough European stations to keep our interest, including several Gs, GWs, GMs and PAs. I was even able to reminisce about Sam Inch's cider from Winkleigh, Devon, about five miles from where I was born with Geoff G4SOF in Barnstaple!

A determined effort one afternoon gave nine of the 10 different Japanese regions in 60 minutes, all on 21MHz. Three hours later, we repeated the feat, this time getting the region missed in the first attempt. An application to the Hijmei Radio Club for their 'Worked all Japanese Regions in 24 Hours' award was submitted.

### Radio Conditions

Radio Conditions there were worse than in Europe for QRM and QRN. Although it could perhaps be a difference in receivers compared with what I am used to at home in the Netherlands.

The 7MHz band in the evening (1600 UTC) is as bad in Siberia as it is here in central Europe. Listening on 7MHz during a Sunday afternoon, the

S-meter hardly dipped below S9 through the whole band.

To Siberians, DX is still working the Pacific islands, but they're a little easier to contact than they are from Europe. And of course Europe, especially the rarer locations GD, GJ, GU, HB0, C3, EA6, 8 and 9 etc. So how about planning some DXpeditions next year?

Next time you are looking for something new to work, think about all the different Oblasts and prefixes in the Soviet Union. The prefixes UA9 and 0 refers to Asiatic Russia, but the first letter that follows the number in the Soviet Union is also determined by the Oblast (or republic).

There are more than 190 Oblasts. Awards are available from the Radio Sports Federation (3) for 100, 150 and **All** Oblasts. **But take note! These are not all DXCC areas.**

My XYL Rosemary, was also able to make her first ever QSO from the club station. She was thrilled to work a JA, and was very pleased when a contact with VK5CJE resulted in her being called "a schoolgirl by the young sound of your voice" by the Australian station!

### Enjoyable Holiday

An immensely enjoyable holiday was had by us all. And of course we are looking forward next year to hosting Serge and his family when they come to the Netherlands.

My thanks go to all operators in the region who contributed to a very memorable holiday. I'm also grateful to the other operators worldwide with whom I made contact with.

I'm also grateful to the Soviet Authorities for issuing a permit to me for this memorable mini DXpedition. Finally, my apologies go to those whom I could not hear through the QRM.

#### Useful addresses:

- (1) **ECRA, Postbus 9316, 3506 GH UTRECHT, The Netherlands.**
- (2) **WACRAL, G3XNX Membership Secretary, 51 Alma Road, Brixham, Devon TQ5 8QR, England.**
- (3) **Radio Sports Federation of the USSR, PO Box 88, Moscow, USSR.**

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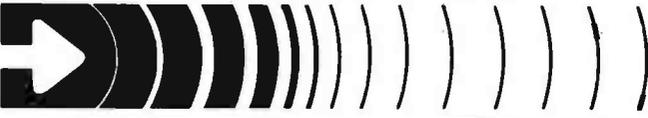
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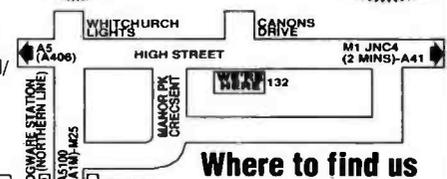
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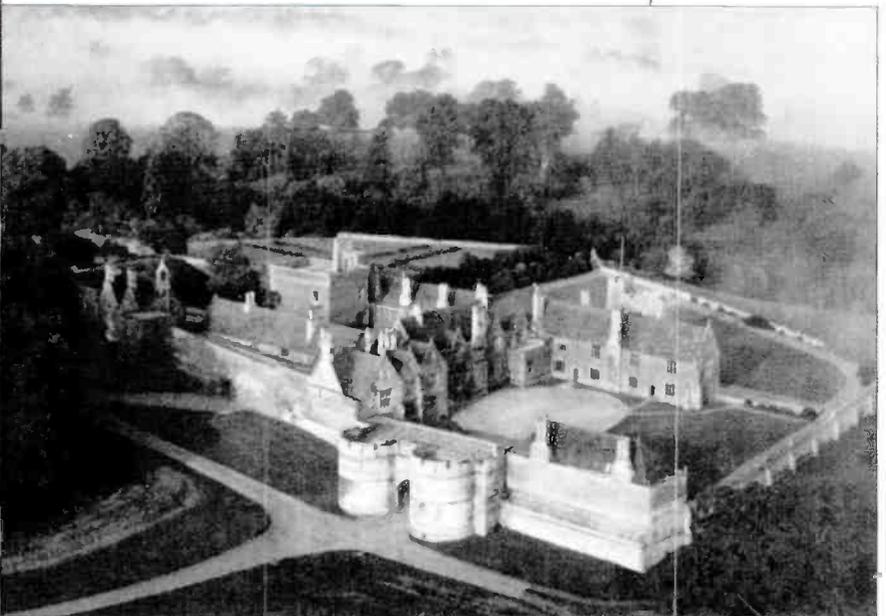
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73 from Dave G4KQH, Technical Manager.

# Castles On The Air – GB8RC

**DX**  
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Rockingham Castle QSL card.

**Top: G0PGM Pete Maskell (L) and G4TTX Roy Smith (R).**

**Centre: G1WPM Terry Bromley shows SWL Adam Sonn the ropes.**

**Bottom: Andrew Coles 8 years, getting the feel of the hobby.**

In past years, Kettering Amateur Radio Society have mounted several well attended field days. After the successful Castles on the Air event in 1992, it was inevitable that the club would be on the air again from Rockingham Castle, Leicestershire in 1993.

Commander Saunders Watson very generously allowed us back to his property. This year we asked for accommodation outside the Castle walls, but still within the grounds. The final choice was a disused cow shed on high ground above the Welland valley.

Just prior to the event on May 15 and 16th, we were informed of the ill health of the co-ordinator, Paddy McGill. Due to this, the event was to be cancelled for 1993.

However, having made all the arrangements and purchased the QSL cards, the decision was taken that we would still put the GB8RC station on the air. But it would be as a special event by Kettering ARS.

## Equipment Assembled

All the equipment was assembled on the Friday evening ready for an early start on the Saturday morning. Two h.f. stations were used.

The first station consisted of a Yaesu FT-990 and linear running 400W into a beam antenna mounted

on a mobile tower loaned to us by a local Scout troop.

The second station was made up of an Icom IC-735 with a home-brew linear. This fed up to 400W into a wire antenna strung from a tree to the top of the tower.

Activity started at 6am and after a slow start the contact rate built up. By lunch time both stations were working at a steady pace.

Activity finished on the Saturday at 10pm. On Sunday the hours of operation were from 6am until late afternoon.

## Cowshed Stations

The change of location to the cowshed led to the stations being more accessible to the public. Following publicity in the press and on local radio, interested onlookers turned up to see just what we were up to.

Allowing for the poor band conditions compared to 1992, the event was a success. The contact count was 600 for the two days, some 200 down on 1992's activity.

Even though we did not make so many contacts, in no way spoilt our fun, the weather was fine and sunny. A door on the cow shed would have made it a bit warmer!

The fact that a caravan club located in the next field had to draw water from a tap next to the rig was a worry. But we coped.

It is almost certain that we will be back next year, if for no other reason than we still have 1100 QSL cards to use up. Besides which, everyone seemed to enjoy themselves which at the end of the day is why we do it!

PW



**They take the high and they'll take the low frequencies to promote Scotland on the air. John (Paddy) McGill G3MTH gives you an insight into the Scottish Tourist Board (Radio Amateur) Expedition Group**

# Banding Together For Scotland

The Scottish Tourist Board (Radio Amateur) Expedition Group was formed during the winter of 1988 at the request of the then Chairman of the Scottish Tourist Board, Mr Alan Devereux, CBE, DL, GM8VJV. I had known Alan Devereux for most of his ten year reign and had worked with him in the past. In conjunction with the Chairman and the founder members of the group the following aims were agreed.

The first was to set up special event stations from locations in Scotland that are unique, cultural, scenic or in any way relating to Scotland. The second aim was to make the public more aware of the hobby of Amateur Radio in so much that a public relations display would be set up at each location. All locations would be open to the public.

Towards the latter we have had some success in recruiting new members to the hobby and it is very rewarding to either work them on the air or have them return to see us at one of our venues.

## Unique Group

The Scottish group is unique in so much as it is a National Group with 22 members who come from Dumfries, Kircaldy, St. Andrews, Kinross, Prestwick, Bathgate, Glasgow and Lanarkshire areas. Six to eight members attend each monthly event from April to September.

The organisation consists of a system of specific duties and not a committee. There is a Co-ordinator/QSL Manager, an Awards Manager and a Treasurer. There is also an Assistant Secretary/Assistant QSL Manager when required. This system we have found to work well in practice. Each duty is performed unimpeded by any other member of the group.

Suggestions and ideas are fed back from the group members and are acted on by the relevant person. It would take too long to explain each specific duty in detail, but here is a very short resume of each one.

The Co-ordinator is responsible for setting up locations and arranging transport, equipment and personnel. He is also the QSL Manager and is responsible for advertising the events. The QSL Manager also sends all reports to the organisations we work with and finally sends a news letter to all members monthly.

The Awards Manager is responsible for all matters relating to awards. He is also responsible for the design of the awards and the QSL cards when required and is the custodian of the PO Box.

The Transport Manager is responsible for getting all equipment to the locations and is a very important member of the group. A coach built caravanette is used for transport.

The Treasurer looks after the petty cash while the Assistant Secretary/QSL Manager takes care of the overload when the paperwork gets snarled up.

## Activated Stations

In the past two years the Scottish Group have activated stations in one world heritage site, three museums, one police college, one cultural centre, two distilleries, seven castles and one memorial tower.



**Scottish Tourist Board (Radio Amateur) Expedition Group, GM4UQG, GM3MTH, GM3YOR, GM0MYS, GM4RGV, GM4NDO and Tommy with the RSGB Jack Wyllie Trophy (G5YG) in 1990.**

We have awarded five separate 'one off' certificates and also have two on-going colour certificates awarded for contacting a certain number of our events in Scotland.

When attending an event, each member brings their own equipment. The group has a 23m portable tower, a home-made 2-ele. 14/21MHz Quad, a 2-ele. 3 band western Yagi, a 5 band Hi-Gain vertical, a 3 band Jaybeam vertical, a WARC band Sandpiper vertical, G5RV, 3.5/7MHz dipole, 14/21MHz dipole and an assortment of single band slopers.

We pack enough coaxial cable to cover any circumstances we may find ourselves in plus all the back up spares required to set up stations in locations not previously seen. Also in the kit is an assortment of portable masts ranging from 4 to 12 metres

All the equipment did not appear overnight. It was donated, bought, loaned or scrounged in the traditional Amateur fashion.

Five separate stations are set up at each event. One on c.w., h.f., s.s.b., l.f., WARC bands and 144MHz. It is group policy to always have a dedicated c.w. station at each event. We also have two dedicated c.w. operators and two back-up operators in the group.

The group works because we work as a group and not as individuals. We get on very well together. There is a lot of internal slanging but it keeps you on your toes and it's all in good fun. We are fortunate that we have no Glory Hunters or Primadonnas!

## Lads And Lassies

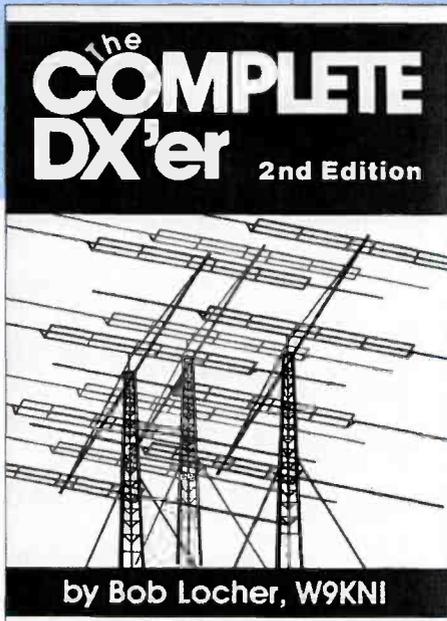
We would particularly like to thank all the lads and lassies out there who contact our events. Without you there would be no point in setting up these stations.

Special thanks to PW who never forgot to look after the Amateurs north of the border with mentions of our events in the magazine. For the future we will have at least one Multi-International event, a couple of Multi-UK stations events and hopefully an almost completely new set of locations.

Please keep in touch and thanks to all.

PW

Anyone wishing to contact the Scottish Tourist Board (Radio Amateur) Expedition Group can do so by writing to them at PO Box 59, Hamilton, Lanarkshire ML3 6QB.



# The Complete DX'er (2nd Edition)



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Although this book is aimed more towards the newcomer to the hobby, there is definitely something for everyone within its pages.

The art of DXing, or distance and rare stations chasing, is seen by some licensees (or short wave listeners) as a black art. The reality is that this black art is merely the application of a little knowledge, helped by a small amount of luck.

**The Complete DX'er (2nd Edition)**  
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W9KNI

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## Errors & Updates

Tone-E, The PW Electronic Analogue Voltmeter Pages 20 and 21 PW October 1993.

There were three unfortunate errors in the article about the analogue voltmeter with variable audio tone. The major error was that according to the circuit diagram the unit was mute! A piezo buzzer (labelled PB), should have appeared across the resistor R11 in the collector circuit of Tr4.

The type number given for IC1, in both the shopping list and Fig. 3, was wrong. Integrated circuit IC1 should have been labelled as a TL074 or TL084 **not** TL071/81. The third type number LF444 is however, a suitable substitute.

Another item wrongly labelled was the

I.e.d., connected to the negative rail and R20, should have been given the number D7 instead of the label D6. The information is given correctly in the Shopping List.

*We apologise for these errors. Editor.*

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Join the *PW* party, led by the Editor Rob Mannion G3XFD, when we fly out on a scheduled Delta Airlines flight from Gatwick on Monday April 25 1994. We'll fly direct to Cincinnati and our private coach will take us to the Holiday Inn in Dayton for our seven night stay. There'll be several day trips in our private coach and we'll spend a day at the world famous United States Air Force Museum. There's plenty of shopping and other attraction for the family too!

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Although Rob Mannion G3XFD is leading the *PW* party, the entire holiday is being organised by the Bristol based professional group tour operator RCT International. Annette Oxley at RCT is waiting for your enquiry and she'll be delighted to send you a full itinerary and booking form. Don't delay, send away today and fly with *PW* to the greatest amateur radio adventure of 1994!

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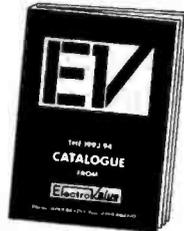
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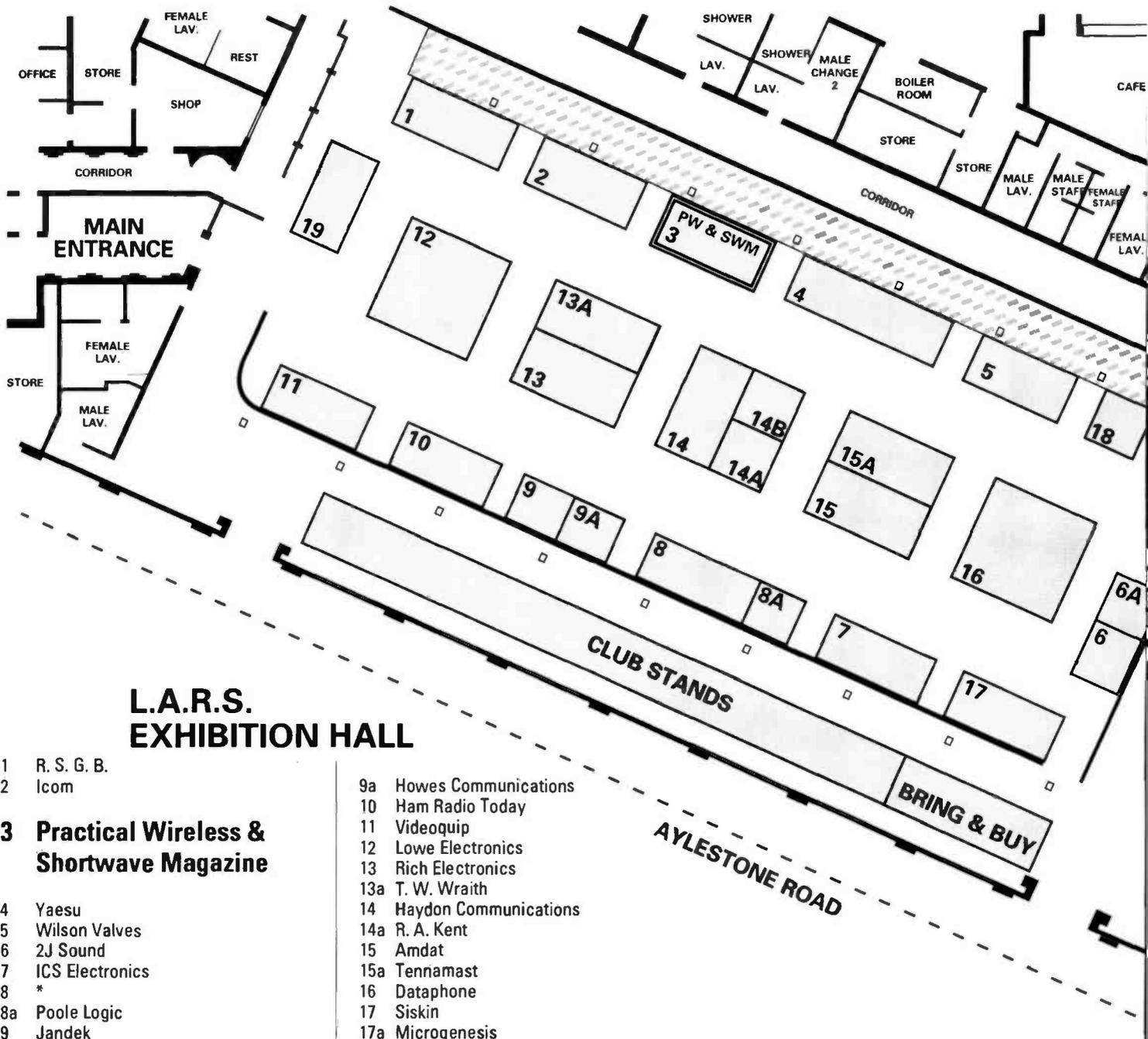
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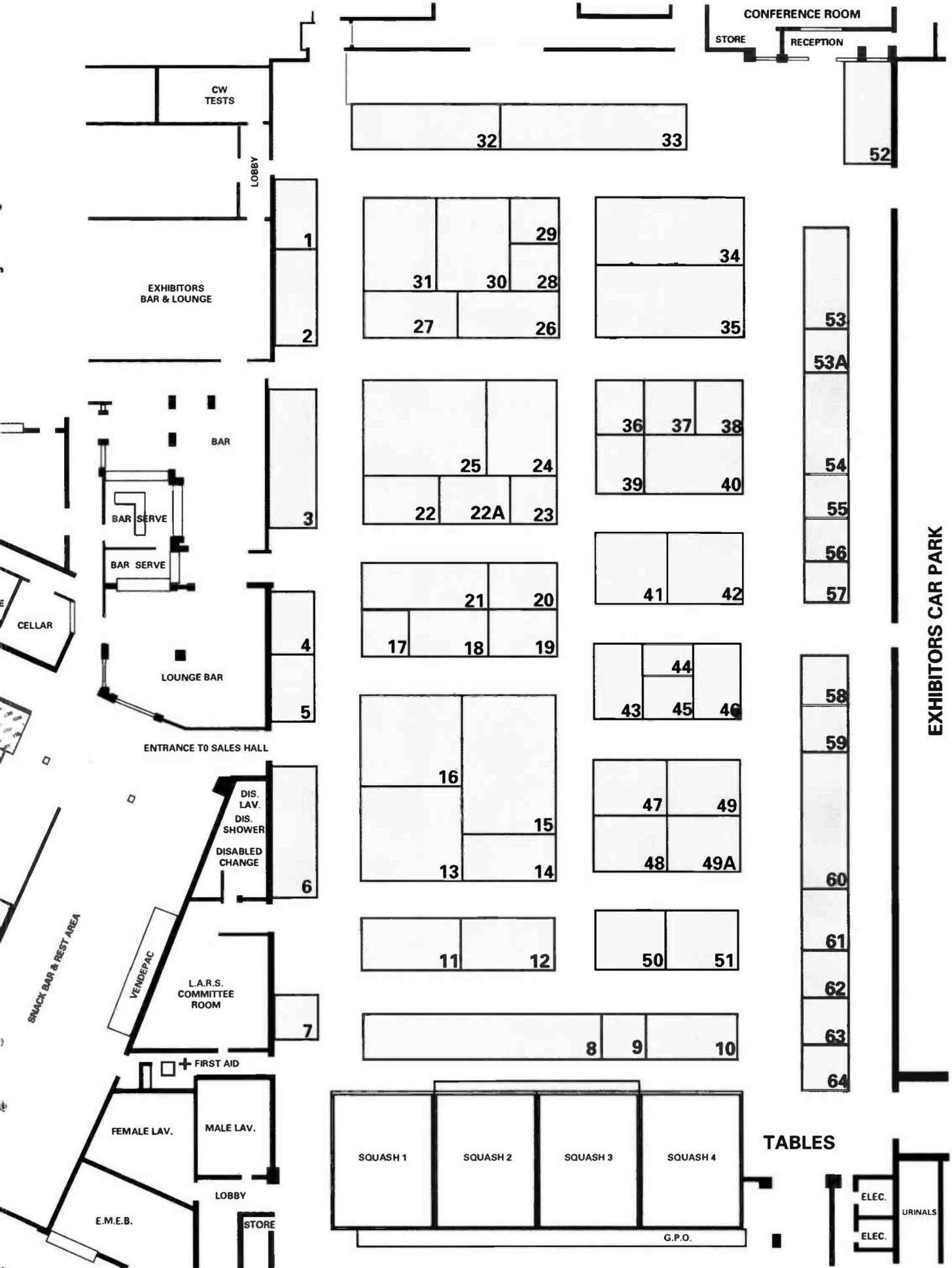


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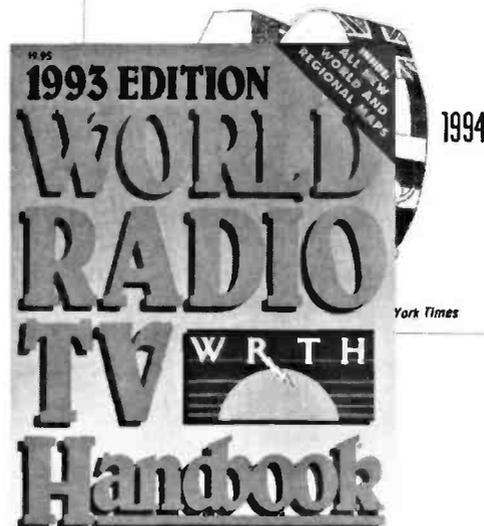
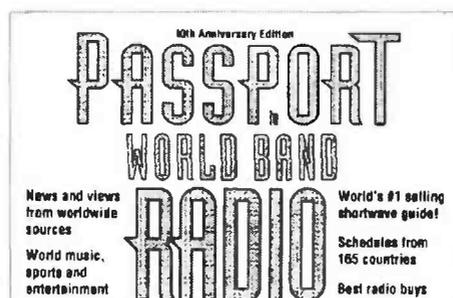
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## 144MHZ QRP CONTEST

*Once again our hard working adjudicator Neill Taylor G4HLX brings you the results of the PW 144MHz QRP Contest, an event which is aimed at being fun for everyone.*

For their entry in the 1993 QRP Contest the G3OAP/P team managed to find a particularly pleasant site and good weather - despite the fact that they 'bent' a brand new antenna setting up their station.

The eleventh annual Practical Wireless 144MHz QRP Contest was held on a warm and sunny Sunday in June. Although propagation conditions were generally poor and the level of activity lower than last year's 10th anniversary special, those taking part enjoyed a good day of QRP operation.

Despite the mediocre conditions, very good distances were worked by many stations. It just shows what can be done with the 3W output power!

Altogether 95 entries were received, a few more than in 1991, but not as many as last year's bumper entry. Some 35 of these stations were single operator and 67 were portable. The results tables show a few changes from the pattern of the last few years.

### The Winning Group

The overall winning group, for the first time, is the Hereford VHF Contest Group GW1VDF/P. They operated from a 630m a.s.l. site in Powys.

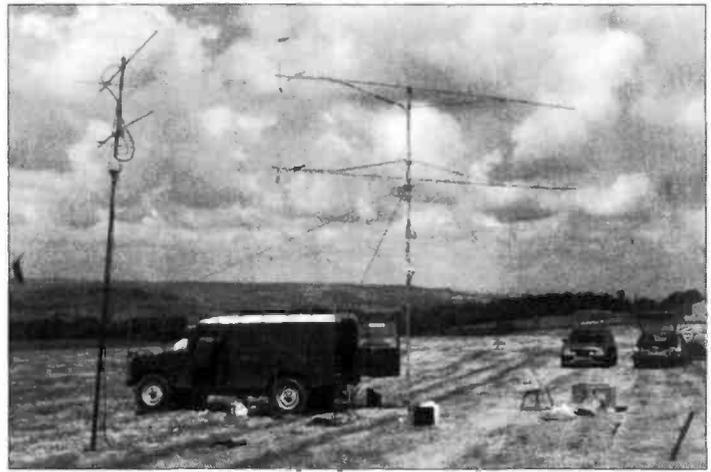
The Hereford group were in third place in the 1992 contest, when they operated from a different location. This year they had planned to use their array of two 19-element Yagis as usual.

However, a fault developed in one of the antennas just before the contest started. So they were reduced to a single antenna.

The last time a station with just one antenna won the contest was in the very first event in 1983! For their success this year, the Hereford group will receive the winner's cup plus the special prize of a Cushcraft 144MHz antenna donated by Specialist Antenna Systems and Cushcraft (USA) Inc.

In second place is the Oldham Radio Club GIORC/P, who have entered on eight previous occasions, but never achieved higher than fifth place before. Their efforts bring them the runners-up prize of a Portable Battery Power Pack, donated by Bob Keyes GW4IED of Key Solar Systems.

The Mansfield group who have won the QRP contest for the last three years were unable to get together to



enter this year. However, one of their operators, M. Cowley G0GAG, decided to take part on his own from home.

He achieved a remarkable result: third place overall, leading single operator, and leading fixed station. This is the highest position that a fixed station has ever been placed.

### Tennamast Trophy

This year's winner of the Tennamast trophy for the leading Scottish station is Colin Smith GM0CLN/P. Details of the other leading stations will be seen in the tables.

Certificates will be awarded to the winners and to the leading station in each locator square. Full detailed results lists will be sent to all who supplied an s.a.e. with their entry, and to those who now send a request (with s.a.e.) to the Broadstone office.

I shall also circulate the detailed list through the packet bulletin board network shortly after this issue is published. So look out for bulletins addressed to "CONTST" originating from G4HLX on your local BBS.

### Listener's Challenge

For the first time this year we introduced a Listener's Challenge to give v.h.f. listeners a chance to compete. This was in response to requests from several s.w.l.s last year.

Sadly, the challenge attracted only one entry. This came from Kevin Baldry and Mike Robertson who logged 40 stations in nine locator squares. They will receive a certificate for their efforts, and lets hope that next year they are given some competition!

### Relatively Slow

Most operators found the rate of making contacts was relatively slow. But opinion was divided on whether it was because conditions were poor or whether the number of stations active was lower than usual.

"Conditions were poor with gaps between contacts" remarked GW0NWR/P. On the other hand G4JBR/P reported they had "never

heard the band so quiet".

From over the border GM1FML/P offered another explanation: "less activity... must be the dastardly packet effect"! Their comment was presumably referring to the rising popularity of digital modes attracting support away from traditional activity such as s.s.b. contesting.

Not everyone saw the poor propagation in a negative light, though. For example, G3NPB said that "conditions were not as good as last year but that made it even more interesting, it took me over 15 minutes to complete my only contact with Scotland".

Advice came from G0OVA/P, who pointed out the need for careful listening when conditions are down. "We needed to examine every little 'squeak' on the band by beaming up very carefully - a tiny 'bit of splatter' turned into EI6ARB/P".

### Height Of Season

Despite the annual scheduling of the QRP contest at the height of the sporadic-E season, only once in its eleven-year history have we enjoyed a major E-s opening. And even the minor lifts have been few.

This year followed the disappointing pattern, although two stations, both in Devon, report briefly hearing signals from Spain. At G4JBR/P the operators "fell off their chairs" when called by EA6FZ in Majorca (JM19 square). At nearly 1400km, this was the longest distance worked in the contest.

The lack of c.w. activity was regretted by G4JBR/P, who pointed out that "when conditions are as poor as they seemed to be, c.w. would be an obvious option to increase your score". Others made similar remarks, but at G0LAR/P "a tortuous attempt at Morse did get us a contact, sadly turning out to be our one duplicate of the day".

### Warm Sunny Weather

If few appreciated the propagation we'd arranged, at least most did welcome the warm sunny weather.

This was once a traditional feature of the PW QRP contest, now returned at last!

Typical comments on the weather were: "the weather could not have been better, we have the sunburn to prove it"! from G6SRC/P. And also "the sun was shining, not a breath of wind" from G3WOR/P.

However, GM1FML/P discovered that if you climb high enough you can escape the good weather. The group reported that they "removed jackets and jerseys" during the long ascent to their 570 metre a.s.l. site. But the "prospects for a fine sunny day" soon disappeared when they found "the reality at the top, with hasty donning of warm weatherproof gear, was a proverbial hurricane".

## Antenna Problems

As I've already noted, the winners GW1VDF/P had antenna problems. The trouble began 10 minutes before the contest start time, when one of their two 19-element Yagis would not tune properly.

A last minute decision to abandon the 19-element and operate with a single Yagi lead to "the first contact being made whilst the mast was still being secured by the other operators". They were not the only ones going through such an experience at that moment!

Another group, G3OAP/P, had a "lesson on how to bend a brand new antenna only five minutes out of its packing case". At G0LAR/P, two of the group made an "attempt at erecting the antenna mast. By using a passing cloud as a reference point, the pair managed to snap the mast in two and bend the two 12-element antennas".

To be fair, the group at G0LAR/P were doing their antenna erecting in high wind conditions. The same was happening at GM1FML/P, where "the mast was held in place by attaching it to a triangulation point, which was held in place by being attached to a large mountain".

Meanwhile, G6SRC/P had "unforeseen problems when an antenna connector unscrewed after we had the 60 foot mast in the air".

Another group, GW4SOC/P, seemed to have little time left to get their station together after the long climb to their mountain-top site in Brecon. But in the rush to get on the air, they had made a mistake about the start time of the contest: "We hurriedly set up camp and the station and put out a transmission at 0800 GMT".

The call from GW4SOC/P was heard at G0LAR/P who were "listening around to check conditions". It "led to Pandemonium" as, fearing that they may be an hour late for the start, "our paperwork was buried under a scrum of operators all seeking the rules"!

When this was done, they gently corrected the GW4SOC/P team who told me that, "with an hour to wait, took a much needed rest and looked at the breathtaking view around us"!

"An incredible amount of QRM" from an unknown source was experienced by G8VEL. They reported that "the noise was so bad that I took several breaks but still ended up with a headache and some temporary ear damage. It sounded like muffled RTTY".

I'm afraid that the report from G8VEL seems typical of the pollution of the v.h.f. spectrum that is becoming all too common these days. It coincides with the rise of home computers and other poorly screened domestic digital apparatus.

## Welcome Newcomers

It's pleasing every year to welcome some newcomers to the world of v.h.f. contests. "Our first contest from the Swale club for nine years" was the comment from G6SRC/P. They reported that "we all very much enjoyed the day and with the experience gained are now looking at entering other contests on the v.h.f./u.h.f. bands".

The comment from GW4SOC/P pointed out that it was "our first contest as a group. We entered for the enjoyment of participating rather than going all out for glory, and we all enjoyed ourselves very much".

Several groups again had novices amongst their operators. Those who worked G4HLX may have noticed a young voice much of the time. This was my son Ben 2E1BSO, getting his first taste of contest operating.

## A Little Moan

Before concluding this year's report, I can't avoid having a little moan once again. It's about the entrants who make the adjudicator's job unnecessarily difficult by not fully complying with the rules.

The problems include: Missing covering information, such as lists of squares worked, logs presented with columns in the wrong order, or with multiplier contacts not indicated, entries sent to the wrong address or posted way past the closing date.

All the misdemeanours result in a penalty being imposed. Generally it means 5% off the adjudicated score for the offending station. A late, incomplete entry sent to the wrong address thus gets 15% deducted (yes, there was one!).

Next year I shall have to consider disqualifying stations who persist in making my job harder, especially when it seems obvious that they have not read the rules fully (and if you haven't seen them in the magazine, they're available free from the office in Broadstone on request - you don't even need an s.a.e.!).

## PW 144MHz QRP Contest 1993

Pos.	Callsign	Points	Pos.	Callsign	Points
1	GW1VDF/P	8547	49	G7COC/P	1040
2	G1ORC/P	4872	50	G3NPB	975
3	G0GAG	4025	51	G4ZVN/P	952
4	G0HAS/P	3784	52	GX8NJA/P	945
5	GW0NWR/P	3560	53	GW4WVO	930
6	G4SRS/P	3528	54	GM7GUC/P	918
7	G8DDY/P	3171	55	EI4GRC/P	893
8	G4RSE/P	3124	56	G1JDP/P	882
9	G1POS/P	2860	57	GM1FML/P	828
10	G4ZTR/P	2814	58	G1CEI	810
10	G3OAP/P	2814	59	G1SWQ/P	806
12	G6WIR/P	2780	60	G7OFW/P	804
13	G0RMG/P	2755	61	GW1CXK/P	750
14	G8ETD/P	2717	62	G0ADH/P	748
15	G3WOR/P	2698	63	G2HR/P	612
16	GW4SOC/P	2646	64	G4JBR/P	572
17	G6ARC/P	2583	65	GX0PZE/P	570
18	GW8ZRE/P	2556	66	GM0SGH/P	554
19	G0OVA/P	2500	67	GW3EOP/P	550
20	G7NNN/P	2304	67	G7ESY/P	550
21	GD0TFO/P	2244	69	G0RKG/P	520
21	G0SEA/P	2244	70	G4AVN/P	513
23	G6SRC/P	2220	71	G7FDC	508
24	GW11KN/P	2156	72	GM4YWS/P	507
25	G0PCX/P	2155	73	G0AVU/P	505
26	GM0CLN/P	2100	74	G4EDR/P	468
27	G0GZQ	2086	75	G0LAR/P	441
28	G3PII/P	1872	76	G1JGE/P	432
28	G7FOX/P	1872	77	G0MYM	407
30	G7LQD/P	1840	78	G4CIB/P	312
31	G3LRS/P	1792	79	GM8TT/P	286
32	GW3CSA/P	1763	80	G7GYS/P	253
33	GW6DQO/P	1728	81	GM4YEQ/P	232
34	GM4ITR/P	1720	82	G0MQM	217
35	G4SME/P	1668	83	G2FKO/P	208
36	G0OCE/P	1650	84	FA1ROW/P	198
37	G4ARI	1648	85	G7AXE/P	192
38	EI6ARB/P	1638	86	G8BMI/P	180
39	G4NOK/P	1530	86	G7OED	180
40	GM0OCG/P	1422	88	G7EKC	150
41	G0BNC/P	1414	89	G0SMV	144
42	G0NYL	1350	90	GW0NKN	90
43	G4TSW	1296	91	G0GCI	80
44	G17CMC/P	1240	92	G7NRO/P	66
45	G1BWJ/P	1180	93	GW8AWT/P	55
46	G0OPH/P	1106	93	G8VEL	55
47	GW0SYG/P	1105	95	G0TMT/P	28
48	G3BPK/P	1104			



## Enjoyable Contest

Despite the disappointing propagation conditions and the lower level of activity, many comments have been received saying how enjoyable the contest was. The winners, GW1VDF/P, say "the PW contest again seems to have turned out to be the contest of the season. There's

**Fig. 1: A welcome tea break after setting up the site for the team at GWONWR/P the 'North Wales Wafflers'. Judging by his knees Ted GWODSJ has obviously discovered that cows had recently been in the field!**

**Leading Stations**

**Overall Winners**

Hereford VHF Contest Group  
GW1VDF/P

**Runners Up**

Oldham Radio Club  
G1ORC/P

**Leading Single Operator and Leading Fixed Station**

M. Cowley  
G0GAG

**Runner-up Single Op. Fixed Station**

Oldham Radio Club  
G1ORC/P

**Leading English Station**

Oldham Radio Club  
G1ORC/P

**Leading Welsh Station**

Hereford VHF Contest Group  
GW1VDF/P

**Leading Scottish Station**

Colin Smith  
GM0CLN/P

**Leading Irish Station**

John O'Sullivan  
EI6ARB/P

**Listeners' Challenge**

**Winners**

Kev Baldry & Mike Robertson

**Editor's comment: On behalf of the PW Editorial team and readers, I pass on my thanks to Neill Taylor for all his hard (voluntary) work in running the contest. Without you Neill, there would be no PW QRP Contest. Thank you. G3XFD.**

**Leading single operator stations**

Pos	Name	Call	score	QSO	Squ	Loc	Ant	asl,m	Tx/Rx
3	M. Cowley	G0GAG	4025	161	25	IO93JD	16Y	50	IC251E
7	Peter Thompson	G8DDY/P	3171	151	21	IO90JO	2x19Y	225	FT221R
9	Jon Page	G1POS/P	2860	143	20	IO92CA	14Y	300	FT480R
10	John Lemay	G4ZTR/P	2814	134	21	JO01HW	2x9Y	75	SSBT/V
14	Trevor Rumble	G8ETD/P	2717	143	19	IO91CL	9Y	270	IC290E
18	Dave Hewitt	GW8ZRE/P	2556	142	18	IO83JA	HB9CV	560	TR751E
19	Tony Crane	G0OVA/P	2500	125	20	IO91GI	13Y	295	TR751E
21	John Bellis	GD0TFO/P	2244	132	17	IO74SE	11Y	120	FT290R
30	Mike Baguley	G7LQD/P	1840	115	16	IO93AD	9Y	140	FT290R2
37	Tim Raven	G4ARI	1648	103	16	IO92IQ	10Y	200	F850

**Leading multi-operator stations**

Pos	Name	Call	score	QSO	Squ	Loc	Ant	asl,m	Tx/Rx
1	Hereford VHF Contest Group	GW1VDF/P	8547	259	33	I82JG 1	9Y	630	TR751E
2	Oldham Radio Club	G1ORC/P	4857	232	21	IO93BJ	2x9Y	635	FT290R
4	Adrian Jordan & Ian Carter	G0HAS/P	3784	172	22	IO81VG	2x13Y	245	TR751E
5	North Wales Wafflers	GW0NWR/P	3560	178	20	IO82KU	14Y	350	FT221R
6	Stroud District ARS	G4SRS/P	3528	168	21	IO81UP	2x9Y	245	FT221R
8	South Essex ARS	G4RSE/P	3124	142	22	JO01EN	19Y	55	IC271E
10	BBC Ariel RG Rampisham	G3OAP/P	2814	134	21	IO80PU	2x17Y	250	FT225RD
12	Burnham Beeches Radio Club	G6WIR/P	2780	139	20	IO91KG	2x9Y	130	FT736R
13	R. & J. Jones	G0RMG/P	2755	145	19	IO91EX	12Z	245	FT290R
15	Worthing & District ARC	G3WOR/P	2698	142	19	IO90TV	17Y	220	FT221R

**Leading stations in each locator square**

Sq.	Name	Call	No. entrants in square
IN99	Eric Rulier	FA1ROW/P	1
IO53	Galway Radio Experimenters' Club	E14GRC/P	1
IO63	John O'Sullivan	EI6ARB/P	1
IO70	David Blackford	G3NPB	2
IO71	Cleddau Amateur Radio Society	GW0SYG/P	5
IO74	John Bellis	GD0TFO/P	2
IO75	Rik McHarg	GM8TT/P	1
IO76	Glasgow VHF Contest Group	GM1FML/P	1
IO80	BBC Ariel Radio Group Rampisham	G3OAP/P	6
IO81	Adrian Jordan & Ian Carter	G0HAS/P	8
IO82	Hereford VHF Contest Group	GW1VDF/P	3
IO83	Dave Hewitt	GW8ZRE/P	6
IO84	Colin Smith	GM0CLN/P	1
IO85	Keith Fisher & Nigel Webster	GM4TR/P	5
IO86	Ochil Hills Contest Group	GM0OCG/P	4
IO90	Peter Thompson	G8DDY/P	2
IO91	Burnham Beeches Radio Club	G6WIR/P	11
IO92	Jon Page	G1POS/P	8
IO93	Oldham Radio Club	G1ORC/P	11
IO94	Paul Heptinstall & Derek Smith	G0OPH/P	7
IO95	Northumberland Contest Trio	G1SWQ/P	1
JO01	South Essex Amateur Radio Society	G4RSE/P	6
JO02	C. & D. Rolph	G7GYS/P	3

**Leading Stations using a single antenna**

Pos.	Name	Callsign	Antenna
1	Hereford VHF Contest Group	GW1VDF/P	<b>MET 19 ele yagi</b>
3	M. Cowley	G0GAG	<b>16 ele long yagi</b>
5	North Wales Wafflers	GW0NWR/P	<b>Cushcraft 14 ele Boomer</b>
8	South Essex ARS	G4RSE/P	<b>MET 19 ele yagi</b>
9	Jon Page	G1POS/P	<b>14 ele yagi</b>
13	R. & J. Jones	G0RMG/P	<b>12 ele ZL special</b>
14	Trevor Rumble	G8ETD/P	<b>9 ele yagi</b>
15	Worthing & District ARC	G3WOR/P	<b>Cushcraft 17 ele Boomer</b>
16	SODA Contest Group	GW4SOC/P	<b>8 ele yagi</b>
18	Dave Hewitt	GW8ZRE/P	<b>HB9CV</b>



something about this one that I just can't put a finger on".

Well, I suppose GW1VDF/P are bound to appreciate it, although their remarks were made before they knew that they had won! Plenty of other entrants made similar remarks, though,

**Fig. 2: The station of G8VEL who reports "an incredible amount of QRM" from an unknown source seems typical of the pollution of the VHF spectrum that's becoming all too common (see text).**

and G3NPB sums it all up: "once again a hugely enjoyable contest, my high spot of the year. Everything is right about this one, the length of time, the power, the rules and indeed the activity".

So, in closing this year's report I say thank you to all who sent in an entry or checklog for the contest. My congratulations to all leading stations and it's time for me to ask you to note in your diaries the date of next year's PW 144MHz QRP Contest which is Sunday 19th June 1994. The best of luck to you all!

Neill Taylor G4HLX

Keen DXer and operator Ed Taylor G3SQX has taken a close look at a linear amplifier from the American manufacturer Ameritron which is capable of 1kW output on all h.f. bands.



# The Ameritron AL-80BX Linear Amplifier

Review

As a keen DXer and operator I looked forward with some eagerness to getting hold of the Ameritron linear amplifier. The design is fairly standard, with a single 3-500Z in grounded grid mode.

There's very little to go wrong with the amplifier and it has the ability to run 400W all day. Ideal for contesting and getting nearer to the front of pile-ups!

The appearance of the AL-80BX confirmed the anticipation. When it arrived, it was a solid looking, rather heavy box, containing a suitably weighty mains transformer.

On one side is the input and control circuitry, on the other is the p.a. compartment, with large pi-network components. The amplifier is of high specification, and looks good.

The equipment generally lived up to its initial promise, but it was not completely without problems. I had a lot of good usage out of the AL-80BX, and worked stations that otherwise would have got away.

However, several faults developed in the review amplifier. This ought not to have happened.

The review period left me with mixed feelings. I thought that the AL-80BX was a good amplifier, but I would like reassurance that Ameritron and the importers had improved their pre-delivery testing.

What do we actually expect from an h.f. linear amplifier? Everyone wants something different, but let's consider some of the requirements, and the extent to which the AL-80BX meets the needs.

## Nine Bands Essential

The ability to cover all nine bands is essential. Some linears omit 1.8 to 2MHz, and models destined for the USA do not include 24 and 28MHz without modification.

The amplifier must produce 400W without struggling, which means a capability of perhaps 700-800W running flat out. This helps to ensure operation in a linear part of its characteristics. In these respects, the AL-80BX succeeds.

The amplifier should look like 50Ω load to the transceiver. It should also be able to drive the usual 50Ω antenna system. It would also, of course, be helpful if the amplifier could cope with a wider range of output loads, allowing for an s.w.r. of up to perhaps 2:1 or 3:1.

The switching must have a straight-through position, to allow the main rig to be used 'barefoot'. In this respect the AL-80BX is satisfactory, although its operation in the 10/14MHz position is a compromise, as will be seen later.

The amplifier ought to incorporate circuits to protect against misuse, and to obviate the possibility of producing spurious output. You don't want the amplifier to fail expensively if your feeder breaks in mid-QSO, or if you forget to operate the band change switch!

I didn't subject the AL-80BX to serious misuse. But it looked well capable of standing up to anything reasonable and it's equipped with useful monitoring circuits.

The changeover from transmit to receive needs to be well designed. Some amplifiers cannot be used directly with certain transceivers, because the current drawn by the changeover relays is too heavy.

In the AL-80BX, relays are used. They operated well with several rigs, but their reliability is suspect (see later for details).

A keen c.w. operator might prefer to operate with full break-in, usually precluding the use of relays altogether. However, a 'QSK' option is available for the AL-80BX as an option.

## Trend In Design

The trend in amplifier design is to follow transceiver design by using solid state devices. This is not necessarily an

improvement, because it can mean an increase in distortion and spurious output.

Most solid state linears are fixed tuned, requiring no tune-up. This is a mixed blessing although the average level of non-linearity is likely to be higher, the possibility of gross maladjustment and serious interference is quite low.

In practice, just changing bands with a single switch (or none at all if the main rig and linear are electronically linked) is a big operating convenience.

## Using the AL-80BX

The amplifier is not too difficult to set up initially. The valve is packed separately and takes just a few minutes to install.

Connecting the mains is a bit more challenging. After cutting off the moulded 110V plug, I was confronted with three wires whose colour-coding is not obvious.

Study of the manual showed how to connect the plug. A note for non-Americans would have helped. (See comment from importers at end of text. Editor).

Transceiver interconnection is well explained, with useful diagrams. The leads are of standard type, and an auxiliary 12V output is available on the back panel if needed.

The Load and Plate controls need to be set up for each band and in some cases, for the c.w. and s.s.b. portions of each band.

The positions of these two controls should be recorded. They can be recalled accurately enough on a band change to require little further adjustment.

## Rated At A Kilowatt

The AL-80BX is rated at a 1kW, although this drops off a little at the higher frequencies. It cruises along at 400W on all nine bands, producing a nice clean SSB signal, hardly getting warm.

Internal circuitry switches off the 3-500Z when there is no input (between words or dots and dashes). This reduces the heat production even further. Noise from the internal fan is almost imperceptible.

The quality of the signal was such that stations contacted were not aware that an amplifier was in use. Although some commented about the signal level on their S-meter!

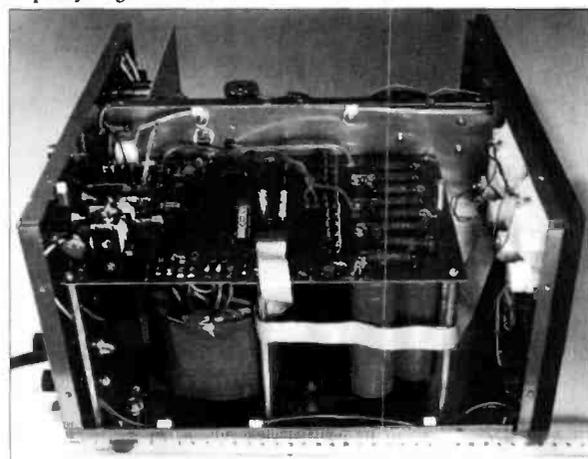
The switching on the amplifier groups together the six higher bands into three positions. They are 10/14, 18/21 and 24/28MHz (marked as Aux). So, some of the input networks, which are pre-tuned, have to cope with two bands.

The switching arrangement works well apart from the 10 to 14MHz position. Not surprisingly, it's difficult to design a circuit which will cope with a frequency range of 10 to 14MHz.

The result of the switching is that the input s.w.r. on 10MHz is greater than 3:1. This in turn means that most transceivers will not drive the amplifier to full output on this band. This is not a problem in the USA, because their power limit on 10MHz is 200W.

The 10 to 14MHz input circuits can be retuned from the back panel using a trimming tool and the s.w.r. on 10MHz brought down to a reasonable 1.5:1. This pushes the 14MHz s.w.r. to over 3:1, but a compromise can be found, with an s.w.r.

Fig. 1: The Ameritron AL-80BX, as a heavy duty item of equipment is a robustly and neatly built unit. The 'X' suffix denotes the amplifier as an export model, equipped for European mains voltage.





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of about 2.5:1 on each band.

The 2.5:1 s.w.r. is not ideal, and might cause problems with some transceivers. The correct solution would be a separate position for each band.

The instructions on setting the a.l.c. and driver levels are rather hard to follow. But once the amplifier is operational, the levels need no more adjustment.

In fact, the front-panel a.l.c. control allows adjustment of output from 150W upwards. This a useful facility.

The manual also suggests that the amplifier can be driven hard to produce a form of speech compression, without introducing distortion. The a.l.c. voltage generated by the AL-80BX is then supposed to reduce the transceiver output so as to obviate non-linearity.

I think the suggestion is perhaps risky. This is because there is no guarantee that the transceiver will react quickly enough to a change in a.l.c. voltage, and an r.f. spike could be generated.

A warning is given about key clicks when using the a.l.c. control in this manner for c.w. However, I would recommend a proper speech processor for s.s.b. rather than relying on the method described.

## Number Of Faults

It wasn't all plain sailing with the AL-80BX supplied for review and a number of faults were apparent, some of them from the outset. In summary, they were as follows:

The forward and reflected power indications are given by a cross-needle meter. On the review amplifier the meter was not operating correctly, with a fault apparently in the measuring and driving circuitry.

Another cross-needle meter showed grid and plate current and the needles stuck together at some (high) settings. This gave me one or two heart-stopping moments until the solution, a sharp knock on the front panel, was devised!

The transmit-receive changeover relay also tended to stick in the transmit position. This could be solved by a bang on the side of the case but it was an extremely annoying fault!

A side-effect of the transmit-receive switching problem was that the standby/operate switch did not work. This meant that it was impossible to take the amplifier out of circuit without disconnecting the cables.

## Not Serious

I don't regard any of the faults I've mentioned as serious. If only one of them had occurred, the equipment would have been sent back for repair without comment.

Of course, the 10 to 14MHz input tuning system is a design problem and some users might decide to live with it. But to have all the mechanical faults appearing in one piece of equipment looks like a quality control problem, and it's surely more than just bad luck.

There could have been some damage during carriage of the amplifier from the USA. But am I expecting too much in supposing that the importer should unpack and test each item of equipment as it arrives in the store? A pre-delivery check would have revealed some of the problems before the AL-80BX arrived in my shack.

However, in conversations with Ameritron and the UK retailers, I was told that hundreds of these amplifiers were being used without complaint. Although accepting this entirely, I can't help having a few nagging doubts.

I was also not altogether happy with the instruction manual, because together with problems mentioned already, some of the descriptions were rather terse. The circuit diagrams in the manual were poor, making fault-tracing difficult.

Obviously an instruction manual is not expected to be a workshop manual. But I think there should have been more circuit explanations, with p.c.b. connection information.

## Impressed By Performance

All the visiting operators who have used the AL-80BX were impressed by its performance. It was easy to use and adjust and band-changing, even in the heat of a contest, was quite straightforward.

We had no trouble in achieving 400W output. Even after 20 hours of continuous operation, the amplifier was cool.

For the purpose of the review, the AL-80BX was used on all nine bands over a three month period. This included normal operation for 'ragchews' on 3.5 and 7MHz (c.w. and s.s.b.) an afternoon of intense activity operating a special event station and during three major contests.

In a residential area, some amateurs are afraid to run over

100W because of the possibility of breakthrough and interference. It's quite practicable to operate without the amplifier, and only to switch on for difficult conditions.

Switching in the linear for difficult conditions minimises the time during which neighbour problems can be experienced. The AL-80BX was fun to use in this way!

After fruitless calling in a DX pile-up, the amplifier would be switched on. The extra S-point or so often meant that the DX station would respond within two or three calls.

## Summing Up

So, in summing up what's my verdict on the AL-80BX? In fact I liked it, and found the amplifier to be very straightforward to use in practice.

The AL-80BX interfaced with every transceiver I tried, and reports of audio and c.w. quality were good. After a short period of practice with the controls, I think any owner could be pretty sure that their signals would be of high quality.

The price of the AL-80BX is quite high. But on the other hand it's a piece of equipment that should continue working for many years.

As I've already mentioned, there are doubts about the level of testing and quality control. These problems ought to be discovered before the user buys the amplifier, not afterwards. However, the design is basically sound and I would be happy to use the AL-80BX as a general purpose and contest amplifier.

## Thanks

My thanks go to Ross Clare GW3NWS, for his comments and help in evaluating the amplifier. I'm also indebted to the members of the Flight Refuelling Amateur Radio Society G4RFR for their help when they used the amplifier at GB4HQ during the IARU contest.

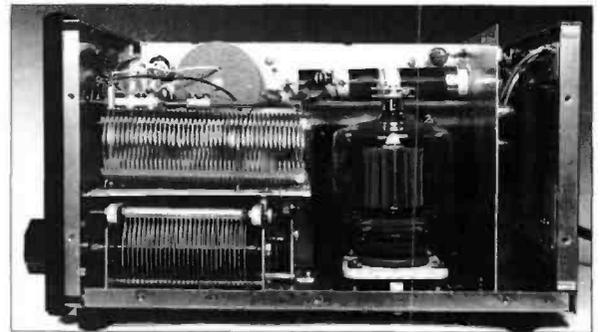
Finally, my thanks go to Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS. Tel. (0702) 206835, FAX (0702) 205843, for the loan of the review amplifier which they can supply for £1499 (price correct in September) plus insured carriage of £10.

## Manufacturer's Specifications

Frequency coverage:	1.8, 3.5, 7, 10.1, 14, 18.1, 21, 24.9 and 28MHz.
Input:	Pi, Pi-L. Typical drive for full power output 85W
Output:	Typical p.e.p. s.s.b. 1kW, c.w. 800W
Metering:	Forward and reflected power, s.w.r., a.l.c. threshold and output voltages, e.h.t. voltage, anode and grid current.
Connectors:	Phono type for a.l.c., p.t.t., and 12V output, r.f. SO239.
Distortion (3rd order i.m.d.):	-35dB at rated output
Valve type:	3-500Z (Continuous rating 500W)
Power supply:	No load 3.1kV, full load 2.7kV, full load current 450mA.

## Dimensions

Weight: 27kg



**Fig. 2: The 'final' power for the AL-80BX unit is provided by a 3-500Z valve, with a warm-up time of 10 seconds.**

**Fig. 3: Ed Taylor G3SQX on the air and logging in the latest contact gained with the AL-80BX linear amplifier (in background).**



*Practical Wireless* asked Waters & Stanton for their comments on points raised by the G3SQX review: Jeff Stanton in reply stated that "At the time Ed Taylor first had the linear, it was literally the only one we had as we were waiting for a new shipment. Therefore we could not exchange the unit despite the faulty meter. We are now random checking the Ameritron linears before despatch to customers to eliminate this kind of fault. Also, all linears are now supplied with the UK mains plug fitted.

I take your comment about the brevity of the circuit diagrams, but on the other hand we do not encourage our customers to fault find with this type of high power amplifier. Since we visited MFJ at Dayton in the spring, both MFJ and their associated company Ameritron have made big efforts to improve quality control and this has paid off in very few faults appearing. As you know, they now produce several state of the art products like the MFJ 249 digital analyser and MFJ 1278 data controller, although American manufacturers generally are still learning from our Japanese friends".

PW



**The Completed PW prototype Tiny TIM (Transceiver In Miniature) 3.5MHz s.s.b. project, designed by Tim Walford G3PCJ.**

*This month Tim Walford G3PCJ completes the description of his s.s.b. Transceiver In Miniature 3.5MHz project, and explains how you should finish off the transmitter section.*

Now you've completed the receiver it's time to start work on the transmitter section. But before you begin, I suggest it's a good idea to turn all preset resistors fully anticlockwise before fitting them to the p.c.b.

Fit the microphone socket and the Tune switch and wire them up to the board. Then install the two relays, RL1 and 2, resistors R30 and 31, C40, 41, D3, 4 and Tr6 which controls the change-over switching.

Turn on and listen for the relays clicking over as you operate your p.t.t. switch, (it needs to ground the p.t.t. line). The receiver should also be silent while on transmit.

Now install the transmit pre-amplifier R23-26, C37 - 39, L5, Tr4 and 5. If you have another 3.5.MHz receiver you can listen to this rig to check this part.

When the Tune switch is closed during transmit (which severely unbalances the balanced modulator) r.f. is produced for tuning up purposes. Advance the drive preset R27 a little and you should be able to hear this rig's carrier on another receiver if its antenna wire is nearby when you close the Tune and p.t.t. switches.

### Radio Frequency Components

Install all the other radio frequency components R21 - 23, C34-36, R28, C42, L3, Tr2 and 3. Now wind 33 turns of 24s.w.g. wire tightly onto the T68-2 toroid for L4.

Leave 50mm spare at each end in case the turns need altering and solder it in place temporarily. Fortunately, the modern enamelled wire (with a slightly pink coloured enamelling) needs only a very hot iron to burn off the insulation.

However, take care as the fumes given off by the burning enamel are irritating. Make sure your work place is well ventilated.

The output f.e.t. has to have its tab isolated from the heatsink. So to isolate it, put the thin heatsink washer between the tab and heatsink (preferably with a dab of heatsink compound if available). The nut and bolt (if metal) also need isolating by the small shouldered bush that fits snugly into the hole in the f.e.t.'s tab.

Now you can fit the heatsink, making certain the wide side of the central part can accommodate the output f.e.t. Tr2.

The source lead of the f.e.t. should only be soldered on the top of the p.c.b. And since a good direct earth connection is required, you should not solder it on the underside in case it has to be changed!

The drain and gate should be soldered underneath as normal. Remember to check whether any earthy part you are fitting needs to be soldered on both sides.

Connect up your power meter (set to read power out) and feed this to your dummy load (or a known 50Ω antenna feeder). Put a 2A meter in the positive d.c. supply lead. Check the Tune switch is off and that R28 is fully anticlockwise.

Switch on and go to transmit. The supply current will rise a little from the receive value about 50mA when you press the p.t.t. switch, mainly due to the relays.

Slowly advance the preset R28 (while on transmit) till the supply current rises to 400 to 500mA. There should be negligible r.f. output and the current should fall back, on going to receive.

### Tune Switch

Turn on the Tune switch, then advance the drive preset R27 so that on transmit about 3 to 5W p.e.p. is being produced. Next adjust the two cores of T2 and L2 for max output at a frequency near 3.7MHz.



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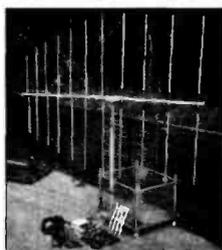
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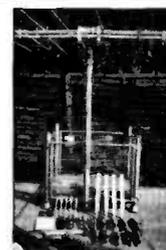
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Then adjust the drive preset R27 for just below maximum output. This should be about 12W p.e.p. if using 12V supplies.

If you are using a higher supply voltage watch out that the heatsink doesn't get too warm - go to receive for a while! If you can't get 12W p.e.p. (on 12V) into a known 50Ω load, you can try one more or less turns on L4, but it's not likely to need altering. If all is well fit L4 with short leads.

You can now fit all the speech amp parts, R32-36, C43 - 48, IC7 and the wiring to the microphone input (including any extra parts for your type of microphone - see later).

With the Tune switch off, go to transmit and whistle into the microphone. Now adjust the microphone gain preset R32 for the point just below maximum output.

Increasing the microphone gain further will increase the degree of clipping. This is best done in the light of other station's comments or with an oscilloscope and two tone audio generator. Your 'Tiny TIM' is now ready for on air use!

Good antenna matching is always important to get the best out of any transmitter. This rig needs a 50Ω unbalanced load, so if you're connecting it to a dipole, I recommend you use a balun.

It's better to use a link coupled resonant matching unit which will help reduce out of band signals. An output low pass filter should not be needed.

If you become seriously stuck, you'll have to seek assistance with more sophisticated test gear. Don't forget to check for solder whiskers and that devices are correctly oriented! The circuit diagrams contain typical voltages on the test points for guidance.

**Speech Amplifier**

The speech amplifier is designed for microphone impedance of 100Ω and outputs down to 1mV. Crystal microphones can be used without extra parts.

Dynamic microphones will need a resistor across the input to earth in the position Rx on the p.c.b. Typical values being 470 to 680Ω.

Electret microphone inserts sometimes need a few kΩ to a low positive supply. If you don't know the value required try 2.2kΩ in position Rv on the p.c.b. layout.

If your chosen microphone needs a positive supply with no extra resistors, take a lead from the left hand pad of Rv to one of the unused pins in the microphone. No isolating capacitor is needed.

Incidentally, you can use any type of socket to suit whatever microphone you have. But you need to know its pin connections and modify the front panel to make it fit (this is best done before it's soldered to the main p.c.b.).

Personally, I suggest the DIN five pin 180° type because it's the cheapest! Some 'communication' style

microphones have their own amplifier. These need a few kilohms to earth, so I suggest trying a 4.7k7Ω resistor in position Rx.

Don't use the +6V for microphones with their own amplifier. Invariably they have their own battery (replace it regularly regularly). However, you can use the +8V supply with suitable dropping resistor(s), if you have to power it.

**Primarily For Phone**

Although the 'Tiny TIM' is designed primarily for 'phone use, it can be used for c.w. For use with the key, you'll need a separate tone oscillator and a means of keying it, the output being applied to the mike input.

Sidetone from the keyer can also be fed into the audio amplifier at the ST pad on pin 2 of the 2030 amplifier. The audio stage remains active on transmit for this purpose.

You should perhaps unplug the microphone and connect the c.w. circuits instead to the microphone socket. This will avoid what I thought was a serious problem with the keyer. It turned out to be the microphone picking up bench vibrations from my key!

The v.f.o. and r.f. bandpass filter may need retuning for your preferred band segment. You shouldn't need to do any mods to the p.c.b.

With a bit of ingenuity you can also add receiver incremental tuning (r.i.t.). A narrow c.w. audio filter can also be added immediately prior to the audio gain control.

**Some Extra Sensitivity**

Anyone using a particularly short antenna may find that some extra sensitivity would be useful. This can be achieved by increasing the audio gain of the TDA2030 stage.

Halving the value of R16 will double the audio gain, etc. But to keep the same low 300Hz bandwidth you will need to double the value of C23. A value of about 2μF should be about right.

I suggest you carry out modifications to the amplifier with caution. This is because it increases the risk of audio breakthrough on transmit from microphone to loudspeaker when the audio gain control is at maximum. You may be able to use 150Ω for R16 and 3.3μF for C23.

Good luck! I hope that you get as much fun out of your 'Tiny TIM' as I have had in designing and using it.

However, I can't close without saying a big thank you to the members of the Yeovil ARC who tolerated my experiments. And thanks to all those numerous article writers who unwittingly contributed many ideas towards the development of the transceiver.

PW

**Radio Diary**

\*Practical Wireless and Short Wave Magazine in attendance.

**\*October 29/30:** The 22nd Annual Leicester Amateur Radio, Electronics & Computer Exhibition will be held at the Granby Halls, Leicester. All the usual attractions and facilities. Frank G4PDZ on (0533) 871086.

**November 6 & 7:** The Seventh North Wales Radio & Electronics Show will be held at the Aberconwy Conference Centre, Llandudno. Doors open at 10am on both days. Admission £1, children under 14, 50p. B. Mee GW7EXH on (0745) 591704.

**November 7:** Bishop Auckland Radio & Computer Rally will be held at Spennymoor Leisure Centre. Doors

open 11am, 10.30am for disabled visitors. All the usual stalls, bar and catering facilities. M. J. Shield G0PRQ on (0388) 766264.

**November 7:** Donegal TIR Cornaill Amateur Radio Society will hold its annual radio rally at Jacksons Hotel, Ballbofey, Co. Donegal, Eire. Large trade presence is expected, Bring & Buy, leisure facilities on site. Special accommodation rates will be available in Jacksons Hotel. Ken McDermott EI4DW, QTHR on 010-353 74 31109.

**November 13:** AMS 7 The All Micro Show, Electronics Fair & Radio Rally will be held at Bingley Hall, Stafford

(Signposted from Junction 14 of M6). Large trade presence. Bar, refreshments & free parking. Sharward Services on (0473) 272002.

**December 5:** Leeds & District Amateur Radio Society will be holding its rally at Allerton High School, King Lane, Leeds. Four large main halls, talk-in on S22, catering facilities. Richard Tillotson G7HUE on (0532) 552344 or FAX (0532) 393856.

**December 12:** Centre of England Christmas Radio, Satellite, Computer & Electronics Rally is being held at the Sports Connexion Centre, Leamington Road, Ryton on Dunsmore Coventry

A45/A423. Doors open at 11am, 10.30am for disabled visitors, admission £1. Over 80 traders, Bring & Buy, talk-in on S22. Bar and hot food all day, ample free parking. Christmas special 'Spot The Cracker' on many of the trade stands to win a prize. Frank Martin on (0952) 598173.

**If you're travelling long distances to rallies, it could be worth 'phoning the contact number to check all is well, before setting off.**

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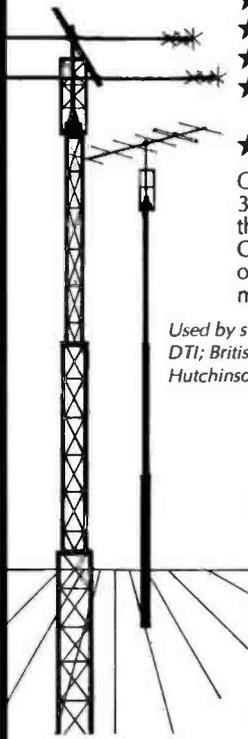
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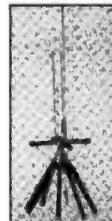
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# Valve &

I try not to be too repetitive. But each subject that I raise in *Valve & Vintage* generates more interesting information and/or requests for help from you, my enthusiastic readers.

For instance, another important component often used in the home-made breadboard receivers, referred to in my September column, is the plug-in coil. They were typical of 1920s thinking and the idea was often used throughout the following 40 years.

Take a look at that 'stacked' four valve receiver in Fig. 1. On the top deck, you will see three plug-in coils.

The set in Fig. 1, must go back to the early 1920s. This is because the inter-connecting wire is uninsulated and square in shape, unlike round covered wire which soon became the norm.

The ends of the square wire had to be hammered flat before they could be attached to a component's terminals. Do try and preserve this rare type of wire and style of wiring, if a set like this comes your way.

## Like A Honeycomb

Each coil in Fig. 1, has two differing pins. The home-brew versions were wound, like a honeycomb, on a special DIY tool. The working wavelength of these

inductors was governed by the number of turns of cotton covered wire on the former.

It was common practice to have a flat piece of suitably drilled polished wood on top of the cabinet. These held perhaps a dozen, different sized coils.

Most coils had an identification mark or number and to change waveband, another set of coils was plugged-in. One manufacturer had the slogan 'What are the wild-waves saying' stamped on the outer covering of their coils!

Referring again to Fig. 1, the coil on the left is in a fixed socket. However, the pair on the right are mechanically connected by a spindle so that the coupling between them can be varied by a knob on the front panel.

Over the years, plug-in coils dedicated to the home-constructor were made by various firms. These included Eddystone, Denco, Telsen and Raymart.

However, during the Second World War, plug-in coils were used in the transmitter section of the 'B2' suitcase set. They were also used on each of the four frequency ranges covered by the MCR1 'Biscuit tin' communications receiver, Fig. 2.

One coil unit is attached to the set (centre right Fig. 2) in its working mode. The others are shown on the top between the

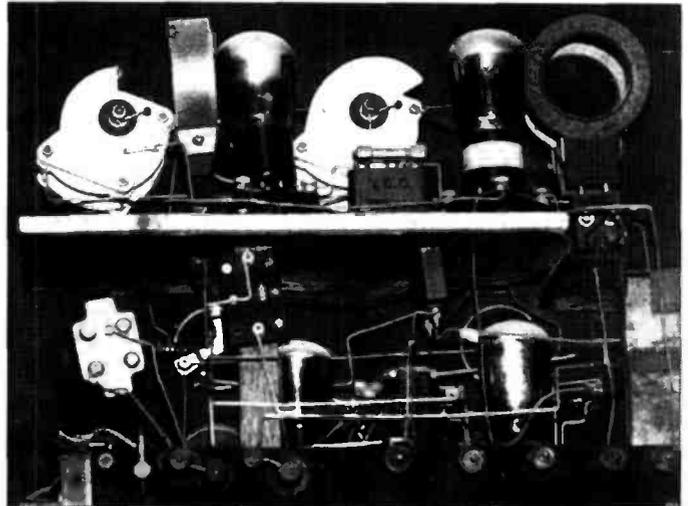


Fig. 1: A 'stacked' four valved receiver using plug in coils (see text).

receiver and the lightweight headphones. The tuning dial is numbered 0 to 180 which associates with the calibration plate on the top of each coil.

Plug-in coil packs were also used in the WS-46 'Commando' set. They were employed in conjunction with quartz crystals (type 10XJ) to pre-tune the WS-46 to three operational frequencies.

A number of plug-in coils were used to extend the range of the Eddystone 358 receiver, Fig. 3. These were changed by lifting the lid.

Plug-in coils appeared in my servicing work. Around 1950, I altered the working channel of a Philips television receiver from Ch.1 to Ch.3, in Band I, by replacing three plug-in coils.

## The Famous HRO

Another famous communications receiver noted for its plug-in coil units, is the National HRO shown in Fig. 4. One of these was recently purchased by John Stevens (Leek, Staffordshire) who is keen to get it working.

Firstly John, I suggest you try one of our advertisers for a manual. But make sure that you quote the valve types, because, the first models that reached the UK market, prior to 1939, had valves with 2.5V heaters. Later HRO receivers which

came over for military use, had (I think) the 6.3V valves.

Briefly speaking, the HRO design with its calibrated coil units, as shown in Fig. 4, is unique. One of the (nine?) plug-in coils with handles and its frequency/dial related tuning graph on the front plate can be seen, along the lower centre of the set in Fig. 4.

The HRO with its plug-in coils and single knob slow-motion tuning drive, was, in my view, a combination of the best technical thinking of the time. I believe most HRO receivers employed separate power packs and speakers.

I agree that separate coil-packs are inconvenient to use and store. However, when this set was built, a large number of amateur and professional users concentrated their efforts on one particular wavelength.

The plug in type of coil-pack did away with the need for a multi-wafer wavechange switch. The plug in types removed all the problems of oscillator drift caused by dirty or worn switch contacts.

Classic communications receivers, like cars, have their own band of followers. So, before you start taking an HRO apart for renovation, have a chat to the owner of an original HRO.

You should find one or more, among the older members of your local amateur radio club. I say this

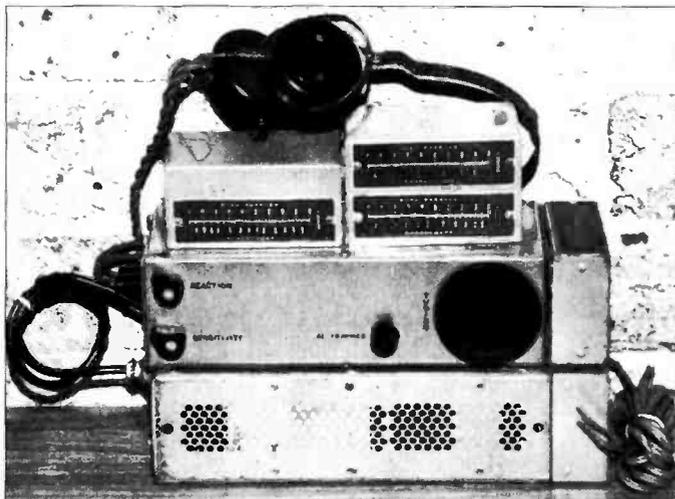


Fig. 2: The famous MCR1 'Biscuit tin' receiver from the Second World War.

# Vintage

By Ron Ham

because in addition to its war service, factory made receivers, like the HRO, were the work-horse of many amateur stations from the mid-1930s to the late 1960s.

## Two Versions

Visitors to the Amberley Chalk Pits Museum (Near Arundel, West Sussex) can see two versions of the HRO. They have special associations and are exhibited in the vintage wireless building.

One of the HRO receivers is the original version with the American UX base valves. The second, later model, using valves with the International Octal type base.

The earlier set belonged to the late Nell Corry G2YL. The other receiver belonged to the late Lou Ely G3HQQ.

Nell's set was used for her studies of propagation and solar work in the pre-war days. Lou's, Fig. 4, was loaned to the Worthing Radio Club in 1947, for use as their main receiver in the first National Field Day organised by the RSGB after the Second World War.

If you find an HRO that has been stored for sometime, examine it carefully before switching it on. Make sure that the power unit is for 240V a.c. mains.

It would also be wise to remove all the valves and screening cans. Then look for any corrosion on the valve pins or in their sockets.

Check the power input lead and renew it if the insulation on any of the cores (I think there are four cores) is perished. A short-circuit on this lead could severely damage the external power-pack.

Next, clean the contacts on the plug in coil assembly and those inside the set. Then lubricate the shaft bearings on the tuning capacitor to make sure it and the drive mechanism, runs freely and smoothly.

The drive mechanism itself is a beautiful piece of mechanical engineering. Any 'sticky' problems here will spoil the performance of a first-class receiver.

You should also check the fixed resistances for changed values and

the 'small' capacitors for short-circuits or low-insulation. Also, before attempting any realignment of the i.f. transformers, be sure that the trimmers move easily and the peaking capacitors across the coils are electrically sound.

Finally, I believe that a good number of the wireless collectors and professional radio engineers among my readers are unfamiliar with the world of amateur radio. They're probably unaware of the amount of information and personal knowledge about early sets, covering the era from 'spark to space' held by amateurs. So, don't be afraid to write to your nearest club for advice. You should be able to get the secretary's address from your Public Library.

## Hallicrafters Receiver

"I recently bought a Hallicrafters receiver, the Model S120 at my local boat fayre", wrote Ken Bland (Crayford). Ken went on to tell me that it has a twin black mains lead with a flat two pin plug. The rear chassis is marked '105-125 Volt AC-DC'.

Before you do any more with the Hallicrafters Ken, my advise is to get a radio engineer to examine it. This is because the receiver may have a live chassis. I have no doubt that the secretary of your local radio club could recommend one of their older engineering members to help you.

Hallicrafters made sets to suit most types of civilian and military user. Ken's letter suggests that his model was built for use in the USA, on less than half the UK (250V a.c.) mains voltage, or on board ship where I believe, d.c. supplies can still be found.

As you rightly thought Ken, the polarity of the mains lead is important with a.c./d.c. sets. But even after establishing the polarity, the general insulation on your model may not now be safe enough to use on the UK mains. So, my advice is to get it checked and if all is well, you should enjoy using your Hallicrafters.

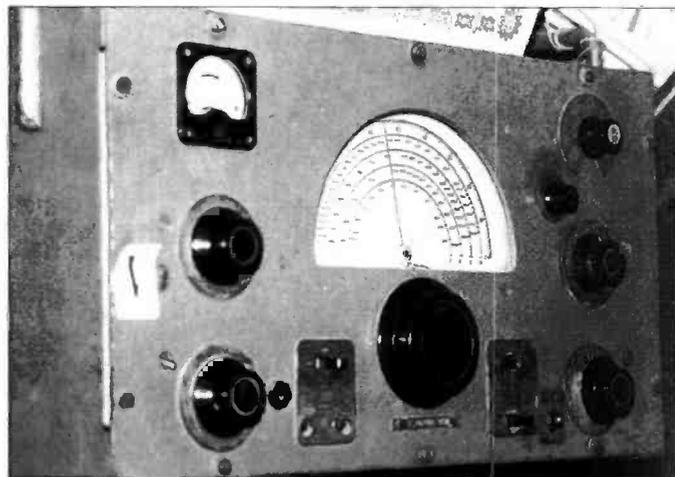


Fig. 3: The range of the Eddystone 358 receiver could be extended by plug-in coils (see text).

## VHF In Spitfire

Mark Garton (Birmingham) has been given an ex-RAF R1147A, v.h.f. receiver. He was told that it may have been used in the famous Spitfire aircraft.

A quick look in my 1969 edition of *The Narrow Margin*, by Derek Wood, with Derek Dempster helped. Referring to the book revealed that in the early part of the war the Spitfire used a TR9 h.f. transmitter and receiver.

Later, the v.h.f. TX/RX types TR1133 and TR1143 were fitted in the Spitfire. Personally speaking, I don't think that type of aircraft had need of a receiver only unless (perhaps), later in the war it was used to receive a navigational

beacon or 'private' communication of some sort, separate from their main radio telephone.

It's many years since I handled an R1147. But, from memory, I think the acorn valves used in the front end are types 954, 955 and 956.

Finally, if your public library cannot supply a book giving detailed information about the Spitfire and its equipment don't despair. I suggest you write and ask the radio section at The RAF Museum in Hendon.

Don't forget that I enjoy reading your letters. You can send them to 'Faraday', Greyfriars, Storrington, West Sussex RH20 2HE.

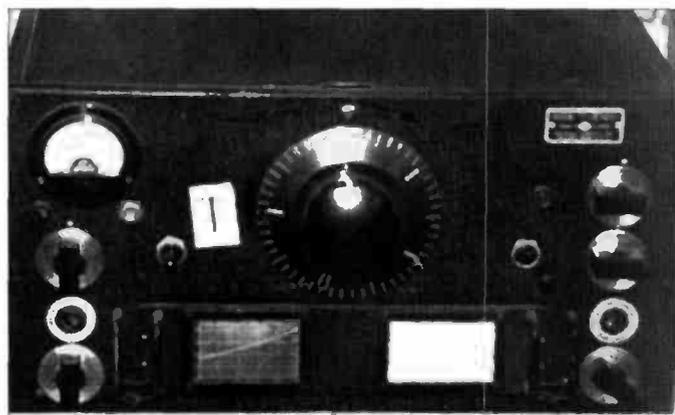


Fig. 4: The HRO receiver, a classic design originating from the 1930s.

# Antenna Workshop

In this month's antenna workshop Peter Dodd G3LDO, discusses methods of measuring impedance, and how this affects v.s.w.r.

I recently had an interesting chat with a friend on the virtues of the full-wave loop antenna, the quad type loop. A 14MHz version will fit in a small garden, it may be fed so that the polarisation is horizontal or vertical and it doesn't need radials. The only problem was that the s.w.r. remained stubbornly high, no matter how the element lengths were adjusted, when he fed it directly with 50Ω coaxial feeder.

If we look at the s.w.r. curve of this type of loop antenna, shown in Fig. 1, you can see that the resonant frequency appears to occur at an s.w.r. of around 2.6:1. This relatively high s.w.r. is bearable, because the antenna performances would not be adversely affected.

Problems occur however, with transistor r.f. power amplifiers. Solid state amplifiers and their protection circuits are not quite so happy about a high s.w.r. Some method of matching the antenna to the coaxial feeder (and to the 50Ω nominal impedance of the amplifier) must be found.

The degree of mismatch depends on the antenna feed impedance. Before we can bring about a cure, we have to identify the scale of the mismatch problem. We must measure the antenna feed impedance.

Let's suppose that we have an impedance measuring instrument,

connect it to the loop antenna and make a number of impedance measurements at several frequencies within the band. We would get a series of readings like those shown in Fig. 2. These have been plotted on the cartesian impedance chart described in September 1993 Antenna Workshop.

After plotting the readings on the grid, you can see why it's not been possible to get a low s.w.r. reading. The impedance at resonance is far too high. The problem may be cured using a matching transformer or network.

Impedance comprises resistive and reactive parts. Any impedance measuring instrument must be capable of measuring both these parameters (bearing in mind the reactive part may be capacitive or inductive). There are various ways of measuring impedance, but in general the techniques for making these measurements can be classified into two groups: Null methods, or deflection methods.

## Null Method

The Null method normally uses a measurement bridge circuit. The unknown impedance is matched to a calibrated adjustable standard impedance. The degree of matching is indicated by a zero reading (or lowest) reading on a meter, or

minimum noise heard with a receiver. An example of such a measurement bridge, is the noise bridge. A simplified diagram of noise bridge is shown in Fig. 3.

The advantage of the bridge circuit, is that direct reading can be made, no calculations are required. The accuracy of the balance measurement is independent of the calibration of the null indicator.

The upper frequency limit of a noise bridge is up to about 100MHz, depending on the bridge construction. Simple designs are only suitable for the lower frequencies.

One disadvantage of the bridge method, is that the relatively complex bridge network contains many stray impedances. These may change with bridge adjustment.

A second disadvantage is that the reactance of the capacitor (the reactance reference) is frequency dependant. The reactance scale can only be calibrated for one frequency, with a table or graph used to predict the reactance at other frequencies. In spite of the limitations the balanced bridge circuit, found in amateur radio journals and handbooks, is the most popular method of impedance measurement.

## Deflection Method

The deflection method, of

measuring complex impedances, compares the unknown impedance with a fixed standard impedance. The ratio of voltages across the resistive and reactive components (the resistor and capacitor) are measured with voltmeters. The circuit, or antenna, impedance at the unknown connector, changes the ratio of these voltages.

In practice three readings are required as shown in Fig. 4, and this is the source of one name given to this technique - 'the three meter method'.

Because of the simpler circuit, with fixed reference components forming one leg of a half-bridge and the absence of an adjustable impedance (reducing the stray impedances) the method gives greater accuracy. The method also allows measurements to be taken at higher frequencies. I've made one circuit that gives good results at 146MHz.

The disadvantage of 'the three meter method' of impedance measurement, is that the accuracy of measurement is dependent on the accuracy of the voltage measurements. In addition the method is not direct reading like balanced bridges. Some calculation is required to reduce the raw measurements to impedance values.

The need for calculation is probably the reason that the

Fig. 1: The v.s.w.r. curve for a full wave loop on 14.2MHz.

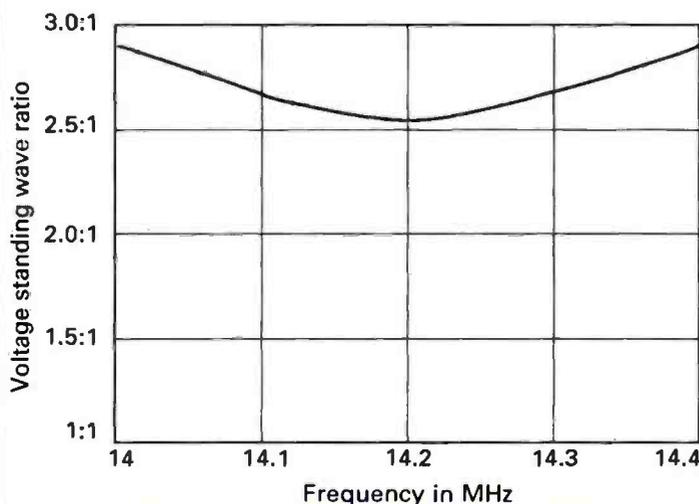
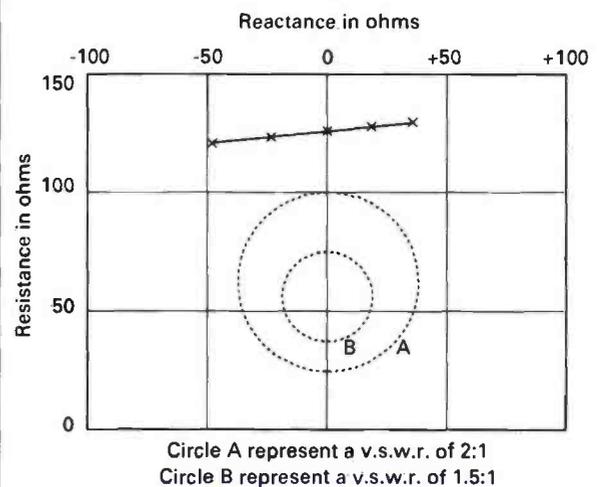
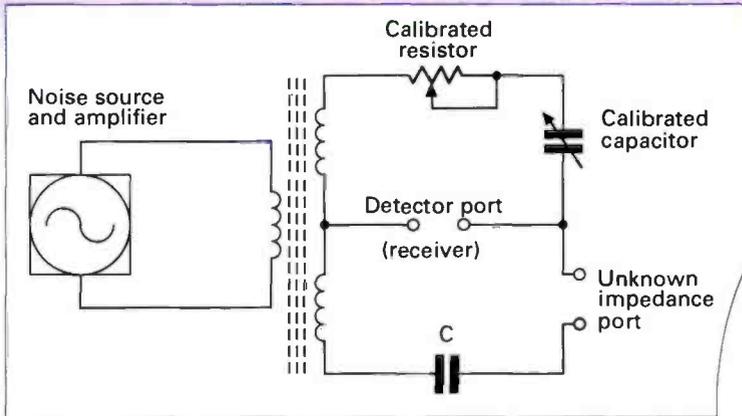


Fig. 2: The impedance plot of the antenna mentioned in text and in Fig. 1.





**Fig. 3: The diagram of a noise bridge with variable resistance and reactance controls.**

deflection method of measuring impedance not being popular with radio amateurs in the past. Although the availability of computers for the calculations may change this.

### Common Situations

During the course of making experiments with antennas the following represents two of the most common situations where impedance measurements are required.

- 1: When adjusting the matching between the feeder and the antenna. In this case accuracy is not important and the objective is to adjust the matching system for a resistive reading of  $50\Omega$  and zero reactance (if  $50\Omega$  coaxial cable feeder is being used).
- 2: To plot the impedance over a range of frequencies to obtain an antenna characteristic. In this case many measurements are required, together with the greatest accuracy possible.

### Both Methods

I use both methods for impedance measurements. I use a receiver noise bridge for antenna adjustments and a three meter impedance measuring box for impedance characteristic plotting.

I also use a specific instrument for a specific task. This is because the receiver bridge is more convenient

and the three meter method is more accurate.

The measuring instruments described above, measure impedance as  $R \pm jX$  (series resonance). Although it is beyond the scope of this particular session, I feel that I ought to mention admittance. Admittance (parallel resonance) is the reciprocal of impedance, with the resistive and reactive components known respectively as conductance and susceptance.

The unit of admittance used to be the mho, (the reciprocal of the ohm), but it's now called the siemen (S). Admittance can be measured using a noise bridge, but the reference components must be in parallel instead of in series.

### Why Admittance?

So why measure admittance? Admittance is useful for calculating parallel combinations of circuit elements. Conductances and susceptances can be added in the same way that resistances and reactances can be added in series tuned circuits, without having to do complex mathematics.

Think of when you're finding the overall resistance value of resistors in parallel. The method adds the reciprocal values of each individual resistor.

How much easier it would be if you had those reciprocal values to start with. Then you could merely add them up and convert the final

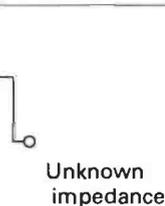
value back again!

The reciprocal values of measured values, can then be converted mathematically if required. But I find it easier to use a Smith Chart. To use this method, mark the admittance value on a Smith Chart, then draw an s.w.r. circle with the radius equal to the distance between measured admittance mark and the centre of the chart. The impedance value is diametrically opposite on the s.w.r. circle as shown in the example of Fig. 5).

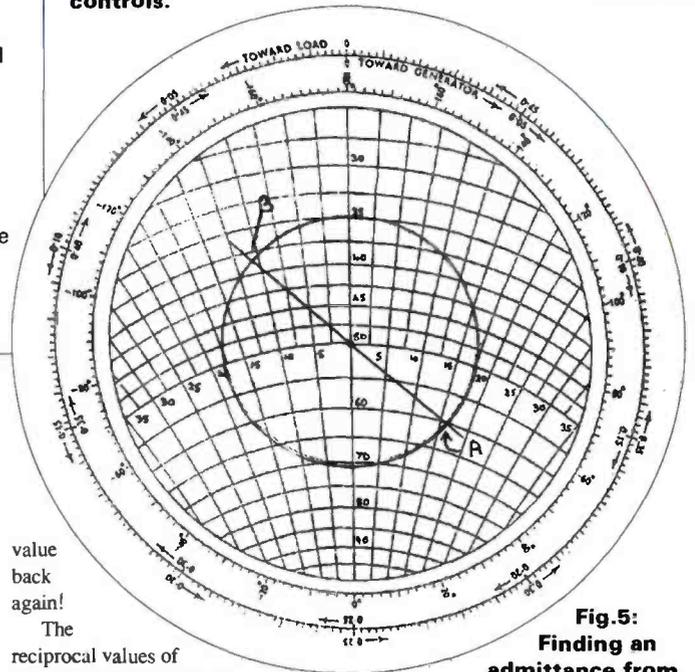
In the next session I'll describe aspects of the noise bridge in more detail. But in the meantime, if you have questions on antennas then why not drop me a line. I'll try to deal with your query in a forthcoming session.

Write to me at:  
37 The Ridings  
East Preston  
West Sussex BN16 2TW

PW

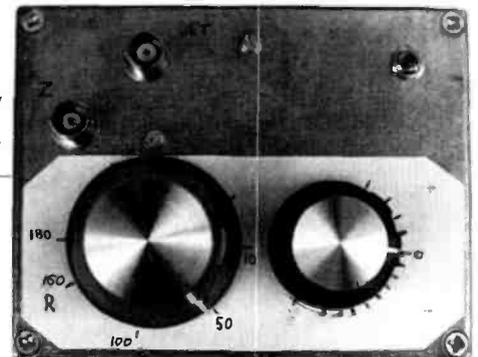


**Fig. 4: A representation of the 'three meter method' of measuring complex impedances.**



**Fig. 5: Finding an admittance from an impedance is easy using a Smith Chart. The impedance value plotted at A, has the admittance value to be found at point B. See the text for more details.**

**Fig. 6: A noise bridge unit, built from a Jandek kit. This project has the advantage of including frequency compensation, helping to cancel stray impedances in the bridge network.**



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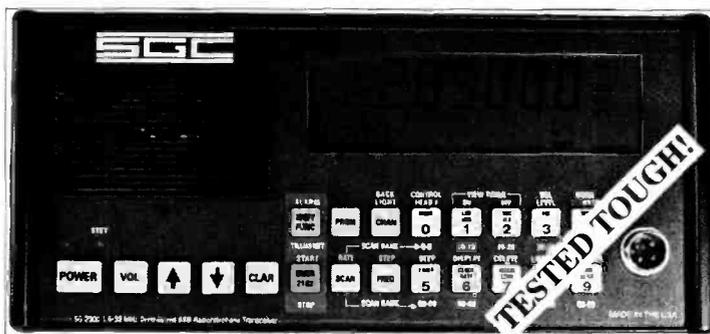


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## THE MARCHIONESS DISASTER WERE YOU LISTENING THAT NIGHT?

It was the early hours on the morning of August 20th 1989. Two boats sailing down the Thames, the pleasure cruiser Marchioness, and the sand dredger Bowbelle, were about to collide, causing the death of 51 people. A major TV documentary, to be broadcast later this year, will be looking into the background to that disaster. The producers are looking for anyone who might have been monitoring maritime frequencies at the time and may have heard any relevant transmissions from vessels on the river that day. If you think you can help, please contact Alex on 071 388 7700 as soon as possible. Responses will be treated in the strictest confidence.

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The Computer  
in Your Shack

BITS & BYTES

I'll start this month with software news. This consists of one new program, and several upgrades.

Back in the May 1993 'Bits & Bytes' I reviewed a superb logbook program called SHACKLOG. I liked SHACKLOG so much that (no, I didn't buy the company!) I have continued using it as my main logging program.

The latest version of SHACKLOG, version 3.24 has some added improvements, and is free if you own version 3.0 or above. Just send a disk and stamp.

If you do not own SHACKLOG, then it's available for the 'unchanged' price of £27.50. An additional IOTA directory is also available for £7.00.

The prices include VAT and postage. Contact Alan Jubb G3PMR, 30 West Street, Great Gransden, Sandy, Bedfordshire SG19 3AU.

Another program reviewed in the May issue was SUPER-DUPER. This is a contest logging program that leaves you free to enjoy the contest itself.

A few minor bugs were found and the whole program has been upgraded, with the addition of a few extras. Registered users can upgrade free. Just send a formatted 3.5in disk and a couple of IRCs to Paul O'Kane EI5DI, 36 Coolkill, Sandyford, Dublin 18 Eire. Or write to Paul for more information.

For those of you keen on Packet, or any other data mode, you may be interested to know that LAN-LINK has been upgraded to version 2.20. This now includes PACTOR. It has had a few minor bugs fixed, as well as some interesting improvements.

LAN-LINK is Shareware, so you can get an evaluation copy from me by sending a FORMATTED disk (any IBM/PC format) as well as return P&P, or just send me a few IRCs and I'll supply the disk and stamp.

The new program I mentioned is a Worked All

Peter Hunter GOGSZ welcomes you to another edition of your favourite column. This month he has some information about an interesting book for all you computer users, as well as some software news.

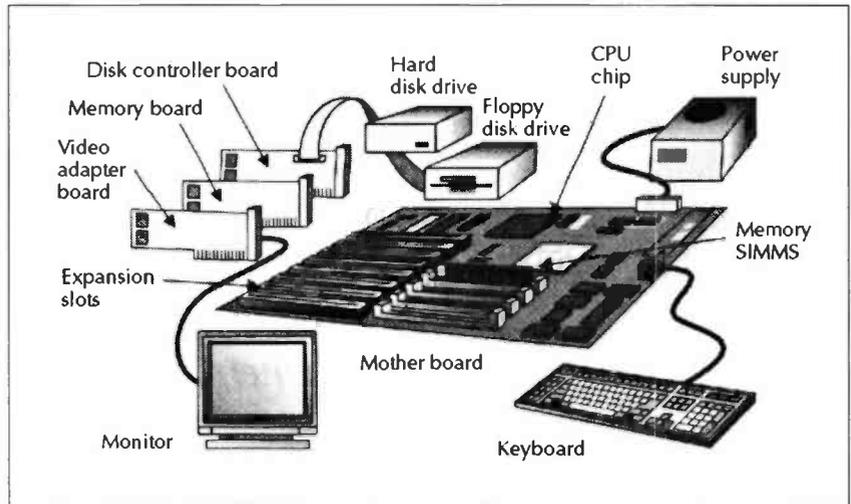


Fig. 1: Just one of the many illustrations in *PCs Made Easy*.

Britain awards management program. This is Shareware, so evaluation copies can be passed around.

The program is simply called WAB and it will take care of all your needs if you're a WAB fan. You can get a copy of WAB by sending £3.00 (inclusive) to NCSL (Norwich City Shareware Library), 6 Gurney Close, Costessey, Norwich NR5 0HB. Tel: (0603)747782.

**New Computer Book**

The new computer book I mentioned is called *PCs Made Easy Second Edition* By James L. Turley. And *PCs Made Easy* is exactly what it says. I have never read a book that makes technical information so easy to understand.

In its 438 pages it explains every aspect of a computer, and computing. From 'Starting your computer for the first time', 'What your computer can do', to 'What are all the parts'. Then on through a complete 'What Is' section: What is Memory, a Disk, a File, a Program, an Operating System, an Application Program, a Network, a Programming Language etc.. As well as a lot of 'How do I's' and 'Do's & Don'ts'. Each one of these sections is a

complete, informative chapter, with many sub-sections within each chapter.

The book, *PCs Made Easy* makes interesting reading if you read it from cover to cover. However, it's also an excellent reference manual. If you've ever struggled with the hand book that came with your computer, or your DOS manual, or any other "How to" book, then you need this latest edition of *PCs Made Easy*.

I especially like the way in which the author has kept everything in a 'friendly', easy to understand manner, and yet he still makes this book so comprehensive that even the experienced computer user can benefit from its contents. This book is the ideal introduction for all computer users, as all personal computers, including Apple Macs, are catered for.

The book is useful if you own a computer but don't understand the manual, or have a computer without a manual. If you want to know what's inside your computer, what all the bits are for, how they work and how to get the most from them, then *PCs Made Easy* is for you. Copies of *PCs Made Easy Second Edition* are available\* from the PW Publishing Book Service for

£14.95 plus £1 P&P (UK), £1.75 P&P (overseas).

That's it for this month. I'm always glad to hear from you, so please keep in touch. 73 de Peter, GOGSZ @ GB7LDI.#35.GBR.EU, or 2, Mayes Close, Bowthorpe, Norwich NR5 9AR. Tel:/FAX: (0603) 748338.

\*This book is our Subscribers' Club special offer this month. Editor

E N D

Report

S  
BANDS  
H  
F

*Paul Essery GW3KFE reports on what's been happening on the h.f. bands.*



The Yaesu FT-990 made by the Yaesu Musen Company see text for obituary on JA1MP.

This month I'll start with a helpful hint. 'Snappy operating' seems to be the in-word. To send 25 CQs followed by one gabbled call sign is barmy.

In fact a CQ is a waste of time unless you regard a UB5 as rare DX. The experienced operator knows this, so almost invariably looks for someone interesting and calls them, 'search and pounce' mode.

My advice means that, even if contests are anathema to you, the sharpening-up of your reflexes produced by operating for a few hours in a contest every now and then is valuable exercise. It helps your self-confidence too.

Above all, try and vary your operating hours. If you know a country is going to be on the band at 0400UTC, set the alarm to suit. I recall how the late G2DC did this once in mid-winter, hopping into the shack, working his 326th country and being back in bed chuckling ten minutes later!

**Conditions and Happenings**

The slide downwards continues. The 'eleven-year cycle' is by no means cast in stone, we might just be in for a short one.

At the time of writing the Equinox is approaching, we're beginning to see the changes it brings to the bands. When you read this, it'll be in full swing.

Now, sadly for news of some deaths. Firstly **Shunsaku Inoue JA3ANC** who was president of Alinco, founded by his father back in 1938. Secondly **Sako Hasegawa JA1MP** who founded the Yaesu Musen Company in 1959. Thirdly **Jim Rafferty N6RJ** who was one of the world's top DXers. Jim lived just long enough to see the picture of himself and his station on the cover of July *CQ Magazine*. Also reported to have passed on is **HK0BKX**. August 1 was the day the c.w. watchkeeping on the 500kHz band stopped by the US Coastguard. An omen for amateur c.w.?

**News**

**Jim VK9NS** is still progressing the licensing position in Bhutan, A5. The relevant Minister simply replied "No progress". Jim adds that **VK9CE** often makes short trips to VK islands.

Whether the forth coming expedition to Pratas Island will count for DXCC credit seems to depend largely on how accurately the distances can be measured and just where on the island you measure from! I've heard they'll be on about the time you receive *PW*, so work 'em first, worry later.

New Hong Kong calls seem to be in the VR2 series now.

The Scottish Expedition Group will be on from November 27 - December 5, with **GB0SEG** on Dunnet Head, **GB2SEG** in Central Scotland, and **GB4SEG** from Fife. Stations working all three will get a certificate.

By the time this reaches you the Mellish Reef exercise will be just about over. Cards will be starting to go out by December 1. The address is **VK4CRR**, but please remember to enclose envelope and return postage.

The CQ WW DX Contest is on 'phone over the weekend October 30-31 and c.w. on November 27-28, 1.8 to 28MHz less the WARC bands. Categories are single-op single or all band; high power, low (less than 100W out) and QRP which is less than 5W. 'Single-op Assisted' which is where you go if you use any form of spotting network.

Multi-op multi-transmitter all-band stations must be within a 500m diameter or within the station licensee's property whichever is greater and all antennas to be connected to the transmitters and receivers. Only one signal on any given band.

The multi-single category, only one transmitter and one band in any ten minute period. Exchange **RS(T)** plus your CQ Zone (014 for UK). Notice that all logs are to be checked for

duplicates, which are to be clearly marked - too many unmarked means disqualification. Computer disks should be accompanied by a paper log. Postmark by December 1 (Phone) or January 15 (c.w.) to *CQ Magazine*, 76 N. Broadway, Hicksville NY11801.

**The 1.8MHz Band**

**Ted G2HKU** in Sheppey had his usual sideband contacts with **ON7BW**. He found **GW4RPU** at S9+ a lot one evening around 2000UTC instead of his usual S5. Omni-V, separate antennas were used for send and receive.

For **G3BDQ** there were of course the Europeans, plus **Z21HS** and a scratchy **VK5LK** at 2120. The 'window' to VK only lasted for a few minutes and was marred by static and deep fades. I also heard the VK.

**Angie G0HGA** in Stevenage returns after absence, now with an **IC-735**, to find **LX0HAR** for a brand new one. How about a few people moving up to the top end of the band for the Novices?

**The 3.5 And 7MHz Bands**

On 3.5MHz **PT7YS** and **9V1XQ** were sideband scalps for **G3BDQ**. My own (TS-440S) station was only used on Sunday nets and TVI tests.

On 7MHz **G2HKU** has been peeling off the Cubans on c.w. The c.w. mode was used by **G3BDQ** for **VK2KM** and **DU9RG**. Anton **UB5COS**, operating my station, managed to find **UA0** on 7MHz.

**Eric G0KRT**, a QRP operator says that in an old issue of *SWM* of 1951, he noted a comment that to give **RST579** and call for a repeat is to be a Lid. Lids are long lived, alas!

Eric worked two-way QRP to **ON5UP**, while normal-power stations taking his call

were well spread around Europe. Eric uses a Lake DTR7, plus the W3EDP top against a counterpoise.

**The 10 And 14MHz Bands**

Only one mention on the 10MHz band this time. At 0600UTC, **G2HKU**'s key and **G5RV** connected with **VK3DQ**, while the QRP rig caught **HG8SDS**.

On 14MHz **G2HKU** used the low-power rig to hook **G4VXE/TF/P**. The use of full power made **4K3WQ** (Oleniy Is, near Murmansk). The latter station is mentioned also by **G0HGA**, but for Angie the pick was probably **4L8A** in Georgia, CIS.

My call was given a right bashing by **UB5COS** on 14MHz in the late evening c.w. and 'phone. But perhaps the pick of the crop for him were the YI and OD5 stations.

**Late News**

The *DXNS* for August 25 now explains what happened to **Romeo** and **Danny LZ2UU** in Libya. Libyan and Egyptian so called counter intelligence imprisoned them on suspicion of a plot to assassinate Presidents Mubarak and Gaddafi!

**Romeo** says that, short of a miracle, they would still have been there. As soon as his health, damaged by the maltreatment, is corrected he will be going to the USA and depositing the DXCC documentation for this, and the rest of the 5A papers.

To get the late news in, I had to pull out earlier material. Apologies to anyone who lost out, but **Romeo** seemed to matter.

Deadlines are middle of the month and to 287 Heol-y-coleg, Vaynor, Newtown, Powys, Wales SY16 1RA.

E N D

Scene

SATELLITES

In this month's look at amateur radio in orbit, Pat Gowen G3IOR provides information on the new amateur radio satellites aboard the SPOT-III.

Six passenger satellites were carried with SPOT-III on the recent ESA ARIANE V-59 Kourou launch. Of these, two are commercial satellites from the University of Surrey stables and four are of amateur radio interest.

**Passenger Satellite**

First of the passenger satellites of interest is the Korean KITSAT-B. This is the successor to the currently operational KITSAT-A.

From HL5PCU of the Korean Satellite Technology Centre comes the information that KITSAT-B is a 47.5kg 352 x 356 x 670mm spacecraft. Structurally it's very similar to its forerunner KITSAT-A.

The KITSAT-B (like all of the passenger satellites) goes into a sun-synchronous orbit at 800km altitude. It will have an equatorial inclination of 98.7°.

The spacecraft carries 9600baud digital store and forward communications. There's also a charge coupled device (c.c.d.) earth imaging system, an infra-red sensor, low energy electron detection and a DSP experiment.

Uplinks to the satellite are on 145.870 and 145.98MHz and the 5W downlinks on 435.175 and 436.500MHz. For power KITSAT-B uses the latest high-efficiency GaAs solar cells feeding a 14V 6AH NiCad battery.

The satellite is controlled by a primary 80C186 and a secondary Z80 computer. This is backed up with a 12Mbyte RAMDISK.

**Commercial Microsat**

The second satellite of interest is EYESAT-A. This is a commercial microsat, but houses an amateur component called AMRAD.

The AMRAD has a single modem uplink on 145.850 and downlink on 436.800MHz. The speed is a versatile 300 - 9600bps.

Powered by GaAs solar cells feeding a 14V 6AH

NiCad battery, the EYESAT-A uses exactly the same hardware as KITSAT-B. It's said not to be FTLO compatible, and the commercial end of the satellite will exercise priority use. Additionally, AMRAD also has a f.m. talk-through mode similar to OSCAR-21/RS-14.

**PoSAT**

Richard Limebear G3RWL tells me that there is yet another 9600baud store and forward transponder aboard the Portugese PoSAT, which is a UoSAT based model. The satellite has a 145.925 and an 145.975MHz uplink giving 435.250 and 435.275MHz downlinks.

The PoSAT carries two cameras, one with 1km and the other with 200m resolution, static sensors and cosmic ray measuring equipment. It also has autonomous navigation with GPS and a star sensor.

**Italian Microsat**

Another amateur radio microsat that I've mentioned in an earlier 'Satellite Scene' is ITAMSAT. This spacecraft carries 1200/4800/9600bps digital store and forward.

The ITAMSAT uplink frequencies are now known to be 145.875, 145.900, 145.925 and 145.950MHz, and the downlinks 435.870 and 435.820MHz. Happily, ITAMSAT will be fully compatible with the current microsats.

**Israeli Satellite**

The Israel Polytechnic Institute has arranged the launch of its first 60kg packet radio BBS carrying satellite. It's to be called Guerwin-1 and will be launched from the Baikonur cosmodrome in Kazakhstan later this year.

Initially, Guerwin-1 was to fly on an ARIANE launch vehicle from ESA at Kourou. But due to both political and technical difficulties, it's now to be put into orbit with a German and Russian satellite under the auspices of the

Fig. 1: Bruce Balla VE2QO demonstrating his support for the Ariane satellite launch programme in a practical fashion!



newly formed Space Research Institute of Russia.

**SUNSAT**

Jan ZS6BMN sends news from Professor Garth Milne ZR1AFH. The information is that the South African SUNSAT MicroSat will carry an amateur payload.

The satellite will give both 9600baud store and forward digital packet radio and 1200 AFSK. This is to provide compatibility with standard terrestrial equipment.

Both the satellite's 145 and 435MHz channels will have uplink and downlink options as well as full bulletin board facilities. The PACSAT Standard Protocols now being used on Oscars 16 and 22 are likely to be followed.

A 'Parrot' mode on 145MHz is to be provided, especially for the novice category school users. This will digitally store uplinked speech on a given special channel, and then retransmit it on the same frequency.

Experimenters will be able to hear their own transmission being relayed over a wide area footprint each pass. The 145MHz down-link will also be used to distribute the South African Radio League's weekly bulletin world-wide if required. A linear 144 to 28MHz transponder will also be provided for the satellite by AMSAT South Africa.

**Mexican Satellite**

Doctor David Liberman XE1TU reports that UNAMSAT-1, the University of Mexico amateur radio meteorite detector (mentioned in an earlier 'Satellite Scene') should be

launched later this year. It will contain a 70W r.m.s. peak-pulse transmitter working on 40.997MHz.

The UNAMSAT-1 also carries a single conversion receiver with simultaneous l.s.b. and u.s.b. detectors. It has a control circuit using a Motorola 68HC805B6 microprocessor.

The satellite's microprocessor will control the pulse duration and the repetition rate for the r.f. pulses. If the echoes received from the meteorites meet the proper criteria, then the microprocessor will increase the pulse repetition rate and start sending the digitised echoes to a RAM buffer located on the main CPU board.

The Doppler shift data will then become part of a file. The user can then download to study and analyse the information with special ground-processing software that will be made available from AMSAT.

When UNAMSAT-1 is not being used for meteorite speed determination, it will perform the regular duties of a Bulletin Board System. It will operate similarly to OSCAR-16 and LUSAT-OSCAR-19 using the same software.

The transmitter frequencies for UNAMSAT-1 are 437.200 and 437.060MHz. The receivers will be on 145.83, 145.85 and 145.87MHz.

That's the lot from the world of amateur radio in orbit this time. Cheerio for now!

E N D

*Danorama*

THE  
BACK  
PACK

*Roger Cooke G3LDI, remembers a barbeque, reports on a reader's letter and gives news of a packet group.*



**Fig. 1: Left to right, Mary and John VK2SB, Fred VE7PL with Jean his XYL.**

Well, that's the summer over, winter yet to face, hopefully it won't be too severe, to minimise VAT! However, winter should bring with it some improvement in propagation. My Stateside link has been virtually non-existent for the last nine months, with most of the North American mail going via satellite. I live in the hope that I will be running a satellite gateway (Satgate) myself in the near future. I'll keep you informed on the progress, if and when!

**June Barbecue**

This year's June barbeque on an almost perfect day, was a truly international event, even if this is co-incident! With more than 100 people attending everyone had an enjoyable time. This event has become a permanent feature in the diary of the Norfolk AX25 Group and has grown each year.

Featured this year at the barbeque, was a stand from the Norwich Short Wave Centre, manned by Paul, G4XBT. There was Ped-racing, organised by John G4VEL and Steve G7LVA. They brought along some old

mopeds and organised races for everybody. John G8VPE did his usual roaring trade with the cactus plants. Quite popular with the ladies (the cactus plants I mean!).

John Bays VK2SB and XYL Mary, from Sydney Australia together with Fred Wyatt VE7PL and XYL Jean, from Victoria in Canada feature in Fig. 1. Though John isn't involved with packet, Fred is very active and runs a busy Node and BBS back home in Saanichton, near Victoria.

Sheila G0KWP and her husband Terry keep reptiles as pets, and they brought along Sheila's pet python, as you can see in Fig. 2. Nobody dozed off that afternoon, and I made a point of checking the flower beds before Sheila left!

In Fig. 3 the crowd apparently indulges in a little UFO spotting. They were actually watching a quarter-scale model Cessna, flown by Geoff G4ODC. Geoff's model overflowed the barbeque taking pictures as it went. Next step is aeronautical mobile!

**Reader Spot**

Our reader spot, is where you introduce yourselves to other readers. Shown sitting in his shack, Fig. 4, is Robert Scarfe G4TUK, from Little Melton in Norfolk.

Robert has packet facilities, but he's not what you might call an 'active' user. He's more interested in both slow and fast-scan TV. He has quite an impressive station to support his interests. Robert is active on h.f. to u.h.f. and the equipment he uses includes:

On h.f. there's an Icom IC-740, while a Kenwood TS-



**Fig. 2: Sheila G0KWP, her pet python and some wary onlookers!**



**Fig. 3: Are they UFO spotting? No they're all watching Geoff's (2nd left) quarter scale model Cessna's fly-by.**

4000A is used on v.h.f. For slow-scan TV, the Robot is used with a 286/AT. For fast-scan TV, Robert uses a Wood and Douglas receiver and an Aztec transmitter.

Robert's antenna farm, all on a crank-up 25m tower in the back garden, consists of dipoles for the three bands 1.8, 3.5 and 7MHz, and a Cushcraft tri-bander for the higher h.f. bands. Sitting above that a 10-ele beam for 144MHz. For packet and general f.m. use, a collinear is on the side of the tower.

Fast-scan TV at G4TUK goes through three quad-loop Yagis (facing in different directions) on the top of the tower. One is permanently fixed on GB3TN, in Fakenham, and the other two are on the rotator.

Robert is a member of the Norfolk AX25 Group and mail for him can be left at GB7VLS. He is also a member of BATC, his main interest.

By profession a TV and video technician, Robert says that this side of the hobby isn't like work. Judging by the time he spends on the mode, he must be right!

Every year, Robert makes a short video of the Norfolk barbeque and then tacks it onto the end of the last years' event. He also puts on demonstrations for the local radio club, especially when the club gets involved with something like the Norfolk Show.

**Salop Packet Group.**

Charles Reynolds GW3JPT, an ex-resident of Norfolk, has sent me the diagram of the Salop packet user group network. The map is self-explanatory, but I have no other details.

I would appreciate more from the user groups. If there is an up-date on this map, or if you have a map of your packet group, perhaps you'd like to send them to me.

That's it this month again, as per usual, news, brickbats and bouquets to G3LDI @ GB7LDI, QTHR or Tel: (0508) 70278. 73 and happy packeting de Roger G3LDI.

**Fig. 4: Robert G4TUK at home in his shack.**



**E N D**

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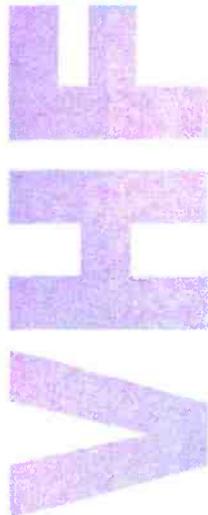
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*David Butler G4ASR has news of the recent Perseids meteor shower and of a v.h.f. DXpedition to Iceland. He's also got details about transatlantic tests and an opportunity for you to try your hand at e.m.e. communication.*

Report



There was much media speculation prior to this years Perseids meteor shower. It was suggested that we would be in for a once in a lifetime celestial firework extravaganza.

The speculation regarding Perseids arose because the earth would pass through the tail of the comet Swift-Tuttle associated with the shower. Even NASA delayed the launch of the shuttle *Discovery* in case it was hit by a piece of debris!

However, reports indicate that no unusual activity occurred during the shower maximum on August 11-12. The peak in activity was rather broad with a gradual increase in reflections from 2000UTC on August 11 through to 0100UTC on the 12th.

Rates started to increase from 0100UTC reaching a peak between 0230-0330UTC. It was noticeable that conditions were not as good as that recorded in 1991 and 1992. Nevertheless the Perseids shower is one of the most reliable during the year and much DX was worked via its ionised trails.

### Mixture Of Contacts

Ray James **GM4CXM** made a mixture of c.w. and s.s.b. contacts on the 144MHz band. Most were random, that is unscheduled, and included such DX as **G4DHF/TF/P**, **ES5RY**, **S57TW**, **YL2MB**, **YU1LA**, **9A1CCY** and **9A1EZA**.

Ray also worked **HA9RC**, **I1KTC**, **IW2BNA** and **OE6XHF** between 0200-0400UTC on August 12. He mentions that in previous years, the Perseids shower has produced reflections up to 2.5 minutes long. This year the longest he heard was 50 seconds duration from **IK50IY**.

It's worthwhile mentioning that one of the advantages of meteor scatter is that 'propagation' can be in any direction you choose. So, I decided to

make schedules in directions (and distances) that I normally don't work via Sp-E or aurora.

It's unusual to work Scandinavia on Sp-E and difficult to work over 1500km to the north-east via aurora. A number of long distance c.w. contacts in excess of 2000km were made from my QTH (**IO81**) on the 144MHz band.

My QSOs included **ES5RY** (**KO38**), **ES5WE** (**KO38**), **OH2BAP** (**KP20**), **OH2BNH** (**KP20**) and **OH5IY** (**KP30**). Medium distance c.w. QSOs, around 1500km or so, were made with **GOJLF/TF/P** (**IP24**), **HA3UU** (**JN96**), **SM5DIC** (**JO89**), **S51AT** (**JN75**) and **S57TW** (**JN75**).

Contacts on s.s.b. were completed with **EA3DUY** (**JN12**), **G4DHF/TF/P** (**IP34**), **HA1YA**, **HA6VV**, **SM5MIX** and **9A1CBE**. 'Gotaways' included **RU1A** (**KO48**) at 2186km from whom I only required the final 'rogers'.

Schedules were also arranged with **UV1AS** (**KO59**) at a distance of 2236km. Reflections were generally weak, although I did receive both call signs during one test.

The RAF club station **G6RAF** (**IO92**) uses an **FT-225RD**, **4CX1000** amplifier and 2 x 14-element Cushcraft Yagis on the 144MHz band. Throughout the Perseids the station was operated by **Reg Wooley GW8VHI**.

During the peak on August 11-12 a total of 23 s.s.b. contacts were made. Most of the QSOs were to the south-east with stations located in **HA**, **I**, **OM**, **S5** and **YU**. In other directions **TF** and **UZ2FWA** (**KO04**) were worked.

### Active From Iceland

During August a group consisting of **G4DHF**, **G4ODA**, **G4VXE**, **G8IJC** and **GOJLF** were active from Stafafell, Iceland (**IP24**). Operation was on the 50, 144 and 430MHz bands.

Most v.h.f. activity was

via meteor scatter although some contacts, mainly on the 430MHz band, were via e.m.e. On the 50MHz band an **FT-736** and 4-element J-Beam Yagi were used.

Over 220 stations were contacted mainly via m.s. although there were two short Sp-E openings. The first of these was on August 7 giving contacts in **GM** and south-east England.

The other Sp-E opening occurred on August 10, with the band opening to **G**, **ON** and **PA**. An Auroral-E opening was detected from 0045UTC on August 5. All the UK beacons were **T9** but no **G** activity was heard. Where were you all?

On the 144MHz band a **Trio TS-850**, a **muTek** transverter and **3CX800** amplifier were used. The antenna was an 80-element Cushcraft collinear array.

Over 50 m.s. contacts were completed, all but one being on c.w. A few e.m.e. schedules were made, mainly with Europeans like **G4SWX** and **DL5MAE**.

The take-off to the west was obstructed and not good for North American contacts. All QSOs made on the 430MHz band were via e.m.e. for obvious reasons!

The group used an **FT-736**, **3CX800** amplifier and 8 x 21-element Yagis, shown in the photograph Fig. 1. A total of 23 contacts were logged which included **DL9KR**, **G3LTF**, **SM2CEW** and **K2UYH**.

For the peak of the shower, during the night of August 11-12, the group operated from locator **IP34**. A total of 127 random s.s.b. contacts were made on the 144MHz band. And this was despite using only one-quarter of the antenna array, 20-elements!

The best DX during this session was into **DL** at 2150km. They were also active on the 50MHz band but closed down early because of mutual **QRM** to the 144MHz system.

For completeness I should record that over 3500 QSOs were also made on the l.f. and h.f. bands. A Zenith

386 portable PC with the **G3WGV** Turbolog software was used to keep track of contacts on all bands.

All QSL cards for contacts with **G4DHF**, **G4ODA** and **GOJLF** should be sent via their home calls. Cards for contacts with **G4VXE/TF/P** should be sent c/o **PO Box 23, Tewkesbury, GL20 5RN** or via the bureau.

### Bridging The Atlantic

In the March 1993 issue I described tests carried out in 1979 and 1980. These were aimed at bridging the path across the Atlantic on the 144MHz band.

**Derek Hilleard G4CQM** (previously **G8CIW**) has written to me with details of tests he has been carrying out since 1989. The series of attempts were inspired by the memorable aurora of March 13-14 1989.

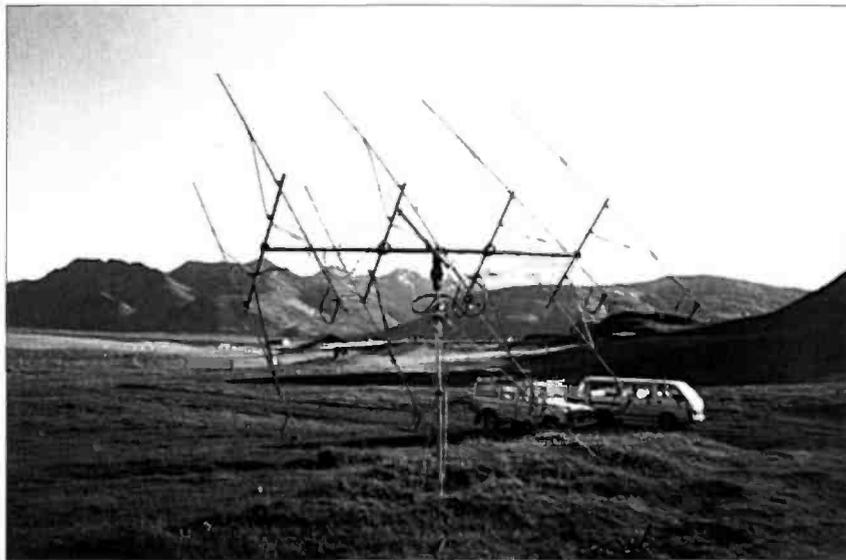
During the 1989 event, an Auroral-E contact was made with **VO1QF** on the 28MHz band and Derek's thoughts turned to higher frequencies. Tests on the 144MHz band were arranged with **VO1QF** whenever auroral propagation was prevalent.

Experiments continued through to December 1989 without success when a change of QSO partner was made. The station chosen was **VE1BVL** who runs 1500W into a pair of **M2-Yagis**.

Several attempts were made to hear **VE1BVL** during 1989 and 1990. After months of monitoring **G4CQM** decided that his QTH in Surrey was not suitable for terrestrial 144MHz communications with North America.

However, in 1992 Derek moved to a new location in north Devon (**IO70ST**). The QTH was only 8km from the Atlantic Ocean with ground sloping down to the north-west. An ideal location for tests to North America!

Derek then read the request from **VE1MQ** in the March issue of *PW*. He was looking for QSO partners (as



**Fig. 1: The 430MHz array used in Iceland by G4VXE/TF/P. (Photo by G4VXE).**

was VE1HD) and so a new series of tests were started during the 1993 Sp-E season.

At the QTH of G4CQM, a Trio TS-120V transceiver operating at 28MHz drives a home-made transverter. This feeds an amplifier capable of 250W output into a 12-element M2 Yagi.

It was also decided to monitor the Band II 88-108MHz f.m. broadcasting allocation. A 5-element Yagi and Sony receiver was used with various North American broadcast stations allocations loaded in memory.

The beacon W3VD on 28.296MHz was also monitored. This proved to be a useful indicator of Sp-E across the Atlantic path.

There were several v.h.f. openings, but the m.u.f. did not appear to rise much above 50MHz. Despite many hours of monitoring and running schedules with VE1MQ and VE1HD no positive identification was made.

During one test on July 25 at 1445UTC a voice did appear in the noise, but it was indecipherable. The station of VE1MQ had originally sought schedules with European stations during the Perseids meteor shower.

It was widely reported that this shower would be of an usually large magnitude this year. Schedules were quickly arranged with VE1HD (FN96), VE1KG (FN84) and VE1MQ (FN65) to run on August 11-12.

### Initial Tests

Initial tests during the early evening of August 11 were cancelled as conditions didn't seem very good. It

seemed to show a marked improvement later and a test was arranged with VE1HD commencing at 2200UTC. During this schedule there were times when Derek copied unidentified weak s.s.b. signals.

Interestingly, the station of VE1HD claims to have heard signals from G4CQM. In a telephone call to Derek he said "I heard you, I recognised your accent. I heard your callsign and mine, three S-units above the noise in your 2207 period".

When I spoke to Derek about the Canadian's claims, he told me that VE1HD definitely sounded very positive and excited. Nine tests in total were made with the three Canadian stations but no positive signals were heard in the UK.

Congratulations to Derek G4CQM for attempting what may seem to some as an impossible task. The challenge of the Atlantic path on the 144MHz band is still there to be broken.

Derek tried via three modes of propagation, Aurora, Sp-E and meteor scatter. In my opinion I think the first contacts to be made will be via Sp-E.

Aurora and meteor scatter, because of the path geometry, generally produce weak signals. Signals via Sp-E on the other hand can be exceedingly strong. There is always a chance, albeit slim, that multi-hop Sp-E could one day bridge the terrestrial path between Europe and North America.

I wonder who will be the first to accomplish it? The important thing to remember is that you won't make it if you don't try. Get those sked partners arranged now!

### Moonbounce For Everyone

There's going to be a chance for moonbounce for everyone in November! During the first leg of the ARRL e.m.e. contest on October 9-10 a large radio telescope was pressed into service on the 144 and 430MHz bands.

The 46m diameter dish at Algonquin Provincial Park (FN05XW) Canada will also be used on the 430 and 1296MHz bands during the weekend of November 6-7.

The good news is that because of the enormous gain of the dish, you don't need very much power to work them. On the 430MHz band about 100W will be sufficient, while on the 1296MHz band considerably less, around 25W, should be enough.

The group will use the call sign VE3ONT and adopt the following schedule. On Saturday November 6 they will be QRV from approximately 0340-1700UTC. They will transmit on 432.050MHz and listen between 432.050-432.060MHz for replies.

Activity on Sunday November 7 will take place between 0450-1730UTC. The Canadians will transmit on 1296.050MHz, listening between 1296.050-1296.060MHz. Stations should avoid calling VE3ONT on their transmit frequency.

All operation will be to a 'random' format meaning that VE3ONT will accept no schedules. If conditions are poor they will use a 30-second sequence in which VE3DNT transmits the first 30 seconds and listens during the second 30 seconds of each minute.

Sat 6 Nov 93			Sun 7 Nov 93		
UTC	Az	EI	UTC	Az	EI
1030	268	20	1100	261	20
1100	274	15	1130	267	15
1130	279	11	1200	273	11
1200	285	06	1230	278	06
1230	290	02	1300	283	02

**Note that this is not the usual sequence used for e.m.e. communications.**

Operation will be primarily on c.w., although s.s.b. might be employed depending on signal strength and the number of stations calling. An h.f. liaison will be maintained on the h.f. net frequency 14.345MHz.

The dish has been configured to transmit and receive left-hand circular polarisation (LHCP) on both bands. This means that after reflection from the surface of the moon the signals will be right-hand circular polarised (RHCP).

So, to work VE3ONT you need to run RHCP or vertical or horizontal polarisation. The latter two polarisations will only be -3dB down on the circularly polarised signal.

Attempts with LHCP will be totally useless! This is because the cross-polar discrimination (XPD) will be in excess of 36dB (at least 6S-points).

The station will use 1kW transmit power on the 430MHz band and 100W on the 1296MHz band. Power amplifiers and receiving pre-amps will be located at the dish feed.

Ideally you'll need to elevate your antennas. This gives you more time to listen off the moon.

If your antennas are fixed then you'll have to wait for the moon to pass through their vertical beamwidth. The information in the diagram, Fig. 2, provides details of which way to beam when the moon is setting. If you want full tracking information for your home QTH send me an s.a.e. and locator details.

**That's all I have for you this month. Please send your reports to me at Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP or via packet radio @ GB7MAD or the DX Cluster system.**

**Fig. 2: Tracking details for e.m.e. contest.**

**E N D**

Round-up

BROADCAST

Peter Shore starts this month with a look into his postbag and also has some interesting news on Deutsche Welle.

I start this month with some news from reader **John Hitchon** who has written from Gairloch in Ross-shire. John says that after a break of 20 years, he has returned to his hobby of short wave listening and remarks "My, how things have changed!".

The biggest change that John has noted is in communications receivers. He recalls the days of tuning an army R107, and says that today's digital read outs do rather spoil the listener. John also remarks on the end of jamming, and the opening up of the 13MHz band, which he says is his present day preferred band.

John says that his collection of QSL cards must be quite antique, with several cards from countries that no longer exist. Using a new 13m long wire antenna slung between the chimneys on the roof ridge he is getting good results with a magnetic balun and a metre-long earth rod driven into the "nearly always damp ground here in Wester Ross."

Already John has successfully QSLd the Faroe Islands, so considers that he has quickly regained his touch. He looks forward to adding to the 60 countries he has so far verified. Thanks for your letter, John, and welcome back to short wave listening. I do hope that you will find this column useful in giving you some tips for stations to tune to.

**Autumn Schedules**

Radio Australia's Autumn schedule has arrived. It suggests several times and frequencies for UK listeners to try to pick up the station. At 0700 to 0900, try 21.595 and 17.95, from 0900 to 1100 use 21.745 from 1100 to 1300 try 17.910, between 1430 and 1800 use 11.68, 9.51 and 7.26 and from 1800 to 2030 try 7.26 and 5.96MHz.

Radio Australia's sports programmes on Saturday between 0200 and 0730, and on Sunday between 0300 and 0730 are directed to the Pacific on 21.74, 15.24 and

11.72, to Papua New Guinea on 11.88, to South Asia on 21.595 and to South East and North Asia, try 21.525MHz. These are all useful frequencies to see if you've won a fortune on the Aussie Football Pools!

Radio Australia's weekly media programme, *Communicator*, hosted by Glen Bartholomew, can be heard on Tuesday at 1130, 1530 and 1930UTC. *Science File* is on Wednesday at the same time.

The listener contact programme, *Feedback*, is on the air on Saturday at 2210 and several times on Sunday, 0010, 0210, 0410, 0610 and 0810UTC. You can get in touch with Radio Australia by phone on +61 3 881 2360.

Revisions to the short wave schedule of Channel Africa mean that English programmes are currently beamed at 0200 to 0400 on 5.96MHz. They're from 0300 to 0500 on 3.995, 0400 to 0500 on 7.23 (with 500kW), 0500 to 0600 on 9.695 (also 500kW), and 0600 to 0700 on 15.22MHz (500kW).

The English service then takes a break until 1000 when there is an hour-long broadcast to East Africa on 17.805 with a 500kW transmitter. At 1100 there is a further hour to central and southern Africa on 9.73 with 500kW. English to Africa in the evening starts at 1600 with two hours on 4.945MHz, and at 1600 to 1700 on 15.22 (500kW) and 1700 to 1800 on 11.75MHz (500kW).

Radio Veritas Asia's winter schedule took effect on September 5 The station broadcasts in Mandarin, Ukrainian, Burmese, Karen (for India), Kachin, Bengali, Hindi, Urdu, Indonesian, Sinhala, Tamil, Telugu, Pilipino and Vietnamese.

The Philippine based Radio Veritas owns two 250kW transmitters made by the Swiss Brown Boveri Company. Transmission times are: 2100-2255 on 9.615; 2130-2225 on 9.555; 2230-2255 on 9.56; 2330-0055 on 9.535; 2300-2325 on 11.82; 2330-2355 on 9.56; 0000-0025 on 11.82; 0030-0125 on 15.53; 0100-0155 on

15.35; 0130-0230 on 15.53; and 0200-0230 on 15.51.

During the European daytime, the station broadcasts at 1000-1025 on 9.555; 1000-1055 on 9.52; 10230-1125 on 15.13; 1100-1125 on 11.79; 1130-1500 on 9.52. There's also 1130-1430 on 9.555; 1435-1530 on 9.615; 1500-1600 on 15.14. and 1535-1600 on 15.57MHz.

**Short Wave Transmitter**

Do you want to buy a rather good, high-powered, hardly used, short wave transmitter? The World Service of the Christian Science Monitor is planning to consolidate its North American transmitting operations into a single site at Cypress Creek, selling off the Scott's Corner, Maine, transmitting station.

The Scott's Corner site launched WCSN to the world back in 1987. An additional transmitter is to be bought for the Cypress Creek site, allowing it to beam towards Africa.

The Christian Science Monitor is trying to trim its expenditure on broadcasting, both at home in the USA, and overseas. The move to Cypress Creek is estimated to provide savings of around US\$ 1.6 million each year.

**Extra Staff**

More than 200 extra staff are going to be added to Deutsche Welle's payroll in the next few months, as it expands its international television and German services.

Deutsche Welle celebrates its 40th anniversary this year, the station is committed to providing a 24 hour-a-day TV service. The station now includes all the staff from the former Deutschlandfunk operation. If you have access to a steerable dish antenna, you can watch DWTV on Eutelsat II-F1 at 13° East, transponder 27 at 11.163GHz. The DW headquarters



has a new address following the changes in German post codes this summer. It is now **Deutsche Welle, 50588 Cologne, Germany. The listeners' mail department has a FAX machine on +49 221 389 41 55.**

Malta's Voice of the Mediterranean, based in Valletta, uses Deutsche Welle's relay on the island. The station, co-owned by Libya and Malta, broadcasts in Arabic and English, beaming to both the Middle East and to Europe. English is transmitted at 0600 on 9.765 and at 1400 on 11.925MHz. Arabic follows an hour later on the same channels.

I have mentioned before in this column that Radio Vilnius in Lithuania faces some problems with finances. It seems that a local company has come to the rescue and is sponsoring the overseas broadcasts until the end of this year.

**That is all I have room for this month. Do drop me a line at the PW Editorial Office in Broadstone if you pick up anything interesting, your fellow readers would be pleased to have your tips from the broadcast bands!**



**E N D**

# ARCAD E

## The PW Shopping Arcade

Welcome to the *Practical Wireless* 'Arcade'. In this section of the magazine, you'll be able to find all those important services 'under one roof' - just like the shopping arcades you see in the High Street.

Let your eyes 'stroll through' the Arcade every month and you'll find all departments open for business including: The Book Service, PCB Service, Binders and details of other *PW* Services. Make a regular habit of 'visiting' the Arcade, because in future, you'll have the chance of seeing special book offers and other bargains. And don't forget, this Arcade is open wherever you're reading *PW*!

## Services

### Queries:

Practical Wireless,  
PW Publishing Ltd., Arrowsmith Court,  
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Broadstone, Dorset BH18 8PW.

We will always try to help readers having difficulties with *Practical Wireless* projects, but please note the following simple rules:

- 1: We **cannot** deal with technical queries over the telephone.
- 2: We **cannot** give advice on modifications either to our designs, to commercial radio, TV or electronic equipment.
- 3: All letters asking for advice **must** be accompanied by a stamped self-addressed envelope (or envelope plus IRCs for overseas readers).
- 4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
- 5: Only one problem per letter please.

## Back Numbers

Limited stocks of many issues of *PW* for past years are available at £2.00 each including post and packing. If the issue you want is not available, we can photocopy a specific article at a cost of 85p per article or part of article.

Over the years, *PW* has reviewed many items of radio related equipment. A list of all the available reviews and their cost can be obtained from the Editorial Offices at Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW for a stamped self-addressed envelope.

## Binders

*PW* can provide a choice of binders for readers' use. Plain blue binders are available, each holding 12 issues of any A4 format magazine. Alternatively, blue binders embossed with the *PW* logo in silver can be supplied. The price for either type of binder is £5.50 each (£1 P&P for one, £2 for two or more).

Send all orders to PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

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Components for *PW* projects are usually readily available from component suppliers. For unusual or specialised components, a source or sources will be quoted. Each constructional project is given a rating to guide readers as to the complexity.

**Beginner:** A project that can be tackled by a beginner who is able to identify components and handle a soldering iron.

**Intermediate:** A fair degree of experience of building radio or electronic projects is assumed, but only basic test equipment will be needed to complete any tests and adjustments.

**Advanced:** A project likely to appeal to the experienced constructor. Access to workshop facilities and test equipment will often be required. Definitely not for the beginner to attempt without assistance.

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Practical Wireless, November 1993

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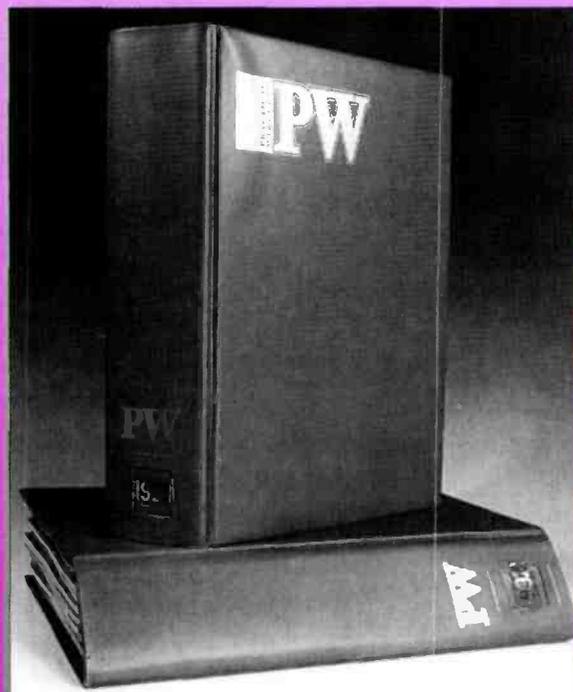
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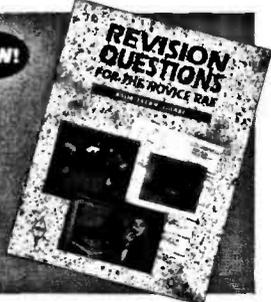
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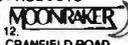
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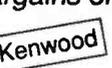
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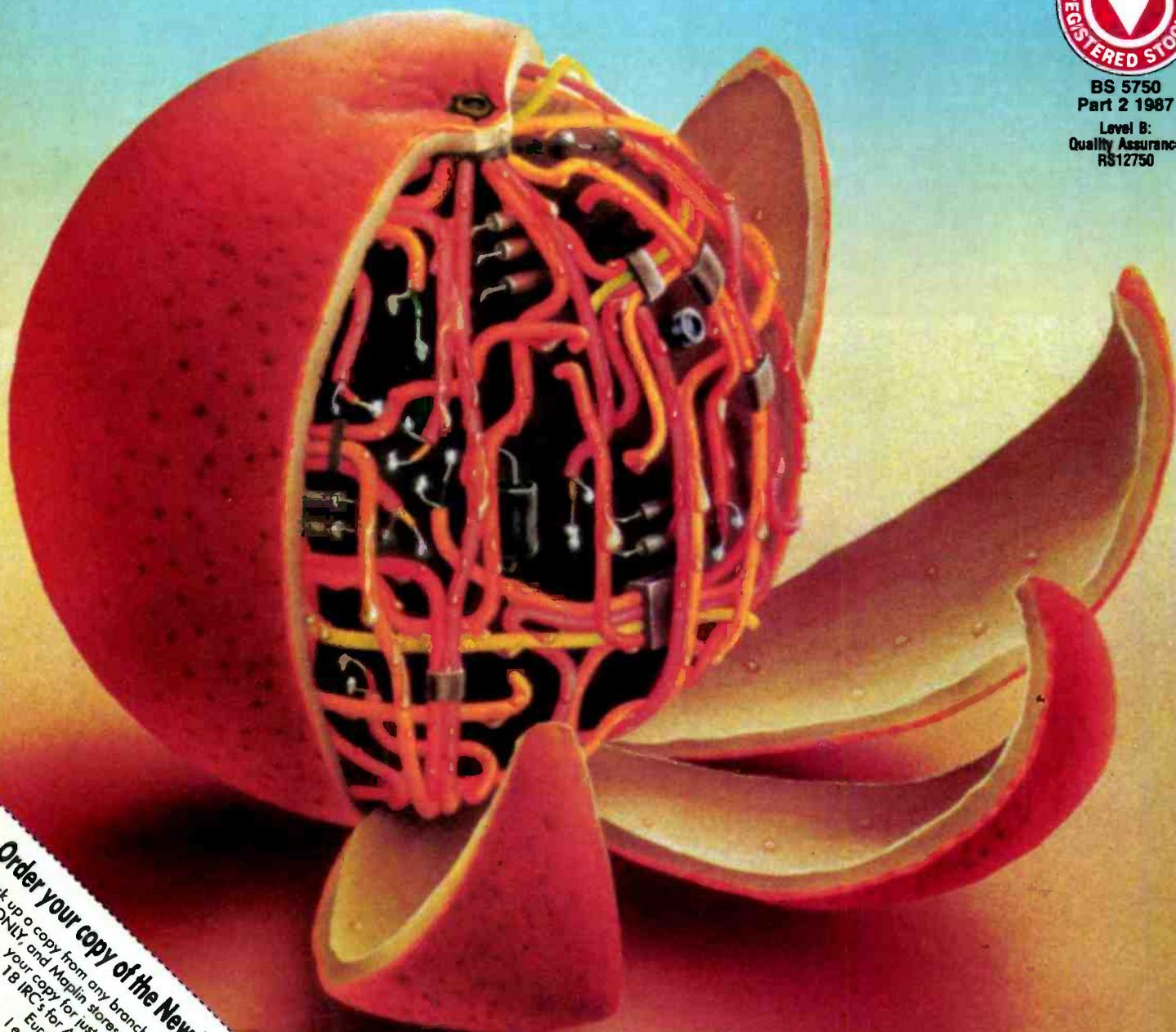
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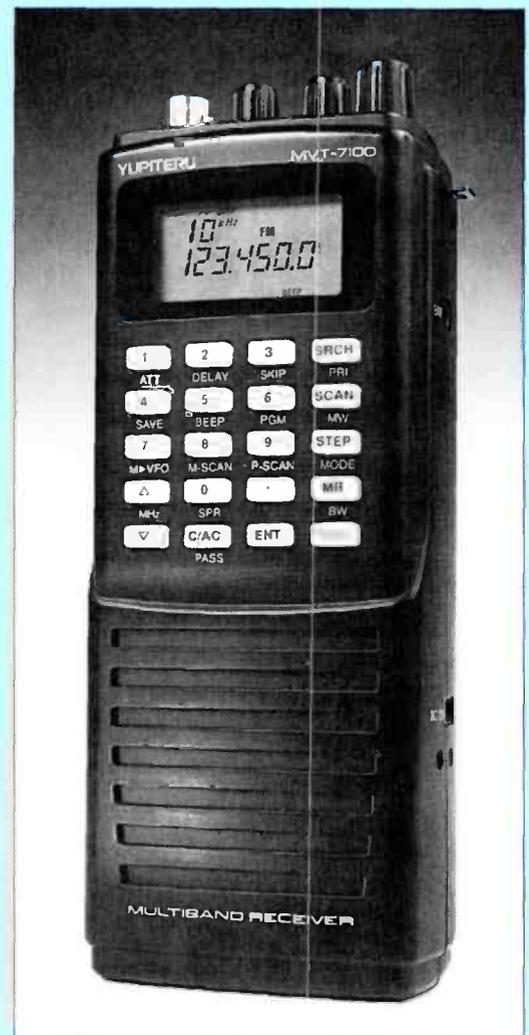
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To enter the free competition all completed questionnaires must be sent to the address on page Q4. Entries must be received at the *PW* offices by Tuesday 4 January 1994. The first questionnaire drawn out by the Editor will win the sender the Yupiteru scanner. The two runners up will win the one year subscriptions. The Editor's decision is final and no correspondence will be entered into.



**How many issues of PW do you usually buy a year?**

1  3  6  9  12

**How do you obtain your copy of PW?**

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- on firm order
- home delivery
- casual purchase

From an amateur radio dealer

By subscription

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**Do you have difficulty finding a copy of PW?**

Yes  No

**How many other people usually read your copy of PW?**

None  1  2  3  4  5  6  7 or more

**How many of these magazines do you also read or buy per year?**

	None	1-3	3-6	6-9	9-12
Radio Communication	<input type="checkbox"/>				
Ham Radio Today	<input type="checkbox"/>				
Short Wave Magazine	<input type="checkbox"/>				
Electronics + Wireless World	<input type="checkbox"/>				
Monitoring Times (USA)	<input type="checkbox"/>				
Popular Communications (USA)	<input type="checkbox"/>				
CQ Magazine (USA)	<input type="checkbox"/>				
73 Magazine (USA)	<input type="checkbox"/>				
Maplin Magazine	<input type="checkbox"/>				

**Which of these newspapers do you regularly read?**

- |                 |                          |               |                          |              |                          |
|-----------------|--------------------------|---------------|--------------------------|--------------|--------------------------|
| Daily Mail      | <input type="checkbox"/> | Daily Express | <input type="checkbox"/> | Daily Mirror | <input type="checkbox"/> |
| Daily Telegraph | <input type="checkbox"/> | The Times     | <input type="checkbox"/> | The Star     | <input type="checkbox"/> |
| The Guardian    | <input type="checkbox"/> | Today         | <input type="checkbox"/> | The Sun      | <input type="checkbox"/> |
| The Independent | <input type="checkbox"/> | Local         | <input type="checkbox"/> |              |                          |

**Do you own a home computer?**

- Yes  No

**If "Yes", which type (e.g. BBC, IBM PC Compatible, Macintosh, etc)?**

---

**Do you hold an amateur radio transmitting licence?**

- Yes (Class A)  Yes (Class B)  No   
 Yes (Novice A)  Yes (Novice B)

**How much do you spend on the radio hobby in an average year?  
 (including QSL expenses, books, equipment, shows etc)**

- Under £50  £251-£500   
 £51-£100  £501-£1,000   
 £101-£250  Over £1,000

**Have you ever bought anything from an advertisement in PW?**

- Yes - Major equipment  No   
 Yes - Antennas   
 Yes - Accessories   
 Yes - Components   
 Yes - Books

**If "Yes", how would you rate the service you received from the advertiser?**

- Poor  Acceptable  Good  Very Good

**How many rallies/exhibitions do you visit annually?**

- None  1  2  3  4  5 or more

**How would you describe your expertise in electronics?**

- Beginner  Average  Advanced

**Which of these clubs/societies/groups do you belong to?**

- |        |                          |       |                          |
|--------|--------------------------|-------|--------------------------|
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**Do you have any other major hobbies? If so, what:-**

---

**How interested are you in the following regular features in PW?**

	Very interested	Fairly interested	Slightly interested	Not interested
Reviews - Major Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviews - Accessories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constructional - Major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constructional - Minor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What a Good Idea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Modifying Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advertisements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bits & Bytes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Broadcast Round-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Packet Panarama	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VHF - Up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HF Bands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Valve & Vintage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Club News	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keylines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Newsdesk '93	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio Diary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Receiving You	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Book Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Offers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**On a scale of 1-10, how would you rate the technical content of PW?**

(Not technical enough)    1    2    3    4    5    6    7    8    9    10    (Too technical)

**We regularly devote issues to a theme and sometimes we add extra pages in the form of free pull-out supplements and catalogues. How do you rate them?**

	Very interesting	Fairly interesting	Slightly interesting	Not interesting
Kits & Home-brew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Morse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
QRP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Test Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VHF & UHF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antennas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mobile Operating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Workshop Special	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computing In Radio (Supp)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advertiser's Catalogues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**How interested are you in reading about the following aspects of radio?**

	Very interesting	Fairly interesting	Slightly interesting	Not interesting
Help for Beginners/Novices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
News Items	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Modifying ex-PMR equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Test Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical Jottings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal Experiences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Show Reports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scanning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Short Wave Listening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basic QSOs in...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**How do you rate the overall design and layout of PW?**

Poor        Fair        Good        Excellent   

**How do you rate the look of PW's covers?**

Poor        Fair        Good        Excellent   

**How easy is it to spot PW on the newsagent's shelf?**

Very Easy        Fairly Easy        Fairly Difficult        Very Difficult   

**How often do you construct projects published in PW?**

Never        Seldom        Often        Always   

**On a scale of 1-10, how difficult do you believe it is to become a radio amateur?**

(Too Easy)    1    2    3    4    5    6    7    8    9    10    (Too Difficult)

**Do you believe the ability to send and receive Morse code manually is still relevant to amateur radio?**

Yes     No

**How closely do you read the advertisements in PW?**

I read all or nearly all of the advertisements   

I read some of the advertisements   

I read the occasional advertisement   

I never read the advertisements   

**Which of these do you use regularly?**

CW	<input type="checkbox"/>	Moonbounce	<input type="checkbox"/>
PHONE	<input type="checkbox"/>	Fax	<input type="checkbox"/>
RTTY	<input type="checkbox"/>	SSTV	<input type="checkbox"/>
AMTOR	<input type="checkbox"/>	FSTV	<input type="checkbox"/>
Packet	<input type="checkbox"/>	Satellites	<input type="checkbox"/>
Repeaters	<input type="checkbox"/>		
Other _____			

**Which of these bands do you transmit on or listen to most often?**

	Usually	Often	Sometimes	Never
1.8MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
144MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
430MHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2GHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4-5.6GHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10GHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Above 24GHz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HF Broadcast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Can you say, briefly, how you would like us to improve PW?**

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**PERSONAL DATA**

Personal details are required for statistical purposes only and will be treated in the strictest confidence. Please ignore any of the following questions that you do not wish to answer. You must, however, supply your name and address if you want to be included in the prize draw. The information in the questionnaire will be stored on a database but it will not be stored and/or associated with your name and address.

**How old are you?**

- Under 15
- 15-25
- 26-35
- 36-45
- 46-55
- 56-65
- Over 65

**Are you employed in an electronics related field?**

- Yes  No

**What is your annual income?**

- |  |  |                                       |
|--|--|---------------------------------------|
| Under £6,500 <input type="checkbox"/>    | £15,001-£20,000 <input type="checkbox"/> | Over £30,000 <input type="checkbox"/> |
| £6,500-£10,000 <input type="checkbox"/>  | £20,001-£25,000 <input type="checkbox"/> |                                       |
| £10,001-£15,000 <input type="checkbox"/> | £25,001-£30,000 <input type="checkbox"/> |                                       |

**Please tick this box if you do not want to receive further information from PW Publishing Ltd and/or associated companies**

Thank you for taking the time to fill out our questionnaire. If you write your name and address in the space below and send the completed form to the address below, you will be entered into our free prize draw. We will be happy to pay the postage\*.

PW Publishing Ltd. (Survey),  
 FREEPOST,  
 Arrowsmith Court,  
 Station Approach,  
 BROADSTONE,  
 Dorset BH18 8PW.  
 (NO STAMP IS REQUIRED)

NAME \_\_\_\_\_ CALLSIGN \_\_\_\_\_

ADDRESS \_\_\_\_\_

\*Unfortunately, the FREEPOST facility is only available for readers within the United Kingdom, Northern Ireland, Channel Islands and the Isle of Man. Despite this, although readers abroad will have to pay the postage to return their questionnaires, they will still have free entry to the competition, and with the closing date of January 4 1994, we have allowed plenty of time for entries to arrive from around the world. - Ed.

POSTCODE \_\_\_\_\_