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Reviewed
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Performance without compromise

practical Wireless

APRIL 1992
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NEXT ISSUE (MAY)
ON SALE APRIL 9

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Sorry to Waters & Stanton for not crediting them for last month's cover. They kindly provided the range of power meters used to help illustrate our graph.

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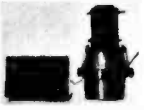

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Keylines

Amateur radio provides opportunities to extend other hobbies. As many of my friends already know, I'm a very keen railway enthusiast. I never miss the chance of talking about trains when I'm working someone over the air, who shares the same interests.

Another hobby of mine, which seems to be an ideal companion to amateur radio, is learning foreign languages. Although I'm not a natural linguist, I thoroughly enjoy the learning process and being able to talk to friends abroad while getting some practice at the same time.

I've set myself a personal goal this year, in that I will be able to converse with the many French visitors who come to the Hamfest at Friedrichshafen. This excellent show is a truly international event, and there's a fascinating variety of languages to be heard, and English is not (as yet) as commonly heard as the other tongues...until the English speaker is overheard!

English Barrier

Unfortunately, for the English speaker, there's a 'barrier' which seems to appear automatically whenever our language is spoken. This barrier hasn't anything to do with racist attitudes, but is usually brought about by someone else who is very anxious to practice their acquired English!

Perhaps you've noticed it when you have been abroad? Whenever you try your best to converse in their language (whether it be French, German, Italian, etc.) invariably the other person replies automatically in excellent English!

Although it's not quite so bad on the air (because you can't see the 'onlookers'), it takes some determination to plough on in the other language. It's particularly embarrassing when the other side of the conversation insists on speaking English, and you are trying your best in their language and not managing very well.

Internationally Spoken

In many ways, it's a pity that our language is in many ways an internationally spoken tongue. Maybe it's because our neighbours have got fed up with us shouting at them, and decided it was best to learn what we were shouting at them for in the first place. (Basil Fawlty has got a lot to answer for!).

Joking apart though, nowadays when we do try our hand at other languages, unless we really go off the beaten track, we're unlikely to be very far from an English speaker who can help you out. Mind you, there are times when you can't choose your interpreter, or their age for that matter.

In the mid 1960s, I had travelled down to Austria, and found myself in a remote village where it appeared no one understood English. I only had a few words of German in those days, and the local stationmaster promptly brought his eight year-old daughter out to interpret for us!

I felt very ashamed, that two reasonably intelligent adults had to rely on such a young child to interpret for them. She did an excellent job too, and from that day onwards I was determined to learn as many languages as I could. And of course I started off with German.

Evening Classes

I would be most interested to hear from other radio enthusiasts who are also keen on learning other languages. Learning a language can be fun, and perhaps the best way is to join evening classes because you can become immersed in the language.

However, for many of us, free evenings are at a premium and we have to use some of the excellent audio-visual systems to help learn the new language. For many years I've favoured the Linguaphone system, and although the recordings have often been quite old, they have been of tremendous benefit.

My family and I invested in a brand new French Linguaphone record course several years ago, and I intend to get a Spanish course soon. However, (and I am speaking from experience) I recommend the records, because tapes can so easily be chewed up by a bored tape-recorder!

The Best Way?

So, if you're keen on learning other languages, how do you start the process? What's the best way?

I've mentioned my basic method, which is backed up by lots of listening as I drive around in the car. In fact I'm convinced my labrador, who travels in the car every where with me, understands the various languages better than I do!

I would be interested to hear from readers on this subject, who are interested in this extension of the hobby. It would be helpful in the preparation of our next feature on holding QSOs in foreign languages.

When I'm working in the shack, or for that matter in my office, I rarely listen to the amateur frequencies! As I'm working, I usually listening to the many foreign broadcasting stations that can be heard on the short wave broadcasting bands. It's on these frequencies that you can hear 'Dutch by Radio' from Radio Netherlands, along with the many other language-by-radio courses offered by other foreign broadcasters.

Free Dutch Course

Several years ago, Radio Netherlands offered a free Dutch language course to listeners of their (excellent) English service. As I'm a keen tram enthusiast (I watch the Dutch detective series 'Van der Valk', based in Amsterdam for the trams, not the police action!) and enjoy visiting Amsterdam itself, I got one of the courses. It has proved useful, so keep an ear open for marvellous offers like this!

It also pays to read Peter Shore's 'Broadcast Round-Up' in *PW*'s 'Backscatter' section, because that's where you'll find the latest news on the short wave broadcast scene. There are many languages to be learnt, and you can even find details on where you can hear Latin broadcasts on short wave!

And finally, I must not forget those readers who want to learn English. For these readers, there is of course the widely acclaimed *English By Radio* series. This is provided by BBC English Service and they can be contacted at: Bush House, PO Box 76, Strand, London WC2B 4PH.

If there isn't one at the moment...you never know we might even get an inter-G European language practice net! It could be good fun, instructive and worthwhile, especially if we could lay Tony Hancock's Japanese QSO "It are not raining here in Tokyo" to rest at last, especially as the Japanese amateur had at at least tried to learn our language, whereas Hancock had but one word of Japanese!

First Novice

As I write this edition of 'Keylines' in February, I've just worked my first Novice on h.f., using c.w. on 3.5MHz. I had been listening to the young chap working away, slowly but surely with his careful Morse. However, all was not well, and the fault was not his!

The young Novice carefully called several G3 and G4 stations, but despite repeated (polite and correctly sent) calls, he wasn't answered. Eventually, I called him and we had a brief but interesting QSO.

This young man must have wondered why he hadn't been answered by the various stations he'd called. At my QTH he was a good S-9, albeit affected by QSB. However, and despite the QSB, I'm sure that the Novice station was being ignored by the other stations!

Novice Ignored?

I don't have any proof of course, and there's no way I can prove my theory. All I can say is that if the Novice station was being ignored, I feel very ashamed that I am a radio amateur.

Surely, if I am correct and the Novice was being ignored, the offending operators are showing contempt for their own hobby. In my mind, there's no difference whatever between ignoring an obvious newcomer to the bands, and turning an interested person away from a club or radio shack. That's not the spirit of amateur radio is it?

There are very few radio amateurs who would deliberately say to a young person that they're not welcome in the shack. The vast majority of enthusiasts positively encourage enquiries from people of all ages, when they've shown an interest.

Unless you're an amateur who would slam the door in the face of a keen, potential enthusiast, why do it on the air? So, please, if you value our hobby and want to see it enter its second century, take the time and trouble to work these Novice stations. They are, after all, radio amateurs, and they will play an important part in our hobby's future.

73 DE
Rob Mannion
G3XFD

Receiving You

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

PW October 1992 Issue

We particularaly need reader's letters with memories of *PW* for the Diamond Jubilee issue. Get writing - it's your special celebration too!

★★★ STAR LETTER ★★★

Dear Sir

A number of years ago in *PW*, June 1982 to August 1983, you ran a series of articles entitled 'Are The Voltages Correct?,' by Roger Lancaster. Later, you published reprints in small book form of the whole 14 parts of these excellent articles costing £1.50.

So, what about the current series of articles 'Mathematics for the RAE' by Ray Fautley G3ASG, being published later in a small book form, as you did with the Roger Lancaster articles? I am sure this could be a viable proposition.

I have followed these articles throughout and am sure that something similar collected together would be useful as a reference guide to both young and old.

What do you think?

E. Fielding G4IHF
Lytham St. Annes
Lancashire

Editor's reply: Thank you for the suggestion Mr Fielding, and you'll no doubt realise that your suggestion will join the pile! I'm particularly pleased that readers are asking for reprints of Ray Fautley G3ASG's series, and the Rev. George Dobbs G3RJV's, 'Getting Started The Practical Way'. Unfortunately, we can't really reprint them until they've finished. However, we hope to provide a 'natural break' with both series. This will enable the authors to restart the series, perhaps in a more advanced form, or with a slightly different approach. It will also enable us to offer the reprints and continue to publish both author's popular work. You never know, we could end up with both series appearing in reprint form as editions one and two!

Dear Sir

How's this for service? I recently returned my mobile microphone to Heatherlite of North Humberside for repair after three years service between car, caravan and home.

I sent my parcel off late on Friday afternoon, and my microphone was repaired and returned to me on Tuesday morning. This was despite the fact that I had sent it to the wrong address. The cost was less than my local shop charge for supplying a four pin mic plug!

Tony Harris G7DGL
Stoke-on-Trent
Staffordshire

Editor's comment: Long live good service Tony!

Dear Sir

Having read your review of the Global GDO MkII Dip meter in February *PW*, I felt I must write to put forward a suggestion that came to mind. It's because I consider that the construction and operation of a GDO, is the most instructional and rewarding of all projects available to the novice or experienced amateur.

Like you, I used a mains operated GDO with a triode valve for many years until it was replaced by the excellent *PW* f.e.t. dip oscillator by John Thornton Lawrence GW3JGA in *PW* October 1985.

My suggestion is, why not arrange an up-date to his design with (a) additional l.f. coverage and (b) a switchable modulating facility. I am sure this would be very popular with readers. It could be followed up as before, by an article describing the many uses of this versatile piece of test equipment.

Vic Flowers G8QM
Sunniside, Newcastle-upon-Tyne

Editors's reply: We hope you find the Dip-meter project in 'Getting Started The Practical Way' useful Vic.

Dear Sir

I have been a *PW* reader for many years, and I thoroughly enjoy your various columns and articles. I have been interested in radio all my life and am now a keen s.w. listener.

Since 1986, I have had a Sangean ATS803 which covers 150kHz to 29.999MHz continuously. I chose this set because it has a b.f.o. I also have a National Panasonic RF135OB which also covers 530kHz to 30MHz, but has no b.f.o.

My other interest is CB radio, and I operate two 4W/12W p.e.p. output a.m./s.s.b.transceivers, a Uniden and a Grant AX144. These are legal in New Zealand where we use 26.330 to 26.770MHz.

I read 'Quaynotes' column, and I suggest he does a series on the legal CB activity of other countries. I've enclosed a booklet put out by the New Zealand Radio Frequency Service.

I like Fred Judd G2BCX's homebrew antenna articles and was impressed with his 50MHz design (Sept 1991) and the 144MHz 'Ringbase' (Sept 1982) with the $\lambda/2$ wave radiator loaded to $3\lambda/4$ wavelength. I wonder which is best?

Best wishes for the future.

Ian Wishart, Queenstown
New Zealand

Editor's reply: Nice to hear from you Ian. Thanks for the booklet, 'Quaynotes' will see it.

Dear Sir

Your correspondent John Bidgood, writes in the February issue of *PW*... "Who is F. C. Judd G2BCX?" I have also read G2BCX's numerous articles in both *Practical Wireless* and *Short Wave Magazine*. I presume this must be the one and same F. C. Judd that wrote articles for magazine called *Tape Recorder* (or something similar), back in the early 60s.

I seem to recall his items about constructive recording, involving sound mixing, splicing tape, microphone technique, and how to get the best out of your equipment. I put his advice to good use, and very quickly became a news reader/presenter on a pirate radio ship.

I remember buying some sound effects records, which I still have, recorded by F. C. Judd on the Castle label. They were produced by Recorded Tuition Ltd., of Woodford, East London.

I too would like to hear about Fred's long involvement in the radio and electronics field. Let's hope his retirement from antenna rigging will give him more time in a sitting position in front of his word processor keyboard.

Andy Cadier, Folkestone, Kent.

Editor's reply: Thank you Andy, we'll pass on your letter to Fred and I've no doubt you will get a personal reply as he appreciates readers' interest. We hope to bring the 'Radio Personality' feature, starring G2BCX, very soon.

Dear Sir
Congratulations on your new look magazine, full of interest without getting too 'high tech', which is I'm sure what most amateurs need. Colour coding of your pages makes it very easy to quickly find the article of interest. Being recently retired I have in the last two years refound *PW* and it re-kindles my interest.

Just one small criticism! Can you settle for printing the issue month in the bar code block as in the August 1991 issue?

Good luck.

R. Fattinson GW3KVX
Powys, Wales

Editor's reply: Thanks for your comments Mr Fattinson. However, our Art Editor Steve Hunt says that any apparent 'colour coding' of articles was purely coincidental and not deliberate! However, Steve was interested to hear your comment. The month of issue by the way, is not normally placed in the bar code box, because it can be hidden from view on the newsagents' shelf and the issue you mention was exceptional.

Dear Sir
There is a fine line to be drawn between the sensible use, and objectionable use of Q-codes in telephony. To understand this one must define radio communication. It is not, as many radio amateurs apparently think, the construction of transmission equipment followed by a brief radiated signal in order to get a '5 and 9' signal report from the extreme ends of the earth.

Radio communication is the two-way exchange of intelligent information. In this context, when you tell the other amateur that his signal is suffering from QRM at your end, you are saying something intelligent.

When you suffix practically every sentence with QSL, you are not communicating, you are just rubbishing the English language. Any intelligent person would say something like 'Did you get all that?', particularly since QSL has changed its use in amateur parlance to mean written (printed) confirmation of a two-way radio communication.

Likewise, to say 'I wish you 73 and 88' is pedantic and ungrammatical when you mean 'best wishes' and 'love and kisses'. If you must use these terms, at least make them grammatically correct, by saying 'seventy threes and eighty eights'.

Geoff Leonard G0GSB
London

We are delighted to receive your letters, but do try to keep them short. It helps us, and makes it easier to get more letters in!

Queries
We will always try to help readers having difficulties with a *Practical Wireless* project, but please note the following simple rules:
1: We cannot give advice on modifications to our designs, nor on commercial radio, TV or electronic equipment.
2: We cannot deal with technical queries over the telephone.
3: All letters asking for advice must be accompanied by a stamped, self-addressed envelope (or envelope plus IRCs for overseas readers).
4: Make sure you describe the query adequately.
5: Only one query per letter please.

Back Numbers & Binders
Limited stocks of many issues of *PW* for past years are available at £1.80 each including post and packing.
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Each constructional project is given a rating to guide readers as to its complexity.
Beginner: A project that can be tackled by a beginner who is able to identify components and handle a soldering iron fairly competently.
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Components for our projects are usually available from advertisers. For more difficult items a source will be suggested in the article.
The printed circuit boards are available, mail order, from the Post Sales Department.

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Competition Corner April '92

Newsdesk '92

Tennamast

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Tennamast are always pleased to quote for any special mast requirements you may have, and custom build many masts to suit individual locations.

A new facet was added to their business recently, when they entered into the boating industry with a new, patented boat storage cradle. This won the prestigious Silk Cut Nautical Design Award for 1990/91, which is probably the highest accolade in the British marine industry.

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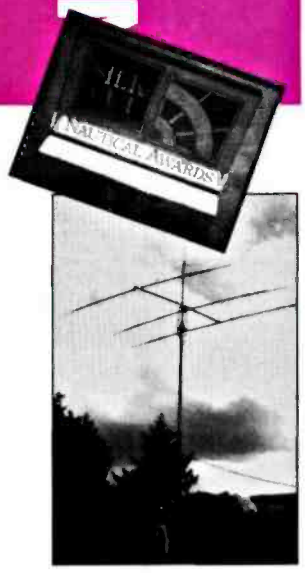


The Late Allan Barraclough GW3UDO Of Allweld Engineering

On Thursday 13 February, Allan Barraclough GW3UDO, suffered a heart attack and died at his home in Wales.

Born in India 52 years ago, he came to England when he was 16 years old and joined the RAF where he served in Yorkshire, Norfolk and Libya, working as an airframe engineer. When he left there he retrained as a designer draughtsman with a special interest in welding. He went on to work for a firm on the edge of Croydon Airport, Philips Welding, where he designed a remote control window mechanism that is still used in factories and offices today.

In 1969, he left Philips to set up his own company manufacturing towers and telescopic masts, and many readers of *PW* are now the proud owners of an Altron tower from Allweld Engineering.

After his wife and family, Allan's three great passions were radio, flying and shooting. He was 10 years old when he built his first crystal set, and he gained his amateur radio licence while in the RAF. He was an active amateur, always willing to share his enthusiasm for the hobby and for many years he was an instructor in the Air Training Corps, where he was given a commission.

He recently became a qualified pilot, and after his cremation in Swansea on Thursday 20 February, his local flying club held a flypast in his honour.

He was also a skilful shot with both pistol and rifle and was a member of the local gun club as well as shooting at Bisley.

Allan leaves behind his wife Gillian and son Erol, to whom we extend our deepest sympathies. He will be missed.

Roger Hall G4TNT

ARC No Link With ARE!

Amateur Radio Communications Ltd. (ARC), of 38 Bridge Street, Eariestown, Newton-le-Willows, Merseyside WA12 9BA, would like to make it clear that they have no link with ARE Communications Ltd, Hangar Lane, Ealing, and this has been the case since 1 May 1988.

Eddystone Users Group

Eddystone Users Group is for users and collectors of Eddystone and Strattons receivers and related products. The Newsletter carries receiver reviews, servicing information, readers' hints, free members' ads, and much more. It is out six times a year and membership is already worldwide. With members in Alaske, Papua New Guinea, UAE, Norway, as well as the more prosaic places. We have in two years grown from a seven page to a 24-page newsletter, much of the content coming from members.

Thanks to the kindness of Chris Pettitt, the Managing Director of Eddystone, we are able to use the Company logo on our EUG badge, and we can now provide members with copies of a number of period Eddystone publications. UK membership is £8 inclusive, cheques to **EUG, 112 Edgeside Lane, Waterfoot, Rossendale, Lancashire BB4 9TR.**

Amateur Radio On The STS-45 Shuttle Mission

The eight day duration STS-45 Atlantis Space Shuttle Mission, currently planned for lift-off at 1301UTC on March 23, will be the fifth NASA mission to carry the SAREX Shuttle Amateur Radio Experiment.

Onboard with mission commander Charles Bolden and mission specialist C. Michael Foale, will be four amateur radio operators. Mission specialist David Leestma is N5WQC, pilot Brian Duffy is N5WQW, mission specialist Dirk Frimont is ON1AFD, and with payload specialist Byron Lichtenburg is Kathy Sullivan, who is now awaiting her call-sign allocation. All will operate under Dave's call N5WQC.

The high 57° inclination of Atlantis will bring it well above the v.h.f. radio communication horizon for all of the world's major countries, including the UK, and the crew between them can speak numerous European languages.

As in the past, the operators will be communicating with students at various schools world-wide, one of those selected being the station at Harrogate Ladies College, who were so successful with their contacts with MIR and Helen Sharman's GB1MIR operation. Most SAREX transmissions will be spontaneous open contacts, the operating times being dictated by launch time, geographical constraints, and when the astronauts work activities allow time to operate.

The SAREX mission will employ a battery-powered voice-operated 2m f.m. transceiver, with 3kHz deviation. The primary frequencies intended for use during the mission are 145.550MHz for the Atlantis downlink and 144.910, 144.950, 144.970MHz, plus other specially selected frequencies for the uplink from earth stations. There will be no SSTV or packet radio operations on this flight, due to power need limitations.

Orbital and pass information will be supplied by W1AW bulletins and on the AMSAT nets. These meet on Sundays at 1015 on 3.780MHz and at 1800 on 14.282MHz, Mondays and Wednesdays at 1900 on 3.780MHz and Saturdays at 1000 on 14.280MHz. Additionally WA3NAN, the amateur radio club station of the Goddard Spaceflight Centre at Greenbelt, Maryland, will be active from one hour before lift-off and throughout the mission on 14.295 and 21.350MHz. It will be rebroadcasting the SHUTTLE audio and providing tracking and pass information.

Over the same period as the STS-45 Shuttle mission the current U4MIR and U5MIR amateur radio operators on the Soviet MIR space station will be being replaced by the new crew, who will continue their amateur radio activities.

If overhead passes occur between one hour before or up to two hours after dusk, Atlantic will be clearly visible. Further information from Pat Gowen G3IOR QTHR.

Nevada To The Rescue Of G0RSC

Members of Clayesmore School radio society were delighted when Mike Devereux G3SED of Nevada Communication in Portsmouth, came to their rescue. Mike had heard that the society's KW2000B h.f. transceiver had developed several faults, and arranged for it to be repaired at Nevada's own workshops.

The newly repaired transceiver was handed over in a ceremony at the school, which is located deep in the Dorset countryside between Blandford Forum and Shaftesbury. The KW2000B was gratefully accepted by members of the society, in the presence of the Headmaster Mr. David Beeby, his wife and members of the teaching staff.

The ceremony took place during a talk and demonstration evening on amateur radio, presented by Rob Mannion G3XFD and Tex Swann G1TEX. Mike Devereux G3SED joined in with the talk, and during the following 'on air' demonstration, conditions on v.h.f. and h.f. were such that good contacts were made, including a QSO with a German station, much to the fascination of the audience.

Keen Society Members

Clayesmore Radio Society has some very keen members, some of whom are already building Howes kits for 7MHz receivers. Several members, including one of the teaching staff, have now decided to aim for their own licence.

The society has reserved a callsign, and soon as G0RSC (G0 Radio Society Clayesmore) is issued by the DTI, the station will be on the air during Tuesday evenings. The society members will be looking for contacts with other schools, to arrange further schedules and possible visits.

If you are interested in working G0RSC, please write or call

George Scott,
Head of Science Department,
Clayesmore School, Iwerne Minster,
Blandford Forum, Dorset DT11 8LL.
Tel: (0747) 811217.

'Operation Euro-Baby 1992'

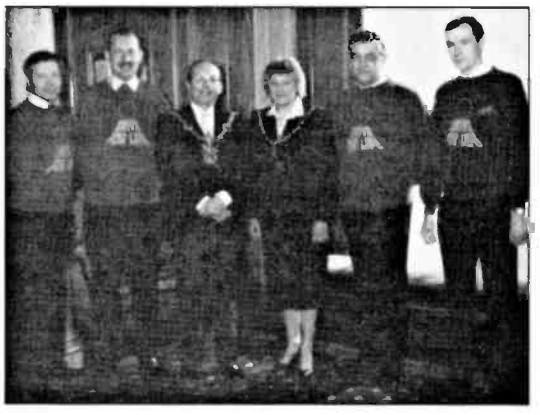
On Wednesday 22 April 1992, a team of four, including Richard Hook G8LVB, will depart from St. Marys Hospital, Portsmouth, on a 7200 mile record-breaking, European, 'Drive For Life'.

The team will be visiting all 12 European Community capital's, a total of over 7200 miles, where they will be met by various Mayors, Presidents and Prime Ministers, and whilst in Rome, have a private audience with Pope John Paul II.

The aim of this record-breaking drive, is to raise £250 000 for vital life-saving equipment, needed to monitor prematurely born babies in the new Neo-natal Unit being built at St. Mary's Hospital, Portsmouth. Each year, over 700 babies are born prematurely in the Portsmouth area. With the money raised, they hope to ensure that their chance of a normal life can be further enhanced.

Richard and his three colleagues, Alan Hartill (Police Officer), Tony Sinclair (Police Officer) and Kevin Taylor (Travel Consultant), will be waved off from St. Mary's Hospital at 0600hrs on April 22, by the Lord Mayor of Portsmouth. The team will head north to London, where they will be met by the Lord Mayor of Westminster at the House of Commons.

From London, they will drive to Dublin, Brussels, The Hague, Copenhagen, Bonn, Luxembourg, Rome, Athens, Madrid, Lisbon and Paris, before returning to Portsmouth, 16 days later.



During the drive, and using the special callsign GB8OEB, Richard will be busy making contact with amateurs via the various repeaters located throughout Europe, using the latest Alinco DJ-F1E 144MHz hand-held, kindly donated by Waters & Stanton of Hockley, Essex, which they have named their 'Little Baby'. This particular transceiver is capable of receiving the airband frequencies between 108-138MHz and will be ideal for the team to obtain the latest 'Volmet' weather conditions as they travel through Europe.

Clement Clarke International, who are well know for the manufacturing of aircraft headset's, are assisting Richard's charity drive by donating two of their latest Delta 100 headsets, these headsets will be used in conjunction with the Alinco DJ-F1E transceiver.

During the 'Drive For Life', the team will also be using a new Mercedes 300TD estate, kindly loaned by their local Mercedes dealer, David J. Sparshatts Ltd., of Portsmouth.

Radio amateurs and short wave listeners might like to know that Richard has produced an award which is known as the 'Operation Euro-Baby Gold Diploma'. For a copy of the 'Operation Euro-Baby Gold Diploma Rules', send a stamped addressed envelope to the below address, but HURRY!

If you would like to assist the 'Operation Euro-Baby' team in any way, please contact Richard on (0705) 379328. The address for the donations is **'Operation Euro-Baby', 8 Chalkpit Road, Paulsgrove, Portsmouth, Hampshire PO6 4EX.**

Can You Help?

John Vernon, 9 Waterson Avenue, Moston, Manchester M10 9BY, is looking for a circuit diagram to go with his Pye Olympic v.h.f. a.m. type no. M201, 156 to 176MHz. Can anyone help him?

Dr. Joe Bartolo 9H1DW of 24 Old Treasury Street, Valletta VLT 10, Malta, is having great difficulty in obtaining as obsolete transistor. The transistor is a GET 538, belonging to a LEAK 'Stereo 30' amplifier. LEAK was owned by Arthur Rank organisation, and Joe does not know whether they are still in existence. He wonders if anyone knows of any stockist who might still have these obsolete transistors. A close substitute might also work, but even this he cannot obtain locally.

He would appreciate anything anyone may recommend about obtaining this device, and perhaps the address of LEAK.

Mr J. Sitton, 29 Hudson Road, Stevenage, Herts SG2 0ER, has a b/w u.h.f. clock radio TV, but two of the components have burnt out. The set is a MATSUI Model MCR530, year of manufacture unknown, the clock works but no TV or radio. Mr Sitton is a disabled, but will re-imburse any costs within reason, including postage. Even a circuit diagram of Matsui would help, and he will photocopy and return original.

Newsdesk '92

Club News

Axe Vale ARC meet 1st Fridays, 7.30pm in the 'New Commercial', Trinity Square, Axminster, Devon. Further details from **Pat Cross G0GHH on (0297) 33756.**

Aylesbury Vale RS meet 1st & 3rd Wednesdays, 8pm in the Village Hall at Hardwick. March 18 is their AGM and April 1 is Roger Piper G3MEH on the 'Aspects of VHF Aerials'. Further details about the club from **Martin G4XZJ on (0296) 81097.**

Barr Beacon RC meet 1st Mondays and 3rd Wednesdays, 7.30pm at 112 Walsall Road, Aldridge, West Midlands. For further details, ring **(0922) 36162.**

Barnsley & District ARC meet Mondays in the radio club room and shack, at the rear of the Darton Hotel, Station Road, Darton, Barnsley. March 16 is a talk by Bill G3GRT on 'Home Construction And QRP', the 23rd is their AGM, the 30th is an On The Air night and April 6 is a talk by the Radiocommunications Agency. For further information, ring **Ernie G4LUE on (0226) 716339.**

Basingstoke ARC meet 1st Mondays, 7.30pm at the Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke. For further details, please contact **John Randell G3DAZ, 243 Paddock Road, Basingstoke, Hants RG22 6QP.**

Bedford & District ARC meet Thursdays, 8pm in the Allen Club, Hurst Road, Bedford. More details from **Gavin Carmichael, 15 Evesham Court, Avon Drive, Bedford MK41 7AJ. Tel: (0234) 365660.**

Bradford ARS meet 2nd & 4th Thursdays, 8pm at the Polish Ex-Service Club, Shearbridge Road, Bradford, West Yorkshire. March 12 is a social evening, the 26th is RSGB Video evening and April 9 is a natter night. **Charles Bolt G0ACX on (0247) 494694.**

Braintree & District ARS meet 1st & 3rd Mondays, 8pm at the Community Centre, Victorie Street, Braintree. **M. Andrews, 22 Arnham Grove, Braintree, Essex CM7 5UQ. Tel: (0376) 27431.**

Brighton & District ARS meet 1st & 3rd Wednesdays, 7.45pm at the Roast Beef Bar, Brighton Racecourse, Elm Grove, Brighton. More details from **Harold Lunson G3WR, 17 Tongdean Rise, Brighton, East Sussex BN1 5JG. Tel: (0273) 501100.**

Bromsgrove & District ARC meet Fridays at Avoncroft Arts Centre, South Bromsgrove, Worcester. March 13 is their AGM. More details from **Joe Poole G3MRC on (0562) 710010.**

Bromsgrove ARS meet at Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. March 24 is Mike Wilkes, the Redditch Heart Foundation. **Mr D. Edwards G4ZWR, 2 Mason Close, Headless Cross, Redditch, Worcs B97 5DF. Tel: (0527) 546075.**

Bury St. Edmunds ARS meet 3rd Tuesdays, 7.30pm in Room EO-40 of West Suffolk College, Out Risbygate, Bury St. Edmunds. For more details, contact **Ian G0KRL on (0359) 70527.**

Bury RS meet Tuesdays, 8pm in The Mosses Community Centre, Cecil Street, Bury, Lancashire. 2nd Tuesdays are Lecture/Talk nights and other Tuesdays are general natter nights with the club's 'new' rigs on the air. More details from **Colin Fox G3HII, 'The Lair', 5 Pinewood Crescent, Holcombe Brook, Ramsbottom, Bury BL0 9XE. Tel: (0204) 883212.**

Buxton Radio Amateurs meet at the Lee Wood Hotel, Buxton at 8pm. March 24 is their Annual Nosh. For further details, contact **Derek Carson G4IHO on (0298) 25506.**

Charnwood Amateur Radio Contest Club meet Saturday lunch-time at The Priory Hotel, Loughborough. Dedicated to operating and demonstrating the joys of amateur radio and furthering the hobby. Listen S17 or contact **Phil on (0509) 232927.**

Chelmsford ARS meet 1st Tuesdays, 7.30pm at Marconi College, Arbour Lane, Chelmsford, Essex. More details from **Roy & Ela Martyr G3PMX & G6HKM, 1 High Houses, Meshbury Road, Great Waltham, Essex CM3 1EL. Tel: (0245) 360545.**

Conwy Valley RC meet 1st Thursdays, 7.15pm at The Studio, Penrhos Road, Colwyn Bay, Clwyd. April 2 is a Visit by Dragon ARC 'Return Debate'. For further details, contact **Merfyn Jones GW4NNL, 72b Princes Drive, Colwyn Bay, Clwyd LL29 8PW. Tel: (0492) 530725.**

Cornish RAC meet at the Memorial Hall, Perranwell Station, Perranwell, nr. Truro, 7.30pm. For further information, please contact **Mr G. Bate, 9 Tresithney Road, Carharrack, Redruth, Cornwall TR16 5QZ. Tel: (0209) 820836.**

Coulsdon ATS meet 2nd Mondays, 7.45pm at St. Swithun's Church Hall, Grovelands Road, Purley, Surrey. April 13 is a Surplus Equipment Sale. **Andy Briers G0KZT on (0737) 557198.**

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford, Coventry. For further details phone **Jon on (0203) 610408.**

Denby Dale & District ARS meet at Pie Hall, Denby Dale, nr. Huddersfield, 8pm. March 18 is a Rig Test night, April 1 is 'Worked All Britain' talk by Brian G0BFJ and the 8th is a Surplus Equipment Sale. More details from **Ivan Lee, Clayton Lodge, Sunnyside, Edgerton, Huddersfield HD3 3AD.**

Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane, Derby. March 18 is their AGM, the 25th is 'Technical Topics', April 1 is Foolish Junk Sale and the 8th is 'AMTOR - What It Is And How It Works' by Alan G3XOF. More details from **Richard Buckby G3VGW, 20 Eden Bank, Ambergate, Derby DE5 2GG. Tel: (0773) 852475.**

Derwentside ARC meet Wednesdays, 7.30pm in the Steel Club, 36 Medomsley Road, Consett, County Durham. Regular talks by amateurs and non-amateurs. Construction work overseen by Don G4LGA. Further details from **Geoff Derby G7GJU, 60 Pine Street, Grange Villa, Chester-le-Street, County Durham DH2 3LX. Tel: 091-370 2032.**

Dragon ARC meet 1st & 3rd Mondays, 7.30pm at the Four Crosses Hotel, Menai Bridge. March 16 is 'Amateur Television' by John Lawrence GW3JGA, April 2 is a Visit to Conway Valley ARC and the 6th is 'The Royal Charter' by Robert Williams GW3CGN. **Tony Rees GW0FMQ on (0248) 600963.**

Dronfield & District ARC meet 1st & 3rd Mondays, 7.30pm in Room 3 of Gladys Buxton School, Oakhill Road, Dronfield. On other Mondays, members meet socially, by arrangement at the Fleur-de-Lys Public House, Main Road, Unstone. March 16 is a talk on the 'Worked All Britain' Awards Scheme by Steve Bryan G1SGB and April 6 is their quarterly club committee meeting. More details from **Piers Oldham G7HRW, 110 Green Lane, Dronfield, Nr. Sheffield S18 6FU. Tel: (0246) 290444.**

Dundee ARC meet Tuesdays, 7pm in the College of Further Education, Graham Street, Dundee. March 17 is a construction night, the 24th is a talk on a 'Visit to Russia' by Paul Rudd GM0CQL and the 31st is a construction night. Further details from **George Millar GM4FSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.**

Dunstable Downs RC meet Fridays, 8pm at Chews House, 77 High Street South, Dunstable, Beds. March 20 is an RF Test Equipment evening and April 3 is 'Repeater Linking'. Further details from **Wendy Jefferson on (0582) 451057.**

Easington ARS (Co. Durham) meet Thursdays, 7.45pm at Southside Social Club, Easington Village. Further details from **Mr H. Walker G3CBW, 20 Birchfield Drive, Eaglescliffe, Stockton-on-Tees, Cleveland TS16 0ER. Tel: (0642) 788280.**

Echelford ARS meet in the Community Hall, St. Martin's Court, Kinston Crescent, Ashford, Middlesex, 7.30pm. March 12 is 'When The Balloon Goes Up' by Ian Jackson G8RWH (RAYNET), the 26th is a Bring & Buy Sale and April 9 is their AGM. Further details from **P. Townshend G6PMT on (0344) 843472.**

Edgeware & District RS meet at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, 8pm. March 12 is 'The Post Office Tower' by George Morley G0OXH, the 26th is an informal GX3ASR on the air and April 9 is 'AMTOR & SSTV' by Hank Kay G0FAB. More details from **Howard Drury G4HMD, 11 Batchworth Lane, Northwood. Tel: (0923) 822776.**

Fareham & District ARC meet Wednesdays, 7.30pm in Portchester Community Centre, Westlands Grove, Portchester, Fareham, Hants. Details from **Rod Smith G0ERS on (0705) 373572.**

Fylde ARS meet 2nd & 4th Thursdays, 7.45pm at South Shore Lawn Tennis Club, Midgeland Road, Blackpool. March 12 is Preparations for NARSA Rally and the 26th is an Informal. **Eric Fielding G4IHF on (0253) 726685.**

Glenrothes & District ARC meet in their clubrooms, Provosts Land, Leslie, Fife, 8pm. Further details from **John Hardwick GM4ALA on (0592) 742763.**

Gloucester ARS meet Wednesdays, 7.30pm at St. John Ambulance HQ, Heathville Road (off London Road), Gloucester at 7.30pm. March 18 is Packet Self-Help Group, the 25th is construction group, April 1 is a construction contest and the 8th is home-brew clinic. Further details from **Jenny Beckingham G7JUP on (0452) 528533 Ext. 2731.**

Grafton RS meet 2nd & 4th Wednesdays, 8pm in Holy Trinity Club Hall at the rear of Holy Trinity Church, Granville Road, London N4. Further details from **Rod G0JUZ on 081-368 8154.**

Great Lumley AR&ES meet Wednesdays, 8pm at Great Lumley Community Centre, Great Lumley, Nr. Chester-le-Street, Co. Durham. For more details, contact **Barry G1JDP on 091-388 5936.**

Halifax & District ARS meet 1st & 3rd Tuesdays, 7.30pm at the Running Man Public House, Pellon Lane, Halifax. March 17 is 'QRP' by the Rev. George Dobbs G3RJV. For further details, contact **David Moss G0DLM, Beechwood Lodge, Leeds Road, Lightcliffe, Halifax, West Yorkshire HX3 8NU. Tel: (0422) 202306.**

Hambleton ARS meet in Room A5 of Northallerton Grammar School at 7.30pm. March 16 is an RAE class, the 23rd is 'Model Engineering' by Frank Sunley G0LEL, the 30th is an RAE Class and April 6 is a Club Project night. For more details, contact **Nigel Robertshaw G0NHM on (0609) 776608.**

Haddesdon RC meet 1st & 3rd Thursdays, 8pm at the Conservative Club, Rye Road, Hoddesdon (side entrance). On March 19 you can meet the RSGB General Manager, Mr Philip Smith and April 2 is a social evening. Details from **Peter Fairhurst G0KLU on (0992) 33036.**

Horndean & District ARC meet 1st Thursdays, 7.30pm at Horndean Community School, Barton Cross (off Catherington Lane), Horndean, Hants. April 2 is Brains trust. For more information, contact **Stuart Swain, 35 Mavis Crescent, Havant, Hampshire PO9 2AE. Tel: (0705) 472846.**

Hornsea ARC meet Wednesdays, 8pm at the Mill, Atwick Road, Hornsea. March 18 is EMC Forum by David G0MXI, the 25th is a natter night, April 1 is 'Microwaves' by Ted G8AZA and the 8th is a committee meeting. Further information from **Jeff G4IGY on (0964) 533331.**

Horsham ARC meet at the Guide Hall, Denne Road, Horsham, West Sussex, 8pm. April 2 is a Home-brew evening. Further details from **Peter Stevens G8SUI, 11 Nutwood Avenue, Brockham, Betchworth, Surrey RH3 7LT. Tel: (0737) 842150.**

Ilford Group RSGB meet Fridays at 7pm. They do not teach, but will fully answer any questions that members ask. They offer training and guidance on how to build and test electronic equipment, training on the safe use of tools, and how to solder, with full use of all test equipment. Members are encouraged to build equipment, which they can do in the workshop. The club takes part in NFD each year. For further details, please contact **J. Hooper on 081-478 3741.**

Ipswich RC. Contact **Mrs S. Elden G8HYE, 124 Larchcroft Road, Ipswich IP1 6PQ.**

Keighley ARS meet at The Cricket Club, Ingrow, Keighley, 8pm. March 12 is a night on the air G0KRS & GX7KRC, the 19th is a natter night, the 26th is an 'Introduction To Satellites' G7HJT, April 2 is a natter night and the 9th is a Junk Sale. Further details from **Kathy Conlon G1IGH on (0274) 496222.**

Kettering ARS meet Tuesdays, 7.30pm at the Electricity Sports & Social Club, Eksdale Street, Kettering. March 17 is a talk & demonstration by Howes Communications and April 7 is their AGM. Further details from **Ian G0RDV (but QTHR as G7EHM) on (0536) 514544.**

Kidderminster & District ARS meet alternate Tuesdays, 8pm at The Queens Head, Wolverley, Worcestershire. For more details contact **Geoff Philpotts G7JIR, 62 Ernsley Close, Stourport-on-Severn, Worcs DY13 0AH. Tel: (0299) 379229.**

King's Lynn ARC meet Thursdays, 7.30pm at the 19th King's Lynn Scout HQ, North Runcton. Further details from **Derek Franklin G0MOL on (0553) 841189.**

Lothians RS meet on the 2nd & 4th Wednesdays, 7.30pm in the Drwell Lodge Hotel, Polwarth Terrace, Edinburgh. Further details from **Mel Evans at 56 Southhouse Road, Edinburgh EH17 8EU or telephone 031-664 5403.**

Loughton & District ARS meet in Room 14 of Loughton Hall, 7.45pm. For more details contact **Mike Pilsbury G4KCK on 081-504 4581.**

Louth & District ARC meet 3rd Tuesdays, 7.30pm at the Kings Head, Louth. More details from **Neil Bartholomew G0JXY, The Bungalow, Main Road, Grainthorpe, Lincs LN11 7HX.**

Maidenhead & District ARC meet at The Red Cross Hall, The Crescent, Maidenhead, 7.30pm. March 17 is their AGM. Details from **Neil G8XYN on (0628) 25952.**

Manchester & District ARS meet Tuesdays, 7pm at Simpson Memorial Community Association, Moston Lane, Manchester M10 9NB. Further details from **Roger Farnley G0KTR, 6 Cardigan Road, Hollinwood, Oldham OL8 4SF.**

Mansfield ARS meet at the Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. April 2 is a talk by Dave G4CUO on 'Satellite Communication', plus the judging of home construction projects. Further information from **Mary G0NZA on (0623) 755288.**

Midland ARS meet in Unit 22, 60 Regent Place, off Caroline Street, Birmingham B1 3NJ. Wednesdays are RAE classes and Thursdays are natter nights. March 17 is a talk on 'Radio Operation in Rumania', the 27th is an Atari night and the 30th is a Computer night. For further details, contact **John Crane G0LAI on 021-628 7632 evenings.**

Milton Keynes & District ARS meet 2nd Mondays at North Bucks Youth Sports Hall, Haversham Road, Wolverhampton, Milton Keynes. On April 13 they have a Junk Sale. For more information, please contact **Julian Winson G3FGB on (0908) 611005.**

Morecambe Bay ARS meet every other Tuesday, 7.30pm at the Trimpell Sports & Social Club, with Morse instruction each Tuesday during club meetings. For more details, please contact **J. Burrow G0NYD, 36 Longfield Drive, Cragbank, Barnforth, Lancashire LA5 9EJ. Tel: (0524) 733212.**

Nelson & District ARS meet Wednesdays, 7pm at Llancaiach School Nelson. They also run a c.w. class at their meetings. Anyone wishing to find out further information is welcome to call in, or otherwise contact **Leighton Smart GW0LBI at 33 Nant Gwyn, Trelewis, Mid-Glamorgan, Wales CF46 6DB. Tel: (0443) 411736.**

Norfolk ARC meet Wednesdays, 7.30pm at 'The Norfolk Dumpling', The Livestock Market, Harford, Norwich. March 18 is an informal & committee meeting, the 22nd is a surplus equipment auction/Bring & Buy, the 25th is 'Weather Satellites' by Richard Gedge, April 1 is their AGM and the 8th is 'Radar', a talk by an Officer from RAF Neatishead. **Jack Simpson G3NJQ on (0603) 747992.**

North Bristol ARC hold their meeting at S.H.E., 7 Braemar Crescent, Northville, Bristol. **Chris Budd G0LOJ on (0454) 616267.**

North Ferriby United ARS meet Fridays, 8pm at the North Ferriby Utd. FC Social Club, Church Road, North Ferriby, East Yorkshire. March 13 is 'Keys & Keyers' members' night, the 20th is Home Construction Part 1, Frank G3YCC, the 27th is club station on the air and April 3 is a discussion, Ken G4VKK. Further details from **Frank Lee G3YCC on (0482) 650410.**

North Wakefield RC meet Thursdays at The White Horse PH, Fall Ings Lane, East Ardsley, Nr. Wakefield. Morse classes start at 7.30pm and all are welcome, with the Novice class on Friday evening. More details from **John Hoban G0EVT on (0924) 825443.**

Nottingham ARC meet Thursdays, 7.30pm at the Sherwood Community Centre, Mansfield Road, Nottingham. March 12th is a talk on 'Packet Radio For Beginners' by a beginner, Mike G2SP, the 19th is an Exhibition of home-constructed equipment and Competition for the Constructors' Cup, the 26th is a talk on 'Short Wave Listening' by Martin G6ABU, April 2 is their AGM and the 9th is Forum. Further details from **Rex Beestall G1LRI on (0602) 733740.**

Pontefract & District ARS have Morse classes on Mondays, Novice classes on Tuesdays and normal meetings on Thursdays, all at the Carleton Community Centre, 8pm. March 26 is 'Construction' by the Rev. George Dobbs G3RJV. Details from **Colin Wilkinson on (0977) 677006.**

Poole RAS meet 2nd & last Fridays, 7pm at Lady Russell-Coates House, Lower Constitution Hill Site, Bournemouth & Poole College of FE. March 13 is an 'Introduction To Satellites' by Peter Biggs G7AZP and the 27th is on the air, construction projects and c.w. practice. More details from **Vernon Cotton G3BCI, 45 Branksome Hill Road, Bournemouth, Dorset BH14 9LF. Tel: (0202) 760231.**

Prudential ARS is open to all employees and ex-employees of the Prudential companies. All those interested in PARS should contact **David Dyer G4DNX at 'Highbank Cottage', Underhill, Moulsford, Oxon OX10 9JH.**

Reading & District ARC meet 2nd & 4th Thursdays, 8pm at The Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. March 12 is 'British WWII Radio Design' by Charles Boville & Russel Rixon G8ORE, the 26th is a Spring Junk Sale and April 9 is 'Understanding Transceiver Specs' by Gary Clark G0BRK. **More details from Vin Robinson G4JTR, 4 Hilltop Road, Cavarsham, Reading RG4 7HR.**

Rochdale & District ARS meet Mondays at T. S. Frobisher, Greenbank Road, Rochdale. March 16 is Hams & Libraries, the 23rd is a construction night and the 30th is their AGM. Further details from **Brian on 061-653 8316 or Dave (0706) 32502.**

Rhyl & District ARC meet 1st & 3rd Mondays. March 2 is a Viewing Video of club activities. For more details, contact **Ken Padley GW7IAR, 67 Rosehill Road, Rhyl, Clwyd LL18 4TS. Tel: (0745) 338276.**

Salisbury Radio & Electronics Society meet Tuesdays, 7.30pm at Grosvenor House Centre, Churchfields Road, Salisbury. March 17 is an activity evening, Test Equipment Part 1, Morse & RAE class, the 24th is a natter night, Morse & RAE class, the 28th is Presentation of Plaque commemorating Marconi experiments to Roving Kennels, the 31st is an activity evening, Test Equipment Part 2, Morse & RAE class and April 7 is Guest speaker, Morse & RAE class. For further details, contact **Bert Newman G2FIX on (0722) 743837.**

Salop ARS meet Thursdays, 8pm at the Old Buck's Head, Shrewsbury. March 12 is a talk by Strumech, the 26th is a Chairman's discussion night and April 9 is a construction competition. Further details from **Glenda G1YJB on (0939) 232090.**

Sevenoaks & District ARS. Details from **The**

Secretary, c/o Sevenoaks District Council, Council Offices, Argyle Road, Sevenoaks, Kent TN13 1HG.

Shefford & District ARS meet Thursdays, 8pm at the Church Hall, Ampthill Road, Shefford, Bedfordshire. For further information, contact **Nigel G1JKF on (0908) 274473.**

Silverthorn RC meet Fridays, 7.30pm at The Chingford Community & Adult Education Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. More details from **Andrew Mowbray G0LWS on 081-529 4489 between 5.30 and 6.30pm weekdays only.**

Solihull ARS meet 3rd Thursdays in The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. March 19 is 'Radio Cracker' operating a local community broadcast station by Tony Sutton G6VOA. Tony was the Technical Manager for the Birmingham 'Radio Cracker' station, which was on the air for 24-hours a day during the first three weeks of December 1991, to raise money for charity. For more details, contact **Colin Taylor G3USA, 231 Robin Hood Lane, Hall Green, Birmingham B28 0DH. Tel: 021-777 9965 evenings or (0827) 53344 daytime.**

South Dartmoor ARC meet Mondays, 8pm at South Dartmoor School, Balland Lane, Ashburton, Devon. This radio club has a committee of only one adult - the rest being school-age youngsters! Although anyone wishing to join in is welcome. For more details on this Novice-run radio club, contact **Peter Thornhill G6ZKQ, 21 Elmbank, Buckfastleigh, Devon TQ11 0DX. Tel: (0364) 43433.**

South Dorset RS meet 1st Tuesdays, 7.30pm in the Wessex Lounge of Weymouth Football Club. April 7 is their AGM & Construction competition. **Geoff Gwillian G4FJO, 13 Overlands Road, Wyke Regis, Weymouth DT4 9HS. Tel: (0305) 781164.**

South Notts ARC meet at Highbank Community Centre, Farnbrough Road, Clifton Estate, Nottingham, or Fairham Community College, Farnborough Road, Clifton Estate. March 13 is construction, the 20th is talk-in S22 & Open Forum, the 27th is on the air and April 3 is talk-in S22 & Open Forum. For further details contact **Ray G7ENK on (0602) 841940.**

Southgate ARC meet at Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. March 12 is a talk by Mike Dennison G3XDV, from the RSGB, the 26th is a club de-brief after the SARC&C Show, videos & photos, etc., and April 9 is a Grand Surplus Equipment Sale. **Brian Shelton G0MEE, 22 Berkeley Gardens, Winchmore Hill, London N21 2BA. Tel: 081-360 2453.**

Spalding & District ARS meet Fridays, 8pm at The Riverside Centre, The Old Fire Station, Double Street, Spalding, Lincolnshire. Further details from **David Johnson, 65 West Street, Bourne, Lincolnshire PE10 9PA. Tel: (0778) 425367 (6-7pm).**

Spen Valley ARS meet Thursdays, 8pm in Old Bank Working Men's Club, Mirfield. Alternate Thursdays are 'Noggin & Natter nights'. Further details from **Ian Barraclough G7DWY on (0484) 716453, early evening.**

Stevenage & District ARS meet in Ground Floor Rear Suite, Sitec Building, Ridgemond Park, 7.30pm. March 17 is their AGM, the 24th is 'VHF Packet Primer' by Peter G0GTE, the 31st is a construction consultation by Ralph G7HFD and April 7 is 'Electrical Safety in the Shack', a video evening. More details from **Pete Daly G0GTE, 48 Lincoln Road, Stevenage, Herts SG1 4PJ. Tel: (0438) 724991.**

Stirling ARS meet Thursdays, 7.30pm at premises near Throsk, Stirling. Details from **Brian Mulleady GM0KWL, QTHR or on (0324) 36235.**

Stockport RS meet 2nd & 4th Wednesdays, 7.45pm in Room 14 of the Dialstone Centre, Lisburne Lane, Dfferton, Stockport, Cheshire. March 25 is a Surplus Equipment Sale and April 8 is 'Test Equipment & Usage' G3NUQ. Further details from **John Verity G4ECI, 7 Adelaide Road, Bramhad, Stockport, Cheshire SK7 1NR. Tel: 061-439 3831.**

Stourbridge & District ARS meet 1st & 3rd Mondays, 8pm at Robin Woods Community Centre, Scotts Road, Stourbridge. March 16 is their AGM. Details from **Dennis Body G0HTJ at 53 Grove Road, Wollescote, Stourbridge, West Midlands DY9 9AE.**

Stratford-Upon-Avon & District RS meet 2nd & 4th Mondays, 7.30pm at the Home Guard Club, Main Road, Tiddington, Stratford-Upon-Avon, Warwickshire. March 23 is Pacific crossing on operation Raleigh, John Layton G4AAL. Further details from **Alan Beasley G0CXJ, 2 Ilmington Road, Blackwell, Shipston-on-Stour, Warwickshire CV36 4PE. Tel: (0608) 82495.**

Stroud & District ARS meet fortnightly in the Minchinhampton Youth Centre. For more details, please contact **Dave Stallon on (0453) 886964.**

Sutton & Cheam RS meet 3rd Thursdays, 7.30pm at Oowns Lawn Tennis Club, Holland Avenue, Cheam, Surrey with natter nights on 1st Mondays, in the Downs Bar. March 19 is a construction contest, the 28th is the S&CRS Annual Dinner, April 2 is a committee meeting at G3CDK and the 6th is a natter night. More details from **John Puttock G0BWV, 53 Alexandra Avenue, Sutton SM1 2PA.**

Taunton & District ARC meet 1st & 3rd Fridays, 7.30pm in 'The Basement', County Hall, The Crescent, Taunton. Other Fridays informally for a natter and station operation, Morse code classes, etc. For further details, contact **Mr W. Lindsay-Smith G3WNI, Way Close, Madford, Hemyock, Cullompton, Devon EX15 3QY. Tel: (0823) 680778.**

The GB3HZ Repeater Group meet at Chiltern Communications, Lincoln Road, Cressex Industrial Estate, High Wycombe, Bucks, 8pm. Details from **Francis Rose G2DRT on (0494) 814240.**

The Submarine ARC submerge on Thursdays, 7pm at HMS Dolphin, Gosport, Hants. For more details contact **K. Fisher G0LKX on (0329) 281174.**

The Three Counties ARC meet every other Wednesday, 8pm at the Railway Hotel, Liphook Hampshire. March 25 is a demonstration of Packet Radio and April 8 is 'Long Distance Microwaves' by Ian Lamb G8KQW. **Kevin Roche G8GOS on (0420) 83091.**

Thornbury & District ARC meet at the United Reform Church, Chapel Street, Thornbury, 7.30pm, talks start at 8pm. Morse practice sessions are held between 7.30 and 8pm. March 18 is a Technical Topic and the 25th is a VHF/HF Activity/natter night. More details from **H. Cromack G0FGI at Rose Cottage, The Naite, Oldbury-on-Severn, Bristol, Avon BS12 1RU. Tel: Thornbury 411096.**

Torbay ARS meet Fridays, 7.30pm at the ECC Social Club, Highweek, Newton Abbot. March 13 is a club night, the 20th is monthly meeting, Dartmoor talk & slides, the 27th is a club night and April 3 is a club night. More details from **Andy Stafford G4VPM on (0803) 329055.**

Trowbridge & District ARC meet at 8pm, in the Territorial Army Centre, Bythesea Road, Trowbridge, Wiltshire, 8pm. March 18 is an Open evening. More details from **Ian Carter G0GRI on (0380) 830383.**

Verulam ARC meet 2nd & 4th Tuesdays, 7.30pm at the RAF Association Headquarters, New Kent Road (off Malborough Road), St. Albans, Hertfordshire. 2nd Tuesdays are their activity evenings and 4th Tuesdays are their main monthly meetings. On March 24 they have the annual 'G3PAO Memorial Lucture'. More details from **Walter Craine G3PMF, 5 The Crescent, Abbots Langley, Watford, Hertfordshire WD5 0DR.**

Wakefield & District RS meet Tuesdays, 8pm in First Floor Rooms, Ossett Community Centre, Prospect Road, Ossett. **John Bailes G0MVA on (0924) 260048.**

West of Scotland ARS meet Fridays, 7.30pm at the Scout HQ, 21 Elmbank Street, Glasgow. For further details, please contact **John Power GM0KTO, PO Box 599, Glasgow G3 6QH.**

Whitton ARG meet Fridays, 8pm at the Whitton Community Centre, Percy Road, Whitton, Twickenham. March 27 is 'Radio Data Systems' by Mark Saunders of the BBC. More details from **Ian G0OFN on 081-894 9131.**

Wiesbaden ARC - DA1WA - is a club mainly for US military personal stationed anywhere near Wiesbaden, Germany. For more details, contact **Robert Kipp DJ0PU, Hugelstr. 25, D-6070 Langen, Germany.**

Wigtownshire ARC have meetings and RAE classes every Thursday, 7.30pm at the Community Education Office, Stranraer Academy. More details from **Ellis Gaston GM0HPK, 3 Victoria Buildings, Cairnryan, Stranraer, Dumfries & Galloway DG9 8RA. Tel: (0581) 2202.**

Wimbledon & District ARS meet 2nd & last Fridays in St. Andrews Church Hall, Herbert Road, Wimbledon SW19. March 13 is a general activity evening and the 27th is a Surplus Equipment Sale. **Chris Frost G0KEB, 61 Selbourne Avenue, Tolworth, Surrey KT6 7NR. Tel: 081-397 0427.**

Winchester ARC meet 3rd Fridays, 7.30pm at the Red Cross Centre, Durngate House. Further details from **Malcolm Butler G0LMD, 44 East Stratton, Nr. Winchester, Hants SO21 3DU. Tel: (0962) 89550.**

Wirral ARS meet 1st & 3rd Wednesdays, 7.45pm at Ivy Farm, Arrowe Park Road, Birkenhead, Wirral. March 18 is 'The G3WPD Dip Oscillator & Wave Meter' by Norman Kendrick G3CSG. More details from **Alec Seed G3FDO on 051-644 6094.**

Yeovil ARC meet Thursdays at Red Cross HQ, Grove Avenue, Yeovil, Somerset. March 12 is a Construction & Operating night, the 19th is Constructors' Contest, the 26th is Construction & Operating, April 2 is 'How To DX' G3NDF and the 9th is Construction & Operating. Further details from **Mike Woodford G0JVG, Holm Wood, 5 Orchard Close, South Petherton, Somerset TA13 5DX.**

Club Secretaries please keep your details as brief as possible.

Please send in all of your 'Club News' items to Sharon George at the editorial offices in Poole.

Club News

Radio Diary

March 15: Wythall RC will be holding their Annual Rally at Wythall Park, Silver Street, Wythall (nr. Birmingham). Doors open 11am to 5pm. Usual traders, bar and refreshment facilities, Bring & Buy. Talk-in S22. Admission 50p. Full details from **Chris G0EYO on 021-430 7267.**

March 15: Tiverton South West Radio Club Mid-Devon Rally will be held at the Pannier Market, Tiverton. Easy access, only minutes from junction 27 on the M5. Free parking. Two halls of trade stands, Bring & Buy stall and mobile snack bar. Further displays and full refreshment facilities in the club room bar, which is to open throughout the day. Doors open 10am. Talk-in on S22. More details from **G4TSW, Mid-Devon Rally, PO Box 3, Tiverton, Devon.**

March 22: Pontefract & DARS have their Annual Components Fair & Spring Rally at Carleton Community Centre, Carleton, nr. Pontefract. Doors open 11am to 4.30pm. Admission by prize programme. Bring & Buy, traders, licensed bar, bookstall, etc. Talk-in on 144MHz. Car boot spaces available. Extra car parking. Details from **G0NQE on (0977) 677006 or from G0AAO (0977) 643101.**

March 29: Bournemouth Radio Society's 5th Annual Amateur Radio, Electronics and Computer Sale will be held at Kinson Community Centre, Pelhams, Millhams Road, Kinson, Bournemouth. Doors open 11am. Admission is 50p, including prize draw ticket. Light refreshments available. Talk-in on S22. For further details of table bookings, etc., contact **Vic G4PTC on (0202) 516593 evenings after 6pm.**

April 5: The Launceston 6th Amateur Radio Rally will be held at Launceston College. Doors open 10.30am. **Maggie. Tel: (0409) 21219.**

April 12: Cambridgeshire Repeater Group will be holding their Amateur Radio Rally at Philips Communications Systems - Catering Centre, St. Andrews Road, Chesterton, Cambridge. Doors open 10.30am. There will be a Junk sale, Bring & Buy, Auction. Further details from **Mike G6COQ on (0223) 440373.**

April 19: Centre of England Easter Sunday Radio & Electronics Rally will be held at the National Motorcycle Museum, Bickenhill, near the NEC (Jct. 6 M42). Doors open 10.30am, 10am for disabled visitors. Admission £1 (concession for RAIBC members and senior citizens). Over 60 traders, ample free parking, bar & restaurant facilities. Talk-in S22. Easter special: 'Spot The Egg' on many of the trade stands to win an easter egg. Details from **Frank Martin G4UMF on (0952) 598173.**

April 26: The Bury Radio Society are holding their Annual Rally/Hamfest at 'The Castle Leisure Centre', Bolton Street, Bury, Lancashire. More details from **Laurence Jones G4KLT on 061-762 9308.**

April 26: Lough Erne ARC have their 11th Annual Mobile Rally in The Killyhevlin Hotel, Enniskillen. Talk-in on S21. Contact **Alwyn GI0BFD, 15 Glenwood Gardens, Sligo Road, Enniskillen, County Fermanagh, Northern Ireland BT74 5LT. Tel: (0365) 323802.**

May 4: Dartmoor Radio Club Rally is to be held at St. Pauls Church Hall, Yelverton. Doors open at 10.30am. Free parking, usual traders, refreshments, Bring & Buy. Details from **George Spray on (0822) 853885.**

May 17: The 35th Northern Mobile Rally will take place in the Flower Show Hall at the Great Yorkshire Showground, Harrogate, north Yorkshire. Showground opens 10am, doors open 10.45am. Talk-in on S22. Bring & Buy, bar and cafeteria. Free parking and loads of stands. Entry and parking of Wetherby to Harrogate Road. Separate arrangements for disabled visitors off Hookstone Wood Road. Details from **Mike G0MKK on (0423) 564353/507653 or FAX (0423) 520992 or @GB7CYM.**

May 17: The 'Parkanaur' Rally will be held at the Silverwood Hotel, Lurgan, Co. Armagh. Doors open from 12 noon. There will be the usual trade stands, Bring & Buy, bookstall, QSL bureau, etc. Talk-in on S22 (145.550). The proceeds of this rally will go to the Stanley Eakins Memorial Fund, at Parkanaur, near Dungannon. This is a very worthy charity, and they hope to see a really good turn out of everyone interested in all aspects of radio and electronics. Details from **Jim Lappin on (0762) 851179.**

May 24: The Plymouth Radio & Electronics Fair by the Plymouth Radio Club will be held at Plymstock Comprehensive School, Church Road, Plymstock. Over 25 stalls selling electronic, computer and radio components. Second-hand bargains for the enthusiast. Free parking, Bring & Buy, club station on the air, bookstall, hot & cold buffet and grand raffle. Doors open 11am, admission is £1 at door. Further information, phone **Plymouth 787181.**

Kenwood TS-450SAT HF Transceiver

As he's a keen 'mobileer' and wants to encourage h.f. mobile working, Rob Mannion G3XFD was pleased to get to grips with the compact Kenwood TS-450SAT transceiver. Here's what he thought of this fairly new rig.

Review

It all began when I was searching for a rig to use as a basis for an article, with the sole intention of getting more people active on h.f. mobile operating. So, I rang Lowes in Matlock, Derbyshire.

"Have you got a rig that will work mobile, with the minimum of fuss" I asked? And that's how I came to have the Kenwood TS-450SAT in my shack, with the job of reviewing it, and trying it out mobile.

Reputation For Quality

Kenwood have a reputation for producing high quality equipment, and neat designs. However, I was quite unaware of quite how compact the rig was! To say this transceiver is compact, is an understatement.

Despite clever photography, the advertising people rarely seem to be able to convey size effectively. So, after a conference with Tex Swann G1TEX, and Steve Hunt our Art Editor, we thought that Tex's driving glasses would provide a good perspective to judge the size of this 100W rig by. Small isn't it?

Read The Book

With a modern and complex rig, the golden rule has got to be 'read the book', and by that I mean read the manual! The Kenwood TS-450SAT comes with a lot of documentation, and it looks overwhelming at first, although I quickly realised it's because different languages are catered for in one book.

Despite the occasional 'Japanese' English, the manual is excellent. It's clear, concise and very helpful. There are pages of diagrams showing the operator everything they need to know. Occasionally, (and surprisingly) the English captions don't flow quite as smoothly as the diagrams do, but despite this, the manuals are excellent.

I was soon confident enough to go on the air, and that was when I became concerned, because I thought the transceiver was 'deaf'. But, I was soon to find out just how wrong I was!

Circuit Description

Before I get carried away with my on the air experiences, let's have a brief look at the specification of the transceiver itself. But, before I start, I should say that at first glance, although the receiver specification is excellent, it doesn't really give you a firm idea of what to expect on the air.

The receiver is a triple-conversion superhet, and it's tuning range (on the TS-450SAT) is continuous from 30kHz (not 500kHz as the manual says in one place) to 30MHz. The first i.f. is 73.05, and the second is 8.83MHz, while the third is 455kHz.

As supplied, the receiver works on s.s.b., c.w., f.s.k., a.m. and f.m. The transceiver I had on loan came fitted with all filters, except the 500Hz version. The receiver is fitted with a tuneable notch filter and an i.f. shift facility.

The transmitter works on a.m., c.w., f.s.k., f.m., and s.s.b., with a maximum output power of 100W. However, I'm not going to bore you with just a list of statistics, because I feel that if you're going to buy a rig like this, you'll know it's going to be good. What you do want to know is how it performs on the air!

On The Air

The on air performance was superb. I did a lot of s.s.b. operation and a great deal more c.w. working with the transceiver, and much of the time I was able to run at reduced power. However, when I had first switched the rig on, I thought the receiver side was 'deaf', although I soon found it was just an exceptionally quiet receiver.

I always regard the 7MHz band as the ultimate test, especially on c.w. at weekends! So, I spent a Saturday afternoon on 7MHz, thoroughly enjoying myself on the key.

Conditions on 7MHz had been excellent. The band had provided some very good inter-European working, and I had been very pleased at the very low noise level in the rig.

At first, I found the receiver's extremely low noise level, to be misleading. There were times when I thought the antenna had gone open circuit!

The afternoon drew on, and I started a very enjoyable c.w. QSO with Eric G0KHR up in Stockport, near Manchester. When Eric and I started, the band (and our frequency) had been exceptionally quiet, but we were in for a surprise.

Switched On QRM

Eric G0KHR and I were enjoying the un-cluttered frequency, until suddenly (as I said to Eric, it was just as though someone had 'switched on' the QRM) I passed the QSO back to him, and the noise, QRM and general clutter was there, at S-9+.

Now it was time for the transceiver to show its paces, and it coped very well, despite not being fitted with the 500Hz filter. Although Eric was a good signal, the continental signals were incredibly strong. I had never come across such a rapid change in conditions on the band before, and I'm a keen and regular 7MHz operator.

I had to use the built-in notch filter facility, and it was good. However, the most impressive and effective aid was the i.f. off-set tuning facility.

This extremely effective and very useful facility (in action, it provides the same effect as the variable selectivity found on the Eddystone 750 and 888A receivers, although I do realise it works in a different way) made c.w. operation particularly easy on the busy 7 and 14MHz bands. It was so easy to use too, and can provide

up to 90dB attenuation of the unwanted signal!

Although I would have liked the opportunity to try the 500Hz filter, I now realise that it can only make a superb little receiver better!

Mobile Fashion

The next stage was to try the Kenwood out mobile fashion. But to be honest, as small as it is, you do need a large parcel shelf for safe mobile mounting.

All I did, was to place the rig in an old p.m.r. cradle (it fitted nicely, but didn't have the depth of the original occupant, before driving to my favourite hilltop lay-by. I used my set of trusty G-Whip antennas for the tests.

The rig, of course, worked superbly. The reports on the audio and general signal quality were very pleasing. The automatic antenna tuning unit also worked quickly and efficiently, a definite advantage when using a mobile antenna.

I did find that the receiver's audio output was a little low for my liking, which could be a problem with high background noise levels in a moving vehicle. Having said that, I've no doubt many operators would be using a headset boom-microphone in any case.

I was pleased to see how well the control panel coped with bright sunlight in the car. I found no problem in reading it at all.

The final matter of interest (forgive the pun) was how the rig would react to the extremes of heat in cars (you know how hot they can get, even on a mild day). Well, the whisper-quiet cooling fan did its job very well, so much so that I enquired how Kenwood had achieved such a silent-running cooling system.

Despite looking through the manual, I couldn't find any information. However, the Lowe workshop staff in Matlock, confirmed there are two fans, not one! These brushless d.c. units are electrically noiseless and very efficient. I can confirm that, because for a time (helped by the manual) I wasn't sure there were any fitted!

Control Panel

Although I do have one or two little reservations regarding the layout on the control panel and other items, I would strongly recommend this rig to anyone. However, the Kenwood TS-450SAT is likely to prove extremely useful to those wanting to work mobile (whether it be in a car, on an inland waterway holiday or maritime) or just portable.

It's also a delightfully neat rig to have perched on a desk or workbench. I found that I used the rig a great deal to listen to the short wave broadcasting bands when I was working, it's really a versatile little transceiver.

My only reservations are to the size of the 'important' controls, r.f. gain, r.i.t., i.f. shift, and a.f. gain, which are of the concentric or coaxial type (as well as being rather small). I would have liked them to be larger.

The only other comment is regarding the VOX. I found that I consistently left the microphone plugged in when I was working c.w. This meant that the transceiver 'keyed' itself on loud c.w. signals when the VOX activated. An indicator on the front panel, or perhaps an auxillary switch (operated when c.w. was selected) would help.

Review

Conclusions

All in all, I found that the Kenwood TS-450SAT was not only a delightful little rig to use, it also performed extremely well. I must congratulate the Kenwood designers (you never know we might get to know and meet these anonymous people one day!) in packing a great deal into a small space.

The designers have really come up with an amateur bands and general coverage receiver that's packed a high performance specification into a small space, along with an excellent transmitter and automatic antenna tuning unit. This rig is definitely not the 'bottom of the range'. Well done Kenwood!

My thanks for the loan of the Kenwood TS-450SAT and associated power supply, go to Lowe Electronics of Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (0629) 580800 or FAX: (0629) 580020, who can supply the TS-450SAT for £1375, plus carriage and £192.95 for the associated PS-33 power supply, plus carriage.

As we go to press, Lowe Electronics have announced they are to offer a free matching PS-33 power supply for a limited period with the TS-450 range. Further details from Lowe Electronics.

Specifications

General	
Modes	s.s.b., c.w., a.m., f.m., f.s.k.
Memory channels	100
Antenna impedence	(with automatic a.t.u.) 20-150Ω
Power requirements	12 to 16V d.c. (13.8V reference)
Grounding	Negative
Current consumption	2A (receive, no signal) 20.5A (transmission)
Operating temperature	-10°C to 50°C
Frequency stability	Less than ±10ppm
Frequency accuracy	Less than ±10ppm
Dimension (w x hx d) including projections	280 x 107 x 340mm
Weight	7.5kg (with automatic a.t.u.)
Frequency range (transmit and receive)	1.8 to 29.7MHz including WARC bands
Frequency range (receive only)	30kHz to 29.999MHz
Transmitter	
Output power (without AT-450 tuner)	1.9 to 28MHz 100W (max) less than 20W (min) s.s.b., c.w. 40W (max) a.m.) less than 10W (minimum)
Modulation	Balanced (s.s.b.) Reactance (f.m.) low level (a.m.)
Spurious radiation	Less than -50dB
Carrier suppression (with 1.5kHz reference)	More than 40dB
Unwanted sideband suppression (with 1.5kHz reference)	More than 40dB
Max. freq. deviation (f.m.)	Less than ±5kHz
Audio freq. response	400Hz to 2.6kHz
Receiver	
(although the general coverage receiver tunes from 30kHz to 29.999MHz, specifications only cover 500kHz to 29.999MHz in the Kenwood manual	
Receiver circuitry	Triple conversion superheterodyne
Frequency range	500kHz to 29.999MHz (30kHz to 29.999MHz model reviewed)
Intermediate frequencies	1st: 73.05MHz, 2nd: 8.83MHz, 3rd: 455kHz
Sensitivity: 500kHz to 1.62MHz	Less than 4μV (s.s.b., c.w. f.s.k.) at 10dB (S+N)/N (less than 32μV a.m.)
Sensitivity: 1.62 to 21.5MHz	Less than 0.2μV (s.s.b., c.w., f.s.k.) (less than 2μV for a.m.)
Sensitivity 21.5 to 30MHz	Less than 0.13μV (s.s.b., c.w., f.s.k.) (less than 1.3μV for a.m.)
Sensitivity (f.m.) 28 to 30MHz	Less than 0.25μV at 12dB SINAD
Selectivity s.s.b., c.w., f.s.k.	-6dB, more than 2.2kHz, -60dB, less than 4.4kHz
Selectivity a.m.	-6dB, more than 5kHz, -50dB, less than 18kHz
Selectivity f.m.	-6dB, more than 12kHz, -50dB, less than 25kHz
Image rejection	More than 70dB
1st i.f. rejection	More than 70dB
Notch filter attenuation	More than 20dB
Squelch sensitivity	Less then 20μV 500kHz to 1.62MHz (c.w., s.s.b., f.s.k, a.m.) Less than 2μV 1.62 to 30MHz (s.s.b., c.w., f.s.k., a.m.) Less than 0.25μV 28 to 30MHz (f.m.)
Audio output	1.5W into 8Ω (10% distortion)

Extending The Ra Current Meters

Don't discard those surplus meter movements. Even if they're only capable of reading a few microamps at full scale, Arthur Rumbelow G3KKC says that you can extend their current range, using standard value resistors and save money at the same time!

How often have you discovered a need to measure a particular value of circuit current, and then found you don't have a suitable meter? It's on occasions like this we have to resort to using a meter with a full scale reading, or deflection (f.s.d.), far smaller than the current to be measured.

When using a meter to measure a current greater than it's designed to carry on its own, we have to bypass some of the total current, away from the instrument. This bypassed, or shunted current, flows through a shunt resistor, R_{shunt}, as shown in **Fig. 1**.

From Ohm's Law, we can find that the ratio of the resistance R_{shunt} to R_{meter} equals the ratio of the current I_{meter} to I_{shunt} (please note the inversion).

$R_{shunt}/R_{meter} = I_{meter}/I_{shunt}$ (*equation 1*)

From this formula we can make a general formula for calculating the value of R_{shunt}, or R_s as I will now call it.

Where $R_s = R_m/n\text{-}1$. (*equation 2*).

In this formula, R_m is the internal resistance of meter (R_{meter} in **Fig. 1**) and n is the factor by which original meter scale is to be multiplied. In general terms, if the 'n' factor is greater than about 500, then using 'n-1' is the same as using 'n' itself.

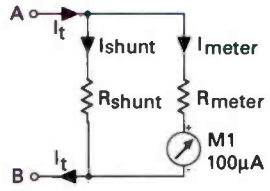


Fig. 1: A 'standard' f.s.d. increasing circuit. The 1989 edition of the *ARRL Handbook* even suggests using a variant of this method for calculating the internal resistance of meters, where this is unknown.

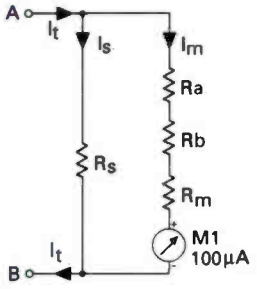


Fig. 2: A modification to the circuit of Fig. 1, allows us to use preferred values of resistors. See the text for the explanation.

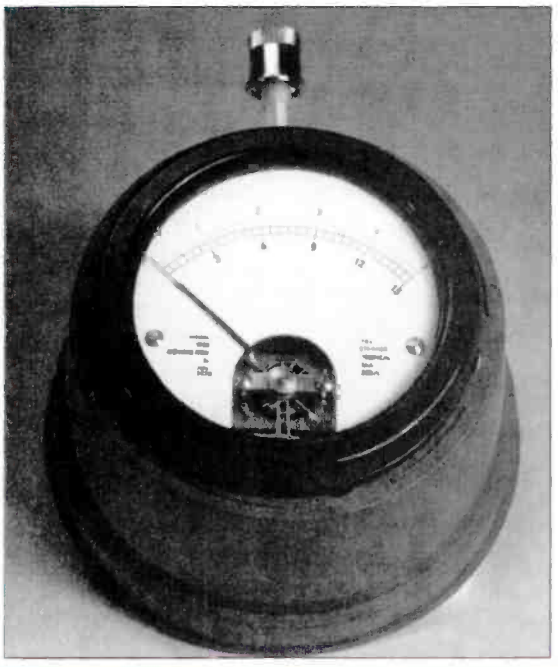


Fig. 3: Using G3KKC's method of extending the current ranges of low current reading meters, movements such as the one in the photograph, (which cost £1 at a rally) can prove to be excellent value-for-money.

Typical Meter

Let's look at this process in more detail, by taking a typical µA reading meter. This meter may have a f.s.d. of 100µA, and an internal resistance of 3750Ω.

For the purpose of the exercise, we'll assume that we want to use it to read 300mA f.s.d. We can calculate two values of R_s using the general term 'n' or, the mathematically more correct, 'n-1' term. These values, are 1.250416806Ω (when using 'n-1'), and 1.25Ω if we use 'n' instead. Whichever value we choose to use, we could make it up from resistance wire.

Unfortunately, some trial and error work might be necessary to get an accurate value. Alternatively, if we were to use a 1.2Ω resistor there would be a known reading inaccuracy of about 4%.

Moreover, when coupled with resistor value variation, and a possible movement inaccuracy of 2-5%, the resulting reading accuracy might be inadequate.

Another Look

If you take another look at the diagram of **Fig. 1**, you'll see that this is a variant of the method given in many amateur radio handbooks. Although I've not seen it mentioned in any of the better known textbooks, there is a method of making the situation easier.

This easier method is derived from basic physics, which by using Ohm's law, states that the ratio of the resistances R_s:R_m is the ratio of the currents I_1:I_2. My method allows readily available wirewound resistors and preferred standard values of 0.25W resistors to be used. This can save a great deal of trouble!

My idea is based on making the apparent meter resistance greater. This has the effect of increasing the value of R_s. If we make R_s equal to the next available preferred value above the value calculated, then we don't have to play around with resistance wire any more. So, let's have a look at how it can be done.

Preferred Values

In our example (as the shunt current is almost 3000 times greater than the meter current, I'm going to use 'n') the ratio of R_s/R_m is 1:3000 ($3.33 * 10^{-4}$).

With R_m set at 3750Ω, R_s is 1.25Ω (using the 'n'

nge Of Low

value). If I wanted to use a wirewound resistor of 1.5Ω, then R_m(new) would have to be 1.5*3000 or 4500Ω. For all practical purposes this value may be assumed to be exact as the error is well under 1%.

These new values of Total resistance R_m(new), would mean adding one, or more, resistors in series with the meter, as shown in **Fig. 2**. The difference between the values R_m(old) and R_m(new) is 750Ω. This value could be made up from three resistors, 330Ω +390Ω+30Ω. All of these figures are preferred values, available as close tolerance high stability resistors.

Another Example

Here's another example, and a variation on the theme. Let's assume that we have a resistor of 2.2Ω instead. So, let's use this value of 2.2Ω and do a little more arithmetic. If 2.2:R_m = 1:3000, then R_m(new) = 2.2*3000 = 6600Ω.

Using standard values resistors, to bring the 3750Ω (internal resistance) of the meter up to 6600Ω, means adding more resistance (2850Ω) in series with the meter. This value can be made up with two resistors, R_a and R_b, as shown in **Fig. 2**. One combination to make up the value, 2850Ω is one 2700Ω, and one 150Ω in series (0.25W).

Some Examples

I've worked out some examples using preferred values of wirewound resistors for R_s. In working these values out I've also assumed the R_m value (3750Ω) used as above. These values are shown in the table of **Fig. 4.**

The shunt resistance must be capable of dissipating the power necessary. Up to approximately 1A, a 3W wirewound type could be used.

Above this level of current, resistors capable of dissipating greater power should be used. It's important to remember that if this resistor went open circuit, it would be disastrous for the meter!

PW

Further Reading: Mathematics For The Rae on page 39 of this issue discusses the power dissipated in resistors.

Required f.s.d.	'n' factor	R_{shunt} (*) calculated	$R_{s,\ next}$ Preferred value	New total Series Value	Additional resistance Resistanceneeded
1mA	10	416.67Ω	470Ω	4230Ω	480Ω
5mA	50	76.53Ω	82Ω	4018Ω	380Ω
10mA	100	37.88Ω	39Ω	3861Ω	111Ω
50mA	500	7.52Ω	8.2Ω	4092Ω	342Ω
100mA	1000	3.75Ω	3.9Ω	3896Ω	146Ω
500mA	5000	0.75Ω	0.82Ω	4099Ω	349Ω
1A	10 000	0.375Ω	0.39Ω	3900Ω	150Ω

* Based on the original meter value of 3750Ω and the 'n-1' value

Fig. 4: A table of values based on a 100μA meter with an internal resistance of 3750Ω. See text for more explanation.

The Pigtail

A Reliable 144MHz Antenna for Mobile Working In A Reliant Car

Tex Swann G1TEX, our technical sub-editor, runs around on three wheels! As a keen, and very loyal, 'Reliant' owner, Tex has developed a mobile antenna to combat the problems brought about by the glass fibre body on his 'Plastic Pig'. The 'Pigtail' antenna could also prove useful on boats, or caravans.

Some while ago in a previous job, I had to commute daily to get to work. This involved a round trip of about 150km, which due to starting at 7.30am, meant being on the road at the unearthly time of 6.15am! The local repeater was a source of companionship at that time of the day, and also on the return trip in the evening, but for reliable communication, I needed a good antenna.

One problem presented itself almost immediately! It's a difficulty that faces drivers of all glass fibre-bodied Reliant three wheelers, who want to transmit. How do you fit an antenna for 144MHz mobile working?

Let's face it, the 'Plastic Pig' was never designed with radio communications in mind. Leaving aside the many jokes about the machine, which I tend to join in with, (So do we Tex, so do we! **Editor**) as I'm a happy and contented Reliant owner. So, let's have a look at the radio problems associated with this long-established three-wheeler or the "aeroplane minus wings" as G3XFD calls it!

Ground Plane

In normal 144MHz mobile systems, the roof of the vehicle forms a more than adequate ground plane, against which a $\lambda/4$ or $5\lambda/8$ antenna does remarkably well. The body length of the average car body is such that, even though it's not an ideal surface, it's vastly better than the same length of glass fibre reinforced plastics material (g.r.p.).

I'm fond of my little car, and I didn't fancy the idea of radial elements on the roof. The prospect of taking out the lining, and putting a large mass of aluminium foil on the inside of the roof didn't appeal to me either!

Suitable Antenna

How could I end up with a suitable antenna on such an apparently unsuitable vehicle? After a little thought, I realised that the ideal antenna for this job, wouldn't require an earth plane.

So, it was a simple problem, with a simple solution. All I needed was an end fed antenna, which has no need for an earth plane.

But the problem I was left with, was just how do you produce an end-fed antenna on 144MHz? Such an antenna would be one or more complete electrical half waves long, and have a feed impedance of around 1000Ω. Not an easy match to 50Ω coaxial cable!

Feed Impedance

After I had looked in the various manuals, I confirmed that a half-wave, end fed antenna seems to have a feed impedance of around 1-1.5kΩ. If some method could be found to match the 50Ω coaxial cable to this impedance, it would perhaps provide a suitable antenna with reasonable performance.

At first, I tried the tuned auto-transformer circuit, demonstrated in Fred Judd G2BCX's article on a 50MHz mobile antenna (*PW*, September 1991 page 33). This circuit provided a fair match, when it was very close to the centre frequency, but the matching rapidly deteriorated away from this point.

A further problem, was in choosing the correct tapping point on the coil. If I chose a tapping low on the coil, sensitivity was good but bandwidth was poor. If I went too high on the coil, sensitivity was poor, but the antenna bandwidth was much better!

Unusual Ideas

So, I had to go back to my collection of reference manuals. In these 1950s vintage books, there are many unusual and useful ideas to be found. I wasn't to be disappointed, as I rediscovered the π-match, which is a more than adequate method for coupling very different impedances.

I won't bore you with all the maths involved, but it's fairly easy once a few assumptions have been made. The impedance step-up is about 25:1, or (to be exact) it would have been if the antenna was exactly $\lambda/2$ long.

Had this been the case the matching might have been a little more difficult. What I actually opted for was an antenna slightly longer than $\lambda/2$. This makes the impedance slightly reactive, which allows more normal values for the π-match components. It could also equally apply to an antenna slightly shorter than $\lambda/2$. The theoretical circuit of the matching unit is shown in **Fig. 1.**

Making The Antenna

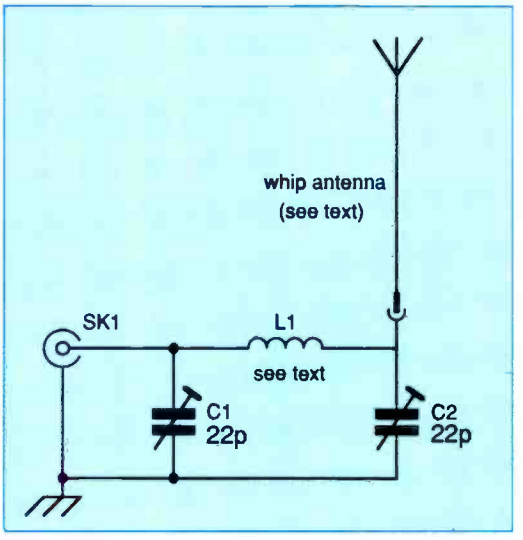
It's time to start the job, and get down to making the antenna. The photograph shows the Mark II version, and it uses the top portion of an old hollow, glass fibre fishing rod (well what else for a vehicle with a glass fibre body?).

You should choose a length about a metre long. I found that at this length, the larger end of the tapering fishing-rod would still fit into a PL259 plug.

Next, you should take a length of multi-strand flex (a little longer than the length of fishing-rod) and thread it through the hollow rod. If you find the flex is too thick, all you have to do, is solder a length of thinner flex to it, so it will pass through the end of the rod.

After this stage is completed, find a PL259 plug of the type that has a large diameter cable entry hole. Solder the flex into the plug, then push the rod into the hole, pulling the flex tightly from the narrow end. Then you

Fig. 1.



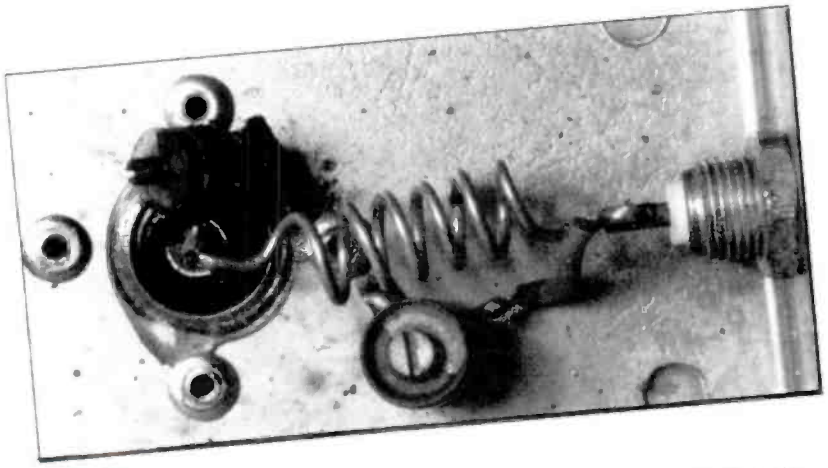


Fig. 2.

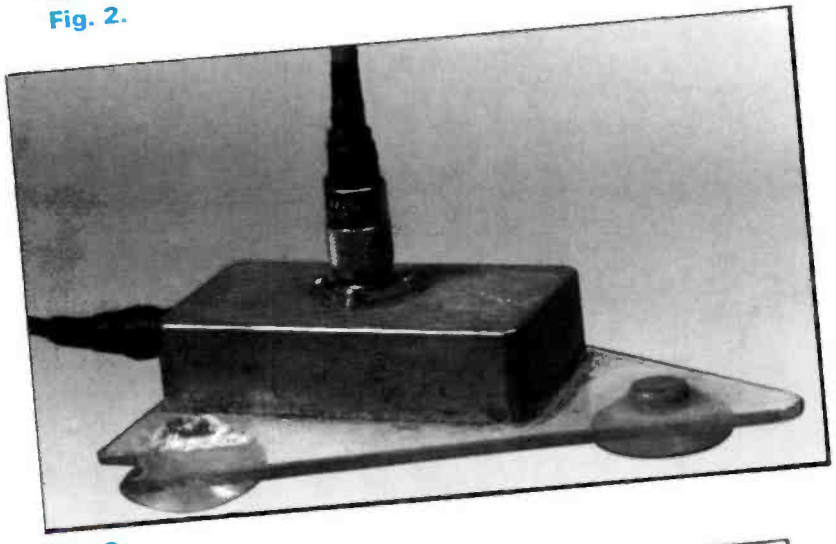


Fig. 3.

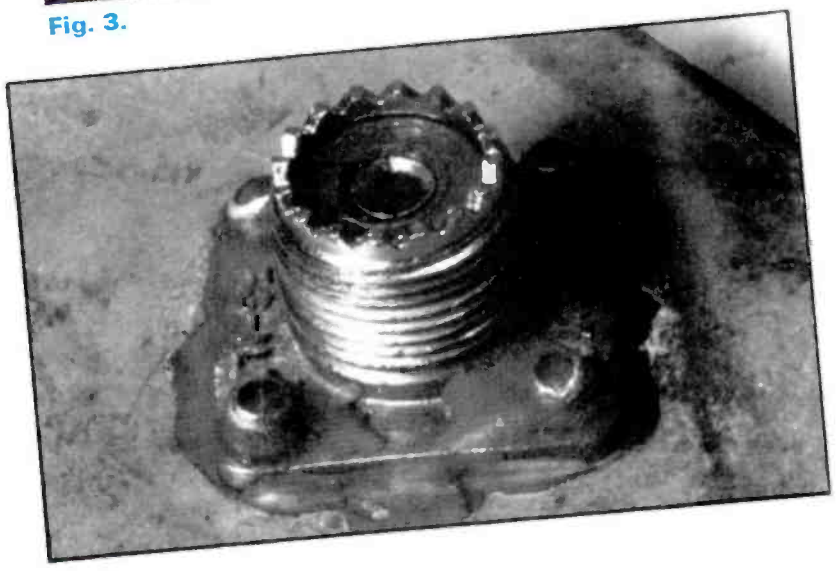


Fig. 4.

How Much? **£8 (depending on your junk box!)**
How Difficult? **Beginner**

Shopping List

Die-cast aluminium or other suitable box for base (see text), length of hollow glass fibre fishing rod (your local fishing tackle shop will probably be quite pleased to sell you a broken rod quite cheaply), wire for coil winding (see text), nuts, bolts and washers as required (alternative to rivets used by author), PL259 plugs and sockets. Two variable trimmer capacitors (22-30pF film type or Oxley will do, but see note in text reference power levels). Rubber suction-pad type feet (from hardware stores), suitable plastics material for mounting plate, waterproof sealing compound (bathroom silicone type or rubber windscreen sealant) self-amalgamating tape (for cable and plug sealing) and length of 50Ω cable and epoxy resin adhesive ('Araldite Rapid' is suitable).

should fix the rod into place with some epoxy resin adhesive. When that's completed, you can start on the next part of the project, building the base unit.

Aluminium Base Box

I used a small, die-cast aluminium box for the base. Almost any box will do, but if it's made from metal, it should be as small as is possible.

You should drill suitable holes for an SO239 socket in the 'bottom', before fitting the socket, with earthing tags under one of the fastenings. I used blind rivets for this job.

To keep the weather out, all holes should be liberally smeared with a waterproofing sealant. I used a rubber glue, and it seems to work very well. Although not strictly necessary, I also fitted a BNC socket for the feed point, as it makes adjustments easier.

Then you should take a length of copper wire of about 0.7 to 1.2mm diameter, and wind the coil, which should be of approximately six turns. If you have silvered copper wire then so much the better, although this only provides marginally better performance.

If you do fit a second socket for the coaxial feed, then the coil may be soldered in place between the two centre connectors. The photograph, **Fig. 2**, shows how it's done and the photos in **Fig. 3** and **4** show more general details of the antenna.

To mount the antenna on my 'Plastic Pig', I cemented the assembly onto a sheet of clear plastics material. You can use virtually any plastics for this purpose, and I fixed some rubber suction-pad 'feet' underneath, to do the same job as a 'mag-mount'.

Setting Up

Setting up and adjusting the antenna for a good v.s.w.r., is an easy task. Begin the process by setting the transmitter frequency to the middle of the area of interest (145.3MHz for the f.m. frequencies).

Then, by adjusting C1 and C2, you can reduce the s.w.r. measurement to its lowest reading on transmit. It should also be possible to achieve a figure of less than 1.5:1 over most, if not all of the 144MHz band.

The 'Pigtail' can also be employed as a useful, portable indoor antenna. I've used it for this purpose, and if you look at the front cover of the June 1990 *PW*, you'll see the antenna in use on the table, during my annual summer 'portable expedition!

Finally, it's important to remember that the components shown, are suitable for a maximum power of no more than about 5W, especially if the antenna is to be used outside in all the conditions the British climate has to offer!

Tail End

With just 2.5W maximum output from my 144MHz rig, I could use our local repeater from a distance of 60km 'up country' on a regular basis. I could also hear other stations up to 150km distance. Not bad for a little 'Pigtail'!

PW

A Simple Inductance And Capacitance Bridge

Construction

Stephen Knight Bsc., reminds us that the ability to wind inductors and measure their inductance can be a useful facility to most experimenters. So, with that in mind he's come up with this practical and very useful bridge, which could solve many problems for constructors.

Of the three fundamental quantities in electronics, resistance, capacitance and inductance, it's inductance which is the most difficult to measure. The value of inductance is also the most difficult to obtain, with any degree of accuracy relative to that of resistance and capacitance.

Constructors can buy ready-wound inductors, with values ranging from a micro-Henry (μH), to a few hundred milli-Henries (mH) with an accuracy of about 5%. For the purposes which these components are sold, such as r.f. chokes and possibly filter elements, such accuracies are, for most purposes, perfectly adequate.

However, this is not universally so. There are only a limited number of values obtainable, and for values which are not included in this range, we find ourselves at a disadvantage. For while inductors can be wound at the work bench cheaply and easily, unless we can measure what we have wound, those advantages disappear.

Small Inductors

I'm not going to consider large, iron-cored inductors, where the inductance may run into hundreds of Henries. I shall however, concentrate on smaller inductors (which may have dust-iron core adjustment) having values up to, say, one Henry.

These values of inductance are in the province of most experimenters, especially those with an interest in radio receiving and transmitting equipment.

Wheatstone Bridge

The project is based on the classic Wheatstone bridge and its adaptions. Bridge methods tend to be neglected nowadays, this is because for measurement of resistance and capacitance, there are now better, cheaper and easily operated alternatives.

However, in the case of inductance measurements, the bridge method offers a convenient and uncomplicated method. It's particularly convenient for the range of inductors I've mentioned.

The usual difficulty with bridge methods, arises from the fact that the bridge balance is affected by the 'loss angle'. This is much greater in inductive components than in capacitive elements.

This involves the successive adjustment of two controls on the bridge. There's one to balance magnitude (as in a purely resistive bridge) and the other to balance the phase angle differences.

For this project, I have assumed that the phase angles of the inductors we're likely to measure, are close to the ideal. This means we can avoid worrying too much about balancing out phase angles, and compare only the value of the inductive reactance, with that of an internal standard.

Simple Modification

The bridge used is a simple modification of Maxwell's circuit shown in **Fig. 1.1**. Two arms of the bridge are purely resistive, R_a and R_b. The adjustable arm consists of a standard variable inductor L_1 in series series with the variable Rc.

The unknown arm contains the coil, whose inductance L_x is required (The resistance Rx, is the effective a.c. resistance of the inductor at the frequency of measurement). The problem here is the need for a standard variable inductor, which is not something we're likely to find in the average workshop.

As we are not concerned with phase angles, we can leave out Rc, making the resistive arms have a continuously variable ratio. This is done by using a potentiometer as shown in the modified bridge, **Fig. 1.2**.

The variable inductor can be replaced with a range of fixed inductors (of known values), with the unknown inductor, L_x, placed into the fourth arm. With the equation of balance as given in the figure, we will know the ratio R_a/R_b (from a calibrated scale) and L (one of a standard range); hence L_x will be found as a simple product. The diagram, **Fig. 1.3**, shows the basic method of measurement and how the various components of the bridge fit together.

Circuit Details

The main circuit diagram (excluding the power supply), is shown in **Fig. 1.4**. It consists of three sections,

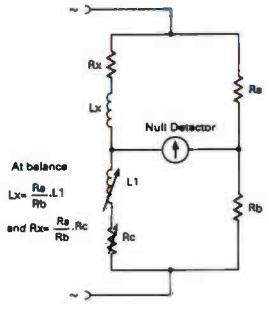


Fig. 1.1: Maxwell's modification of the Wheatstone bridge.

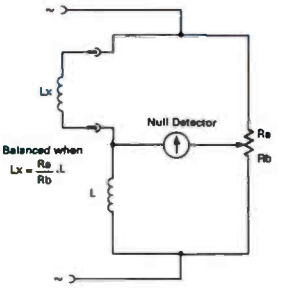


Fig. 1.2: The final modification.

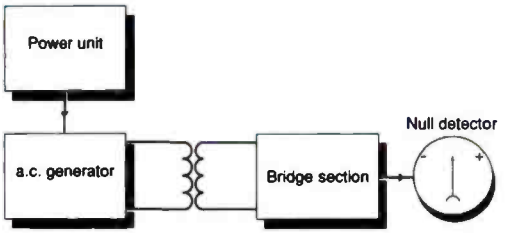


Fig. 1.3: Block diagram of the inductance and capacitance bridge.

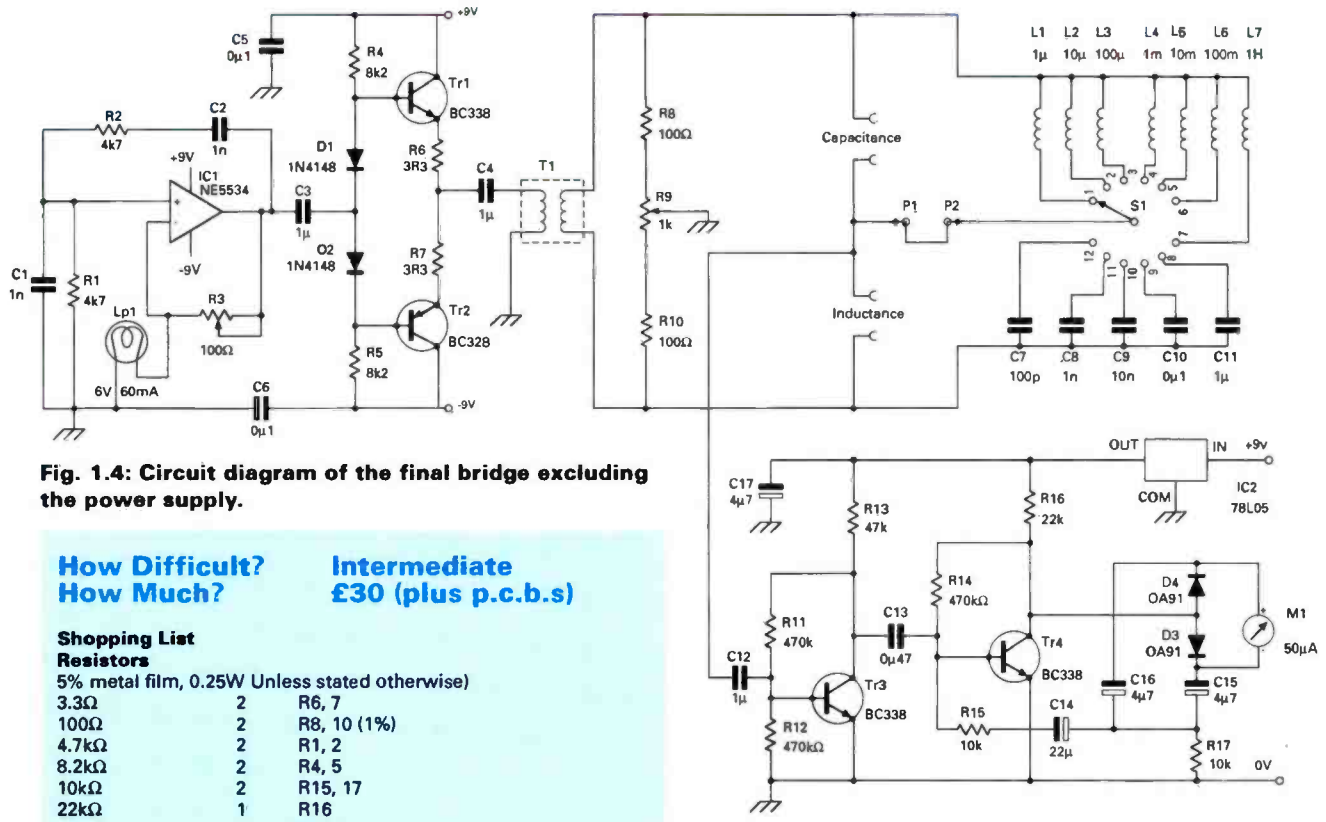


Fig. 1.4: Circuit diagram of the final bridge excluding the power supply.

How Difficult? Intermediate
How Much? £30 (plus p.c.b.s)

Shopping List

Resistors

5% metal film, 0.25W Unless stated otherwise)

3.3Ω	2	R6, 7
100Ω	2	R8, 10 (1%)
4.7kΩ	2	R1, 2
8.2kΩ	2	R4, 5
10kΩ	2	R15, 17
22kΩ	1	R16
47kΩ	1	R13
470kΩ	3	R11, 12, 14
Resistors variable		
100Ω	1	R3 (miniature pre-set)
1kΩ	1	R9 1W linear, type CLR (Colvern)

Capacitors

Type and tolerance as stated

100pF	1	C7 polystyrene 1%
1nF	3	C1, 2, 8 (**C8 1%**)
10nF	1	C9 (1% tolerance)
100nF	1	C10 (5% tolerance)
0.47µF	3	C13, 18, 19
1µF	1	C11(5% tolerance)
4.7µF	2	C15, 16 25V tantalum
22µF	1	25V tantalum
470µF	2	25V radial electrolytic

Semiconductors

Integrated circuits		
NE5534	1	IC1 Opamp, (see text)
78L05	1	IC2 100mA regulator
Transistors		
BC328	1	Tr2 (p.n.p.)
BC338	3	Tr1, 3, 4
Diodes		
1N4148	2	D1, 2
OA90/91	2	D3, 4
Zener Diodes		
D5, 6	2	9V 1.3W

Inductors

See note below regarding suitable sources of inductors.

L1	1µH
L2	10µH
L3	100µH
L4	1mH
L5	10mH
L6	100mH
L7	1H
T1	(see text)

All inductors are available from the CirKit Toko range or (up to 100mH) from Electrovalue, R.S. Components or Electromail.

Miscellaneous

Meter 50µA type MU (or T-series may be used), switches single-pole, 12-way Lorlin miniature, Two-pole on-off miniature. T1 is a RM6 pot core with bobbin and clamp (AL = 250). T2 12-0-12V (power supply transformer) 3VA p.c.b. mounting mains transformer, 250V neon indicator, miniature type. 6V 0.36W LES bulb, wire terminations. Terminal points (preferably spring loaded) (3 of). Case: Maplin Blue Case (see text). Knobs, 6BA 1/2in screws and nuts, 1/4in spacers, 11/4in spacers, 8-pin DIL socket for IC1 (if needed), connecting wire, 3-core mains lead solder.

each being built on small separate p.c.b.s representing the block assembly in **Fig.1.3.**

The a.c. source is a conventional Wien oscillator using an NE5534 op amp with filament bulb stabilisation. The actual frequency of this source is not critical, but other practical considerations appear.

The source has to 'look' into the bridge at balance, and might not be too happy at seeing an impedance not far removed from zero! Because of this, it has to be capable of delivering sufficient power into a very low impedance.

With the values used, the frequency of oscillation is about 35kHz. This is fed to a pair of complementary transistors, Tr1 and Tr2, into a step-down transformer feeding the bridge proper. This transformer has an impedance ratio of about 72:1, so the bridge loading doesn't at worst fall below a few ohms.

Capacitance Ranges

By using a 12-way switch in the bridge circuit, five capacitance ranges can be included. In this arrangement, the ratio arms are reversed in the changeover from inductance to capacitance measurement.

This method does away with the necessity of two distinct scales for the ratio, since this will increase as inductive reactance increases, and decreases as the value of a capacitor increases and capacitive reactance decreases.

Thanks to these effects, a single scale calibration showing the arm ratio on both sides of one-to-one, will be practical for both measurements.

The output from the bridge is fed to a simple null detector comprising transistors Tr3 and Tr4. Negative feedback is applied over both stages. A 50µA meter, itself in a diode bridge arrangement, indicates the minimum (or balanced) condition at the input.

The feedback operation protects the meter from severe overloading, even with a far out-of-balance state, and a sensitivity shunt is unnecessary.

The power unit (to be described next month) is entirely conventional and provides a dual 9V output stabilised by Zener diodes.

Board Assembly

The two main circuit boards are shown in **Figs. 1.5** and **1.6**. The oscillator and null detector boards need little comment.

On both boards, the only points to watch are the polarities of the diodes and electrolytics, together with care in fitting the

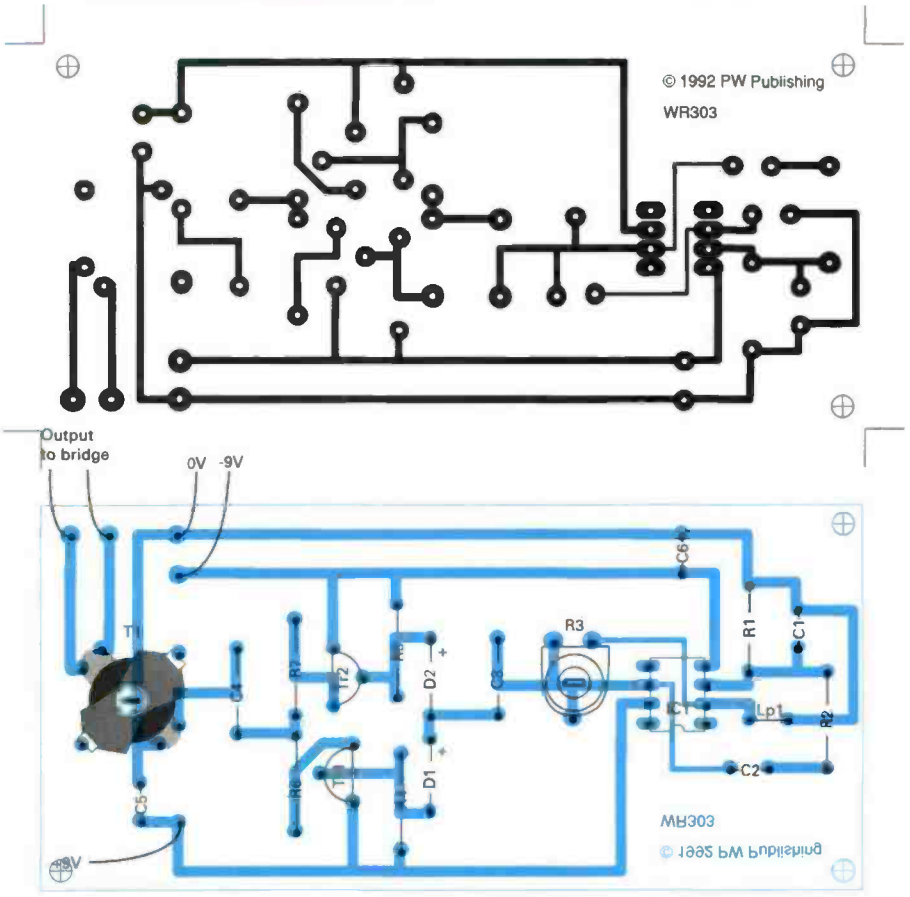


Fig. 1.5: The oscillator p.c.b. showing track layout and the component overlay details. See text for T1 pin connection details.

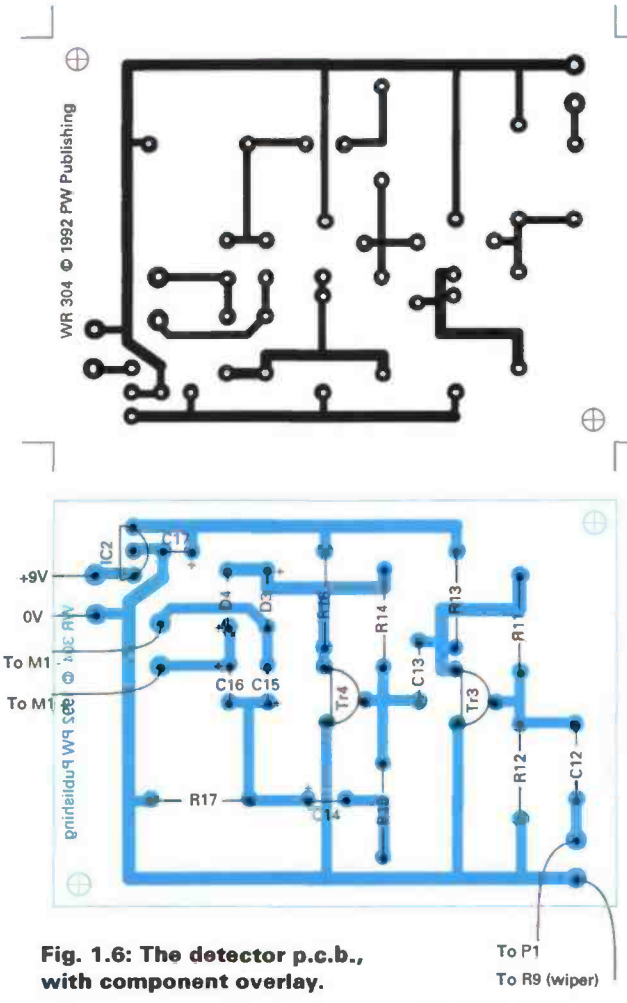


Fig. 1.6: The detector p.c.b., with component overlay.

transistors (of the complementary pair) in their right places.

Transformer T1 is a type RM6 pot core, with an inductance factor A_L of 250. They have a bobbin which has integral pins on a 0.1-inch grid.

The pins are grouped in threes on each side of the bobbin, and the outermost pin of each group must be snipped off to allow the unit to be fitted to the print pads on the board. The bobbin is wound with 105 turns of 36s.w.g. enamelled wire for the primary, and 12 turns of 26s.w.g. for the secondary. There's no need for tape insulation between the windings.

Each coil is brought out to a pair of the pins, and neatly soldered. Which end goes to which of the pins doesn't matter.

It is however, important to get it the right way round when it is assembled with its two half-cores. The 'spiky' ends of the retaining clips go to the single pads. The core adjuster should be screwed well in.

The Final Stage

Next time, I'll describe the power supply, the bridge board, and the final assembly stages, testing and calibration of the simple capacitance and inductance bridge. The good news is that, if you use the recommended components, all the hard work in calibration has already been done for you.

Getting Started The Practical Way

This month, the Rev. George Dobbs G3RJV takes a look at the Hartley oscillator, and describes the building of one of the most useful tools in the amateur radio workshop...the dip meter. And, as is usual with George, he leads off with a suitable quotation!

"De nihilo nihilum, in nihilum nil posse reverti"
(Nothing can come out of nothing, nothing can go back to nothing)
Persius AD 34-62
...or (G3RJV interpretation) *"you can't get owt from nowt"* as they used to say to me in my Lincolnshire youth! Take it from me, this is worth remembering when dealing with oscillator circuits.

So far in this series, we have built audio oscillators. These are oscillators that produce an output that we can hear.

Radio frequency oscillators (r.f. oscillators) are more usual in our hobby. Oscillators of this type appear in most receivers, and in all transmitters and, as the name implies, they produce a signal at radio frequencies.

The principle of operation is the same as the audio oscillator. The basic circuit is that of an amplifier, where some of the output is fed back to the input (feedback) to set up a cycle of oscillation.

Within the circuit there will be elements to set the frequency of that oscillation, usually in an r.f. oscillator this will be a tuned circuit.

Resonant Frequency

Just as in music, strings or tubes can have a resonant frequency which produces a particular note. It's the same in electronics, where a circuit can resonate at a chosen frequency.

The circuit, **Fig. 1(a)**, shows a **parallel tuned circuit**. There's nothing to it really, only a capacitor and an inductor. The term **inductor** is the usual name for a coil, although many of us 'old hands' still call them coils!

Without going into a lot of theory, a tuned circuit relies on a property called **reactance**. The reactance resists the flow of alternating current (a.c.) in a circuit.

Capacitive reactance and **inductive reactance** work the opposite way round. This means that the reactance of an inductor increases as the frequency gets higher, whereas the reactance of a capacitor increases as the frequency gets lower.

So, for any given values of capacitance and inductance, there will be a frequency when both are the same and cancel out. This is the **resonant frequency** of that tuned circuit.

Since the reactance **impedes** the flow of a.c. current in the circuit, the resonant frequency is that at which the circuit will allow a **high current** to flow.

At frequencies above and below resonance, the a.c. current flow is **resisted or reduced**. So, a tuned circuit **accepts** or **tunes** a particular frequency.

Variable Capacitor

The diagram, **Fig. 1(b)**, shows the use of a variable capacitor to vary that frequency. Interesting, isn't it? But that's all the theory you are going to get here!

This is 'Getting Started the **Practical Way**' and there are plenty of books dealing with the theory of the subject, and we are simply going to build a circuit to see it working and get some **practical** use out of it!

Hartley Oscillator

The diagram, **Fig. 2**, shows the circuit of an r.f. oscillator of the type known as a **Hartley oscillator**. I assume it's named after a Mr Hartley, for although my radio archives have references to the circuit back at least to the 1930s, they say nothing of the man behind the circuit.

The circuit shows our first example of another active device, the **field effect transistor** (f.e.t.). This is a type of transistor with a higher input impedance than the bipolar transistors that we've used so far. The terminations also have different designations, and they are referred to as: the **source**, **gate** and **drain**.

There are two questions that can be asked of an oscillator circuit, and they are: where is the feedback loop to maintain oscillation, and what determines the frequency of the oscillation?

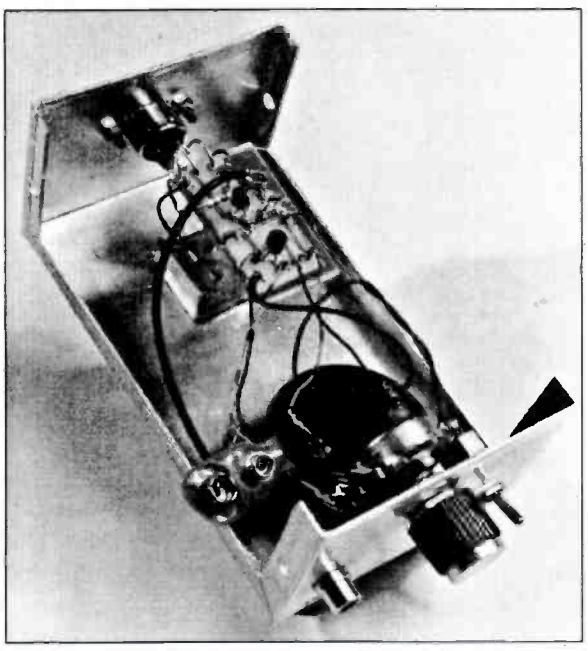
In this circuit, the tuned circuit can be seen clearly in L1 and the variable capacitor. The feedback is applied through the inductor in the tuned circuit. This is tapped, to allow signal to be fed back from the source to the gate.

Feedback Controlled

The amount of feedback is controlled by the placement of the tap in the coil. The higher the tap is up on L1, the greater the feedback.

The ideal amount of feedback is just that required to maintain oscillation, over the whole tuned range of frequencies. Too little and the oscillations will not begin. If there's too much feedback, there can be problems of instability or even over-heating of the transistor.

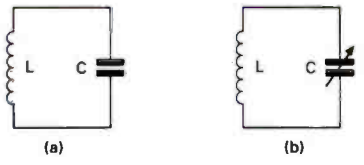
In the circuit, **Fig. 2**, R1 provides a suitable



A view of the completed dip-meter.

Fig. 1: Parallel resonant circuits.
(a) is of fixed frequency.

(b) is frequency variable.



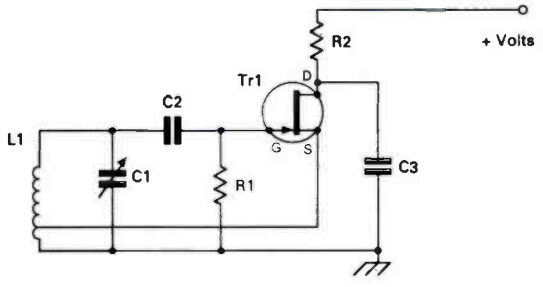


Fig. 2: The Hartley oscillator has the tuned frequency selected by L1 and C1.

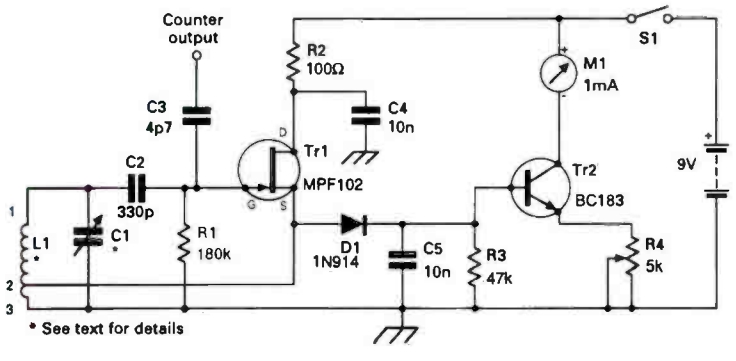


Fig. 3: Adding a few more components to the circuit of Fig. 2, allows us to 'see' the strength of oscillations on meter M1.

voltage for the gate of the f.e.t., and C2 couples the tuned circuit to the gate. Notice that R2, in the supply line, has a decoupling capacitor, C3.

A decoupling capacitor takes any signal appearing at R2 to ground. This keeps the signal away from the supply line, and it also reduces the chances of extra feedback and instability.

The output, in this case, can be taken from the source or the gate, of Tr1. We're going to use this circuit to make one of the most useful items of test equipment for the amateur radio constructor...a 'dip meter'.

The Dip Meter

The dip meter, which was known as the 'grid-dip meter' in the days of valves, is one of the most useful items on the radio constructor's bench. The earliest reference to these instruments, seems to have been a practical circuit by W6WB in *CQ Magazine* in 1947.

The basic task of the dip meter is to measure the frequency of a tuned circuit. It can also be used to measure the resonant frequency of antennas.

Other jobs the dip meter can do include measuring unknown inductances and capacitances, and detecting unwanted harmonic resonances in circuits. However, its main use is probably finding the resonant frequency of tuned circuits that use home-wound coils.

In a practical form, the dip meter is a calibrated variable frequency r.f. oscillator with an inductor mounted outside the instrument's case. The externally mounted inductor is arranged so it can be brought close to another tuned circuit.

When the tuned circuit being measured is at the same frequency as the dip meter oscillator, it will absorb some of the energy from that oscillator. When this happens the current drawn by the oscillator will decrease, and this can then be measured on a meter.

The frequency of the dip meter is already known and is shown on the instrument's dial (in other words, it's been calibrated). All the operator has to do, is to read the frequency from the dial where the the maximum 'dip' occurs.

The early valve versions used a meter to measure the current in the valve grid, hence the name 'grid dip' oscillator, which is still used by many radio amateurs. Nowadays, since transistors don't have a grid, the term dip meter is more correct.

The Circuit

The diagram, **Fig. 3**, shows the circuit of a dip meter using the Hartley oscillator. The transistor, Tr1, is exactly the same circuit as the oscillator circuit shown in **Fig. 2**.

For the dip meter to be effective, it's essential to have a meter on the instrument, which can clearly show what (if any) oscillatory energy is being absorbed by the circuit being tested. For this purpose, many dip meters have a sensitive current meter monitoring the current flowing in the gate circuit of the oscillator. This circuit uses another method.

The circuit around D1 and Tr2 is very similar to that which we used in the field strength meter earlier in this series. Rather than measuring the current flowing in any part of Tr1, this circuit monitors the strength of the oscillation produced by Tr1.

The diode, D1, acts as a detector (just as it would in a crystal set). The transistor, Tr2, amplifies the voltage produced by D1 to drive the meter M1. A variable resistance, R4, in the emitter of Tr2 allows you to adjust the reading of the meter.

How It Works

Now let's see how it works, and you'll soon see how simple it is! When Tr1 is oscillating, a radio frequency signal, the frequency being controlled by L1 and C1, appears at the source (S). The diode, D1, detects this signal, converts it to a d.c. voltage and TR1 acts as a d.c. amplifier to drive the meter.

The variable resistor, R4, allows the meter reading to be set on, or near, full scale for normal oscillations. When a tuned circuit, which is on the same frequency as L1 and C1, is brought close to L1, it will absorb some of the energy from the oscillator. The amplitude (strength) of the signal at the source will be reduced, and this will produce a dip in the meter reading.

Frequency Measuring Scale

A signal output point is also provided at the gate of the f.e.t., via a capacitor, C3. This is to drive a frequency counter.

As I've already mentioned, dip meters require a frequency measuring scale (the calibration) to be provided. This can be added underneath the knob which controls C1, so that the frequency at which the dip occurs is known.

Calibrating and adding the oscillator frequency scale to the instrument, is probably the most difficult part of building the dip meter. However, if you're fortunate enough to have a frequency counter (digital frequency meter), there's no need to have a scale on the knob of C1 because the frequency of the oscillations can be measured by the frequency counter.

(Editorial note: Many constructors owning a modern communications receiver, with a digital frequency read-out type of tuning scale, can take advantage of their good fortune, to calibrate the dip meter).

The choice of this circuit means that a 1mA meter can be used. This is useful because it suits my own style of 'radio meanness'!

Good quality moving coil meters are expensive. Fortunately, meters with a full scale deflection of 1mA are perhaps the most common type to be found on the surplus market.

It doesn't matter what's marked on the meter scale, as all we require is to see the needle swing downwards as the oscillator 'dips'. My meter was culled from an old project, but if new constructors can't find a surplus movement, I have named a suitable new meter in the parts list.

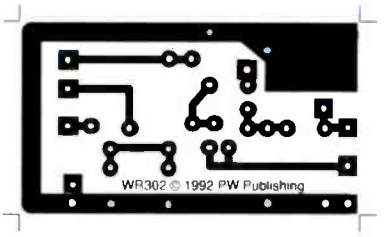


Fig. 5: The Dip-meter track pattern.

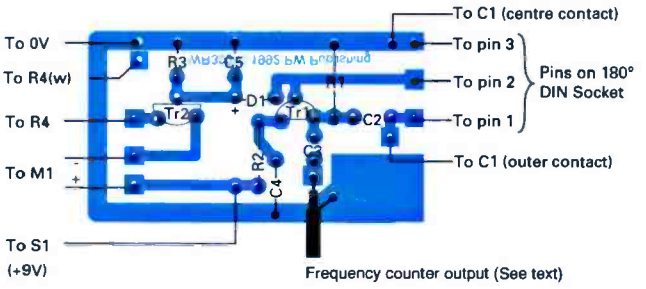
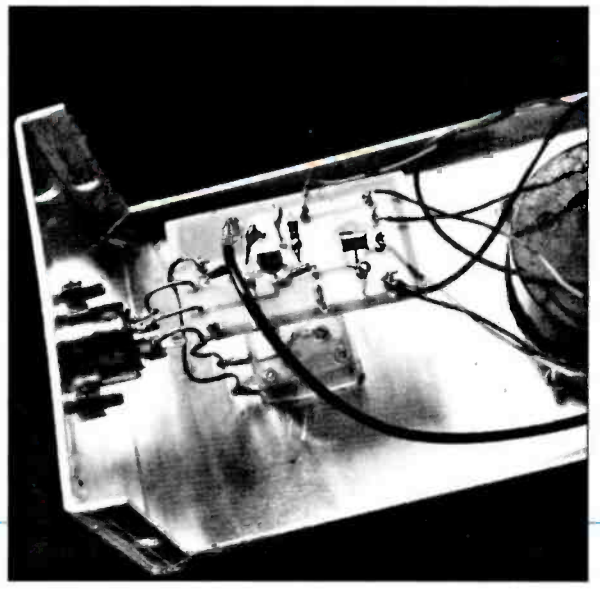
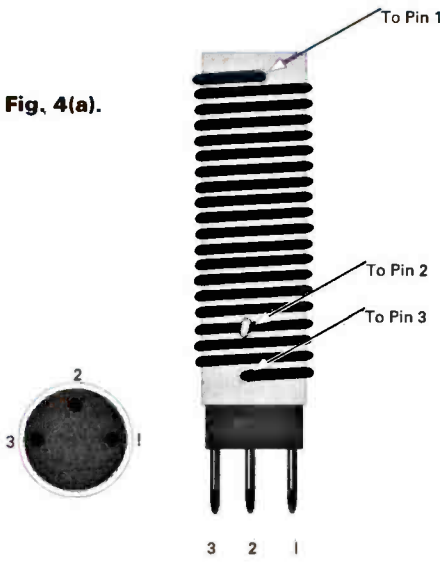


Fig. 6: The circuit board layout, with the overlay as seen from the component side of the board.



The p.c.b. is mounted directly behind the DIN socket with C1 visible behind it.

Fig. 4(a).



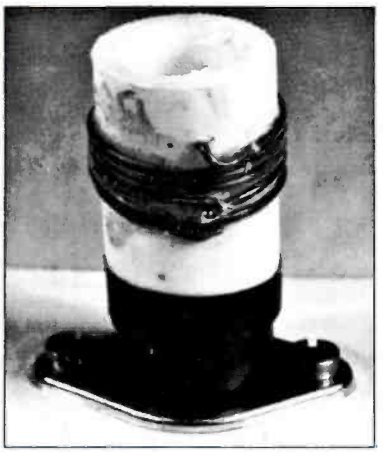


Fig. 4(b): The coils follow this general layout. Table 1 gives details of the number of turns for each coil.

Exciting Winding

This project introduces another exciting new pursuit to this series, and that's the winding of homemade coils, or inductors. Although I've already said that calibrating the instrument could be the most difficult part of this project, others might say that winding the coils is the worst job!

So that the dip meter can cover the whole of the amateur radio h.f. bands, four plug-in coils are required for L1. In the past, when I have written articles on projects using home-wound coils, more problems seem to have come from these components than from anything else. But you aren't going to let me down - are you?

The required coils are not difficult to make. They're wound on short lengths of flexible plastics electrical conduit tubing, which has an outer diameter of 15mm.

This tubing is available from DIY stores, although any plastics tubing of the same diameter could do the job. The recommended tubing fits well onto the coil base which is a 3-pin DIN plug. The 3-pin DIN plug will allow the coils to be plugged into a corresponding DIN socket mounted on the dip meter casing.

Four lengths of the tubing are required, and you should begin with lengths of about 60mm long, as the coils can be trimmed to size **after the windings have been made**.

The coils are all **close wound**. This means that the windings are placed side-by-side (each turn touching its neighbour) and the direction of the windings is the same throughout the coil.

The wire used, is enamelled copper wire. This is copper wire with a coating of varnish, which provides a flexible insulating layer around the wire. Although some modern enamelling melts as you apply the soldering iron, it's a good idea to scrape the coating off the wire, before tinning it where a solder joint is made.

The Coil Tap

The tap in the coil winding is the most difficult part, so I suggest you begin with this job. A simple way is to drill a 1mm hole near one end of the tube and push a length (about 80mm) of PVC insulated wire through the hole.

Next, you should pull the end of the wire out of the tubing nearest the hole until just about 5mm sticks out of the side of the tube. Remove approximately 2mm of the PVC covering from this end of the wire, and form the end into a hook.

Scrape this end clean and tin one end of the coil wire (1mm should be enough), and then solder the tip of this wire to the hook of the PVC covered wire. Then wind the short end of the coil (marked 2 - 3 in **Fig. 4(a)**) by laying the windings side-by-side, pulling gently to keep the turns tight.

After the correct number of turns have been added to the tube, carefully drill another 1mm hole where the winding ends. Then cut off enough wire to reach the end of the coil, with some to spare, and pass it through the new hole to bring it out the same end as the PVC covered wire.

The next job is to scrape and tin the tip of the coil wire, before soldering it to the tapping point and adding the main part of the coil winding. The main winding **must** be wound in the same direction as the small part of the coil winding.

When the winding is completed, drill another 1mm hole. Cut enough wire to reach the far end of the tube and pass the wire through the hole. All three wires should emerge from the same end of the tube, which is the end with the smallest winding. The diagram, **Fig. 4(b)**, shows how the windings are arranged.

Table Of Turns

To save a lot of work, I've prepared a chart, **Table 1**, showing the numbers of turns required for the four coils, and how these windings relate to the circuit diagram and the completed coils.

Don't forget to remove excess tubing from the coils, to make the top of the tube about 2 - 3mm from the end of the winding marked '1'. The coils are then completed by adding the 3-pin DIN plug.

Adding the plug to the coils, requires the three wires to be shortened until they just emerge from the tube. The wires are bared, tinned and carefully soldered to the pins of the DIN plug.

The tapping point goes to the centre pin on each of the coils. Looking at the DIN socket from the pin end, with the centre pin at the bottom, wire 1 goes to the left pin and wire 3 to the right pin. The DIN socket can be glued to the tube or simply held in place with a binding layer of PVC tape.

Building The Dipper

The diagram, **Fig. 5**, shows a layout for the dip meter built on a printed circuit board (p.c.b.). This is viewed from the underneath (copper track side) of the board.

The diagram, **Fig. 6**, shows a view looking down on the component side, through to the copper track side of the p.c.b. In other words, we are looking down on the components, and through to the copper track.

As with previous projects, it would be possible to build this circuit using 0.1in matrix 'perfboard'. The layout could follow the p.c.b. design, when transferred to the 'perfboard'.

If the p.c.b. technique is used, the construction is simply a 'push the components in the holes and solder' job. The orientation of Tr1, Tr2 and D1 must be correct as shown on the drawing.

The capacitor C3, provides coupling from the oscillator to a counter. The value, 4.7pF, is enough to drive my frequency counter on all ranges.

Should the 4.7pF value fail to drive an available counter, it can be increased, as the higher the value of C3, the more signal reaches the counter. Don't be tempted to use a very high value for C3, as this could overload the counter and cause false readings.

Metal Case

The prototype dip meter is built in a case measuring 133 x 760 x 520mm. Although the dipper requires a metal box, the size chosen depends upon the dimensions of the available meter, the control knob and calibration scale used for the instrument.

On my prototype, an accurate scale was not important because I can use a counter to check the frequency of the oscillator. I used a large knob for ease of operating the tuning capacitor on the dipper, in conjunction with a pointer on either side with two simple hand-drawn scales.

Table 1:

Frequency MHz	Winding Between 1-2	Winding Between 2-3	Wire Gauge
1.6 to 2.6	60 turns	12 turns	26s.w.g.
2.6 to 6.6	40 turns	10 turns	26s.w.g.
6.1 to 15.2	16 turns	4 turns	22s.w.g.
13.8 to 34.7	4 turns	2 turns	22s.w.g.

In fact, I have no real need for any frequency scale for the dipper, as I simply read the frequency from the counter. If the scale is essential, it's a good idea to have a larger box to allow for a bigger and easier to read scale.

The Controls

The tuning knob control for C1 and the meter fill the 'face' of the dip meter, the DIN socket is at one end and the sensitivity control, R4, is at the other, with S1 and the counter output socket.

On my design, the p.c.b. has no mounting holes and is fixed to the DIN socket by means of stiff wires from point 1, 2 and 3 on the board. The dip meter tuning capacitor, C1, is a polyvaricon variable capacitor. These sometimes have short control shafts and are difficult to mount with a large knob.

The variable capacitor I've suggested in the parts list, has an shaft size, which is adequate for most large control knobs. There are two fixing screw mounting points on the front of the polyvaricon. Using these can be a fiddley job, and I cheated by fixing the control on the inside of the metal box with an instant adhesive.

The PP3 battery is fixed to the inside of the box between the meter and the variable capacitor using double-sided tape. Alternatively, if there's enough room in the box you've chosen, suitable moulded plastics battery holders are available.

Testing And Calibration

The completed dip meter board should be mounted on the DIN socket and the interconnections made between the board and the meter, controls, switch and battery. Your 'dipper' is now ready to be tested.

To test the dip meter, push in one of the coils and switch on. The meter needle should show an indication on the scale. Rotating R4 will move the needle up and down the scale. Check that this movement is smooth as R4 is rotated. You'll find that as the ranges are tuned, there will be some variation in the reading which can then be compensated by adjustment of R4.

Standard Test

Now it's time for the dip meter test. This is the standard test I do to check if a dip meter is any good. It's a good one to try on any commercial dip meter, if you're contemplating buying one. But why bother after building this project?

To start the test, set the tuning control anywhere on the scale. Turn up sensitivity control, R4, until the meter reads nearly full scale. Grip the coil with one of your hands, and the reading should go down. When you release the coil, the meter reading should rise again towards full scale.

Another test is to gently place the tip of a small screwdriver into the end of the coil. Again, this should the meter pointer to dip. If these tests are satisfactory, and you get the results I've mentioned, then all is well and you can go on to the next stage.

Calibration

If a counter is not available, the dip meter will require a frequency calibration scale for C1 on all four ranges. One way to do this is to use a counter, but if you have one, what's the point of the scale!

Although it might be possible to borrow a frequency meter for calibrating the dip meter. The simplest way is to use a general coverage short wave receiver.

Placing the coil near the antenna of a receiver, will allow the oscillator signal from the dip meter to be heard. The receiver must be set for c.w. or s.s.b. reception. You should hear the signal (with the receiver b.f.o. on, or the receiver set to s.s.b. or c.w. as suggested) as a strong whistling note.

The ideal knob for the tuning capacitor, C1, is a large one. It should have either a double pointer marking (if it only has one, add another) or a cursor made from perspex.

Having a pointer at opposite ends of the knob, means that a scale can be added above and below the knob, since C1 has only 180° of movement. In fact, two scales are added above and below the knob for the four ranges. The job of calibration is carried out by selecting convenient calibration points around the scale, after locating the frequencies on the monitoring receiver.

The careful constructor will no doubt add the figures using rub-down lettering, but I (saving money again!) wrote them on my scale with a ultra-thin felt tipped pen. Without a frequency counter, the accuracy of the dip meter depends upon the amount of time and effort expended in calibrating the tuning scale.

Shopping List

Resistors

Carbon film 5% 0.25W

100Ω	1	R2
47kΩ	1	R3
180kΩ	1	R1

Resistor variable

5kΩ	1	R4	Linear potentiometer

Capacitors

4.7pf	1	C3 (see text)
330pF	1	C2 (ceramic)
10nF	2	C4, 5

Capacitors Variable
(See miscellaneous)

Semiconductors

MPF102	1	Tr1
BC183	1	Tr2 (BC109 also suitable)
1N914	1	D1

Miscellaneous

Variable capacitor for dip meter tuning (CX) Polyvaricon, Maplin catalogue ref: FT79L. TR1 (MPF102) is available from Maplin as QH59P). Miniature toggle on-off switch, 4 off 3-pin DIN plugs (Maplin HH25C suitable), DIN socket (Maplin HH32K suitable), 1mA meter movement (Maplin QHRW94C suitable), frequency counter socket (phono socket or similar). Enamelled copper wire 22 and 26s.w.g. Aluminium case to fit (Minfford Engineering A45 or larger size suitable).

Ready For Use

The Dip Meter is now all finished and is ready for use. I'll be talking about that next time, cheerio for now!

Mathematics For The RAE

Finishing off his discussion on resistors, Ray Fautley G3ASG explains the power rating of these simple, but much misunderstood, components.

Before we start, I'm sure that you'd like to have the answers to last session's questions I left you with. So, here they are. I have given the answers correct to six decimal places, and then in brackets, you'll find the 'normal' answer correct to two decimal places.

i) 11.111111Ω (11.11Ω)
ii) 1001mA (precisely!) (1A or 1000mA 'normal')
iii) 99.990001μA (100μA)
iv) a. 11.111111Ω (11.11Ω)
b. 1.010101Ω (1.01Ω)
c. 0.200401Ω (0.20Ω
d. 0.1001Ω (0.1Ω)

They were fairly simple, weren't they? If any one of those problems caused you difficulties, you can send a large s.s.a.e. to 'Maths Help March' c/o Tex Swann G1TEX at the Poole editorial offices, and he'll send you the full working of the problems.

Now it's time to get down to this month's business. It's related to last session's work in that we will deal with power dissipation in resistors. Power is dissipated in resistors when a current flows through them.

Power Handling

When designing a circuit, we need to know what power is going to be produced in the circuit, or resistor, to allow us to put the correct size resistor in the circuit. If a resistor has too much power fed into it, it will overheat. At best, it will only change its resistance value. At worst it might burn out, or even explode.

Remember, a fuse is just a special resistor design to 'blow' when the current is too great. The power handling of resistors (normally known as their 'dissipation' rating, and quoted in watts or fraction of a watt) must be at least as great as the power produced in them.

Power Dissipated

For this reason, we need to calculate the power dissipated in a resistor (or circuit). When we know what power is produced, we can arrange to put in resistors that can dissipate (or get rid of) the power. It's quite simple to calculate the power in a resistive circuit. All you have to do, is just multiply the voltage across the circuit, by the current flowing in the circuit. Mathematically we say (we'll call this *formula one*):

power (P) = volts (V) * current (I)

Note that at this point, we don't need to know what value resistance the resistor is. All we need to do, is measure both values and multiply them together. With this in mind let's have a look at some examples:

1) The station rig is on a 12V power supply unit (p.s.u.) with an actual output voltage of 13.2V. On receive it takes 0.7A current, and on transmit 2.5A. What power is being taken in both conditions?

Firstly, on receive at 13.2V, the current taken is 0.7A. From formula 1, we know P=V*I. This gives a power drain of 13.2 * 0.7 =9.24W on receive. On transmit the power taken is 13.2 * 2.5=33W.

As a little bit of extra fun let's try this problem: what would be the efficiency, if on transmit the set were producing 20W of r.f. energy? The answer is of course, the useful power (r.f.) divided by the total power taken 33W (20/33=0.606, or about 61%).

Let's take another example. In this problem we have a 10Ω resistor connected across 12V. The current flowing is 1.2A (12/10). From formula one the power dissipated is (12V * 1.2A) 14.4W.

Other Methods

Sometimes we don't know, or we're unable to measure either the voltage or the current in a circuit. There are two other methods of calculating the power within a circuit. Both of these methods use the resistance value of the resistor in the calculation.

If the current is known then use:
$P=I*I*R$ ($P=I^2R$) *(Formula two)*
If the voltage only is known then use:
$P=(V*V)/R$ ($P=V^2/R$) *(Formula three)*

Now let's check if they work! To start off, we'll use our example from above, the 10Ω resistor on a 12V p.s.u. From formula two, $P=I^2R$, we find that the power is 1.2*1.2 *10, or 14.4W. So that formula works, now lets try the other one.

Using formula three, $P=V^2/R$, and putting figures in, we find the power to be once again 14.4W (12*12/10). From this example, you see we can use whichever formula is the most convenient to use.

Examples To Try

Here once again, I've provided a few examples to let you try out your new found skills. This time, I'm going back to the multiple-choice method of setting the questions.

1) A resistor of 5Ω is fed from a p.s.u. of 10V, what power is dissipated in the resistor?
a) 20W b) 2W
c) 50W d) 0.5W

2) A p.s.u. of 13.5V is powering a circuit that is taking 2.8A. What is the power being supplied to the circuit?
a) 4.82W b) 533W
c) 37.8W d) 105.84W

3) A resistor of 100Ω has a current of 10mA flowing through it. What is the power dissipation in the resistor?
a) 1W b) 1mW
c) 1kW d) 10mW

4) A 50Ω resistor has a voltage of 22.36V across it. Calculate the power being produced.
a) 2.236W b) 1118W
c) 10W d) 236W

5) In a circuit a 5W resistor of 4.7Ω is to act a long-term load. What would be the maximum voltage across it if the 5W is not to be exceeded? (The answer is correct to two decimal places).
a) 3.786V b) 23.542V
c) 5.003V d) 4.847V

As usual, I'll give you the answers next session. See you then!

CB HIGH & LOW

By 'Quaynotes'

This month, 'Quaynotes' looks back on the previous users of 27MHz, chats about antennas and suitable mounting systems.

I suppose that I could start this month's column off with the sub-title 'When 27MHz went to war'! Did you know that during the Second World War, virtually the whole of the present 27MHz band (a wavelength of 11 metres) was used for the UK coastal radiolocation (radar) stations known as the Chain Home Low system? (**see note***).

A CH transmitter provided a **normal** operational power of around 500kW (half a million watts). This was fed to an enormous curtain antenna array (with reflector) suspended between four 350ft high towers. See **Fig. 1,** and as the Editor insists on metric, that's about 107 metres!

Development In Earnest

Development of radio-location began in earnest during 1935 at Bawdsey Manor, near Felixstowe in Suffolk. By 1939, there were enough operational CH stations to cover the whole of the south and eastern UK coastline. The stations were used for tracking and locating the approach of German aircraft from bases in Germany, and later from German occupied European countries.

The Bawdsey station was also used for development and experimental work on other radar systems. One particular experiment, involved modifying a 27MHz CH transmitter to provide a power output of 1.7MW (1.7 **million** watts!). However, this power level had to be reduced to 1MW to prevent the transmission lines and antenna elements from melting!

Radio Controlled Models

When the war ended, a frequency band based on 27MHz was allocated for radio controlled models. There was another frequency allocated based on 465MHz and the maximum power permitted for either was 5W.

***Note:** The method of converting frequency in MHz to wavelength in metres, in case you are wondering, is 300/f MHz = 300/27 = 11.1. recurring).

The power level allowed for CB radio on 27MHz, as per the present Department of Trade and Industry schedule, is 4W. The permitted power level is hardly likely to set your antenna on fire! Despite this, there are other aspects concerned with safety where antennas for both mobile and base station operation are concerned, which I'll deal with later.

Speaking Of Antennas

Speaking of antennas, reminds me of one particular useful design. You may remember seeing a photo of the Ring-base antenna for 27MHz in 'CB High & Low' (*PW* January 1992).

If you want to make yourself an antenna that will provide the same performance, you'll find the details for constructing the RB10 (ring-base) antenna featured in *PW* issues July and August 1990.

The RB10, originally designed for portable, or fixed station operation, on the amateur 28MHz band, will operate just as efficiently on 27MHz. The two part article contains information for the minor adjustments necessary for use on this band.

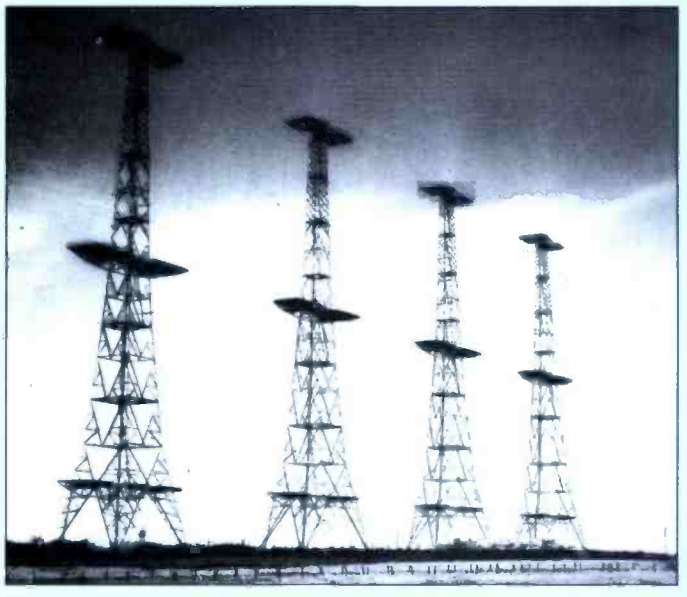


Fig. 1: With an antenna like this you could go places on 27MHz! The four 107m high towers used to support the high 'curtain antenna' and its reflector, used for wartime radiolocation (radar) stations operating on 27MHz (see text).

Summer Is Coming!

Now that summer is coming, how about having a go at direction finding or 'Fox-hunts' on 27MHz during the summer months. If you have any back numbers of *PW*, take a look at January 1991, page 24, in Part 2 of 'Circular and Square Loop Antennas'.

If you want to have a go, there's a photo and details for a fairly compact circular loop direction finding antenna, which is tuneable between 20 to 30MHz. Moreover, it's deadly accurate on receiving (don't forget that directional antennas are **illegal for transmitting** purposes on 27MHz), if you know how to use d.f. loops that is!

Want to know more on this fascinating subject? I could share a great deal with you, but I can also tell you, the Editor might need some gentle persuasion to provide the space!

Mobile Antennas

The secure mounting of mobile antennas is very important. A long 'whippy' 27MHz mobile antenna on a very small mag-mount, can be swept from a car roof by strong cross-winds or low tree branches. The often very strong cross-winds created by heavy goods vehicles, when they're either overtaking you or passing in the opposite direction, can also dislodge a mag-mount.

A mag-mount for a mobile antenna more than 1m in length, should have a base and strong magnet at least 150mm (6in) in diameter. A combination of this nature was loaned to me recently by **Nevada Communications Ltd., at 189 London Road, North End,**

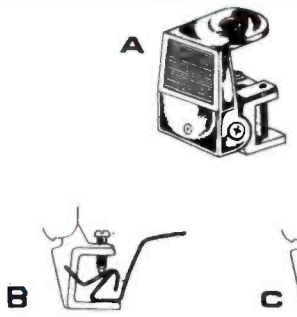


Fig. 2(a): A standard gutter-mount. (b) and (c) Correct method of securing to car, with rain gutters of different widths (diagrams courtesy of Nevada Communications, Portsmouth).

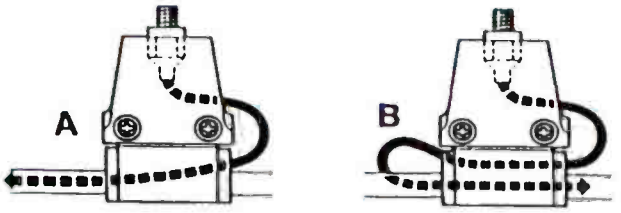


Fig. 3(a) and (b): Don't forget to leave a small amount of slack in the coaxial cable, as shown, to prevent pulling on socket.

Portsmouth, Hants PO2 9AE. Tel: (0705) 698113.

The antenna on loan was a 27MHz mobile whip, model T445 (Boston) 1.7m long, including base coil. The mag-mount was 160mm in diameter (Model 140PL).

On the side of the box, Italian wording described that the antenna and mounting was okay for maximum vehicle speeds of 130-180km/h. Both were quite secure in a situation as described above, and I also know that both the antenna and mounting have been tested in the UK at just over 145km/h (90mph) on a windy day. All in the interest of safety!

The Gutter Mount

A gutter-mount is safer for 27MHz mobile antennas. Although the antenna will be at the side of the car roof, this will make no measurable difference to the transmission or reception. This is because the average car roof is ineffective as a **ground-plane** for this frequency band.

A gutter-mount, similar to that shown in **Fig. 2 (a)**, must be correctly fitted as in **(b)** or **(c)**, depending on the rain gutter width. Make sure there is a small amount of slack cable as in **Fig. 3 (a)** and **(b)** to prevent pulling on the socket.

Special Mounts

Special mounts for fixing antennas on the side of the car, are available for vehicles not provided with rain gutters. You can also buy magnetic and gutter-mounts with swivelling bases. The swivel action is useful, as the antenna may be pushed down parallel with the car roof, when entering a garage, car-port or low-roofed multi-storey parking facility.

Finally, I must apologise for the non-appearance of the article on s.w.r., but I will be looking at that very soon, in time for the better weather and easier antenna adjustments.

That's the lot for now, but don't forget to let me know if you want to know more about d.f. or 'Fox-hunting' on 27MHz.

Quaynotes

Reflections

This month, Ron Ham continues his look at lightning, fuelled by reader's interests before discussing propagation and reports, with a final peek at SSTV.

Firstly, a big thank you to each of you who have told me in such detail about your experiences during thunder-storms. Therefore readers, without apology, I lead again with the fascinating subject of lightning.

John Weatherley (Florida, USA) suggests that **"For the hobbyist the only safe procedure for operator and equipment is to disconnect power, antennas AND earth connection when storms threaten."** John, who has studied this problem world-wide on a professional basis, told me of an amateur in Botswana who had most of his radio equipment destroyed, although he had disconnected his antennas and his gear from the mains, but his earth was still connected.

"Not even buried cables are immune," said John, having investigated severe damage to a communications station in Africa which was caused by a strike several hundred yards away. It literally exploded every power f.e.t. in a large switching power supply due to induced currents in the underground cable.

John believes, as I do, that "nothing protects against a direct strike." He also said that "the enormous current of a lightning stroke has a correspondingly huge magnetic field associated with it and will induce a current, in any conductor, within a wide radius proportional to the distance from the source."

Church Bells

During her local history research, Joan found the following piece about lightning in a parish magazine dated November 1923. Under the heading, "Church Bell-ringing during a Thunder-storm", it said, "A recent allusion to the ringing of bells at a church on the occasion of a thunder-storm calls to my mind the old belief in Switzerland that the undulation of air, caused by the sound of the bell, breaks the electric fluid under a thunder-cloud.

These words are inscribed on the great bell of the Minster of Shaffhausen: "Vivos voco, Mortuos plango, Fulgura frango" - "I call the living, I mourn the dead, I break the lightning". The writer continues about the ceremonial uses of church bells and includes a poem from which I quote the first verse, "Mens deaths I tell, My doleful knell: Lightning and thunder, I break asunder; On Sabbath all, to Church I call:". Although originally intended to call people to service before clocks were invented, it seems that church bells were also used to drive evil spirits away from the consecrated building!

Equipment Damage

At one time, **Paul Drinkwater** (Wolverhampton), worked on a marine-based commercial broadcast station in the Middle-East. During a thunder-storm there was a spectacular lightning strike at sea which sent all the needles on the meters of their 20kW transmitter over their end stops, triggering all the overload protection devices simultaneously. "Being a fully valved unit, the transmitter survived the event," said Paul.

"All this energy floating around and entering the soft front end of our rigs has the potential to do some mischief," wrote **David Turtle** (Erith) in a long and interesting letter on the subject. He said, "At least with Hertzian antennas (beams and suchlike), in cases other than close or direct strikes, both sides of the antenna will have similar potentials so the front end may not be under too much stress.

The main danger here will be from the rig antenna/chassis becoming part of the path to ground. Marconi antennas relying as they do on a ground connection as a counterpoise, can be presented with a high potential across the antenna connections, as well as being a pathway to ground. You cannot rely on the d.c. continuity of a.t.u. or shunt loading coils to remove the sharp step pulses of a close strike."

John Dudeney (Saffron Walden) recalls a mast-head amplifier being disabled by a lightning strike, and on examination the input coil was completely reduced to ash. But, the Philco T2028 germanium transistor was unharmed!

Lightning Conductors

David Turtle admires the skill with which lightning conductors are dressed into the nooks and crannies of a building during its decent to ground and tells us that, "there are two good reasons for it being a tape rather than a wire other than for aesthetic purpose. One is so it will have a much larger surface area for cooling purpose, the other is that high frequencies tend to travel on or close below the surface of a conductor rather than deep within its body."

John Weatherley points out that "most lightning rods on buildings, are to reduce the likelihood of a strike by bleeding off the electrostatic charge between the ground and ionised air above the building".

While visiting Saville Gardens toward the end of last year, Joan and I spotted a monument, **Fig. 1**, near Windsor Great Park, with a very handsome lighting conductor. The copper tape descends just to the left of the centre corner.

Caution And The Unexpected

One of John Dudeney's grandmothers "not only removed all mirrors from dressing tables and walls during thunder-storms, but laid them face down on the beds and covered them with sheets." On a summers day way back in 1939 John

Fig. 1: Monument near Saville Gardens, Windsor Great Park.

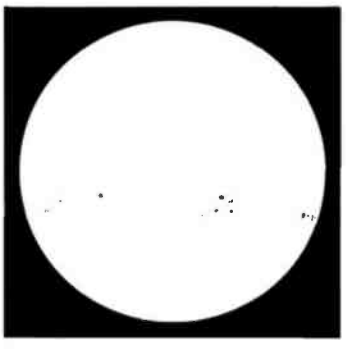


Fig. 2: Sunspots, 1330 on 23 December 1991.

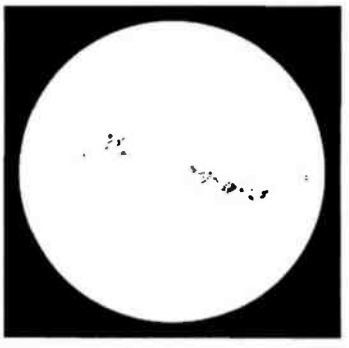


Fig. 3: Sunspots, 1005 on 27 December 1991

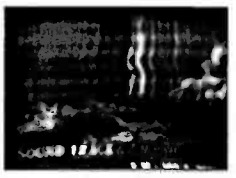


Fig. 4: Bangkok TV received via an 'F2' opening, on Ch. E2.

was sitting in the car with his grandmother at Devil's Dyke, a beauty spot on the South-Downs near Brighton. They could see considerable lightning in the black sky toward the north and his grandmother exclaimed that "a house had jumped". Next day they heard that a house had been struck by lightning.

In 1977, he was driving south, in thunder and torrential rain, through Norwood. "The road ahead was straight for a few hundred yards and then curved round to the right," explained John. However, in the brilliance of a flash to ground immediately ahead, he got the impression of a criss-cross frame which could not be accounted for by anything visible after the flash.

Less than a minute later he rounded the bend and a building on his left was covered with scaffolding in the same pattern that he had just seen. Due to refraction? Several years ago John heard a BBC science programme report that ball lightning had passed through the cabin of a Russian airliner. Fortunately, apart from alarming the passengers no one was hurt. However, the aircraft was soon landed and in addition to the damage caused by the storm to the radar and other instruments, small holes were found in the nose and tail of the aircraft.

Observations

Patrick Moore's routine solar observation at his observatory in Selsey continued through the Christmas holidays, as seen by the drawings he made of the progress of those sunspots and groups at 1330 on December 23, **Fig. 2** and 1005 on the 27th, **Fig. 3.**

Around that time **Cmdr Henry Hatfield** (Sevenoaks), using his spectrohelioscope, observed two sunspot groups, 16 filaments, six very small quiescent prominences and two active areas at 1154 on the 24th. Henry observed three groups ("one very long chain"), 15 filaments, 10 quiescent prominences and the remains of a flare at 1214 on the 27th. Henry's radio telescopes recorded individual bursts of solar noise, at 136MHz, on the 23rd, 25th, 26th and 27th and at 1297MHz on the 23rd, 25th and 26th.

Ron Livesey (Edinburgh) using a 2.5in refractor and a 4in projection screen, located four active areas on the sun's disc on December 8, 24 and 26, five on days 9, 23, 27 and 29 and six on the 4th, 10th, 11th and 13th.

Northern Lights (Aurora Borealis)

"All it cost to view Heaven's lightshow was a little time," wrote **Roger Phillips** (Kendal) about the auroral events that he witnessed late on October 31 and November 8. During the former he saw "a vast coronet of pale white stretched across the north", later "maroons had developed overhead and well to the North-East while pale white search-lights explored the zenith from the North."

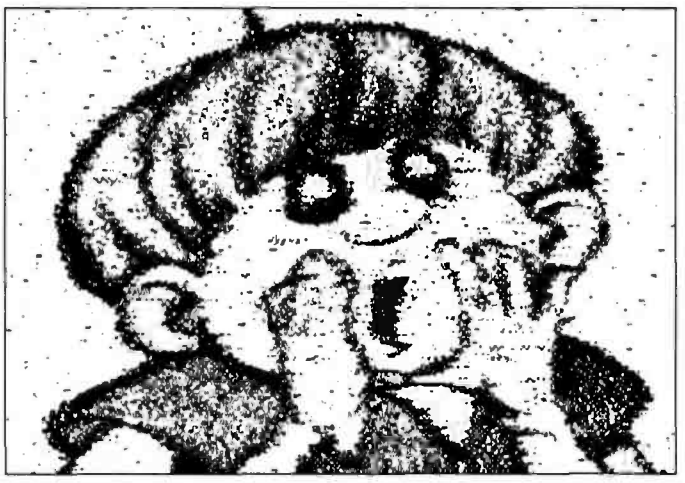


Fig. 5: Slow-scan television picture received by John Scott in Glasgow.

Roger told a colleague, who was seeing aurora for the first time, that it was the best display that he had seen in over ten years. However, it was nothing compared to the event he saw between 2130 and 2205 on November 8. Despite the sodium lighting from a Kendal estate, Roger saw faint search-lights passing across the sky between 1820 and 1915.

At 2010 he drove to Scream Point, off the Windermere road, where he remained until 2245 and was rewarded with a display of natural beauty. The event continued as a pale clear light, variously pulsating as a battery of search-lights occasionally turning to crimson at the extreme north-west and north-east. Aircraft passing into Scotland were seen to strobe all the way to the horizon, the Shap Fells.

The climax of the display, which Roger describes as a "crescendo of light" came about 2200 when the search-lights, turning to maroon, expanded into a coronet. The halo, which he had seen earlier, reappeared like "a giant ribbon tied across the heavens with its knot of reds and greens splashed about the south of the zenith."

Roger's vivid description, for which we are all grateful, continued, "to its extremes in the West and East tall curtains of yellowish-white fell to the horizons over Windermere and Tebay like hail-showers." By 2230, only a faint white glow remained.

Auroral Reports

Ron Livesey is the auroral co-ordinator for the British Astronomical Association. He received reports of 'glows' for the overnight period on December 1, 10, 12, 16, 26 and 28, 'arc or band' on the 1st and 10th. There were reports of 'rayed arc' on the 27th, 'rayed bundles' on the 27th and 29th, 'active, moving and pulsating' on the 9th, 27th and 29th. There were 'coronal' or 'half sky' on the 29th from observers ranging from Southern England, through Scotland to Goose Bay in Canada. It is interesting to learn that the 'ray bundles' on the 27th were seen as far South as Hampshire and Sussex.

Tone-A

Tony Hopwood (Worcester) reported hearing auroral reflected signals on the 144MHz band on December 27 and (Wishaw) heard them weakly on the 2nd, 17th and 28th. For the benefit of newcomers, auroral reflected c.w. signals sound like a low pitched 'burr' and s.s.b. transmissions are best described as a ghostly whisper. The pitch of the former is often so poor that in radio terms it is just known as Tone-A.

Do remember that when aurora manifests,v.h.f. antennas must be directed toward the north to receive these reflected signals. Doug compared his radio-aurora reception for 1990 and 1991, and found far more activity in the latter year with peaks of 12 days in June and over 10 in October and November. **Gordon Foote** (Didcot) reports that the German beacon DK0WCY on 10.144MHz gave strong auroral warnings at 0040 and 0920 on December 8.

Band I

During December, **Simon Hamer** (New Radnor) had an interesting haul of DX. This was via several modes of propagation, in a part of the spectrum which is generally unused and quiet in the UK.

He checked this band at 0800 on the 13th and identified pictures coming from Australia on Ch. A0 (46.172MHz) and New Zealand on Ch. NZ1 (45.250MHz) and Malaysia and Thailand on Ch. E2 (48.25MHz) via an opening in the upper 'F2' region of the ionosphere. Next day, at 1830, he received 'pings' of picture from Norway via meteor trail reflection during the Geminids shower.

Then in January came a rare coincidence, especially for the winter months. On the 3rd he saw unidentified 'pings' of pictures at 1920 on Chs. R1 (49.75MHz) and R2 (59.25MHz) via meteor trails of the Quadrantids shower, but on the 4th, the predicted peak, Simon's meteor watch was blotted out by a Sporadic-E opening because of which he logged pictures during the early evening from Austria on Ch. E2a (49.75MHz). Czechoslovakia was received on Chs. R1 (49.75MHz) and R2 (59.25MHz), France on Ch. L3 (54.0MHz), Germany on Chs. E2 (48.25MHz), E3 (55.25MHz) and E4 (62.25MHz), Hungary and Romania on Chs. R1 and R2 and Switzerland on Chs. E2 and E3. However, he said that there was unidentified meteor 'pings' interfering with the Sporadic-E activity throughout Band I.

From India, **Lt. Col. Rana Roy** (Meerut) sent a photograph, **Fig. 4**, of Bangkok TV that he received via an 'F2' opening, on Ch. E2, at 2100 on November 24. Rana's picture shows the typical smeary and distorted television-signals that arrive via this mode of propagation.

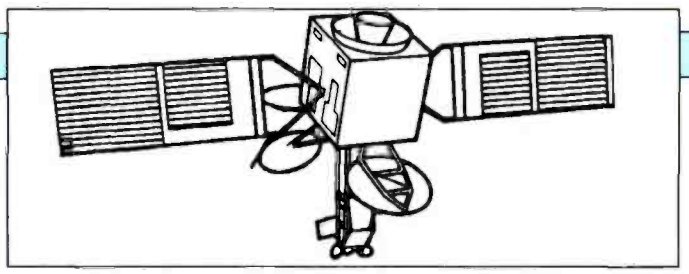
Slow Scan TV

Nothing to do with it, but I think the look of amazement on the face in **Fig. 5**, would have summed up my feelings had I been in Simon's shoes and witnessed that combined meteor and Sporadic-E event. **Fig. 5**, is one of the many slow-scan television pictures received by **John Scott** in Glasgow around 14.230MHz during December.

There are several spots on the h.f. and v.h.f. amateur bands where slow-scan television pulses can be copied. Briefly, these sound like 'twittering' and can be decoded through certain computers, like the Sinclair 48k Spectrum, with a suitable program. However, before undertaking such a project I suggest that you seek advice from one of the software suppliers who advertise in *PW* and/or our sister journal *Short Wave Magazine*.

Editorial Note: Readers will find our 'Computing In Radio' special of interest this month.

Reflections



Satellite Scene

by Pat Gowen G3IOR

This month Pat Gowen covers the OSCAR-13 mode preference survey, the resulting schedule, how to decode SARA, Phase III-D development and how to get a truly direct ROBOT QSL.

OSCAR-13's Mode Polled

James G3RUH, in collaboration with share commanders **Peter DB2OS** and **Graham VK5AGR**, has been weighing up the opinions submitted by 85 concerned world-wide users and listeners as to whether expressed opinions that " .. too much time devotion to L mode .." was the majority feeling. The vast majority of returns were unreservedly in favour of maintaining Mode L, even though many of them neither had, nor ever would, have Mode L mode capability for themselves. The common denominators were 'use or lose' and 'incentive and opportunities for experimentation'.

Very few wanted Mode L off altogether, but many respondents regretted that 'B' mode was not on at best squint angles around apogee. But they recognised the fact that 'L' mode does need the best part of the orbit if it is to work properly, and agreed with the suggestion that Mode L and Mode B take alternate apogees or days.

Balancing these views against the technical options imposed by flight software and solar power production, the command team will invoke the following experimental schedule for OSCAR-13, on a trial basis for the period from March 16 to 8 June 1992.

Mode JLs transponders will be on for four days per week, Monday, Wednesday, Friday and Saturdays UTC from MA 100 to MA 150. Mode J will go off from MA 120 to MA 135. The Mode B transponder will be on at all other times. The 'S' mode will be on every orbit from MA 120 to MA 135, the beacon on 'L' days and the transponder on 'B' days.

The aggregate amount of time allocated is 200 mean anomaly counts per week, compared with the earlier average of 227. However, the actual useable time is considerably increased, because for northern hemisphere stations the squint angle is never worse than 15%. This corresponds to an off-pointing loss of no more than 1.8dB. Thus a minimum e.i.r.p. of only 1.5kW RHCP will always realise modest s.s.b. communications. This translates to 25W to an 18dB gain antenna, 50W to a 15dB, or 100W to a 12dB, a modest required maximum power.

James says, "The fact is that transponder mode schedules are divisive, and nothing can please everyone. So let's give this experiment a try. If it works, then good. If it doesn't we can easily go back to the old arrangements".

Here follows the experimental tabled schedule for AO-13 from March 16 to 8 June 1992, by when a new schedule from the last date will be announced.

Mode B 000 to 100: Mode JL Mon, Wed, Fri, Sat UTC

Mode JL 100 to 120

Mode SL 120 to 135: 'S' Beacon on 'L' days

Mode JL 135 to 150: 'S' Transponder on 'B' days

Mode B 150 to 256

Omni-Antennas from MA 240 to 030: Alon/Alat 180/0

OSCAR-13 Activity

Stefano IW2DBL, writes that he was delighted to work Noel P43FM in Aruba (QSL PA0FM) and another Noel 4S7AVR in Sri Lanka (QSL via Bureau) on OSCAR 13 Mode B s.s.b. Several new stations have appeared on this mode from USA, Japan and Europe, plus a few more from the UK.

Decoding SARA Telemetry

Belgian friend **ON1KPS** sends the full technical and general information you will need to decode SARA's digital telemetry, which is coming down as 300 bauds digital telemetry on 145.955MHz in f.m., ±5kHz deviation. It has a 0 level and start bit: 2200Hz, one level: 1200Hz. It gives out 171 seconds of measurements and a blank of one second. This data is prefixed before the measurements with the following message sent in ASCII code:

SARA
ESIEEPSPACE
BP99
93162 NOISY LE GRAND CEDEX FRANCE
SATELLITE AMATEUR DE RADIOASTRONOMIE
ECOUTE DE L'ACTIVITE DECAMENTRIQUE DE JUPITER
FX0SAT FX0SAT FX0SAT

Header Meanings

Let's look at the header meanings! 'SARA' is the satellite's name, ESIEEPSPACE is the name of the *Ecole Superieure d'Ingenieurs en Electrotechnique et Electronique*, This is followed by the address, where 'BP' is 'Boite Postale' e.g. the Post Box, where your reports and QSLs may be sent. The five digit number is the postcode, and Noisy le Grand, the City in France.

After this SARA's status is given, the fact that it is an 'Amateur Radio Astronomy' Satellite, and then it tells what it is doing, i.e. listening to the activity of radio emissions on decametric wavelengths from the planet Jupiter. The last line gives SARA's assigned callsign FX0SAT three times.

Reading The Lines

For the telemetry itself, each line ends with a CR($13) and LF($10). The number of the measurement is given with three characters: CYCLE N XXX. XXX represents this number in binary

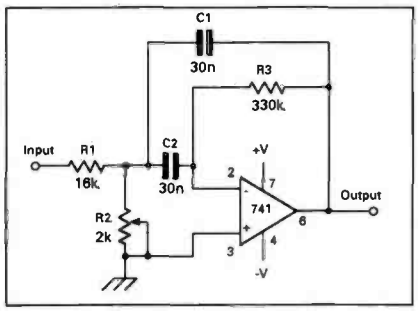


Fig. 1: Audio filter for SARA Telemetry Decoding.

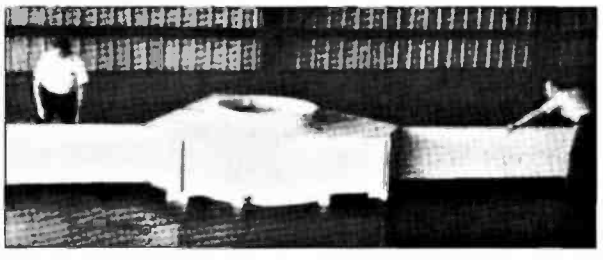


Fig. 2: AMSAT-DL's photo of the life-size P.3D model.

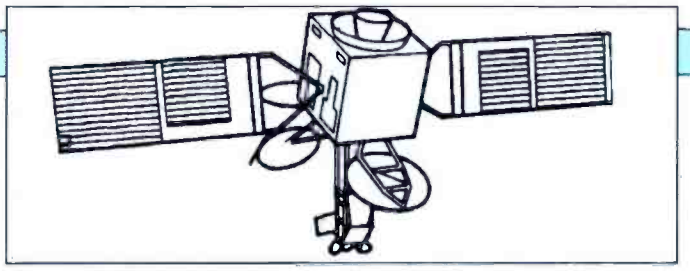


Fig. 3: How things have grown! Phase III-D sealed to OSCAR-13 (top left) and any one of the recent microsats (upper right).

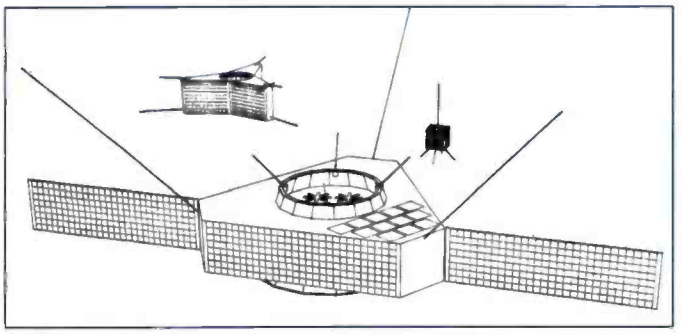
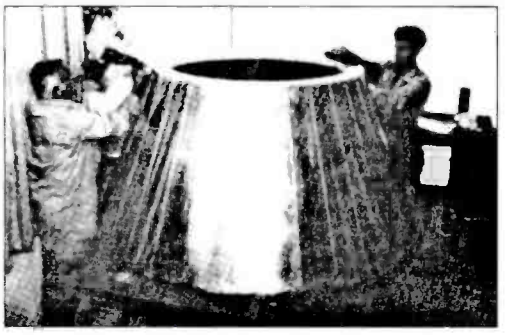


Fig. 4: AMSAT-DL's Konrad Muller and Boris Lang fabricating Phase III-D's conical adaptor.



code with the l.s.b. at the end.

A 500Hz subcarrier contains the information on the spacecraft's battery voltage, and is defined by the equation: U = .0148 x F - .613 where U is the battery voltage in volts, and F is the received frequency in Hertz.

A 220Hz subcarrier contains information about the spacecraft's inside structure temperature, and is defined by the equation: T = .714 x F - 164.2 where T is the temperature in Celsius, and F is the received frequency in Hertz.

The information may be read by connecting a frequency meter to the filtered output of a receiver. A 50Hz wide band-pass filter centred on 220Hz, or 500Hz, should suffice. The circuit given in **Fig. 1** from Hilburn & Johnson, Manual of Active Filter Design, McGraw Hill, 1973 will perform this task adequately. With R2 set at 2kΩ the filter should have a centre frequency of near 210Hz, and when set at 350Ω it should be approximately 500Hz. The bandwidth will be approximately 50Hz.

Sampling

Jupiter's radio flux information is extracted from the onboard receiver by sampling the eight channels between 2 and 15MHz. These elementary measures are represented by eight bytes, and are performed in 172 seconds, or one transmission cycle.

The measures are then transmitted within 256 frames, and each frame is composed of two elementary measures as: T C0 C1 C2 C3 C4 C5 C6 C7 C0 C1 C2 C3 C4 C5 C6 C7, where T is the frame number (0 to 255), and CX represents the amplitude of the receiver channel number, the m.s.b. is the parity bit (even). The 256 frames are followed by 48 control bytes.

Storage and Error Correction

The 512 measurements are stored in RAM (random access memory). The first measurement to be transmitted, frame 0 (172 seconds old), is the most recent. This is followed by frame one, and so on, until the last frame, 255, which is 24 hours 27 minutes old.

To give error correction, the 512 bytes are stored in 4096 words (12 bits wide) of protected memory. They are divided into four pages numbered one to four. The twelfth bit is added to each word to obtain an even number of "1's". There are 48 control bytes/words, which are initially set to zero. Twelve control bytes/words are associated with each page of memory. Every bit from a measure byte/word is exclusive OR'ed with its associated control byte/word.

The Shape of Things to Come

The news is that AMSAT are progressing with work on the Phase III-D spacecraft, due for launch on ARIANE-5 in October 1955. A full-size model has already been made, the shape and impressive size of which may be seen in **Fig. 2**, the photograph from AMSAT-DL. Comparison with the upper left OSCAR-13 and the upper right AMSAT microsat shows the relative dimensions of Phase-III-D in **Fig. 3**.

The manufacture of the conical adapter by Konrad Muller and Boris Lang from 32 separate segments is shown by **Fig. 4**. The planned internal layout and the positioning of the propellant fuel tanks drawn up by Dick Jansson WD4FAB is shown by **Fig. 5**.

The scaled to earth planned orbit, is shown by **Fig. 6.** Initially, ARIANE will place the spacecraft into a 35000km apogee, 200km perigee ellipse at an inclination of 10° to earth's equator. At this low perigee height, atmospheric friction would produce some drag, lowering the required apogee. So the first task is to fire the built-in thrust motor when the spacecraft is at apogee to raise the perigee to 500km. After orientation, the next burn would take place at perigee, raising the apogee to 47 000km. After further positioning, the following burn would be to both change the inclination to 60° and raise the perigee to 4000km.

The final carefully planned thrust negotiations would take the spacecraft to its final stable orbit of 4000km perigee and 47 000km apogee to 63.4° inclination, at which it would see sustained passes over earths main areas, at regular maximum user opportunity times, twice daily.

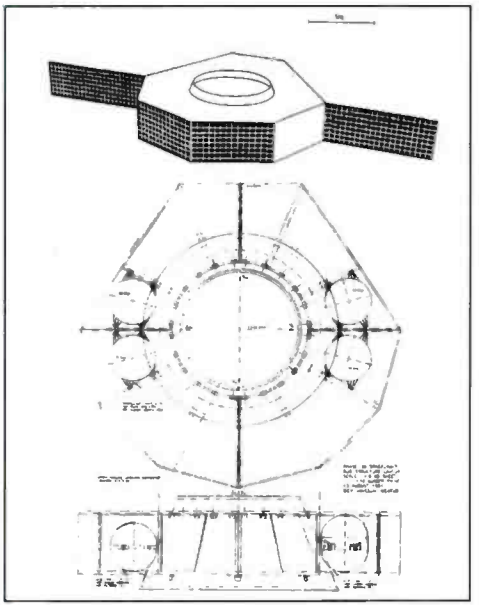


Fig. 5: WD4 FAB's Phase III-D structural layout plan.

Fast Direct OSL

Those of you who have worked the various Robots on the RS series

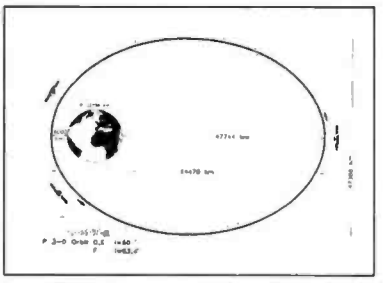
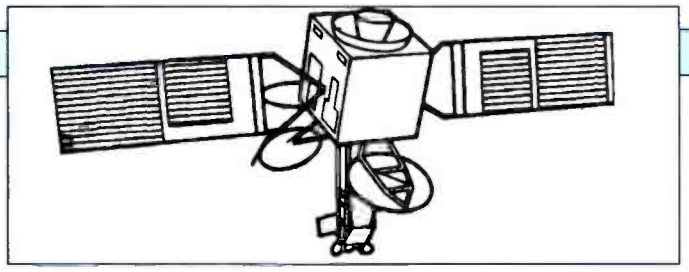


Fig. 6: AMSAT-DL's sealed orbit for Phase III-D.

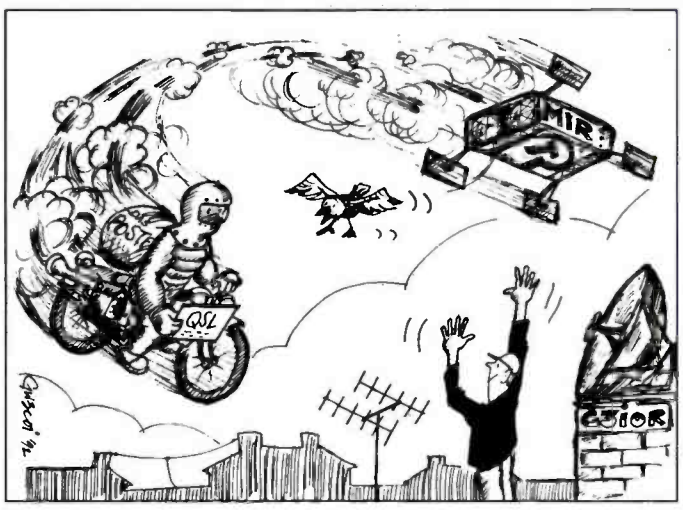


of satellites, will know that eventually a QSL card arrives for the contact. Up to now this has been done by digitally downloading the ROBOT memory of stations recorded, then they are handwritten by Andy Mirinov. This means the QSL has taken up to two years to arrive via the bureau.

As a means of investigating a means of speeding up this hitherto protracted process, the new Russian Group headed by Ura Ollirapoff UR1IC, will be experimenting with a newly devised fully automatic system. This should result in you having a QSL card delivered directly to your QTH, within a few minutes, or at the longest within a day.

The experiment, to celebrate the centenary of Marti Tridva, who developed the first printer delivery robot, is to have the RS-12 satellite direct QSLing for a full earth coverage 12-hour period, commencing from 2359UTC on March 31 this year. All that you need to do is to contact the ROBOT in the usual manner. After it has sent your serial number and wished you '73', i.e before it calls CQ again, is to add at the same sending speed, your ten figure International QTH Locator, your local wind velocity in km/h and direction in degrees true.

For myself for example, I would add JO02PPBLAQ nnn nnn, the 'BL' being the 0.1km divisions and the 'AQ' the 10m refinements,



added to my usual Maidenhead locator square. If the wind were 5.2km per hour coming from the North East, I would add 052 045 in the nnn nnn section. If there is no breeze whatsoever, send nothing after your precise 10m locator square.

Are You A Good Catch?

The ROBOT and RS-12's navigational computer will then calculate the exact time and position when a precision weight QSL card, with known drag factor may be released from the printer paper ejector port, so as to land within 10m of your QTH.

Those with greenhouses need have no fear, as the aerodynamic design and mass of the re-entry friction resistant QSL material, will mean that the final descent velocity is reduced to less than 2.75km/hour. With the latest Keplerian elements and a known a.s.l., it should be possible for you to calculate a precise overhead pass and a QTH and time, where you will be able to catch your QSL card as it falls those last few metres to earth.

Beware Burned Fingers!

It's not recommended that you make more than one QSO. Many others also wish to have the opportunity in the 12-hour limited period. There is the added danger that dual QSL cards, having twice the mass but similar drag frictional co-efficients, could incinerate as they first enter earth's atmosphere, resulting in only a few ashes scattering over a wide area. Some cards may have slightly burned corners if it is not raining.

Don't Get Caught Out!

Those participating, must be sure to accurately calculate their QTHs from a large scale Ordnance Survey Map, and to define their stratospheric wind velocity to within 0.010492% of true. Otherwise the new UK anti-litter laws, with their very high fines, will be applied to those who initiated the paper drop into public areas. The satellite or ROBOT itself, is protected by immunity from prosecution by international diplomatic immunity.

Satellite Modes & Frequencies

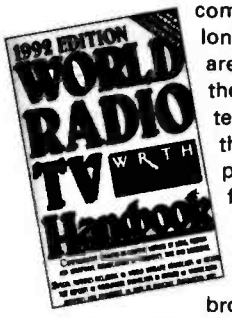
Finally, many readers have asked for the frequencies and modes used by the many amateur radio satellites. An s.a.e. with a request for 'SATFREQS' to *PW* will provide this comprehensive information to you.

Remember also, that an s.a.e. sent to *PW* marked 'KEPSETS', will provide you with the latest fully titled sets of all satellites.

Book Reviews...these are new editions to the *PW* Book Service, see page 64.

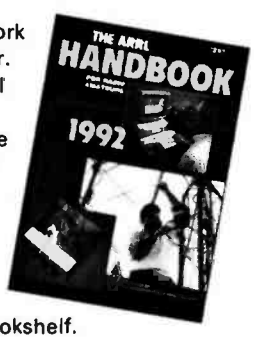
1992 Edition World Radio TV Handbook
Editor Andrew G. Sennitt
Billboard A.G. (Publishers)
590 pages, price £18.95
Available from *PW* book service, £1 post and packing.

Keen listeners from all over the World await the new edition of the *WRTH*. The 1992 edition has just arrived and as usual the comprehensive country-by-country listings of long, medium and short wave broadcasters are filled with new details. For the first time, the *WRTH* has been able to include complete technical details of Radio Moscow, following the demise of the USSR, and the internal political changes. The *WRTH* has special features including: world satellite broadcasts, receiver test reports, information on worldwide broadcasts in English. There's information on the broadcasters' addresses and their personnel, and maps showing principal transmitter sites. All this information makes the *WRTH* an excellent reference book.



The ARRL Handbook For Radio Amateurs 69th Edition
Editors Charles Hutchinson K8CH and Joel Kleinman N1BKE
The American Radio Relay League (Publishers)
ISBN 0-87259-169-7
Approximately 1000 pages, price £16.95, available from *PW* book service, £1 post and packing.

This very large and heavy book, newly-published for 1992, contains much new material. Long since regarded as being a standard reference work for radio enthusiasts, it grows year by year. New entries for 1992 include: new material on RTTY and AMTOR, new material on operational amplifiers, new material on the biological effect of r.f. energy, a design for a 1.5kW h.f. linear amplifier using inexpensive valves, an h.f. noise bridge, new antenna designs, a portable c.w. transceiver for 10 and 14MHz, a transverter and p.a. for 23cm and many other items. An excellent book for your bookshelf.



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PACKET PANORAMA

Roger Cooke G3LDI introduces a new feature this month, in the shape of a 'page three' sysop. Now you can find out about the people behind the bulletin boards, and all is revealed!

Sysop Of The Month

Starting this issue, I'm introducing 'sysop of the month', in the hope that it will encourage a few of you to send me photographs. Let's have some details of what you do, what you would like to see done, and what you intend to do. It's all good stuff you know! Hope you like the first offering.

The first in the queue, is **Dave Lane G3VOM**, sysop at **GB7GMX**, situated in Swinton in Manchester. Dave, shown in **Fig. 1**, said he had the shack especially spring-cleaned. All the whisky and gin bottles were removed for the picture!

The equipment in use at GB7GMX is as follows:

An elderly(?) Amstrad PC1512 complete with five ports, covering 144, 430 and 1.3GHz, along with any two h.f. bands. The various TNCs in use are Kams, RLC 100, MFJ1274. The radios completing the set up are, a TM531E on 1.3GHz, an FT780R for 430MHz, and on 144MHz an IC22A chirps away. On h.f., two Icom IC735s look after the long distance work.

Antennas in use at v.h.f./u.h.f., are a helical on 1.3GHz, with collinears and beams for both 430 and 144MHz. The antennas for h.f. include a 'magnetic loop' on the low bands with dipoles and long wires for 14MHz upwards.

Dave says his shack is not of the tidy variety, and he sometimes forgets where all the wires go (don't we all?). He has been interested in packet since 1984, and obtained a TNC from a friend in the USA.

Nobody appeared to be interested, so Dave sold it on. He later found out that others were on, but their paths never crossed!

Dave also says that it is easier to get permission to operate amateur radio in the former USSR, or the Commonwealth of Independent States as it's now known as, than to obtain site-clearance in the UK. Seems Red tape is only available in the UK now!

Father Clive

The second Sysop to be featured, is shown in **Fig. 2**. This is **Colin Chadburn G6WHL**, Sysop of **GB7KLY** in Keighley, W. Yorkshire. Colin is the author, of (or its father really I suppose) of the now-famous 'Clive' database. He's also the PRO for the Yorkshire AX25 Packet Group, and a committee member of the Northern Heights ARES.

Obviously feeling left out of it, Colin's XYL Julie, is taking the RAE this year. So, in a year or two, Colin might have to make a written request to sit in that chair! However, the pin-up picture, visible just above the PC screen, will have to go when Julie reigns in the shack Colin!

Colin, like many operators these days, came into amateur radio via CB. He presently shares his not-so-cluttered shack with an IBM clone, and what looks like an Amstrad CPC6128, plus other terminals.

He wasn't over enthusiastic about the hobby until packet came along. Colin says he hasn't spoken into a microphone since the day his BBS went on the air. In fact, he doubts whether he could even find one!

At 39-years of age, Colin has two married daughters, and he's also a grandfather with two splendid grandchildren!

Introducing Clive

In case you've you haven't met 'Clive', let me introduce it (or him?) through 'his' originator. Colin enjoys running the 'Clive' database, which is very comprehensive and he was kind enough to supply me with lots of very interesting information. So, with that, I'll let Colin take over.

"The 'Clive' database was 'born' on the air in early 1990. His voice was a BSX1, and an elderly FDK750E giving 10W (sometimes) into a dipole. Messages were sent and received through the two nearest BBSs. Confusion then ruled 'on the air'.

The station was intended to be a part-time affair. However, right from the start it was clear that part-time working was acceptable, but full time operation would be better.

Incoming requests would sit on the BBSs all day waiting for me to come home and boot up the computer, connect, read my mail, and process all the 'Clive' messages.

Similarly, the replies were all transmitted by hand. I'd have a print-out of the users callsign and BBS, and a list of the files required. Working from that print-out I'd connect to a BBS, do an 'SP...' then upload the files.

It was very tedious, but it did prove that the BBS network could take it even if I couldn't. As amateurs in my home town of Keighley heard about packet, the number of users on 144.650MHz began to increase.

I retired the FDK and bought a brand new Navico to replace it. The 25W output, although better, was still giving unreliable connects. A beam antenna was next on the shopping list, then at last I had a station that could happily cope with all the traffic".

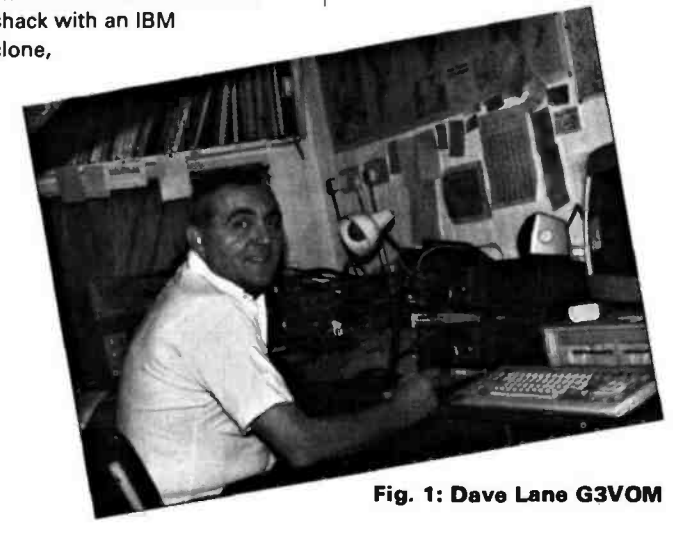

Fig. 1: Dave Lane G3VOM

Popular Clive

"Within a couple of months Clive's popularity had grown to the extent that I simply had to do things differently. Either I had to abandon the project, or invest some cash in devising a better method of searching and dispatching files.

A few weeks later the sysop of GB7YHF turned up at the club one Wednesday. I began, systematically to pick his brains about automatic forwarding. It wasn't too long after this meeting that I lost my

PACKET PANORAMA

Fig. 2: Colin Chadburn G6WHL.

hero worship for sysops, and realised that far from being heroes, they were just as daft as myself.

The realisation of this fact, encouraged me enormously and led to an application for a 'GB7' call. Which in the best traditions of the RSGB, was still being processed six months later.

However, back to the forwarding. A BSX2 was duly built and huge chunks of program butchered, and lo and behold, bugs not-withstanding, it actually worked! Every time GB7YHF connected, the requests would come in and the replies would go out. A nice round 10Kbytes or so at a time.

The amount of data that was transferred, was quite staggering. I remember once coming in from work to find that there had been some twenty odd requests arriving, all in the same day, and that the replies, (over 120k) were still being sent some ten hours later. Messages from worried sysops and irate BBS users began to arrive, demanding to know why I was sending all this stuff".

Time To Move

"The time to move off 144.650MHz had arrived. Once again the Northern Heights crowd came up trumps.

A brand new node mysteriously appeared in XGN's shack one night, and a 'Wessie' arrived on my lap one Wednesday in the pub.

Within hours, 'Clive' had a dedicated link to Doug's BBS in Batley. 'Clive' could pass as many files as often as it liked. Sighs of relief were heard rippling out for at least thirty miles around.

That was a while ago now, since then I have formally announced the end of the experiment. The 'Clive' project as per the original specification has been a huge success, and will continue for the foreseeable future.

Several sysops have asked about the possibility of running 'Clive' as a server to an existing BBS. Since establishing something resembling a decent station, I've graduated from being addicted to packet to being obsessed by it. I have also applied for a NOV to run a BBS, with the hope of re-writing 'Clive' as a server".

Major Advantage

"One major advantage of 'Clive' having a GB7 call, is the possibility of the data base handling of third party messages. In the near future, I hope to attempt the impossible.

This will involve cloning 'Clive', and creating a network of databases which communicate with each other. Right now I have absolutely no idea how I will do this, it's all pie-in-the-sky as yet, but we live in hope as the saying goes. Today Keighley, tomorrow the world perhaps?"

All Automatic

"Since 'Clive' became the UK's first packet radio database it has grown quite rapidly. With around 2000 files on the system and 300 callsigns in the log from all over the UK.There are few BBS which can rival the sheer amount of files on 'Clive' let alone it's versatility and ease of use.

The latest version is a completely automatic program, which is capable of handling huge amounts of output, splitting large files into packet sized chunks as it goes. It has been great fun to play with if nothing else, and who knows how far it will go. To this day, I still haven't heard of anything even vaguely similar.

My sincerest thanks go to all the lads at the Northern Heights club in Queensbury, for the invaluable help they have always given in helping to make 'Clive' viable. I also thank everyone who has already used 'Clive', as without them I would be very lonely, and no doubt certifiably mad to boot!

A special thank you also, to the many many node and BBS sysops who have handled 'Clive' traffic. Without you, we would all be the poorer!"

Latest Developments

Now some of the latest developments concerning 'Clive'. The very first networking version went on test during mid December 1991, between GB7KLY and GB7FCI.

Chris has been writing a utility for use by 'Clive', that searches the messages on a BBS for messages originating from 'unknown Clives'. Should it find one, it automatically sends off a request for information regarding the topics stored on it.

Once a reply (automatic), has been received the 'new Clive' joins in the network, and any requests for 'speciality' information on it will be forwarded by 'Clive', to the 'Clive' storing that information.

It's as revolutionary a concept as the original 'Clive' which went on the air from a personal mailbox. But a way will have to be found of limiting the number of BBSs that may join a net. It wouldn't do, for a UK station to be transferring requests to one in the USA, at least not with the state of the present network.

Such headaches are still some distance away in the future, and the number of networking 'Clives' will need to be carefully controlled. At the moment, the networking will be dependent on the user's choice of topic.

A topic may cover quite a wide range of information. For example, the 'SPACE' topic includes 'MIR', 'NASA', Shuttles, Voyager, Galileo, Hubble telescope, etc. I am already trying to think of ways of narrowing down the scope of information that may be requested over the network.

Very specific topics, may evolve as more sysops run 'Clive' to store info on 'their' favourite subject. Networking may even be carried out as far as requesting individual files from a BBS, when the identity of the BBS actually storing that information is unknown to the user.

Sign-Off

It's time to sign-off now, but I should mention that Colin is looking for remote sysops for 'Clive'. If you fancy the job, why not contact him G6WHL @ GB7KLY.

As I've run out of space for this month, Clive's commands will have to wait until the next packet. See you then!

As usual, news, photographs, brickbats and comments to G3LDI @ GB7LDI or on (0508) 70278. For 'snail-mail' users I'm QTHR.

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For Sale PC, Akhter DFK 700UK. 40 Mbytes, hard disk. Sidekick v1.56A programme inserted. Panasonic professional printer KX-P1592 multimode. All in mint condition, very little use cost £800, accept £400 o.n.o. Ray. Tel: (0282) 842124.

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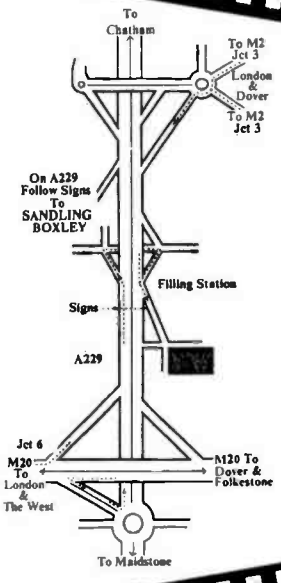

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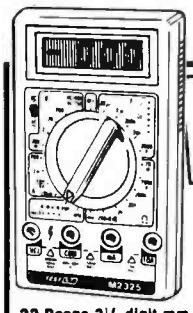

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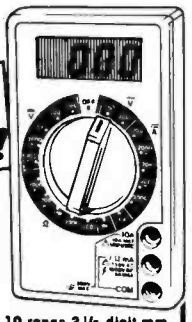

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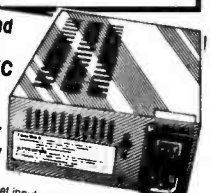

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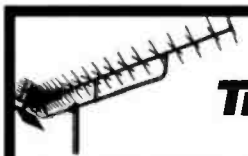

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FOCAL POINT

The World of ATV

Colossal Lift

We had some pretty extreme weather this past January. Strong gales attacked antenna systems, leaving mine at least leaning over at a drunken angle. In fact, it has been so unpleasant outside that I have not yet been up on the roof to fix them. More unusually, the month of January provided some periods of steady high pressure. The resulting lifts must have sent some hearts racing!

Here in the Midlands, we noticed how it played havoc with broadcast TV reception on u.h.f. All four channels on Sandy Heath were un-viewable on one evening, and only by returning to Sutton Coldfield could anything half watchable be seen. The BBC did at least apologise, and the next day even our local radio station had the weatherman from the local airfield explaining what had "gone wrong".

For the ATV fraternity nothing at all had gone wrong. **Phil G1HIA** in Bristol rang up to say he had got P5 reception reports from France on 24cm, sending just 1.5W. His QSO partner was Jean-Francois F1EDM (presumably still living in the Le Havre region), and the pair of them achieved a 20 minute full-duplex sound and vision link-up on the evening of January 30. Pictures in both direction were P5 quality, with F1EDM transmitting 40W on 70cm and Phil, as mentioned, with 1.5W from an Aztex transmitter on 24cm. The path length was 286km. If nothing else, this illustrates that you don't need a big expensive station to work the DX, just common-sense looking for the signs of good DX.

DX Visitor

I was pleased to receive a visit recently from **Ivan Javorsky**. Ivan comes from Ostrava, Czechoslovakia, and has just quit his job as head of technical operations at Moravian TV. Now he's on a British Council four-week course learning about the British way of making TV programmes, and hopes to work on a cable channel, or as an independent producer, when he goes back to Czechoslovakia.

A keen follower of the ATV scene (he reads *CQ-TV* of course!), he was introduced to the BATC committee who just happened to be having a meeting on the day of his visit.

He told us that a 'TV pioneer' in Ostrava, built a 405-line receiver many years ago. The 'pioneer' received British programmes by Sporadic-E on occasions, until a local band I transmitter opened up and blocked the airwaves.

Ivan also explained that a massive conversion exercise has started in his country. Their next TV transmitter to be built, in Bratislava, will transmit PAL G colour and sound. All Czechoslovak television will migrate from SECAM to PAL, but because of the cost, it will be phased over 10 years. While modern sets can handle both PAL and SECAM colour and any sound sub-carrier, there are also some Russian-made single-standard sets in use, and their owners will be reluctant to scrap these straightaway.

ATV Extravaganza

The British Amateur Television Club's annual rally will not be far off by the time this issue hits the streets. The location is the (now) usual one, at Harlaxton (near 'Thatcherville 'in Lincs.) and the date is Sunday May 3. Harlaxton is just off the A1 road, about an hour and a half's drive out of London; it is also 30 miles north-east of Leicester, so it's convenient for the Midlands as well.

As well at the trade stands there will be demonstrations and displays, also an outdoor market and a bring-and-buy table. This is the premier event in the ATV calendar, so be there or else!

Lowestoft Goes Live

Britain's newest television repeater GB3LO, entered service on low power last December. Output power is 1W from a pair of bow-tie antennas, at 88 metres above sea level, co-sited with the 430MHz voice repeater GB3YL.

While not in repeat mode, it radiates a series of useful test signals including the BATC Handbook test card, and also some teletext-style information pages. A callsign page with c.w. ident is radiated at regular intervals too.

Even at low power, initial coverage is good. **Paul G8JBD** is just one kilometre from the 'box' and has worked **Andy G8VLL** in Norwich, a distance of 35km. Signal reports have been received from Dick G4RRX also in Norwich. When funds permit a Mitsubishi 'brick' p.a. will be purchased. Donations and signal reports please to Allan G4KDL care of RA Electronics, 133 London Road South, Lowestoft, Suffolk. Well done lads - I hope you get some juicy Continental (and British!) DX through the repeater.

Help Wanted

Tony Fell G7DGW reminds those who can spare the time, that they might wish to become instructors for the novice licence. The novices, he says, are permitted SSTV and on 1.3GHz and 10GHz fast-scan ATV; bearing in mind how most people can relate to TV, this might be a good way for ATVers to demonstrate their expertise.

"As you are probably aware, we have yet to achieve 26 class A novices, but over 260 B novices exist, serving to demonstrate that Morse is at the very least of limited interest to the young people of today," says Tony.

"Being an instructor myself, I can tell you the course, based as it is on hands-on practical experience, is very rewarding. Indeed I now find this approach preferable to the standard RAE class I teach, but I am lucky to give practical work there too."

GB3LO, the Lowestoft repeater is now on the air and awaiting your call. Input is 1249MHz, output on 1316MHz. More details in the column.

Slow-Scan News

Thomas GM4CAU, probably Britain's last practising slow-scanner judging by the lack of other reports, writes: "The Sunday sked on 7.095MHz is now well-established. The invitation to others who have built the G3WCY/G4ENA system has produced no newcomers at all. Despite the QRM on 7MHz, good pictures have been exchanged between Britain and Belgium. When conditions permit, we occasionally QSY to around 14.235MHz where the level of QRM is much lower.

"Conditions on 14MHz have been rather low since early October, so the level of SSTV activity has been low too. I read with interest the article by Mike G6IQM 'A New SSTV Standard' and agree with him whole-heartedly. The entry price certainly deters many who would like to try SSTV. Even the construction of the G3WCY/G4ENA deters many would-be newcomers to SSTV."So the time is ripe for a new approach in order to encourage many more to try SSTV. A reason for joining the 7.095MHz net perhaps? At least it is somewhere to thrash out the details of a new standard.

SSTV adds a new dimension to a QSO, especially on the h.f. bands, enjoyed only by a few.

"I am busy trying to eliminate r.f. problems (on transmit) when operating on the h.f. bands. No problems like this on 144MHz - only lack of activity."

Well, I didn't say it, an SSTVer did! Is it not time to declare slow-scan once and for all dead in Britain now? Shouldn't we just hand over their spot frequencies to packet? I am merely being provocative, not offensive, when I say this mode seems to have ground to a total halt. Prove otherwise to me!

And that's it once more. Please keep your reports coming in so that we can all keep up with what's going on in amateur radio's most highly developed model!

Andy Emmerson G8PTH

Back-Scatter

HF Bands

Reports to
Paul Essery GW3KFE
287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1RA

Conditions

At the moment, only the end-fed is in the air here. Monitoring the bands on this antenna gives me the feeling that the bands in January have been pretty good and your letters bear this out.

News

Thank Heaven! A little bird tells me that in USA the FCC is clamping down on operators using part callsigns. This was always both illegal and silly, slowing down good operators and creating a need for insurance contacts. My own feeling is that the DXCC Desk should now back up the authorities by refusing to accept QSLs from DX stations permitting the practice.

Over the Christmas holidays, between Christmas Day 1991 and 1 January 1992, **G4BUE** (Upper Beeding) changed his call to GB0QRP, using a Ten-Tec Argonaut 2 on c.w. at 5W output. Some 645 contacts resulted, spread over 11 bands, 1.8MHz to 144MHz, 476 being two-way QRP. Altogether, 62 DXCC countries were raised in all continents, with four continents on 1.8MHz alone, by way of RA9CT, K1KI, EA8QO and OY9JD. Now, who says there isn't much activity at Christmas-time, or that you can't work much with low power??

Short wave listener, **Mark Grubb**, from Newark, wrote in for his first try at chasing the DX with an FRG7 and an a.t.u to an end-fed wire. Mark has a **VERY** valid point when he refers to the people who will 'gabble' their callsigns so fast as to be all but uncopiable.

Perhaps the worst example heard at GW3KFE is the character - apparently aiming at the Boston repeater - who used to lift the local repeater GB3PW. Time and again he would gabble his call and once the call of the chap he was after; so after literally thousands of repetitions I **STILL** don't know what his call is!

John Clarke is either G8KA, or TK5FF from Cauro, from which place he writes to comment on the contest thing. As he says, you can never please 'em all.....but he recommends his method: at 0200 or whatever, go to the shack, armed with a thermos of coffee, a bottle of water, and a half-bottle of port. This keeps him going for quite a while; though as John says, at 70-odd, neither he, nor the port, would last out the whole contest!

As always, for what follows, our thanks to K1AR for his Contest Calendar, to *The DX Bulletin*, *DX News Sheet*, *The DX Magazine* and The Canadian Amateur, plus of course all your letters.

The 1.8MHz Band

Dave G0DJA has held his A licence for some years, but has only just got onto the bands with a TS-830S, so this is a first report - welcome aboard. Dave is primarily a low-power operator, and on 1.8MHz his QRP made it from Crigglestone to F6BKP.

John G3BDQ (Hastings) says he found conditions on the band pretty awful, so he has spent more time on 3.5 and 7MHz. Nevertheless, contacts were made with W1HMD, WJ2D, WZ1F, KZ2S, WB9Z (Illinois), IV3PRK, UA6LGP and UB5NBJ.

Angie G0HGA (Stevenage) mentions HE7IIF, F6BKP, DL2HWA, OK1DWJ and G4AKY. On a different tack, Angie asks about Geoff Watts - the address is 62 Belmore Road, Norwich NR7 0PU, for his Oblast list, DX Prefix-Country-Zone list or whatever.

The only 1.8MHz activity this month for **Ted G2HKU** in Sheppey; Ted says even his sked with ON7BW would have 'gone west' had he not had the loop for reception purposes.

Leighton Smart GW0LBI, in Trelewis has had his operating time somewhat reduced by the demands of family and job-hunting. However, his QRP signal managed GI4SAM, G4DBN and GM0HIG all on sideband, plus GI3PDN on the key.

In Bath, **Andrew G3VWC** 'thinks' - pessimist! - that he solved his trap problems; hence on c.w. the band was made to yield up EA8EA, YL2DX, UC2LDS and UA1TGI. Plus, we note, G3FRW, using an AR88D and a valve transmitter.

The 3.5MHz Band

Dave G0DJA again; for this first foray on 3.5MHz, Dave mentions c.w. with G4XJU, G0FGW, G3EFR, G4ZZB, LY2BCS, G3JUX, H0HZF, plus sideband with G3GLB, G0DNA and G4IUE.

The group VC1PBM, UB4WXL, KZ1AB, VE1RO, ZL2APW and DL7HZ/TK all fell into the log at John G3BDQ; the mode s.s.b.

Apart from the usual small fry, Angie G0HGA got among the long-haul stuff this time, with W1MK, VE3CRG, UL8LWA, ZA1ZAB, 4U1ITU, LX/DK7QB and UO5ON.

By sticking to QRP, Ted G2HKU got out to OK2BMA, GB0QRP, DL8KZ, Y23VH and GM4BKV.

Yet another low-power merchant is Leighton GW0LBI, who managed two-way QRP with YU3EO, LY2PAQ, UC1CWB, DL4DQA, EC2AWC, OK1FR, GI4PCY, plus PA0RDT; Leighton hooked 'em all with 2W of c.w..

An unusual call on 3.5MHz is **Don G3NOF** (Yeovil) who mentions his s.s.b. reaching out to AD1G, UL7FXC, VO1VE, VY2MC, W3TWW and 3A2LU.

Now we head across the water, to **Pat ON7PQ** in Kortrijk, who seems to have been giving 3.5MHz a bit of a bending....9M8DX, ZB2X, J6DX, PJ9A, C56/G3SXW, VU2PTT, JAs, 4K2MAL, VS6/AG9A, JJ1VKL/4S7, WE7K, assorted East Coast Ws, 6W6JX, UI8OAE, YA0RR, JW0D, VP5/SM3TLG, J37ZF, VK3MR, OX3MC, EP/HA5BUS, 4U1UN, A61AC, JA1CGM (long path), ZL4IE, ZL1ATZ, UC1ZC/JW, HI8A, 3A/FD1MOC, VK1FG, VQ9SS, VK6HD, 5U7M, ZL3GQ, HK7DSZ and J79DX.

Over To 7MHz

Firstly on 7MHz, **Eric G0KRT** (Kingston-upon-Thames) returns to the scene after his move from Welling some months ago. Eric now has a Lake DTR7 on the band, and after experimenting has settled on the 28m top plus quarter-wave counterpoise arrangement. Eight G contacts, including two-way QRP with F6DCM and ON5CV, plus DF0PX, DJ4LD, DL1SDU/P, DL2ZAE, DL3KVC, DL8DWW, F8VO, HA7JJS, IK4LHC, IN3BAO, LA4O, ON4GU, ON5TB, UA3DVF, YT3KI, YU3AP and YU3PG are the first fruits of this exercise; it will be interesting to compare against the results from Welling.

Dave G0DJA seems to split his operating about equally between sideband and c.w., the former for G4ZTR, G0PFN, ON7SH, G2AKR and GI4NJQ, while the key did the needful with G0CBW and DK8SR.

Another to use both modes this time is John G3BDQ, who keyed with RI8AA, K2LE, XE3LPS, 4Z4DX, UA0LK (Vladivostok), UI8LB and 3X0HNU for an all-time new one. In addition, s.s.b. managed UW9CD, AP2KAH, CU2BD, ZL2APW and UA4FFL.

It is of course all-c.w. at ON7PQ; Pat found 4X1NM, BY1PK, KH0AM, VS6/AG9A, AD6C, W6s and W7s, HL2IVL, YA0RR, EP/HA5BUS, A61AC, HS0AC, JAs, 7P8EN and S79BA.

At Angie G0HGA's station, the half-sized G5RV manages to be free of TVI, so K4EWG, K1ZZI, WB3EPC, W1ESC, K1RU, W4XJ, K4JPD, K4CRF, KE2WY, N4BZX, WR4I, K1JKS, NQ2F, AB2E, W1GUE, NF2M, WO3Z, KT3I, W1TBY, KE3H, NT3U, W3KR, WT2A, W4FMZ, VP2V/AA2DX, EP/HA5BUS, VC1HA, VK8JP/MM off GJ(!), UO5ON, UA9CT, UA0SPB and RA9QX.

Ted G2HKU tried the band, and came up with W1BDU, UM8MAD, UJ8JMM and UA9JXV.

The WARC Bands

Reports for the WARC bands are a bit thin this time, but we'll start with Dave G0DJA first. On 10MHz, HB9DDC was worked, while on 18MHz he found OH6GL and RA3AET, all these three were worked on QRP c.w., while a bit more power was used for EM3W.

Over to Don G3NOF in Yeovil now, for 18MHz, where the s.s.b. signal managed OY9JD, PT7BZ, VU2RX, Ws, Z21HJ, ZS1AVU and ZS5VDK. Turning to 24MHz we find Don raising A92BE, AA4VK/KP1, AP2KAH, CE8ABF (Tierra del Fuego), ES5D, GD4WBY, HK0HEU, HR2JEP, IS0JBY, JA2KSI, OY9JD, P43HM, PJ8AD, RO5OP, T77J, TK5XN, TU2YH, UO5GO, VC1YX, VO2GUY, VP2EY, VP2V/KB5GL, VU2RG, Ws, WA4DAN/KP1, XE1ENK, Z21HJ, 3X0HNU, 5T5CJ, 6W1QJ and 7P8EN.

Ted G2HKU tried 18MHz for ES0NW, OG8LAE, EA8/DK7ZB, ZA1TAE, while the 24MHz crop included K0DEQ, KB5IQJ, W1BFT, WR3E and EA6ZY.

Not to be outdone, **G0KDZ** used 10MHz c.w. for 9K2MU, SU1HV, ZA1TAE, P40V, JJ1VKL/4S7, 4K2CC, 4K3BB, UM8MBA, OD5/LA4GHA, 8P9EM, HI8A, U0AG, OX3FV, VK4XA, HK7/SM5HV, K6DDO, WA6ZJC, W6KUT, K6STI, JH2CLV, JA9FHB, JA1GRM, JA5MHD, JG6MQI, ZS6QU and KL7U.

Now we turn to the list from ON7PQ; Pat mentions 10MHz with 9M8DX, OK1IAI/YA, 8P9HT, C56/OH2BPW, TU4XM, J68AD, OY2H, VO2GUY, UW1ZC/JW, OD5/LA5GHA, ZS0Z, KL7U, 3C1EA, A61AC, S7BA, 3DA0BK, FP/VE1KM, VP5/WA2TMP, 4K1ADQ and 7P8EN. On 18MHz, Pat located UL0A, VK3DQB, J79DX, 8P9EM, 3B8FG, FP/VE1KM, 3X0HNU, 7P8EN and UW1ZC/JW. That leaves us to look at 24MHz, and here the scalps included 5V7AK, J37MB, WN4KKN/ZP5, 8P9HT, JT1CO, TU4XM, J5AUA, J28FO, VK1FT, 4U1UN, YA0RR, ZS0Z, JL6HKJ, JAs, ZD8OK, VO2GU, A61AC, 3D2QB, J79DX, 8P9EM, 3B8FG, FP/VE1KM, 3X0HNU, 7P8EN and UW1ZC/JW.

Finally on the WARC bands, I looked at the list from **Vince 9H1IP**; Vince made it to LZ2VU, UA2FEK (Kaliningrad), OK1IAI/YA, 8R1UN, JM1GLZ/JD1 (Minami Torishima), ZS0Z (Penguin), 5H3RA and TR8GL.

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This leaves us 24MHz and UA2FEK, 4U1UN, OK1IAI/YA, JM1GLZ/JD1, P29DX, ZS0Z, V2/JH1ROJ, XX9AW, TR8GL, V47N, TK5XN and VP5VEU.

QSLs

In Chapel-en-le-Frith, **Chris G0CLP** (ex-G5ECD), has been answering QSLs for his father G4BZP's operations as 9U5BZP, (May 24 to June 28 last year) and Chris says that on January 11, all cards had been answered. In time out from work, 9U5BZP managed to knock up some 6444 contacts, in 120 DXCC countries, using TS430S and a vertical.

The 14MHz Band

On 14MHz, it's Chris G0CLP again; who managed s.s.b. contacts with ER3A, plus c.w. to ZL1AH, EA8/G4BZP, PJ9A, C56N, 4M5F, KH0AM (Saipan), OY2J, P40V, PJ7A and C56B. Ted G2HKU and the c.w. QRP worked OH2BDA and OE6JBG.

Don G3NOF says he stuck to 1500-2000z on this band, and so netted AP2JZB, C56/G3RZ, CU2YA, F8HB/EA6, FO4DL, J73WA, KG4DD, KH6WU, P30JE (5B4JE), RE1A/RZ4HZZ (IOTA Eu-133), S42U, S79KMB, V63NW, VE7FJE, VE7GDJ, VK3ZJ, VK6LG, VS6VO, VU2JJQ, WQ7B (Montana), XX9AS, Z22JE, ZA1TAG, ZS1DZ, ZS500A, ZS6AZQ, ZL2RR, 3B8CF, 3B8GA, 4S7EF, 5H3DC, 5T5CJ, 5N8LRG, 5Z4FM, 7Z1AB, 9J2EG, 9L1MR, 9M8FH and 9X5SW.

On to ON7PQ, where we find Pat keying with V85HG, 9M6NA, KH0AM, KH6SP/P, A4XA, EP/HA5BUS and 9K2TK,

Another short list: John G3BDQ mentions only 4K2CC on Franz Josef.

Angie G0HGA worked WE6V, at 1514z, K3BI, W4XJ, G3KDP (QRP) RW9HYY, UA9EZ, RL7LCT, plus, in one night-owl session N4TO, AC4HB, W3ZGD, WA2HZT, K4RKP, NA5W (Texas), KV8H, KD1EV, W9KNI and WS9D.

Andrew G3VWC in Bath, says he has 'ironed out the problems with the traps'(!) and so he keyed with JH3FOX, VU2CC, KP4DD and UF7FWW.

Simon Griggs is a s.w.l. who has come back after a break, with an AR88LF. Simon noted 9K2LX, ZA1HA, YV5DPO, TG9AXB, YS1ECR, TI2/P/N9IUO, SV1LV, 9H1FBS, ZL1AW, ZL3BT and VK3RT.

The 21 & 28MHz Bands

First on 21 and 28MHz, Chris G0CLP reports working EM3W, RU9H/UA0OGS, EO50PQ, EA8/G4BZP, ES0NW, ZA1DX, ZA0BXC on 21, while 28MHz gave EM3W, EA8/G4BZP, TA3PB, ZA1HA, ES1CC, CU2AA, XE3ARV, ZL2BRB, VU6CM; on s.s.b. he noted ZA0DXC, EA8/G4BZP, ZA1QA, ZZ2AA, XE3ARV, ZA1DX and 4J4GAM.

It was c.w. all the way for Ted G2HKU, on 21MHz VE3EOW, PZ1DY, UA6LC and with QRP KB1FK; on 28MHz we find N5TP, W2MUM, W3VT, N4TO, K7OUT, VE3FXR, AD6C, VC3LAJ, VP5P, K9HLT, YN/SM0OIG, W1RAN, W2BA, K9WA and VC3AT, plus QRP with N4AR, KB1FK, U5GJ, UB5AAD, LZ1BB, OH6NPV and CX3EU.

Don G3NOF from Yeovil now; on 21MHz AA4VK/KP1, DU9RG, CY1TX, J37ZA, OH0NA, PJ2HB, PZ1EL, TF3IM, VE2JRK (Z.2), XX9AS, 8P9CU and 9K2IC; on 28MHz A47RS, BZ4RC, DU1PX, HI8A, K7OBX (Ariz), V31DX, VP2V/KB5GL, VS6VO, VU2YK, WA4DAN/KP1, W5IJU, XX9AW and ZA1TAH.

From Kortrijk, Pat ON7PQ went on 21MHz for P4/N7NG, ZS0Z, EP/HA5BUS, A61AC; switching to 28MHz and we find HC5M, KP2/OH6ZS, 8R1K, 6V6U, D68GA, A61AD, ZP0Y, 9N1MM, PZ1DY, ZS0Z, EP/HA5BUS, V2/JH1ROJ.

John G3BDQ spoke to YB2ARO and keyed with JR6UDM, YB2UDH, VP2EY, 3A2LR; on 28MHz he reports just XE2FGC on the key, while sideband managed ZA1TAH, J73VE, 4Z4DX, YB3OSE, 8P9CU, 3B8GA, 7X2VXK, AP2MYC, AA4VK/KP1 (Navass and a new one for John), CZ2SS (Prince Edward Is), VC1PBM and 7P8FE.

Despite the TVI, Angie G0HGA keyed with N1GLG, W1GUE, W2ERJ, WA2SON, K3NUD, WA3EJL, K3MQH, NE3P, N4JYV, K8XF, WB8E, NB8G, W8JGU, K8MP, W9YYG, W9GW, K9VCM, W0RWS; VE3KLM, VE2GDI, VE3HX, EP/HA5BUS, plus sideband to 9H4CM and WA4DZE. On 21MHz she recorded WA2SON, N4NHQ, WB3AVN, VE2EXP, and UL8PXB.

On 21MHz, Leighton GW0LBI was all low power; at 5W of sideband he worked I7UNL/QRP, ZA1HS, UZ9WH, LZ5G and I2XHO, with 500mW, DL5DYL at 200mW, OE6GJD at 100mW, HA6NW and UC3AA at 50mW. On 28MHz it was milliwatts all the time with YU4ENS and YU4AR.

On 28MHz, Andrew G3VWC included RL7PJL, WB7OKS, UZ9XYK, W6IA and K7YMN.

Finally, I have a letter from **Bernard F6EYK** near Grenoble. Bernard copied to me his report to G4ASR's column, in which he documents several cases where the presence of an auroral event at v.h.f. has been accompanied by odd sounding signals on either 3.5 or 7MHz. Bernard notes such in 1989 and in detail from October 30 through November 1991. This is quite interesting, and I feel there should be work done by amateurs to try and correlate these effects on the lower bands with auroral manifestations.

Finale!

That's it for this time. I've had to cut heavily to get it all in - sorry! Deadline dates are: March 16, April 17 and May 21, addressed as always as at the head of the column.

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VHF Up

Reports to
David Butler G4ASR
Yew Tree Cottage
Lower Maescoed, Herefordshire HR2 0HP

Solar Data for January 1992

During the last two weeks of December and for the period up to January 5, there were a record number of M type flares, the largest being an M7.8/1B flare which occurred on December 28. The solar flux level during this period was high, peaking at 280 units on January 3 whereas the geomagnetic activity was mainly quiet, averaging 11 units for the period.

On January 2, however, the A-index rose to 21, causing a small aurora on the 3rd. Between January 6-12 there was very little solar activity and the flux and spot counts remained high. The geomagnetic A-index remained quiet up to January 11 when it reached 20 units, staying at this level until January 14.

Weak 'Scottish-type' auroras were observed in central England during this period, continuing through to January 17. There was a large decline in solar activity between January 13-19, with the flux dropping down to 152 units by January 18. Although the solar flux levels increased a little, there was very little change in solar activity through to the end of the month.

Auroral Events

Auroral events during the first three weeks of December were not very good, most openings being weak and only reaching the 50MHz band. There was a flurry of 144MHz activity between December 27- 29 but contacts were generally no further afield than 600km or so. Very little occurred in January, weak events being reported between January 11-17 and 26-31 continuing into February.

On January 11, between 1723-1840UTC, I made c.w. contacts on the 144MHz band with GM4UFD (IO97), GM4YXI (IO87), GM0NXP (IO75), GW4VEQ (IO73), SM5BSZ (JO89) and SM5MIX (JO78). Another QSO was made with SM5MIX in a weak aurora on February 1.

In the February issue of *PW*, G2CZS asked if anyone had noticed any correlation between the effects observed on 28MHz and auroral conditions on 144MHZ. **Bernard Stroh F6EYK** has sent in a very detailed reply which I have passed to G2CZS. Bernard is located near Grenoble (JN25), probably a little bit too far south for regular observations of auroras on the v.h.f. bands but nevertheless his observations of corresponding effects on the 3.5MHz and 7MHz bands are very interesting and valid.

On many occasions, when geomagnetic disturbances are in progress, Bernard has observed that the background noise on the l.f. bands changes to that of a 'frying' noise. Signals may become weak or sometimes fade out, even over path lengths of 20km. Quite often, stations would exhibit 'burbly' or 'quivering' modulation. Looks like we should keep an ear out on 3.5MHz to warn of impending auroras! Thank you for your report Bernard. It was very much appreciated.

Sporadic-E

In the January issue of *PW*, I mentioned that you should keep a look out for the winter peak in Sp-E as it might even reach the 144MHz band. **Derrick Dance GM4CXP** reports that on January 4, a number of 144MHz packet radio stations in the Kelso area showed Italian stations in their 'heard' list between 1556-1616UTC. Stations logged during these times included I2AMH, IW2BAI, IW5CMM, I5IPW, IK5PWJ, IK0IHA and IK0PGB.

Derrick suspects that Sp-E was the most likely cause and wondered

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if anyone worked any DX during this period. Although I haven't received any reports from UK stations, **Jean-Pierre FC1PMD** (JN13) mentions that he worked LA1YCA (JO38) and LA8OJ (JO28) on the 144MHz band at 1600UTC and an hour later, **Claudio I4XCC** (JN63) reported working F1CDI (IN93), FD1MUL (IN93), F6ANQ (IN94), F6DRO (JN03) and F6GPT (IN94) via f.a.i. a weak signal mode that quite often occurs during or after a Sp-E opening.

Whilst all this was occurring, propagation on the 50MHz band was going really wild with a wide spread Sp-E opening covering many European countries, including CT, DL, F, I, LX, OE, ON, OK, PA, SV, YO and YU. To further confuse the situation, the band was also open to KM1E/C6A, KP2A, HC1BI, PZ1EL, YV5ZZ and the USA! The Sp-E on 50MHz lasted for over eight hours, from 1100-1900UTC, but it was noticed by a number of stations that the skip distance dramatically shortened to 250km around 1550UTC, a sure sign that the m.u.f. was rising towards the 144MHz band.

Tropo

During most of December and January, a fairly stable anticyclone weather system was centred over the UK. This produced large areas of cold air trapped beneath warmer air and extended periods of fog, adding considerable water vapour, the propagation melting pot was being set up for some super tropo DX.

A number of readers have reported the lengthy opening to the north coast of Spain between December 22-30. **Steve Damon G8PYP** (IO90) stayed on the 144MHz band to work EA1CJT (IN63) on December 22 and EA1DKV (IN53), EA1DDU (IN73) and EA1TA (IN53) on the 23rd. **Richard Girling G4FCD** (IO91) worked EA1CJT, EA1EBJ (IN73) and EA1TA on the 22nd and then moved up to the 430MHz band to work EA1NU (IN73) and EA1TA. Unfortunately, he couldn't find anyone on 1296MHz to give him EA on that band.

Steve Potter G1JHZ (IO82) reported hearing the EA1VHF beacon, on 144.867MHz, for hours at a time but **live operators** were hard to come by. Using a Trio TR9130, 25W and a 7-element Yagi he worked on Christmas Day, EA1DDU, EA1EBJ, EA1NV and EB1EHT, all in locator IN73.

On the 430MHz band, Steve uses a Trio TR9500, 10W and a 12-element Yagi and was pleased to work EA1TA on the 25th for a new country. **Mark Trotman G1FYC** (IO81) was also happy to work EA1TA on the 144MHz band, proving that 2W into an 8-element Yagi can work DX under the right conditions.

Rik Royall G8ESB (IO94) found the 430MHz band very frustrating during December because of the power restrictions in force during that month, by the request of the Radiocommunications Agency. True to form, the conditions were very good and although he heard a number of HB9 stations he was unable to contact them. Rick did manage to work FC1PAU by moving him up to 434.2MHz from the 144MHz band, but gave up trying to explain the unusual frequency!

Located in southern England, **Neil Underwood G4LDR** (IO91) had no such restrictions and was able to work, on December 2, HB9MIN/P (JN37) and FC1CYB (JN17). Neil uses an FT780R, a 50W amplifier and a 17-element Yagi on the 430MHz band.

OK, OZ, SM, SP. In two openings, January 2 and 11, **John Regnault G4SWX** (JO02) managed to work a total of 50 SP stations on the 144MHz band!

Ela Martyr G6HKM (JO01) found conditions to be equally good on the higher frequencies. Contacts on the 430MHz band during January included HB9BHU (JN37), HB9RSO (JN36), HB9SAX (JN36) and SP2DDV (JO93). On January 15/16, Ela

FC1PMD (JN13). Steve mentions that he arranges his schedules via packet radio and finds it fairly productive. Stations can contact him @ GB7SIG, but it should be noted that packet radio is not the fastest means of communication known to man. At least a couple of weeks should be allowed to set up the sked and to send a confirmation to the distant station.

Claudio I4XCC, running 1kW into a 20-element Yagi on a 9m boom, made a number of successful s.s.b. contacts during the Quadrantids including G4PIQ, G4RRA, G6ZTU, G0LBK, GW4VEQ and GW8JLY.

Do you own a p.c. and want to be able to calculate the best times and directions for any particular meteor

144MHz QRB Table

Distance in kilometres

Station	Tropo	Aurora	Meteors	Es
G0KON	1438	1578	2001	1865
G0CUZ	2943	1758	1996	2943
G0DAZ	2923	1780	2026	2923
G0DKM	2811	1488	——	2203
G0EVT	3080	1640	1808	3080
G0FYD	1315	1856	——	2019
G0ISW	1059	566	——	2057
G0LBK	3060	1755	1876	2350
G1DWQ	1454	1812	——	1838
G1EZF	1730	1757	1920	2375
G1KDF	3023	1421	——	2386
G1LSB	1319	733	1732	2723
G1SWH	3035	1429	1650	2372
G3FPK	1835	1686	——	2337
G3LTF	1824	1846	2021	2174
G3SEK	1560	1681	1872	2154
G4ASR	284	82029	2107	2853
G4DHF	1498	1530	2000	2448
G4JCC	1334	1158	1018	2173
G4MUT	1183	684	1533	2068
G4NBS	1321	1714	——	1901
G4RGK	1466	1757	1920	2375
G4VXE	2862	1448	1501	2880

Station	Tropo	Aurora	Meteors	Es
G4YTL	1450	1774	2025	2172
G4ZTR	1040	1640	——	2130
G6DER	1834	997	1957	2068
G6DZH	2924	711	——	2233
G6HCV	2880	1450	1912	2880
G6HKM	1304	1555	——	2265
G6LEU	2820	910	——	2430
G8HHI	1742	——	——	2058
G8JDX	2667	1368	——	2663
G8LHT	3070	1780	1868	2510
G8MFJ	1209	1210	1329	2188
G8PYP	1240	1451	1479	2318
GD4XTT	3053	——	——	1700
GI1JUS	3067	1614	1507	2216
GI8YDZ	1216	1809	1901	2562
GJ4ICD	1620	1100	2050	2090
GM4CXM	1428	1750	2100	2023
GM4YXI	3160	1881	2048	2513
GW1MVL	1553	——	——	2320
GW4VVX	2823	1391	1313	1910
GW8VZW	2830	1473	——	2238
DN1CAK	1420	1186	1948	2725
DN1CDQ	1420	1186	1948	2124

Richard G4FCD was also able to make the most of the tropo conditions on the 430MHz band by working, on December 2, HB9MIN/P, OE5MKN (JN78), OE5VHL (JN68), OE5VRL/5 (JN78), OK2BFH/P (JN99), OK2BRS/P (JN99), SP2DDV (JO93) and many German stations. Moving up to the 1296MHz band Richard also made s.s.b. QSOs with DK2EG (JN59), DL3NQ (JN49), HB9AMH/P and, for his best DX ever, OE5VRL/5.

During many days in January, but especially the period January 2- 3 and 11-19, stations situated throughout the UK were able to work much DX on the v.h.f. bands. Many *PW* readers, including **G1THG, G1UGH, G2CZS, G4YRY, G4SWX, G6HKM, G6ZTU** and **G0OFE** reported working deep into Europe. Contacts could be made with stations in DL, HB9, I, LA, OE, worked HB9, LX, OE and many DL stations. Contacts were also made on the 1296MHz band with DC4XH (JO43), DG1BH (JO33) and PA3FXV (JO23) on the 11th, DB2VY (JN39), FC1EZQ (JN27) and ON4YZ (JO20) on the 13th and DC8UG (JO30) on the 15th, with DE5XBL being heard at 51 but not strong enough to work.

Meteor Scatter

Steve Damon G8PYP (IO90) arranged four s.s.b. schedules during the Geminids meteor shower in December. Two scheduled on the 13th produced virtually no reflections but the next two tests, on the 14th, gave some excellent bursts allowing him to work DG7SF (JN48) and

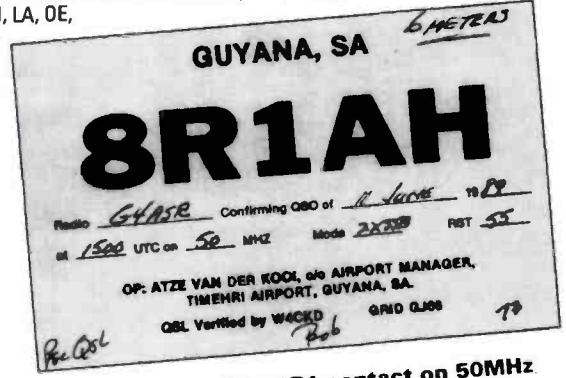

Fig. 1: The first G to 8R1 contact on 50MHz

shower? **Ulrich Kratsch DL3YEL** has re-written a Basic program by DL5MCG into Turbo Pascal.

The new program, called MS-Predictor, gives distance, beam heading and best elevation for the station you want to work for any of 38 meteor showers. To obtain the program, send a formatted disk, including packaging and sufficient IRCs, to Ulrich Kratsch, Mangelsdorfstr.10, D-W-4830 Guetersloh, Germany.

The 50MHz Band

According to **Gabriel EA6VQ**, the Spanish authorities have agreed that radio amateurs may use the 50MHz band but the official notification will not be published until the spring. Until then, any EA stations that you may work on the 50MHz band are illegal!

A message from **Chris SP4TKK**, of the SP 50MHz DX Group, said that a meeting had been held at the end of January with the Panstowa Agencia Radiowa, and that applications for 50MHz permits could be made during February. Polish stations are expected to have access to the band during March. One station, SP3CUG, is known to be ready and awaiting his permit. He has an Icom IC726, a small amplifier of 20W and a 5-element Yagi.

A number of stations are now active from Czechoslovakia

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including OK1DID, OK2BTI, OK2PZW, OK2ZZ, OK3CGX, OK3LQ and OK3LU. Stations in the Bohemia (OK1) and northern Moravia and Silesia (OK2) areas have restrictions because of a t.v. transmitter operating on 49.75MHz/56.25MHz. The QSL address for Zdeno Sterbacek OK2PZW is Dvorska 16, CS-67801 Blansko, Czechoslovakia and that for Palo Kosinoha OK3LQ is Febr. Vitazstva 24, 90101 Malacky, Czechoslovakia.

The first 50MHz licences have been issued in the Lebanon to OD5SK and LA4GHA/OD5 and OD5MR is also expected to be QRV soon. In an opening on February 1, **OD5SK** (KM74), running 5W into a ground plane vertical, worked 30 stations in G, GD, GI, GM and GW. The event started at 1010UTC with GI0OTC and finished at 1046UTC with GM4UPL. 4X1IF and 5B4JE were also worked by many stations.

Jon 5B4ZL, passes on the news that Cyprus now has the same 50MHz privileges as the UK, insofar that restrictions regarding vertical polarisation and mobile operation have now been lifted.

In an opening on December 23, the Lithuanian club station **LY2WR** heard KP4EIT peaking S9, but was not able to make a QSO. The club are using an Icom IC726, 10W and a dipole. Any QSL cards can be sent to the TV Transmitter Radio Club, P.O. Box 927, 23044 Vilnius, Lithuania.

Andy RA3TES (LO15JW) is now QRV for crossband 28MHz/50MHz contacts. He is using a dipole and home made converter and reports hearing the Cornish beacon GB3MCB on December 23. On January 28, he was heard direct on 50MHz working into the UK. It is unclear if he has a permit to transmit. Under similar circumstances, an RB5 station was heard working a number of UK stations on January 29. Perhaps it will all come clearer in the next month or so.

One station that does have a permit is **Mike Chirkov UL7GCC**, located in MN83KC. He is using a transverter designed by UL7GAN, running 100W e.r.p. On January 28, he was heard by GJ4ICD at 559 but no QSO was made. However, on January 29, but this time signing as UL7GCC/P from MN83KB, he made a number of contacts into Europe including CU1EZ, G6HKM and GJ4ICD. Propagation was apparently multi-hop Sp-E, over a distance in excess of 5800km! If you want to try and get a card direct, write to Mike at P.O. Box 1, 480113 Alma Ata, Kazakh, Russia.

Want to work Rodriguez Island, one of the dependencies of Mauritius? Well, you can't! But you could if you arranged to send a 50MHz rig to 3B9FR. Apparently, he wants to be QRV on the band, but doesn't have a radio! Come to think of it, I wonder if any of you want to work Herefordshire on 10GHz. If anyone wants to send me a transverter.....!

Annual v.h.f./u.h.f. table

Final positions for 1991

Station	50MHz Countries		70MHz Countries		144MHz Countries		430MHz Countries		1296MHz Countries		Total points
		Counties		Countries		Counties		Countries		Counties	
G6HKM	61	55	—	-	74	24	40	11	33	8	306
G4FCD	27	22	—	-	85	19	57	17	35	9	271
G0NFH	44	25	30	7	61	17	43	11	13	2	253
G8ESB	9	6	25	8	86	16	45	9	20	5	228
G4ASR	1	54	50	9	70	30	—	-	—	—	214
G4LDR	25	20	18	2	65	14	36	6	—	—	186
G0FYD	19	48	—	-	77	31	—	-	—	—	169
G8PYP	17	40	1	1	47	21	19	4	—	—	150
G6MXL	10	18	10	4	39	12	24	5	12	4	138
G0EVT	13	29	-	-	37	18	14	6	—	—	117
GW7EVG	-	—	-	-	47	6	—	—	—	—	55
G1THG	8	11	-	-	23	9	—	—	—	—	51
G7CLY	-	—	-	-	38	10	—	-	—	—	48
GM4CXP	2	1	2	2	22	3	—	-	—	—	32

The 70MHz Band

Conditions during the first of five RSGB cumulative contests on 70MHz, held on January 26, were not particularly brilliant. Even so, I managed to work 45 stations in the two hour contest including GM4AFF (IO87) at 570km and EI2CA/P (IO63).

My 70MHz system consists of a Trio TS120V operating at 28MHz, driving a home-brew transverter with 4CX250B p.a., into a 6-element NBS Yagi at 25m above the ground. During a weak aurora on February 1, at 1727UTC, I worked GM6VXB on s.s.b. 57A bothways. He is the only 70MHz fixed station located in IO97AQ.

VHF News

The **Martlesham Radio Society** are holding a v.h.f. round table at the BT Laboratories, Martlesham Heath, Ipswich, Suffolk on April 12. Apart from an opportunity to meet fellow v.h.f. enthusiasts in amicable surroundings, there will be technical workshops, talks and equipment measuring facilities. Admission is strictly by ticket only and can be obtained by sending a stamped addressed envelope and names of all applicants to Roy Smith G6GAU, Lykkebo, The Street, Burstall, Ipswich IP8 3DN.

The 1992 **Scandinavian v.h.f. meeting** will be held in Angelholm, southern Sweden, between June 5-8, at the club headquarters SK7OL. If you have any equipment to display or if you wish to give a lecture, then contact me and I will get in touch with SM0FSK, the SSA v.h.f. manager.

The German radio club **DL0WAE** is now active on the 50, 144 and 430MHz bands and is looking for schedules via tropo, meteor scatter and e.m.e. Members of the club, located in JO42, include DL1YAW, DL1YDI, DL4YBM and DF8AE. They run 5W into a 4-element Yagi on 50MHz, 400W into four 9-element OZ5HF Yagis on 144MHz and 10W into two 23-element Yagis on 430MHz, but they expect to have e.m.e. capability on this band soon. If you want a sked, contact George Winter DL4YBM Upheiderweg 131, D-4803 Buende, Germany or listen for them on the v.h.f. net 14.345MHz.

Fig. 2: The GB3LER beacon site. Left to right, G6JQV, GM4IPK, G8ESB and G6GEJ. Photo provided by G8ESB.

Expedition Update

Bill Wiseman KM1E is active on the 50MHz band, until the end of March, with the callsign C6A/KM1E. QSL cards go via his home address, PO Box 120, Woolwich, ME 04579, USA.

Another keen operator **P43FM**, will be active on the 50MHz band from Aruba until the end of March. Cards can be sent via his home callsign PA0FM.

Commencing on March 1 for a four week period, **VK0KC** will be QRV from Casey Station, Antarctica (OC53) on the 50MHz band.

Steve Bryan G1SGB is hoping to be active from the Sule Skerry lighthouse during April. He will be active on the 144MHz band, concentrating mainly on WAB.

The **VP8SSI** expedition to the South Sandwich Islands, is now set to take place between March 14 and April 28, including a two week stay on Thule Island. The operators include JE3MAS, OH2BH, WA3VYN, WA4JQS, W6MKB, W7KNT, KJ9I and K0IR and the team will operate six complete stations including 50MHz and 144MHz e.m.e. Operation via OSCAR satellites will be brief, as there is only a very small footprint from Thule Island, but if time permits there may be some operation via the RS10/11 and RS12/13 series of satellites. Any QSL cards should be sent via AA6BB/7 for s.s.b. contacts and to KA6V/7 for c.w. and RTTY contacts.

The expedition to Georgetown, Guyana (GJ06) by G3JVL, G3SED, G4CCZ and G4CVI will take place between April 20 to May 22. The main emphasis will be on the 50MHz band with operation to be on a 24 hour basis. Look out for any of the above callsigns with the suffix 8R1. The operation will also include ten days of activity from PP8. Any QSL cards should be sent via K. R. Diamond, SMC Radio Club, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY.

Incidentally, only one 50MHz contact has so far been made from the UK with 8R1, and the QSL card in **Fig. 1** records the details of the QSO. The contact, lasting no more than 15 seconds, was made via multi-hop Sp-E and was particularly pleasing as 8R1AH went QRT the very next day and returned home to Canada having spent many months in Guyana trying to work into Europe.

Beacon and Repeater News

The callsign **DX1HB** is to a new beacon active on 50.008MHz from the Philippines. It is running 20W into an omni-directional antenna from locator PK04.

During the severe gales of December 1991, the antennas for the 50MHz and 144MHz **GB3LER**

IMPORTANT ANNOUNCEMENT

Sadly due partly to the recession and partly over-trading there has been a large number of bankruptcies, receiverships and closures within the amateur market. These events have left a large number of amateur enthusiasts disillusioned and feeling the repercussions.

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FT107	HF transceiver (12VDC)	S/H	£499.00
FL7000	HF linear 500W PEP	S/S	£1299.00
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IC725	HF transceiver	S/H	£625.00
FT102	HF transceiver	S/H	£639.00
FT70G	HF transceiver	S/H	£379.00
FT400C	HF transceiver	S/S	£199.00
FT711RM	UHF mobile 25W	S/S	£295.00
FT290R	VHF portable 3W	S/H	£249.00
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FT23R	VHF hand-held	S/H	£169.00
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LPM 144-3-100	VHF linear	S/S	£235.00
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FTV107	Transverter 2m 10W	S/H	£169.00
FR101	HF receiver +FM +VHF	S/H	£249.00
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FRDX500	HF hand-held	S/H	£159.00

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FT757GX	HF transceiver	S/S	£700.00
FRG9600M	VHF/UHF receiver	S/S	£440.00
FRG9600M	VHF/UHF receiver	S/S	£440.00
FT767GX	HF transceiver	E/D	£1300.00

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ICF-PRO80	Sony scanner	S/H	£229.00
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TS530	HF transceiver	S/H	£525.00
R2000	HF receiver + VHF conv	S/H	£535.00
FT102	HF transceiver	S/H	£555.00
FRG9600	VHF/UHF receiver	S/H	£395.00
SX400	Scanner c/w HF convertor	S/H	£375.00
TS950	HF transceiver + ATU	S/H	£1695.00
VF230	Ext VFO	S/H	£215.00
FT726	VHF transceiver 2m + 6m	S/H	£775.00
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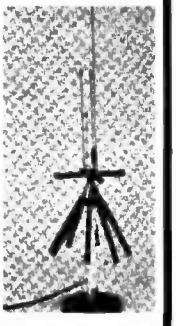

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Back-Scatter

beacons were both damaged. However, the units are now operational again, running 40W into a dipole on 50.064MHz and 100W into two 6-element Yagis, beaming at 45 and 135°, on 144.965MHz. Another beacon on 432.965MHz runs 20W into a 12-element Yagi. The photograph, **Fig. 2**, shows the 144MHz and 430MHz antennas at the Lerwick beacon site.

It is worth noting that Andy Steven GM4IPK has paid for the majority of the equipment himself. If you wish to contribute towards the GB3LER fund, you can contact Andy at 27 Dalsetter Wynd, Dunrossness, Shetland ZE2 9JJ or telephone him on (0950) 60312.

After a break of several years, the Isle of Wight beacon GB3IOW is again QRV on 1296.900MHz.

QRZ Contest!

A 50MHz Trophy contest will be held on April 5 between 0900-1700UTC. There are sections for the single operator fixed or portable, multi-operator fixed or portable and listeners. Signal report, serial number, locator and county information must be exchanged.

The last in the present series of RSGB 70MHz cumulative contests will be held between 0900-1100UTC on March 15. The contest exchange consists of RST, serial number, locator and QTH.

The annual 70MHz fixed station contest will be held on March 29 between 0900-1500UTC. There are sections for single operator, multi-operator and listeners. Signal report, serial number, locator and QTH must be exchanged.

The oldest wireless club in Great Britain, the **Derby and District Amateur Radio Society**, will be holding their 6th annual 144MHz contest on March 22 between 1300-1700UTC. There are four sections for fixed or portable stations running either low power 30W output or full legal power limit 400W output.

All contacts must be made on s.s.b. and the band plan must be observed. The contest exchange consists of callsign, signal report, serial number and county. A contact with G3ERD or G8DBY scores 10 points and all other contacts score two points. The final score is the total number of contact points multiplied by the number of counties worked.

Each country outside the U.K. is scored as a county. Logs must show, time of contact in UTC, callsign of station worked, signal strength and serial number sent, signal strength and serial number received, county or country. The RSGB type log sheets are preferred but any neat alternative is acceptable.

Logs submitted on computer disk are not acceptable. Please head each sheet with the callsign of the entering station, the county in which the station was located and whether a single or multi-operator. Completed entries should be sent to the Derby and District Amateur Radio Society, 119 Green Lane, Derby, DE1 1RZ to arrive by the April 21. The winner and runner up in each of the four categories will receive a certificate.

The German AGCW-DL 430MHz c.w. contest will be held on March 21 between 1900-2300UTC. There are 3 sections relating to power output; A = less than 3.5W, B = less than 25W, C = more than 25W output. Participating stations, who must only use the band 432.010-432.150MHz, should call "CQ AGCW TEST" and exchange RST, serial number, power class and locator, for example; 599001/C/IO81MX.

The French amateur radio society, REF, are holding their annual e.m.e. contest on April 4-5. This is a good time for the newcomer to listen off the moon as many stations will be active. Moonrise on April 4 is 0600UTC and moonset is 2030UTC. Moonrise on the 5th is again at 0600UTC but moonset is at 2200UTC.

The 1st 1296MHz contest, the 2nd is in November, will be held on April 12 between 1600-2200UTC. There are sections for single operator fixed station, multi-operator fixed station and listeners. The exchange consists of report, serial number and locator.

The last in a series of winter microwave cumulative contests, for all bands from 3.4GHz and up, will be held on March 16. Although the aim of these sessions is to encourage fixed station operation, portable stations are most welcome to participate.

Annual c.w. ladder

Final positions for 1991

	Band (MHz)			
Station	**50**	**70**	**144**	**Points**
G4ASR	56	65	384	505
G4OUT	-	48	220	268
G0FYD	69	-	197	266
G0EVT	17	-	11	28
G0DJA	-	-	29	29
GW4VVX	-	-	11	11
GM4CXP	1	6	7	

Number of different stations worked during 1991

QTH Locator Squares Table

Station	50	70	144	430	1296	Total
G3IMV	364	—	467	125	52	1008
GJ4ICD	504	—	269	121	59	953
GW4LXO	367	1	258	108	48	781
G6HKM	333	-	232	115	53	733
G4ASR	279	43	350	41	3	716
GM0EWX	404	—	211	18	—	633
ON1CAK	249	—	280	53	11	593
EI5FK	314	—	187	58	—	559
G0DAZ	146	—	221	137	39	543
G6HCV	309	—	233	—	—	542
G3UVR	—	50	258	141	64	533
G4KUX	—	—	372	120	—	492
ON1CDQ	188	—	258	55	10	489
G0OFE	300	—	172	—	—	472
G0EVT	186	—	222	60	—	469
G1SWH	201	30	166	62	9	468
G4RGK	—	—	284	124	50	458
G3XDY	—	—	211	150	92	453
G4MUT	143	25	155	94	34	451
G0FYD	227	1	201	6	—	435
G8PYP	238	2	129	40	—	409
G0LBK	—	—	267	89	46	402
G1LSB	73	—	176	144	—	393
G6DER	—	22	163	110	78	393
G8LHT	79	19	165	93	14	390
G1EZF	—	—	263	93	—	388
G4XEN	—	—	274	111	—	385
G4NBS	—	35	138	108	67	348
G4YTL	—	38	276	24	—	340
G4RRA	—	—	255	80	—	335
G3COJ	—	—	186	103	44	333
G8PNN	7	25	129	99	64	324
G4SSD	—	—	229	93	—	322
G4FRE	—	—	102	146	72	320
G1SMO	206	—	112	—	—	318
GM0HBK	132	8	156	19	—	315
G4TIF	—	—	200	110	—	310
G4DHF	—	—	307	—	—	307
G4ZTR	78	28	120	50	30	306
G1EGC	—	—	198	80	23	302
G8HHI	—	—	148	110	38	296
G0NFH	136	27	92	28	12	295
G6MGL	—	—	141	69	59	289
GM4CXP	50	—	201	32	—	283
G6MXL	84	23	100	52	22	281
DL8FBO	—	—	280	—	—	280
GW6VZW	118	—	143	6	—	267
G4PCS	—	—	258	3	—	261
G3BDQ	256	—	—	—	—	256
G1GEY	—	—	168	77	11	258
G3NAQ	—	—	175	80	—	255
G6DZH	—	—	158	87	—	245
G6STI	—	—	152	69	24	245
G3FPK	—	—	241	—	—	241
G1UGH	125	—	114	—	—	239
G4IGO	—	—	238	—	—	238
G0EHV	—	—	160	75	—	235
GW4FRX	—	—	231	—	—	231
G4DOL	—	—	223	—	—	223
G4MEJ	—	—	213	—	—	213
G8LFB	—	—	209	—	—	209
G8MKD	—	—	150	49	—	199
GJ6TMM	—	—	151	48	—	199
G4YCD	—	—	197	—	—	197
G1TCH	94	—	95	6	—	195
GI1JUS	—	—	192	—	—	192
G0KDN	—	—	186	—	—	186
G8XIR	—	—	123	—	62	185
G7ENF	59	—	89	24	—	172
G4FVK	—	—	82	50	23	155
G7ANV	—	—	153	—	—	153
G4AGQ	—	—	104	42	1	147
G8XTJ	29	—	116	—	—	145
G0ISW	58	—	64	20	—	142
G6MEN	41	2	63	26	4	136
GW4VVX	10	—	120	—	—	130
G1WPF	—	—	97	29	—	126
G0FEH	—	—	101	24	—	125
GW6ARL	116	—	—	—	—	116
GW1MVL	—	—	109	7	—	116
G1IMM	—	—	98	17	—	115
GM0GDL	—	—	88	23	—	111
G7CFK	109	—	—	—	—	109
GM1ZVJ	58	—	48	—	—	106
G1CEI	11	—	77	18	—	106
GI4DWA	—	—	103	—	—	103
G7CLY	—	—	100	2	—	102
GM0JDL	—	—	88	—	—	88
G4WHZ	—	—	76	—	7	83
G0GTF	76	—	—	—	—	76
G1THG	34	—	35	—	—	69
G1NVB	—	—	73	—	—	73
G0HDZ	—	—	64	—	—	64
G0HEE	—	—	73	—	—	73
GU4HUY	—	—	73	—	—	73
G2DHV	—	—	33	7	2	42
G7AHQ	—	—	34	—	—	34
GW7EVG	—	—	32	—	—	32

No satellite or repeater QSOs
Starting date January 1 1975

Back-Scatter

Summer microwave contests have been scheduled by the RSGB microwave committee to take place between 0900-2100UTC on the following Sundays, April 26, May 24, June 14, July 19, August 16, September 13, October 3-4, the latter to coincide with the IARU contest arranged for the same weekend.

Scandinavian activity contests will be held between 1800-2200UTC on the following dates: 50MHz on March 24 and April 28, 144MHz on April 7 and May 5, 430MHz on April 14 and May 12, Microwaves on March 17 and April 21. A full set of rules can be obtained from myself on receipt of an s.a.e.

Deadlines

Please send your letters to reach me by the end of the month. I always write up the column in the first week of the following month. Don't forget that I can also receive messages via packet radio at my mailbox GB7TCM and I can also be contacted at my DX cluster GB7DXC.

Photographs of your shack, antennas or any v.h.f. activity are especially welcome. Other pictorial items such as QSL cards, awards, certificates, etc., are also required. They will all be returned to you.

144MHz QRB Table

Top distances (km)

Tropo	3160	GM4YXI
Aurora	2143	G4YTL
Sp-E	3080	G0EVT
Meteor	3100	GW4CQT

Back-Scatter

Broadcast Round-up

Reports to Peter Shore via the PW Editorial Office

The international radio scene continues to be volatile. Some stations continue to cut back the number of languages and hours they broadcast, whilst others plan new images and names! The latest to think of revamping its "corporate image" is Belgium's BRT International. The station, which broadcasts in English, has announced that it will have a new logo, change its name and have a whole selection of new jingles, which will give the station a brand new profile.

The station has started relays on f.m. in the Brussels area and is investigating using satellite for services to Europe. Whether this will change the programmes on the station remains to be seen. I recall that on the evening of the Herald of Free Enterprise disaster there was not a single mention of it on the English language service. All the programmes, including the news, were taped and no one in the English service could be reached to come in to broadcast live.

Here's a case of the disappearing radio station! Radio Surinam International from the former Dutch colony in central America, has vanished. The station used to be relayed by RadioBras in neighbouring Brazil, but has been unheard for some months. English language programmes were heard along with Dutch and Tsonga between 1700 and 1800 on a 17MHz frequency, but it seems they are no more. Perhaps the political climate has changed in Surinam, rendering the need for external broadcasting to the country's former rulers in Europe unnecessary. Or perhaps they have run out of cash. **Roy Merrall** reports last hearing the station on 25 September 1991.

Some of the stations relayed by the former Soviet empire no longer have the benefit of high-powered transmitters. These include Radio Afghanistan whose external and domestic services had, since the time of the Soviet invasion, been relayed by transmitters in the Soviet Union. But other operators are making use of the facilities: Adventist World Radio started transmissions from Siberia on February 1 beamed to India and southern Asia.

Radio Polonia has become Polish Radio Warsaw once again and now is a shadow of its former self. The finances of the station have been severely affected by the state budget which is desperately short of funds. The radio station is now on the air for just 18 hours a day and four language services have been closed. These include French, Italian, Finnish and Swedish.

The main thrust of the station is now towards its eastern neighbours of Russia, Ukraine, Belorussia and Lithuania and to the west to which it is broadcasting English, German and Esperanto. The latter has been retained as the inventor of Esperanto, Ludwig Zamenhof, was Polish. The frequencies and times for English appear in the European News section.

A brand new schedule will take effect at Radio Netherlands on March 29. There will be a new English language transmission lasting three hours between 1330 and 1625. The first and last hour will be the same, but the middle hour will carry a different feature programme. This will displace the 0830 and 1130 broadcasts - the latter beamed to Europe.

The transmissions to Africa at 1630 and 2030 will merge into a new three hour transmission at 1730. There will also be a new three hour block at 0030 for Asia. This is a completely new departure for the station which is currently investigating how to run programmes with continuity announcers which will replace the somewhat cumbersome taped system in operation at the moment.

What does this mean for European English language listeners? It means we'll all have to try to get reception of the services beamed to other parts of the world, which might prove less than easy. In the longer term, however, Radio Netherlands is planning a new European service to be heard throughout the continent in a joint project with Dutch domestic stations. Details are thin on the ground, but keep watching *Practical Wireless* for the latest news. We'll be printing a schedule of the rearranged English service as soon as we have it.

Last month we reported that Vasily Strelnikov was not working for Radio Moscow anymore and suggested that he perhaps might get a job at Radio Netherlands. Within days of that being typed into the word processor, up pops Vasily on *Media Network* described as 'Moscow reporter'...!

As this edition of *Practical Wireless* went to press, a very important radio conference was getting underway in Spain. The World Administrative Radio Conference, WARC-92, is a major frequency allocation conference and could have major effects on the short wave bands for radio amateurs and broadcasters.

International broadcasters are pressing for more of the short wave radio spectrum to relieve some of the overcrowding which exists at present, and several suggestions for expansion into frequencies adjacent to some of the current broadcast bands have been put forward. There is also some pressure for broadcasters to adopt single sideband transmitting from the year 2007 or earlier. This is thought to be a way to alleviate some of the overcrowding, too, but many broadcasters are against this, as insufficient s.s.b.-capable radio receivers exist at present in the developing world.

For the amateur fraternity there will be moves to harmonise the amateur radio allocation at 7MHz. The WARC-92 promises some healthy arguments over its four week duration and we'll bring you more in future columns.

European Stations (all times GMT=UTC)

Roy Merrall reports that REE in Madrid has dropped 9.675 and 9.53MHz for its 1900 English language broadcast, using instead cluttered 6.13MHz to the Middle East.

Polish Radio Warsaw's English language service is now heard at:

1300 on 11.815, 9.525, 7.145 and 6.135MHz
1600 on 11.84, 9.525 and 7.285MHz
1800 on 9.525 and 7.145MHz
2030 on 9.525, 7.27, 7.145, 6.135, 6.095 and 1.503MHz

Radio Kiev in Ukraine has 24-hour domestic coverage on 9.56, 9.72 and 9.785MHz in parallel with the long standing 4.94MHz. The foreign service can be heard in English to Europe very well at 2200 for an hour on 6.02MHz in parallel with 7.40MHz after 2230. English is again heard at 0245 on a clear 4.825MHz. To North America the transmission at 0100 is strongly heard on 7.40 and parallels

Back-Scatter

of 9.75, 15.18, 17.605 and 17.69MHz.

Vatican Radio's English service beams programmes to Europe:

0600-0620 on 7.25, 6.245 and 1.53MHz
0730-0745 on 15.21, 9.645, 7.25 and 6.245MHz
1120-1130 on 15.21, 9.645, 7.25 and 6.245MHz
1715-1730 on 7.25, 6.245 and 1.53MHz
2050-2110 on 7.25, 5.885 and 1.53MHz

Radio Yugoslavia has a short, variable length news bulletin at around 0350 on 7.40MHz, following the Armenian transmission to North America 0300-0400. Weaker parallels can be heard on 9.75, 15.18, 17.605 and 17.69MHz.

Croatian Radio has a short English news bulletin at 1305 on 7.24 and 9.83MHz. There's also an English language bulletin at around 0500 on 7.315MHz, usually for a little over ten minutes.

African and Middle Eastern Stations

The Voice of the Islamic Republic of Iran carries English at 1930 on a poor 15.26MHz, in parallel with that old chestnut of 9.022MHz, which at the time of writing, offers reasonable reception.

Iran's Flag of Freedom Radio continues to be regularly heard by Roy Merrall on 11.47, 9.355 and 9.25MHz. The station announces a schedule of:

0300-0330 on 15.556, 11.47, 9.25 and 9.045MHz
0645-0730 on 15.105 and 11.47MHz
1400-1445 on 15.105* and 11.47MHz
1630-1825 on 15.565, 15.10, 11.47 and 9.355MHz

Roy believes that the frequency marked * could now be 15.10MHz. Initial identifications are given in English, French and Persian.

English programmes from Baghdad have returned, although not to the extent of pre-war days. Now calling itself Radio Iraq International, the station beams to North America at 2315 for an hour on 11.83 and 15.455MHz.

The current schedule for the English service of the Voice of Turkey in Ankara is:

2100-2200 on 9.445MHz
2300-0000 on 9.685 and 7.185MHz

Asian and Pacific Stations

Radio Afghanistan, which appears to be no longer relayed from transmitting stations in the former Soviet Union, can be heard with English at 1830 for thirty minutes on 9.635MHz. This is preceeded by a half hour German programme, and this is followed by French also for thirty minutes.

Radio Australia's latest frequency schedule makes the following suggestions for European listening:

0700-0900 on 21.775MHz
0900-1300 on 21.72MHz
1430-2100 on 13.755MHz
1630-2100 on 9.86MHz

The Voice of Free China in Taipei, Taiwan, had English at 2200 on 11.58 (giving SIO333) with a weaker parallel of 9.8525MHz. Also noted weakly at around 0300 on 5.95MHz.

Radio Alma Ata in Kazakhstan has English at 2230, reported on 21.49, 17.73, 17.715, 17.605, 15.385, 15.27, 11.952, 9.705, 9.505, 5.97, 5.96, 5.26, 5.035, 4.395 and 3.955MHz.

The SLBC service from Colombo, has a Middle Eastern transmission during the late afternoon on 11.80MHz. The station can often be heard clearly at 1900 with English news from around 1925, also on 11.80, but suffers from interference from RAI signing on for its 1930 transmission.

North, Central And South American Stations

Radio Nacional de Argentina on 11.71MHz is occasionally heard on a clear channel at around 2030, says Roy Merrall, with a very muted VoA. When this happens, a number of other South American regulars appear at around 1945 such as Radio Globo on 11.805; Radio Brasil Central on 11.815; Radio Anhanguera on 11.83; Radio Aperecida on 11.855 and a new one, Radio Gaucha, Porto Alegre on 11.915 (from 2010).

English broadcasts from South America are few and far between these days, but Radio Nacional da Colombia in Bogota broadcasts *Colombia DX* each Saturday at 2330 on 11.8225MHz (unfortunately not the best frequency sandwiched between two other stations). The station's address is PO Box 94321, Bogota, Colombia.

Radio Havana Cuba was noted by Roy Merrall with English at 2200 on 7.215MHz. Problems with interference from UAE Abu Dhabi affect the channel. There's a *DXers Unlimited* programme on Saturdays at 2210 on the 7MHz channel, repeated Tuesdays at 1920 on 17.705MHz.

The HCJB station has a new outlet on 15.14MHz from as early as 1830 in Spanish, improving steadily until 2330 and beyond. There is a reasonable parallel on 11.96MHz. RCI causes problems on 15.14 between 2000 and 2100.

Spanish speakers amongst *PW* readers might like to try logging relays of Radio Miami International by WRNO in New Orleans. The relays are daily at 0400 on 7.465MHz.

WWCR, also from the United States, carries English at 0800 on 5.935MHz.

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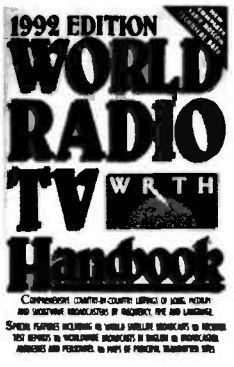

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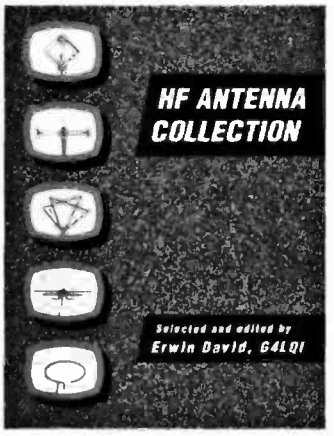

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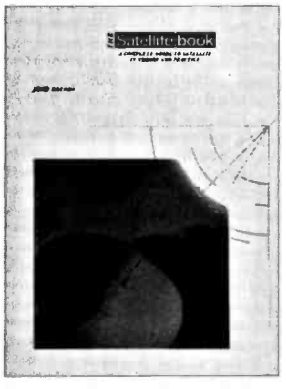

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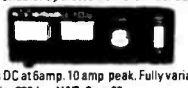

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Computing in Radio

0 GO TO 1000
1 SOUND TN,DI:FOR Y=0 TO WC :NEXT :RETURN
2 SOUND TN,
3 PRINT C$; :
4 FOR X=1 TO
GOSUB 1 :N
5 X=(INSTR(
4:GOSUB 3
RETURN
6 FOR X=1 TO
10 CLOSE:CLS:
"[P]re-recor
:PRINT "[R
paramet
11 IN$=INK
12 IF IN$=
100:GOT

Computing In Radio

Richard Wilmot GW3RRI uses his specialist knowledge to remove the mystery often associated with computers and communications. He then introduces us to the increasingly fascinating electronic world opened up by these amazingly versatile machines.

Computing In Radio Showcase

What's available? Who sells it? What does it do? How can I use it? How much is it? You'll find all these questions answered in our 'Computing In Radio Showcase' starting on page XIII.

16-Page Pull-out Magazine

Windows on the World

Love them or hate them, Personal Computers are part of the future.

Some applications of PCs in radio have been simply "naturals"—like reception of FAX and SSTV. Who needs old windscreen wiper motors and spark-gap recording paper when it can all be done in software—and manipulated in many ways once captured and saved to disk? (The older readers among you will recall such things from the past...)

There are still plenty of radio enthusiasts who need a nudge in the direction of the technology—although many who once swore at the RFI generated from computers have now been delighted to discover that this is largely a thing of the past with LCD displays. And most traditional desk top CRT systems are no worse than domestic TVs (in fact, most are better).

Walk and chew gum

But personal computers are generally regarded as systems for doing one thing at a time. Radio is essentially a multitasking medium: you tune the radio, listen to the output, switch the mode in "real time"—so why is it that your PC can't do this as well?

Well, using our DESQview multitasking operating environment your DOS PC (IBM Compatible) can. DESQview allows you to run more than one DOS application (including MS Windows) at a time. Applications are appearing all the time to control the new generations of receivers fitted with RS232 serial interfaces. DESQview is compatible with virtually all the DOS applications that you can think of—although it must be noted that some of the more experimental applications encountered in specialist scientific applications controlling serial communications may occasionally transgress the rules of DOS programming and require special attention.

But tweaking and tuning is half the fun of radio, isn't it? And getting computers and radio to perform tricks that you never thought possible will broaden the horizons of your hobby.

DESQview Users do it in DOS Windows

This publication is aimed at radio enthusiasts—so you'll be encouraged to learn that Quarterdeck technical people understand the excitement and enthusiasm that putting technology to work in creative new circumstances can bring. For example, our own DESQview User Magazine carries a feature on DESQview with packet radio in issue 4.

In the application display shown here in our optional 50 line VGA mode, one DESQview Window is running an application that controls our ICOM R71 through the CT17 interface—and the lower window contains a simple list of frequencies and station information.

A single DESQview script key (macro) has been written (in about 20 seconds) that cuts the frequency information from the list, and transfers it to the window controlling the receiver. The list can be created in any wordprocessor, card index or database.

Imagine...

In another window, you could be receiving SSTV or FAX information—or maybe plotting the orbit of a satellite. All the time, you'll be online to your local BBS. But remember that you'll need to have enough serial ports, and enough expanded memory to enable you to do these operations simultaneously. 386/486 users have it easy—our QEMM memory manager used in conjunction with DESQview creates DESQview386—a multitasking operating environment that automatically sets up for optimum performance. Owners of 8086/80286 are not abandoned, though—and many facilities, including multitasking, are available through use of our products.

If you use an IBM PC or compatible and you don't use a product like DESQview, then please call us for details of our ever evolving product range, and where to find your nearest dealer. We'll even try to single out those who have a radio enthusiast on their staff.

Quarterdeck UK

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Computing in Radio

As a professional in radio communications, specialising in computing applications, Richard Wilmot GW3RRI asks: "Do you operate RTTY or packet radio? Can you display weather satellite or SSTV pictures? I know that many PW readers are already very aware of the many uses to which a home computer can be put in the field of amateur radio and short wave listening. This much is clear from the articles which appear in PW, and from the response to them.

There are however, quite a number who haven't yet ventured into this relatively new field of the hobby, for a variety of reasons. I hope that this article will encourage them to take the plunge and get all the benefits that modern computer technology has to offer". Richard Wilmot GW3RRI.

The main reason for a reluctance to become involved with computers, seems to be a feeling that the technology is too complicated. People get the idea that they have to have a degree in micro-electronics and another one in computer programming, before they can begin to understand what's going on! I'm pleased to be able to assure you that nothing is further from the truth!

New Words And Concepts

There are new words to be learnt of course, and new concepts to be understood, but the amount of knowledge needed to get started is minimal. It mainly consists of knowing how to connect up the computer system, switch it on and load a program. All this is generally easier than hooking up a transceiver to its various accessories, so everyone has the ability.

Although electronic and programming skills may be very useful to help you find a job, they are not needed to operate a home computer for our purposes. They're no more needed than r.f. engineering skills are needed to operate your transceiver! The transceiver by the way, if it's in anyway a modern rig, contains at least one computer, and quite likely several.

Although specialised skills went into making the computer and writing the program, neither of them is your concern, as you just buy them ready-made. All you have to do is to press the right keys to make the program perform your wishes, while following the instructions which came with it. If you can operate your rig, you are easily qualified to run a computer!

What Can Computers Do?

What can computers do for you? The answer to that is more or less anything that you can get a program for. These days, programs are available for a very wide range of radio uses, as well as for business, education, and a wide range of hobbies. And, of course, there are all those games to play!

The programs (often known as software) fall into two natural divisions or groups. There are those for which the computer is connected to a radio, which are used for receiving and transmitting data of various kinds, and programs where the computer runs alone, providing ancillary services such as log-keeping.

The First Group

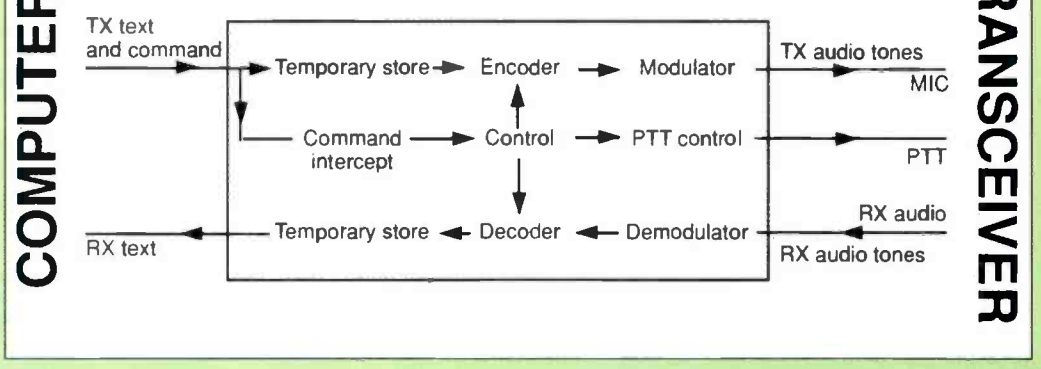
Starting with the first group, the application which most people will be familiar is packet radio. The usual way to operate this is to use a TNC (terminal node controller). This is a hideous jargon term (but never mind what it means, you know what it does!) connected to the computer as shown in **Fig. 1**.

Also shown is the signal path through the different stages. The TNC is, in fact another computer, with a built-in program which does the actual work of sending and receiving the signals to and from the transceiver. It sends the received text to your home computer for display, and accepts the messages which you type in for transmission.

Not Very Demanding

The use of your computer just as a display and keyboard is not a very demanding task. A very simple program will suffice, although some are

Fig. 1: What goes on in a TNC.



AOR Receivers via Computer Control

ACEPAC-3A is a new and exclusively developed multi-function IBM-PC based program to further increase the flexibility of the AR3000A and AR3000 receivers. No additional hardware is required other than an AR3000A, IBM-PC compatible computer and a standard serial lead.

The software package is designed to run in conjunction with the AR3000A which is an extremely versatile start-of-the-art receiver featuring all mode reception with coverage from 100 kHz to 2036 MHz without gaps. An RS232C port is provided ready for connection to any 'reasonably priced' PC compatible computer using a standard serial cable, the software runs under DOS.

ACEPAC-3A is menu driven for ease of operation and has basic on screen help at the touch of a button, a comprehensive printed operating manual is also supplied as part of the ACEPAC-3A package. Two disks are supplied, one 3.5 inch 720 kB format and the other 5.25 inch 360 kB. Of course you may install one copy onto the hard drive of your computer.

Default settings ensure you can 'get up and go' with the minimum of fuss or delay, these defaults may be changed any time to tailor the exact configuration to suit your needs. When called, ACEPAC-3A checks the serial port connection for the presence of an AR3000A, if the connection is not established ACEPAC-3A enters emulation mode so that you may still familiarise yourself with the software.

Providing you have the appropriate computer hardware, the ACEPAC-3A display is in colour except for the sweep facility (spectrum analysis type graph). For this function you need a graphics card such as CGA, EGA or VGA although Hercules will be supported in all other respects if required. There are two types of display available for the sweep facility (graph-line or dot) and three types of scanning in this mode. You can program start and end frequency, mode, attenuator setting and step size.

Band activity can be monitored both as sweep display and as an 'X' axis table format with squelch opening percentage recorded for each frequency. This is useful to indicate 'how active' the frequencies are in the programmed search range. In addition to the graphic display, ACEPAC-3A can produce a detailed numerical list from the graphical information which may be printed on an Epson compatible printer.

The signal strength is displayed as a vertical bar with a resolution of 16 steps. Most AR3000A functions are available via remote control and status is displayed on the computer's monitor screen: Frequency, Step size, Attenuator, Mode, Memory bank, Scan, Search etc.

ACEPAC-3A offers further storage of frequencies, mode, attenuator and lockout in the form of memories. One memory file has 400 channels divided into 4 banks of 100 channels. ACEPAC-3A can make more than one memory file to increase the memory capacity but is of course limited by disk space. If you make just one extra memory file you can store 800 memory channels! Up to 15 memory files may be created in each directory containing ACEPAC-3A. Memory files may be down-loaded from the computer into the AR3000A. **R.R.P. £119.00 including VAT. Carriage extra £2.00 by post.**

AORSC - Spectrum Coordinator is a powerful program for the IBM-PC compatible computer, which allows the user to control the AR3000A, AR3000 or AR2500 receivers using the serial port of the computer. Many facilities are offered allowing a high performance radio monitoring system to be put together very simply. The AR3000A supports the 'games port' (if fitted in the computer) to further increase search and scan speed.

A text display is used to present information to the user about the operation of the software. The status of the receiver and software is displayed on the computer monitor above a list of the memory channel contents. The bottom line of the screen contains a menu providing options for the main facilities of the software.The computer's keyboard may be used to select the frequency and mode of the receiver using dual VFOs. It is possible to switch instantaneously between the two VFOs with a single key press. A fixed VFO offset may be entered into the system and the VFOs locked together using the "tracking" facility so that the offset is maintained while tuning across the spectrum.

A Microsoft compatible mouse may be used to control the receiver instead of the keyboard, this greatly enhances operation of the software since it is not necessary to memorise key strokes in order to use the program's facilities.

Three thousand mode sensitive memory channels are provided, each with dual VFOs and 50 character comment. A selection of these memories is displayed on the screen so that the user can review memory contents easily. The display of memories can be paged up and down so that it is possible to check on the contents of the entire bank of 3000 channels from the VDU.

A comprehensive range of scanning facilities is provided with the software. It is possible to scan memories, free scan or perform band limited scans. Frequencies that are found when using the free scan or programmable band scan (PBS) can be transferred directly into the program's memories either manually or automatically.

It is possible by using the PBS, to automatically locate signals and place their frequencies in the top 500 memory channels of the software. In addition, channel occupancy can be calculated optionally from preset PBSs so the level of spectrum usage for a band of frequencies can be measured. Similar statistics can be calculated from memory scan with output directed to a printer or disk file.

The Single Frequency Watch (SFW) facility allows statistics about signal activity on a single frequency to be calculated over a period of time. Regular reports on the density of traffic on the frequency can be output to a printer or disk file. This facility allows the number of transmissions per hour to be calculated together with the amount of activity expressed as a percentage of the total time per reporting period. The frequency of reports may be determined by the user.

A list of up to 100 unwanted frequencies can be built up for rejection during scanning operations. It is possible to individually "tag" memory channels so that a Morse character "A" is sent through the PC's speaker to alert the user to the presence of activity on a memory channel while memory scanning.Offset Simplex Reconstruction (OSR) allows both sides of a simplex transmission that are on different frequencies to be recovered by switching intelligently between the two VFOs of the system.

A comprehensive listeners logbook is incorporated allowing the activity of stations to be manually recorded on disk. Print outs of logbook information can be produced and sent to your printer if connected. It is possible to add logbook entries while scanning using a single key press.

Various conversion routines are provided that allow memories, logbook information and the reject frequency list to be output to disk in text format. This allows the data to be imported into an external data base (not supplied) where it can be modified to the user's requirement. The altered data can then be imported back into AORSC so that it can be used with the software.

A comprehensive printed operating manual is supplied as part of the AORSC package, pages of help information may also be read from disk for display on the computer screen while the software is being used. Two disks are supplied, one 3.5 inch 720 kB format and the other 5.25 inch 360 kB. Of course you may install one copy onto the hard drive of your computer. The computer requires a minimum of two floppy disk drives or one floppy disk drive and a hard drive. **R.R.P. £75.00 including VAT. Carriage extra £2.00 by post.**

SCANMASTER 2. Not an AOR product, it is designed and manufactured by E.M.P. Ltd. Scanmaster is a "self contained black box" which plugs directly into the computer control socket of the AR3000, AR2002 (and soon AR3000A) where control of the receiver is taken over by Scanmaster. No programming is required to use Scanmaster, it has it's own powerful commands to perform Searching, Memories, Remarks, Logging, Activity Reports etc. INFORMATION is generated for you to control and manipulate, this information can be uploaded, downloaded, printed, stored etc.

You may communicate with Scanmaster using most computers running a simple terminal program via the RS232 port. Anything sent to or from the terminal can be automatically stored in the Scanmaster's spare memory which is backed up with a lithium battery, a Clock/Calendar is built-in for accurate logging and is battery backed so the date/time will be correct even when tuned off.

You can connect to Scanmaster at any time and view the information even when it has been turned off for a while. The latest microprocessor technology has been implemented to make the unit User Friendly. Scanmaster has a powerful Scheduler so that jobs can be set up to run on a certain date/time, at date/time intervals, for a date/time duration or for a number of times.

Operation is from a nominal 12V DC supply which is ideal for base, vehicle or portable use and is relatively low cost so that every Radio Engineer should have one! Once you have used Scanmaster you will wonder how you ever used a receiver without it!!

Scanmaster is designed to be upgraded, and will control many different radio receivers with just a change of software and connecting leads. Plug-in boards and software packages are available to further expand Scanmaster's power and usefulness. All boards except ROMCARD contain their own operating software and will work with any of the main Scanmaster software packages thereby allowing the various boards to work with any receiver supported.

ROMCARD enables Scanmaster to hold up to 8 different software packages so that Scanmaster + ROMCARD can drive up to 8 different receivers with only a change of connect leads. Upon performing a cold start, Scanmaster checks if a ROMCARD is fitted, if so displays all fitted ROMCARD software packages on a menu for user selection. Software is available for: AR3000, AR2002, (AR3000A soon!), CHASE, IC-R7000, IC-R9000, & FRG9600.

TONECARD is able to Decode and Encode a variety of signalling tones including DTMF, SELCALL, CTSS, FFSK (MPT1317, etc) and also decode then action signalling protocols such as TRUNKING, JRC Band, BAND 3 etc. Scanmaster + TONECARD can do more than control scanning receivers! JRC ROM is an optional software package for TONECARD and is tailor made to support the new JRC Band signals used by the Gas and Electricity Co.s., it features many powerful diagnostic and engineering facilities.

CELLCARD contains the same modem/filter chipset as a cellular telephone. Scanmaster + CELLCARD can decode the signalling protocols used on the UK TACS system and optionally the AMPS system. It can decode data and commands then carry out channel hopping and other cleaver activities. CELLCARD can be used as a powerful diagnostic tool and is available to AUTHORISED USERS ONLY!! **Prices start from £249.99 including VAT.**

If you are unable to obtain supplies of AOR products from your local dealer, you may order directly – we have a fast mail order service.

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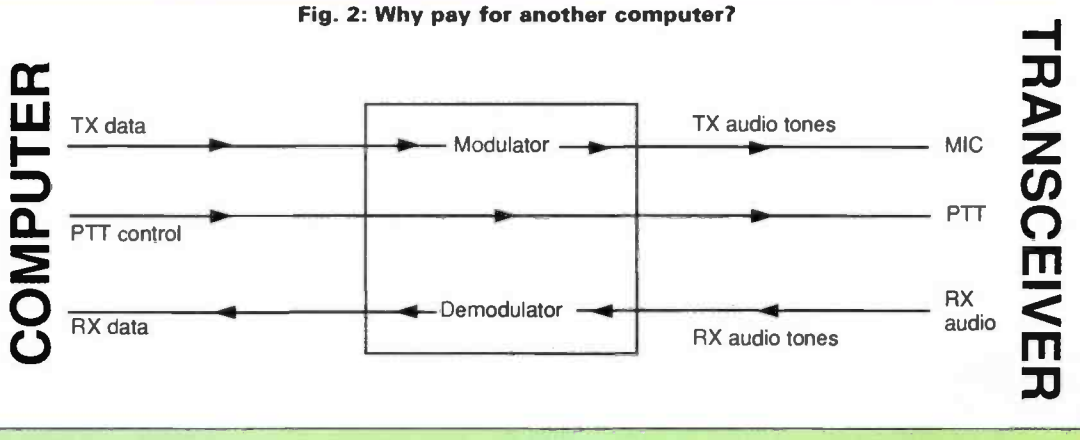
Fig. 2: Why pay for another computer?



more sophisticated, with flashy colour displays and lots of fancy features.

This type of program is also used when people send computer data over the telephone. This ensures that such programs have been written for just about any computer ever made. However, whether you can find one for the computer you have, will depend on whether it is still a fairly popular model.

As you can see, with the TNC approach you are actually using two computers, and their combined power is far greater than you need. In particular, your home computer is just loafing along, working at a tiny fraction of its capacity.

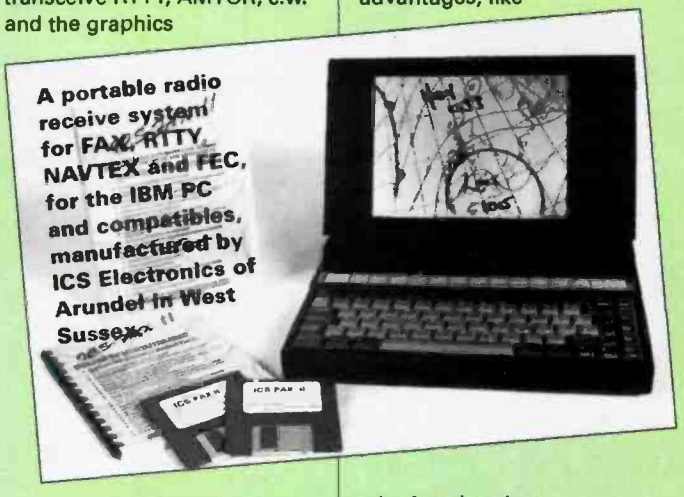
On the basis of 'why pay for another computer', in the form of the TNC, when you already have one which could easily do the job, packet systems have been produced for some computers which just need a comparatively simple piece of electronic hardware. This demodulates the audio signal and generates the transmit tones, all the rest being done by the program.

A typical set-up is shown in **Fig. 2.** As it is the hardware which is the expensive part to produce, this approach has brought the price down quite a bit.

Several Modes

In the same way that a TNC can handle several modes, as each mode needs just an extra piece of program, and perhaps a variation in the electronics, so the self-contained systems are able to do the same thing.

Indeed, there have been an enormous number of programs produced over the last 10 years for a good selection of computers to transceive RTTY, AMTOR, c.w. and the graphics



modes of SSTV and FAX. For these last two modes, this method really comes into its own as a TNC is really only geared up to use text, and they are generally unsuitable for transceiving pictures.

One Stage Further

It's even possible to take the process one stage further, and have the computer itself demodulate the signal and produce the transmit tones, thus eliminating the hardware altogether. As only a program is now needed, the price is much lower still.

This method is not really feasible for packet operation, because of the mode's high speed, but it's very suitable for lower speed modes like RTTY. Whereas the performance on marginal signals may not match the best of the expensive units, there are compensating advantages, like the fact that they are very simple to set up.

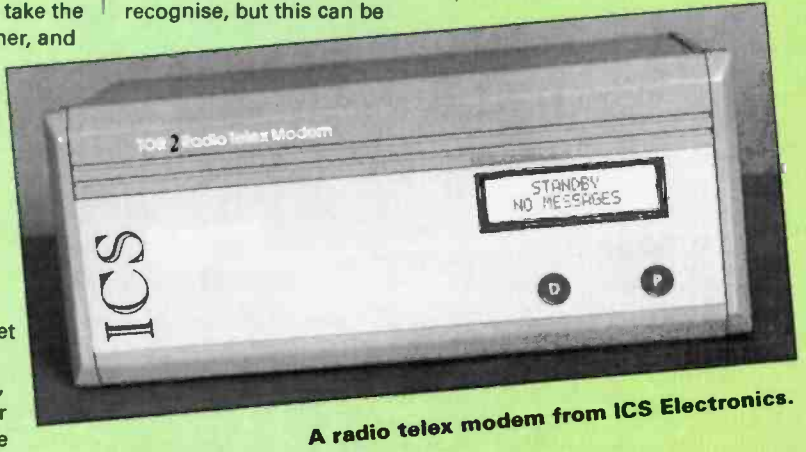
Such systems represent excellent value for the newcomer. As most computers are unable to accept an ordinary audio signal direct from the receiver, there is usually an interface involved. This converts the voltage to one which the computer can recognise, but this can be very simple and is normally supplied with the program.

Listening On The Bands

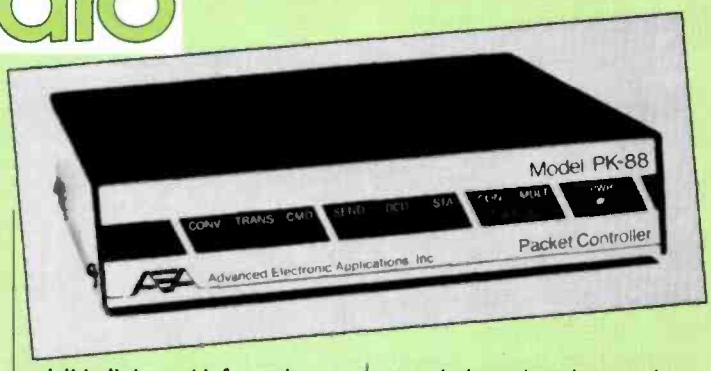
Although I realise that *PW* is the magazine for the radio amateur, and its sister journal *Short Wave Magazine* caters for the listener, I also know that many *PW* readers do little or no transmitting. However, many do like to eavesdrop on both the amateur and commercial utility bands. For these, the computer offers possibly even more scope than it does to the transmitting amateur.

There have been an enormous number of programs written for a large range of computers, to decode and display all of the common modes. Most programs need some sort of hardware, but, again, this is usually not very complicated and normally comes with the program.

The only mode that needs more complex hardware is the reception of weather satellite pictures. This is because of the modulation method



A radio telex modem from ICS Electronics.



The PK-88 packet radio controller made by Advanced Electronic Applications Inc. , from the USA.

used, but even then, the requirements are not excessive.

Relatively Cheap

The use of these relatively cheap and simple-to-use systems has been a major factor in getting new people interested in the hobby. It can also be a very useful way for anyone to get an introduction to the use of computers in radio, and to the modes themselves, as a receive-only program will be easier to operate than a transceive one.

The number of different signals you can hear is much greater than just the contents of the amateur bands. The SSTV and packet radio modes are amateur-only systems, but they are the only exceptions.

Radio-teletype, or RTTY, is transmitted from countries all around the globe. Each one anxious that you should hear its own version of world and local events.

The results can be fascinating! Not long ago I copied the Xinhua News Agency in Beijing telling the world all about the 4th international kite flying championships in New Delhi!

Weather Charts

There's not much amateur radio FAX about, but there are a lot of weather charts coming through at all times. These are not just the ordinary synoptic charts, the sort of thing you can see in the papers, but include a large range of charts for other purposes.

Upper air forecasts for airliners, wave height and sea ice analysis, land temperature and rainfall records for agriculturalists and many more, are yours for the asking. There are also press pictures, mainly from Germany, which have quite a habit of turning up in your newspaper the next day. These can be really intriguing at times, like the FAXed photograph I treasure, showing a detective entering a house...in his bathing trunks!

Origins Of AMTOR

You may call it AMTOR, but this system is actually a commercial mode called SITOR. It was originally developed to provide better ship-to-shore telex links.

The AMTOR system is not only still used for this purpose, (plenty of frequencies to listen to) but also for INTERPOL work (sorry, all the sensitive stuff is scrambled!). Another use is providing the world-wide NAVTEX service, in which stations round the globe take it in turns to transmit gale warnings and advice of navigational hazards to shipping. Saves having to wait for the Radio 4 shipping forecast!

Satellite Results Impressive

Satellites are transmitting pictures of the earth to us 24 hours a day, and the results can be really impressive. A geostationary satellite located above the equator sends pictures every four minutes of sections of the earth's surface covering all of Europe and Africa.

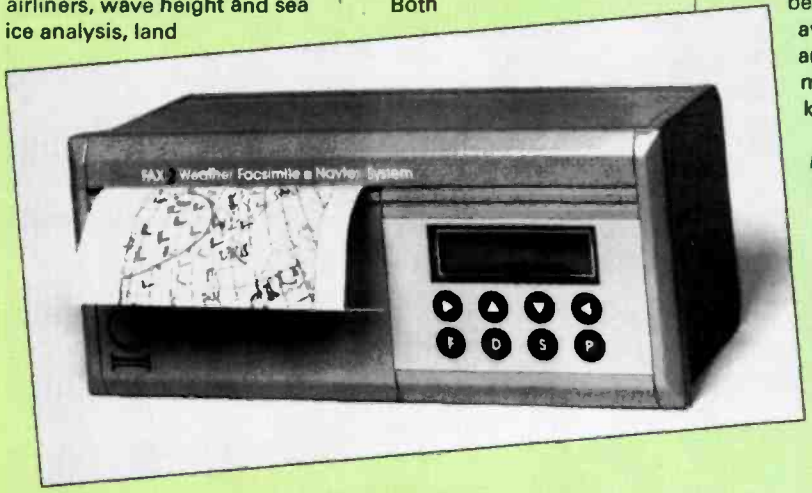
Both visible light and infra-red detectors are used to create the pictures. A visible light picture of Northern Europe, including the UK, is sent every 30 minutes during the day, so that you can see how the weather patterns are developing. Transmissions are on 1.69GHz and a special antenna and receiver will be needed.

Low Orbits

There are also several satellites in low orbits, each of which gives three or four good passes of 10-15 minutes twice a day, generally once during the daytime and once at night. These satellites transmit continuously both infra-red and, during daylight, visible light pictures.

Because they are so much lower than the geostationary satellite, it's easier to get a good picture from them, a resolution of 5km being easily obtained. Transmissions are on various frequencies around 137MHz.

It may be possible to get adequate reception using a scanner radio and a discone antenna. If not, a crossed dipole antenna is easy to make or buy. Nowadays, special satellite receivers are becoming more easily available and cheaper, and you can even make them up from kits.



A portable weather FAX and NAVTEX receiving system.

Morse Still Used

Even the humble Morse c.w. is still actually used, mainly by coastal stations. You can listen when you've got bored with the amateur CQs.

You may have been considering getting one of the stand-alone decoders on the market, but if you use your computer instead, you will get added advantages. These include a full screen display, permanent copy to a printer, temporary storage of text and pictures in the computer's memory and permanent storage on disk. All this and a lower price, too!

Variety Of Tasks

Now it's time to turn to those programs where the computer runs alone. Here, there is a variety of ancillary tasks which your home micro can perform for you. These include log-keeping, contest scoring, teaching you Morse code, locating your contact on a map, satellite tracking and predicting (even controlling the antennas) and more.

Most of these things can still be done by hand, as it were, but using a computer offers several advantages. For log-keeping, it can search your log (or logs) for a callsign you type in.

The computer will then show you on the screen who and where the station is, and when you have worked before, even before the CQ call is finished! Some programs may also have the ability to search on a partial call, in case you didn't copy it all.

Although specific amateur radio or s.w.l. logging programs will usually be easier to use, being designed specially for the purpose, you can, in fact, use any general database program as they have similar facilities.

Contest Scoring

Although I've never done v.h.f. contest scoring myself, it's obvious that the old method of plotting locations on a map, measuring the distance with a ruler, and working out the score must

have been a very tedious chore. It was also rather inaccurate.

Now, you just type in the station's locator! Then the computer calculates the distance and score instantly and effortlessly. It also adds up the totals, printing everything out in the required format.

The Radio Society of Great Britain now even let you submit your entry on disk! Despite this, the disk has to be in the right format, and it's effectively restricted to PC computers.

Program Plots Position

If you don't go in for contests, you can get similar programs which are designed to show you where your contact is, by plotting the station's position on a map on the screen. You type in the locator, or perhaps latitude and longitude or National Grid reference, or even the name of the place, and the mighty micro does the rest.

Like the contest logging program, it works out the distance and it also calculates the correct beam heading. All this information is printed up on the screen, together with any other details it cares to provide. These may include local clock time, and if you're DXing world-wide, you may see the great circle path taken by the radio signal curving over the map!

Satellite Fans Catered For

Satellite fans are catered for by programs which predict when a given satellite will be visible. They will also tell you its azimuth and elevation during this time, so that you know where to point your antenna.

Programs may give a list of values, and also show the track of the satellite over the earth's surface on a map. If you're lucky, you may even be able to get a system which will control the antenna rotators to automatically track the satellite as it flies over.

In My Day

Want to learn Morse and get that A licence? There's no problem - just use your computer. In my day (I thought that I'd get that in just once but I promise not to do it again!) you hooked up a Morse key to a buzzer or oscillator, and got an experienced friend to send Morse to you and check your own sending.

This is still an excellent method, if you have the 'right' friends, but it's not so good if you don't! Even the best of pals has his or her own life to lead, and they can't guarantee to be available whenever you want to do some Morse training.

It's particularly advantageous to do at least some practice every day. This is the great benefit of the micro. It can send Morse to you for hours if you want, at any speed and with each character perfectly formed.

It will also check your copy so that you can see where you're going wrong. The computer can send your problem characters more often and possibly check your sending. All this at any hour of the day or night - much more handy than the most co-operative friend!

Choice Is Huge

The choice of software available is huge. A look at the 'showcase' section of this 'computing in radio' special and the adverts every month, will give you an idea of what there is to buy, and how to find it.

The only general advice I can give you about buying computing gear, is the following: If you are going to need several items to work together, typically a program, a piece of hardware and connecting leads, you should make every effort to get them at the same time from the same supplier.

By doing it this way, the equipment you buy should all be compatible with each other, and if you do have any trouble there's a clear place to go for advice or complaints. Many problems result when items are obtained from different sources, and are either not properly compatible with each other or aren't wired up correctly.

Buying A TNC

The same advice is just as relevant if you are buying a TNC. You also need a program for your computer (usually called a driver program) and a connecting lead.

Make sure that you get both with the TNC, and don't be put off by the salesman telling you that you can get them somewhere else. If he can't provide the complete set-up, take your custom elsewhere to someone who can!

Buying A Computer

What computer should you buy? Buying a computer can be a more difficult question than what to use it for, once you've got it.

Computers vary considerably in their size, capabilities and ease of use. They also vary in their level of support for radio applications.

I am also all too well aware that any advice I give will attract waves of criticism from those already 'computerised readers', who feel that their pet machine has been misrepresented, maligned or ignored altogether. However, there are certain factors which need to be clearly held in mind when you make your choice. So here I boldly go, and I can only advise 'computerised readers' not to read this part!

First Time Purchase

For a first time purchase, I would strongly recommend going for something simple and cheap. Once you've developed some experience, and have a better knowledge of where your interests lie in this direction, you may want to go for a higher specification machine.

This will be able to run the more complicated systems but it will also set you back a lot more money. A large number of users are very happy to stay with a small micro, and they do have their advantages.

Don't get the idea that a small computer can't do anything worthwhile. For most uses, the performance of the whole system is limited by factors other than the computer. So, getting a more powerful machine will not help at all.

Don't get fooled into playing the 'numbers' game, where people buy their computer on the basis of which one can boast the highest numbers: processor speed, amount of memory, etc. For the vast majority of radio uses, these figures are totally irrelevant.

Because the simpler computers are cheap, they are also very popular. So there are a lot of programs available for these machines, and they cover most radio activities.

The following factor, is actually the **most important single consideration** in choosing a computer. **My advice is that your decision should be based on the availability of programs for**

Some computer supply companies offer a 'tailor made' system to suit your needs. This system is an example supplied by Northdown Services (NDS) Computers of Meopham in Kent.

the uses you have in mind.

It doesn't matter how expensive the computer is, or how high its specification, if you can't get the program you want, then it's just so much useless electronic junk taking up valuable space in your shack or living room. A program is just as essential to the computer as the electricity it runs on!

Total Market Limited

The radio hobby is not a universal pastime, and so the total market for this type of software is limited. However, the programs still take the same amount of time and effort to write.

This means that the good programs are only available for the more popular computers. The latter comment is a purely economic fact, and it does not imply that other computers are inferior or unsuitable from a technical viewpoint. It only means that not enough people with interests in the radio field have them, to make writing the programs a commercially worthwhile task.

Surprising though it may seem, many people have not realised this essential fact. They blindly go ahead and buy whatever fancy-sounding computer the salesman talks them into!

The new computer owner can then spend a fruitless few days phoning round all the program suppliers, only to find out that their wonder machine is not supported. Some of these frustrated customers then write letters to the radio magazines, complaining that the software houses don't write programs for their micro, as if it is somehow their duty to do so.

Special Mention

Three computers must be singled out for special mention, for different reasons. The first is the Spectrum.

The Spectrum was Clive Sinclair's creation. It was his biggest hit, before he became obsessed with super-tech and went bust.

When it came out, nearly 10 years ago, it immediately sold in huge quantities and has remained remarkably popular with different groups ever since.

Although it was a pretty basic machine by today's standards, from the radio point of view the Spectrum had the great advantage that it could read an ordinary audio signal at loudspeaker volume.

The computer could also produce output tones, making available some very cheap receive and transceive systems. Some of these are still selling well today.

Good Idea

A look through the 'showcase' section of this special will give you a good idea of what is available for the various computers. Although many of these micros are no longer made, they are still freely available second-hand or as stock clearances at radio rallies.

The reason that the software is produced, is that the computers are still popular. So you shouldn't have a great deal of difficulty in getting hold of a well-supported machine.

Early Model

The early model (called the Spectrum 48k) has been superseded by larger versions. These have more memory and extra features like a proper printer connection and a disk drive. They also have a rather sharper screen display, but this has been obtained at the cost of increased r.f. noise output.

As well as the cheap receive and transceive systems I've already mentioned, there have been a large number of other programs written for the Spectrum. These often involve the use of some hardware, and cover a very wide range of radio topics.

Many of these machines provide a performance as good as that obtained from much more expensive computers. You could do a lot worse than start off with a Spectrum.

The BBC Machine

The second computer I've set aside for a special mention is the BBC machine. The BBC was produced for educational purposes and quickly found its way into just about every secondary school in the country.

Because their children were using it at school, many parents also bought one for home use. For this reason the BBC became the standard computer of its day for 'serious' use.

The BBC also became popular with radio amateurs, and a wealth of software was produced. It has connections for printers, disk drives and quite a good graphics screen display. It's very well worth considering one of these excellent machines for your first steps into the computer world.

The original BBC-B model was subsequently replaced by the BBC Master. This model had more memory and some extra features.

I think that all the radio systems available will run equally well on either model. The systems are unlikely to make much, if any, use of the Master's extra capabilities, and so it doesn't matter which one you get.

The BBC machine will always need some hardware to connect with a radio, but it has a convenient connection for such things. It has a reputation for producing a lot of r.f. noise, but this is rather exaggerated, and there are things you can do to reduce this problem.

The Archimedes Range

More recently, Acorn (the company that made the BBC computers) has produced the Archimedes range. These machines are completely different from the BBC and are in no way compatible.

Acorn produce what is called a BBC emulator, which is supposed to allow Archimedes users to run BBC programs. These work by intercepting the points where the program uses the standard BBC system, and then diverting them to the equivalent routines in the Archimedes. Unfortunately, there's not an exact correspondence between the two computers, and so some conversions are not possible.

It is extremely unlikely that any radio software you get will work using an emulator. This is because these programs usually operate the chips in the BBC machine directly, and will thus not run on a machine with any other internal arrangement.

Quite a few other computer manufacturers have produced BBC emulators for their machines. The same comments I've already mentioned apply to these also, as well as to the Electron computer.

The Electron machine was designed to be compatible with the BBC, but it lacks many of the BBC's useful features and has a different internal hardware. On reflection, it's a major compliment to the BBC computer, that so many other micros have felt the need to take this step. The answer must be that if you want a 'Beeb', as they are affectionately called, ignore the imposters and buy the genuine article.

The PC

Finally, we must consider the PC. The PC was originally produced by IBM as their Personal Computer (hence the initials). Nowadays, equivalent versions are produced by a vast number of world-wide manufacturers, who have found that they could provide the same facilities at a much lower price.

These machines are called 'compatibles' and in theory they will run any programs written for the IBM PC. Amazingly perhaps, this is generally true in practice. This is because software writers are very aware that most of their customers are using compatibles, rather than the pukka PC. They make sure that their programs are as universally acceptable as possible.

There are a large number of PCs in use throughout the world and although sales in

the UK have been limited, they are now increasing fast, as prices have been falling recently. There are also a large number of radio related programs available. All this would seem to make the PC or compatible the ideal choice, but there are problems!

Timers And Connections

Unfortunately, PCs lack the range of useable timers and a convenient connections for radio interfaces which are often found in the 'simpler' machines, especially the BBC. As a result, you either use the serial port, which is very limited for this type of application, or you have to go to the other extreme and install a complex printed circuit board, containing all the required facilities, inside the PC.

Although it's a straightforward task for a reasonably competent person, newcomers especially, may well be reluctant to open up their computer to install these boards. The extra boards are usually known as 'cards'.

The presence of extra 'cards' in the computer can also produce other problems, if the board's operation clashes with something else in your machine. These need knowledge to sort out.

The original PC came out in 1981, with a specification which looks very primitive compared with what they offer today. Since then, there have been several versions of both the processor, internal hardware and screen display.

Programs written for the original machine should run on today's PC, but the reverse is not necessarily true as software, quite naturally, takes advantage of the latest developments. For this reason, they may no longer be compatible with very early versions which lack an essential feature.

Up To Date Model

If you are going to use a PC, it's probably best to get a fairly up-to-date model. This is important, particularly if you are anticipating using it to display a graphics mode such as FAX.

As the PC developed, the standard of the video display improved. Modern programs give a much better picture if you use the current video display standard, called VGA.

In fact, there all sorts of super-VGA display systems installed in PCs these days. They offer higher resolutions and sometimes more colours.

However, as these are all produced by different manufacturers, there's no agreed standard for the use of these advanced facilities. Some top-end programs are able to use these systems to full advantage. Others tend just to use the 'standard' original VGA modes which are common to all of them.

In spite of falling prices, PCs aren't cheap. You are looking at several hundred £s for a new one with hard disk drive and VGA display, even if it just has a monochrome monitor. You also have to make sure that the Operating System (the piece of software which controls the computer's basic facilities) is correctly installed.

Experienced Help

At least in the initial stages, you are going to need someone experienced to help get your system correctly set up. There are various assorted second-hand or surplus PCs to be found at radio rallies. But I would advise against a newcomer getting one of these, unless an experienced friend is on hand again to provide advice.

Computers from this source are really only suitable for the experienced user, who knows what he is buying, how to get it set up and can troubleshoot the problems. The machines that I've seen are also not at all cheap! The software available for PCs is also generally more expensive than the equivalent for the other computers mentioned.

Good Software Support

The fact that I've singled out three computers for special mention, does not imply that there are no other suitable machines. For instance, both Commodore and Atari machines have a good deal of radio software support.

These machines are certainly worth considering. However, once you get outside this group the amount of radio software available falls off rapidly.

In general, if you can get a disk system with the computer, do so as it makes life a lot quicker and easier. The PCs are disk-only anyway, but for these you should seriously consider having a hard disk.

This form of storage is a fast, high capacity disk permanently installed in the computer. It can hold all your programs and save you having to mess about with all those floppies!

Once you've used one, you'll see the great convenience it offers. It's virtually essential if you are going to run large programs like graphics packages, and desk top publishing, etc.

If you need the speed and memory of a PC for other purposes, then it can be used for radio as well. Otherwise, it's really way over the top for nearly all radio applications. You are paying a lot for a specification you do not need. The other well-supported machines are much cheaper and very much simpler to set up and use.

Modest Priced

You can get a 48k Spectrum for a modest price, around £20 or thereabouts. The final model, the Spectrum +3, which has a proper printer port and disk drive, is available for around £70.

A BBC-B with disk system should set you back no more than £100. You should also be able to buy a complete set-up with monitor and printer at a bargain price as well.

The price I've suggested, may include a lot of useful software. And as I have already mentioned, PC prices are still way above this level.

Radio Frequency Noise

You may have heard horror stories about micros wiping out radio signals completely. The amount of r.f. noise emitted depends not only on the particular computer, but also on the frequency and the precise details of how your set-up is arranged.

It's impossible to give simple advice or recommendations. All I can say, is that the stories have usually been embellished in the telling! Most permanent installations don't suffer unduly from noise. There are steps you can take to reduce the level, in the unlikely event that it does cause a serious problem. However, don't let this consideration worry you at this stage.

A Great Deal To Offer

You can see that computers have a great deal to offer the radio enthusiast. They can improve existing activities, and at the same time provide access to the new data and graphics modes.

In my opinion, it can't be very long now before the keyboard is as common as the microphone in any amateur radio station. It's a fact of life today that seven year old children, accept the use of computers as part of everyday existence, in the same way that adults watch the television.

Nobody's too old to take the plunge! Countless retired people have not only had great enjoyment from harnessing a computer to their hobby, they've also made a valuable contribution to its development. Whatever your age, why not join them?

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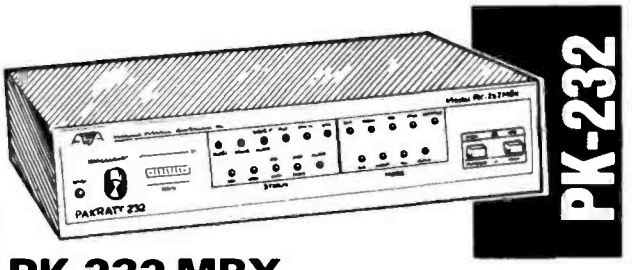

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ICS

Equipment Showcase

Now you've read Richard Wilmot GW3RRI's introduction to using computers in radio communications, it's time to see what's on offer, who can supply it to you, what it can do and how much it's going to cost you! Naturally enough we start off at A.

A

Aardvark Computer Services. (E. J. Lilly) 9 Greenfields Way, Burley-in-Wharfedale, Ilkley, West Yorkshire LS29 7RB. Tel: (0943) 862885. This company supplies consumables for computer users. They can supply everything required, from floppy disks to tapes and data cartridges, paper, computer furniture, printers and IBM compatible machines. Telephone enquiries are welcomed, and price lists are available.

AMDAT, 4 Northville Road, Bristol, Avon BS7 0RG, Tel: (0272) 699352 or FAX: (0272) 236088. This company specialises in packet radio hardware and software for the PC. Their catalogue provides full information on their range of hardware and software for packet radio on h.f., v.h.f and satellite. No prices are given in the catalogue, and telephone enquiries are advised.

B

BOSCAD Ltd., 16 Aytoun Grove, Baldridgeburn, Dunfermline, Fife, Scotland KY12 9YA. Tel: evenings only (0383) 729584. This company produces Morse products for PC and Atari. Their PC Morse Trainer is claimed to be the 'ultimate' computer tutor, and it includes send and receive, punctuation, procedurals and it also includes foreign language wording and symbols. It costs £37.50. You can write or telephone and Boscad will send you a free demo of the latest program.

C

CMB Shareware, 7 Rookhope Grove, Bishop Auckland, Durham DL14 0SW. Tel: or FAX: (0388) 662875. This shareware library currently offers the following programs of interest to radio enthusiasts: PC-Ham, What's Up, Charts Unlimited, Logic Simulator, AcNet, plus a variety of communications (modem software), databases, word processors. Further details available direct from CMB at their Bishop Auckland address.

CLP Computer Supplies Ltd., Unit 7, Holland Way, Blandford Forum, Dorset DT11 7TA. Tel: (0258) 459544 or FAX: (0258) 459565. This company provides a comprehensive 'consumable' replacement service, and they are able to provide literally everything the computer user needs. Of particular interest to the amateur radio computer user however, is the 'continuous card' the company supply. This card is suitable for producing QSL cards direct from a computer printer. Samples of the card, continuous labels and listing paper are available direct from CLP, and they welcome telephone enquiries.

Computermate Supplies Ltd., 1 Brookside, South Mimms, Hertfordshire EN6 3PT. Tel: (0707) 875757 or FAX: (0707) 875513. This company supplies Goldstar PCs, CD ROM drives, and CD Rom software. They also stock a wide range of sophisticated computer game software. They have a specialist range of flight simulation software packages for the frustrated pilot!

D

Databak Shareware, Ashton House, 26 Portland Road, Hove, East Sussex BN3 5DJ. Tel: (0273) 205001 or FAX: (0273) 720961. An interesting range of software is listed on the (very long) print-out style catalogue. Several CAD programs and drawing packages are listed. Telephone for full details are ordering requirements and costs.

E

Enware Engineering Software, 49 Wimborne Road West, Wimborne, Dorset, BH21 2DQ. Tel: (0202) 842443. Enware was formed in 1990 to provide an engineering software/hardware design service to industry. The company produces ENLOG, a computerised amateur radio logbook and database for the IBM PC. ENLOG is available (please state disk size) via mail order at £29.99 including post, packing and VAT.

G

G4TYF Log, Ernie Ashton G4YTF, 64 Gurney Valley, Bishop Auckland, County Durham DL14 8RW. Tel: (0388) 607500. Ernie Ashton has produced the latest up-date to his 'G4YTF Log' program, adding many new facilities to the amateur radio logging software. It has now been re-written for the Commodore, C64 or Amiga, the BBC B or for the IBM PC or compatible. The full version costs £25. If you would like a free demonstration, for any of the machines mentions, please send a suitably sized s.a.e. direct to G4YTF at the Bishop Auckland address.

Gemini Shareware Ltd., Weston Business Park, The Airport, Weston-Super-Mare Avon BS24 8RA. Tel: (0934) 644414 or 644344 or FAX: (0934) 644044. This company sells computer software by the 'shareware' method. This means that users buy the programs from them at £3 per disk. If the program is not public domain, the user has to contact the author, and pay a registration fee if they intend using the program on a full and regular basis. Full details of the service in their 50-page catalogue No. 3/91, cost £1, from Gemini Shareware. Items of amateur radio interest include UK139 Amateur Radio Log, BU303 FAX program and many others.

Grosvenor Software, 2 Beacon Close, Seaford, East Sussex, BN25 2JZ. Tel: (0323) 893378. This software supplier produces IBM PC programs for RTTY, AMTOR, Morse (transmit and receive) SSTV, FAX, audio analyser (receive only). The Atari ST series of computers are also catered for. Full details are obtainable by sending an s.a.e. direct to the East Sussex address.

H

HOKA Electronics (UK), 26 Bury Road, Shillingdon, Bedfordshire SG5 2NY. Tel: (0462) 711600 or FAX: (0462) 711769. This company specialises in software and hardware for the radio amateur and listener. Their most popular product is the Code 3, which is on offer at £299 and provides features such as: Morse with on screen w.p.m. indicator, packet radio AX25 with selective callsign monitoring 300 baud, RTTY/ Baudot/ Murray/ ITA2 / CCITT2 plus all bit inversion, FAX (up to 16 shades), SITOR, ASCII, Hellschreiber and a host of other facilities. Added to the very comprehensive supplied facilities, HOKA offer extra options for the system such as: Oscilloscope (displays frequency against time), Piccolo Mark 6., etc. Telephone enquiries are welcomed for the product leaflet which provides comprehensive details and prices.

Martin Hopkins (Computer Broker), Kirkhams, Birds Lane, Midgham, Reading, Berkshire RG7 5UL. Tel: (0734) 712882 or FAX: (0734) 712110. This broker offers a very wide range of secondhand computers and associated hardware, with a lot of equipment at budget prices. The comprehensive catalogue invites offers for any of the equipment listed. Telephone enquiries are recommended as the stock changes daily. Some software, user books and manuals are available.

I

ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD. Tel: (0903) 731101 or FAX: (0903) 731105. This company is well-known as a specialist supplier in data communications. They can provide FAX, weather FAX, RTTY, FEC, and Navtex for the IBM PC. Their 1992 Spring catalogue provides details on the AEA PCB-88 h.f./v.h.f. packet TNC for the IBM PC and compatibles. Also included is the AMT-3 AMTOR/RTTY terminal unit, designed by well-known G3PLX, the originator of AMTOR. The latest price details and product availability can be obtained direct from ICS.

Interconnections Ltd., 322 Guildford Road, Bisley, Surrey GU24 9AD. Tel: (0483) 797418 or FAX: (0483) 797427. This company offers a very wide range of computer accessories within a large, easy-to-read catalogue. Along with all the necessary computing equipment, spares and ancillaries, the catalogue also has specialised and general test equipment. One product which could prove very useful to PC experimenters is a test card. This card (part ref: 15.01.5505) plugs into an empty slot in a PC and allows the user to mount their own card standing proud of the PC. This then makes the user's card fully accessible for testing and adjustments.

J

J&P Electronics Ltd., Unit 45, Meadowmill Estate, Dixon Street, Kidderminster, Worcestershire DY10 1HH. Tel: (0562) 753893. This company produces and supplies a wide range of amateur radio software and hardware products. They include transceive FAX for the Spectrum only, RTTY for the Spectrum, CBM64, VIC20 and receive only for the Amstrad 464/6128 (prices on enquiry). The company also have a dedicated packet radio modem for use with the Commodore 64 machine, enabling packet operation without a TNC. The modem comes complete with Public Domain (free of charge) software and comprehensive instructions for £50. J&P Electronics also offer a postal service for computer repairs. There's no 'standard' charge for repairs, and each repair is given a firm quotation (no charge for quotation, although the customer pays return postal costs. The company have just started work, following agreement with Grosvenor Software, to produce a modem for use with their Dragon packet radio system, which will cost £50. Telephone for further information on their latest prices and product availability.

K

Kosmos Software Ltd., Freepost, Dunstable, Bedfordshire LU5 6BR. Tel: (0525) 873942 or 875406 or FAX: (0525) 875406. This company produces a range of educational software, and their European language tutorial programs will be of particular interest to anyone wanting to either 'brush up' their French, German, Italian or Spanish. Prices for the language tutors are all around the £20 level for disks, and £17 for cassettes. Computers catered for include: Amiga, Amiga Plus, Atari, IBM, Spectrum, Amstrad, Amstrad PCW, Acorn, BBC and Electron. Full details and catalogue available direct from the company.

L

Lightwave, (Computer Cables & Accessories), Unit 18, Wirral Business Centre, Dock Road, Birkenhead, Merseyside L41 1JW. Tel: 051-6305003 or 051-6398485/6 or FAX: 051-6306237. This company has a very wide range of computer cables, plugs, sockets, adaptors available for literally any purpose associated with computers and interfacing. Further details on the catalogue, and prices from Lightwave, at the above address.

Lucid Publications, George Butler G4BXU, 18 Hobart Road, Ramsgate, Kent CT12 6NW. Tel: (0843) 582939. This small company markets the 'Ultimate Morse Tutorial'. George Butler also reports that he is just about to launch his new database, 'QSObase'. Full details on prices and products are available either by 'phone or by writing to the company direct.

M

Matmos Electronics Ltd., Unit 11, Lindfield Enterprise Park, Lewes Road, Lindfield, West Sussex RH16 2LX. Tel: (0444) 482091 or 483830 or FAX: (0444) 484258. This company supply a variety of computers, scanners, disk drives and related products. Of particular interest to the radio enthusiast is the

realistically priced full Computer Aided Design (CAD) systems they can provide. The 386-20 CAD system, for example, comes with 2Mbyte of RAM, 1024 x 768 pixel colour monitor, 62Mbytes hard disk drive and co-processor. The system runs Windows 3, ACAD, etc. The system costs £999. Further details on other CAD systems and products are available directly from the company at their West Sussex address.

N

Northdown Services (NDS) Computers, 158 Highview, Meopham, Kent DA13 0UT. Tel: (0732) 823662 or FAX: (0732) 823525. This company provide powerful leading-edge systems, free on-site maintenance, and can offer a variety of configurations from the budget priced 386 SX-25 system at £589 to the more powerful 486 DX-33 system at £1109. Prices quoted are for complete systems. The company is happy to tailor systems exactly to the customer's needs.

P

Pocketware, (Ray Harris) 78 Kimberley Avenue, Newbury Park, Ilford, Essex IG2 7AS. Tel: 081-9838686. This company is currently distributing PC shareware and PD software. A catalogue is available on disk, and there a several items of interest to radio amateurs, including PC Track, which is aimed at helping in the tracking of satellites. They also have a program entitled PC-ECAP available (PC-ECAP stands for Electronic Circuit Analysis Program). Special offers on program prices are being offered to readers. Please call (telephone answering machine service) and leave your name and address, to obtain further details from Ray Harris.

The Public Domain And Shareware Library, Winscombe House, Beacon Road, Crowborough, East Sussex TN6 1UL. Tel: (0892) 663298 or FAX: (0892) 667473. This IBM PC software reference guide has a great deal of information packed into 122 pages. Due to the small size print, there are a great number of programs recorded in this book, which costs £2. There are over four pages dealing specifically with amateur radio, and also many other topics related to radio communications to be found in this book. The best way to find out more about this library, is to buy the catalogue, as comprehensive details on how to order, the price list, and the necessary hardware requirements is included.

Q

Quarterdeck Office Systems UK Ltd., Widford Hall, Widford Hall Lane, Chelmsford, Essex CM2 8TD. Tel: (0245) 496699 or FAX: (0245) 495284. This company's products are already in use in the amateur radio market. The DESQview product is involved in packet radio and BBS operations as the multitasking medium. Quarterdeck are also now involved with work on remote RS232 control of ICOM and other equipment being developed in the UK. Full details of the DESQview product, including a well-written full technical perspective, and its applications are available direct from the company at their Chelmsford address

S

Siskin Electronics Ltd., 2 South Street, Hythe, Southampton, Hampshire SO4 6EB. Tel: (0703) 207587 or 207155 or FAX: (0703) 847754. Siskin Electronics are well-known as specialists in the field of packet radio, and the company have a policy of supplying the best range of equipment available for the radio enthusiast. Siskin claim to have the widest range of packet radio equipment available from just one UK source. For those interested in starting on packet radio, Siskin offer free driver software for most computers when a TNC is purchased. Further details, prices and latest stock lists available by 'phoning Phil Bridges at Hythe.

Springfield Publishing Ltd., Springfield House, Llanfyndd, Wrexham, Clwyd, Wales LL11 5HW. Tel: (0352) 770049. This company offers a Public Domain and shareware software library providing programs for IBM compatible PCs. They currently list 37 files under the library heading of Amateur Radio. The files include: a full packet radio TNC driver program with inbuilt PMS, YAPP, UUCODE, WEFAX and Morse Code Tutors. Each file is supplied on a 3.5 or 5.25in floppy disk at the single price of £2.75. Further details from the Wrexham address.

S&S International, Berkley Court, Mill Street, Berkhamsted, Hertfordshire HP4 2HB. Tel. (0442) 877877 or FAX: (0442) 877882. This company has developed by solving other people's PC problems. S&S International was one of the first companies to launch anti-virus software. Full details of the company, and their planned anti-virus seminars for 1992, are available direct from the Berkhamsted address.

Suredata, Unit 5, Stanley House, Stanley Avenue, Wembley, Middlesex HA0 4JB. Tel: (and FAX) 081-902 5218. After hours (0831) 616519. This company specialises in selling new and secondhand Amstrad PCs and PCWs. The company also provides repairs for this popular range of computers. Contact John G3TLU at the Wembley address for full details of the services offered.

T

Technical Software, Fron, Upper Llandwrog, Caernarfon, Gwynedd, North Wales LL54 7RF. Tel: (0286) 881886. Richard Wilmot GW3RRI produces a wide range of amateur radio hardware and software, including a Morse tutor on tape (£8) or disk (£10), Logbook, world and UK/Europe map locator (BBC only) at £10 (tape) or £12 (disk), a locator program and a very useful RAE maths program (available for the BBC, CBM64, Spectrum, VIC20). This program is available in tape (£8) or disk (£10). Further information on the comprehensive range of FAX and Weather satellite decoding systems are available direct from GW3RRI's address in North Wales.

Testware UK Ltd., 46 The Avenue, Harrogate, North Yorkshire HG1 4QD. Tel: (0423) 886415. Testware provide a range of menu-driven shareware designed for use on IBM PCs or compatibles. The comprehensive 165 page catalogue lists a large number of shareware programs of interest to the amateur radio, electronics and associated hobbies (including astronomy). Their catalogue numbers 3248 and 3265 are Morse Tutors, while 1277 is a 'Ham & Electronic Helper' . This disk provides tuition in Ohm's Law, Zener diode stabilised supply, d.c. power supply design, passive band-pass filter, series resonant circuit, low pass 2-pole filter, small coil design, long wire antenna, dipole or half-wave antenna, resistance of wire, crystal calculations, time constant calculations and 'fat dipoles'.

Telephone enquiries are recommended for latest prices, and catalogue availability.

Timestep Weather Systems, Wickhambrook, Newmarket, Suffolk CB8 8QA. Tel: (0440) 820040 or FAX: (0440) 820281. Timestep have been producing inexpensive weather satellite equipment for seven years. Following their success in both the UK and American education market, they are now bringing their expertise to the amateur satellite user. All of their equipment is designed, built and fully supported in the UK by Timestep engineers. The Timestep package PCSAT 111 for example will receive NOAA, METEOR, OKEAN, FENG YUN, MEOTOSAT, GOES and GMS. All images are received automatically on any PC with CGA, EGA, VGA or SVGA display. Call or write to Timestep for a catalogue.

V

Viglen Ltd., Viglen House, 2 Marsh Road, Alperton, Middlesex HA0 1EY. Tel: 081-997 3000. This British company has launched a new range of Genie 386DX/486SX/486DX IBM compatible systems, offering performance and 'upgradeability' at an affordable price.

The new Genie range is available in three different case styles, the Micro, the Executive and the Professional. All are expandable.

The Genie Micro is the smallest of the three, but has two full-length expansion cards. It come with a high-density 3.5in floppy disk drive and has a hard disk capacity of up to 500Mbyte. **The Genie Micro costs £1297 plus VAT.**

The Genie Executive is a slightly larger system, offering expansion capabilities unrivalled in its size with six free expansion slots. The Executive has a hard disk capacity of up to 1Gbyte. **The Genie Executive costs £1398 plus VAT.**

The Genie Professional has additional internal drive options and provides higher capabilities than the Micro and Executive. The standard Genie Professional is supplied with a single 1.44Mbyte floppy drive, with a maximum hard disk capacity exceeding 1Gbyte, leaving two 5.25in drive bays free for expansion. **The Genie Professional costs £1559 plus VAT.**

All models are available in any case styling, allowing the user to choose the processing power, memory and hard disk required before selecting the case style.

W

W. L. Computer Services, First Floor, H.S.L. Buildings, 437 Warrington Road, Rainhill, Prescot, Merseyside L35 4LL. Tel: 051-426400 or FAX: 051-493 1425. This company specialises in Room 7 Software for the BBC and Acorn computers. Among many engineering and specialist design programs, the 'Electronic Hobbyist' program offers help to take you through many electrical formulas and a range of design tasks are made much easier.

Public Domain And Shareware Libraries

Recently, there's been a great upsurge of 'Public Domain' or 'Shareware' libraries. But how many of us know what the difference is?

The idea of public domain software really began with the advent of 'personal' computers. There were so few programs around that programs that had been written, were passed onto friends to use.

These programs could be modified, but the copyright remained with the original 'author'. So, the licence to use the software cost nothing. That was and is the true meaning of 'Public Domain' programs.

As programs became more and more complex, much software that had been written went on to become commercial programs (dBase, Wordstar, Lotus 123, etc). The cost of these programs went beyond what many users wished to pay.

Try Before Buy

The 'Shareware,' or 'Try-before-buy' method of finding software then emerged. With this popular service, you obtain a trial version of the program.

The service works in this fashion: If, within say a month or so, you find it useful, you then register your copy and pay a fee. This fee, typically £5-100 (or the equivalent in dollars $) will bring you the latest version of the program, and the full documentation.

Many commercial products have their 'Shareware' counterpart. 'Aseasyas' for example, is a clever spreadsheet, 'PCFile' is an easy-to-use database program and 'Wordfugue' is becoming a popular Wordstar compatible text editor. The ever growing list goes on and on!

Honour Bound

That, in a nutshell, is the 'Shareware' or 'Try-Before-Buy' method of obtaining software. If you like the program, then you are **honour-bound** to register your copy. If you don't register, then this source of cheap software could well dry up. **So, don't abuse the trust the software author has placed in you.**

Machines

Over the last decade the IBM PC or 'compatible' machine has almost become the universal computer, but there are 'Shareware' libraries for other machines. Even the Amstrad PCW series has an enormous library of software available.

For more in-depth information, study the shelves of your local newsagent for the magazine(s) about your computer.

ADVERTISER'S INDEX

Timestep

Weather Satellite Systems

Timestep produce weather satellite systems that operate from Meteosat, GOES, GMS, NOAA, Meteor, Okean and Feng Yun. Using an IBM PC compatible computer enables the display of up to 1024 pixels, 768 lines and 256 colours or grey scales depending on the graphics card fitted. We support all known VGA and SVGA cards.

The choice is yours of whether you go for a Geostationary or Polar Orbiting system. You can start with either one and add to it later. We can supply complete systems including the PC at very competitive prices or you can buy one part at a time. All the systems and hardware are designed by Dave Cawley and Peter Arnold and manufactured in Britain.

Complete Meteosat systems giving 400 different images a day are available for under £1,000.00 including PROsat II and the dish.

Polar orbiting systems, receivers, antennas, pre-amps and tracking programs together with the PROscan receiver are available at modest cost. Track II, the definitive polar tracking program is just £29.95 inclusive.

The image above is taken from the AVHRR sensor of NOAA 11 HRPT using our new HRPT system. It is available now at less than £1,000.00 less antenna system. A 1.2M tracking dish is sufficient.

Several unique features are available (depending on the software version) such as: NOAA latitude and longitude gridding, NOAA temperature calibration, False Colour with autoshade, Pan and Zoom, Transect, Histogram and variable equalisation, 3D display, 100 frame animation from Meteosat, Live on screen display at up to 1024 x 768 x 256, Mouse interactive operation, Median filter to remove country outlines from Meteosat and a Laser dump facility. New options and features are being added all the time.

Call or write for a full catalogue

Timestep Weather Systems

Wickhambrook Newmarket CB8 8QA England
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