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THREE REVIEWS!

Richard Newton reviews the new Yaesu FT-90R “Micro Commander” courtesy of Yaesu UK Ltd.

Katherine Taylor 2E1HFX reviews SIX pieces of 144MHz equipment suitable for the Novice operator Including: an ADI AT-600 hand-held; the Hora C-150 and the C-408 hand-helds; an AKD 2001 transceiver, an Alinco DJ-V5 and finally an Alinco DJ-195!!

Rob Mannion G3XFD reviews the Carlton receiver kit from Lake Electronics which had to be held over from last month’s magazine due to a packed issue!

Antennas-In-Action

Tex Swann G1TEX has more antenna related news, reviews and projects for you next month.

Plus all your regular favourites including:

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CAN YOU AFFORD TO MISS IT? - JANUARY 2000 ISSUE ON SALE 9 DECEMBER 1999
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Practical Wireless, December 1999
As I write this - the last of this year's 'Keylines' (of the 1999 volume anyway), I'm thinking back to the 'Leicester' show at Donington Park in mid September. It was my intention to write a little on my experience, however, I was spurred into action again by the letters from Howard MOCMG and Keith M1ADQ which appear in this issue's 'Letters' pages. Both readers commented on the 'new look' and very 'open' PW Publishing Stand at the show and that they didn't see me 'on duty' during the show ... even though Keith M1ADQ apparently saw me several times 'off the stand'. Well, as many of you already know ... I was there, but many (so it seems from your letters, E-mails and telephone calls) did not see me because of the newly provided 'come and sit with the show' facility.

My colleagues involved with the show had designed a totally new stand with its 'open' and inviting presentation. This worked extremely well for everyone else involved. However, even though I had a 'personalised' section of the stand where readers and other visitors could come and chat with me - after all, for some people it's the only time we might be able to meet during the year - because it was 'screened off' from the main part of the stand many readers walked by the stand and assumed I wasn't there.

(Those that did enquire were brought to me and get the full benefit of the 'personalised space' away from the hustle and bustle of the main stand where we could chat. And, in this respect, the new lay-out worked very well indeed.) Even though I was dismayed at missing so many of you, I realise that there are tremendous benefits for everyone by carrying on with the new design. All we've got to do is to work out a way of clearly indicating I'm 'in position' so to speak! Several suggestions of large 'cut-outs' of G3XFD (similar to the famous beer adverts on TV) have been volunteered. So, for the 2000 show at Donington Park remember to look out for me at the end of the PW stand - and if you can't see me ... ask and we'll meet up! I'll be delighted to meet you there.

Lighting & Ventilation

The large enclosed and windowless design of the Donington Exhibition Hall requires efficient lighting and ventilation, particularly with all the hot air (from us and the equipment). Firstly, however, as the show settles down to the new venue and we get used to it, I feel sure that the somewhat inadequate lighting will improve. I hope so because various spotlights being used by nearby exhibitors certainly dazzled me at times!

Secondly, and much to my surprise, I've found that the new venue seems to suffer the same ventilation problems as the old Granby Halls - until the air-conditioning systems come 'on line' that is. My feeling is, because of the windowless nature of the building and that the side roller door shutters are mostly kept closed - that it's a necessity for the air-conditioning to be kept on all the time, which wasn't the case (in my opinion) during this year's show.

When I spoke to the organisers (easy to spot and talk to as they're dressed in the now-traditional 'Leicester' show maroon jackets) they were aware and acted on the problem. However, (even though I'm a dedicated 'Non Smoker' myself) I don't think the suggested 'No Smoking' ban would work because the organisers would not be able to enforce a ban on smokers - who'll manage to indulge whenever and wherever they can! No, I think the answer has to be the following request to the organisers - Air Condition and ventilation on 'Full Blast' next year please!

Older Style Components

My Editorial in 'Keylines' on the topic of 'Traditional Components Disappearing?' in the October issue has brought an interesting response from readers - including the letter from Ian Johnson ('Star Letter'). However, although most of the letters and E-mails received on the subject gave me much encouragement - that from Mike Turnbull G7PWL who lives in Whitely Bay, Northumberland was most re-assuring and helpful:

In his letter to me in September - after he'd read 'Keylines' - Mike, our helpful reader was not only able to give me good news regarding the manufacturer of 'traditional' style resistors - he had even contacted the company's UK Sales Manager on my behalf! (Thanks Mike!)

The result is that I now have a letter - originally sent to Mike Turnbull - from Ken Adamson of Welwyn Components. In the letter Ken Adamson says: 'Best assured, Welwyn still manufacture hundreds of millions of wire ended resistors here in Bedlington (Northumberland). Whilst there is an undecided move towards surface mounted circuits, there are still many electronic equipment manufacturers producing through-hole printed circuit boards and this is expected to continue for many years to come'.

The friendly letter from Ken Adamson ends with an Invitation to Mike suggesting that I would perhaps like to visit the factory and see for myself. And I can tell you that the invitation will be taken up next year and I hope that both Mike G7PWL and myself will be able to visit the Welwyn factory in Bedlington and eventually present an interesting and informative article in PW not long afterwards!

So, watch this space readers, and if you know of any other UK-based manufacturing of 'traditional' components - make sure you let me know. Thanks again to Mike and everyone who responded. It's not all 'dooom and gloom' is it?

R A Press Releases

As many readers will be aware, for many years I've been working very hard to convince the Radiocommunications Agency of the need to provide Press Release information - especially those on licence revocations and criminal court case proceedings - with enough information for our readers. I've always regarded the need for full information to be of paramount importance, because otherwise scant information based press releases can lead to PW and other magazines to be just 'notice boards' for Government Departments so that they can be 'seen' (by other Departments perhaps) to be doing their jobs.

It's taken a long time (and I write this from personal experience as I was a Civil Servant myself in the past) to convince the naturally conservative (or do I really mean 'secretive') Government Departments to 'work with us'. However, last month's RA Press Release (page 13 under the heading 'Swindon's Breaker Baker Silenced' should be seen as a real 'breakthrough'.

However, despite the 'breakthrough' I think has been made by the press release - we've now got to convince the RA's Press Office and Legal Dept. to speed things up. I say this because surely there's no reason why it should take from June until September to issue a press statement (that's the time it took for the statement involved to work its way through the 'system').

Well done RA - although I think you could still do better, but at least you do seem to be listening to what we're all saying in our attempts to 'work with you'. So, let's hope that the new century will bring ever-improving relationships between the Amateur Radio Service and the Radio-communications Agency.

Rob G3XFD.
Scarcity Of Older Components??

Dear Sir

I have just read the Editor's comments ("Keylines" November) on the scarcity of the older style components. I have been in the electronics trade for over 20 years, over that time I have been at the sharp end of the trade, both in the manufacturing field and in the repair side. The small outline type components have been creeping up on us for over 15 years. I first came across them at Marconi Instruments in St. Albans, Hertfordshire. At first they caused many problems, the main way of soldering then was a vapour phase process using an inert fluorocarbon liquid. This was heated to over 200°C. The circuit board was lowered into the vapour, as it condensed, the special solder melted and flowed. The substance was called Fluorinert and cost over £50 per pint. The main thing that could happen was that the resistors would lift at one end because of the solder paste not melting at both ends at the same time. (This was called tomb-stoning).

After some time they went over to an infra red reflow system. The basic drawbacks are that they are very fragile, many circuit boards had to be re-laid out because as they were heated, they distorted, when they were fixed in place the components cracked. Ask anybody who repairs video cameras about the electrolytics used. They have a very nasty habit of leaking all over the circuit boards.

So far I have found Farnell Components to stock many of the traditional type components. They will supply anybody and you can phone up and pay by credit card or open an account very easily. They are on Tel: 0113-263 6311 (sales) or FAX: 0113-263 3411 (24 hours). Canal Road, Leeds LS12 2TU. Delivery is free and they keep the best range of resistors to be found anywhere. I have used their service and can recommend them without any hesitation at all. Their catalogue covers everything you could ever need.

The other people who can often supply that hard to find item are Cricklewood Electronics of Cricklewood, London. Even Maplin do a bigger range of components than ever before. Tel: 01702 554000 ... they still supply mostly the wire ended item are Cricklewood Electronics of Cricklewood, London. Even Maplin do a bigger range of components than ever before. Tel: 01702 554000 ... they still supply mostly the wire ended components.

If you really get stuck. try me on Kiddleminster 759971 after 7pm. I have many rare components from my days as a repair person. Yours sincerely from (a new subscriber).

Ian Johnson
West Midlands

Editor's reply: Thank you Ian for an interesting letter. Please see "Keylines" editorial for further comments.

Saint Gabriel... Already on Frequency!

Dear Sir

With reference to Adrian Soane's letter in the October PW about a Patron Saint for Radio Amateurs. I am writing to inform you that there is a Patron Saint for radio operators, St. Gabriel (the messenger angel) which is celebrated on the 29th September (the same day as St. Michael, Patron Saint of parachutists) by the French Army Signal Corps.

From 1980-1995 I served as a radio operator/telegraphist in the French Foreign Legion and wherever we were based or serving we worked closely with the French regular army signal corps, and every year the Legion radio operators would be invited to join them for the Fete du St Gabriel.

The day would start with a cross country running competition followed by a church service later in the morning. Lunch began with a toast to St. Gabriel and to all radio operators killed on active service, lunch usually continued for the rest of the day with large amounts of good French wine being drunk and a jolly good time being had by all.

I hope this sheds more light on the subject.

73 from Phil Measom
G0ZZZ/75PEH
London

Not Christians?

Dear Sir

With reference to the subject of religion in our hobby. The October issue of PW had a rather nice letter from Adrian Soane M0ARY suggesting that Max Kolbe SP3RN be made Patron Saint of Amateur Radio.

Well, I can imagine that there were thousands of radio operators who gave their lives for the freedom of the human race and who were not Christians and who would certainly have abhorred the idea of Amateur Radio groups adopting a Christian symbolism as patron.

Why did Adrian not suggest Mercury as a symbol? After all, lots of us wear that in our cap badges so that the Adrian of this world could feel free to proselytise their own religious myths and cause even more divisions in the human communities. Yet that attitude is not the outcome when it is the other way around. It appears that 'sleekit beauties' are more respected than the genuine 'evedded' non-religious truly natural human beings who wish to communicate with each other free of the ancient scourge of insidious mythologies.

Robbie GM4RAI
Wick

Becoming A Radio Amateur

Dear Sir

I have to agree totally to Mel Gardiner's letter in the October issue of PW. I first became aware of Amateur Radio in the late sixties but didn't take the RAE until 1998.

First of all, how does one become a Radio Amateur? You have to sit an exam, that's OK, but you can only sit or take the exam on two occasions in the year - the second Monday in May or the first Monday in December. This, however, is about to change in the near future.

I had to wait 57 days between sitting the exam and going on air - this hobby is all about communication, I think! Anyway, I assume, like most Radio Amateurs, I was thinking about the 12wpm Morse exam. Not anymore, often making well over 300 contacts on 6m in Europe. I began to wonder why I could to these stations on 6 but not on the other bands I could hear them on. Does having the ability to understand Morse make one a better operator? I don't think so.

Regarding the risk of Amateur Radio looking 'fuddy duddy' - take a look at the front cover of the October 1999 edition in the top right hand corner is a photograph of the Belgian operator ON6UC smiling and holding a small dish for microwave use. Step back for a moment, take a look at this magazine cover on a shelf in the newsagents.

This image doesn't help to promote or encourage new blood into the hobby. It's images like these that give the hobby a 'fuddy duddy' image. There is a communications revolution taking place right now. If Amateur Radio doesn't wake up and change soon, then it will frit the background of its own QRM.

Matthew McLauchlan
Fife

Editor's comment: The smiling, somewhat younger face of ON6UC was deliberately chosen for use on the front cover in October because he WAS smiling - something of a rarity in Amateur Radio photographs where the rather 'stiff' Victorian image still prevails! Perhaps readers would like to suggest an image we can project if the photograph demonstrating obvious enjoyment of the hobby is not suitable?

Pace-Maker

Advice Please!

Dear Sir

As a regular reader of PW over the years, I have particularly appreciated both the technical items and the views and experiences of your correspondents. I have recently been fitted with a Pace-maker and am seeking reassurance that it is safe to continue to operate my equipment which is run at all times, barefoot.

There must be many amateurs who have faced this problem who would be happy to share their experiences and

COMPILED BY ROB MANNION
professionals who would know the limitations necessary.

May I, through the auspices of your column, seek the information I require in the hope that I can renew my active participation in what has been a fascinating hobby for me over the years. Thank you,

Les Ward G4XGC
16 Fishers Close
Blandford Forum
Dorset
DT11 TEL

Editor’s comment: Les does not state what form or model of pacemaker he has. However, I have no doubt that other readers in the same situation may well have had specific instructions and can help. (Please write directly to Les)

Compulsory Logging

Dear Sir
I would go along with the thoughts expressed by Walter Farrar G3ESP (“Letters” August PW) concerning compulsory loggings. What might be more useful would be the accurate maintenance of a station diary indicating times of station opening and closing, experiments and results of transmissions made, alterations to antennas, etc.

This would leave time to fill in QSL cards if required at the time of contact. I have visited in the late 1940s early 1950s - plenty of fag packets around!

But concerning log books and QSLs and reference to the letter (October ‘Letters’) from Adrian Soane MOABY regarding SP3RN. I wonder if any real ‘Old Timer’ logged SP3RN and perhaps retains a QSL card? A QSL card from a Saint - well, that would be something!

Richard Patterson G3KVV
Powy

Calling ‘CQ’ With Pergola MkII

Dear Sir
Shortly after reading the article by Dick Pascoe G8BPS in the October ‘Antenna Workshop’, I was watching a gardening program where they were building a pergola.

There were the usual upright poles in two parallel rows with connecting pieces along the top. Instead of the usual wood cross pieces, they used copper tubing, with end caps to prevent wind noise. As I watched, I thought what a good way to hide a log periodic!

Yours sincerely
John Halliburton GM4A70
Fife

Editor: Interesting idea - however, please don’t tell the ‘Tabled’ press if your greenery wilts in the presence of r.f. transmissions!

Scanner Help Needed!

Dear Sir
I have a problem that I think your readers can help me with. I have recently purchased a Realistic PRO-2039 scanner. The question is, though the set works quite well on its telescopic antenna, would there be any improvement by using an outdoor antenna at a height of twenty feet? If the answer is ‘yes’ then another problem rears its ugly head. How do I fit one? Obviously, with an outside antenna, I shall have to use coaxial cable which requires an earth. Is there an adapter that one can fit in the antenna socket to accept coaxial cable, or will I have to open the thing up, cut a hole in the back and fit a SO239 or BNC socket and connect to the existing antenna point to earth? If I have to do this, how and where please?

I live in the country about one and a half miles from Rainham and four miles from Chatham in Kent. Hoping someone can assist.

John Noble
1 Meirscourt Farm Cottages
Meirscourt Road
Rainham
Kent ME8 8PJ

Future Of The Hobby & The PW ‘Leicester’ Show Stand

Dear Sir
It was good to meet the Editor on his visit to the South Normanton Club in North Derbyshire earlier in the year. (It is important to remember the ‘South’ bit - just ‘Normanton’ is miles away - as G3XFD found out when he got lost on his visit to us!)

Funnily enough, I did exactly the same thing about 30 years ago when travelling down from Yorkshire for the first time for a job interview! (I got it and have been in the area ever since).

I didn’t see the Editor on the stand at Castle Donington, in fact the whole stand looked a bit sparse - there seemed to be only one person there, whose face I didn’t recognise from the magazine. Perhaps I was too early? I was there virtually first thing Friday.

Incidentally I have also followed the ‘Great Morse Debate’ with tremendous interest and now that the dust has settled it is apparent that with regard to Morse, there are three self evident truths.

In no particular order, these things are: 1). Even in the Millennium, Morse is (and will remain) a very variable efficient and cost effective mode of communication. 2). There is no justification in retaining it as the accessqualification to h.f. 3). The only people who knock it are those who can’t do it. Whether the present and further planned licence changes will increase recruitment to the hobby is a moot point.

Whether a general ‘dummimg down’ throughout the whole of society - the transformation of whole generations into ‘button pushers’ who have little understanding of the technology behind the buttons they press and/or increasing use of E-mail/the Internet, will eventually kill the hobby, remains to be seen, though may be likely after a couple of generations - that is tomorrow.

What will, however, bring about the end of the hobby long before then, a totally and unnecessary premature demise, is the apathy if too many of today’s licensed amateurs. I read that there are some 15 000 of us in the UK. My current callback listings run to some 180 pages of small print.

Regardless of licence class, where are they on the air? On 2m, 4m, 6m ... All too often these bands are just barren wastelands of white noise. Most of us have noticed this. You can bet your life "others" have. When these bands are taken from us, that will be the death knell of our hobby. It will be too late then to bleat about “the Council”, “MHz”, "the Internet" or "dummimg down". There will be no one to blame but us - who are really the dumb ones?

Howard MOCMG
Nottingham

Dear Sir
I attended the Leicester Rally on Friday 24th September arriving there about 20 minutes prior to opening time. I saw your good self (Editor) arrive and enter the building but I am sure that you entered a time warp (shades of "Counting Up From The Millennium").
I passed by the Practical Wireless stand purposely about 12 times in order to catch up with you but you seemed to have completely disappeared off the face of the earth - or at least the show. I kept my eyes peeled as I walked about but you were nowhere to be seen perhaps partaking in some of that 'Irish Whiskey'?! I hope that you enjoyed the Leicester Rally as much as I did Rob and I hope to catch up with you at some other rally in the future!

Kevin Wells M1ADQ

Editor's comment: Please see 'Keylines' editorial for further comment on the 'Leicester' show stand.

Things Aren't What They Used To Be?

Dear Sir

Hardly a week goes by without a Class A, Class B operator, or a main agent, local Amateur Radio shop bemoaning the fact that "fings ain't what they used to be"!

Yet the answer is in their hands!

Open PW or any other magazine and what do you see? "Price Match", a radio touted at £700 can now be had for £600.

Enquire as to what the receiver is really worth, question the painfully obvious mentality of surface-mount rigs those amongst sales persons at the other end "Hey Brian, this man was in Royal Corps of Signals" - Tell him our Engineer's on leave!

I am afraid that I have, like an ancient wire-recorder, a long memory and can remember not so many years ago when a rig with wrong frequency shift or "Echo-Charlie rocks" in a new transceiver wasn't uncommon. My wife's research takes her from Matlock to Axminster via Cambridge, so duty-driver often has a statutory break at most appropriate places. Sure, there are bad apples, but also a lot of good ones.

I would advise any amateur or s.w.l. to subscribe to PW or SWM for a year. Complete disappearance is of course obligatory for the first year of being licensed so I had no problem remembering the code.

Incidentally, on the subject of buying PW ('Keylines' November issue), the only reason I don't take out a subscription is that we give all the business we can to our Village Shop - to lose it would be a disaster. Whenever we have moved house one of my first jobs has been to place an order for PW with a local shop. I've never had a problem getting my copy in over 50 years!

73 de Ron G3DSV

Exeter

More On Morse

(And Motorways???)

Dear Sir

Thinking about 'The Great Morse Discussion' has given me the answer to another national problem which is somewhat parallel to ours: 'Congestion on Britain's Roads'.

Drivers should be divided into two classes, A and B. The B class would, as at present, be required to pass the current driving test but, to become an A class motorist, it would be necessary to take a course in car maintenance and be proficient at dismantling an engine, de-coking the cylinders, grinding valves, adjusting the carburettor or Injectors, etc.

Having obtained a 'Maintenance Certificate', the A class motorist would:

- be entitled to drive on any road, but the B class motorist would not be permitted to use a motorway and would be limited to the old A roads. This would, at a stroke, relieve the congestion on the nation's motorways, the M25 and M6 in particular. Those with an A licence to use motorways would have a prefix on their number plate, M6, etc.

- There may be some drivers who have no interest in motor mechanics or are unable, for health reasons or lack of time, etc., to delve into the workings of their vehicle. They may consider the system unfair but this would be irrelevant since the object of the excruse would not be to produce better motorists but to relieve congestion on the roads.

Learn or novice drivers would be relegated to "B" roads unless they had passed the maintenance examination when accompanied by an A class driver, they could use a motorway. In the left hand lane only, at speeds of less than 30mph.

There are a few minor details to be ironed out but, given the will of the authorities, my scheme could be in place by the 1st April 2000, in time for the summer holiday traffic.

This scheme is, of course, intended as an interim measure pending the take-over by commercial interests of all roads when, in order to provide dividends for shareholders, motorists would pay for the privilege of using any road on a sliding scale from motorway down to byway.

R C Perry G7CQD

Hereford

Suffering A Stroke - Long Term Memory

Dear Sir

I was very interested in the experience of Neil Barrowman GMOLTQ ('Long Term Morse Memory', 'Letters' PW November). When I had my major stroke in 1993 it was I that was concerned with my long term memory! I have always kept a Morse tape to keep up my speed, a lot easier than trying on the bands. I got my wife to bring into the hospital our tape recorder and my tape.

The Consultant was most amused to find me one morning with a single piece earphone and a tape recorder. He was most interested to know what I was listening to as I was just about managing to write at the same time.

I was able to read the Morse but my speed had dropped but it did not take many days to recover it.

The Consultant thought it was a wonderful way of checking and helping the long term memory. Morse was of course obligatory for the first year of being licensed so I had no problem remembering the code.

Practical Wireless, December 1999
Svetlana Announces UK Company As European Distributor

Svetlana Electron Devices Inc have announced the appointment of PM Components Ltd, based in Kent, England, as their new “full-service, stocking distributor serving all of Europe”. The Press Release which we received at the PW Offices states that PM Components combine vacuum tube experience and technology “in a full range of services to many of the biggest names in the music business, both in guitar amplification and high-end audio”.

What with PM Components' tube testing, grading and matching and their technical support and consulting, they are a “perfect complement” to Svetlana’s product line, Svetlana claim. Svetlana ask people to contact PM Components for additional information and pricing, stating that they are confident that their customers will receive the “ultimate in value and customer service”.

New Mini Beam ZX Yagi!

Nevada has been in touch with PW to tell us all about the brand new ZX Yagi - Mini 1020 h.f. beam antenna. Ron Eberson of ZX Yagis in Holland, Nevada tells us, has been manufacturing “top class” beams for European DXers for a number of years and the Mini 1020 h.f. beam was designed and built at Nevada's request, they state.

Ron has produced this mini beam for Radio Amateurs with small gardens! The antenna covers the 14 (5.56Dbi gain), 21 (5.76Dbi gain) and 28MHz (6.50Dbi gain) bands and has a boom length of just 2m and a maximum element length of 5m - so Nevada says.

This new Mini 1020 HF Beam costs as little as £193 and Nevada say that they have been appointed exclusive distributor of these antennas. If you are interested and would like to know more, Nevada say that they will provide more information on receipt of an s.a.e. Send any requests to Nevada, 189 London Road, North End, Portsmouth P02 9AE. Tel: 0239-266 2145. FAX: 0239-269 0626. Or why not visit their Web site: www.nevada.co.uk

New PC-Based Oscilloscope!

Vann Draper Electronics Ltd have sent Practical Wireless information on a new PC-based oscilloscope from Beta Instruments. In fact ... PW have been lucky enough to secure one for review and Tex Swann G1TEX will be reviewing it in the next Electronics-in-Action pages so keep your eyes peeled for that review COMING SOON!

In the mean time, here
Lightweight Switched Mode Power Supply

Waters & Stanton (W&S) have been in touch with PW to tell us all about the brand new Samlex SEC 1223 23A lightweight switched mode power supply. W&S say on to say that they have been appointed exclusive distributors of this power supply.

This brand new power supply is very compact, W&S say and measures around the same size as the Icom IC-706 and the Yaesu FT-100 (two rigs which W&S the power supply is most likely to be used with). Lighter than the IC-706 itself, the press release states, this little power supply costs £89.95 and W&S say that they are already selling well.

If you would like to learn more about the Samlex SEC 1223, then please contact Waters & Stanton direct on Tel: (01702) 209935. FAX: (01702) 209584. Spa House, 22 Main Road, Hockley, Essex SS5 4QS. E-mail: info@wsplc.demon.co.uk or visit their Web site: www.watersand-stanton.co.uk

Beyond Electronics?

The new Maplin catalogue is now out and is in a "new look" format, Maplin claim. The new catalogue, dated "Sept 99-Feb 2000, contains over £60 worth of vouchers which can be used on Maplin orders. It has been increased to include 1600 pages with the addition of over 1500 new products and no less than 2000 price reductions. Once again, the catalogue is available in both the traditional paper version and on CDROM. The CDROM has "comprehensive" search facilities, pricing is in Sterling and Euros along with product pictures and technical specifications.

To obtain your copy please telephone Maplin: (01702) 554000 or call into one of their many stores nationwide. The paper version costs £3.99 (order code CA20) and the CDROM only £1.95 (order code CQ04). You can also purchase copies from branches of W. H. Smiths.

Lightweight Switched Mode Power Supply

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A Thing Of The Past

News now from Quiller Electronics Ltd who tell us that "Faulty switches caused by overheating during the soldering process are now a thing of the past". The solution they have come up with are MULTIMEC switches manufactured in PBT which they say is more resistant to heat than conventional plastic materials.

The mechanical lifetime of such switches, they tell us, is more than ten million operational cycles and actuator travel is 1mm. Accessories, Quiller state, include buttons and bezels in a variety of colours, extended height or illumination.

A complete engineering catalogue is available on the Internet at: www.mec.dk For more information please contact Quiller Electronics Ltd, 2 Paisley Road, Bournemouth, Dorset BH6 5EU. Tel: (01202) 436755. FAX: (01202) 421255.
Antique Catalogue?
For those readers interested in the Vintage aspect of Amateur Radio, the new year 2000 'Antique Electronics Supply' catalogue has recently fallen on to the PW news desk.

The catalogue contains a number of interesting vintage components including valves of all shapes and sizes. To get your hands on a copy please write to 'Antiques Electronic Supply', 6221 S. Maple Avenue, Tempe, AZ 85283, USA. Or why not visit their Web site at: www.tubesandmore.com

World Radio in 2000!
The new World Radio TV Handbook (WRTH) for 2000 is out now. You can purchase a copy from the PW Book Store for a mere £19.95.

Mainline Component Catalogue
Mainline Electronics have been in touch with PW to tell us all about their new catalogue/magazine which is available from November.
Mainline Electronics are a well-established distributor of radio components, etc., and they tell PW that due to continued expansion they have set up a new surplus sales division and produced the catalogue (of which you can see the front page of the draft copy here).

The catalogue will contain the variety of "high quality manufacturer excess items" which they have on offer along with prices. A new company has been formed to deal with this side of the business called Mainline Surplus Sales. For further information, please contact Mainline Surplus Sales on Tel: 0116-277 9717. FAX: 0116-247 7551. PO Box 235, Leicester LE2 9SH. E-mail: sales@mainlinegroup.co.uk

Haydon's 'Ham' Hamper
Mike Haydon of Haydon Communications has sent PW information on the products which they will have on the Haydon stand at Picketts Lock this November.

Firstly, Haydon say that they will have the new Garmin GPS-III+ on sale. With its loadable Mapsource CDROM for enhanced detail along with the PC download facility (PC lead supplied) and their "Tradelock" feature which will quickly navigate you home without the need to store "Waypoints". Haydon will be selling the GPS-III+ for £329 including VAT.

Also on their stand this November will be the Motorola TA-200 which, Mike says, is the very latest in licence-free handhelds and which is so easy to use "a child could show an adult..." he says.

Haydon's Christmas special on the Motorola at Picketts Lock will be £150 for a pair (including VAT).

Finally, they will also have the Q-Tek Triton antenna on show and for sale which is proving to be a very popular antenna - Haydon say they ran out of them on the second day of the Leicester Show! The antenna covers 50, 144 and 430MHz with four elements and has a boom length of only 1.13m with the longest element measuring only 2.96m in length. The Q-Tek Triton will be selling for £69.95 (including VAT).

Any further details can be obtained from Haydon Communications on Tel: (01708) 862524. FAX: (01708) 868441. Unit 1 Thurrock Commercial Park, Purfleet Industrial Estate, London Rd, Aveley, Essex RM15 4YA.

Web Watch
PM Components' Web site: www.pmcomponents.com
Nevada's Web site: www.nevada.co.uk
Vann Draper's Web site: www.vanndraper.co.uk
Waters & Stanton Web site: www.waters-and-stanton.co.uk
Complete MEC engineering catalogue: www.mec.dk
Antique Electronic Supply Web site: www.tubesandmore.com

RSGB Yearbook, £14.50 (including P&P on orders placed before Christmas Day).
Other new titles available from the PW Book Store include: Passport To World Band Radio 2000 which will cost only £15.50 (including P&P on orders placed before Christmas Day);

'News Extra' can be found on page 45...

Practical Wireless, December 1999
This month Ian Poole G3WYX considers the question: 'What Is A ... VMOS. FET'? Ian says that the vertical metal oxide silicon field effect transistor (v.m.o.s. f.e.t.) is widely used and here he explains why it's so popular...

Introduction, v.f.e.t.s have become firmly established as a useful radio frequency device.

Problems Overcome

The v.f.e.t. is able to overcome many of the problems that prevented f.e.t.s from being used in power applications. Their new structure enabled much higher powers to be handled than was previously possible with bipolar transistors of an equivalent size and cost. The reason for the great improvement lies in the structure of the device. To show the advantages of a v.m.o.s. device, a traditional m.o.s. device is shown in Fig. 1. Here it can be seen that the gate separates the drain and source. Current flows horizontally between the source and drain, controlled by the potential on the gate. As the current only flows through a relatively small area, resistance values can be high, reducing the efficiency of the device.

The v.f.e.t. uses a different structure as shown in Fig. 2. The main striking point about this device is the 'V'-groove structure as shown in Fig. 2. The gate consists of a metallised area over the 'V' groove and this controls the current flow in the p-region. As the gate is fabricated in this way it means that the device retains the exceptionally high input resistance typical of the m.o.s. family of devices.

Great Interest

The advantages provided by the v.m.o.s. f.e.t. make these devices of great interest to Radio Amateurs. Their high current handling capacity makes them very useful in r.f. driver and power amplifier stages. The structure also leads to very low values of internal capacitance. In particular, the gate drain feedback capacitance is very low. This makes them very stable when they are used at h.f. and even v.h.f., simplifying circuit design and construction. The fact that little stabilisation is required also improves their efficiency making them even more attractive.

The devices are very robust. Many bipolar designs are very sensitive to levels of v.s.w.r. But, although less sensitive in this respect, designs using v.f.e.t.s should still be treated with care, they are able to withstand much higher levels of reflected power. In some instances, levels of 20:1 may be tolerated without damage.

One problem encountered with many devices is that it's difficult to use them in parallel because one device tends to take all the power and becomes overloaded. This is not so with v.f.e.t. When their temperature rises they tend to turn off. This means that current can be shared between several devices without the need for external circuitry.

Finally, impedance matching is much easier than for many other devices. They present an almost constant input impedance regardless of the output conditions. This means that once the input circuit has been adjusted it can be left regardless of any adjustments made to the output.

Widest Use

The v.f.e.t. finds widespread use in amateur circuits. They are widely used as drivers in a number of transmitters and they are also very popular with QRP enthusiasts where they provide an ideal output device in a QRP transmitter. Here the cheap device is capable of providing a few watts of power, sufficient for making contact on the h.f. bands around Europe and further afield with a good antenna.

In another application, v.m.o.s. f.e.t.s can be put to good use in active antennas. One of the problems encountered in the design of these antennas is that, as they are untuned, the active device has to tolerate high signal levels whilst maintaining linearity. In this case, the high power handling capability of the v.f.e.t. makes them ideal for use and many circuits have been designed successfully using them in this application.

That's all for this month's 'What Is A? Next time I'll be back to tell you about Gallium Arsenide ... until then, why not visit my Web site.

http://website.lineone.net/-ian_poole

Practical Wireless, December 1999
**Antenna Range from MOONRAKER (UK) LTD.**

**Halo Loops**
- 2 metre (size 12" approx) £12
- 4 metre (Length 92"
- 6 metre (Length 126"

**6 metre (Boom 33') (70cm 8.4dBd) (Length 100')**

**70 ans (Length 26")**
- 2 metre (size 12" approx) £12
- 4 metre (Length 92"
- 6 metre (Length 126"

**70 cms (Boom 12')**
- 2 metre (size 12" approx) £12
- 4 metre (Length 92"
- 6 metre (Length 126"

**Hord Drawn**
- 2 metre (Size 20"
- 4 metre (Length 92"
- 6 metre (Length 126"

**6' Stand Off Bracket**
- (Complete with U Bolt) £6

**70 cms 8 4dBd (Length 100')**
- 2 metre (size 12" approx) £12
- 4 metre (Length 92"
- 6 metre (Length 126"

**2 metre (size 12" approx) £12**
- 4 metre (Length 92"
- 6 metre (Length 126"

**GSRV Wire Antenna**
- (10-40/80 metre)
  - **Full 2 Year Warranty on these Antennas**
  - All Gaming LANDS
  - One Special Kit: £22.95
  - Standard Hard Drawn £24.95
  - Flex W3ave £32.95
  - PVC Coated Flex W3ave £37.95

**Vertical Fibre Glass (GP) Base Antennas**

**SQ 6 8 M Range VX GP Linearly**
- Specially Designed Tubular Vertical Antenna individually tuned to within 0.05% (maximum power 100watts)

- **BM100 Dual-Boader** £29.95
  - (2 m 36#) (70cm 6.0dB) (Length 39"
- **SQBM100 Dual-Boader** £39.95
  - (4 m 56#) (70cm 5.6dB) (Length 39"
- **SM200 Dual-Boader** £29.95
  - (2 m 35#) (70cm 5.6dB) (Length 67"
- **BM200 Dual-Boader** £39.95
  - (4 m 56#) (70cm 5.6dB) (Length 47"

**Mounting Hardware**
- **ALL GALVANISED**
  - 6' 5 Element Bracket £6.95
  - 8' 8 Element Bracket £9.95

**Special**
- **9YGI Beams**
  - **Suits receivers & transceivers**
  - **ASL5 Kit plus HA5OR hardware**: £29.80

**Yagi Beams**
- **All Enamelled Stainless Steel**
- 2 metre 4 Element (Boom 48") (Gain 7.6dB) £19.95
- 2 metre 5 Element (Boom 62") (Gain 10.5dB) £34.95
- 2 metre 8 Element (Boom 156") (Gain 13.5dB) £56.95
- 2 metre 11 Element (Boom 190") (Gain 16.0dB) £75.95

**Flex Weave**
- **Hord Drawn** £27.95

**Crossed Yagi Beams**
- **All Enamelled Stainless Steel**
- 2 metre 5 Element (Boom 54") (Gain 7.6dB) £44.95
- 2 metre 8 Element (Boom 126") (Gain 11.6dB) £84.95
- 70 cms 13 Element (Boom 2") (Gain 12.5dB) £54.95

**2: Special Yagi Beams**
- **All Enamelled Stainless Steel**
- 2 metre 5 Element (Boom 38") (Gain 9.5dB) £31.95
- 2 metre 7 Element (Boom 60") (Gain 12.5dB) £39.95
- 70 cms 7 Element (Boom 2") (Gain 11.5dB) £24.95
- 70 cms 12 Element (Boom 4") (Gain 14.5dB) £39.95

**Suits receivers & transceivers**
- **ASL5 Kit plus HA5OR hardware**: £29.80

**Audio Filter**
- £29.80
  - *Clean up your reception*
  - *Reduce noise and interference*
  - *Sharp SSB / Speech filter with faster rol-off than IF*
  - *Simply connects between radio and external loudspeaker or headphone*
  - *Suits receivers & transmitters* **ASL5 Kit plus HA5OR hardware**: £29.80

**ACCESSORY KITS**
- **AA2** Active Antenna 1.5kHz to 30MHz £8.90
- **AA4** 25 to 150MHz Active Antenna £19.90
- **ARIB 11** 110 to 137MHz Active Antenna £18.90
- **ARIB 16** 50 to 500MHz SW Receiver £29.90
- **CLS 60/180TV & IF Filter for our kit £16.00**
- **DC8** “3 Meter” for direct conversion RX £19.90
- **DB2** Counter Buffer (fits to Rx to feed DT105) £5.90

**Suits receivers & transmitters** **ASL5 Kit plus HA5OR hardware**: £29.80

**Top Value Receiving ATUs**
- **CTUB**: covers 500kHz to 30MHz, efficient, flexible “I match” circuit, 50/299 sockets. Improve antenna performance! Factory Unit £49.90. Kit (including case and all hardware): £29.90.
- **CTUB**: covers 500kHz to 30MHz, efficient, flexible “I match” circuit, 50/299 sockets. Improve antenna performance! Factory Unit £49.90. Kit (including case and all hardware): £29.90.

Please add £4.00 P&P, or £1.50 P&P for electronics kits without hardware.

**HOWES KITS**
- Contains good quality printed circuit boards with screen printed parts locations, full clear instructions and 2 boiler mounted components. Suitable, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets, or you can browse this information on our Internet Website (URL at top), UK delivery is normally within seven days.

From Dave G4KGR, Technical Manager.

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**Practical Wireless, December 1999**
Welcome to the 1999 Competition results article. Without exception the PW & Kenwood UK Club Spotlight Magazine Competition judging panel - Dave Wilkins G5HY, David Barlow G3PLE (whose original idea started the competition) Jim Bacon G5YLA, Tex Swann G1TEX, Jamie Donaghy M0CLI and myself thought that the standard of entries was very high indeed. Well done everybody!

With seven 'National' entries, striving to win the Bert Newman G2FIX Memorial Trophy ('Bert's Bell') and 13 'Local' category entries, aiming to win the magnificent Spotlight trophy, the annual competition is thriving. The judges were particularly pleased to have a good number of 'National' entrants - and we welcomed that from the Irish Radio Transmitter's Society (IRIS) for the first time and plus the interest the panel have in our hobby and the entrants - and we welcomed that from The Irish Radio Transmitter's Society (IRIS) for the first time and particularly pleased to have a good number of 'National' entrants - and we welcomed that from The Irish Radio Transmitter's Society (IRIS) for the first time and particularly pleased to have a good number of 'National' entrants - and we welcomed that from The Irish Radio Transmitter's Society (IRIS) for the first time and particularly pleased to have a good number of 'National' entrants - and we welcomed that from The Irish Radio Transmitter's Society (IRIS) for the first time and particularly pleased to have a good number of 'National' entrants.

Without exception - and there were some truly excellent magazines entered this year - the standard was very good indeed and I would like everyone to realise that this also included entries from truly 'one man' hand-produced magazines. So, whatever you think about your 'sole' produced magazine... don't think it won't stand a chance of winning a prize!

Reluctant To Enter?

Occasionally I'm approached by club magazine Editors who have been reluctant to enter because "Our magazine is only produced on a photocopier and there's only one person compiling it each time". In reply, I encourage them to enter and explain what the adjudication panel is looking for.

The adjudicators aren't just looking for 'glossy' magazines - professionally produced and 'fancy polished'. No, with their expertise the panel of judges know that 'fancy wrapping' could hide a disappointing surprise inside. I can say this because we all know that it is possible to unwrap a delightful looking chocolate from its wrapper... only to find we don't like the flavour when we eat it!

So, we look further and more carefully into what's on offer from each entrant because the most ordinary looking publication can turn out to be an excellent magazine. This is why all magazines that are entered into the competition stand a good chance of winning - even though they may lack the gloss of some of the other entrants.

As the competition becomes a regular annual event for those that enter, it's very pleasing indeed for the judges to see that some of the comments and suggestions from the previous year's competition have been 'taken on board' by the Editor of the magazine involved. And to highlight this, I'm pleased to share with you an encounter I had with one of the 1999 'National' category entrants, when he approached me at this year's 'Leicester' Show at Castle Donington.

The magazine Editor involved had received the letter I'd sent out to all the entrants, informing them that had won and the number of points that had been awarded to the individual entrants. He approached me and expressed surprise that "My magazine has done so well this year, especially after I've seen a copy of the winner's magazine".

We managed quite a long chat together and I was delighted to learn that he'd been to see this year's winner of the 'National' category. However, I pointed out that the adjudication panel had seen graphic evidence of his (the Editor's) efforts to improve the use of various typefaces and not to have the main body text in 'bold' (this had been commented on by all the judges last year). The Editor had then taken this on board and the result this year was a magazine that was easier to read and much more pleasing to the eye. That's why his magazine had achieved good results this year against an ever-improving standard of entry.

Assessing The Entries

I think it's now time to explain just what the judges are aiming to do in assessing the entries, which we try to make as fair as possible. In doing this, I hope I'm answering some of the occasional questions which come my way.

Fig. 1: Hilda Rusbridge, Sister of the late G2FIX (accompanied by her daughter Vicky and Son-in-Law Gerry who made the trophy) presenting the 'Bert Newman G2FIX Memorial Trophy ('Bert's Bell') to members of the Remote Imaging Group, the 1999 National Category winners at the 'Leicester' Show at Donington Park on Saturday 25th of September.

In the evaluation process, each judge will read the accompanying 'covering' letter which has to be provided by each entrant. This, in accordance with the rules, asks the entrant to state what category the club is entering under, what the club is, how many people are involved in producing the magazine, how it's printed, published and distributed and how many copies are involved.

Additionally, we ask the entrant to inform us what - if any - sponsorship is involved with their magazine, this gives the judges a good idea of what money is available for producing the magazine... an important pointer when comparing one magazine against another. Again, this criteria is why it's possible for any magazine entering the competition to stand a good chance of winning on overall merit rather than just overall spending!

Incidentally, the 'covering letter' tends to be a fascinating read! And when reading them it's surprising to see (even with the magazines produced by the larger clubs) how many are 'one man band' production teams!

All the judges are either active in the Amateur Radio 'Club Scene' or have had extensive experience of clubs in the past. Several - including myself - have also been Editors of club magazines themselves. This experience, plus the interest the panel have in our hobby and the

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journalistic aspects of Amateur Radio, is then used to evaluate each individual entry.

Obviously, each judge has their own likes and dislikes and a ‘feel’ for certain articles and style. This will be clearly indicated by each judge’s personal comments (the comments from each adjudicator are clearly attributable to the individual) on the adjudication result sheets which are sent to each entrant after the magazine carrying the competition results has ‘gone to press’.

Without fear of giving anything away and influencing next year’s entrants - I can tell you that (obviously) PW reflects my own ‘style’ and interests in the hobby itself. As Editor of PW it’s impossible not to influence a magazine that’s been part of your life for so long without having some effect!

In rounding off this section of the results article I would like to remind everyone entering the 2000 contest to remember this: Do not produce a magazine with the sole intention to enter the contest! Instead we ask you to enter a magazine that’s been produced for your club members by your best efforts. By doing so you’ll be creating something very special and it will be a publication that reflects your club, and its activities in the best light possible. And if you do win one of the categories of the PW & Kenwood Club Spotlight Competition - it will just add a little more polish to your own trophy - your club magazine itself!

Finally, to emphasise the wonderfully friendly atmosphere which has grown around the competition, I must mention the spirit of co-operation that is developing between the various club magazine Editors. This has been clearly demonstrated by individual Editors writing to the winners of the two categories to ask for copies of the magazines involved.

I’m pleased to say that it’s a good indication of the nature of the people involved that the requests have been answered by friendly and immediate responses. Actions like this make me feel proud and give me much hope for the continuing success of our hobby in the future!

National Category

As mentioned earlier in this article, there were seven entries in the ‘National’ Category this year and the standard was exceptionally high. The adjudicators, as previously mentioned were delighted to receive an entry from the Irish Radio Transmitters Society (IRTS) the National Society for the Republic of Ireland, along with entries from the British Amateur Television Club (BUTC), the Royal Air Force Amateur Radio Society (RAFARS), the British Amateur Radio Teledata Group (BARTG), the Radio Amateur Invalid & Blind Club (RAIBC), the Remote Imaging Group (RIG) and finally, last but not least - the Royal Signals Amateur Radio Society (RSARS).

For the ‘National’ category only, I took the decision to award marks out of 60 instead of 50 as in previous years so the panel of judges could include both PW’s Tex Swann GITEX and the Salisbury Club’s Secretary Jamie Donaghy MOCLI. This was because, in previous competitions, Tex has ‘stepped down’ to allow the ‘guest’ judge (for the ‘National’ category only) from the Salisbury Club to take his place.

The Salisbury Club provide a ‘Guest’ adjudicator as part of the continuing remembrance of Bert Newman G2FIX. Bert - a great character - was a famous campanologist (Bell Ringer) and it seems very appropriate that his family provided the bell-shaped trophy. It was also made by his niece’s husband! We were also pleased to have an entry to the competition from RAFARS - for whom Bert G2FIX often acted as their ‘Net’ controller on 3.5MHz.

National Winners

The outright winners this year in the ‘National’ category were the Remote Imaging Group whose superb RIG Journal attained a magnificent 59 points out of a maximum of 60. With the majority of its members being active Radio Amateurs, the RIG group caters for the specialist reception of remotely taken images (hence the name), particularly from satellites.

The comments taken from the adjudication sheets make interesting reading!

Jamie Donaghy MOCLI’s comments on the A5 sized magazine (which has a full-colour stiff cover) were: "Tremendous production, cannot fault it in anyway. Hard to believe its an amateur effort as it engenders quality and professionalism from cover-to-cover". Score 10 out of 10.

Dave Wilkins G5HY (who commented that he's an ex-member of RIG) said: "A superb national magazine, very professional in every way. This might make me renew my subscription". Score 10 out of 10.

David Barlow G5PLE commented: "Read all through cover-to-cover, joined RIG (since). Superb production - fantastic value for money for members. I nearly stole the copies - but thought that perhaps the other judges ought to see them". Score 10 out of 10.

Jim Bacon G3YLA said: "What a great journal! Alright, I'm a bit biased on the subject matter, but this is very professionally produced magazine, both editorially speaking and in production. Very well done!" Score 10 out of 10.

Tex Swann GITEX said: "Excellent feel of quality production with full page colour pictures but full width columns making it a harder to read magazine. Full of information for those interested in this specialist subject. Good Technical read". Score 9 out of 10.

My own comments were: "Even bearing in mind that this is a professionally printed publication - the ethos of a 'club journal' is still there. Even the best printed journal can be badly let down by poor editorial - this is not! Well done RIG! Score 10 out of 10.

Traditionally the Remote Imaging Group have attended the ‘Leicester’ show for many years - and I’ve always enjoyed visiting their stand at the old Granby Halls site in Leicester which, although in the same hall as the PW stand, was located in a far corner away from us. However, at the Donington Show, RIG were very close to our new stand and it was easy to arrange things for the presentation to take place. (See Fig. 1).

The presentation took place on Saturday 25 of September and, once again, ’Bert’s Bell’ was presented to the winners by Hilda Rusbridge, sister of the late Bert G2FIX. However, this year although the younger element of the ‘Newman’ clan weren’t able to come - I’m pleased to report that Vicky Amos (Bert’s Niece) and her husband Gerry (who made the trophy) were both there to see the trophy presented.

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Incidentally, last year's winner - the Belenus QRP Club - very kindly presented Hilda with yet another beautiful Edam cheese straight from Holland courtesy of Robert van der Zaal PA9RZ. So, everyone went home happily!

Other Comments

It seems appropriate to include some comments on the other entrants' magazines for the benefit of readers (however, all entrants will see their adjudication sheets).

David GS3PLE said (of the IRTS Newsletter) "How nice to see photographs of the EI calls I have worked many times - good news value - deserves encouragement and like myself the Editor has Multiple Sclerosis, so I appreciate his difficulties".

Jaimie MOCLI commented (on the BATC CQTV magazine) "Excellent in every way, let down by 'clip art' - but still up there with the best of them for content and overall presentation, adoption of an A4 format a big improvement."

Commenting on the Royal Air Force Amateur Radio Society Society magazine (excellent "DARS with 33.5 points.

"...on behalf of all the Judges. I thank you for your efforts in 1999 and look forward to 'uncorking' your entries for 2000. Good luck everyone"!

At-A-Glance National Category 1999

Points out of a possible 60

Winners: Remote Imaging Group (RIG Journall 59 points

Second: The British Amateur TV Club (CO TV) with 54 points

Joint Third: The Irish Radio Transmitters' Society (IRTS) Newsletter and the Royal Signals ARS Mercury (both with 52.5 points)

Followed by (in order of points scored):

51.5 points: Belenus QRP Club
50 points: Royal Air Force ARS
49.5 points: British Amateur Radio Teddington Group
48.5 points: The Radio Amateur Invalid & Blind Club

Pursuit Hotting Up!

When I read through the adjudication panel's comments I could clearly see the pursuit is 'hotting up' and Crownstalk may have a run for its money next year. So, let's look at the comments from the adjudicators:

Commenting on the Cockenzie & Port Seton entry (42.5 points) GS3PLE said "Full of news, some very good lay-out touches". On the Crowcastle ARC entry (42 points) GS3PLE said "With some adjustment this could be a winner". And on the Worthing & DARCS entry (also with 42 points) I said "What a wonderful 'one man' effort - even prints his own front covers"

Cray Valley ARC's entry (39.5 points) got "A nicely 'balanced' newsletter' comments from GS3YLA. While Oldham ARC's entry (39 points) received "Clear lay-out and good mix of contents" from GS3YLA. Echelford ARS's entry (36 points) drew comments including "Information on front and back pages excellent, good original articles" from G1TEX. The Bromsgrove & DARCS entry (38.5 points) attracted praise from GS3YLA who said "A nice clear newsletter - nice to find a list of members and content details". On the Otley ARS (West Yorkshire) entry (36.5 points) I commented "This magazine is coming in leaps and bounds. Don't change it Editor! We keep polishing". Reporting on the East Yorkshire (formerly North Ferriby) ARS (36.5 points) GS3YLA said "I like the 'club' atmosphere of this newsletter. It has some nice uses of colour/graphics - just enough."

Warrington ARC's entry (35 points) drew comments including "A very accomplished newsletter...with a wide range of interesting articles..." from GS3YLA. On the South Dorset ARS entry (34 points) I said "A friendly, informal and informative little one man' effort. Well done Editor".

Finally, with 33.5 points, comes the Farnborough & DARCS (Hampshire) entry. And although it earned the lowest score - bearing in mind it is a very new magazine, I think I must end up (to encourage all entries with comments from all the adjudicators).

"Well printed and neat" (GS3YH), "Well printed, deserves support from members" (GS3YLA), "New product with potential" (GS3PLE), from myself "A 'rusty' and promising youngster - what a wonderful effort from the Editor". And finally, from G1TEX (obviously a wine connoisseur) comes "A young' magazine - but showing a good range of articles ... at an 'early stage' of development. Will improve with age and will be high in the rankings next year".

With Tex's words of encouragement ringing in my ears (and 'fizzing' in the wine glass!) on behalf of all the Judges I thank you for your efforts in 1999 and look forward to 'uncorking' your entries for 2000. Good luck everyone!

At-A-Glance Local Category 1999

Points out of a possible 50

Winners: Crowborough & District ARC Crowcastle with 43.5 points

Second: Cockenzie & Port Seton Newsletter with 42.5 points

Joint Third: Colchester Radio Amateurs and the Worthing & District ARC with 42 points

Followed by (in order of points scored):

Cray Valley ARS with 39.5 points. Oldham ARC with 39 points, followed by the Echelford ARS and also the Bromsgrove & DARCS, both with 38.5 points. Then came Otley ARS together with East Yorkshire (formerly North Ferriby) both earning 36.5 points. Next came Warrington ARS with 36 points, South Dorset ARS with 34 points and Farnborough [Harmonic] & DARCS with 33.5 points.
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In Part 2 of 'Get Going On Microwaves', I took a look at the development of Amateur Radio microwave equipment in the UK and I described the two fundamental ways of assembling components at these frequencies. One method is to build sub-assemblies in, or around the waveguide section and then bolt these together to form a complete r.f. system. I mentioned that, as the physical size of waveguide is related to frequency, this method of construction is usually only to be found on the 10, 24 and 47GHz bands.

The other technique is to dispense totally with waveguide components and to build everything on a printed circuit board (p.c.b.) either as r.f. sub-assemblies or as a complete package. This method is very popular and it’s now possible to buy ready-made assemblies or as a complete package. This method is also used on the h.f. or v.h.f. converter that is often used on the 144MHz band (c.w./f.m./s.s.b.). One method is to provide a second switchable crystal thus allowing the transverter to be used additionally for repeater or satellite operation, but not both.

Amateur TV

There has recently been a large increase in the number of stations becoming active in Amateur TV (TV) communications on the 1.3GHz and other microwave bands. Limited allocations on the 430MHz band has resulted in many operators moving up to higher frequencies in search of wider bandwidths.

Most of the amateur video transmissions are transmitted in colour using frequency modulation (f.m.) with an associated sound sub-carrier (s.s.c.). normally 6MHz above the video carrier frequency. However, you can’t use a 1.3GHz transceiver to transmit ATV as the source of between 1.14-146MHz.

In the example shown, a stable crystal controlled local oscillator (l.o.) source at 1152MHz is mixed on the transmit path with an intermediate frequency (i.f.) signal from a 144MHz transceiver. The resultant output, at 1296MHz, is then amplified before being passed to the antenna. Similarly, the receive signal, at 1296MHz, is amplified in a low noise amplifier (l.n.a.) and then mixed with the l.o. signal to produce the 144MHz i.f. signal which is then passed to the driving transceiver for demodulation.

Transverters are fully linear, so whatever mode your driving transceiver uses (c.w./f.m./s.s.b.), it will also be available on the 1.3GHz band. In common with transverters for other bands, the output frequency range is normally arranged to cover only the narrow band c.w. and s.s.b. sections of the band. Therefore, a transverter for the 1.3GHz band will usually have an output between 1296-1298MHz, corresponding to a driving source of between 144-146MHz.

However, in the UK, the 1.3GHz band is some 85MHz wide and also supports communications for repeaters, satellites, Packet radio, other digital modes and ATV. Some manufacturers have recognised this fact and provide a second switchable crystal thus allowing the transverter to be used additionally for repeater or satellite operation, but not both.

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Amateur TV

There has recently been a large increase in the number of stations becoming active in Amateur TV (TV) communications on the 1.3GHz and other microwave bands. Limited allocations on the 430MHz band has resulted in many operators moving up to higher frequencies in search of wider bandwidths.

Most of the amateur video transmissions are transmitted in colour using frequency modulation (f.m.) with an associated sound sub-carrier (s.s.c.). normally 6MHz above the video carrier frequency. However, you can’t use a 1.3GHz transceiver to transmit ATV as the source of between 1.14-146MHz.

In the example shown, a stable crystal controlled local oscillator (l.o.) source at 1152MHz is mixed on the transmit path with an intermediate frequency (i.f.) signal from a 144MHz transceiver. The resultant output, at 1296MHz, is then amplified before being passed to the antenna. Similarly, the receive signal, at 1296MHz, is amplified in a low noise amplifier (l.n.a.) and then mixed with the l.o. signal to produce the 144MHz i.f. signal which is then passed to the driving transceiver for demodulation.

Transverters are fully linear, so whatever mode your driving transceiver uses (c.w./f.m./s.s.b.), it will also be available on the 1.3GHz band. In common with transverters for other bands, the output frequency range is normally arranged to cover only the narrow band c.w. and s.s.b. sections of the band. Therefore, a transverter for the 1.3GHz band will usually have an output between 1296-1298MHz, corresponding to a driving source of between 144-146MHz.

However, in the UK, the 1.3GHz band is some 85MHz wide and also supports communications for repeaters, satellites, Packet radio, other digital modes and ATV. Some manufacturers have recognised this fact and provide a second switchable crystal thus allowing the transverter to be used additionally for repeater or satellite operation, but not both.
Specifically for audio frequencies.

In practice, ATV colour transmissions require a dedicated transmitter with a video modulator bandwidth of 10MHz or more. Because of the wider bandwidths involved with ATV, the received signal needs to be quite strong for perfect copy. This is very similar to the effect noticed between an f.m. telephony signal and a narrower s.s.b. signal.

At the frequencies involved with 1.3GHz, it's difficult to generalise about distances that can be achieved but under normal conditions, with a few watts and a beam antenna, you'll probably contact stations around 30-50km away. To overcome this limitation, a number of ATV repeaters have been installed at elevated locations throughout the country.

In October 1999 there were 26 such units licensed for the 1.3GHz band in the UK. The principle is the same as the voice repeaters that you find on the 144MHz band with the exception that, instead of a 600kHz repeater shift, it's a whopping 60MHz.

One advantage of this wide frequency spacing is that you can monitor your signal whilst transmitting through the repeater. Transmitters, because of their wide bandwidth requirements, need to be specifically designed for television use. They can be obtained either as a ready made unit or as a kit from specialist sources, details of which I will give you next month. You can build your own modulator/transmitter from component parts but I would not recommend this if you are inexperienced in either TV or microwave techniques.

**Satellite Receivers**

The constraints for receivers are very similar to those for transmitters except here you have one more option to consider. Surplus set-top satellite receivers can be modified and will provide a very low cost introduction to ATV reception on the 1.3GHz band. Although you won't need the dish antenna or low noise block (l.n.b.) down converter these units will be worth keeping for future experiments on the 10GHz band.

Satellite receivers tune over the frequency range 750-1750MHz - and thus cover all the UK allocated ATV sub-bands which lie between 1243-1325MHz. In theory, all you need to do is connect an antenna to the satellite receiver and then tune it to the appropriate frequency. The unit will then provide i.f. amplification and demodulation of the local ATV signal.

But please don't rush off and plug an antenna into your satellite receiver as you'll only damage it! Most receivers are designed to power the external l.n.b. with a d.c. voltage (+17V) up the coaxial cable. Unless you wish to power an external pre-amplifier (recommended) via the coaxial cable, this voltage needs to be internally disconnected or an adapter called a 'd.c. block' fitted in series with the cable.

The overall sensitivity of a domestic satellite set-up is actually determined by the performance of the l.n.b. located at the front-end of the system. The set-top box can actually be quite insensitive and possess a poor noise figure without any significant loss of overall system performance. You will need to increase its sensitivity by placing a 1.3GHz low-noise amplifier ahead of the receiver.

One other point to note is that the deviation of ATV transmissions is about half that used for direct-to-home (d.t.h.) satellite carriers. One consequence, therefore, of using a satellite receiver to pick up ATV signals, is that the level of the demodulated video will be lower. This is the same effect you get when receiving a reduced deviation (12.5kHz channeling) f.m. telephony signal in the old 25kHz system. To compensate for this you only need to turn up the audio gain. Similarly, when using a satellite receiver you turn up the video gain control.

Both systems are prone to adjacent channel interference though because of the unnecessary use of a wider bandwidth. Because of this no satellite receiver can ever be as good as a receiver designed specifically for ATV.

One option I would recommend is that you try to obtain a surplus professional receiver, sometimes known as an integrated receiver decoder (i.r.d.). Many have a facility to switch off the l.n.b. voltage and also provide a selection of video bandwidths and audio sub-carrier frequencies. Having said that, many operators DO use domestic satellite receivers and they really are an inexpensive way to get started on microwaves.

**Forgotten Bands?**

Now I'll take a brief look at systems available for the 2.3GHz, 3.4GHz and 5.7GHz bands. These are the 'forgotten bands' and, although activity is relatively low, there are now a number of UK amateurs developing equipment for both terrestrial and satellite communications.

Apart from the Icom IC-970, which has an optional unit for the 2.4GHz band, I'm not aware of any commercial transceiver available at these frequencies. The only units I know of are narrow band transverters available either as a complete module or in kit form from specialist s.h.f. suppliers.

There is also, if you know where to find it, surplus terrestrial and satellite communication equipment which can form the basis of a microwave transmitter or receiver. One such module is the Drake 2880 microwave down converter designed for TV distribution service in the band 2400-2700MHz.

The Drake 2880 unit is ideal for use as a 2.4GHz receiver front end for the amateur satellite service. It is very compact, easily modified and can be located at the antenna (Yagi or dish) to receive various amateur satellites including Phase 3D when it gets launched.

Incidentally, I made mention of these brand new, but surplus, down converters in my 'VHF Report' column some time last year. However, as with all things surplus, the source eventually dries up, so please don't ask me...
where you can get one! On this theme it's worth keeping a look out for surplus satellite communication equipment.

One point to note, though, is that the fixed satellite service (at C-band) has a down-link (receive) allocation around 4GHz and an up-link (transmit) allocation around 6GHz. Using surplus equipment it's quite easy to make a sensitive 3.4GHz receiver and a high power 5.7GHz transmitter but not the matching transmitter or receiver.

The 10GHz Band

Now I'll take a look at the 10GHz band. This is probably the most popular of all the microwave bands. Indeed, it's quite likely that there are more UK operators on this band than all the other microwave allocations put together. Because of this there is an abundance of ready made transverters, kits and surplus equipment that can get you going on the band.

One of the simplest ways to get going on the 10GHz band, and I really do mean simple, is to use a Doppler radar surveillance unit commonly found inside burglar or intruder alarms. One such unit is the Solfan module and these can be obtained at radio rallies, flea markets or from various electronic dealers and traders.

The module already operates on, or near, the 10GHz band and usually comes complete with its own antenna, a small horn. Surplus units cost about £15 and with the addition of a simple modulator board (£15 or less) you can make a system capable of transmitting and receiving both video and audio signals.

The diagram, Fig. 2 shows a typical set-up using the Solfan module. The heart of this transmitter/receiver is the in-line doppler module. (You can also find surplus Solfan module. The heart of this transmitter/receiver is a 10mW Gunn diode and a mixer diode separated by an isolating iris plate mounted within the waveguide cavity.

I described the principle of this type of transmitter/receiver last time (Part 2) but it's worth mentioning again. With one station transmitting on 10.100GHz and the other station transmitting on 10.200MHz, the receiver i.f. frequency for both stations will be the difference, which in this case will be 100MHz. This can be picked up on a standard f.m. broadcast radio or a scanner set to wide band f.m. mode. In general terms you can choose the i.f. frequency to be anything you like but it's best to keep the i.f. frequency somewhere between 10-100MHz.

Earlier on in the article, I mentioned the possibility of using a surplus satellite dish antenna and l.n.b. to receive ATV and f.m. telephony signals on the 10GHz band. There are a variety of low noise block down converters but ones capable of receiving from the Astra series of satellites will typically cover the range 10.95-11.75GHz.

To receive signals in the 10GHz amateur band it is necessary to lower the I.o. frequency of the l.n.b. by approximately 800MHz. This can be achieved by changing the dielectric resonator or 'puck' inside the unit.

Another possibility is to buy the latest generation l.n.b. which has a l.o. frequency of 9.75GHz. Then by using a 500MHz frequency shifter (such as the ADX unit) it is possible to tune the 10GHz band on your satellite receiver. If you don't want any of this complication you can obtain an l.n.b. from specialist sources that has already been converted for use on the 10GHz band.

Surprisingly, perhaps, it is also possible to convert a surplus l.n.b. into a low-power transmitter. Although the output may be no more than 15mW this will be sufficient for local contacts.

Directional Antennas

For the lower microwave bands, 1.3GHz and 2.3GHz, a directional antenna such as a Yagi is most acceptable. These can either be with straight elements or a loop Yagi with circular elements. If an omni-directional antenna is required, this could be a simple whip for vertical polarisation or an Alford Slot for horizontal polarisation.

On higher frequencies, from 3.4GHz and up, a dish antenna becomes more practical. This can be a conventional centre-fed (prime focus) parabolic dish or an off-set fed satellite dish. As you move up in frequency for any given size of dish the beamwidth progressively becomes more narrow. If you choose too large a dish at s.h.f. it will be impractical to line up on other stations.

For use on the 10GHz band, a dish of between 300-600mm in diameter will be easy to manage, 450mm being a good compromise. At 24 and 47GHz you may only need a dish around 300mm in diameter.

Coaxial Feeder

At v.h.f. and u.h.f. frequencies it is conventional practice to locate all equipment in the shack and connect it to the antenna via coaxial feeder. On the microwave bands this may not be acceptable, due to the high attenuation of cable at these frequencies. One alternative is to mount the receive pre-amplifier, transmit amplifier and switching system right at the antenna to keep losses to a minimum.

Another method is to use two antennas, one for receive with an integral pre-amplifier and the other for transmit with a co-located amplifier. This saves on providing an expensive coaxial transmit/receive relay. It may also give you a better system performance when using modes such ATV repeaters where the input (transmit) frequency is at 1248MHz and the output (receive) frequency is 60MHz higher at 1308MHz.

However, even this method may not be entirely satisfactory and it might be necessary to mount everything at mast-head. Many microwave operators do just that but you do need to ensure you have a waterproof box and possibly have some method of maintaining the electronics at a reasonably constant temperature.

If you use a transverter in this configuration then you only need to run one coaxial cable up the mast to provide a feed for the i.f. drive. You'll also need to provide a cable for the d.c. supply and switchover (p.t.t.) arrangement.

73 David G4ASR

Practical Wireless, December 1999
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The RD500VX is a new kind of wideband receiver with sleek, robust styling, ...only 8 inches wide!

It's massive memory can store information equivalent to several scanning directory books. Any word such as "Fire," "Air," "Voice Of America," or even your local town can be searched for. It can hold 54,682 entries, each with 20 characters of text, mode, and frequency. A 45 key TV style remote is provided for text entry and control, and a PC keyboard can be plugged into the receiver. ...No more thumbing through scanning directories, and no PC needed!

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Now that we’ve built the beginnings of a set of really basic test equipment ‘tools’, Rob Mannion G3XFD suggests some ideas for a suitable workbench. And he’s got some really ‘practical’ ideas for those really dark days of Winter!

Now that we’ve built the ‘basic’ items of simple test equipment, I think it’s a good idea to think about a suitable bench to work on. The idea for this edition of ‘Radio Basics’ has come from two sources: readers (particularly students living away from home) asking for advice and the fact that my own office/workshop is no longer available as I’m preparing to move into a new home very soon.

It’s gratifying indeed to hear from so many new readers – especially those who are still at school or college. Despite this however, it’s rather unfortunate that I, with my experience and enthusiasm for the ‘Radio Basics’ series, have forgotten the difficulties faced by the newcomer to the hobby – especially if they’ve not got the full understanding of fellow students and landlords, parents, partners or pocket-money (or student’s allowance) purse-string holders!

### Portable Bench Design

During the ‘Leicester’ Show at Donington, and recent visits to the Hull and East Yorkshire Clubs where I talked to readers and Novice Instructors, I’ve realised that the “where can we carry on our hobby” question is often left unanswered. The problems suffered by others was brought into sharp focus recently when my own office, equipment and most of my large quantity of “stores” collected over many years was packed away, awaiting my move to a smaller, more manageable house.

I was then left with a problem, especially as I still had the practical prototype projects to build for ‘Radio Basics’. Fortunately, I remembered the excellent portable ‘A Table Top Project Bench’ written by Vic Flowers G8QM and published in the December 1992 issue of PW.

I built two of Vic’s designs to be used by the members of the school radio club I was then organising. A further 20 or so were then built by the boys in their carpentry lessons!

The diagram, Fig. 1 (reproduced from the original article) which, together with Fig. 2, provides an excellent idea of what can be done. And even if you don’t want to strictly follow G8QM’s design* - it will give you many ideas of your own.

*As we’ve sold out of the December 1992 magazines, I’ve asked the PW Book Service to provide photocopies of the article (which gives full constructional information) and

There are available for £2 including P&P. Please ask for the ‘Radio Basics’ ‘Table-Top Bench’ Reprint.

### Latest Version

Bearing in mind that I’m unlikely to be into my new home and ‘set up’ much before February of 2000, I’m incorporating some new ideas into my latest version of the G8QM bench. The whole unit’s power supply - lighting and everything else - is to be provided by (in my case) a Watson 20A standard 13.8V power supply rather than direct from the mains.

By adopting the 12V d.c. power supply approach I can make the portable bench much more versatile. For example - I’ll be able to take it in the back of my car and along with my portable tool box I’ll have a real ‘field day’ emergency repair facility.

Along with the small 12V high intensity incandescent lighting available from two sources: readers (particularly students living away from home) asking for advice and the fact that my own office/workshop is no longer available as I’m preparing to move into a new home very soon. It’s gratifying indeed to hear from so many new readers – especially those who are still at school or college. Despite this however, it’s rather unfortunate that I, with my experience and enthusiasm for the ‘Radio Basics’ series, have forgotten the difficulties faced by the newcomer to the hobby – especially if they’ve not got the full understanding of fellow students and landlords, parents, partners or pocket-money (or student’s allowance) purse-string holders!

### Tool Box Storage

Once you’ve got a portable table-top work bench which, incidentally, I’ve used in conjunction with a Black & Decker ‘Workmate’ (remove the workbench from the top of the ‘Workmate’ and you’ll immediately get somewhere to saw and prepare printed circuit board material, etc.) you need to consider storage.

In recent years there’s been a veritable explosion in the availability of strong storage boxes. My wife Carol suggested I buy some of the (meant for groceries of course!) very reasonably priced plastic boxes with lids and handles from Sainsburys. I did, and they’re excellent for radio components. I also bought one of the very large ‘multistack’ type of tool-boxes with carrying handles and small wheels (when packed up and ready for transport with their ‘shopping trolley’ folding handles they almost look like the modern suitcases with wheels, so familiarly seen at airports). Even so, they’re light enough for me to carry up the stairs to my office.

The multiple trays and (very) large storage boxes provide more than enough storage and if I ever need to bring the box into the PW office to complete a project - everything is to hand.

So, in rounding off the final ‘Radio Basics’ for 1999 I suggest that you (even if you don’t have storage problems … they’ll still be immensely useful) treat yourself with several storage boxes. Then, either point the family at Halfords, or any of the large DIY stores or motor car accessory shops as suitable sources of Christmas presents. Radio enthusiasts need not be difficult people to buy Christmas presents for – especially when they’re needs are known! Cheerio for now and carry on enjoying the hobby!
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Practical Wireless, December 1999
THE PW PERSONAL ORDER FORM

Roger Hall G4TNT - PW's Advertising Manager - describes how we’re launching the PW Personal Order Form service to help readers buy with extra confidence from advertisements in this magazine.

Many readers will have noticed how the battle for their custom has become more intense as the popularity of the hobby has declined. Fewer amateurs buying less equipment means there are now some great deals to be had but it also means that some dealers may try to cut corners when it comes to honouring their commitments. Also, as the real cost of Amateur Radio equipment has fallen and the competition for your custom has increased, some of the smaller shops have either gone out of business or been swallowed up by the bigger companies. In some areas, it’s almost impossible to find a local shop and now the trend is towards mail order purchasing.

This, in itself, is not a bad thing but it does mean you’ll probably be buying from a shop you’ve never visited and from a salesperson you’ve never met. So, how do you know who to trust with your money? You could go on air and ask about the dealer you’re thinking about buying from, but the risk is that there may be one or two vociferous individuals who will be happy to tell the world about their grievances while the majority of satisfied customers just keep quiet. The same is true of the Internet. The various radio related newsgroups are a good place to ask but, again, you may not get a representative (or honest) selection of answers.

The truth is, there is no real way of telling beforehand how your transaction will be handled, how well the equipment will perform or whether it will go wrong. All you can do is to take reasonable precautions before you buy and know what to do if the worst happens. This is where we aim to help. First of all, take a look at the Top Ten Tips in the Buyer’s Guide box. If you follow those guidelines before you buy, you’ll have minimised the chance of something unforeseen cropping up and you’ll be prepared should the worst happen and you have to return the goods.

Secondly, whenever you order goods from an advertisement in PW, make sure you use the Personal Order Form that will be printed in every issue from now on. Call around your list of potential suppliers first and then post or FAX them this form when you place the order. It has been carefully laid out to help you make sure you’ve not forgotten anything and it will act as written confirmation of the deal. If you post it, don’t forget to keep a copy! If you have placed the order over the telephone, still send them the form with ORDER CONFIRMATION written across it.

The vast majority of transactions are trouble free but, if you are one of the unlucky ones who does have a problem, here’s what you should do. Write to the supplier enclosing a copy of the order form and the advertisement (you did keep them, didn’t you?) and outline your complaint. The letter should be accurate and brief but should also contain the details of any telephone conversations you’ve had with the company. It’s always a good idea to make a note of the date, time and the name of the person you’re speaking to whenever you call a company.

If the supplier fails to resolve the matter to your satisfaction, contact us and we will be happy to take up the case on your behalf. Just write (or ‘phone calls please) to Roger Hall, Advertisement Complaints Dept., PW Publishing Ltd., Arrowsmith Court, Station Approach, Dorset BH18 8PW enclosing copies of all relevant paperwork and we’ll take it up with the supplier. We have helped many readers in the past and almost always succeeded in putting matters right but this has been on an ad hoc informal basis. Now that we have formalised this process, we can only accept complaints if the original order was placed on the PW Personal Order Form to show you bought from an advertisement in PW and not from one in another magazine. Also, the order must have been for goods that were advertised in this magazine (but not in Classified or Bargain Basement advertisements) and not for goods that did not appear in the advertisement. Not only will we help you to pursue your claim, we will also publish in the magazine a selection of the complaints we receive and the responses from the advertisers. This will help other readers when it comes to deciding where to buy from and who they prefer to deal with.

We also intend to publish rulings from the Advertising Standards Authority. When we get complaints about the content of advertisements, some of which come from readers and some from other dealers, we refer them to the ASA whose job it is to decide whether the advertisement is legal, honest, decent and truthful. They then make an impartial ruling in favour of either the complainant or the advertiser. Up until now, we’ve just asked those concerned to comply with the ruling but now we’re going to publish those rulings in the magazine so that readers can see for themselves how advertisements are judged.

We hope our Personal Order Form, along with our offer to take up complaints on your behalf and the publishing of complaints and ASA rulings will make it easier for you to make an informed choice when it comes to parting with your money. You should also look out for buying advice in future issues of PW where we will be bringing you features on your rights when buying and returning goods, the pros and cons of buying ‘grey’ imports and many other topics that will allow you to buy with extra confidence from advertisements in PW.
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- Radar by P. S. Hall: A study of military radar from Crome House to Patern. Numerous photos and illustrations of equipment. Published by Brassey’s Technology Archive. 178 pages. Authors from The Royal Military College of Science. £10.50 F.P £5.00.
- Vintage Radio Valve Line-up Guide, 1950s-1959s: This invaluable book contains the valve line-up and replacements guide for hundreds of radios, pre-war and post-war. 138 pages. £15.50 including P&P.
- Eddystone Communications Receiver Data 1950-1970: A facsimile reprint of the circuit diagrams, general description and some service notes for sets from 1950-1970. 30 pages. £5.50 including P&P.
- Chelmsford General Hospital Surplus Wireless Catalogue, circa 1956: A facsimile reprint of the firm’s 179 page catalogue containing government surplus wireless equipment, general generators, government photographic equipment. With photos and details of receivers, transmitters and glider path gear, etc. £11.50 including postage.

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**Practical Wireless SD-610 review August 1995.**

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<table>
<thead>
<tr>
<th>Model</th>
<th>Bands</th>
<th>Trap Packs</th>
<th>Price</th>
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<td>Anti-Corrosion Compound</td>
<td>£10.45</td>
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An Area Often Sadly Neglected...

Audio Aspects of Amateur Radio

Gordon King G4VFV, our regular ‘Looking At’ author brings you an interesting article on the subject of the ‘Audio Aspects of Amateur Radio’ which he suggests is often sadly neglected!

Looking back to the early days of Amateur Radio, before the serious advent of the single sideband (s.s.b.) suppressed carrier (J3E) mode, amplitude modulation (A3E) was the prime phone mode. At this time, detailed attention was commonly directed to the audio and modulator section of the transmitter.

A popular scheme for obtaining amplitude modulation (a.m.) in pre-transistor days was called anode or plate modulation. Here, the final stage (the power amplifier or p.a.) of the transmitter, normally operating in Class C, had (superimposed upon its direct-current anode potential) an alternating potential that varied in accordance with the information carried by the audio signal derived from the microphone.

The superimposition of the audio upon the r.f. carrier wave was achieved by an audio power amplifier, known simply as the modulator, which could be operated in Class A, Class A/B or Class B. The input to the modulator was obtained from the speech amplifier, which was an audio amplifier of often considerable merit, following the principles of the day for high audio quality (before the term ‘hi-fi’ had been coined!). A skeleton circuit of the idea is shown in Fig. 1.

High Audio Power

Remarkably high audio power was required with the a.m. type of modulation. For example, if the requirement had been to modulate fully (100%), a 400W carrier produced by a Class C power amplifier running with an efficiency of, say 60%, then the d.c. input power would have had to have been in the order of 600W, with the modulator power half of this - some 300W.

The carrier power, was generally more modest than suggested. But even so, for full and low distortion modulation, the audio finals in home-brew transmitters of the day might have sported such valve types or equivalents as the 6L6, 6LQ6 or even the 807 in Class A/B or Class B push-pull.

Great pride was taken over transmitting speech of the highest possible quality and for this to be demonstrated, home-brew or even commercial communication quality receivers - often with external loudspeakers - were adopted by many stations. The fidelity and depth of the reproduction was a joy to the ears, often competing well with a.m. broadcast stations of the time.

The A3E mode hasn't completely vanished from our bands. You can still sometimes hear a net of some of the less -young' enthusiasts adopting this mode, perhaps, on top band or 3.5MHz when and where spectrum space might be in less demand.

The chief disadvantage of the anode modulated Class C amplifier method was the large audio power required for full modulation. The audio section of the transmitter was often equally bulky and complicated as the r.f. section, adding significantly to the demands of the power supply unit which, again, was a remarkable piece of kit.

Provided the modulation level could be reduced (and it often was), the audio power demand was increased and the audio quality of transmission enhanced. Nevertheless, the method was the most widely used and had the advantages of relative simplicity, good linearity and fidelity and high anode efficiency.

Other methods of A3E were in use, some requiring significantly less audio power, such as control grid and suppressor-grid modulation but the next milestone was really single sideband suppressed carrier J3E. It's well known, of course, that A3E requires double the band space of J3E for a given modulation frequency or spectrum.

Thus, if the modulation is a high-quality voice spectrum from, say 30Hz-6kHz or more (including overtones), then A3E requires a band space of 12kHz or more while J3E can get away with 6kHz or so. This is because all the information is carried by one sideband, so the other is redundant and can be suppressed. In addition, the mode saves over two-thirds in power because of the suppression of the carrier.

The audio in the one sideband is recovered by combining that sideband with a locally generated signal whose frequency is within five to ten cycles of the original carrier frequency. This wasn’t very easy to accomplish accurately in days past, but nowadays of course, it’s common practice with contemporary circuits and electronics.

In passing, it is also interesting to note that a double sideband suppressed carrier (d.s.s.c.) arrangement would require the locally generated signal to have, not only the exact frequency of the original carrier, but also to be phase coincident.

Frequency Modulation

Although the original idea of frequency modulation (F3E) was germinated before the 1920s (and more seriously considered around 1925 by the late Major E. H. Armstrong), it wasn’t until the middle of the 1950s before it was used for serious high quality broadcasting. This is the form now known as wideband f.m. (w.b.f.m.).

Frequency modulation was then experimented with and eventually adopted by transmitting amateurs in the early 1970s. It was found that remarkably good speech quality could still be achieved with f.m. over a significantly restricted...
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Pair Of Sidebands

With a.m., a single pure audio frequency modulating the carrier gives rise to a pair of sidebands - one sideband requires a displacement from the carrier equal to the modulating frequency. For example, a 1kHz pure tone modulating a 1MHz carrier would have one sideband at 1MHz minus 1kHz (0.999MHz) and another at 1MHz plus 1kHz (1.001MHz). The amplitude of the sidebands is governed by the modulation level. For 100% a.m., each sideband is half the amplitude of the carrier (Fig. 2).

Now, for this 1kHz signal to be handled with maximum fidelity, the receiver must pass both sidebands without attenuation. Hence, the receiver’s r.f./l.f. bandwidth must be at least two times 1kHz (or 2kHz).

The audio stages must also have a flat response up to 1kHz, even for relatively poor quality speech, so sidebands or a single sideband of substantial amplitude approaching 5 or 6kHz could well be produced, especially when the modulation level is high. Even so, it’s surprising how small a bandwidth will accommodate intelligible or communication quality speech.

In the early days, there were far fewer signals occupying the amateur bands than there are today, so there was much less pressure on spectrum space which is one of the reasons why, in bygone days, we could enjoy the luxury of full-blooded a.m. with almost studio quality fidelity!

Although we have reduced spectrum space by around half by using the J3E mode, we still often find the band cluttered such as to demand the use of filters or bandwidth reducing expedients to reduce adjacent frequency interference and sideband splash. The pen chart responses in Fig. 4 compare the audio bandwidth required of a super quality hi-fi system with that of a mediocre quality speech circuit, in, say, J3E mode.

The much narrower bandwidth which is adequate for A1A mode is also revealed. It is clear, of course, that we wouldn’t be able to accommodate many super quality audio circuits on the h.f. bands, but that the possibility is there to carry many more Morse circuits without interference, given adequate receiver selectivity!

Spectrum Space

The greater the spectrum space that’s available within an amateur band, there’s a greater corresponding number of transmissions that can be accommodated without mutual interference. The v.h.f. and s.h.f. bands are typical bands with lots of ‘elbow room’, which is why it has been possible to adopt the F3E mode in these bands. Such a wide band mode, of course, would be totally out of the question in any of the h.f. bands.

Now, while the a.m. modes yield a pair of sidebands (or a single sideband) per modulation frequency, f.m. produces a series of pairs of sidebands. These are separated from the carrier by one, two, three, etc., times the modulation frequency.

Just a single pure modulating tone, for example, requires a bandwidth greater than a mere two times the frequency of the modulation, depending upon the deviation which, to some extent, has a similarity to the depth of a.m.

Either Side Of Carrier

As the multiple sidebands spread out either side of the carrier wave, so their amplitudes fall (Fig. 5). Deviation is a measure of the amount by which the carrier is caused to vary above and below its mean frequency as a function to the amplitude of the modulating signal (the amplitude of the carrier, of course, remaining constant with f.m.).

With broadcast f.m., the maximum deviation is 75kHz, but with narrow band f.m. (a.f.f.m.), it’s much more limited, in the region of 2.5-3kHz in our bands, to reduce the spread of sidebands. This has worked well with our 25kHz f.m. channels, but with the introduction of narrower f.m. channels an even lower deviation will be necessary to avoid adjacent channel interference on a busy band.

The rate at which the carrier frequency is caused to change by the deviation corresponds to the frequency of the modulating signal, while the ratio of the deviation to the modulation frequency is called the modulation index.

Capture Effect

The f.m. mode also has an interference limitation advantage over a.m. as well as enhanced fidelity, along with another valuable feature called the capture effect, where only the strongest of co-channel signals results in an audio response. Provided the wanted signal is around two times stronger (depending on the deviation) than any unwanted signals on the same (or near) frequency, means the latter fail to produce an audio output of any significance.

There’s no equivalent with a.m. Here, the wanted signal needs to be a greater number of times stronger than a co-channel one not to be troublesome. However, the effect has maximum advantage with wideband f.m. where a greater deviation is feasible, such as with radio and TV-sound broadcasting. Nevertheless, on the amateur bands, its attribute can be detected during a tropospheric lift - particularly on repeaters!

Microphone Source

The microphone is generally the source of the audio signal and. In the very early days before the advent into Amateur Radio of the moving coil or dynamic microphone (one of today’s most popular transducers), the carbon-granule microphone which was originally developed for telephone applications, commonly played a part. (See Fig. 6).

In simple form, the unit consists of a small insulated enclosure containing carbon granules which are in electrical contact with electrodes, one at each end. One electrode is fixed while the other, which is free to move, is mechanically coupled to a diaphragm.

Sound waves impinging upon the diaphragm exert a varying pressure on the granules, thereby changing sympathetically their contact resistance across the two electrodes. A voltage applied across the electrodes in series with the primary of a transformer becomes modulated with the sound waves and a corresponding audio signal appears across the secondary of the transformer. The disadvantages of this are poor frequency response and high noise level (the typical ‘frying bacon’ sound!).

Next, there’s the moving coil microphone. This works rather like a moving coil loudspeaker in reverse. Sound waves impinging upon a shaped diaphragm cause it to move attached to it (and free to move within a strong magnetic field) to move minutely to and fro in sympathy.

A small e.m.f. is thus produced across the coil, upon which is modulated the audio information. When the output impedance is low, a step up transformer is used either internally or externally to increase the impedance to a suitable value for coupling to the input of the audio amplifier.
Instead of a moving coil and diaphragm, some microphones employ a corrugated ribbon suspended between the poles pieces of a powerful magnet, called the ribbon microphone. These microphones are generally used because the frequency response is flat. The ribbon microphone is most useful when recording speech or music. In this type of microphone, the sound waves pass through a metal plate, and the resulting vibrations are converted into electrical signals.

Thermal Noise
The amount of circuit or thermal noise (background hiss) is a function of the circuit bandwidth. If the bandwidth is basically unfiltered, then the output is referred to as white noise, analogous to white light which is composed of all the colors (frequencies) of the light spectrum.

When the circuit bandwidth is restricted or filtered, then the noise is no longer "white." In fact, with a fifth octave treble roll-off we will be hearing pink noise. The thermal noise which we hear from our speakers and 'phones is certainly not white - more like pink, despite what one may hear over the air!

By restricting the audio bandwidth, the fidelity is bound to suffer, but since Amateur Radio is not hi-fi then this doesn't matter much, provided intelligibility isn't impaired. In fact, it might be improved because of the reduced thermal noise with the decreased bandwidth. This is a function of the noise power bandwidth.

In other words, the more we close the window (reduce the bandwidth), the less noise we allow in! Each time the bandwidth is halved, the noise power falls by 6dB.

Moreover, a less wide audio passband will also attenuate those audio components (whistles, sideband, splash, etc.), which would otherwise cause severe QRM. The plot of pen chart traces in Fig. 8 show a restricted audio passband at (a) which would be suitable for J3E mode and another at (b) which might be too narrow for reasonable quality speech but just about right for Morse A1A. Compared with the 'flat' response also shown, the thermal noise in (a) would be about 10dB less and in (b) about 15dB less, while the noise in (b) is about 5dB less than that in (a).

Audio filters based on passive inductor/capacitor (LC) configurations have been used with good success even when a receiver is equipped with narrowband c.w. or s.s.b. Lf filtering, especially when the filter is located at the front of the Lf. strip. This is because the audio filter reduces the power of the noise actually produced by the i.f. circuits themselves. However, when the filter is located at the end of the Lf. strip, the addition of an audio filter is unlikely to be so spectacular.

The bandwidth of a filter (e.g. the bandpass response) is a frequency range between the -3dB points at each side of the response characteristic. For example, in Fig. 8, the bandwidths of (a) and (b) respectively, are approximately 2KHz and 700Hz.

Quite accurate tailoring of the LC values of passive filters is necessary to achieve the required parameters. These are the mid-band frequency and input and output impedances in particular and compromises are generally necessary, such as the use of input and output matching transformers and careful component selection.

This kind of filter also suffers insertion loss. The latter is eliminated while the former are rendered less critical by the use of active audio filters.

These are significantly more popular than the passive types and are more readily adapted to home brewing, though they can be obtained commercially. Early species used a pair of transistors per 'element' but nowadays of course, it is the i.e. which represents the core component.

Finally, just a final word about the response of audio circuits to r.f. Although such circuits are certainly not designed with r.f. in mind, in the shack, (especially with outside end-fed antennas and any type of indoor antenna), the residual r.f. level might well be high enough to enter the filters, microphone channel or even the speaker circuit and impair their operation. This is where some sort of r.f. detecting device can pay dividends.

The best plan, of course, is to reduce the shack's r.f. level. But it may also be necessary to employ r.f. filtering at both the input and the output, taking the conventional form of r.f. chokes and capacitors along, possibly with ferrite beads and toroids.

Electret Microphone
The Electret Microphone is a development of the electrostatic or capacitor microphone, whereby the polymer plastic film is fitted which might merely provide switched degrees of treble roll-off. As an example of an Electret Microphone, a microphone channel or even the speaker circuit and impair their operation. This is where some sort of r.f. detecting device can pay dividends.

The best plan, of course, is to reduce the shack's r.f. level. But it may also be necessary to employ r.f. filtering at both the input and the output, taking the conventional form of r.f. chokes and capacitors along, possibly with ferrite beads and toroids.
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Call in and listen to the latest Mini Disc or Hi-Fi systems
Welcome to Part 2 of the 'Sentinel' project. Next in line for building the project is the metering circuit and while the components in the sensor modules are critical, the components in the d.c. part of the project can be from the junk box. The meter does however need to be a 100pA movement.

Similarly, the few components could be mounted on a group board. But I decided to use a small piece of Veroboard, fixed to the meter terminals, for neatness and to provide an easy mounting for the preset potentiometers.

You'll require a piece of 0.1inch spacing Veroboard 24 holes wide by 12 holes high. The 4mm holes for the meter terminals do not align with the punched holes so, if you don't have a drill stand, a little careful needle file work may be called for.

Wire the switches (adjusting wire lengths to suit the case used) and the Reference potentiometer and connecting leads to the board as a complete sub-assembly before mounting the board and front controls. It's much easier that way!

Assembly Stage

For the assembly stage of the 'Sentinel' I'll remind readers that I've provided full details, which are available for the advised s.a.e., in the October issue of PW* (and thank you for the response, everyone who has contacted the PW offices and myself directly at home. It's good to see such interest in a project such as this!)

However, to help anyone who is planning to build the project from the circuits and information given here I'll provide some basic guidance gained from building the prototype.

*Note: Please see end panel regarding instructions how to obtain the suggested p.c.b. and Veroboard layouts and other instructions. Editor.

Nickel Plated

To start off on the assembly tips, it's important to note that many u.h.f. socket solder ‘spills’ are nickel plated and they can be difficult to solder. It's therefore worthwhile tinning them before assembly. Fit both sockets ensuring that they are well tightened.

Wrap Around

The case is a simple two-piece wrap around assembly designed to be made with minimal facilities. I made the prototype with the aid of a 'Workmate' bench, two short pieces of angle iron, some scrap 16s.w.g. aluminium for packing pieces and of course a short piece of wood to cushion the hammer blows.

Check that the screws bed down into the recommended die-cast box as the distance between the screws in the spacer is very small. Any inadequacy in the preparation of the spacer or the countersink drilling may cause them to touch. (If they do, simply file the screws down slightly).

Fit the feed-through capacitors C2 and C4 with the nuts on the outside of the box. While they need to be tight, take care not to over tighten as the screw threads may strip. Also, if the wire ends are bent, don't be tempted to straighten as you will almost certainly break the ceramic.

To reduce the possibility of any flash-overs in the transformer the top of the windings are sealed with a dab of epoxy resin. Ensure that it flows around the sleeving of the first winding starts and into the pvc insulation both at the front and back of the winding.

While you have the epoxy resin to hand, apply a small dab to L1 and L2 to secure them to the p.c.b. This will prevent them from rattling and the wire fracturing if subjected to prolonged vibration.

The PW'Sentinel Meter.

Fig. 1: Rear view of the prototype.
The voltage on the module input for a given power supply will be the peak voltage which will result in the calibration process.

Calibration Process

To calibrate the 200W r.m.s. range a d.c. supply of 14.14V is required and for the 800W p.e.p. range a d.c. supply of 28.28V is required. Ideally a variable bench supply of about 30V would be used but if not available something like a 10kHz potentiometer string across a 30V supply will suffice.

However, if the supplies are a problem the shack 13V p.s.u. can be used to calibrate at a power less than full scale deflection (f.s.d.). A 13.8V d.c. supply would be equivalent to 13.8\( \sqrt{2} \)V r.m.s., i.e. 9.76V. The equivalent voltage at the input to the sensor would therefore be 97.6V and the power 97.6\( \div \)50, i.e. 195.5W. Check the voltage on your p.s.u. and redo the arithmetic if it's not exactly 13.8V.

More important than the p.s.u. is the voltmeter that's used to measure the calibration voltage since this will decide the accuracy of the power ranges. Ideally this should be a digital voltmeter but failing this a reliable analog instrument can be used.

Set the PW Sentinel mode to RMS and set the preset potentiometers: R17 and R18* fully clockwise. Set the supply voltage to 14.14V or note the voltage of your fixed supply and calculate the equivalent power.

(See Fig. 1 on page 37 of the October 1999 PW.)

Connect the negative supply line to the earth stud and the positive line to the earth wire that goes to the meter circuit board. Adjust R18 for an indication of 200W or the power you have calculated.

Reset the mode switch to PEP and adjust the supply voltage to 29.28V or note the voltage of your fixed supply and calculate the equivalent power. Adjust R17 for an indication of the 800W, this will actually be the 200W mark as the p.e.p. range is x4, or the power you have calculated. This completes the calibration process.

Disconnect the power supply and connect the meter circuit board earth wire to the earth stud solder tag. Slide the chassis into the case from the back, fit the fixing screws in the bottom and fit the rubber feet. Then you really will have a useful monitor units - and you'll have 'home-brewed' it yourself!

Help Line

Jim has a small quantity of copper foil for the transformers. Anyone wishing to avail themselves of this (free of charge) or have any technical queries (e.g. please) to Jim Brightman G0JXN, 35 Perryfield Road, Cheshunt, Hertfordshire EN8 0TQ or Tel: (01992) 469204 at any reasonable time weekdays.

Final Assembly

For the final assembly, I recommend that you fit the meter first but leave off the nut that secures the strap until later in the assembly. Then fit the meter circuit board to the back panel with self tapping screws. You will be able to gain access to the terminal screws. You will be able to gain access to the strap until later in the assembly. Then fit the meter circuit board to the back panel with self tapping screws and connect the leads from the meter board to the feed-through capacitors.

Next fit the switches and potentiometer with the front panel in place. When tightening the toggle switch take care not to damage the panel paint.

Cut the spindles to length and fit the knobs. Fix the modules to the back panel with self tapping screws and connect the leads from the meter board to the feed-through capacitors.

Fit and connect the phono socket and finally fit the strap with the meter fixing nut and the earth stud. Then fit a solder tag under the earth stud but do not connect the earth terminal wire as this is used in the calibration process.

Calibration Process

The calibration process is relatively straightforward. The voltage on the module input for a given power supply may be calculated by transposing the power formula

\[ P = \frac{V^2}{R} \]

i.e. for 200W r.m.s. the voltage is 100V RMS. When rectified by the detector the peak voltage will result in the calibration process.

To calibrate the 200W r.m.s. range a d.c. supply of 14.14V is required and for the 800W p.e.p. range a d.c. supply of 28.28V is required. Ideally a variable bench supply of about 30V would be used but if not available something like a 10kHz potentiometer string across a 30V supply will suffice.

However, if the supplies are a problem the shack 13V p.s.u. can be used to calibrate at a power less than full scale deflection (f.s.d.). A 13.8V d.c. supply would be equivalent to 13.8\( \sqrt{2} \)V r.m.s., i.e. 9.76V. The equivalent voltage at the input to the sensor would therefore be 97.6V and the power 97.6\( \div \)50, i.e. 195.5W. Check the voltage on your p.s.u. and redo the arithmetic if it's not exactly 13.8V.

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(See Fig. 1 on page 37 of the October 1999 PW.)

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Disconnect the power supply and connect the meter circuit board earth wire to the earth stud solder tag. Slide the chassis into the case from the back, fit the fixing screws in the bottom and fit the rubber feet. Then you really will have a useful monitor units - and you'll have 'home-brewed' it yourself!

Building The Project - Help From PW

As I stated in the October issue of the magazine, it's often the case with the more advanced constructional projects, that we do not have enough Editorial space within PW to provide the very comprehensive and detailed instructions for some projects, as in the case of this example provided by Jim Brightman. However, we do have copies of the author's own p.c.b. drawing and assembly information which will be included in the information pack prepared by the author.

So, for those who are interested in building this very interesting and useful unit and wish to follow Jim Brightman's 'Heathkit style' step-by-step approach, all the extra information we have to help you complete the project is available free from the PW Editorial office in Broadstone by sending a large (A4 sized) self-addressed envelope with two 1st Class stamps. (Readers outside of the UK - including Ireland) are asked to write to me (or E-mail me) for further advice. Incidentally, all feedback generated by projects such as this, help us to evaluate the interest there is for similar ideas and this is very useful information indeed!

Rob Mannion G3XFD, Editor.
Licence Free Low Power UHF Transceiver

The Alinco DJ-SR1

Richard Newton G0RSN, with a little help from his family, reviews the new PMR-446 radios from Alinco - the new DJ-SR1! Nevada kindly loaned PW two radios and we set Richard loose on them. Ever wondered just what these new licence free radios have to offer? Well, you need look no further ...

The Alinco DJ-SR1 is a u.h.f. f.m. transceiver and it operates on the new, licence free, 446MHz band. The radio itself looks very professional and comes supplied with a belt clip, hand strap and a basic, but informative, information leaflet.

The radio is clearly not designed for the Amateur Radio market, rather it is aimed at short range family or business use and replaces the now defunct Short Range Business Radio (SRBR) which was licensable and operated on and around 461MHz. Although still being used, the SRBR system will be phased out over the next few years.

The beauty of 446MHz is that it is truly licence free! The transmitters are only allowed very low power - a maximum of 500mW - which is quite adequate for line of sight communications over about a mile or around a factory/business complex. Obviously, however, terrain will take a considerable toll at these power levels and frequencies.

What Does It Offer?

So, what does the Alinco DJ-SR1 have to offer its operator? Well, in answer, I have to say, I was amazed at the build quality and functions that I found on this little radio. It is cheap to run, working on 3 x AA cells or optional rechargeable batteries. (See Fig. 1).

Something that I didn't expect to see was an external power connector, but there is one and it's positioned on the top of the radio next to the Speaker/Mic sockets. (See bottom of page, far right).

The radio requires 5.5V* of external power and anything above this will have a rather adverse effect. Also, the information supplied with the radio warns against using external power when normal alkaline batteries are being used.

*Optional EDH-18 cigar lighter adapter with built-in noise filter and regulator available.

Fixed Antenna

One of the conditions of licence free operation is that the radio has got to have a fixed antenna. The Alinco has got a rather neat way of giving the best of both worlds. The 'SR1 has a long, thin helical antenna that pivots and can be folded down along the side of the unit. (See Fig. 1). In this position the radio will receive quite well, but transmission is not advisable.

The antenna then swings up and gently locks at a right angle to the radio. This means the radio can be leant on its side with the antenna vertical. Useful perhaps if you have external power and a speaker/microphone connected, the radio could be clipped onto a desk and operate as a would-be base station. Gentle pressure then overcomes the lock and the antenna continues up to the normal position.

Impressive Array

This neat little hand-held PMR-446 transceiver comes with an impressive array of functions. The licence free radios have eight frequencies allocated to them which include the following:

- Channel 1: 446.00625MHz
- Channel 2: 446.01875MHz
- Channel 3: 446.03125MHz
- Channel 4: 446.04375MHz
- Channel 5: 446.05625MHz
- Channel 6: 446.06875MHz
- Channel 7: 446.08175MHz
- Channel 8: 446.09375MHz

This Alinco, like most other radios on the market, then increases the usefulness of these frequencies by the use of CTCSS tone squelch. The DJ-SR1 has full CTCSS ability using 39 CTCSS codes.

The 'SR1 has a user-friendly way of selecting the CTCSS codes and they are all given an alphanumeric code. For example, tone squelch 131.8 is assigned A07. If you have a radio set to operate on channel one, using the tone squelch 131.8, then the display would read 1-A07, channel two with the same tone would read 2-A07 and so on. To save configurations, an operator can save channel and tone information in one of the radio's 20 memories!

The radio also has tone alert functions, a MONI button which will defeat the CTCSS so that you can monitor the channel and hear everything that is going on. In fact, the DJ-SR1 allows you to disable Practical Wireless, December 1999
the CTCSS altogether - although this isn’t a particularly good idea. The ‘SR1 also has a TX/RX indicator i.e. and will scan memory channels as well!

Energy Saving Functions

Energy saving functions are included in the package - such as Auto Power Off Timer and a Transmit Time Out Timer. The radio can also be set to Low Power transmit, though I’m not certain what this is, as the book doesn’t indicate any technical information on this feature.

The attention to detail on this little radio is also illustrated in its ability to scan incoming CTCSS tones. This feature is especially useful if the person you are communicating with has another make and model of ‘446 radio that doesn’t display the tone squelch it is using. Just get your friend to transmit, set the CTCSS tone scan to off and wait for it to find the matching tone for you!

There are extended controls to the radio. The key beeps can be toggled on and off, as can a beep which the radio emits after every PTT press. It can be set to show memory channel numbers only and the lamp can be set to either default to on or off when you turn the radio on.

The little Alinco DJ-SR1 looks good in its high impact black plastic casing and well labelled controls. The easy-to-see display is back lit with its impact black plastic casing and well labelled controls. The easy-to-see display is back lit with its

On Air

I thought that I would employ the hardest test ‘on air’ first. This meant using the one control I haven’t mentioned as yet, the LOCK key. This locks all controls except PTT, LAMP and ON/OFF.

I set the radios (Nevada loaned me two radios) up and attached two speaker microphones (Icom ones worked fine) and handed them over to my two in-house experts - Thomas, aged six years and Oliver, aged four.

My sons had a whale of a time and were able to wander all over the house and through the garden and stay in perfect contact on low power. They even had a QSO with their Grandad, Terry G7VJJ, what fun they had!

The display on the Alinco DJ-SR1 includes a four-segment ‘S’ type meter, which wasn’t very accurate but served as a good indicator. I had also noticed that the audio quality of both transmitted and received audio was very good indeed. So, it was time for a bit of ‘DX’!

Great Times

As we all know, there have been great times in the history of radio and I often visit the Sandbanks peninsular at Poole which, as some of you may know, is where Marconi conducted some of his most famous radio experiments. Well, I too now rate myself in the halls of radio pioneer fame! I got my wife, Diane to use the radio! Yes I did - honest! I went for a little trip around the neighbourhood and kept in touch with Diane at home.

She was able to tell me what she wanted from the shops and I was able to co-ordinate the kettle - what a team! The ‘DX’ was thanks to my father-in-law Terry G7VJJ who assisted me with an experiment. He remained indoors and I went mobile, I headed away from his location and managed to keep contact for just over a mile. This was with buildings and trees around, in town, with Terry in the house and me in a car. Needless to say - I was very impressed!

Final Use

The final use we put the radios to was a house-to-house intercom. Normally, Terry and I use the 433 or 145 MHz amateur bands for keeping in touch from his house to mine. We only live a few hundred yards away from each other and it’s a bit of fun.

However, it’s only Terry and myself who can use it, as we are the only ones licensed. This was not so though, while I had the Alinco DJ-SR1s to play with. We even got Diane talking to her Mum, Barbara on the radio! The signal between the two houses was great, in fact we were able to use low power on occasions.

I’m sure that there are 101 uses for these new radios, limited only by the individual’s imagination. I’m certain that they will be well-used by young and old alike.

The Alinco DJ-SR1 is simple enough to appeal to those who just need a radio to communicate, but have no interest in Amateur Radio whatsoever. The radios are also, however, ideal for those who have an interest in radio but want a no hassle, relatively low cost way of trying radio out before they embark on either the Novice or full RAE!

What better way to practice your operating procedure for the Novice exam? You never know - it may even encourage new people to the hobby?

My thanks go to Nevada for the loan of the two Alinco DJ-SR1s and the BC-10 twin quick charger. (See photo at the top of this page). The Alinco DJ-SR1 costs £119, the optional BC-10 costs £29.95 and optional EDH-18 costs £27.95. More information is available from Nevada on Tel: 0239-266 2145, FAX: 0239-269 0626, 189 London Rd, North End, Portsmouth PO2 9AE. PW

The two Alinco DJ-SR1s sitting inside the BC-10 twin quick charger (optional extra - see text).
Antenna Rotator
AR-300XL
Max load 60kg (with support bearing). 360 deg rotation in approx 65 sec. (cable not supplied). Support bearing optional extra. £49.95 FREE P&P
Optional Support Bearing £14.95.

Gold Peak 1300
1300mAH Nickel Metal Hydride (NiMH) AA size rechargeable cells. No memory effect. Over twice the capacity of Nicads. £2.00 + P&P

Syncron SX-144/430
2m/70cm cross needle direct reading SWR/1000W power meter. £39.95 inc P&P

MAYCOM AR-108
• Full civil airband • Covers 108-136.975MHz (AM) & 136-180MHz (FM) • 99 memory channels • 5kHz, 10kHz, 12.5kHz, 15kHz, 25kHz & 1MHz steps • Dual channel watch • LCD display with signal meter
SPECIAL OFFER PRICE £69.95 + £5 P&P
ALSO AVAILABLE
• PSU charger £8.95 • Professional earpiece £8.95 • Airbender micromag £19.95 • In-car adaptor £8.95 • BNC to SMA antenna adaptor £5.00 • 2 AA nicads £3.00 AR-108 + all above accessories for £109.95 + £10 P&P

DX-394 Shortwave Communications Receiver
150kHz to 30MHz AM, USB, LSB, CW digital receiver with 160 memories.
£199.99. £99.99 + P&P.

Sangean AT-909
Portable short wave receivers are always popular and if there's one with long wave, medium wave and VHF coverage as well, we can guarantee it will be popular. That's why the AT909 caught our eye. It has over 300 memory channels and will also auto-scan, looking for stations. It has narrow and wide filters for AM reception and also has SSB facilities with a superb "slow tuning" rate in this mode. We've had nice reception of Shanwick and Volmet but don't expec miracles on 80m! The FM section also has RDS built-in so you can identify stations on the large clear LCD screen. £129.99 + £5 P&P

Comtel COM-212
Covers 66-88, 137-174 & 406-512MHz. FM, 30 memory channels + 1 priority channel, lock-out function, 2 sec scan delay, built-in charging circuit, flexible antenna. £49.95 + £5 P&P

PRO-2042 Base Scanner
1000 channel AM/FM/WFM (switchable) scanner. Covers 25-520MHz and 760 to 1300MHz. £299.99
£179.99 + £10 P&P
SRP Mini-Mag 2/70
2m/70cm dual band mobile antenna featuring super strength mini-magnet (only 30m diameter) c/w miniature coax and plug. £19.95 FREE P&P.

Silver Diamond
Four band discone. TX 6m, 2m, 70cm. 23cm, 200W, RX25-1300MHz. Stainless steel construction. £49.95.
£29.95 + £5 P&P

WM-918 Electronic Weather Station allows the measurement and display of weather data. Displays indoor/outdoor temperature, relative humidity, dew point, wind speed, wind direction, wind chill, barometric pressure and daily & accumulated rainfall. Four weather symbols show you a weather forecast: sunny, partly cloudy, cloudy and rainy. Memory for highest/lowest temperature, relative humidity, dew point temperature, maximum wind speed, minimum wind chill, daily and accumulated rainfall. Weather alarm warns you of high and low temperature extremes, rate of rainfall, wind chill, wind speed and drops in pressure. £179.95 inc. P&P.

Free IBM PC compatible software kit worth £29.99.
Offer ends 15th December, 1999.

Fairhaven RD-500VX
£799.00 incl. P&P + free wideband discone & long wire kit.

GRE Wideband Scanner Pre-amp
Improves reception 100-1000MHz by up to 20dB, variable gain control, powered by 9V PP3 battery or DC adaptor fitted with BNC adaptors. £49.95.
£19.95 + £3 P&P (30 pieces only).

Micro "Stealth" Discone
RX25-1300MHz. Small and unobtrusive, suitable for portable use. £29.95.
£14.95 + £5 P&P

DC-AC Invertors, 12V DC in 240V AC out
150W version (for notebook computers, etc.) £39.99 £29.95 + £5 P&P
300W version (for small power tools, etc.) £59.99 £49.95 + £5 P&P
600W version (for medium power tools, etc.) £129.99 £99.95 + £10 P&P
1000W version (for large power tools, etc.) £159.99 £129.95 + £10 P&P
2500W version (for most purposes, etc.) £499.99 £419.95 + £15 P&P
Deluxe G5RV Half-size antenna (40 through 10m) £12.00 + £3 P&P.
Deluxe G5RV Full-size antenna (80 through 10m) £15.00 + £3 P&P.
Amateur Radio & Disabilities?
No Problems!

Paul Essery
GW3KFE
explains that, with some special adaptations, 'a little help from friends' and special organisations set up for the purpose - Amateur Radio operating for the disabled is not a problem!

There are, unfortunately, just about as many forms of disability as there are disabled people. For the 'normal' things, the Health and Social Services facilities come into play. However, the disabled person wanting to take up Amateur Radio often needs specialised help which the 'system' just isn't geared up for. In practice the RA1E or NR1AE pass is often the easy bit as organisations such as the Radio Amateurs' Invalid & Blind Club* (RA1BC) will have teaching aids, so all the prospective student has to do is to provide the enthusiasm. Although, with some disabilities, it may mean two or three club members working together to provide extra help.

Further details from: Hon. Treasurer/Membership Sec. Shelagh Chambers, 78 Durley Avenue, Pinner, Middx. HA5 1J1.

When the time for sitting the RA1E comes, it's best to discuss in detail with the RA1BC how the exam is to be taken especially if 'mobility' is a problem. There are various ways in which the test can be administered, for example, a verbal examination taken in the candidate's home may be needed.

On the Morse side, again RA1BC may yield ideas for the tutoring. When the test time looms, special arrangements can be made with the RSGB Morse Test Service, again perhaps involving a test at the candidate's home. Remember: The exam/test is traumatic enough even for many able-bodied candidates!

Confidence & Encouragement
For the disabled, who often lack self-confidence, it's so much more likely that they will unconsciously undermine their own chances. Encouragement is the word, and lots of it!

To help, you should organise things as early as possible so whoever is to do the test or invigilate the exam can familiarise themselves with the problems they face and what must be done. It can be traumatic for the examiner too! And, of course, an invigilator's flutters can transfer to the candidate like lightning!

After The Examination
Having taken (and passed of course!) the examination - it's time to look at the realities. To get on the air, interests, depth of pocket and so on must be considered.

To spend a wad of money on say, an h.f. rig only, to find later that the interest has shifted to 'nattering' on v.h.f. is sad. So, I advise that you try (if you're the new operator, or persuade the disabled beginner you're helping - to start with simple gear until the real interest has emerged.

Needs Vary
The needs of the disabled person vary: they can be simple, such as lifting the operating desk up enough to let wheelchair arms clear the underside so the owner can reach the controls of the rig. Then comes the more-difficult one-off adaptation of a rig for use by someone with a specific disability.

Other areas which might need to be looked at include the station log-keeping, modification to a microphone's send-receive switch and arranging for a key that our new Radio Amateur can actually use.

You may have no problem with a key or microphone that insists on wanting to 'walk' when in use, but it may well be very different for a disabled friend. For this one the answer is so simple - scrounge a bit of 'Slip-Not' from the Occupational Therapist (OT) or Physiotherapist and sit it under the key(s). Slip-Not will hold the key in place nicely and when it begins to feel as though it is dusty and losing its grip, a quick rinse in soapy water makes it like new again.

However, there's a bit more psychology here too: 'phone operation can improve the speech of a person with a disability. On the other hand I know of a licensed amateur who combines a hearing disability resulting in a very narrow frequency range with severe tinnitus. For that amateur, communication...
with anybody else involves the other operators using Morse, though he himself can speak after a fashion, having learned before the hearing problem hit him 50 years ago.

**Antenna Erecting**

In most places the antennas-erecting expertise exists in the local club and the RAIBC have already been mentioned. So, where else can you turn for help in this area? To assist, let's take a look.

Throughout UK there are groups ("panels") of people from the Rehabilitation Engineering Movement Advisory Panels (REMAP) who are there to help. This voluntary organisation (Registered Charity No. 1004568) exists to apply design and engineering expertise to solving problems a disabled person (and disabled Radio Amateur) might have.

Each Panel combines the skills of the caring professions, (Occupational Therapists, physiotherapists and so on), with those of professional engineers and others with needed skills. So, with this expertise the Panel can make sure that the engineered solution will not harm the user and that it meets current safety requirements and so forth.

There are already some Radio Amateurs serving in REMAP nationally and at local level and of course more are welcome. On the user's side, Panels have been able to help various Radio Amateurs overcome their disabilities and get on the air.

You can contact the National Organiser, Dur- ing J J Wright, 'Hazeldene' Ightham, Sevenoaks, Kent TN15 9AD. Tel: (01732) 883818. Scottish readers can contact REMAP in (Scotland) by way of John Golder at Malside Lodge, Beith, Ayrshire KA15

1D. Tel: (01294) 832566.

Either the addresses provided will give you the name telephone and address of the Chairman and Secretary of your nearest Panel. And, if you are in Powys, you can contact me. Paul Essery GW3KFE, personally on - TEL/FAX: (01686) 628958.

**Free Of Charge**

Financially, REMAP local Panels deliver technical aids or modifications to the client completely free of charge. Panels, though, are always pleased to receive donations from ANY source to assist their work. Such donations may be in cash, or by way of materials or access to workshop processes.

For all practical purposes each REMAP panel is unique, so the precise details about how they operate vary, but I can assure you they ALL could use some help!

Not an engineer? But got a good workshop and a good pair of hands? Perhaps you can also make things to someone else's design, or take a share in a joint project. Not an engineer and wouldn't know how to make anything? Don't worry, all local Panels need help from fund-raisers, administration, photographers and many other skills. Try them and see ... you won't be turned away!

**Mark Makes His Mark**

**As Young Amateur 1999**

Mark Haynes 2E0APH from Harlow in Essex truly made his 'mark' when he became 'Young Amateur of The Year' 1999 at the ceremony held at the RSGB's HF Convention at Old Windsor on Sunday 10th of October. Mark - who had been 'runner up' in the jointly sponsored Radio Society of Great Britain and Radiocommunications Agency Award two years ago - greatly impressed the Judges with his achievements. Mark's activities, ably supported by his Father Keith G3WRO, include Novice instruction at the Harlow & District ARS where he and his father are both members, Morse tuition, contest operating and public speaking on the Amateur Radio hobby.

Presented with his award by the RAN Chief Executive David Hendon, in the presence of RSGB President Hilary Claytonsmith G4JKS, families, friends and other assembled guests, Mark also made a short speech outlining his hopes and plans for the future of the hobby.

Rob Mannon G3XFD, Editor of PW comments: "I've had the great pleasure of working Mark on 144MHz when I was on my way to East Angia in September and to say that this young man is a gentleman on the air is an understatement. He's truly a great ambassador for our hobby. I'm also proud to say that he's a PW author - having had his article The Story of A Novice - A Whole New World In Two Years' published in the December 1998 PW."

'Runner Up' in the 1999 Young Amateur competition was Daniel Keene G7GIK from Four Marks near Alton in Hampshire, who enjoys Packet radio and repeater operation. The other finalists included Jonathan Constable 2EOATE and Kate Glover M1DRB, both from Sussex.

The RSGB have preliminary announced the fact that the 1999 Young Amateur of The Year Award will probably be the last in the present format. News of changes will be announced during 2000.

**Fresh 'ZN414' Chips From Kanga!**

Despairing constructors lamenting the loss of the long-established ZN414 'one chip' radio integrated circuit need worry no longer because PW has learned that 'Fresh Chips are now available from Kanga Products! The good news wrapped in a plastic bag (not newspaper!) came from John Fletcher G4EXD, who recently acquired Kanga Products, when he presented PW Editor Rob Mannon G3XFD with a new MK464 L.e., an (almost) direct replacement for the very popular ZN414. The 'fresh chip' arrived at the G-QRP Club's Rochdale QRP Convention on Saturday 23rd of October and proved very popular with the keen 'home brewers' attending the 'traditional rally' which forms the heart of the long-established convention!

John explained that: "The Ferranti ZN414 was a ten-transistor L.F. receiver integrated circuit supplied originally in a TO-18 case and later in a TO-92 plastic package. It was the heart of a simple a.m. receiver and for years it was a popular subject for projects In electronics magazines. For many enthusiasts the ZN414 must have been their introduction to receiver construction. Sadly the ZN414 is no longer made but the MK464 is now available as a replacement".

Kanga Products have the MK684 available for £1 (plus 50p P&P any quantity) and in the comprehensive details, complete with circuit, the slight pin-out differences in the three-lead component are clearly illustrated in the diagram provided. Further details from: Kanga Products, Sandford Works, Golden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115-967 0918. Fax: 0870-658 8608. E-mail to sales@kanga.demon.co.uk or look up their Web site: http://www.kanga.demon.co.uk
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  - RRP £999 Transceiver only
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  - RRP £1249 Transceiver only
  - Package deal:
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- **FT-920AF**
  - Often overshadowed by the FT-1000MP, the newer design FT-920 sports HF & 6 metres in one neat package.
  - RRP £1499 Transceiver only
  - Package deal:
    - FT-920AF HF & UHF Base Station
    - FT-20 Automatic Antenna Tuner
    - MD-100 Desk Mic
    - Samlex SEC1223 Base PSU
    - Yaesu FT-11550 Collins SSB Filter
  - Total value £2217
  - ML&S £1999 or PAY NOTHING FOR 6 MONTHS then pay £1999 with NO INTEREST or pay £56.34 for 36 months at 24.9% APR.

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  - The ultimate business only once 100W HF & 6M Linear.
  - RRP £1609 or PAY NOTHING FOR 6 MONTHS then pay £1699 with NO INTEREST or pay £46.36 for 36 months at 24.9% APR.

- **FT-890**
  - The smallest best performer Hand hold Scanner from Yaesu, who else!
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  - The smallest handheld in the world. Even has a remote head!
  - RRP £619
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- IC-746
A brilliant performer with HF, 6M and 2M as standard,
100W right across the range.
RRP £1699.99 Transceiver only

Package deal:
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Samlex SEC-1223
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FL-223 5GB Filter
SM-4 Desk Microphone.

Total value: £2042

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FL223 5GB Filter

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combines with a flexible boom which houses
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Counting Up From The Millennium!

Most of us are somewhat tired of the various 'count downs' to the coming 'Millennium'. However, for this issue, the last for 1999, Rob Mannion G3XFD is presenting the final 'count up' from the Millennium! Rob is letting his imagination run wild with 'cuttings' of imaginary Amateur Radio 'news' items which (might) appear in the magazine in future years. They're intended to be thought provoking, sometimes controversial and interesting but above all ... totally imaginary!

Elderly Amateur Arrested For Dangerous Driving

An elderly disabled Amateur Radio enthusiast has made 'headline' news in the tabloid news-disk pages recently, so our News Desk Editor, Daniel Daire, has discovered. In his report Dan writes: "The Radios Amateur Involved, one Rupert Berhardt Mannion is an 86 year-old severely disabled motorised 'buggy' bound enthusiast who has been causing "chaos" (sic) according to the tabloid press - by driving his battery-powered conveyance without due care and attention - having run down several customers in his local Sainsbury-Tesco store in Ferndown, in the Wessex Region of the Federated English States (FES)."

"It appears that despite being warned by the local Community Police Sub-Contractors Wessex-Pel, Mannion had insisted on continuing to drive his 'buggy' while talking on his Amateur Radio 'mobile' equipment. The incident became so serious that the nearest full-time Policeman had to be called in to handle the case, rather than the local Sub-Contractors. This meant the officer had to travel from East Anglia where he'd been called to deal with a particularly heinous Motoring Offence.

A Practical Wireless Connection?

Unconfirmed reports - from the notoriously unreliable tabloid disk press - also state that Mannion, who (allegedly) still insists on using the callsign G3XFD (which is illegal as it pre-dates the formation of the FES) claims some connection with Practical Wireless. This - if true - might have repercussions as such irresponsible PIPS (Privileged Infirm Persons) could be seen to be doing much harm to our hobby while driving their 'buggies' and trying to operate their illegal high power (yes ... more than the EMC regulation 10W p.e.p. limit) transceivers at the same time!

Dan Daire continues: "From my investigations it appears that G3XFD - as he insists it must be - has run down several supermarket customers and the excessive power levels from his transmitter have also caused several other wheelchair and 'buggy' users to lose control of their conveyance as the transmissions affected the electronic controls. One (reportedly) shot into reverse as Mannion passed by and deposited its rider into an ornamental fishpond outside the store and another accelerated into the fish counter ... ending up amongst a fresh delivery of Spanish Squid!"

"Finally" (says our Newsdesk Editor) "...The whole sorry story is compounded by the fact that it appears Mannion has been operating his whole Amateur Radio hobby from his especially adapted PIPS bungalow without the permission of the Neighbourhood Inspection Council Electorates (NICE)! This (so he claims) is because he had been living in the bungalow since 2000, before the advent of the FES."

So, here we have the possibility of a truly major offender bringing our hobby into dis-repute! I can say this because it also appears that G3XFD is using analogue superhet receivers which are capable of radiating their 1 milliwatt local oscillator outside the store and another accelerated into the fish counter ... ending up amongst a fresh delivery of Spanish Squid!"

Radio Net On 6.5MHz An Overwhelming Success

The newly introduced 'RadioNet' licence free radio-linked International computer service based on 6.5MHz has taken the UK and the EU by 'storm'. Based on computer-transceiver units the system has proved beyond doubt that users previously limited by the original telephone-based 'Internet' systems land-line costs and availability limitations, now have greater freedom at no cost.

Now, once the user has bought a Government Catalogued High Quality (GCHQ) approved computer-transceiver (no licence required) and erected the simple antenna, they'll be ready to join the 'Internet Of The Air' at no cost whatsoever, apart from the initial and running costs of the equipment. Additionally ... no training is required to set up the radio link!

Based on each individual system providing a 'cell', the 6.5MHz system provides free radio-linked computing message services throughout Europe and around the World. The thousands of individual units 'report' via the 6.5MHz common frequency to a 'server' transmitter located in each region. No on-off switch is provided as each system must be 'on' to pass traffic to and from others units as part of the cell. However, the encrypted messages can only be 'opened' and 'read' by individual readers they are being sent to.

Success of the system was guaranteed once the necessary International short-wave radio links were set up. These, in the same way as the regional 'server' provider's transmitter-receivers, are 'sponsored' by major computer manufacturers who in return for providing the free high power stations in each region are allowed to 'tag' on advertising and sales information to every message radiated in their area.

However, it's not all good news! There are reports of computer interference to the newly-extended '40 Metre' Amateur Band which starts at 6.7MHz, from badly adjusted GCHQ computer-transmitters. But you can be sure - PW will watch developments of this network (and GCHQ equipment) very closely on behalf of readers!

Please direct any correspondence or comments to the PW office in the correct year - remembering to add the relevant space-time-warp code.
NOVEMBER SHORT WAVE MAGAZINE

Whether you are brand new to the hobby of radio monitoring or a seasoned DXer, there is something in Short Wave Magazine for you every month!

BROADCAST SECTION

◆ LM&S
◆ Bandscan-America

Info In Orbit Special

Weather Satellites - Getting Going

It all started during a lunch hour… yes, that’s when Lawrence Harris first heard about weather satellites. But it took a further 15 years before he found the opportunity to re-investigate them.

‘Info’ Readers’ Pictures

Lawrence shares a few more of the pictures submitted by ‘Info In Orbit’ readers.

OKEAN-1 A Satellite With A Mission

Recent bursts of telemetry from OKEAN-1 may have been the first heard from this type of satellite by some newcomers to WXSAT monitoring. Lawrence takes a look at its instrumentation, which helps explain the unusual images that we may see during the coming months.

WXSAT Reception Competition

Competitive image acquisition was the theme of the recent RIG mailing list contest. However, Lawrence forgot to set-up his gear. Read all about the winning entries.

Also This Month

Philip Mitchell explains how to become an expert weather forecaster for a minimum outlay, by utilising a wealth of data transmitted via h.f. radio teletype.

Paul Swansbury gathers with like minded devotees and discusses various radio wish lists. Did they come up with a dream receiver? Read ‘Radio - Technology Pull or Market Push’ and find out.

Joe Carr K4IPV takes a final look at ‘Passive RF Parts You Can Use’.

CRAMMED FULL OF ESSENTIAL INFO FOR ANY RADIO ENTHUSIAST - CAN YOU REALLY AFFORD TO BE WITHOUT IT?

November 1999 Issue

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<td>IC-706G</td>
<td>HF 6m, 2m, 70cm</td>
<td>£999</td>
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<tr>
<td>IC-746</td>
<td>HF, 6m, 2m 100W, 100W, 100W with tuner built in</td>
<td>£1395</td>
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<td>FT-920AF</td>
<td>HF &amp; 6m built-in tuner with FM &amp; FREE AM/FM Filter</td>
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<td>FT-847</td>
<td>The new mobile-base. DSP HF 2m-70cm 50WHz.</td>
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<td>TH-G71E Full 5 Watts power. Wide band receive.</td>
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<td>DR-140</td>
<td>2M mobile 50W</td>
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<td>DR-430</td>
<td>Mobile 70cm</td>
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<td>DJ-G5</td>
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<td>SM1 13/600 ohm selectable, 8 pin desk mic</td>
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<td>Microphones</td>
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<tr>
<td>C-60A dual impedance desk mic internal pre-amp</td>
<td>£106</td>
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**Yaesu FT-847 options**
- ATAS-100 active tuning ant system | £224
- FC-20 automatic ant tuner | £197
- MD-100 460MHz desk top mic | £96
- YF-115S 45kHz/50kHz Collins Mechanical filter | £99
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<td><strong>KENWOOD</strong></td>
<td>TS-530SD HF MINT BASE 240V</td>
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<td><strong>KENWOOD</strong></td>
<td>TS-690SAT HF / 6M / 50W</td>
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<td><strong>KENWOOD</strong></td>
<td>TS-880SAT TRANSCEIVER HF +50MHz</td>
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<td>TS-850 TRANSCEIVER 0-30MHz</td>
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<td><strong>KENWOOD</strong></td>
<td>TS-945B HF BASE 100W Inc 2 x CW Filters</td>
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<td><strong>KENWOOD</strong></td>
<td>TS-950SDX HF BASE DIGITAL 150W</td>
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<td><strong>DRAKE</strong></td>
<td>SW3 REceiving World Band</td>
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<td><strong>ICOM</strong></td>
<td>IC-771E 2M MULTI MODE</td>
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<td>IC-725 HF/FM</td>
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<td>IC-725 TRANSCIEVER PLUS FM</td>
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<td><strong>ICOM</strong></td>
<td>IC-726 HF / 6M / MULTI MODE</td>
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<td><strong>ICOM</strong></td>
<td>IC-735 HF 'MINT'</td>
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<td>IC-735 TRANSCEIVER</td>
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<td><strong>ICOM</strong></td>
<td>IC-737 BASE TRANS, INC TUNER 0-30MHz</td>
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<td><strong>ICOM</strong></td>
<td>IC-751 HF 0-30MHz 100W</td>
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<td><strong>ICOM</strong></td>
<td>IC-765 HF Base Station 0-30MHz</td>
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<td>IC-TBE 2 m 70m &amp; 6m HANDIE</td>
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<td>AT-230 ATU 0-30MHz</td>
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<td>PS-33 Power Supply</td>
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<td><strong>KENWOOD</strong></td>
<td>PS-52 22AMP PSU 870 EXT</td>
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WE ARE 5 MINS AWAY FROM J11 M6

Please mention Practical Wireless when replying to advertisements
As is usual at this time of year, the Rev. George Dobbs G3RJV has a special offering for you which he says are "two little circuits for after the Christmas pudding" (provided you can keep awake of course)! But first comes the usual appropriate quotation ...

"The siren waits thee, singing song for song"
Walter Savage Landor 1775 - 1864,

In the whole, Christmas traditions should be left untouched, however new they are. I say this because, in recent years, I've offered a couple of little circuits each Christmas to relieve the tensions of the festivities and to provide an escape route to the workshop! Over-filled with food and weary of the social obligations, the radio constructor can retire to the workbench saying "I am just going a make a little novelty for the children (or grandchildren)!

For this month I've provided a novelty circuit with a more useful circuit thrown in to justify the exercise. So, gather up the bits for these circuits before the shops and mail order companies close for the ever-longer break and prepare yourself for a little Christmas peace in the workshop.

The Pole-Check

The 'Pole-Check' is a useful little circuit, which has been around in some form or other for many years. It's simply two leads coming from a small container (I use a 35mm film canister - see Fig. 1) that may be used to check the polarity of a circuit or a power source. Each of the leads has a light emitting diode (l.e.d.) mounted at the point where it enters the container.

When the leads are applied across a circuit or a power source, one of the l.e.d.s will light to show that the adjacent lead is connected to the positive (+) side of the circuit. It's very simple ... a lighted l.e.d. shows a positive lead.

The circuit is shown in Fig. 2. The whole thing comprises of just four diodes, two l.e.d.s and a resistor and works as follows:

Imagine that the probes are connected to a voltage source of unknown polarity. If probe 1 is connected to the positive side of the voltage, diode D1 will conduct passing current to l.e.d. 1, through the resistor (a current limiter for the l.e.d.) and D3 provides the completed path, l.e.d.1 will light. If probe 2 is connected to the positive side, the conducting path will be via D4, l.e.d. 2, the resistor and D2. In this case l.e.d. 2 will light. It's as simple as that!

The heading photograph shows my prototype and as I've already mentioned - I used the 35mm film canister to hold the minimal electronics although a smaller container would do the job. The probes are two clip leads that enter the lid of the canister with an l.e.d. placed close to each lead. The placement of the leads and the l.e.d.s must follow the circuit: probe 1 next to l.e.d. 1 and probe 2 next to l.e.d. 2.

The only thing likely to go wrong is the placement of the leads with respect to each other. But be careful when working with leads that are close to the l.e.d.s!

Practical Wireless, December 1999
Fig. 3: The 'Siren' project circuit which G3RJV suggests could be used as 'justification' for disappearing into the workshop.

wrong with the building of this circuit is (ironically!) failure to get the polarity correct! The diodes and the l.e.d.s must be mounted as shown in the circuit diagram. (Fig. 1 shows the polarity of the diodes and the l.e.d.s.).

The circuit suggests the 1N4001 for D1-4. In fact, I used 1N4005 diodes because I have a lot of them. The l.e.d.s are standard red types. The circuit is fine for use up to 12V and ideal for keeping in a car toolbox to check those complex wiring harnesses.

The Siren

The diagram in Fig. 3 shows the 'justification circuit' I've mentioned. This project provides the ideal excuse for being in the workshop!

In fact, the project is a wailing siren sound generator (see picture in Fig. 4), which should prove popular with children. It produces a rather alarming sound that's easy to vary and customise to the youngster's taste and could also be used as an alarm.

The circuit is built around two 555 timer chips (the 555 was probably the first and is still the most popular timer chip). The device is often operated in an astable mode where it's re-triggered to work as a free running oscillator; the trigger connection on pin 2 is connected to the threshold connection at pin 6. (It can run in a monostable mode, where an input pulse to pin 2 triggers a timed output).

A control voltage input, at: pin 5, allows the output frequency to be modulated. This is the facility used in this circuit to produce the wailing effect.

The integrated circuit, IC1, is wired as an astable oscillator with a frequency of around 800Hz. The output is a square wave and the frequency is determined by the values of R1, R2 and C1. Ideally the value of R2 should be at least three times the value of R1. The output is coupled via a capacitor from pin 3.

There's enough output to drive a small loudspeaker but the total d.c. resistance presented to the output should be in the order of 80Ω. If, as in my case, an 80Ω speaker was not available, a series resistance, Rx, can be used to make up the total resistance. (The volume will not be very high but probably high enough for the potentially unpleasant sounds this circuit can emit).

Lower Frequency

The second 'chip', IC2, is another astable oscillator running at a much lower frequency. This provides a ramp voltage to modulate the 800Hz oscillator. The slow waveform at Cf feeds a pnp emitter follower transistor, which modulates IC1 via the 2.7kΩ resistor. This produces a slow frequency modulation of the signal generated by IC1.

The overall wailing effect depends upon the frequency of this modulation. There is some advantage in offering a range of 'undesirable' sounds and this range could be achieved by altering the values of either Cf or Rf, which control the frequency of IC2.

Since the value of Cf is the more difficult to vary, I arranged for the value of Rf to be made up from a fixed resistance and a pre-set potentiometer wired as a variable resistance. The values shown seem to produce a useful range of sound effects. This is an area where the individual constructor can play and perhaps gain the approval of the recipient of the unit!

Fig. 4: The 'Siren' circuit can be built into a simple ABS plastic box and could be used as part of a 'shack' burglar alarm circuit (see text).

I built my version of the circuit on perf-board and mounted it in a small ABS box with a small speaker, a PP3 battery and a switch. Individual constructors could no doubt find more novel and appealing (euphemistic?) ways to mount the circuit. It may even fit inside a toy or one of those small PC speaker cases. Possibly the most important thing is to find someone who will take it away from you!

So - have a peaceful Christmas and a very happy new Millennium!
November 14: The Great Northern Amateur Radio Society are holding their 11th Radio & Computer Rally at the Lee Valley Leisure Centre, Chingford, London E4. Doors open from 1030, admission is £1.50. All the usual radio and electronic stalls, component and special interest exhibits. For further details contact Colin G0UCH on (01706) 376579 or e-mail colin@g0uch.force9.co.uk.

December 8: West Kent Raynet will be holding their quarterly meeting at the Castle Room in the Angel Centre in Tonbridge. The meeting will start from 2000 and any Radio Amateurs who are interested in learning about West Kent Raynet and its activities will be welcome. Food will be available. Further details from Colin G0UCH (QTHR) on (07930) 893664 or e-mail colin@g0uch.force9.co.uk.

2000

January 23: The Lancastrian Rally will be taking place at Lancaster University. Routes from south - leave M6 at J33, routes from north - leave M6 at J34; open at 1100 for disabled visitors. Entrance fee is £1.50. There will be a Bring & Buy, Morse tests on demand - two passport photos required. Licensed Cafe on site. For booking details contact (01772) 621854.

January 18: Oldham ARC will be holding their rally at the Queen Elizabeth Hall, Clive Centre, West Street, Oldham, Lancashire. Doors open 1100, 1030 for disabled visitors. Event features the usual traders and a Bring & Buy stall. Morse tests available on demand. Talk-in on S22 via GH40SC, commencing 0730. Refreshments and free car parking will be available. Details: (01706) 367454. E-mail: mcwv@netcomuk.co.uk.

February 6: The 15th South Essex Amateur Radio Society are holding their Radio & Computer Rally at the Paddocks, situated at the end of the A1303, Long Road, Canvey Island, Essex. Doors open from 1030 and features include Amateur Radio, Computer & Electronics exhibits, Bring & Buy, RSGB Morse testing on demand (two passport photos required). There will also be home-made refreshments, free car parking with space outside main doors for disabled visitors. Admission is just £1. More information from Brian G70IO on (01368) 756331 before 2100 please.


February 13: The Northern Cross Rally is to be held at Thoresby Park, Athletics Stadium, Wakefield, in one large hall, just out of town on the M1, J28, or the A38. Turn west of Rochdale. Follow the orange arrows from M62 J 20. Doors open 1100 (1045 for disabled visitors). There will be refreshments and a rest area. John G70OA, evenings, on (01770) 376204.

March 19: The Norbreck Amateur Radio, Electronics and Computing Exhibition, organised by the Northern Amateur Radio Societies Association (NARSA) at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country. Peter Denton G6CCF on 01516-305790.

March 19: Bournemouth Radio Society's 13th annual sale at Kinson Community Centre, Pelhams Park, Bournemouth. Doors open 1030 and close at 1630. Talk-in from G1BRS on 2m (14MHz/502). Amateur Radio and computer traders, clubs and specialised groups, excellent refreshments, admission £1. Details from Steve Goodger, 66 Hursley Wood Lane, Eastleigh, Hants. E-mail: relarn@mirage.com.

April 18: Swansea ARS will be holding their annual show in the Swansea Leisure Centre on the A4067 Swansea-Mumbles coast road. Doors open 1030-1700 and attractions include: trade stands; Bring & Buy; local interest groups; full catering & licensed bar. Admission is only £1, child 50p. Further details from Roger Williams G4AHS, Show Secretary on Tel: (01792) 404422.
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Practical Wireless, December 1999
Hello and welcome to the last Electronics-in-Action (E-i-A) for this Millennium. I'm not going to worry about any millennium bug, whatever name it's given, I intend to hibernate over the holiday period, stock up only on batteries for the toys that the grandchildren will surely get in Santa's sack.

Let me look at a few books for your library so that you have something to read over the coming festive time(?) A compilation of four years' worth of 'Technical Topics', the column written by Pat Hawker G3WA, in RadCom (The Journal Of The Radio Society Of Great Britain) is now available as a 'stand-alone' book: Technical Topics Scrapbook (1990-1994). The A4-sized book has over 300 pages all solidly packed with comments, feedback, ideas and small circuit details covering all aspects of the hobby of radio.

Presented in chronological order from January 1990 to December 1994 the pages are printed in the same format as they originally appeared in RadCom and make very interesting reading. It's possible to follow a thread of comments, or ideas, as they were printed, but I cannot put this book into a particular category, as it covers so much of interest. This is an excellent book that reflects, from a small time window, the range of topics covered by Pat Hawker in his column that has appeared continuously in RadCom for the last 41 years.

Work Cut Out

The compilers of Technical Topics Scrapbook (1990-1994) must have had the work cut out when they came to creating the index covering all 48 issues of a column that could take any direction, and frequently did. This book is an absolute must for any radio shack!

The second book I have from our 'Book-store' this month is from Ian Sinclair. Practical Electronics Handbook (Fourth edition) has over 430 pages so it isn't a light book covering many topics in the eleven chapters and four appendices. This book is more of an 'aide-memoire' than a teaching book, the first four chapters dealing with passive and active discrete components, typical circuits and linear integrated circuits (I.C.s).

Most other chapters would perhaps be more relevant to those dealing with digital electronics and computing as they cover digital I.C.s, microprocessors, digital signal transfer, digital to analogue (D-A) conversions and computer use in design and manufacture. The final chapter covers hardware and practical work. This book is a good reference book for anyone interested in more generalised electronics.

Another reference book that I found in the Bookstore is Electronics Hobbyists Data Book (BP396) by Robert Penfold. There are six chapters in this smaller format book, but there's much varied information in its' 240+ pages. Chapter one covers general circuits types. Chapter two, a shortish chapter covers the various coloured and numerical codes used to indicate values on many components, chapter three covers operational amplifiers, chapter four covers logic I.C.s with chapter five covering many other semiconductor components. The final chapter, six, covers other miscellaneous data. This is a very good value general data book at the price of £5.95.

My 'Tuppence'

The final book this month was profiled last month, but I'm unashamedly throwing my 'tuppence' in, because I feel this is a superb book. The Man Who Invented The Twentieth Century: Subtitled 'Nikola Tesla, Forgotten Genius Of Electricity', the hardbacked book from Robert Lomas, really is a very good read and readily lives up to its sub-title. Like many I had heard of Tesla but I didn't have any idea of his contemporaries he really was.

Nikola Tesla was interested in the 'wireless' transmission of electrical power rather than of signals, and so failed miserably to appreciate what Marconi had grasped (or was to grasp several years later). While Tesla was lighting his workbenches with radio waves (wireless) fluorescent lights and using multiple tuned circuits to transmit power, by wireless means, to specific circuits, radio signals via wideband spark transmissions had only just begun.

My own favourite 'story' from this well researched book is when Tesla demonstrated ultra low audio frequencies to Samuel Clemens (pen-name - Mark Twain) with disastrous personal results for Clemens. I feel rather saddened by my own lack of knowledge before I picked this book up (and found it difficult to put down again) and read it. This book redresses our 'mis-laying' the knowledge of Nikola Tesla and his inventions, Highly recommended.

Stager Update

I'd better put on the sack-cloth and ashes first this month to bring you an update to the Morse Stager project that I presented in the October 1999 E-i-A column. A letter from George Fisk says 'I expect that you will have noticed that the circuit diagram (of the Morse Stager, shon on p60 of the October 1999 PW. Ed.) shows IC2 as an LM741, while your prototype unit uses what you probably intended the diagram to show, an NCI458'.

To be honest George, I hadn't spotted that one, otherwise it would not have been there. I used the parameters from the '741 'Op-Amp' data sheet, but forgot to change it when I came to drafting out the circuit diagram. As George mentioned I did use the '1458' type of Op-Amp IC, which contains two '741 similar units. George also mentions two capacitors, that were shown on the p.c.b. overlay but not actually on the circuit diagram.

The two capacitors referred to are the two items shown with dotted lines near IC2 on 3 and 4 on Fig. 4 (p.41 Oct '99). These two capacitors were 'designed in' to give more gain and audio output from the two LM386 audio amplifiers if needed, which they weren't! George also referred to my comments about a high level of 'white noise' that could be present in the earpieces of the headphones, suggesting that the units might be unstable at ultrasonic frequencies.

The 'Zodel network' a capacitor resistance series pair in the output
a new licensee discussing power said "I've just spent half an hour with capacitors in power supplies. This cover as well is the subject of with a hearing impairment. I will suggestion that George made. was higher than normal. One other
periods at a high level.

reduction in hearing capacity in that alone would, I feel, lead to a higher audio frequencies in one ear if the unit was used for long

filter inline. This predominance of the toward the ear with the high pass especially those that are channelled
exist on a radio transmission and
find any instability in the units that

circuit) that George suggested would cure any instability. However, I didn't find any instability in the units that I've built, my comments were more in line with the wideband noise that can exist on a radio transmission and especially those that are channelled toward the ear with the high pass filter inline. This predominance of the higher audio frequencies in one ear alone would, I feel, lead to a reduction in hearing capacity in that ear if the unit was used for long periods at a high level.

Volume Level Warning
My warning about audio volume level is especially true if you are struggling to 'winkle' out the weakest signals from amongst the noise and

whistles. It is often on this type of signal, that you have the audio level higher than normal. One other suggestion that George made, was about the unit's usefulness to those with a hearing impairment. I will have to look into further and let you know in a later column.

Another topic that I shall have to
cover as well is the subject of capacitors in power supplies. This idea was triggered by a letter from John Gomer GBUNZ, in which he said "I've just spent half an hour with a new licensee discussing power

supplies and how all the power goes into the electrolytic (capacitors) on peaks - so, needing large terminals. The concept of 'Ripple-rating' of capacitors is not taught apparently.".

I've discussed the same idea myself at talks about power supplies that I've given to my local radio club, at which I've shown what I consider to be suitable power supply capacitors (about the size of a small coffee [ar with large heavy screw terminals]. Then, on opening up a commercial 20-25A unit, showing only a few small inadequately sized capacitors that may be fed from a very 'meaty' transformer. But that's another session.

Leicester Show
At the recent Leicester show I had only a few short periods to 'wander' around the show for myself and one of the few items I found (and bought) was the unit shown in Fig. 1. The item of Fig. 1 was marked as a tuning unit for the 'Clansman' series of the few items I found (and bought) was the unit shown in Fig. 1. The item of Fig. 1 was marked as a tuning unit for the 'Clansman' series of radios. I have to admit I'd not seen this particular unit before, but it was so 'pretty' that I bought two of them for £3 each.

On stripping the unit down I recovered two 12.5-turn coils on a white g.p. former. I'd thought at first that the formers were ceramic, but I was wrong! The coil was some 28mm diameter and covered a length of 34mm. Using Wheeler's formula (shown here) for calculating the approximate inductance meant I had to convert these values back into imperial (inches) as I have not yet found a completely metric version of the formula.

\[ L_n = \frac{\pi^2 N^2}{8a + 101} \]

Where:
- \( L_n \) is the inductance (in \( \mu \)H)
- \( R \) is the radius of the coil
- \( N \) is the number of turns
- \( L \) is the length of the coil

In Wheeler's formula (shown above) all measurements are in inches and the answer given should be accurate to within a few percent. I'll look for a metric version of this formula, but using the formula given, indicates an inductance of around 2.4\( \mu \)H. The photograph of Fig. 2 shows one of the coils along with a 9:1 Impedance (bump up or step down) transformer. This transformer was one of a matched (but physically mirrored) pair that you can see in Fig. 1.

And Finally.
And finally before I close down for this month, I must mention that by the time you read this Mainline Electronics should have a number of the Jackson Brothers Variable capacitors, variable drives and stand-off insulator back in production. Great news for the hobby after they almost disappeared altogether before Mainline stepped in to rescue them. For more information contact Mainline Electronics at PO Box 235, Leicester LE2 9SH Tel: 0116 277-7648 or FAX: 0116 247-7551 or by E-mail to sales@mainlinegroup.co.uk

See you next time.
Modifying The MQ-2 Antenna

Peter Dodd
G3LDO, after reviewing the MQ-2 antenna in the August 1999 PW, found he could make it perform better!

This Antenna Workshop discusses the methods of re-designing the antenna using the existing four MQ-2 element loading clusters. I must emphasise that this is not a project for beginners. You will also need a dip meter to check the resonance of the elements (see The Antenna Experimenter’s Guide).

In the August 1999 edition of PW I reviewed the MQ-2 antenna, a compact two-element beam for the 14, 18, 21, 24, 28 and 50MHz bands. The antenna uses end loading separate inductance and capacity ‘hats’ at the ends of each element for each of the bands.

One of the spokes in each of the capacity hats is constructed so that the resonant frequency of the antenna may be set at a specific part of the band. A general view of this antenna is shown in Fig. 1, and was originally published in the August review.

In my review of the MQ-2, I mentioned its lack of directivity on 14MHz and the difficulties in trying to match the antenna to the feeder on all the bands. Now a very similar antenna to the MQ-2, the G4MH Minibeam (designed many years ago), also uses similar inductive and capacitive end loading.

The G4MH minibeams designed for the 14, 21 and 28MHz bands has the parasitic element director (rather than the reflector of the MQ-2). In spite of some of the limitations of the MQ-2, I felt that this configuration had promise so I bought the review model with a view to modifying it.

Computer Model

My first task was to make a computer model (using EZNEC) and compare it with the real antenna to test the modelling technique. Because of the antenna's complexity only a single band antenna was modelled. The display, Fig. 2, shows the model of the antenna’s free-space polar diagram modelled at 21MHz.

The performance of the antenna was optimised by altering the reactance value of the inductors. The length of one of the spokes is adjusted in the real antenna but altering the inductance was more convenient in the computer model.

My computer model agreed with the real thing, showing the antenna performance is certainly quite acceptable for a small beam when correctly adjusted. I now had reasonable confidence in the computer model of the antenna, that it would be suitable for looking at other configurations employing element end-loading. So, how important is the diamond shaped reflector of the MQ-2?

The MQ-2’s reflector structure is quite complex. And there were, I believe, problems in the early models with the quad reflector distorting due to the differing expansion coefficients of the insulating and metal sections when subject to large variations in temperature.

Further Investigation

To carry out further investigation, I built a simple model (in the computer) where the end capacity loading is simplified by replacing the four spokes with two spokes (each twice the length of the original ones). The purpose of this makes it easier to manipulate the element spacing and configurations.

In the modelled polar diagram shown in Fig. 3, I’ve replaced the quad reflector with a simple straight element. The polar diagram shown is very similar to that shown of the original MQ-2, make it appear that the extra complexity of the quad reflector is not justified. The differences can be put down to optimisation - you can go for greater gain at the expense of reduced front-to-back ratio.

The next step was to try the parasitic element as a director. All the literature I have and computer modelling programs I have tried, suggest that a normal close spaced Yagi beam (0.11) has improved performance if the parasitic element is tuned as a director. The cubical quad is an exception.

The result of using the parasitic element as a director is shown in Fig. 4. I have repeatedly tried to improve this model with optimisation but this is the best that could be achieved. Although the performance of both antennas is quite acceptable at 21MHz and above, the same cannot be said for when the antenna is used on 14MHz.

Fig. 1: Mechanical layout of the MQ-2 Antenna. Each loading assembly comprises a separate set of inductance and capacity ‘spokes’ for each band. One spoke in each set is constructed so that its length can be varied, allowing a degree of tuning for each band.

Fig. 2: Polar plot of the computer model (using EZNEC) of the MQ-2. The free-space polar diagram is for 21.2MHz with its polar diagram and the X, Y and Z co-ordinates superimposed.
**Elements lengths**

The element lengths were changed from 3.6m to 4.49m and the boom length from 1.37m to 2.1m. In practice this means replacing most of the metalwork in the antenna. The original element tubing diameter is 25.4mm outside diameter. The loading assembly at the ends of the elements have been machined to 22mm to fit inside this tubing.

Because of the increase in size and weight of the new antenna, I felt there was a need for slightly larger diameter tubing. So, I used 30mm tube for the centre sections of the elements. The original tubing was used for the end sections of the elements, telescoping into the new section and other the ends still with the loading assembly.

The reflector and driven elements are the same length but the driven element is cut in the centre so that it may be fed directly with coaxial cable. The original centre insulator is 150mm square and the element is fixed to the insulator using a U-clamp and a nut and bolt, and supported for only 70mm of its length. A more rugged driven element centre section was designed and is shown in the photograph of Fig. 6.

The new centre section comprises a thick aluminium rectangle plate approximately 100mm x 200mm. The insulated elements (with thick pvc insulation) are fixed to the plate with exhaust clamps.

Now comes the tricky bit. As I mentioned earlier the inductance of each of the loading assemblies needs to be reduced to compensate for the extra element length. This is achieved by removing one turn from each of the five coils on each of the loading assemblies.

**Silicone Sealant**

The coils are covered in a layer of silicone rubber sealant. The end of the coil is unsoldered from the bus and one turn removed by pulling the wire through the sealant. The excess wire is then cut off and the insulation scraped from the end, and the wire re-soldered to the bus bar. When all the coils have been modified the elements can be tested.

Fix the driven element loading assemblies (marked DE) to the end of the driven element complete with its centre insulator. Connect a shorting wire across the feedpoint. You could make loop of this shorting wire to couple the dip meter. Mount the element at least 1.5 metres above the ground away from large metal objects.

Adjust the spoke lengths for resonance dips at 14.2, 18.1, 21.2, 24.9 and 28.5 MHz. You might have to remove more than one turn from a coil. When this is done, remove the driven element loading assemblies and fit the reflector loading assemblies (marked R) to the end of the test element. Resonate the reflector element to 13.9, 17.9, 29.85, 24.5 and 27.5 MHz. Remove the loading assemblies and the link/loop from the driven element. Seal the damage to the sealant on the coils with clear silicone rubber sealant.

The antenna can now be assembled and tested. The instructions on the original MQ-2 suggest fine tuning the reflector to obtain minimum s.w.r. but, as you can see in Fig. 7 the s.w.r. at the design frequency is very low anyway.

**Big Improvement**

The modification to the MQ-2 has made a big improvement to the 14 and 18 MHz bands. In the higher frequencies there is no noticeable improvement in gain or front-to-back but the improvement in the impedance bandwidth on all bands is most marked. The antenna has been in use for several weeks now and has weathered several storms without any problem.

Fig. 3: Simplified model where the end capacity loading is modified (see text). The reflector is replaced with a simple straight element and the performance (free-space gain 6.2dB, F/B 13.5dB feedpoint impedance 21IQ) is very similar to that shown in Fig. 2.

Fig. 4: The parasitic element tuned as a director. Free-space gain 4.1dB, a marked reduction in performance compared with Fig. 2 and Fig. 3.

Fig. 5: The modified MQ-2 showing its performance on 14 MHz. Free-space gain 4.6dB, F/B 16 dB, feed impedance 47IQ.

Fig. 6: Driven element centre insulator section. The elements are insulated from the plate and the U-bolts with thick PVC insulation, which is taped to the elements before fixing in place.

Fig. 7: Plots (s.w.r.) of the MQ-2 before and after modification. The original MQ-2 was resonated to the CW section of the band.
Autumn greetings and welcome to my final column of 1999. From the letters I've received it seems my mention of tape recorders in the September column revived fond memories for many of you. Keep your capstans turning, there'll be more soon! Back to radio now and Jurgen Bittner E-mailed me from Bavaria! asking whether I'd heard of a company called Magneta Time Co. Ltd of Leatherhead, Surrey. He tells me he has one of their rather unusual radios.

Jurgen's set has no model number, just the serial: T02702. We both think it may have been for public address use because it has a metal case and a microphone input. Oh... and the push-pull 6V6GTs used in the circuit seem rather excessive for the small, built-in loudspeaker. I'd not heard of this company before and I can't find any mention of them in my reference books.

Anyone know anything about the Magneta Time Co. or their products? Or how one of their sets got to Bavaria? No doubt someone out there in 'PW land' will tell us!

Construction Time

Winter approaches and inclement weather returns (in the UK at least) and 'construction time' is just round the corner. Time to put away the garden tools and reach for the soldering iron. And to get you 'in the mood' I've found an interesting 3.5MHz transceiver project, Fig. 1, which was first published in the March 1953 issue of Practical Wireless.

A Midget 12W Amateur Station. T. W. Dresser, page 134. March 1953

It's typical of dozens of circuits published between the late 1940s and the mid 1960s. Updating such circuits shouldn't be much of a problem but there are a few points to watch for. I'll use this particular circuit to illustrate what I mean.

Please note, although the 1953 circuit has been redrawn for reproduction, it is a faithful copy of the original (indeed, it still has the same mistakes!).

Older Circuits

Whenever you decide to update an older circuit, take the time to redraw it. As you do, write the value and rating of each component next to its circuit symbol. Those of you who prefer the modern notation can convert the values at this time.

For instance, 0.01µF becomes 10nF; 270Ω becomes 270Ω.

Pay particular attention to the voltage rating of capacitors. If in doubt, those capacitors which have no explicit voltage rating should be rated at 150% of the expected h.t. voltage.

Be prepared to modify the circuit too! It may need additional components - often on safety or EMC grounds (in other words... much better R.F. filtering!) - and check for errors and omissions.

In older power supplies I think metal rectifiers are bad news so you should substitute a silicon rectifier. Even better, use a bridge circuit like the one shown in Fig. 2. Unfortunately, silicon rectifiers give a higher h.t. voltage than metal rectifiers, so you may need to add a high-wattage resistor in series with smoothing choke L5. Work out the value by a mixture of Ohm's Law and old-fashioned trial and error.

Although the h.t. voltage, as measured across C18 whilst transmitting, should be between 250V and 300V, use at least 400V working capacitors for C18 and C19.

At switch-on, before the valves draw current, the h.t. will reach the peak voltage of the h.t. secondary winding and that could be in the region of 400V. Unfortunately, new 16µF/400V electrolytic capacitors are quite rare; you may have to settle for 47µF/400V.

The original circuit shows no fuses, so put a 1A fuse in series with the primary of T5 and a 350mA time-delay fuse in parallel with the loading capacitor C5.

In the transmitter section the grid choke, RFC1, can be any transmitting type, but these are difficult to get hold of. Try two miniature 470pF filters in series as an alternative. In any event, RFC1 and RFC2 should not be physically the same. If they are - and have similar resonant frequencies - the valve may happily oscillate without a crystal. Not good!

Ideally, RFC2 should be a transmitting type, but those are difficult to get hold of. Try two miniature 470pF filters in series as an alternative. In any event, RFC1 and RFC2 should not be physically the same. If they are - and have similar resonant frequencies - the valve may happily oscillate without a crystal. Not good!

You really ought to use old, physically large crystals. For example, the 10XJ and FT243 types. Modern miniature crystals can be damaged by the (relatively) high currents in the grid circuit of these single-valve transmitters. A 10XJ and FT243 type.

As an essential safety measure, put a radio frequency choke in parallel with the loading capacitor C5. Use one similar to RFC2 if possible. If C2 breaks down, the h.t. will then flow to the key jack and blow the h.t. fuse.

Whenever you use a valve transmitter which has a traditional pi-tank output, make sure a choke, such as Tye L8. Work out the value by a mixture of Ohm's Law and old-fashioned trial and error.

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Whenever you use a valve transmitter which has a traditional pi-tank output, make sure a choke, such as I've advised, is present. If it isn't, fit one! You do not want 250V d.c. (or more) on your antenna!

In any event, RFC1 and RFC2 should not be physically the same. If they are - and have similar resonant frequencies - the valve may happily oscillate without a crystal. Not good!

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Whenever you use a valve transmitter which has a traditional pi-tank output, make sure a choke, such as I've advised, is present. If it isn't, fit one! You do not want 250V d.c. (or more) on your antenna!

Initially, the value of C5 seems on the low side; I'd try 500pF or more. A broadcast tuning capacitor with its sections in parallel will be ideal.

Superhet Receiver

The receiver is quite interesting and it's actually a superhet with a regenerative detector. As the set is intended for c.w. operation, the detector is set and left at the point of oscillation.

With a single valve regenerative receiver, leaving the detector running 'past the threshold' would be unacceptable
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The transmitter and its associated power supply are shown in Fig. 3. It's appropriate to include it here because the circuit of John's transmitter is very similar to the transmit section of Fig. 1.

John's method of construction illustrates an approach I tend to favour-building functionally separate parts of a circuit on separate chassis. In John's case it was simply a case of building the transmitter on a chassis and the power supply inside a small metal enclosure. Looking at Fig. 1, it's clear that the receive, transmit and power supply sections could easily be split from each other and built on separate chassis. Of course, you could simply build the receiver and power supply sections. Or even use the receiver with a different transmitter and/or power supply.

Part of the fun of home construction is in 'borrowing' bits of circuitry from different published designs and putting them together to create something more personal. It can be much more satisfying (and educational, particularly if you run into problems) than building a straight copy.

However, it usually pays to keep the layout of each section similar to that of the original design. Don't go asking for trouble!

There are other, more practical reasons for favouring the 'building block' approach. For instance, small, functionally separate units are easier to work on than one large chassis. And you can get each bit working properly before moving on to the next stage. This helps with fault finding as there's less to go wrong at any one time; very useful if you're a beginner.

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Practical Wireless, December 1999
This month sees the last of the 'Book Profiles' aimed at providing you with a library of books concentrating on the last Century in radio. The books on these pages will make excellent Christmas presents for loved ones, friends and family alike. If they are interested in nostalgia then why not invest in an early Christmas present?

This time around we look at books which would be of interest to the Vintage collectors among you. The various books on these pages contain information on old radios of varying types, shapes and sizes. The Editorial team hope that you enjoy reading these 'Book Profiles' half as much as the Editor enjoyed 'leafing' through the books themselves.

To order any of the titles mentioned on these pages please use the order form on Page 90.

TELEPHONE, FAX, E-MAIL OR USE THE ORDER FORM ON PAGE 90

Practical Wireless, December 1999
The book tells the reader that the authors of this book - Marty and Sue Bunis - have been radio collectors for a number of years. They have a particular penchant for the novelty transistors and the small pocket-size transistors from the 1950s and early 1960s.

In the introduction to their book, the couple look at such aspects as price and availability, style and size, nostalgia and historical significance and case condition. Once again, as with Transistor Radios - A Collector's Encyclopedia and Price Guide, the transistor sets are mentioned in alphabetical order under their manufacturer, i.e. Acme and Admiral through to Zephyr and Zohar. There are also a number of Motorola transistor radios in this book.

There doesn't appear to be as many pictures of novelty radios in this book as there are in the some other books on the same subject... there are, however, some interesting radios which come hidden inside a book of all things - the Crosley JM-8GN "Magic Mood" radio!

Guide to Old Radios - Pointers, Pictures and Prices
Second Edition
David & Betty Johnson

"This second edition of Guide to Old Radios: Pointers, Pictures and Prices contains more than 3300 listings with updated prices, organised alphabetically by manufacturer; 350 photos and illustrations which document the evolution of both radio and broadcasting; and two additional chapters on the heyday of radio". At least that's what is said on the back cover of the book.

The authors, we are informed in the book, are antiques dealers who specialise in radios and 78rpm records. so who better to write a book all about vintage radios and their values? Their book also mentions (and gives prices of) associated items such as amplifiers, speakers, test equipment and repair manuals.

Not all of the photographs are in full colour, but there is no doubt that this book will have all you need when hunting down those vintage collector's items. The format this book takes is to start from "early crystal sets through the development of nickel-iron batteries to the use of electricity". This book comes Recommended.
**ANTENNAS**

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<td>A3S</td>
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<td>MA5E</td>
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<td>Short wave receiver</td>
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<td>YAESU FHC-100</td>
<td>Short wave receiver</td>
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<td>DRAKE R-3B</td>
<td>Short wave receiver</td>
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<td>JRC NRD-545</td>
<td>Short wave receiver</td>
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<tr>
<td>AOR AR7030</td>
<td>Short wave receiver</td>
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**ANTENNAS**

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<th>Model</th>
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<td>SW/VHF/UHF scanner</td>
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<td>SIVY-500mkII</td>
<td>SW/VHF/UHF scanner</td>
<td>£325</td>
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<tr>
<td>SIVY-700</td>
<td>SW/VHF/UHF scanner</td>
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Ault rotor with too bearing, £40, 3- ele 2 m beam £30. Tel: (0917) 1000/14 beam, £15, 2 m (7417)4 hole plate, £25, Nissi n.w.p.x.w.m. meter, 1.8-150KHz, £15. Tel: (0994) 269419.

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B300 P00 x 20 ft linear amplifier, £60. RAMA 90 frequency controller, £30,000; CE30 pre-amplifier, £30. A Service Bristol, 37, Tel: Swayne (0996) 990550.

Black Star signal generator 1MHz- 9900KHz, £13. Take 13 v 5 A power, £32. RS battery charger, 1.4A, dry cell or battery £15. Baxi 750W, £50. CW/TX 70W, 20 per box. £70. All mit. Tel: Phil on West Midlands (0121) 8934317.

Collins filter i.e. CB 45MHz Wanted. Edyteson 450/90 or B0D7, good condition only please. For sale. Weller TCP station, £16. Telequipment 0222 oscilloscope, £30. Oakeham true RMS meter, £20. Import/collection please. Tel: Peter (0114) 6912228, anytime.


Czech receiver 4L 1-a.m.m., s.s.b. 1.5-12.5MHz p.p., £50. Global a.t.s. AS- 1600, new £20, AS-1600, new £20, 18 sets from £16, £200-2 p.p. with 50 various other military sets for trade. Tel: Ben (0176) 324733. £12. Simon (0176) 412022.

Eddyteson 440 s. 75W 600K, £100. Division of 24600, full as new. Tel: Nick on Uxbridge (01895) 270444.

Eddyteson 440 receiver, £150. Eddyteson 732/4, receiver, £150 n.o.v. Both very nice condition and g.p.a., prefer buyer to collect or whilst by appointment due to weight. Tel: Jim McGowen M1CU on Essex (07719) 340394.


Algo 3D/GPS with round Bakelite case, complete and in excellent condition with perfect Bakelite case, not working, needs minor attention, £25. Tel: Romou (01212) 291245.

Ex (G3EZI) G3ELI kennen Ydwyd Ke@ TS- 850S, AT100 and E35U p.p., £450, no split, determination of n隶属, carassment, price or cost, Tel: David (0117) 9762831, anytime.

Face 2 02x20 to face 70 cm front cover 1980 model for spares or repair with carry case and power pack. Collect items, offer please collect. Tel: Chester (01244) 312071.

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For sale: Tri SO-54 valve communication receiver, g.p.a., £35 plus cargo, covers 1-5 MHz in four switched bands, Tel: John (01814) 323058.

FR-100G receiver with keytop, n.o.v., £20, CR-16 b.Jean, 40MHz, £12, Sandpiper mobile antenna, 3.6 144MHz, £50, Sandpiper, 7141, £72, Tel 2 Prompt 201, £60, Homebrew linear, 144MHz, £90, 1440, £90. Tel: £7435193.

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Icom IC-41 £100 in mint condition. £75. £20 in good condition. £20. Tel: (01727) 221550.

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Icom IC-775 £275 n.o.v. £200, £175 in excellent condition. £200. Tel: (01727) 221550.

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CVO will accept £100 Tel (01608 1t) tuning methods. Auto tuning 153kHz-300MHz nos, scan
in 846/18 8825 all latest boards as at
84618 8825

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Practical Wireless, December 1999
VHF REPORT

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THIS MONTH DAVID BUTLER G4ASR HAS DETAILS OF AN ATTEMPT TO CROSS THE ATLANTIC ON THE 144MHz BAND AND DESCRIBES MICROWAVE OPERATION FROM HILL-TOPS.

In 1995 the Irish Radio Transmitters Society (IRTS) announced that a pair of Waterford Crystal cut glass vases, called the Brendan Trophies, would be awarded to the first two stations to establish two-way communication across the Atlantic Ocean on the 144MHz band and rising to the challenge the stations of Bill Ward GM0CF and Jim Fisher GM0NAI loaned his Discovery amplifier (DC800 p.a.) and it ran faultlessly all week, providing 400W at the antenna. In total, Bill operated the station for 55 hours spread over the six day period.

Unfortunately, nothing was heard in either direction, but Bill wasn't down-hearted. He mentioned that the whole exercise was quite hard going but it might have been worse. It could have rained EVERY day! All the gear performed without so much of a hiccup, even with all the water in the tent. If you mentioned that groups making future attempts should be certain they have sufficient people to share the workload as listening to white noise for hours at a time can be rather demoralising. He also suggests that tests are arranged with a similar enthusiastic group of people able to assemble a high power 144MHz station - if no-one tries then we will never know what can be achieved.

Those of you looking to make the first terrestrial 144MHz contact across the Atlantic Ocean might be heartened by the news that the station of W1WF/MM (DL51), located off the Mexican coast, recently contacted the Hawaiian station KH6EME (KXQ2) over a distance of around 4734km. Both stations also attempted a trans-Pacific contact on the 430MHz band with partial success.

Steve KOXP mentioned on the vhf.dx.discuss Internet group that there are equivalent tropospheric ducts spanning the Atlantic Ocean from the Azores/Spain/Portugal/northern Africa across to Bermuda and other Caribbean Islands. Nobody seems to have taken those possibilities seriously enough to make a concerted, long-term effort to find and use these long distance paths.

He also mentions that there's a north-south marine duct along the North American east coast and south-east to Bermuda caused by the weather system termed the Bermuda High. Again, no-one seems to have investigated the possibilities, possibly because of the lack of serious weak-signal v.h.f./u.h.f. activity on the islands. The only time this duct gets noticed is when someone using an f.m. repeater or simplex operation stumbles across it.

Steve further reports that the Hawaiian duct across the Pacific Ocean was well known by aircraft pilots long before it was spanned by the amateur v.h.f. and u.h.f. bands. He remembers hearing of Second World War ferry pilots reporting its existence over 50 years ago. Similarly, there have been occasional reports by aircraft pilots of Atlantic Ocean ducts. Steve suggests that someone should try to track down such reports for further analysis.

Prompted by Steve's news group report, Peter Taylor G8BCG (ex-H44PT) managed to dig out some details from the 'Extended Range VHF Symposium' held at the Royal Geographical Society, London, in May 1963. The event, sponsored by International Aeradio Limited (i.a.l.), reported that "On a number of occasions San Francisco (SFO) has worked flights near Honolulu (HNL) and at least once has made the first terrestrial flight on the HNL field.

"SFO is probably the worlds best known extended range v.h.f. station and has provided the number one spreader of 'troposcatter', a malady which leads us to disregard the meteorological factor and expect a similar equipped station anywhere in the world to turn out a similar performance".

Peter mentions that the symposium papers cover extensive testing of Pacific Ocean paths. From the UK there were papers covering the route from Malta to Johannesburg. Including reference to then unnamed (e.g. HNL) trans-equatorial propagation.

So, it's all been done before and forgotten! Who will be first to span the Atlantic Ocean on the 144MHz band? Peter reckons it will be two f.m. stations, possibly mobile, in the right place at the right time. Although he thinks high power transatlantic beacons are a good idea these will only be useful for a limited number of enthusiasts. Peter suggests that well sited f.m. repeaters are a more likely source of alert although sadly this won't happen because of incompatible IARU band plans.

MICROWAVE STATIONS

For some years, the microwave stations of Julian Rolle G4UET, Jim Gale G4WYJ and Peter G4ZXO have participated as a team operating in various

---

Fig. 1: The 10GHz dish and 144MHz antenna at the station of G4UXO/P.

Fig. 2: The 10GHz dish at the station of G4UET/P.
Practical Wireless, December 1999

**Fig. 3: Transporting the equipment to the top of Ditchling Beacon.**

**Fig. 4: 1.3GHz Yagi and 2.3GHz Quad Loop Yagi.**

microwave contests and all of the regular 10GHz cumulative events. On this latter band, the group are fortunate to have two separate systems.

The equipment assembled by G4ZXO consists of a DB6NT transverter and matching low-noise amplifier (I.n.a.) using a high electron mobility transistor (h.e.m.t.). The antenna he uses is an ex-Halifax aircraft forward-facing radar dish, 750mm in diameter and fed with a waveguide double-dipole feed. On transmit, a DB6NT solid-state amplifier runs 10W output. In practice, this system enables regular portable contacts to be made with stations up to 400km away. A power of 10W output on the 10GHz band is quite high power and special precautions have to be taken to look after the safety of the team and the sensitive receive equipment.

Because of the higher field density in front of the antenna the dish is located on top of a 4m, high guyed pole, as shown in the photograph, Fig. 1. Care must also be taken with the I.n.a. as the h.e.m.t. device is more sensitive to r.f. overload than a normal GaAs f.e.t.

In practice, the device will be quite happy with input leakage powers of up to 10mW, but higher levels could cause catastrophic damage. To avoid high levels of r.f. from reaching the pre-amplifier, a special changeover relay designed for use at microwave frequencies is used.

It should be noted, at this point, that many of the small relays with SMA connectors available on the surplus market are unsuitable for powers above a few watts. As Peter is running 10W output the isolation of the relay should be better than 30dB to prevent damage to the pre-amplifier.

Isolation (sometimes called crosstalk) is the amount of signal that you can measure at the unused (receive) port compared to the used (transmit) port of the relay. With 10W being applied to a relay with 30dB isolation a level of 10mW will be present at the receive port. This is uncomfortably close to the upper limit that the h.e.m.t. can handle and an isolation of around 35dB or better is preferred.

At the 10W level it is also useful to utilise a relay that has tell-back contacts and interlock these with the transmit/receive control. This will prevent any r.f. being transmitted until the relay has changed over properly. The equipment used by Julian G4UET runs less power than the G4ZXO system but, nevertheless, it is still very competitive. It consists of a G3WDG/G4DVDK transverter kit with the addition of a 1W solid-state p.a. and a h.e.m.t. low-noise pre-amplifier.

The receive pre-amplifier (designed by G3WDG) has a very low-noise figure and is intended for high performance tropo or moonbounce (e.m.e.) applications. It uses a well-proven and reliable Fujitsu FHX06 h.e.m.t. device providing a gain of 12dB and a noise figure of 1dB. As the system is used for weak-signal DXing (c.w. or s.s.b.), Julian uses an SMA microwave connector at the input of the pre-amplifier. Any other type of connector would be far too lossy at these frequencies. For e.m.e. applications where the ultimate in low-noise performance is required the pre-amplifier can be built using a waveguide input arrangement. This method eliminates the loss (around 0.2dB) of one SMA/Waveguide transition.

The transmit amplifier uses a Mitsubishi MGF2430A GaAs f.e.t. device and, although, is capable of running a little more power output, it is throttled back to ensure that the expensive transistor has a long and happy life!

Julian uses a 45mm parabolic antenna (the famous PW dish!) with a Procomm reflector feed. The entire transverter system is located at the back of the dish and mounted on a small ex-Navy tripod as shown in the photograph, Fig. 2. With this arrangement, portable contacts are regularly made over paths of 275-300km.

**NEW PORTABLE QTH**

In previous years, the G4UET, G4WYI and G4ZXO team had operated from Firle Beacon (see Fig. 2). With this arrangement, portable contacts are regularly made over paths of 275-300km. The equipment assembled, (see Fig. 3), This set of wheels has been constructed, (see Fig. 3). A Yaesu FT-290R with replacement Mutek front-end board was used as the driving transceiver for both bands.

**Talk-back, 100W and a 7-element Yagi on the 144MHz band**

Running high power talk-back on the v.h.f. and u.h.f. bands is becoming more of a necessity these days. With path lengths increasing on the microwave bands, upwards of 500km, it is becoming more difficult to make contact on 144MHz frequencies.

A power of 10W and a 2L-Special on the 144MHz band is not good enough anymore. Indeed many operators are now reporting that long distance contacts can be made at good strengths on the 10GHz band with nothing being heard on the 144MHz or 430MHz bands.

**DEADLINES**

That's it again for this month's 'VHF Report'. Last month I gave full details regarding the Leonids meteor shower which will provide extraordinary conditions...
on the v.h.f. bands in les than one week's time.

Don’t forget to be in the shack between 2300UTC on Tuesday November 16 and 1200UTC on Wednesday November 17. Please let me know what you heard or worked on any of the v.h.f. bands during this period.

Forward any details to the address and by the date given at the top of the table. Alternatively you may find it more convenient to make a simple telephone call.

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

73 David GA4SR

**RadioScene**

**HF FAR & WIDE**

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WALES

TEL: (01443) 411459

THIS MONTH LEIGHTON SMART GWOLBI BRINGS YOU REPORTS FROM AROUND GREAT BRITAIN SHARE THEIR VARIOUS CONTACTS WITH YOU.

I’m sure that I’m not alone in hoping that the demise of summer will bring the hoped-for Improvement in propagation conditions on the high frequency bands! For the past few months, reports have generally indicated that, although long-range DX has been worked on all (or most) days, conditions have been more or less rather poor.

Those who were about during previous near-sunspot peaks have all lamented that they have remembered conditions being rather more productive at this part of the cycle. Well, with fingers crossed I’m hoping that as the winter draws in, conditions - particularly on the 24 and 28MHz bands - will come into their own again, with strong signals well into the hours of darkness! Time will tell I suppose!

**PROPAGATION REPORT**

A brief report on propagation now from the ever-watchful Don McLean G3NOF in Yeovil, who says: “Things have been very patchy this month, with even the low frequency bands being dead sometimes. In my opinion, things are not as good as they were this time last year.

“IT seems that 14MHz has again been the most reliable band, with Australia and New Zealand coming in between 0500 and 0900UTC most days, along with African countries at around 1600-1900UTC.

“The 18 and 21MHz bands were patchy on most days this month, although Pacific countries were heard over the North Pole between 0800 and 0930UTC on 18MHz and Asia came in on the short path most days on 21MHz between the hours of 0900 and 1800UTC.

“The 24 and 28MHz bands were the most unreliable this month, although some Asian signals were heard on 24MHz between 1000 and 1600UTC, signals were not strong and prone to deep and rapid fading. On the 28MHz band there were days when nothing at all was heard. On some days Africa was heard around 1400-1800UTC, but were very prone to heavy fading.”

**YOUR REPORTS**

On that rather melancholy note of Don’s, I’ll delve into your reports, starting with the 3.5 and 7MHz bands. First comes Sean Gilbert G4UCJ of Milton Keynes who, using 30W of c.w. into a single 3.5MHz contact with UP4L (Kazakhstan) at 2327, while 7MHz brought in ZS6Z (South Africa) at 2213UTC and a switch to 3W QRP gave him a contact with THCF (Costa Rica) at 0005UTC.

Also using low power on 3.5MHz this month was Eric Masters G0KRT (see Fig. 1) of Worcester Park In Surrey, who hooked up with LA2PKA (Norway) at 1903UTC, using c.w., while on QRP s.s.b.

Eric managed a nice contact with GOAOZ, who was using a miniscule 50mW p.e.p. on a very noisy ‘eighty metres’! Eric’s 7MHz list includes c.w. contacts with RA9FU (Asiatic Russia) at 2007UTC and EC1DNE (Spain) at 0843UTC.

**THE 14MHz BAND**

Judging by reports, 14MHz was the best band this month, often staying open all night. Ted Trowell G2HKU (see Fig. 2) from the Isle of Sheppey in Kent spent quite a bit of time here, making 70W of c.w. to hook up with IV1LS (Mongolia) QSL via W3DOX, SB4/G3ZEM (Cyprus) and JH4ING (Japan) at around 1500UTC.

Operating at 1700UTC brought him a contact with the unusual call 3X1Y1B0 (Guinea) QSL via F5XX and at 2000UTC came VP9IW (West coast USA) and J4ADZ (Japan). After dropping power to 5W, Ted later worked 5D1A (Libya) at 1900UTC.

Meanwhile, Sean G4UCJ reckons that 14MHz was quite productive for his low power operation. His 3W log for this band includes c.w. contacts with HPI AC (Panama), J35W/MV9P (Bermuda) and LU4DD (Argentinia), all at around 2300UTC, while AT0V/LH (India) was worked at 1829UTC and 9V1XE (Singapore) at 1840UTC.

**THE 21MHz BAND**

‘All s.s.b.’ is the preferred method for Don McLean G3NOF of Yeovil in Somerset and using this mode he lists some nice 18MHz DX contacts with A44XM (Oman), H4JA (El Salvador) QSL via EA4URE, T24DX (Tuvalu Island), QSL via EA4CP, XE1VNX (Mexico), 457HIG (Sri Lanka) QSL to DL3ROB, 9M1AC (Sabah), Malaysia), VP5/VVB8VTK (Turks & Caicos Islands) and U0OFF (Asiatic Russia).

Also active on 18MHz was Carl Mason GWOVSW of Skewen in West Glamorgan who used 80W and a half-sized 5GRV antenna on the band; Carl’s s.s.b. reached out to KP4X (Puerto Rico) QSL via WP4MG at 0822 and WAG3A (Canada) at 1600UTC. Switching to c.w. Carl lists his contacts with EK0W (Armenia) and VK3CRS (Australia) at around 0700UTC, while at 1042UTC EL2WW (Liberia) was worked.

**THE 28MHz BAND**

Despite the patchy conditions and heavy fading, the 21MHz...
band seems to have thrown up quite a few gems this time around. All c.w. man, Ted G2HKU, used 70W to work 3B9FR (Rodrigue Island), south Indian Ocean and VQ1GB (Chatham Islands) to K7CB, as well as ZS4C (Brazili, US), L6CBR (Argentina) and S5B/G3VMW (Cyprus), all at around 1500UTC.

Photo CW0VSW offers all s.s.b. contact with D44BC (Cape Verde Islands) and HCSAI (Egypt) at 1500UTC, while 1600UTC brought in K2JG (Brazil) and VE3/GW4VWSU (Canada).

Using mainly s.s.b. on 21MHz was Eric GO7KRT who lists 100W contacts with R8UQTD (Asian Russia) at 1800 UTC and AA2KD (USA), LU6FF (Argentina) and PY2YU (Brazil) at around 2000UTC - the last two being new countries and a new contEth for him on 21MHz.

Don G3NOF worked a long list of countries on 21MHz of which includes D44BC (Cape Verde Islands), HS5AC (Thailand), J1TC0 (Mongolia), Y1EE (Iraq), 5H1US (Tanzania), ODSFN (Lebanon) and 457AB (Sri Lanka).

THE 24 & 28MHZ BANDS

One thing's for sure, our reporter really are hard-working operators! The two highest bands were the poorest of the lot this month, yet they still seemed to be able to dig out the DX that was there.

Sean G4UJC mentions his 30W c.w. contact on 24MHz with EZ8QU (Turkmenistan) on 0930UTC and a 3W QRP contact with K1X72ZZ (Canada) at 1912UTC, while Ted G2HKU lists c.w. contacts with 5X1P (Uganda) Y83QZ (Indonesia) and 4X1VF (Israel) all at around 1900UTC on that band.

Finally, to 'tie up the ribbons' this month, Don G3NOF offers his s.s.b. list including HJ3/DL1GKG® (Dominican Republic), SL9JZ (Egypt), VP9JLT (Falkland Islands) and 9J1A (Zambia),

SIGNING OFF

Once again, despite the less than impressive conditions, it's clear that there is DX out there to be worked. Sometimes it simply means being in the right place at the right time, but more often it means that the amateur has to study prevailing conditions, familiarise themselves with conditions and parts of the world expected to be heard at certain times of the day, as well as keeping a watch on the propagation beacons, which themselves are an excellent indicator of what to expect.

So, successful operation on the L.F. bands is not as simple as it seems! Thanks again to all reporters for their time and effort in making the column a success.

As usual, reports, information and photographs (I'd like to put a face to the names) by the 15th of the month, details at the top of the column.

Leighton GWOLB9

FOCAL POINT

REPORTS & INFORMATION TO:

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THIS MONTH GRAHAM G8EMX FOCUSES ON THE NEW MILLENIUM & WHAT IT MIGHT SIGNIFY FOR THOSE AMATEURS WHO ENJOY ATV.

HE ALSO SPEAKS A LITTLE BIT ABOUT THE BATC RALLY FOR THE YEAR 2000 & BRINGS YOU AN UPDATE ON SOFTWARE MENTIONED IN THE OCTOBER 'FOCAL POINT'.

The world is about to enter the new millennium. Every branch of human achievement is anticipating the major developments that the 21st century may bring. Within the world of electronics and communications, that has the mean to change from analogue to digital technology which, in so many instances, is already here.

Digital computing has been around for many years already - digital sound storage and reproduction has virtually replaced the vinyl disk and digital radio broadcasting has been available for some time now.

Digital broadcast TV has arrived too, but this has been a relative latecomer to the outgoing century. Perhaps this can only heighten how complex a technical development digital TV has been, apart from the decisions on standards and compression that had to be made.

that (for the first time) the Amateur ATV (ATV) tradition of following or sometimes being ahead of broadcast techniques, no longer holds! To appreciate why, let's have a reminder of why the world's technology is replacing analogue 'waves' with digital 'bits'.

NATURAL WORLD

The natural world produces analogue information - every sight and sound is a stimulus of infinitely varying intensity. But it has not been possible to compress these into an electrical form then record, store, transport or reproduce that stimulus without altering its original form, every step of the way. That distortion may be extremely small, but is always there, together with any random noise that is picked up or generated along the way.

But a number is a number. In very simplistic terms, if 100 pulses are put into a line, then 100 recognisable pulses will emerge. If 100 pulses are recorded onto a disk, the reproduction system will find 100 pulses. The number that goes in, precisely comes out.

So, if an analogue signal is encoded into as many pulses as possible, (or has been decided upon), then those many pulses will be what the listener or viewer will get. The more pulses the system uses, the more accurate to the original analogue the reproduced signal will be.

Digital systems also allow data to be compressed, which creates space for extra services.

The massive challenge for broadcast digital TV has been the vast speed and quantity of pulses needed to represent a high definition, moving image. Plus the computing power necessary for compression, error correction, storage and the final conversion back to analogue for the domestic TV picture.

So, is an amateur digital TV system early in the 21st century too large a mountain to climb? At the moment I know of no practical method of digitising a fast-scan picture that would be within most amateur budgets and, arguably, there's no absolute need for ATV to 'go digital' at all - amateurs could use, or continue to use, whatever system they wished.

The pressure for more channels to deliver more viable choice and interactivity has been the other major 'driving force' behind broadcast digital TV. Substantial compression can be achieved within digital systems, fitting more channels into a finite radio spectrum, so a digitally-compressed ATV system would certainly be an advantage on the 432-440MHz amateur band. The world of amateur TV can only wait for developments which, one day in the 21st century, will surely arrive.

STATE OF PLAY

Meanwhile, at the end of the 20th century, I will summarise the 'state of play' for ATV in the UK. At my most recent count there are some 7,10GHz (3cm) ATV repeaters and 25 L3GHz (24cm) ATV repeaters available around the country - with 432MHz coming to carry some simplex ATV.

Membership of the British Amateur TV Club (BATC) is fairly stable at around 2000 members, who receive the Club's quarterly A4 magazine CQ-TV. which, incidentally, came second in the recent PW Club Spotlight Magazine competition 'National section. Congratulations should go to CQ-TV Editor, Ian Pawson!

The BATC's first rally in the 21st century will be at a fresh venue. For the past few years the Club has arranged its ATV rally at the Sports Connexion near Coventry, but has now received an offer to hold its 2000 rally at Bletchley Park, near Milton Keynes.

Bletchley Park may be familiar to you as the (now-famous, but then top-secret) code-cracking centre during the Second World War, where the
claimed unbreakable German 'Enigma' code was broken with 'Colossus', a huge, valved, early computer!

Today, Bletchley Park is a cryptography museum, with a rebuilt Colossus machine and, according to news items, may be preserved for the nation. Also within the complex is an ATV demonstration station, run by Dave McQue and it is thanks to Dave that the BATC has decided to move venue. The provisional date for the BATC rally is April 8, 2000, but 'Focal Point' will remind you again!

**TESTCARDS ON COMPUTERS**

In the October 'Focal Point' I was playing with a piece of computer software called PCA TV, which generates instead static on a computer TV screen and I eventually registered my shareware copy to enable all the facilities. The registering process allocated a number to the user, which, when entered, fixes that copy of the programme to your callsign, in my case GEMX. Everything was fine, until I tried to add sites to its station list. After I tried to use this at a repeater site! But no, the software would not allow any changes to the call after registration (logically enough, of course). A phone call to the software's author, Robin Stephens G8XEU, soon fixed my problem. Robin explained how to remove the original registration, then assigned me two more registration numbers for GBEMXP and A8.

Robbie explained: "This was not a programme fault, many customers have requested this facility so it will be added to subsequent modifications to the programme, to allow for callsign modifications". Mine had been the '03' version and '04' would be available in a few weeks time, so probably available when this is published.

My computer was running PCA TV into a TV monitor at the BATC's Shuttleworth convention. When the 'On' icon is clicked in the 'select output' screen controlling the computer's video card, the vision output is switched from the computer's monitor to the TV set at 625 lines.

All fine, everything working OK! Then, some while into the day, the "On" icon appeared "greyed out", while all Windows users will recognise as indicating "not available". What on earth had happened?

I could leave the answer until the next millennium, but as this may spoil your celebrations, I discovered that the cable carrying video into the monitor was disconnected.

Simply reconnecting the cable (which had been used for other things) enabled the icon and a test card appeared on the TV once again. The video card apparently 'looked for' a 752 termination! Ah, computers are weird, but wonderful!!

**A HAPPY CHRISTMAS & A BRILLIANT PS MILLENIUM PARTY, WHEREVER YOU CHOOSE TO BE! SEE YOU AGAIN IN THE NEXT CENTURY!**

Graham Hancock G8EMX

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**AUSSIE ORACLE**

**LETTERS & REQUESTS FOR TOPICS YOU'D LIKE COVERED TO ME PLEASE.**

**CHRIS EDMONDSON VK3CE**

**PO BOX 123**

**EAGLE HEIGHTS**

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**AUSTRALIA**

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**THIS MONTH SEES THE RETURN OF OUR AUSTRALIAN REPORTER, CHRIS EDMONDSON VK3CE AND THIS TIME HE TELLS YOU ABOUT HIS BIG MOVE TO THE GOLD COAST AS WELL AS SOME NEWS OF AN AUSTRALIAN 'REMEMBRANCE DAY' CONTEST!**

**CHRIS EDMONDSON VK3CE**

"Day from the depths of winter in tropical Queensland, VK4. My name is Chris Edmondson VK3CE. Editor of PW's opposite number in this part of the world - Radio & Communications. Winter? Who's kidding whom? The average daily temperature at this time of the year here is 22°C... probably a bit too close to your summer temperatures! First things first, I must apologize most profusely to you, the readers and to poor Rob and the team at PW. My quarterly column was supposed to appear in the September 1999 magazine, the deadline for which coincided almost to the day with our big move from Melbourne, Victoria, to the Gold Coast - the best part of 2000km to the north. Somehow I managed to write the column and, on the day before we packed all the computer gear away for the journey, dispatched it via the Internet to the PW offices.

Right now, I guess the column is passing the planet Pluto on its way to the PW office outpost. Yes, it took the long route. One day it might actually arrive back in the UK ... I sometimes wonder about all the Internet mail which simply goes missing. I mean, where does it go? What really happens to it if you think about it, you could probably come up with some pretty funny explanations for lost mail. The scary part is that they're probably all true! WHAT'S HAPPENING IN OZ?

So, what's been happening in Oz? The short answer is ... not all that much and plenty, if that makes sense. The bands have been good at times, yet apparently bad at other times, but there's been plenty happening to keep the interest up.

In August each year, one of Australia's biggest contests hits the air. In truth, I'm not much of a contestor. Part of it is simply that I don't have much time free to enjoy my hobby. But once a year I make sure that I have it - so it was last weekend (as I write).

The Remembrance Day Contest (RD) pits state against state and is hotly contested right across the country, as well as in ZL and P29. On h.f., the aim is to work as many stations as possible in 24 hour period and all contacts must be with stations in other call areas. But on v.h.f. and u.h.f., that's simply not practical ... and that's where the fun starts.

Above 50MHz, the RD has no geographical limitations, so contacts are permitted only within your own call area. As the aim of the contest is to get as many point-scoring contacts as possible - and because you may re-work stations on v.h.f. and u.h.f. after two hours have elapsed - the whole things becomes quite comical. Every two hours you re-work the people you worked to start with! Special computer-based log-keeping programs put lists of stations on your screen that you may re-work and, seeing the honour of your state is at stake, participants get pretty keen to amass as many points as possible. It would be fair to say that the RD is Australia's most popular contest, by far.

**CUT A LONG STORY...**

To cut a long story short, I seem to have moved my family and station to a rather good v.h.f./u.h.f. location. In fact, it's a corker! We enjoy unbroken views all the way across all the Gold Coast and Queensland's capital city, Brisbane. We are very elevated here at about 600m (a.s.l) and, as we are close to vertical cliff drops on three sides down to sea level you might imagine that we get out pretty well.

Not that we could be sure of that until the actual day of the contest. As late as two hours before the RD started, my new house had no antennas up at all! An official government radio inspection turned up to admire the view and check out our new 'digs' "Right", he quipped, "I'm going to inspect your station! Ah, hang on a tick, mate, where are the antennas?"

He asked: "In there", I replied with a long face, pointing at the garage.

"But how the devil can you go in the RD without any antennas up?" He quizzed, using a remarkable amount of logic. I muttered something about the tower being used to support all the beams and antennas and packed away after the move from Melbourne (even I had to bow to logic and make sure the children's clothes were in order first) and how much I'd wanted to be on the air for it ... and the next thing you knew we had an antenna up in the sky - using nothing more than a few plastic cable ties to hold it vertical!

After me saying that it should be a pretty good v.h.f./u.h.f. site, I then had to prove it! It's obviously a bit too early to be sure, but I have the sneaking suspicion that I won the VK4 section of the contest by a fairly substantial margin. So, it just goes to show that a little imagination and a well-equipped tool kit can do wonders in a pinch!

**VAST AUSTRALIA**

We have talked in the past about how vast Australia really is and I recently had the mind-numbing opportunity to find out first-hand. Something like 98% of Australia's total population lives within 50km of the sea and almost all of the population lives on the fertile eastern seaboard and a little corner of southern...
Goondiwindi, across the Great Dividing Range at Warwick, then along a motley collection of back roads to the Gold Coast.

Simple - except for two small details: first, it's a flaming long way and second, I had a magazine to produce and only a couple about 200km north from the City of Churches that I realised how isolated the place really was. The land was absolutely green, but there wasn't a tree to be seen, not anywhere.

In fact, the further north I went the fewer things I saw, other than - and don't laugh, I'm serious - emus, eagles, kangaroos (lots of them!), wild horses and camels ... and one lone, solitary, ridiculously silly goat. That introduced pest was trotting down the middle of the highway, 100km from the nearest town and quite oblivious to me - hustling by at Warp Factor Two.

Around sundown I reached the border between South Australia and New South Wales. Aside the border is a little town called Cockburn, which was obviously named by a bloke having a very bad day. I stopped at the local police station for a chat and it turned out that the constable behind the desk was the only South Australian policeman for more than 100km in any direction!

I ended up stopping there for an hour or so, sipping on a coffee as the sun dipped below the horizon and having a good old Aussie yarn. "Whatever you do, mate", he drawled, "you must NEVER drive these roads at dawn or dusk and take it very, very easy at night time. Otherwise you'll hit a kangaroo, dead set".

The policeman's four wheel drive was interesting. About ten radio transceivers Inside, covering everything from h.f. to a microwave satellite telephone (the normal cellular phones aren't much good out there). So he played with his new BMW M5 while I played with his radios. An ideal arrangement!

**EFFECTIVE COMMUNICATIONS**

Effective communications are not just recommended in this part of the world, they're essential. Absolutely essential - your life depends on it. Many of the roads in the outback are infrequently travelled ... and that's an understatement. Some of them would be lucky to see one vehicle per day ... and still they could be classified as 'highways'!

The satellite telephone may take the romance out of communications, but the system is utterly reliable, right across the continent and up to 200km out to sea. It's based on a geostationary satellite running at around 1600MHz and the car-mounted phones run 3W. I suppose it goes without saying that you keep well away from the system!

So, there's only about 10 000 of them in service, but the numbers are increasing and one of the reasons for this is that they're downright cheap. Not only to buy, but also to use. About $1 a minute buys you a call to anywhere in the country, with no cost to receive calls. Compare that to the Iridium system. In this country, it costs something like $12 (almost £5) per minute just to receive a call, and the handset cost three times as much as those for our Mobile Satellite system!

So, I thanked the nice constable and headed further north. In the dark ... very slowly! In the next 50km I must have swerved five or six times to avoid kangaroos. They just bounce out from the side of the road, totally oblivious to the oncoming cars. There were a few quite interesting moments, I can tell you ...

I watched the partial eclipse of the moon a fortnight before your total eclipse of the sun - I was very jealous! - then headed for bed at Broken Hill, a surprisingly large town in the middle of nowhere based on the mining industry.

The next morning dawned bright and clear (they always do in Broken Hill. It gets about two inches of rain a year ... a good year!) and, once the sun was high enough for the kangaroos to have gone to bed, I continued for Queensland. On the first day I had covered a whopping 1340km and Adelaide was the only city I had passed through ... and my average speed for the day was about 120km/hr.

**Nothing** can prepare you for what lies beyond Broken Hill, because **nothing** is the operative word. It's quite incredible. There are speed limits on NSW roads, but the police don't reckon it's worth enforcing it out there. You'd go to sleep from boredom after the first couple of hours.

I had initially suspected the pleasant policeman just wanted to award me the 'Twit Of The Week' Award for blatantly disregarding the speed limit, but after quite a few cars had passed at around 150 to 200km/hr or so, I was starting to wonder. When the road train - in this case a monstrous prime mover hauli...
three 15m trailers for an all-up weight surely well over 100 tons - pulled out with blazing lights and blaring horns to overtake me at around 140 km/h. I finally got the message. For the next three full hours I sat at between 200 and 250km/h, slowing only for three tiny towns in a full 770km stretch!

I don't know how to describe the desolation to you. It certainly isn't a sandy desert or anything, but there are only sparse bushes to be seen and they're rarely more than a foot or two high. The road is straight and flat, there are three stretches of that road which remain ribbon straight for 100km or more and all there is to relieve the monotony of it is a very good music system in the car and a radio to listen to.

RADIO IS KING

Out here, despite the availability of the satellite phone, h.f. radio is by far the best way of communicating. For the next three days I had only covered a little bit of the opposite direction and one maniac on a pushbike! I was far too busy to sign up. The German car was really amazing - it's a very close-knit community out here.

The amazing distances, it's a very close-knit community out here. The German car was remarkably good in the outback. You see, on that second day, in a shade under 12 hours, I covered a phenomenal 1670km, which is quite remarkable at home in the close-knit community out here. The people in every car passing in the opposite direction and one maniac on a pushbike! I was far too busy to sign up. The German car was really amazing - it's a very close-knit community out here.

Next time we meet I'll tell you a bit more about the quite unique communications environment in Australia - and try to convince you to come and visit us in this extraordinary red land of contrasts.

UNTIL THE NEXT TIME I'M IN PW - A WARM 73 FROM...

Chris Edmondson VK3CE
with 128Mb of memory, 12.9Gb DVD drive, high-performance TNT video card with 16Mb of memory, Omega ZIP drive, 17 inch colour monitor, 56K modem and ADA 80 speaker system. The XPS T is a fairly large tower computer, well engineered and sleek. The drive bays at the front have a 3.5 inch floppy, DVD (Digital Video Disk) drive and the ZIP drive in place. Having just visited the Donington show, I was quite surprised to see a Pentium III 400MHz computer with 128Mb of memory, plus other bits and pieces - all for £725. Prices are reducing remarkably quickly.

HAPPY BIRTHDAY!
The Internet has just celebrated its 30th anniversary! Today's global Internet has its roots in the Advanced Research Projects Agency Network (ARPANET), a project funded by the US military in 1969, which aimed to interconnect computers across a common, Packet-switched network.

The original network consisted of four machines, they were Honeywell DDP-516 minicomputers with 12K of memory, connected by 50Kbaud leased lines. The system has grown somewhat since then, however, it was not until 1972 that E-mail was developed.

WEB ENABLED SECURITY?
Take a look at www.atmltd.co.uk (Fig. 4). LookC Pro is the world's first Web enabled security system, giving you access to recorded video event monitoring via a secure server on the Internet. You can replay any event by picking out a date on the calendar and choosing it from that day's event list.

You can replay any event by just picking out a date on the calendar and choosing it from that day's event list by camera, by time or all of them, have hardcopy, or step through the video event frame by frame and also have a live view on screen of the site in question at the same time. So, for the first time the user is empowered to co-ordinate any intrusion as it happens with visual feedback and unlike the security guard the system doesn't fall asleep.

Users can install the system on their own PCs and set up the cameras and sensors to catch criminals, wild life, pictures of the kids, people at the door, or just about anything.

The hardware is accompanied by very extensive software which allows you to schedule behaviour 24 hours a day, seven days a week, arming itself when you have forgotten, disarming itself before you wake up.

You can replay any event by just picking out a date on the calendar and choosing it from that day's event list by camera, by time or all of them and just sit back and watch. You can freeze them, have hardcopy, or make a JPEG file for E-mailing to friends, police or anybody.

Whilst you're in the house or the office you can have the assurance that LookC will call out the friendly name of the triggers if you want it to over the local loudspeakers. For example, it could say "Someone at the door" or "Someone in the shop" when the appropriate trigger is activated. All you have to do is type the name you would like LookC Pro to announce.

This is the ultimate in security, as the pictures can be on the Internet in an instant, available from any part of the world. I think it is suitable mostly for commercial premises, as the cost, at £499 plus VAT, is quite high. However, it certainly does give personal protection and peace of mind and it is difficult to quantify that in money!

I suspect that it could be very high on the list of commercial business premises as a security feature. If you're interested in such a system, get in touch with Bob Golightly at ATM who will be pleased to arrange an installation!

APPEAL FOR SOFTWARE
I am not sure how many people still use the Amiga 500+, but I received a call from a Mr. Hill, who is looking for some amateur related programs, like Navtex, etc. If you know the source of such programs, please give him a
FOURPACK BULLETIN

The latest bulletin received from the Fourpack group tells about the latest node for Worcester - GB7WK which will be sited at Ronkswood. Access for users will be on 144 and 430MHz. A 1296MHz link will provide feed to GB7GLO and a second link is under discussion to link to the DX Cluster in Gloucester. The node will be configured to give automatic routing and will only allow one connect per callign.

The group are looking for alternative accommodation for meetings and were inundated by volunteers to check out the local hostelries for a suitable room. I wonder why?

NORFOLK MARDLE

Now for some Norfolk 'Mardle' (East Anglian for 'gossip'). The station of GB7TLH which is run by Dirk Konopas is closing down the BBS operation but keeping his own Cluster software running under his Node. Users are emigrating to either GB7DI or GB7Vls.

This year's Norfolk ARS BBQ went very well (see Fig. 6), with Fred Wyatt V7PL and wife Jean attending from Victoria, British Columbia. Next event will be on the last Sunday in June 2000, as usual.

Roger G3LDF

BROADCAST

REPORTS & INFORMATION TO ME PLEASE:

PETER SHORE
C/O PW EDITORIAL OFFICE
ARROWSMITH COURT
STATION APPROACH
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BH18 8PW

E-MAIL:
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