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HAM RADIO TODAY APRIL 1992
The mobile rally and exhibition season is now upon us, as you read this. Our many annual visits to these events show that amateur radio mobile operation isn't just limited to land, and in my area many amateurs on pleasure craft use their transceivers to add to their boating pastime enjoyment. But as I write this we haven't had much time for pastimes! The last few days have been very busy for the small team of people, distributed throughout the UK, who have been tasked with the job of deciding the winner of the HRT 'Amateur of the Year' award, with a prize of the Drake RBE receiver kindly donated by Nevada Communications. Many pages of photocopies of nominations, and the accompanying information (some times also covering many pages of newspaper cuttings) have been distributed, studied, and in the end the comments collated.

Upon reading some of the nominations, it makes me realise exactly what extent some people go through, often quietly and without seeking any fame, reward, or whatever, to promote amateur radio. Included in the large number of proposals were two of my regular HRT contributors, and I must admit I was surprised to read about the extent of their past work and achievements in their chosen field. One nomination, which I believe was a very worthy one, was received several days after the closing date and with a degree of sadness I had to return it. I was also surprised to see that one or two well-known amateurs, who in my mind have contributed much of their time to the potential future of amateur radio through their voluntary involvement with our national society, hadn't been nominated. But maybe amateurs feel they have received their reward through publicity.

A Unanimous Decision

But now, the decision has been finally made, and I'm pleased to say it was a unanimous one. This year's award hasn't gone to someone who's well known in the amateur field through his picture appearing in publications, nor someone who 'shouts' of his work. Indeed it goes to someone who, and I hope he doesn't mind me saying this, remains in the 'background' of things.

Without asking for any payment he spends six days every week, sometimes seven, in helping the cause of amateur radio. Every day he receives phone calls from around the world asking for help, and freely gives it. Every day he tirelessly works collecting and distributing information to help other radio amateurs and listeners. Each year he organises an international 'get together', and helps to arrange visits to the UK for amateurs from the four corners of the world including North and South America, Australia, Russia, South Africa, and Japan, in one case even providing accommodation in his own home for a foreign amateur who could not stay elsewhere. All this so amateurs can discuss and disseminate the results of their pioneering work to other amateurs, to promote the future of amateur radio, including work which has helped to save lives around the world.

I haven't known him to have a holiday with his wife, nor receive much thanks for his tireless work. He doesn't seek publicity. Incredibly he sometimes receives complaints from amateurs who feel he should be doing such-and-such above what he already does, voluntarily, probably because they feel he's being paid to do his task. But despite this, he continues. Is it any wonder the very first nomination received here, of a number with his name, was for this man?

A Name in HRT

You may have seen his name and address written in the pages of HRT, as 'further information from...'. You may have even sent him an SAE and been pleased to have received a large bundle by return of post. I know he often works into the middle of the night replying to letters and collating information for the specialised bi-monthly journal he puts together. All in his own time, without asking for reward and often without even getting a 'thank you'.

This year's award goes to Ron Broadbent G3AAJ, the hard-working secretary of Amsat-UK, who spends thousands of hours of his time each year, voluntarily, to the cause of amateur radio, without seeking any fame or reward. I hope you agree with our team that he is a worthy recipient of the award.

Next month I hope to publish a short pictorial feature of the award presentation, that's if I can twist my arm to be photographed!
Dear HRT,

I have read on many occasions that the hobby of Amateur Radio is on the decline, and that steps must be taken to introduce new blood into the hobby.

I myself would like to obtain my licence but I must say that having seen and read what is entailed in the RAE exam, I myself (and probably thousands more people) have been totally put off the idea. Having almost zero knowledge in the field of electronics, and at the age of 38 years when it is not as easy to absorb pure mathematical theory into one’s brain cells as it would be at the age of say 15 years, I feel that the RAE is far too technical. The world of modern radio is unnecessarily out of the reach of anyone other than the dedicated electronic whiz kids of today.

I would say that at least 75% of the exam revolves around the assumption that everybody wants to (and must, to obtain said licence) build their own radio. For instance in this world of ready made shop bought radios, who really cares what part a varactor diode plays in the workings of modern radio? I don’t and I bet I am not alone in my views. Why anyone must be forced into learning what must be to them pure gobbledygook is beyond me. If by way of a miracle I did manage to learn all the technical aspects involved then I would more likely have forgotten them by the time the exam had come around, owing to the fact that I had not the desire nor the need to put most of them into practice.

Yes there must be an exam, I do not dispute this at all. Amateur Radio must not go the same way as the now totally abused CB radio, but you only have to listen on 2m and hear loads of RAE licensed hams abusing the system. Is it alright to do this when you have your licence? I think not!

I attended a RAE course at night school and to be perfectly honest I was bored out of my skull. 30 weeks, 2 hours a week, practical operating procedures, safety, educating me on how to encourage them to find out more. The local radio society also works hard to interest more mature prospective Novices, as there is no ‘ageism’ in our approach to amateur radio.

Yours sincerely,

Ken Smith G3JIX, President, Hilderstone ARS, Broadstairs, and also Leader, Thanet Electronic Club for Youth, Margate.

Editorial comment;

Thank you for your letter, I’m very impressed! I would like to feature your Amateur Radio Club and Electronic Club for Youth in our ‘Club News’ section, maybe your Secretary could drop us a line telling us where and when you meet and what you are getting up to each month. Is it any coincidence that our Consultant Technical Editor recently had his arm twisted to visit Thanet next month, to give current and prospective Novices a talk on getting into amateur radio at low cost with ex-PMR gear? It’s good to see dynamic clubs whose leaders actually do something constructive.

Ken G3JIX can be contacted at: Electronics Engineering Laboratory, University of Kent, Canterbury, Kent.

Letter of the month

Dear HRT,

It’s an odd world isn’t it? Your ‘CQ de G8IYA’ Editorial in the February 92 issue does hit close to the mark. Nearly every hobby ‘movement’ in recent time deciles the ageing nature of its membership. We all know that the amateur radio population is ageing at so many years every year, with very little youth entering the movement.

It is the same (and according to some, more acute) in Model Engineering. There were three entries in this year’s M.E. Exhibition ‘general engineering’ section for the younger teenagers, from all over the country. In the mid-thirties there were often up to a hundred entries and sometimes more.

In our movement, there is the paradox that in spite of this ageing towards extinction, a quite widespread resentment of these ‘kids’ playing about on our bands does seem to be one of the reactions to the results of the Novice Licence scheme. This is a catch 22 situation, if ever there was one.

However, such ‘ageism’ appears only in a section — mainly the older conservative section (with a small ‘c’) of amateurs, but many of these do seem to be well into the ‘don’t change things’ section. We all know that the amateur radio population is ageing at so many years every year, with very little youth entering the movement. The movement.

One of my own young Novices (2E1AAQ) had his article on Michael Faraday published, he got keen on that subject while doing the RAE and Novice course.

Part of the solution (I’ve always pushed for this) is for keen amateurs to collect together Novices, Novice students and enthusiastic young people into, or wanting to get into electronics, thus forming a club that meets regularly in the local youth centre. Other activities, like visits to the Science Museum, mobile rallies, youth hostel trips etc., then follow. I have hinted more than once that a ‘weekend course’ or other ‘training meeting’ would certainly attract my attention as a contributor. Any readers who are youth service training officers, please note.

Finally, my own club always welcomes any young teenagers, plus 10 and 12 year olds who we have a few of. So if you know any youth in our district, please mention HRT when replying to advertisements
become a totally responsible dedicated radio operator etc. that would have been a different kettle of fish. If an individual should want to learn all the technical jargon involved in the construction of radio then that is his/her choice, but is it right that it should be enforced on the rest of us?

To obtain a firearms licence you must prove that you are a fit and reasonable person, and that you are capable of operating in a safe and reasonable way, you do not need a degree in ballistics. I have been a listener for about 12 years, and until the RAE structure changes, I will continue to listen but will most certainly remain silent.

Yours Faithfully,
D. Boardman

Editorial comment;
This is an almost perfect proposal for the 'Novice' training course, which we currently have. No boring theory (at least not much), but instead a great accent on practical training and operating, even down to listening on air, making a logbook and QSL card, and simulated on-air contacts. As far as I'm aware, no mention of a varactor diode anywhere!

Dear HRT,

To Anthony Howat, congratulations on your NRAE, and my very good wishes on going for your RAE, I hope you pass, no doubt you will. Packet radio, sorry Tony I am not interested, computers yes. My only beef is that Novices who pass the 5 WPM Morse test can use certain parts of the HF frequencies, and myself having obtained two credits for my B licence can only use 2m, although I can now read Morse a 10 WPM and transmit at 14. I think Bob Price GW3ECH has solved the problem. Those of us holding B licenses who can do more than the Novice 5 WPM should be allowed on HF with restrictions, after a probational 6 months, have the full rights of a class A licence holder, also have used 2m for 12 months or more. Also who should know what 30dBW is. As for the City and Guilds, yes one should be able to find out how your results came out, ‘War and Peace’ Tony, UGH! I read it, I would sooner read about 007 James Bond, because the technical innovations used in the films are marvellous. May I in writing wish all at HRT my very best wishes.

J. H. Clifton, G7IOU

Editorial comment;
In Bob Price’s letter in the February issue we had an error in his letter. What Bob said was “Why not, from some date next year, scrap the present RAE. Re-introduce the Novice class as a stage One licence, with or without a 5 WPM Morse test, still retaining the HF/VHF split. Then after a minimum of six months on-the-air experience, allow the Novice to sit the remainder of the entrance examination, and so become a class A licensee if the Morse test has been passed at 5 WPM, and a class B licensee if the Morse test is not taken”. Sorry Bob!

Dear HRT,

As an old timer aspiring to my ticket after a lapse of 38 years, I have a problem and you folks may be able to get an answer from the RA next time you sit at the feet of the Gods (or at least Mercury!).

I refer to paper 01, the section on licence conditions. There must be a time lag between (a) changes in conditions from time to time, (b) setting the questions, and (c) sitting the exam.

So how would a paper be marked if an answer correct and up to date was given (due to recent change) but incorrect as at the date the paper was set. I can only suggest that the test paper should indicate the date of setting, and that candidates should be allowed to indicate their interest whilst studying, with a view to receiving amendments to BR68 (Terms and Limitations) as they occur (I assume licensed amateurs do receive such items).

Best wishes to a grand magazine,
Jim Knox

Editorial comment;
The moment something goes into print, for publication at a future date, things can change. One solution, in our opinion in cases such as this, would be to dismiss the question in the marking stage. But we’ll put your comments to the City and Guilds who are responsible for the RAE marking.

Form BR68 is available from the RA, and we believe that if amendments are made then a new form is sent to amateurs at the time of their licence renewal. However amendments to our licence are published in the London Gazette, and it’s up to us to adhere to them immediately rather than waiting to be sent this information. The RA kindly also voluntarily send HRT such details in the form of a press notice, and we are of course glad to publish these for the benefit of amateurs who don’t read every issue of the London Gazette.
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HRT 'Amateur of the Year' Award Winner

This year's winner of the HRT 'Amateur of the Year' Award is that hard-working secretary of AMSAT-UK, Ron Broadbent G3AAJ. As well as voluntarily spending most of his waking life at home devoted to the furtherance of amateur radio, he attends rally stands and even organises the international AMSAT-UK colloquium each year without fail. Ron receives the superb prize of a Drake R-8E receiver, kindly donated by Nevada Communications in Portsmouth, together with an inscribed shield. He was formally proposed by a number of amateurs, the first being G8DLJ who receives the second Drake featured alongside the Drake receiver on the front cover of the Feb 92 HRT.

Ron G3AAJ with Richard G3RWL (supplier of HRT's monthly 'Satellite rendezvous' information) at last year's AMSAT-UK stand at the London Show

Ron is often surrounded with paperwork in his 'home office'
Left: Ron Broadbent G3AAJ, winner of the HRT 'Amateur of the Year' Award

Amateur in court for 2m rig with wideband receive

In our HRT reviews, although the trade sometimes promote 'extended coverage receive' as a selling feature, we've often stressed the fact that an such an extended coverage receiver combined with an amateur transmitter is a no-no in some countries, including the UK. Hence as of late we've never promoted this feature in our reviews, i.e., by on-air or lab tests. As far as we've been told by the RA, it's rather simple, you don't need a licence for a stand-alone receiver, but add an integral transmitter to it and it becomes the subject of licensing. You may have a licence for 2m and 70cm, but not for the same rig to operate on other VHF/UHF frequencies used by PMR services and so on, even if only in receive mode. Yes we know it's an anomaly, as virtually every HF rig has a wideband receiver, but we don't make the law (although we do promote uncensored discussion on such with a view to either change or greater realisation, like now).

Even in what may be termed 'more liberal' countries, amateurs still find themselves on the wrong side of the law. It was recently reported that Eric Dobrowansky KA2YKC was indicted by a New Jersey grand jury for having his IC-901 mobile rig installed in his car, the rig being capable of monitoring police transmissions operating adjacent to the 2m band. Does this sound familiar? Ironically, he was arrested for this offence while he was helping the police in tracking down jamming interference on their frequencies. If he's convicted of the charge, we're told he faces up to a year in jail and a fine of several thousand dollars. Do you fancy being a volunteer for the first 'test case' of this kind in the UK?

Baby talks in CW

From a report in a US publication, Felix and Nancy Smith from Birmingham, Alabama, recently heard their four month old baby Michael making da-da-dih-dih-da sounds. Quite natural you may think, maybe he was trying to say 'Daddy'. But when a radio operator friend came round for dinner, he went white as a sheet. To investigate further, they later tape recorded Michael's sounds and took the recording to a trained CW op, who decoded the sounds. This incredibly revealed the sounds to be supposedly from German submarine 'Lone Shark' Captain Ernst Wegener, who was killed on the 23rd March 1942 by machine gun fire. The baby was relating details of this previous life to Mrs. Smith, who stated 'Just thinking about what he told us makes my skin crawl', although she believes that Michael's CW is now fading.
58th RSGB Presidential Installation

Outline plans for the future of the Radio Society of Great Britain involving a complete re-organisation were highlighted by newly-installed President Terry Barnes GI3USS, at his installation dinner in Bangor, Co. Down, on Saturday January 11th 1992. Terry, who has been treasurer of the Bangor and District Amateur Radio Society in his home town for the past 22 years, told guests, which included five former Presidents, that Council was too large and unwieldy and met too infrequently to manage the society effectively. “We must move with the times,” he said, “and let the policies decided upon by council be implemented by an Executive Committee, smaller in number and meeting at least monthly”.

Terry’s installation took place in Bangor’s Town Hall in the presence of the Mayor, Counsellor Leslie Cree, and Mrs. Cree, and the Town Clerk Mr. Jack McKimm. It was a double celebration for Terry, for as well as being installed as President of the parent body, he was also celebrating the silver jubilee of his own Bangor Club, a double honour in fact for Bangor and District ARS, GI3XRQ, of which Terry’s a founder member.

Terry also made reference to the fact that his installation was taking place in the presence of five former Presidents of the society. They were Barney Patterson GI3KYP, who in 1967, was the first president from GI, John Bazley G3HCT, John Allaway G3FKM, Willie McClintock G3VPK, and the immediate past President John Case GW4HWR. Also attending was the President of the Irish Radio Transmitters Society (IRTS), Dr. Thomas Rea EI2GP and his wife, who had travelled over 120 miles from Galway to be present.

Terry told the guests that the Society had come through a traumatic time in recent years, but he was pleased to report that their financial state was much more healthy than previously. He was presented with several gifts, not only from members of Council, but from clubs all over GI and on the mainland. His own club presented Terry and his wife Yvonne with a beautiful Tyrone Crystal bowl. The presentation was made on behalf of the club past Chairman Alex Bailie GI3XEQ.

For many, indeed the majority of those attending, it was their first visit to GI and members of Bangor and District ARS arranged to have each of the visitors picked up from the airport, brought to their respective hotels, and returned again to the airport. In some cases members of the club found time to take their ‘charges’ on an escorted ‘mini trip of GI. All the visitors were unanimous about one thing. Northern Ireland was not the place so often portrayed on television. The natives were friendly and all decided before leaving that they would be back.

In the week following his installation, the new President was interviewed on BBC radio, local commercial radio, Ulster television and in the local press. No one in GI is any longer in doubt about the nature of amateur radio!

Operation Euro-Baby 1992

During April 1992, Richard Hook G8LVB, plans to take part in Operation Euro-Baby, a ‘drive for life’ using the special callsign GB80EB. Richard plans to drive to all twelve European Community capitals, a total of over 7,200 miles, meeting various VIPs at each. During the drive Richard will be making contact with amateurs via the various repeaters located throughout Europe using a 2m hand held transceiver. 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 Neonatal Unit at St. Mary’s Hospital, Portsmouth.

Richard and his three colleagues, Alan Hartill, Tony Sinclair, and Kevin Taylor, will be waved off from St. Mary’s Hospital at 0600 on 22nd April 1992 by the Lord Mayor of Portsmouth. They will head towards London and from there to Dublin, Brussels, The Hague, Copenhagen, Bonn, Luxembourg, Rome, Athens, Madrid, Lisbon and Paris, before returning to Portsmouth sixteen days later.

Richard has produced an award which is known as the Operation Euro-Baby Gold Diploma which is available to all licensed radio amateurs and SWLs. If you would like to assist the Operation Euro-Baby team in any way, please contact Richard on 0705 379328. The address for donations is Operation Euro-Baby, 9 Chalkpit Road, Paulsgrove, Portsmouth, Hampshire PO6 4EX

The Operation Euro-Baby team, (back left) Kevin Taylor, (right) Richard Hook G8LVB, (front left) Tony Sinclair, (right) Alan Hartill, all shown here with mascot ‘Whitie’.
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Many amateurs associate the name of Yaesu only with amateur radio gear. However, those in the 'communications' world may be aware they also make a large amount of gear for professional communications, to meet demanding government and commercial specifications in terms of technical performance and durability.

I'm told that one day, someone suggested 'why not use this technology to make a high-performance amateur mobile rig?'. The result was the FT-2400H, a 50W 2m transceiver designed to stand up to the knocks in life.

**G4HCL tests a tough, high-power set, this one featuring an alphanumeric display**

 centre environment, all sorts of weird noises emanate from a set's receiver, due to close proximity with many other users of the radio spectrum. In London for example, virtually every other car, motorcycle, and even pushbike rider seems to be equipped with some form of radio transmitter! Trying to receive a weak 2m repeater in this type of environment can be rather difficult if your rig's receiver circuitry is 'wide open'.

**Features**

To get your signal where it's needed, the FT-2400H offers a high transmit power level of 50W, with switchable mid and low power levels of 25W and 5W respectively for more local QSOs. The receiver circuitry uses techniques employed in professional two-way gear, designed to reject strong-signal problems so you can at least have a hope of receiving your QSO partner in the presence of other spectrum users. For durability a large transmitter heatsink is moulded as part of the overall die-cast case, the overall set being of the internationally standard DIN car radio size. The microphone connector has changed from one of the earlier 8-pin 'screw' types to a USA-style telephone connector, with an overall rubber seal to keep the dust out. But the thing notable about the set is that its front panel looks simple and uncomplicated. Does this mean it's a 'basic' rig, like PMR types?

**Bells and Whistles**

Despite its basic front panel layout, the set has all the features one sees on modern 2m rigs, a pull-down flap revealing a panel of lesser-used multi-function buttons. For use with the planned UK CTCSS system for repeaters, it has a built-in CTCSS encoder with an optional decoder if you want to add this for 'silent' monitoring or for use as a paging receiver. The set also has the optional facility for selective calling via the now standard three-digit DTMF codes as used by various 'black box' manufacturers, together with calling party identification and a programmable delay for repeater use. As would be expected, the set has plenty of memory channels (31 fully-tunable memories in total), various scan modes, priority watch, rapid 'call' channel access and the like. In 'diau...
mode the set can be programmed to automatically switch in an automatic repeater shift when you’re in the 145.600-145.850MHz (i.e., European repeater) range, or for USA models the various plus/minus repeater shifts according to normal band usage. A microphone-mounted button lets you transmit a 1750Hz toneburst when needed for repeater access.

**Display**

A unique detail of the FT-2400H is its large, alphanumeric display. Instead of just a small ‘memory channel’ number alongside the displayed frequency, you can program the LCD to instead read “S20”, R7, ‘NET’, ‘CALL’, or whatever, up to four alpha-numeric digits. Great for those who have difficulty in deciphering all the local repeater and chat channels in frequency terms whilst on the move, and checking to see whether a tiny ‘-’ is present for the correct repeater shift. With the constant need to minimise the time factor needed between looking at the road ahead and looking at what your rig is doing (sorry officer, I was tuning my radio), and the subsequent ‘thinking time’, this could be a useful factor in making mobile operation that bit safer.

Another useful function is an auto-dimming backlight. A light sensor built into the front panel of the set monitors the ambient light level, automatically dimming the LCD and rotary controls backlighting by a variable amount to prevent glare — again useful on the move to save distraction from the road ahead.
In Use

I usually start testing a review rig by programming the set up with all the normal simplex and repeater channels used in the UK, for retrieval with the rotary channel knob. However with the FT-2400H having an automatic repeater shift system, I contented myself, at least in the first stages of use, with just programming my three semi-local 2m repeater channels into memory along with the local net channel, and the usual calling channel S20. Then following the instructions given in the manual, I set about giving each of these an alpha-numeric 'tag', such as ‘NET’ for our net channel, ‘S20’ of course for S20, ‘PC’ for the GB3PC repeater, ‘SN’ for GB3SN and so on.

So for local monitoring and the like, I simply hit one of the microphone-mounted Up/Down buttons. The set then cycled through the channels looking for activity, a quick glance at the display showing me exactly what it had found each time. For a more general scan I pressed the ‘D/MR’ button on the set and just initiated an entire band scan, knowing the set would automatically switch between simplex and repeater shift mode as needed — very nice!

The sensibly-sized volume knob on the front of the set (this being larger than the squelch knob which helped me when ‘fumbling’), plus the flap shielding the switches I could accidentally hit, let me control then set by ‘feel’ only when on the move. In time I loaded all the other simplex and repeater channels into memory with suitable ‘R’ and ‘S’ indications, locking these out of scan mode so I could just use them for a quick QSY once I’d established a contact. With all this, I must say this was one of the easiest-to-use sets I’d come across, the very large display helping me enormously whilst trying to QSY on the move.

As for the set’s RF performance, well the high transmit power certainly let me get a more solid signal into the distant repeater which I often have problems with in my locality. Even though I sometimes have trouble on receive with strong signals from a local fire-brigade station transmitter, I found none with this set. Used at home, the I found rejection of 12.5kHz spaced signals, and my very local 2m packet radio BBS/node system, to be very good. I did however find the receiver was slightly less sensitive than others I’d tried, and when running 50W not surprisingly I could sometimes be heard better by distant stations than I could hear them. However the received audio was very clear, even from the small internal speaker when on the move with the set mounted on the top of the car dashboard. In all, an easy to operate set which I enjoyed using.

Insides

Opening the set up reveals it’s constructed using a sturdy all-round die-cast chassis with tough polycarbonate lids (which don’t dent) at the top and bottom, so it should certainly stand up to some knocks! A single PCB in the lower half of the set is used for the RF circuitry, the PA module being bolted directly to the large heatsink. As well as providing better reliability in the first place, this should significantly help any servicing work. Screening of the RF section is provided by a large internal metal screw-down lid, and the VCO section is separately screened to keep the adjacent high-power RF out.
LABORATORY RESULTS:
All measurements taken at 145MHz, high power, otherwise stated.

RECEIVER:

<table>
<thead>
<tr>
<th>Input level required to give 12dB SINAD;</th>
</tr>
</thead>
<tbody>
<tr>
<td>144MHz; 0.170uV pd</td>
</tr>
<tr>
<td>145MHz; 0.170uV pd</td>
</tr>
<tr>
<td>146MHz; 0.160uV pd</td>
</tr>
</tbody>
</table>

A smaller control interface PCB sits on the upper half of the set, this having well-labelled potentiometers for high/mid/low TX power, deviation, S-meter sensitivity, bleep level and the like for user-adjustment, the main control PCB being housed in the set's facia panel.

Laboratory Tests
This showed the strong signal handling of the receiver to be very good indeed, although I would have preferred the absolute receiver sensitivity to have been higher to more closely match the impressively high transmit power for use in rural areas. But then you can't have everything I suppose.

The adjacent channel rejection of 12.5kHz separated signals was very good, the image rejection being very good also. On transmit a good degree of maximum power was available, with the Mid and Low power levels being very accurately controlled over a wide voltage variation as you'd find in many cars. The deviation was accurately set, but the harmonic levels whilst adequately suppressed were a little higher than I'd come to expect from some of the very latest sets.

Conclusions
Yaesu's new rig is certainly built to take the knocks in life, the overall arrangement being solidly built and made for easy servicing — the 'professional' aspect no doubt coming to light here. This extends to the use of the set, as you'll have read I found the FT-2400H very easy to use while on the move, the large alphanumeric LCD combined with automatic backlighting level being used to good effect. So why can't all sets be like this? The set won't, of course, appeal to devotees of dual band rigs as it's a 2m-only rig, but I wonder when the 70cm version is coming out?

My thanks go to South Midlands Communications Ltd. for the loan of the review transceiver.

Squelch Sensitivity;
| Threshold; 0.08uV pd (2.5dB SINAD) |
| Maximum; 0.21uV pd (16dB SINAD)    |

Adjacent Channel Selectivity;
Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal:
| +12.5kHz; 63.5dB |
| -12.5kHz; 52.5dB |
| +25kHz; 78.5dB   |
| -25kHz; 78.5dB   |

Blocking;
Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal:
| +100kHz; 91.5dB |
| +1MHz; 93.5dB   |
| +10MHz; 96.5dB  |

Intermodulation Rejection;
Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product:
| 25/50kHz spacing; 80.0dB |
| 50/100kHz spacing; 78.5dB |

Maximum Audio Output;
Measured at 1kHz on the onset of clipping, 8 ohm load:
2.27W RMS

Image Rejection;
Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signal:
90.5dB

TRANSMITTER

<table>
<thead>
<tr>
<th>TX Power and Current Consumption;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freq.</td>
</tr>
<tr>
<td>144MHz High</td>
</tr>
<tr>
<td>Mid</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>145MHz High</td>
</tr>
<tr>
<td>Mid</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>146MHz High</td>
</tr>
<tr>
<td>Mid</td>
</tr>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

Harmonics:
<table>
<thead>
<tr>
<th>Harmonic</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Harmonic</td>
<td>-65dBc</td>
</tr>
<tr>
<td>3rd Harmonic</td>
<td>-70dBc</td>
</tr>
<tr>
<td>4th Harmonic</td>
<td>-71dBc</td>
</tr>
<tr>
<td>5th Harmonic</td>
<td>-75dBc</td>
</tr>
<tr>
<td>6th Harmonic</td>
<td>-68dBc</td>
</tr>
<tr>
<td>7th Harmonic</td>
<td>-61dBc</td>
</tr>
</tbody>
</table>

Peak Deviation;
4.92kHz

Toneburst Deviation;
4.04kHz

Frequency Accuracy;
-150Hz
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* Dual independent Rx capability.
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* Auto ATU and internal P.S.U.

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* General coverage Rx.
* Power output up to 100W PEP.
* Auto ATU and internal P.S.U.
* 50 memories.

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13M20BP25 25ft base plate mount £653.43

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16M20BP60 60foot base plate mount £972.90

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Yaesu FT-415 Review

Our resident reviewer
Chris Lorek G4HCL tests
Yaesu’s new paging transceiver.

When I reviewed Yaesu’s ‘simpler’ cousins to the FT-415, the tiny FT-26 (2m) and FT-76 (70cm) sets in the September 1991 issue of HR, I mentioned that my personal preference was that I’d have liked a greater number of buttons for operation. Was it ‘deja-vue’ or just a natural development, because here we have, several months later, just what I asked for! In exactly the same case size, Yaesu have progressed the design of the ‘control’ section of their handhelds into keypad radios for the more ‘gadget orientated’ amongst us, whilst retaining the original ‘simple’ control models for those not wishing to wander around with a keypad handheld. The FT-415 is the 2m version, the 70cm FT-815 being similar apart from its frequency range. When I found they were available (they had been for a couple of weeks — I just hadn’t seen them on show at the UK distributors) I couldn’t wait to get my hands on a review sample.

Features

The sets are physically the same size and weight as their FT-26/76 counterparts, i.e. 55mm x 146mm x 33mm with an FNB-27 600mAh nicad fitted. However the importers have decided to instead provide the higher capacity 700mAh FNB-28 nicad with the FT-415/815, extending the overall length by 9mm but increasing the operation period of the set before a recharge becomes necessary.

The set gives a nominal 2W output (1.5W for the 70cm FT-815) from the supplied 7.2V battery, and 5W from an optional 12V battery, also having a plug-in facility for an external supply of 5.5V-16V for mobile use and the like. A three-level switchable low power mode on transmit lets you conserve the nicad life when you need to, with typical output power levels of 5W, 3W, 1.5W and 0.5W from a 12V supply.

Two digital ‘VFOs’ are fitted for you to tune around with, using either the up/down keypad buttons or the clickstep rotary tuning knob. A handy function of the set is an ‘automatic repeater shift’, where (if you’ve enabled this) the set automatically switches in a -600kHz transmit shift for you when you tune between 145.600MHz and 145.850MHz (for European use).

CTCSS

An optional FTS-17A CTCSS unit can be fitted inside the set, this offering a few other ‘niceties’ as well as the usual sub-tone encode and decode. With this fitted, if you come across an off-air signal which you know has sub-tone present, and you’re not sure which tone, then you can initiate a ‘CTCSS scan’ where the set searches through its 37 stored tones to...
LABORATORY RESULTS:
All measurements taken at 145MHz using fully charged nicad unless otherwise stated.

RECEIVER:

<table>
<thead>
<tr>
<th></th>
<th>144MHz;</th>
<th>145MHz;</th>
<th>146MHz;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity:</td>
<td>0.120uV pd</td>
<td>0.120uV pd</td>
<td>0.120uV pd</td>
</tr>
<tr>
<td>Squelch Sensitivity:</td>
<td>&lt;0.06uV pd (&lt;3dB SINAD)</td>
<td>0.15uV pd (16dB SINAD)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjacent Channel Selectivity:</th>
<th>+12.5kHz;</th>
<th>-12.5kHz;</th>
<th>+25kHz;</th>
<th>-25kHz;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref. level to cause 6dB degradation in 12dB on-channel signal;</td>
<td>57.5dB;</td>
<td>55.0dB;</td>
<td>73.0dB;</td>
<td>72.5dB;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blocking:</th>
<th>+100kHz;</th>
<th>+1MHz;</th>
<th>+10MHz;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal;</td>
<td>84.5dB;</td>
<td>95.0dB;</td>
<td>96.0dB;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermodulation Rejection:</th>
<th>25/50kHz spacing;</th>
<th>50/100kHz spacing;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product;</td>
<td>70.5dB;</td>
<td>70.0dB;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Audio Output:</th>
<th>Measured at 1kHz on the onset of clipping;</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ohm load;</td>
<td>295mW RMS;</td>
</tr>
<tr>
<td>8 ohm load;</td>
<td>255mW RMS;</td>
</tr>
<tr>
<td>15 ohm load;</td>
<td>170mW RMS;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Image Rejection:</th>
<th>58.3dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signal;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Consumption:</th>
<th>Measured with battery economiser disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standby, economiser on;</td>
<td>11.5mA average;</td>
</tr>
<tr>
<td>Standby, sq. closed;</td>
<td>44mA;</td>
</tr>
<tr>
<td>Receive, Mid Volume;</td>
<td>68mA;</td>
</tr>
<tr>
<td>Receive, Max Volume;</td>
<td>112mA;</td>
</tr>
</tbody>
</table>

find the matching one. With the current UK 2m repeater CTCSS plan, this feature could be quite handy in the near future, for example if you travel around and need to find the correct tone for a repeater you come across in an unfamiliar area (or of course just seeing whether CTCSS is in use or not on any given channel). Together with this, a CTCSS 'bell' function may be used, where the set may be set to bleep at you for a few seconds on receiving a signal with your programmed CTCSS decode tone, and a small 'bell' flashes on the set's LCD to show you if you've been called in your absence.

DTMF Paging

It doesn't just stop at CTCSS. The set has fitted, as standard, a DTMF encoder and decoder to provide 'selective paging' using the common three-digit DTMF sequence now used by amateur equipment manufacturers. I'm personally pleased to see this 'standardisation', as some time ago we had non-interchangeable 'short data' selective calling, where your callsign in ASCII together with other information could be transmitted to wake other people's receivers up and the like. Technically these were excellent systems, but unfortunately they didn't work in harmony between all manufacturers' sets.

DTMF paging uses a short burst of DTMF tones to open the receiver squelch on other sets suitably equipped and programmed, the receiving set displaying the 3-digit code of the station calling them. With the FT-415, when called the set stores the other station's code automatically, a quick press of the PTT then allowing a manual 'transpond' with the
other station to say you’ve heard them OK, and allows you to continue with communication without needing to defeat the DTMF sequence at each end to listen out for replies.

Battery Saver

For virtually every portable on the market, a switchable ‘battery saver’, or ‘battery economiser’, is fitted. Here the set’s receiver circuits are switched on briefly, then off for a longer period, then back on again briefly. The set checks for a receive signal during each ‘on’ period which, if present, stops the cycling activity. This often causes a brief period of a receive signal to be lost if the signal commences during the ‘off’ period, as many economisers need long ‘off’ cycles to gain any significant advantage. However the FT-415 appears to use a ‘turbo’ mode, where the ‘on’ period only needs to be 30mS, and the ‘off’ period may be programmed in several steps between 30mS (1:1) and 1000mS (1:33).

An ‘ABS’ (Automatic Battery Saver) mode may also be switched in, where the set senses how often the squelch opens and dynamically selects an on/off ratio for you according to its recent operating history! As well as this, you can disable some of the set’s functions such as the ‘Busy’ LED and the internal bleeper if you need to extend your battery life even further.

In Use

The set’s basic operation is similar in many respects to Yaesu’s FT-411 and 811 keypad radios, as my XYL and I both use the 70cm versions of these I found initial programming and the like very easy indeed. The FT-415 fitted with the larger 700mAh pack was, however, smaller overall than my earlier set with a 600mAh battery!

In use I found the set fitted comfortably in my hand as well as in my pocket, and I appreciated the handy ‘Call’ button which let me to get to my local repeater channel quickly. Walking around, I found the set’s receiver was very sensitive, indeed remarkably so. Using the set around my house I found I could easily hear semi-local repeaters at a fully quieting strength where these were somewhat noisier on other handsets. Unfortunately I found I often couldn’t get into these on transmit using the set’s 2W output — you could be tempted to invest in a 12.5V battery (giving 5W) for such uses.

Not once throughout the air tests did the nicad go flat. I often go all-out to use review sets all day after an overnight charge to see how long they last, and I was most surprised at this one. However one such day included a 200 mile car journey, and although I found the receiver audio quality very good for normal handheld use, there just wasn’t enough of it from the internal speaker for use in noisy surroundings such as high-speed road travel. To be fair, plugging in an external speaker-microphone instantly solved this, as the set itself did give ample audio.

When used in my shack at home, I normally plugged in my rooftop aerial, and here the only problem I found was occasional off-frequency reception of my very local packet node (I later found this to be second image reception), but no blocking problems from this. I found the rejection of 12.5kHz spaced signals was very good indeed, combined with the excellent sensitivity it gave in all a good on-air performance. Incidentally, whilst in the shack I found that by plugging in my external 13.8V supply and fitting the slide-on plastic ‘blanking plate’, this being supplied as standard with the set, the overall transceiver was only about the size of a fist microphone! Linked to my small packet TNC, which

<table>
<thead>
<tr>
<th>Freq.</th>
<th>Power</th>
<th>7.2V Supply</th>
<th>12.0V Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>144MHz</td>
<td>High</td>
<td>2.33W/1.07A</td>
<td>5.68W/1.43A</td>
</tr>
<tr>
<td></td>
<td>Low 1</td>
<td>610mW/495mA</td>
<td>610mW/500mA</td>
</tr>
<tr>
<td></td>
<td>Low 2</td>
<td>1.66W/790mA</td>
<td>1.68W/780mA</td>
</tr>
<tr>
<td></td>
<td>Low 3</td>
<td>2.33W/1.07A</td>
<td>3.08W/1.05A</td>
</tr>
<tr>
<td>145MHz</td>
<td>High</td>
<td>2.28W/1.06A</td>
<td>5.50W/1.38A</td>
</tr>
<tr>
<td></td>
<td>Low 1</td>
<td>610mW/480mA</td>
<td>610mW/490mA</td>
</tr>
<tr>
<td></td>
<td>Low 2</td>
<td>1.62W/730mA</td>
<td>1.62W/750mA</td>
</tr>
<tr>
<td></td>
<td>Low 3</td>
<td>2.28W/1.06A</td>
<td>2.98W/980mA</td>
</tr>
<tr>
<td>146MHz</td>
<td>High</td>
<td>2.21W/1.04A</td>
<td>5.76W/1.38A</td>
</tr>
<tr>
<td></td>
<td>Low 1</td>
<td>580mW/480mA</td>
<td>580mW/485mA</td>
</tr>
<tr>
<td></td>
<td>Low 2</td>
<td>1.58W/730mA</td>
<td>1.58W/700mA</td>
</tr>
<tr>
<td></td>
<td>Low 3</td>
<td>2.21W/1.04A</td>
<td>2.93W/945mA</td>
</tr>
</tbody>
</table>

| Harmonics;          | 2nd Harmonic; | -71dBc |
|                     | 3rd Harmonic; | -92dBc |
|                     | 4th Harmonic; | -82dBc |
|                     | 5th Harmonic; | -83dBc |
|                     | 6th Harmonic; | <=-95dBc |
|                     | 7th Harmonic; | -84dBc |

| Peak Deviation;     | 5.12kHz |
| Toneburst Deviation;| 3.16kHz |
| Frequency Accuracy; | +90Hz   |
Yaesu even provide wiring details for in the manual, it made a very compact system.

**Insides**
Opening the set shows, as I expected, a very compact internal layout with "chip" components galore. Flexible PCB interconnection links, with plug and socket connections, are used to link the front and rear assemblies of the set, thus at least helping any subsequent repairs if needed. The block diagram shows a standard superhet receiver arrangement, and examination of the receiver front end reveals that good performance should be available over the 130–174MHz receive range programmed in the FT-415 where licensing regulations allow this.

**Laboratory Tests**
These confirmed the high receive sensitivity found on-air, together with the good adjacent channel selectivity and blocking performance, in all very good strong-signal handling. The receiver current consumption was very low, lower still with the economiser enabled, which should extend the life of the supplied 700mAh nicad somewhat before a recharge becomes necessary.

On transmit the power levels were well regulated, with an ample power output given on 'high' power in each case. The harmonics were reasonably suppressed, and the transmit deviation although slightly on the high side of the 5kHz was within an acceptable tolerance. The frequency accuracy was very good.

**Conclusions**
I was very pleased with the FT-415, it looks like Yaesu must have been reading my comments in the Sept 91 HRT! As well as giving a good technical performance, I found the set to be very versatile in use, yet I appreciated the fact that I could just simply lock the keypad when needed and just use the click-step knob to select memory channels complete with their stored CTCSS/DTMF tones and the like. The CTCSS unit is not fitted as standard in the UK, however if you're going to use the set in the UK I'd advise thinking about this option for present or future use.

My thanks go to South Midlands Communications Ltd. for the loan of the review set.
Jeff Harris G3LWM throws a line to those who are looking for a new location experience

One of the exciting aspects of amateur radio is the opportunity to operate from new locations and to experience propagation conditions in an area away from your home. The facility of Maritime Mobile operation offers all these. In addition if you are operating /MM you will find that certainly on the HF bands your ability to attract QSOs will be greatly increased over your mundane ‘G’ call. G3LWM/MM at anchor near the Sunk Light Vessel is certainly more likely to attract attention on a crowded band than plain old G3LWM!

For those ashore, contacts with /MM stations are always of interest. The writer had a very pleasant QSO on 160m AM with G4WUH/MM off Rotterdam aboard the MS sponsalis bound for West Africa. For the record, I was using a home made VMOS 160m rig and a very old (1941) TCS receiver. Certainly the new Maritime Mobile facility together with the CEPT regulations offer many possibilities for amateur radio in the future.

All Aboard for /MM

Look at the various clauses in your licence that refer either directly or indirectly to Maritime Mobile operation. Whether the station is established on land or sea, there are no relaxations (see however, the item dealing with log keeping) that apply to Maritime operation, and all clauses relating to interference are even more important when operating at sea.

Maritime Mobile is defined as 'located on any vessel at sea'. This means in tidal waters, the territorial sea of the United Kingdom, or in international waters. High Seas or International waters are those areas outside Territorial limits. These can vary between 3 and 200 miles, so you should check the extent of all territorial waters through which the vessel on which you are sailing is likely to pass and conform to their amateur frequency bands as required. The extent of territorial waters and the authority within these areas claimed by various countries is not clear in many cases, so always take the worst case. Use caution if you are likely to be sailing in or near sensitive areas.

Vessels in port usually are required to keep radio silence except for the port control frequencies. While a ship, even when berthed in a foreign port, is still under the sole command of the master, International and Marine Law is most complex in this area. If you do wish to operate from a foreign port you would be well advised to obtain the permission of both the harbour authorities and also the amateur radio regulatory authority for the country concerned.

If you are going ashore at all with any amateur equipment, make sure that you have all the necessary authority and documentation, even if the equipment is only handheld. When taking equipment ashore in a foreign port always advise the customs authorities at the port control or you may find yourself in some difficulties. To ensure that any discussions with customs authorities go as easily as possible, try to take with your original receipts for all equipment that you have, and also necessary documentation from HM Customs to ensure that you can bring the equipment back into the UK without any problems.

While you can now operate in many European countries with simple CEPT (Appendix 1) documentation, this may not cover /MM operation. If you are going to a country where you could expect to run into language difficulties, try to obtain documentation in the natural language.

What Not to Use

If you own a boat and are considering fitting amateur radio equipment bear the following points in mind:

1) Amateur radio and/or CB is no substitute for VHF marine radio, and on no account should it be considered as such.
2) Cellular telephones are not a substitute for VHF marine radio. If you have enough 'spondoolicks' to have a boat and a cellular telephone, you can certainly afford a marine radio.
3) When installing amateur (or any other) radio in your boat the following points should also be noted:
a) Corrosion at sea is far worse than on land. The coaxial cable should be soldered to the aerial. No screw connections should be used. The aerial lead should be taken in an unbroken run to the coax connector at the ring. On no account should any so-called waterproof deck feed-through connectors be used. Any friction type connectors are certain to give trouble sooner or later. G4KU reports that after only a year, connectors have become so corroded that a blow lamp would be needed to get them apart.
b) Power leads may need to be rather long, so use much larger diameter cable than you would for a normal mobile installation to avoid excessive voltage drop. Take the power leads directly from the battery to avoid possible interference from other electronic devices on board.
c) An aerial on top of a mast makes a very good lighting conductor, so when you...
leave the boat disconnect the aerial/s.
d) If you are sailing single handed, forget
leave the boat disconnect the aerial/s.
e) Ensure that all radio equipment is
securely fixed in the boat and if possible
and sailing at the same time.

M’aidez
The RSGB advise the following
about what to do if you happen to hear a
Mayday call
‘In the unlikely event that you hear a
distress call on the amateur bands the most
important thing to do is to listen. Note
down everything that is transmitted
by the station in distress, and the
time and frequency. Pass on all information
to the Police. (Or to HM Coastguard if
you are at sea with a suitable radio.) You
may have some difficulty convincing
them of your sincerity, as distress calls
on the amateur bands are not an every-
day occurrence, so be patient. They will
pass on the details to the Coastguard
Rescue Co-ordination Centre. Only
transmit to the distressed station if you
are absolutely sure that it is going to help.
Remember that a local station will be of
much more use than someone half way
around the world. Never reply to a dis-
tress call heard out of amateur bands.’

The last statement does not of
course apply if you carry a marine HF
and/or VHF radio aboard, but this is a
most important caution and should
never be forgotten. HM Coastguard and
the other Search and Rescue services
are always available, so let the profes-
sionals get on with the job.

In order to operate VHF marine radio
on board a ship it is necessary to have at
least the appropriate restricted VHF
Operators’ Licence. While the knowl-
dge for the simple examination is rela-
tively limited and only covers operating
procedures, you would be well advised
to take the short course run by the RYA. It
is important that you are aware of the
various procedures that apply in a emer-
gency situation.

Silence Periods
In the early days of Maritime radio
communications, when spark transmis-
ters and receivers with very little sensi-
tivity or selectivity were used, it was very
difficult to hear a weak distress signal.
Silence periods were imposed on an
international basis so that a vessel
hadn’t received a response to a distress
call it could be certain that during the
designated silence period no other ves-
sels would be transmitting, and all oper-
ators would be monitoring the distress
frequencies. The ‘Titanic’ disaster in
April 1912 brought about the institution
of the silence periods. Even with today’s
advanced equipment, the silence peri-
dods are still maintained on certain fre-
cuencies.

The following extract is taken from the
Handbook for Radio Operators: “In order
to increase the safety of life at sea
and over the sea all stations of the
maritime mobile service normally keep-
ing watch on frequencies in the author-
ised bands between 415 and 535kHz
must, during their hours of service, take
the necessary measures to ensure watch
on the International radio telegraph dis-
tress frequency, 500kHz for three
minutes twice each hour beginning at
xh.15 and xh.45 (UTC): those normally
keeping watch on frequencies in the author-
ised bands between 1605 and
2850kHz must during their hours of ser-
vice and as far as possible take steps to
keep watch on the International radio
telephone distress frequency 2182kHz for
three minutes twice each hour begin-
ing at xh.00 and xh.30 (UTC)”.

It is therefore certainly mandatory
to keep radio silence if you are using
amateur radio frequencies common
with the 500kHz band.

Other Signals
Remember that in addition to a wide
range of two-way communications
equipment that is installed on a modern
vessel, there are many other receivers,
transmitters and other equipment to be
found, and our licence tells us we must
not cause ‘harmful interference’. This is
actually defined as “interference which
dangers the functioning of a radio
navigation service or of other safety serv-
ces or seriously degrades, obstructs or
repeatedly interrupts a radio communi-
cation service operating in accordance
with relevant government require-
ments”. Also it’s worth remembering
that “when Maritime Mobile, the licen-
see shall cease to operate the station on
the demand of the vessel’s master”.

Equipment which may be installed
includes:
a) Decca Navigation: A position fixing
system that operates in the 70-130kHz
band.
b) Loran C: A long range position fixing
system. Uses frequencies in the 100kHz
region.
c) Omega: Very long range navigational
system. Uses a frequency of 10kHz.
d) EPIRB: Emergency Position Indicating
Radio Beacons, operating on 218kHz,
243MH and 406MHz.
e) Radio Beacon Receivers: Used for
navigation purposes, operating in the
band 233-315kHz.
f) Navtex: A weather and navigational
message system. Uses frequencies in the
500kHz band.
g) 500kHz CW is still being used.
h) Other electronic systems such as echo
sounders, radar, engine control systems.
i) Various satellite navigation and com-
munication systems.

Amateur transmissions might
cause interference with some of these
systems, so it is most important to carry
out a series of tests to ensure that all is
well (Tech Ed’s note — lower 23cm fre-
cuencies may cause ‘blocking’ prob-
lems with Global Positioning System
receivers using the nearby L2 fre-
cuency).

Overseas
Before the introduction of the new
licence and the implementation of CEPT
recommendation T/R 61-01, amateurs
wishing to operate in another European
country had to obtain special permis-
sion from the licensing authority in the
country concerned. This could be a
lengthy and frustrating experience.
Today however radio amateurs in the
majority of European countries can
operate in each other’s countries with-
out a special licence. The only documen-
tation that you need to take is your valid
UK licence and the booklet BR68. CEPT
stands for European Conference of Pos-
tal and Telecommunications Adminis-
trators, or if you like it better ‘Conference Europe des Administra-
tions Postal et Télécommunications’.

At the time of writing, the following
countries have implemented CEPT recommendation T/R 61-01: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, Turkey, Vatican City, and Yugoslavia. I would advise checking your licence for the current situation.

QSL from G4WUH/MM from Rotterdam...’I am now on this tanker on a Japan to Persian Gulf run, operating 80m GMT mornings’

Finally, you may find that either the ‘Reeds’ or ‘Macmillan and Silk Cut’ nautical almanacs may prove useful in providing additional information on non-amateur maritime subjects, these are commonly available from chandlers and large book shops.

My thanks go to G2BCX, G4KYU and regular HMCG Officers at Thames MRSC for their help in preparing this article.
Many users of ex-PMR rigs, fitted with multiple channels, sometimes wish they could have an automatic channel scanning facility, to allow several channels to be checked for activity without the need for continuous knob-turning operations. ‘Manual scanning’ does wear your fingers out somewhat! Also, the Editor’s postscript to her recent HRT 2m synthesised Ramsey kit transceiver review hinted at a forthcoming channel scanner add-on, so she made me get my IC handbooks and soldering iron out! This scanner is very simple, and should be ideal as a low-cost add-on to increase the versatility of many rigs.

**Chris Lorek G4HCL describes how to build a simple 10-channel scanner for your transceiver**

A combination of several TTL and CMOS ICs, to ‘knock up’ a suitable circuit using Veroboard. I’d often thought about documenting that circuit, but in time it became dated with newer ICs becoming available. It was after receiving requests from readers of the HRT ex-PMR conversions, plus the Editor’s constant arm-twisting operations, that I decided I’d better design another! The result is the following very simple-to-build circuit. This may either be built up on the PCB described, or more simply, as I did originally, on Veroboard or similar from the given circuit, using a layout to suit your own requirements and available space. The circuit will operate on any supply voltage from 5-15V, drawing very minimal current. If you shop around, you should be able to build the entire circuit for a cost of just a couple of pounds plus the cost of any LED indicators if you need to add these.

---

**Usage**

It was around fifteen years ago, when I ran three remote-mounted Pye Westminsters, that I decided that I could do with some form of automatic channel scanning. It took me some time, and a combination of several TTL and CMOS ICs, to ‘knock up’ a suitable circuit using Veroboard. I’d often thought about documenting that circuit, but in time it became dated with newer ICs becoming available. It was after receiving requests from readers of the HRT ex-PMR conversions, plus the Editor’s constant arm-twisting operations, that I decided I’d better design another! The result is the following very simple-to-build circuit. This may either be built up on the PCB described, or more simply, as I did originally, on Veroboard or similar from the given circuit, using a layout to suit your own requirements and available space. The circuit will operate on any supply voltage from 5-15V, drawing very minimal current. If you shop around, you should be able to build the entire circuit for a cost of just a couple of pounds plus the cost of any LED indicators if you need to add these.

---

**Printed circuit board, full size, shown from track side**
MODEL SG-2000 HF SSB RADIOTELEPHONE
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You’re in contact anywhere, anytime with the power packed SG-2000 HF SSB transceiver. Engineered for simple operation, the SG-2000 features an alarm generator, 64 factory programmed ITU voice and data channels, 100 user programmable channels and 100 memory channel scanning. Receive and transmit strong clear voice signals. Manage data communications easily on RTTY, ARQ, PACKET and telegraphy. Utilize up to 8 front panels as full function remote stations. A user-friendly American product, sophisticated housing and the SGC technical superiority and quality workmanship make the SG-2000 your radio of choice.

TESTED TOUGH

Circuitry
In use the scanner cycles through up to ten channels, the 4017 providing a CMOS logic ‘1’ output for each channel, cycling through each output step by step. These outputs may be used to directly drive the switching lines of your rig if this accepts CMOS logic levels, alternatively you may add the optional resistors R4 — R13 and switching transistors TR1 — TR10 for each channel. These may be used to drive your rig’s diode switches or whatever for channel selection, and/or switch LEDs for channel indication.

By suitably linking pin 15 of the 4017 IC, this being the ‘reset’ line, the circuit can be preset to scan any number of channels between two and ten. For this you need to add a wire link between pin 15 and the scan output pin ‘one higher’ than the number of channels you require. For example if you want a five channel scan, connect pin 1 (the channel 6 output) to pin 15. The scan is initiated simply by applying power to the circuit, and is halted by 0V (or thereabouts — i.e. a CMOS logic ‘0’ minus the diode voltage drop) from your rig’s receiver ‘busy’ line applied to the ‘busy’ input. Capacitor C1 appears before the scan resumes. To ‘hold’ the scan on a particular channel, for example if you want to listen continuously or transmit on that channel also, a toggle switch fitted across C1 is used. Wiring the circuit’s ‘TX’ input to your mic PTT ground-to-transmit line also holds the scan, which prevents you accidentally transmitting on several channels.

Construction
Apart from the ICs, which must of course be the correct types, none of the component values are critical, thus allowing ‘junk box’ or ‘surplus’ components to be used if available. R2 and C2 control the scanning speed, thus slight variation of these will similarly slightly affect the speed only, similarly with C1 which controls the ‘scan delay’. Increasing the value of these increases the time period correspondingly. Other resistors may be varied by up to 50% in value, depending upon availability, and any types of low-cost silicon diodes and switching transistors may be used.

When building the unit, ensure you use normal CMOS handling precautions for the ICs, if in doubt use IC sockets for these to save a marathon desoldering job if it doesn’t work first time. After building the unit, check your soldering for open and short circuits, plug your ICs in if you’ve used sockets, and happy scanning!

Parts List

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC1</td>
<td>4093</td>
</tr>
<tr>
<td>IC2</td>
<td>4017</td>
</tr>
<tr>
<td>D1, D2</td>
<td>General purpose silicon diode, e.g. 1N4148</td>
</tr>
<tr>
<td>R1, R2, R3</td>
<td>100k</td>
</tr>
<tr>
<td>R4 — R14</td>
<td>10k (optional)</td>
</tr>
<tr>
<td>R15 — R24</td>
<td>1k, to suit LEDs used (optional — not shown)</td>
</tr>
<tr>
<td>C1</td>
<td>22uF 15V</td>
</tr>
<tr>
<td>C2, C3</td>
<td>10uF 15V</td>
</tr>
<tr>
<td>TR1 — TR10</td>
<td>General purpose PNP transistor, e.g. BC108 (optional)</td>
</tr>
<tr>
<td>Switches</td>
<td>Push-button ‘skip’ and toggle ‘hold’ as required</td>
</tr>
<tr>
<td>LED 1-10</td>
<td>Any LED type, for channel indication if needed (optional — not shown)</td>
</tr>
</tbody>
</table>

HAM RADIO TODAY APRIL 1992

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From My Notebook

Geoff Arnold
G3GSR takes a look at aerials

In any field of radio or electrical technology, it's very useful to have some feeling — some 'picture in the mind's eye' — of how a circuit or component works, what happens when changes are made to the circuit or to the voltages applied to it, and so on.

I'm sure you've all seen that most basic of these simplified pictures, the one that appears at the beginning of nearly every introductory textbook on electricity, showing water being pumped around a piped circuit, and using that idea to explain electrical current flow, potential, resistance, etc. Sometimes, this simplified explanation is all that you need to understand enough of a circuit or component for your present needs. At other times, it may form a useful introduction and foundation for the physics and mathematics which must follow as you build your knowledge. For example, as a child of the valve era, I found great difficulty in understanding the junction transistor when it began to be used in radio equipment. I tried to read several textbooks on the subject, all of which started off with semiconductor theory — atoms, holes, energy gaps, transition regions and many more obscure terms. I'm afraid I never got past Chapter 1 of any of them!

Getting the Picture

It wasn't until I went on a course intended for people just such as me, where the transistor was approached first as a black box with three leads coming out of it, which behaved in various ways in response to applied voltages and currents, that I began to 'get the picture'. From the simplest DC model, the lecturer went on to take account of changes in behaviour at audio and radio frequencies, the effect of inter-electrode capacitances, and so on. All this with the minimum of simple maths needed to explain and predict operation in the various modes. Having built up this simplified picture of how the device worked, and applied it to equipment faultfinding, I was able to go back to the books on semiconductor physics and begin to understand what they were getting at.

Just how far you can take any simplified explanation before it begins to part company with the real world obviously varies with the subject under consideration. For an author trying to explain a topic to beginners, it is all too easy to take things too far, and there have been some real 'clangers' dropped in textbooks and magazines over the years. I'm now going to stick my neck right out and attempt to pass on a few thoughts about how I look at aerials and why they behave like they do. Purists may well tear their hair out at some of the assumptions which I shall make, but I hope these ideas will help you as they helped me in getting to grips with the subject.

Tuned Circuit

An aerial can be considered to be a series tuned circuit. It will always be self-resonant at some frequency, though whether that is anywhere near the frequency you're trying to operate at is another question! The inductance and capacitance which form that tuned circuit are not in the form of 'lumped' components, they are 'distributed'. In other words, they are spread along the aerial. The inductance is the self-inductance of the wire, and the capacitance is a combination of the capacitance between the various parts of the aerial (think of it as between the two ends) and between the aerial and earth. That 'earth' may be the surface of the ground under the aerial, or the body of a car or ship, or a system of wires specially erected as a 'counterpoise' earth. Incidentally, it is this distributed nature of the inductance and capacitance which allows the aerial to resonate. Think of it as the fields having room to escape instead of being confined within a coil or capacitor.

From this idea of distributed inductance and capacitance, we can say that as an aerial is increased in length, both its inductance and capacitance increase. Any tuned circuit that has larger amounts of L and C is resonant at a lower frequency, and therefore a longer aerial is self-resonant at a lower frequency than a shorter one. Perhaps I should make it clear here that when I talk about aerial length, I'm talking about the length of the radiating element; for example, the wire in the case of a wire aerial, the vertical rod or tube of a 'ground-plane' aerial, or the rod or tube of the dipole element in a multi-element Yagi. This shouldn't be confused with the length of the boom which supports the elements of the Yagi.

Loading

If an aerial is not self-resonant at the frequency which you want to use it on, and for the moment I'm thinking just about a simple long-wire aerial, you can change its effective length by adding some 'lumped' inductance or capacitance to it.

There are two ways of doing this. One is to insert L and C (or LC) into the feed-point, the other is to add some lumped L or C to the aerial itself. Looking at the first case, the usual laws governing the value of inductances and capacitances in series apply, so that adding C reduces the total effective capacitance of the aerial as seen at the feed-point, increasing its resonant frequency. Adding L increases the total effective inductance, which lowers the resonant frequency.

We've already seen that the shorter an aerial is, the higher its resonant frequency. Or we can say that if it's resonant at a higher frequency, it must be shorter. Thus, putting a capacitor in series with an aerial makes it look electrically shorter, and in fact back in the days when domestic radio meant a valved receiver operating on a long-wire aerial strung down the back garden, use was often made of a component called an 'aerial-shorting condenser'. This was a fixed capacitor fitted at the receiver's aerial input, sometimes with two sockets so that it could be bypassed if not required. Its purpose was not to tune the aerial, but rather to reduce the signal input from a powerful local station, to prevent overloading. It would also reduce the swamping of the receiver's input tuned circuit caused by the added capacitance ("throw-in" capacitance) from the aerial. For greater flexibility, a variable capacitor (called an 'aerial tuning condenser') might be fitted instead, which could be used to tune the aerial to resonance at the operating frequency for maximum sensitivity and selectivity.

If, on the other hand, an aerial is too short to be self-resonant at the frequency of operation, an inductance could be added in series with it at the...
feed-point, increasing the effective inductance of the aerial and so lowering its resonant frequency. This inductance is usually made variable, and is called, believe it or not, an ‘aerial tuning inductance’. As already mentioned, the loading components, C or L, don’t have to be added at the aerial feed-point, they can be added into the aerial itself. They are not then easily variable, of course, and tend to find favour where an aerial is intended for use on one or more fixed frequencies or bands. This is often done in HF aerials for amateur use, especially in reduced-size dipoles or Yagis and in verticals (ground-plane aerials), especially for the lower bands. Since the aim is almost always to use an aerial which is physically smaller (shorter) than the operating frequency would normally dictate, the loading consists either of inductors inserted somewhere along the length of the aerial, or of additional conductors arranged in the form of a ‘capacitance hat’ at the end or ends of the aerial, which add to its natural capacitance. Note the difference from the series capacitor, which made the aerial look shorter. Sometimes a combination of loading coil and capacitive hat is used. Series loading inductors inserted into the aerial are sometimes used to perform two functions, also acting as part of the parallel LC combination of a ‘trap’. A trap is a sort of automatic switch, which isolates the portion of the aerial at the far side of it at a given frequency.

Reactance
When we say that an aerial is self-resonant at the frequency of operation, it means that the inductive and capacitive reactances as seen at the feed-point are equal and opposite, balancing each other out as in any other tuned circuit. The remaining resistive component includes not only the usual tuned circuit losses, but also the fictitious ‘radiation resistance’, which is used to account for the loss of power due to radiation from the aerial. Again as in any tuned circuit, if the frequency of operation moves above the aerial’s resonant frequency, the inductive reactance increases and the capacitive reactance decreases. The aerial is now ‘too long’ and is said to be inductive. If, on the other hand, the frequency of operation moves below the aerial’s resonant frequency, the capacitive reactance becomes larger and the inductive reactance smaller. The aerial is now ‘too short’ and is said to be capacitive.

If the aerial is one which is used to operate on just one frequency, or narrow spread of frequencies, the solution is to change the length to bring it to resonance. This is exactly what we are doing, for example, when we adjust a mobile whip for minimum VSWR, chopping a bit off the end if the resonant frequency is too low, loosening the lock screw and sliding the element back out a little if you chop off too much. You did remember to slip the element right into the base before you started chopping, didn’t you?

If, on the other hand, we want the aerial to be suitable for operation on a number of bands, we bring the aerial back to resonance by inserting the appropriate amount of the opposite sort of reactance, as previously described. Rather than just having a variable capacitor or inductor for the purpose, it is more usual to have what is called an aerial tuning unit (ATU), a combination of variable capacitors and tapped inductors which are used not only to bring the aerial to resonance at the operating frequency, but also to modify the load impedance presented to the transmitter or receiver to achieve maximum power transfer. There are a variety of ATU circuits, with various advantages and disadvantages, but they are outside the scope of this article.

Bandwidth
That leaves just one aspect which I’d like to consider in this introduction to capacitance and inductance in aerials. Once again, just like any other tuned circuit, any aerial has a given bandwidth over which it gives an acceptable performance. In the simplest terms, if the circuit resistance R and the product of the values of L and C are both kept constant, it is the ratio of L to C which determines the bandwidth of a tuned circuit.

We saw in the last article that a thick conductor has a lower inductance than a thin one of the same length. We also saw that a thick conductor has a higher capacitance to surrounding conducting surfaces than a thin one. These facts can lead to an undesirable situation when an aerial made from wire has a narrower bandwidth (equivalent to a higher Q) than one of the same length made from thick tube or rod. Textbooks on aerials talk about the ratio of length to diameter for the aerial conductors, quoting for example a figure of around 25,000 for a dipole for the 80m band made from 16 swg (1.8mm diameter) wire, which equates to a Q of around 14. Using thicker wire will lower the L/C ratio, giving a wider bandwidth.

Adding loading to the aerial will also change its L/C ratio, so that a capacitance hat will broaden the bandwidth, but inductive loading will narrow it.

In Conclusion
The ideas I have outlined in this article can be applied to any conventional aerial system up to the UHF bands. However, I’ve done no more than scratch the surface of the topic in my attempt to give you a feel for what is going on. The principle of adding L or C at the feed-point of an aerial to bring it to resonance is not always quite as straightforward as it sounds. Sometimes you will find it impossible to bring an aerial to resonance, simply because the ATU controls cannot provide the needed value of reactance in compensation. This is especially true where the aerial is either very short compared with the operating frequency, or very long so that it operates in a harmonic mode. Chopping around a metre off the end of a random-length long-wire aerial, for example in repairing a break, can make it impossible to tune to resonance using an ATU which previously performed perfectly well.

If you want to learn more about aerials, I recommend that you read the chapter entitled ‘Aerial Fundamentals’ in The ARRL Antenna Book. I think it is probably about the best introduction to the subject that I’ve come across.

---

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Radio and Electronics Show '92

Saturday & Sunday March 28/29
at the
Sandown Exhibition Centre
ESHER, SURREY

FEATURING

AMATEUR RADIO
CITIZENS BAND
HOBBY ELECTRONICS
HOME COMPUTING
and much more!

ADMISSION: £2 ADULTS,
£1.50 OAPS, £1 CHILDREN
(Children under 12 free when accompanied by an adult)

FREE & EASY PARKING!

Exhibition sponsored by the following magazines:
Ham Radio Today
Citizens Band
Electronics Today International
Archimedes World

and organised by

HAM RADIO TODAY APRIL 1992

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# Your guide to the LONDON AMATEUR RADIO & COMPUTER SHOW

## Red Hall Exhibitors

<table>
<thead>
<tr>
<th>Company name</th>
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<td>AOR (UK) Ltd</td>
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<td>Wilson Valves</td>
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## Special Interest Group Exhibitors

### Blue Hall Balcony

- Air Training Corps
- AMSAT-UK
- Arnold G.C. & Partners
- BYLARA
- Chesnut Computer Club
- Grafton ARS
- Guide Dogs For The Blind
- ISWL
- RAFARS
- RAOTA
- RAQNET (North London)
- Royal Navy ARS
- WAB Award Group

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- Radio Active
- Radio Research
- Silvertronic Ltd
- Southgate ARC
- Specialist Antenna Ltd
- Westlake Electronics
- Wilson Valves

Please mention HRT when replying to advertisements.
Lecture programme:-

Saturday March 7th
12:00 - 2:00. Raynet; Tried and Tested, by Ronnie Cowan, GM4SRL.
2:00 - 4:00. Planning Permission, by John Jackson, JP, G3TZZ, and David Cooper.

Sunday March 8th
12:00 - 2:00. Learning Morse Code, by Ron Ray, G3NCL.
2:00 - 4:00. Introduction to TCP/IP Working, by Tony Kempton, G1BYS.
Dealers, are you sure you're getting a good deal from your wholesale distributor?

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stating name, address & telephone number

Advertisers Please note copy date for the June issue is 24th March
All the above are currently in stock and available for immediate delivery. Standard P&P £1.20, next day delivery £4.60.

BLACK STAR

Top quality, UK made, frequency counters and generators.

Jupiter 2010
- 2MHz function generator plus 20MHz
  - freq. counter
  - £120.00

Orion
- PAL TV Pattern Generator
  - £90.00

1410
- Video Monitor Tester
  - £150.00

Meteor 100
- 100MHz counter
  - £250.00

Meteor 600
- 600MHz counter
  - £350.00

Meteor 1000
- 1000MHz counter
  - £450.00

Apollo 100
- 100MHz counter/timer
  - £300.00

Nova 2400
- 2.4GHz counter
  - £350.00

Jupiter 500
- 500kHz function generator
  - £120.00

Jupiter 2000
- 2MHz function generator
  - £175.00

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  - £300.00

Nova 2400
- 2.4GHz counter
  - £350.00

Jupiter 500
- 500kHz function generator
  - £120.00

Jupiter 2000
- 2MHz function generator
  - £175.00

HAMEG 'SCOPES

All Hameg scopes are supplied with two x 10 probes, mains lead, manual and 2 year warranty.

HM202-7
- Dual channel, 20MHz
  - £150.00

HM205-3
- Digital storage, 20MHz sampling
  - £200.00

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- Dual channel, 60MHz
  - £250.00

HM1005
- Triple channel, 100MHz
  - £300.00

Full details of all the above are included in our comprehensive catalogue, £1.70 (Inc. P&P).

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<td>We have available simply too many accessories to list inc Antennas, Linears, PSU’s, Cases, Manuals, Spares, Software, TNC’s, etc. We also stock C M Howes Kits. Why not give us a ring with your requirements. REMEMBER we have a huge selection of NAMED BRANDS for supply.</td>
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<td>We are a MAJOR IMPORTER of high quality computers and have some great deals for you, just take a look at these SAMPLE prices.</td>
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<td>286-16 40Mb 1Mb Ram VGA</td>
<td>£ 799.00</td>
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<td>386-33 40Mb 2Mb Ram SVGA</td>
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<td>486-33 105Mb 4Mb Ram SVGA</td>
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<td>SVGA Monitor 14&quot;</td>
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<td>105Mb Hard Disk (IDE)</td>
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<td>All products carry a FULL 1 YEAR WARRANTY from our invoice date. We reserve the right to repair or REPLACE at our option. Faulty goods must be returned to us in the original packaging and carriage paid. We do not guarantee that any product is suitable for any particular need, and all product is purchased on this basis. Your rights under the Sale of Goods Act are not affected by these terms.</td>
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<td>You can order by Telephone or Fax. All prices INCLUDE VAT. INSURED next day service by 12.00 is £15.00 inc VAT. Access &amp; Barclaycard are welcome. Special HAM club prices available. Educational &amp; Corporate orders are accepted on receipt of written order. Some items may take up to 14 Days delivery if not in our stock in hand. Office hours Mon-Fri 09.00 to 17.30. Tel: 0782 283388 Radio Shopper Fax: 0782 283723 378 Waterloo Road Hanley, Stoke on Trent ST1 5EH</td>
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The NEW AR3000A is an evolutionary step onward from the highly acclaimed AR3000 and many major improvements have been implemented at the request of enthusiasts. The tuning control is now 'free running' to provide a smooth feel for SSB/CW, x10 buttons have been added to make step size faster and more convenient. All information is contained on a larger LCD with an improved viewing angle instead of a separate LED status indication. The RS232 facility has a switch on the rear panel to enable / disable operation. Memory reset functions are available from the front panel. The re-writing of microprocessor firmware using an even more efficient language has further increased scan and search speeds.

Your listening horizons are truly extended with receive coverage from 100 kHz all the way up to 2036 MHz without any gaps in the range. The AR3000A offers a high level of performance and versatility from long wave through shortwave, VHF and onward to the upper reaches of UHF.

Not only will the AR3000A cover this extremely wide range, it will allow listening on any mode: NFM, WFM, AM, USB, LSB and CW. Tuning rates are selectable from an ultra-fine 50 Hz step for SSB and CW, right up to 100 kHz steps for the TV bands and Band-2.

400 memory channels are provided arranged in 4 banks x 100 channels. Each memory channel will retain mode, frequency, RF attenuator setting, and lockout status.

15 Band pass filters are aligned before the three RF amplifiers (including GaAsFet). This ensures high sensitivity through the entire coverage with outstanding dynamic range and freedom from intermodulation effects.

The AR3000A is powered from 13.8V DC and is supplied complete with mains power unit, DC lead, telescopic whip aerial and comprehensive operating manual. An RS232 port is fitted as standard to enable remote operation by connection to most computers. R.R.P. £765.00 inc VAT. Carriage by post £5.00 extra.

ACEPAC3-A is a NEW and exclusively developed multi-function IBM-PC based program to further increase the versatility of the AR3000A (Please note: The earlier ACEPAC3 will not function with the new AR3000A). R.R.P. £119.00 inc VAT. Carriage by post £2.00 extra.

The NEW WA5000 is an ultra-wide range receiving aerial covering VLF-SHF. A MOS power FET amplifier is utilised to provide superior performance in the HF 30 kHz - 30 MHz range. The useable coverage of the aerial is 30 kHz - 30 MHz / 6dB max & 30 MHz - 2 GHz / 0dB max. The total length of the WA5000 is 1.3m and is fed via a PL259 connector located in the aerial base mount and out of the direct effects of the weather.

Approximately 15m of terminated coaxial cable is provided ready to plug in and start using. The aerial is powered by 12V DC @ 100mA (mains power supply provided), this being fed up the coaxial cable. A small interface box is included for connection to the power supply and receiver, this is fitted with a BNC patch lead ready to plug into any current AOR receiver. "V" bolts and clamps are included to ease installation however a small additional support pole will be required. R.R.P. £150.00 inc VAT. Carriage by post £5.00 extra.

The NEW WX-2000 is a stand alone radio facsimile terminal designed to produce hard copy images from various facsimile services including Weather charts, Maps, News media and even Satellite pictures from NOAA, GOES and METEOR etc. The WX-2000 simply requires an audio signal from a shortwave or satellite receiver capable of receiving facsimile signals.

The built-in high resolution (8 dots per mm) thermal line printer produces crisp images with high resolution. The WX-2000 is also capable of simulating grey scale which is ideal for Automatic Picture Transmission by weather satellites.

In addition to the basic functions, the WX-2000 provides full operational controls such as Auto Start, Sync, Adjustment, Position alignment, Tuning LED etc to produce the highest quality images. The power requirement is 12 - 13.5 V DC @ 3A, this makes the WX-2000 ideal for both on land and off shore applications. R.R.P. £925.00 inc VAT. Carriage by post £5.00 extra.

Please send a S.S.A.E. (34p) for further details on these exciting new models and the AR1500, AR2000, AR2002, AR2500, AR3000 etc.
Realistic
PRO-9200 Review

If you're a regular reader of Scanners International and you think the PRO-9600 looks familiar, you're right. You’ll see a photo of this scanner, under a slightly different guise, in Peter Rouse's 'Scanning USA' feature in the July 1991 issue of this magazine. Then revealed as a brand new foreign product, it's now reached the UK under the 'Realistic' name, and scanner specialists Link Electronics in Peterborough kindly forwarded us a review sample without delay.

A New Look

The first thing that impressed me on seeing the set was its different styling to the 'run of the mill' scanner, the PRO-9200 looking more like a well-finished consumer product than a specialised piece of radio equipment. As such it looks quite at home on a lounge table top or similar, its dark grey finish giving it an unobtrusive appearance.

But specialised it is, because within its case is a full-blown VHF/UHF scanner, capable of monitoring over 68-88MHz FM, 108-137MHz AM, 137-174MHz FM, and 406-512MHz FM. It is, however, designed for uncomplicated use. Switching the set on by rotating the on/off/volume knob immediately sets the receiver scanning through its sixteen memory channels, and even the squelch control has a click-position 'auto' setting, handy for those users who haven't got the hang of adjusting the squelch for the correct position.

Features

The set is designed for mounting on a flat surface, the unit measuring 60mm x 225mm x 165mm. It's powered from an external 12V supply, a small plug-in AC mains adaptor being supplied with the receiver for UK use. A 57mm diameter speaker is built into the top panel, and the gently backlit LCD below this displays the current receive frequency, memory channel, lockout/delay status and the like. A plug-in telescopic aerial comes with the set, the accompanying manual detailing the best length settings of this for receiving either VHF low band, Airband/VHF high band, or UHF. A car radio style of aerial socket is used, enabling an external aerial to be plugged in to let the scanner reach that much further.

Frequencies

As detailed, the scanner covers the VHF and UHF range including the VHF aircraft band on AM, the set tuning in 5kHz steps on VHF FM, 25kHz steps on Airband, and 12.5kHz steps on UHF. It’s USA origins can therefore be seen, as UK PMR users employs 12.5kHz steps and AM is also used on some PMR frequencies.

Individual frequencies can be stored in up to sixteen memory channels for subsequent scanning or manual recall, the set defaulting to scanning through these when switched on. Pressing the 'manual' button cycles through the channels one by one, and the channels may also be numerically recalled. Any number of memory channels may be 'locked out' of the scan mode if you wish, while still allowing these to be manually selected, a small 'Lockout' display next to the memory channel when recalled.

Searching

If you're looking out for new frequencies to listen to, the set can be programmed to search between any two frequencies within a given band, the receiver cycling between the two frequency limits in its 5, 12.5 or 25kHz steps depending upon the band being searched, the receiver halting whenever a signal is found. A two-second 'delay' can be programmed for use in this 'search' mode, or individually in the memory channels for scanning. Here as the search/scan halts when a signal appears, the set remains on that frequency for two seconds following...
LABORATORY RESULTS:

the signal disappearing prior to the search/scan continuing, to save you missing replies on the same channel.

A 'Priority' channel feature is also available. When you select this, memory channel one is briefly checked for activity every few seconds, the scanner locking onto this channel when activity occurs, for the duration of the signal. This can be handy if, for example, you're listening to another memory channel but don't want to miss some important signals on channel one.

In Use

The operation of the set is virtually identical to many 'Bearcat' scanners, and similar to the Realistic PRO-35 (reviewed in the Feb 92 Scanners International) in both operation and frequency range. As such I found the scanner very easy indeed to use, and I'd quickly programmed up the sixteen channels available with my favourite local frequencies.

The plug-in telescopic whip managed to pull in many local signals, and although the set had a plastic outer case this aerial didn't seem to pick up much microprocessor noise from the scanner's control circuitry. However, as most scanner enthusiasts know, it's the aerial that makes the difference, and I was soon ready to plug in my rooftop system. This is where I hit a snag, as the scanner doesn't use a 'normal' coaxial type of connector such as the BNC found on virtually every other scanner on the market. Instead it uses a car radio type of coaxial connector which I had to find, and with a coax lead and BNC in-line socket make an adaptor. Although I understand ready-made adaptors are available, these I could not find in any of my four local radio/electronics stores, including one which sold this type of scanner. Having done that, I tried a variety of aerials ranging from a discone, an active wideband aerial, a log periodic, and a VHF/UHF collinear, all to good effect.

The only real problem I found was that of image reception, i.e., signals received at 21.7MHz (twice the IF) below the tuned frequency, which to be fair is to be expected on a set such as this. I was pleased to find that other strong signals didn't affect the set anywhere near as much as that on some other low-cost scanners I'd tested.

Although the set scanned in non-standard 5kHz steps (for the UK at least) on some VHF ranges, when finding a signal the set 'locked on' to the middle of this rather than simply stopping when the squelch raised, with otherwise distorted reception, again very good.

Conclusions

The laboratory tests confirmed the reasonably good strong-signal handling performance of the scanner, important for a base unit especially if you intend to connect an outdoor aerial using a suitable plug. The unit looks quite smart and certainly not out of place in many lounges, and the simple-to-use controls coupled with a good quality speaker should induce too much 'techno-fear' among first-time users. Although it's limited in memory channels and some modes for 'keen' users, for a current list price of just under £130 I feel it could represent an attractive proposal for either a first-time scanner, or for a second unit just for the home.

My thanks go to Link Electronics for the loan of the scanner for review.

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<th>RX Freq.</th>
<th>Rejection</th>
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<tr>
<td>435MHz</td>
<td>3.0dB</td>
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**Laboratory Test Results:**

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<th>Sensitivity</th>
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</thead>
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<tr>
<td>68</td>
<td>0.26uV pd</td>
</tr>
<tr>
<td>78</td>
<td>0.29uV pd</td>
</tr>
<tr>
<td>88</td>
<td>0.35uV pd</td>
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<tr>
<td>108</td>
<td>0.69uV pd (AM)</td>
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<td>512</td>
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**Threshold:**

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<tr>
<th>Signal level required to raise receiver squelch, 145MHz FM</th>
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<tr>
<td>0.49uV pd (14dB SINAD)</td>
</tr>
</tbody>
</table>

| Auto; 0.78uV pd (22dB SINAD)                                 |

| Tight; 1.75uV pd (30dB SINAD)                                |

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**Blocking:**

| Measured on 145MHz FM as increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB on-channel signal; |
|---|---|
| +100kHz; | 76.5dB |
| +1MHz; | 90.0dB |
| +10MHz; | 96.5dB |

**Intermodulation Rejection:**

| Measured on 145MHz FM as increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product; |
|---|---|
| 25/50kHz spacing; 67.0dB |
| 50/100kHz spacing; 65.5dB |

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**Squelch Sensitivity:**

<table>
<thead>
<tr>
<th>Signal level required to raise receiver squelch, 145MHz FM</th>
</tr>
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<td>0.49uV pd (14dB SINAD)</td>
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</tbody>
</table>

| Auto; 0.78uV pd (22dB SINAD)                                 |

| Tight; 1.75uV pd (30dB SINAD)                                |
The 1992 radio exhibition season is now starting, with many scanner enthusiasts no doubt looking at what’s around. So here’s a roundup of virtually all the scanners available on the UK market today, together with their frequency coverage, modes of operation, number of memory channels available, typical selling price (including nicads and charger for handheld scanners), and which issue the set was reviewed in (SI indicates Scanners International, HRT indicates Ham Radio Today, back numbers and photocopies available from the addresses given at the front of the main magazine). All frequencies are given in MHz, with ‘H’ signifying a Handheld scanner, ‘B’ signifying a Base/Mobile scanner.

Mode of operation indicate those which may be selected on any entered frequency. Note that some scanners have AM limited to Airband coverage only, where this is the case this is clearly shown. All scanners have a ‘Search’ facility apart from those where this is also clearly shown.

Scanner distributors and dealers are shown in the magazine’s advertising pages, these dealers will be pleased to offer full details including the latest prices of the scanners they stock.

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<th>Make</th>
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<th>Freq Coverage</th>
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Field Day News

News from the RSGB indicates that they do now have a QRP section in their HF Field Day, which this year falls on the 6th and 7th of June. The QRP section will have the same rules as for the restricted section but with the addition of the following:

1) Transmitter power is limited to 10W input, 5W output, and
2) The transmitter or outboard PA, must not be capable of RF power output in excess of 15W.

Rule 2 is very nice, as it prevents any operator from getting tempted to wind the power up too much when the going gets difficult. But this 15W is still very QRO compared to our earlier 3W maximum. If you are interested in taking part, make sure you register with G3SJJ (J.C. Burbanks, Southlands, 16 Cotgrave Road, Plumtree, Nottingham NG12 5NX) to get the stationary and your site registered prior to the contest.

I believe several clubs or groups will be entering the QRP section, perhaps also some from countries outside the UK. If you live in the south of England there is the possibility of a club team entering, then contact Chris G4BUE (address below) if you're interested.

Yeovil QRP Convention

One of the most popular QRP gatherings in the south is held each May at Yeovil, Somerset, when the local club takes over a small school and puts on this small convention. It may seem small compared to some of the other rallies, but the atmosphere is great. They put on a very good range of talks, of interest to all amateurs and not only the low power enthusiast. Some traders also attend, but only those who have a genuine interest in this side of the hobby. Don’t expect to see any new equipment on sale, but lots of bargains and many components. This is one of my ‘highly recommended’ shows, it takes place on May 10 at the Preston Centre, Monks Dale, Yeovil. (Details from G3COR as under)

This year, in the lunch break between the talks they are running the 'Receiver Challenge'. Take along a receiver that you have built yourself. The rules are very simple; it must use not more than one diode and one terminal transistor and the aerial, including supports, must fit into a space whose volume is not more than 2500 cubic cm.

Each receiver will be tested against their one Watt transmitter on about 3.550MHz, about 15m away, and the receiver with the best performance will win. In the event of a tie, the transmitter power will be reduced progressively until a winner is found. What a smashing idea for a bit of fun at a gathering of this sort.

So dive into the junk box and have a go. This brings back the real meaning of the hobby, i.e., one to be enjoyed!

Full details of the rules may be obtained from Peter Burridge G3CCOR on 0335 810554. I am really upset to be missing this one but I shall be in Dayton again with my G-QRP Club hat on (report to follow).

QRP Day

This year’s International QRP day will take place on June 17, providing us with another chance to get on the air with a sniff of RF to work old friends and make some new friends. Logs to Gus GBPG at 37 Pickerill Road, Graysby, Merseyside, by July 17. Another event of interest to QRPers is the U QRP Contest over August 22/23. This is only a provisional date and more information later.

Ten-Tec 535 Argonaut II

Do you own one of these transceivers? Some operators are apparently having a few small problems with their set, and Chris Page G4BUE has agreed to collate the data on this. You can contact him at Alamosa, The Paddocks, Upper Seedley, Preston, by July 17. Another event of interest to QRPers is the U QRP Contest over August 22/23. This is only a provisional date and more information later.

Power reduction on TS440S

- Receiver Challenge...

Dick Pascoe G0BPS with the latest QRP news

It is very pleasing to hear so many stations from the old USSR operating QRP it seems that the barriers are coming down in the hobby as well as in the ‘Russian’ countries, we even hear of one intrepid Soviet amateur starting his own kit business for his countrymen. Have you also noticed the lack of ‘P.O. Box’ on the end of QSOs.

Kenwood TS-440S

Andy G4VPM recently wanted to reduce the power on his TS440S, however the drive control would not go low enough, and the power was not stable enough for him. Lowe Electronics came to the rescue with this modification, and as Andy says “a toggle switch in the supply line enables instant switching from QRO to QRP”. Well done Lowe.

What may not be so well known is that this modification will work on many rigs, a small negative voltage on the ALC line will provide for lowering the available power out. Even that supplied by a small 9V battery will suffice.

New QRP Contact

I was recently sad to hear that David G4HYY had resigned as the membership secretary of the G-QRP Club. Over the past four years he has handled the work with just the help of his wife Jennifer, but David says that at least now he will have some time to actually get on the air and perhaps build something! The new membership secretary is John Leek G0BRO. He can be found at Flat 7, 56 Heath Crescent, Free School Lane, Halifox, HX1 2PW.

Well that’s it for now. 72 to all, please send your news and views to me at 3, Limes Road, Folkestone or via. packet on G7SSEK.
Satellite Rendezvous

This month’s AMSAT-UK news, provided by Richard G3RWL.

Shuttle News

This month, INSPIRE, the Interactive NASA Space Physics Ionospheric Experiment will fly on US Space Shuttle ‘Atlantis’ on the STS-45 mission along with the next SAREX package. INSPIRE will use a 7500W electron beam generator modulated at audio frequencies between 50Hz and 7kHz, to transmit VLF radio signals through the Earth’s ionosphere to stations with appropriate receivers.

Because of space and power limitations, the SAREX mission will be restricted to battery powered FM voice operation on 2m; a so-called ‘CQ’ mission. The Shuttle’s orbit is to be 57 degrees inclination, 296 km high, so it will be usable from the UK, the duration of the flight is planned at being seven or eight days.

Satellite Tracking Bugs

There is a bug in several tracking programs which prevent autoupdating of Keplerian Elements from a NASA format input file when the day value is less than 100. This bug only showed up after the first of the year when the NASA EPOCH value began to have a blank in the hundreds position of the day number. However updates from an AMSAT format file are not affected, this is because the AMSAT EPOCH format has no blanks embedded in it. For example the AMSAT format would be 91012.345678 while the equivalent NASA format would be 91 23.45678. So if your software gets upset with the new year’s elements, look for this first and insert a zero instead of the blank.

While on the subject of software, some of the older programs require a sidereal correction which changes each year. The number for 1992 is 0.27477847 (the number for 1991 was 0.27547157).

Table 1. UO-11 Downlink Schedule

<table>
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<td>145.825MHz</td>
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<tr>
<td>From 00:00 Thur to 23:59 Tue (UTC)</td>
<td>645s</td>
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<tr>
<td>ASCII Telemetry</td>
<td>45s</td>
</tr>
<tr>
<td>ASCII Status Message</td>
<td>15s</td>
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<tr>
<td>Binary Telemetry</td>
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<td>ASCII Bulletin</td>
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<tr>
<td>Binary SEU Dump</td>
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<tr>
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| From 00:00 to 13:59 Wed (UTC) | 210s |
| ASCII WOD                  | 120s |
| ASCII Status Message       | 15s  |
| TOTAL                       | 135s |

| 435.025MHz              |          |
| From 00:00 to 1200 Sunday (UTC): 4800 Baud DSR Data |  |
| From 06:00 to 1400 Wednesday (UTC): 4800 Baud DSR Data |  |
| Because of power budget constraints, the 435.025MHz transmitter is off at all other times. |

Oscar 13

Some changes to the ‘normal’ schedule for this satellite have recently been decided, but it will incorporate the outcome of the mode-L debate. There now being sufficient feedback about this.

Up-to-date information about AO-13 operations is always available on the beacons, 145.812MHz or 435.658MHz in CW, RTTY and 400 bps PSK. The active command stations always welcome constructive feedback.

The recent round of ZRO tests ran from October 19th to December 8th. All of the tests proceeded without problems or significant QRM, and conditions for the tests ran from very good to excellent. This was the most consistent batch to date. The response to the tests has been overwhelming with reports from all AO-13 coverage areas. The majority have been from North America and Europe, and it’s hoped that all correspondence will by now have been answered. Schedule work begun in late December for the Spring tests, and the next series will take place when the satellite is once again aligned for Nadir pointing with the satellite aimed at the centre of the Earth’s disc while at apoapsis.

Russian Satellites

MIR Operators now have a Multi-Op/Multi-Transmitter capability. Both Aleksandr U4MIR, and Sergej U5MIR, are operating simultaneously on two different rigs, and the new Icom rig brought up recently for packet operation is apparently doing double duty. The cosmonauts are apparently becoming more comfortable with the equipment and are ‘experimenting’ with new configurations.

Oscar 10

In December DB20S reset OSCAR-10’s IHU, which was randomly switching from GB to EB beacon on Mode-B, than to GB on Mode-L (strong signals!) and back to Mode-B. Now the GB is transmitting only a carrier and Mode-B transponder is on again. Transponders still work fine, so enjoy AO-10! It’s currently available for Mode B operation when it is view, but as usual please do not attempt to use it if you hear the beacon or the transponder signals FVING.

Please mention HRT when replying to advertisements

HAM RADIO TODAY APRIL 1992
MicroSats

Listeners to UO-14 will have noticed that the directory broadcast facility has been in and working fairly well, apart from a software crash in December which was reloaded. Jeff G0K8KA was on holiday in the USA over the Christmas period, the re-loads certainly become quicker when Jeff's around at the University of Surrey!

There is now a new version of PB to go along with the directory broadcasts, and its on the satellite as file number 3d77. It's also available from the usual other sources (and me) and on G8LWY's phone BBS. Of less use is a newer version of PG which takes command line arguments instead of individual packet ACKs, this should allow re-loads of either UO-14 or UO-22 in a single pass with time to spare.

The only other news is that the UK has a gateway for packet forwarding on the microsat. Its G5TLM, run by G8TVJ, he got his notice of variation on Christmas Eve and was doing all the setting up and configuring over the Christmas break. This means there are now 30 World-Wide Satellite Gateways.

UoSAT-OSCAR-11

I'm pleased to say the UO-11 ASCII Bulletin Service has resumed. The Bulletin will be generated on a fortnightly basis at UoS (edited by Greg Jones G0/WD5IDV) and AMSAT-UK (edited by myself), reporting respectively on current events at UoSAT and other news. A new version of the forth diary software has been loaded and is currently operational on UO-11. Previously, the binary WOD was transmitted as one entire block with a single survey header at the beginning. Two problems arose from this method:

1) Users might miss the single survey header (packet 0) and not have defined what the data represented, and
2) If the WOD sequence was interrupted by another scheduled transmission, the WOD sequence started again from the beginning.

The new software now transmits additional survey headers every 32 frames, and the entire dump is transmitted in a number of smaller sized windows as a continuous sequence. These two corrections should reduce the possibility of not receiving the binary WOD and eliminate the need for very long binary WOD slots in the rotation. As a result of this revision, the amount of binary WOD has been reduced to two minutes per cycle. This change has been implemented to support users of the ASCII mode.

AMSAT-UK News

A date for your diaries is the AMSAT-UK Colloquium, this year being held from the 30th July to 2nd August as usual at the University of Surrey (we'll be there — Ed and Tech Ed!). Remember you'll need to book in advance if you want to come along. The G8LWY telephone BBS has a section for AMSAT-UK office stuff so, if you were going to phone Ron G3AAJ up at midnight, don't, leave a message there instead, this is also where you can download your software. The phone number is 081-547 1479, it's multi-speed, 8 bits, 1 stop, no parity.

For further information about AMSAT-UK or if you'd like to book your place for the Colloquium, contact: AMSAT-UK, c/o Ron Broadent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets membership info. As always, SWLS as well as licensed amateurs are very welcome.

UoSAT-OSCAR-22

UO-22 continues to produce outstanding images from its Earth Imaging System CCD camera. Recent pictures of an iceberg off Antarctica have been spectacular, and UO-22 is taking from 3 to 5 pictures a day, as weather permits. AMSAT-UK or if you'd like to book your place for the Colloquium, contact: AMSAT-UK, c/o Ron Broadent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets membership info. As always, SWLS as well as licensed amateurs are very welcome.
I recently received a copy of the latest issue of Mike G6AWD's excellent book, the 'Practical Guide to Packet Operation in the UK'. Comparing this to the first issue, which still sits next to my packet system and regularly used as a handy reference, the latest issue is almost twice as thick! The 137 page A4 sized publication, as well as acting as an introductory guide in taking the beginner through the 'first stages' of getting a packet system in operation, also acts as a comprehensive reference book for the seasoned 'end user' packet station. It includes a number of downloaded 'help' files from BBSs and the like in printed form, together with tabulated lists of UK BBSs and nodes. This issue even adds an appendix of several 'network' maps for the UK, Ireland, and the Netherlands. I'd certainly recommend this to 'old hands' and newcomers alike, and my thanks go to suppliers Siskin Electronics (0703 207587) for the provision of the review copy.

**New Software — TLHCLUST**

This is the provisional name given by Dirk G1TLH to his new program, which is intended to give a multi-purpose interface to the packet network. As well as providing a Bulletin Board System along the lines of YFB/MBL, it adds a 'forms' based message handling system for applications such as Raynet. As well as this, Dirk tells us it will implement and interface with the most popular user functions of AK1A's PacketCluster software.

The program is built on top of, and relies completely on, the BPQ switch for all radio-based operations. The message system will work in a similar way to the PacketCluster network, however Dirk feels that PacketCluster has a number of deficiencies which have resulted in him redesigning the protocol. He tells us that TLHCLUST should have a more reliable network between them which can, amongst other things, cope with multiple routes and user tracking, in a similar way to cellular-based radio systems.

For the SysOp, the program will allow 16 simultaneous connections together with a console task, a spooler, a snoop and a monitor window, and provision is made for the use of RS-232 ports also for either linking or extra user terminals. On-air testing should commence this month, with 'Beta test' releases planned to be available in early April. As well as a 'SysOp' version, a 'user' version will also be available such that any 'forms' used can be sent to users automatically.

**Practical Guide to Packet Operation in the U.K.**

**BY**

Mike Mansfield

**G6AWD**
the Maldives, a comparative article. This latest issue features a network together twelve page illustrated news-
through my letter box. This well put-
tem. Could this find a use in emergency
Cluster Working Group, recently came
see how it gets on.

BARGAINS FOR CALLERS SURPLUS AND SECOND-USER EQUIPMENT ALWAYS WANTED

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TELEPHONE: 0903-234987 FAX: 0903 239050

Scottish Amtor Mailbox
The first AMTOR mailbox to be licensed in Scotland, located in Cove, Aberdeen, came on air on December 9
with GM4EMX ® GB7EMX as SysOp. It's
main role is described as the passage of
mail between the south-west and the
north-east of the UK, with a secondary
role of providing a link to the Scottish
packet network for overseas mail. The
bands of operation will be 80m, 40m,
30m and 20m.

CTRL-Z, End of Message
With the news that Andrew G8TZJ
received the NoV for his mailbox
GB7LAN, along with the node
LANC72:G8TZJ, on December 24 as a
good Christmas present, that's it for this
month. Please keep me in touch with
what you're doing. I can be reached
by either post to the HRT editorial
address, by phone on 0703 262105 until
8.30pm Mon-Sat, fax on 0703 263429, or
of course via packet. Until next month, 73
from Chris G4HCL ® GB7XUZ.
I thought that early December would bring a return of the fabulous conditions we had on 50MHz on November 2nd, but for some reason this never materialised. Things got going again on six later in the month with the solar flux figures rising well over the 200 mark, not that I think that solar flux figures influence 50MHz propagation, but something does which we seem to be missing out on. Tropo on 144MHz and 432MHz were generally good during mid-December, but many people like myself had other things to do instead of playing radio! So on with the reports.

Geoff Brown GJ4ICD, working the world on VHF

144MHz and MS

Eric G8XVJ brings us an interesting report on the Quadrantids MS shower. Eric thought the peak (with him anyway) was around 2350z on the 3rd January, and this lines up with reports from other 50MHz operators who report that around this time there were tremendous bursts. Eric worked the following stations using SSB on the old random MS calling frequency of 144.200MHz; 4/1/92, LA2AB, IK4DCX, YU3XY, IV5AVM, IV3HVT (59+), I4XCC, DG6MG, F6DRO, I1DMP/JN35 (must have been good to get locators as well), ISJUX, IW2BNA, YT3ET, OK1OA, EA3FLN/JN12. Eric didn’t work any new squares, however it is a very nice mixed list all of which were worked within five hours or so. His equipment is a Corsair 2, LT2S transverter, a good old pair of 4CX250ls, and an 18 element ‘boomer’ aerial.

Dave G0DJA reports that he was not very active during the month of December, but concludes in his letter to me that with his QRP CW (5 watts or less) he has worked 8 countries, amazing stuff!

No Repeat

On with 50MHz now. You may well recall that November 2nd was a day that will never be forgotten, and most 50MHz DX operators predicted a repeat in early December. It just didn’t happen, in fact things were poor (for once!).

On the 8th, HC5K was into the UK and there was also a report of an aurora. The 13th brought in the W1 area for many. On the 15th there was heavy ‘Es’ to YU, and later an F2 opening to VE and W with S9+ signals. In fact signals were so strong that I could copy VEs on my handheld Sony PRO-80 receiver!

Ela G6HKM had a ball on the 16th and worked VE1XDX, VE1SLM, K3MLD, WA1AYS, W1ENQ, K2QE, K1GOW, K1DHO, N1GNN, W1EJ, W1CWU, NV1G, W1RCS, W1RBS, W1RVS.

23cm

Ela Martyr G6HKM sends in a report of working HB9AMH on 2/12/91, saying that conditions were poor during the cumulative contest on the 10th. Well at least somebody is still active on this band!

70cm

Conditions on 423MHz were good in the early part of the month, I even managed to catch a few rare bits of DX myself. Ela G6HKM worked HB9MIN/P on 2/12/91, who she said was 59+ from JN37. My DX was all in France and Spain, as the high pressure system just sat over Biscay. Daily openings to the south of France and the north coast of Spain were experienced, and signals with only a few watts were very strong.
way has now received her QSL from Tereck CN8ST, and now has 75 countries confirmed on 50MHz. This reminds me that the UK Six Metre Group still has two plaques available, one to the first class B operator with 100 countries confirmed, and one for the first SWL with 100 countries confirmed by QSLs. On the 17th VE1BVL was into GJ but not the UK, and that the UK Six Metre Group still has two Tereck CN8ST, and now has 75 countries to the band was having a field day, it was everywhere. OKI DIG who was new and one for the first SWL with 100 countries confirmed, confirmed on 50MHz. This reminds me to complete with LY2WR (except from day to day).

S9++, then came a very large 'Es' event. From Sierra Leone, the FY7 beacon was 3rd was good, early morning saw a return of the 9L1 beacon on 50.091 MHz and the 'skip' distance became shorter and the 'Es' was certainly building up. Another Far Eastern opening to Hong Kong (VS6) into the UK. These Far East openings are really out of character for the middle of the Equinox period, openings like these usually happen in October or March. Speaking of which, watch March 3rd with care (Geoff's been looking into his crystal ball — Ed), as during the past two years this has been a very good day for Eastern propagation. Back to the reports, and the 29th brought in big signals from W1 and W4 all around the UK.

1992 came in with a bang, on the 1st there was very strong 'Es' to OH, SM3, SM0, SM7, and Alan GI0OTC had QSOs with ESSMC, and possibly the first QSO from the British Isles with LY2WR. More 'F2' openings occurred on the 2nd into T12 (Costa Rica), YV, and P43 (Aruba).

Sporadic 'E' was becoming common during the past few days, and have you ever noticed that, for instance in June, Sporadic 'E' seems to build on a day-to-day basis? The MUF's rises until we have a very large opening on 144MHz, then for the next few days there is nothing. Well this certainly seemed to be happening in January! Propagation on the 3rd was good, early morning saw a return of the 9L1 beacon on 50.081MHz from Sierra Leone, the FY7 beacon was S9++, then came a very large 'Es' event. DL, CN8, OE, OZ, and LA were worked and the 'skip' distance became shorter meaning a rise in the MUF. Belgium and Dutch stations were S9+ down here in GJ, and the 'Es' was certainly building from day to day.

Later on the 3rd there was an 'Es' opening again, enabling many UK amateurs to complete with LY2WR (except me). Then came the 4th, this seemed to be like June 8th each year, Sporadic 'E' was everywhere. OK1DIG who was new to the band was having a field day, it was obviously a major part in this opening to the USA, as they had major Sporadic 'E' openings in their country at the same time as us. A combination of multi-hop 'Es' and F2 gave us a day never to be forgotten, even the DX Cluster network blew it's top and crashed. Openings continued on the 5th to IT9, 9H, 17, and 18. Again another F2 (Es assisted) opening occurred on the 6th between 1630z and 1900z! It seemed like everybody in the UK was on for this one, and all call areas in the USA were worked. G3WOS reports his best DX as W7, and G4ASR reports working strings of W5s and Os. The 7th continued with P43FM, YV4AB, KP2A, W1, 2, 3, 4, 5, 6, 7, 8, H18A, KM1E/C6A, VE1 and VE3 all being worked in the UK.

Other News

Bill Wiseman KM1E/C6A, worked into the UK on 4th January on 50MHz, and later on 28,895MHz he said the only stations he'd managed to work were: G3KOX, G3WOS, G4IJO, G6IOM, G3ZYY, G3KOX, G3WOS, G4IJO, G6IOM, G3ZYY;
I write this during January as the winds blow and the rain falls! Nevertheless the HF bands have been in reasonably good shape, with occasional openings to the Pacific on 10 metres. Personally, I started the New Year with a big effort on 30 metres, a band which is always full of surprises. I put up a full wave loop, just 25ft high at the top, and managed to catch stations such as H18A, VP5/WA2TMP, SU1HV, FY6SP, VO9QM, J79DX, FM5WD and KL7U. Gotaways (heard but not worked) included J37XC, PJ8AD, HK7/SM5HV, 5N0SKO, SU7M and 7P8EN. I also understand that one evening a station from Guam (KH2) popped up unexpectedly with a good signal into Europe. Incidentally, if all these callsigns are total gibberish to you, you need to get your hands on a list of DXCC countries and prefixes. There is one to be found in the RSGB Callbook, Geoff Watts of Norwich publishes an excellent list (I have the details if required), and there are a number of computer programs these days which allow you instant access to such information, as well as sunrise and sunset times, etc.

**DX News**

Firstly, don't forget that the Clipperton Island DXpedition, FO0CI, is due to kick off around March 8th, while the big operation from South Sandwich (on which Martti Laine, OH2BH, will now be one of the operators) runs from roughly 21st March until 4th April (depending upon weather conditions). If you are new to DXing or to the HF bands generally you may be tempted to give DXpedition operations like these a miss, as there will be plenty of easier ones on the bands to catch your interest. However, take it from me that these are two very rare ones which may not be back on the bands for many years, and you may well end up kicking yourself for ignoring them and instead working the kind of stations which turn up on the bands on a regular basis. Inevitably the pile-ups will be very large during the first few days of these operations, but will soon start to die down, especially on weekdays, and you should be in with a good chance.

Clipperton Island is in the Pacific, just over 1000 miles to the west of Nicaragua, and is not the easiest radio path. 15 metres will be a good bet in the late afternoons if propagation is favourable, or try 40 metres at our sunrise when the rest of Europe has lost propagation. Clippeton island is an atoll, just 1.6 sq km is area, and was once used as a refuelling point for the PanAm Clipper flying boats. However, it has long been deserted and amateur radio operations have been relatively infrequent.

The South Sandwich operation is a different matter altogether. The north-south path is very reliable on all bands, and they should be audible on one or more bands more or less round the clock. The South Sandwich islands stretch out over 200 miles of the south Atlantic and are home to a number of research stations, both British and Argentinean. However, there has been no amateur radio operation since LU3ZY was active back in 1980, so the interest in this one will be intense.

Now to other current and forthcoming activity. Aki, H18A, who I mentioned last month, returns to Japan at the end of March. He deserves a vote of thanks from all HF enthusiasts for the way he has plugged away at the bands throughout his stay in the Dominican Republic, giving many DX chasers a new country on one or more bands. AP/WA2WYR is currently active from Pakistan, especially on CW, and will be there until August. As I still need Pakistan on CW I will be in there looking for him. As I write this I have heard him once on 7MHz CW, but the pile-up was rather on the large side! QSLs go to KK6TX.

Finnish stations are using the prefix OG, rather than the more usual OH, throughout 1992 to celebrate 75 years of Finnish independence.
During January and February amateurs in Cyprus used the prefix P30 rather than the usual 5B4, in their case to celebrate the 30th anniversary of amateur radio in Cyprus.

It appears that Lloyd and Iris Colvin, veteran DXpeditioners, have been on their travels again. They signed HS0ZAP from Bangkok in December and then moved to Kampuchea where they operated as XU8KG. They only managed about 1500 QSOs from Thailand, but were able to attend the SEANET convention. There I am sure they were very welcome.

VP2V/W2GUP was due to be active from the British Virgin Islands until 4th March on all bands, CW only. QSL to his home call.

Finally, various DX bulletins were talking about a big effort from Afghanistan during February or March, signing YA5MM. The operators are said to include UT4UX and UJ8JMM. The plan is for two to three weeks of intense activity with a target of 25,000 or more contacts. There is also talk of appointing QSL managers in both Europe and the USA in order to avoid some of the QSLing problems which have plagued previous DXpeditions from the USSR.

Contesting

Last month I promised some further hints and tips on HF contesting. There are many reasons for taking part in HF contests. They range from increasing your scores (countries, prefixes, US states, or whatever might be appropriate), to testing out your station and operating skills, to trying to win (yes, really!), and lots more. Contesting as part of a contest group can also be great fun socially, provided you all have the same aims in mind (when half the group is going all out and the remainder are there for a good time, tempers can get a little frayed!).

Choose your first contests with care. There are many short, single-band contests (the RSGB LF cumulatives are a good example) in which you can get your feet wet without any massive logistical effort. The first few contacts will be difficult as you get mixed up with contest exchange, don't manage to write everything down quickly enough, or whatever. Soon, though, your skill will start to increase (the same comments apply to both phone and CW contests). The other approach is to dabble in one of the major contests (such as CQ Worldwide or one of the ARL contests), taking a break whenever the pace seems to be getting too hectic. Soon your confidence and your QSO rate will start to build up.

There are, in fact, two traditional ways to go about working a contest. Experienced contesters make good use of both. One is to 'run' the contest, finding a clear frequency (if that isn't a contradiction in terms in the context of a contest) and calling CQ Contest. This way other contesters will come to you. If you have a commanding signal or you are a rare multiplier (for example, in one of the RSGB contests, you may be the only station active from your county), then this method may well keep you going for much of the contest, with contacts coming in at a good rate of knots. The other approach is 'hunt and pounce'. This is exactly what it says. You tune around the band, or bands, looking for stations you haven't already worked and calling them. If you do not have a commanding signal this method may well give you a higher scoring rate. Even the big guns will use this method from time to time in order to find rare multipliers who might not otherwise call them. Hunt and pounce requires good discipline. You need to keep an accurate running check list in order to be able to see instantly whether the station you have just tuned to is one you still need (this is where computer logging really comes into its own). It is also essential to tune carefully in one direction rather than jumping about in frequency. Otherwise you will keep hearing the same loud contest stations again and again while missing out on many others.

Even when you are only entering a contest casually, it helps if you know before the contest starts things like the contest times, the bands it covers, who are eligible to work, and the contest exchange. If all else fails, ask one of the entrants making a certain minimum of contacts. The winners rely on filling up their log with contacts not only with other serious contesters, but with the more laid-back participants. It is very appropriate that these latter operators, who wouldn't otherwise get any reward for their efforts, have some encouragement to keep returning to the fray. Curiously enough, contest participation in international contests from other countries in Europe tends to be much higher pro rata than from UK amateurs, although those UK amateurs who do take part tend to end up with some of the highest scores (operators such as G3FXB and GW4BLE consistently come very high in the overall European rankings in the major contest events). This is all very well, but it would be great to see more up-and-coming contesters in the UK. Maybe they will come from the ranks of HRT readers?

That's it for another month. If you happen to be travelling to the USA in April, don't forget that the annual Visalia DX Convention (California) takes place from 10th to 12th April, and the Dayton Hamvention, the biggest of the lot, is a fortnight later. Meanwhile, as always I am only too pleased to receive your news, views or HF-related photographs, either via the HRT editorial address or to my Callbook address. 73 de Don.
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VISA AND ACCESS WELCOME —
Club News

Acton, Brentford & Chiswick RC meet at 7.30pm on the 3rd Tuesday of each month at the Chiswick Town Hall, Turnham Green, Chiswick, London W4. New members welcome. Date for your diary;
Mar. 17th Preparation for QRP/NFD — discussion.
Further details from Paul Truitt G4WQO, Tel. 071 938 2561

Aylesbury Vale RS meet on Wednesday evenings in the Village Hall in Hardwick, which is located off the A413 between Aylesbury and Buckingham. Dates to remember;
Mar. 18th AGM.
Apr. 1st Aspects of VHF aerials — Roger Piper G3MEH.
Apr. 15th Linear Amplifiers — Peter Chadwick G3RZP.
Further details from Martin G4XZJ, Tel. 0298 81097

Bangor and District ARS meet on the first Friday of each month at the Winston Hotel, Queens Parade, Bangor, starting at 8.00pm. Dates for your diary;
Mar. 7th My other hobby — practical demo by GI4JTF.
Apr. 4th Quiz night — Conducted by G3LJD.
Further details from club Chairman Des Kernaghan G1USK, Tel. Bangor 400251

Bristol (South) ARC meet every Wednesday at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol. Club events;
Mar. 16th Use of Bristol Group’s test gear — Dave G4WRW.
Apr. 25th 10m FM activity evening.
Apr. 1st CW night at the club.
Apr. 8th Visit to the HTV studios.
Apr. 15th Bring and Buy junk sale.
For more information telephone Whitchurch 832222 on a Wednesday evening.

City of Bristol Group meet on the last Monday in the month, 7.00pm for 7.30pm, at The Small Lecture Theatre, Queens Building, City of Bristol. Club diary;
Mar. 30th Use of Bristol Group’s test gear — Malcolm G8KH.
Apr. 27th Quiz night — Conducted by G3LJD.
Further details can be obtained from Dave Coxon G0GHM, Tel. 0275 855123

Bromley and District ARC meet on the 3rd Tuesday of each month, 7.30pm for 8.00pm at the Victory Social Club, Keighley Gardens, Hayes, Kent. Club events;
Mar. 17th Cycling in the Himalayas.
Further details from Mr. Geoffrey Milne G3UMI, 142 Hayes Lane, Hayes, Kent BR2 9EL. Tel. 081 462 2689.

Bromsgrove ARC meet on the 2nd and 4th Tuesday of the month at Lichfield Working Mens Club, Burcot, Bromsgrove. Forthcoming events;
Mar. 10th Natter night.
Mar. 24th Redditch Heart Foundation — Mike Wilkes.
Apr. 14th Night on the air.
Apr. 28th Oscilloscopes — practical.
Further details from Mr. D. Edwards G4TUI, Tel. 0527 540675

Bromsgrove and Dovers ARC meet on Friday nights at the Avoncroft Art Centre, South Bromsgrove, WVR. Other Fridays from the club’s own shack with construction, natter nights and HF operations. Visitors welcome. Forthcoming events;
Mar. 13th AGM.
Apr. 10th Homebrew constructors contest.
Further details from Joe Poole G3MRC, Tel. 0562 710010

Chichester and District ARC meet at St. Pancras Hall, St. Pancras, Chichester, on the first and third Tuesday of each month at 7.30pm. A date for your diary;
Mar. 17th AGM.
Further details from club Secretary D. Clear G0KNU, Tel. Chichester 573541

Conwy Valley RC meet on the first Thursday of each month at The Studio, Penrhos Road, Colwyn Bay, Clwyd at 7.15pm. A date for your diary;
Apr. 2nd Visit by Dragon ARC — ‘Return Debate’.
Further details from Merlyn Jones GW4N/NL, 72b Princes Drive, Colwyn Bay, Clwyd LL29 8WF, Tel. 0492 530725 or Ray Jones GW3MDK.

Cornish ARC meet at Perranwell Village Hall, Perranwell Station, Perranwell, Truro, all meetings start at 7.30pm. Their main meetings are on the first Thursday of each month, consisting of a short business session followed by a talk. The activities night is an informal meeting for construction projects, repairs and general radio related chat. The computer section meet for an evening of computer related talks and discussions. Dates for your diary;
Mar. 9th Computer section.
Mar. 10th Activities.
Apr. 2nd AGM.
Apr. 7th Activities.
Apr. 13th Computer section.
Further details can be obtained from Mr. G. Bate, 9 Trezithney Rd, Carharrack, Redruth, Cornwall TR16 5GZ, Tel. 0209 820836

Dragon ARC meet on the first and third Mondays of each month at the Fourcresses Hotel, Menai Bridge. Club events include;
Mar. 16th Amateur Television — John GW3JG.
Apr. 2nd The Grand Debate — a visit to Conway Valley ARC.
Apr. 6th The Royal Charter — Robert GW3CGN.
Apr. 20th Easter Bank Holiday — A general discussion.
Further details from the Secretary Tony Rees GW0F MQ, Tel. 0248 600963

Echelford ARC meet on the second and fourth Thursday in each month, 7.30 for 8.00pm, at The Running Man pub, Pellon Lane, Halifax, 730pm prompt. The first Tuesday evening is an informal ‘Noggin and Natter’ night, third Tuesday events as follows;
Mar. 17th QRP — Malcolm Dobbs G3LJD.
Apr. 21st Marconi ‘The Vision Realised’ — H. C. Scott M.B.E.
Further details can be obtained from David Moss, Tel. Halifax 20 2056

Hambleton ARC meet every Monday during term time in Room A5, Northallerton Grammar School at 7.30pm. Many of the meetings are RAE classes, other events are;
Mar. 23rd Model Engineering — Frank G0LE.
Apr. 6th Club project night.
Further details can be obtained from Nigel Robertson G0NHM, Tel. 0697 796608

Horndean and District ARC meet on the first Thursday of each month at Horndean Community School, Barton Cross (off Catherington Lane). Horndean, Hants. Club event;
Apr. 2nd ‘Natter night’.
May. 7th EMC update.
Further details from S. W. Swain, Tel. 0705 472648

Horsham ARC meet on the first Thursday of each month at The Guide Hall, Denne Road, Horsham, W. Sussex starting at 8.00pm. Club events;
Apr. 2nd Homebrew evening.
May. 7th Miniature aerials — talk by G3LDO.
For further details contact Peter Stevens G8SUI, Tel. 073794 2150

Keighley ARC meet at the Cricket Club, Ingrow, near Keighley every Thursday at 8.00pm. Most club meetings are ‘Natter nights’ other events include;
Mar. 12th Night on the air G0KRS and G7KRC.
Mar. 26th An introduction to satellites — G7HT.
Apr. 9th ‘Natter night’.
Apr. 30th Maxon Slopes — G3FDW.
Further details from Kathy Connor G1GH on 0274 496222

please mention HRT when replying to advertisements
South East Kent (YMCA) ARC meet every Wednesday, 7.30pm, at the Dover YMCA, Leybourne Road, Dover CT16 1SN. The club run very successful Novice classes at the same venue also on Wednesdays from 6.30 — 8.00pm. The first Wednesday of each month is an evening for Novices (NOAA) where one aspect is dealt with clearly but simply. Club diary as follows;

Mar. 11th Winter project update.
Mar. 18th Natter night and shack activity.
Mar. 25th There's life outside amateur radio — talks.
Apr. 1st NOAA — evening for Novices and trainees.
Apr. 8th Construction contest.
Apr. 15th Natter night and Committee meeting.
Further details can be obtained from Eileen Bevridge G7HXJ, Tel. 0304 372868

Kettering ARS meet every Thursday at 7.30pm at The Electricity Sports and Social Club, Eksdale St, Kettering. A date for your diary;

Mar. 17th Howes Communications — talk and demo of kits.
Further details from Len G7EMM, Tel. 0536 514544

Maidstone YMCA ARS meet at the YMCA Sports Centre, Melrose Close, Maidstone, Kent. They have an RAE course starting on the 10th January, then every other Friday 8.00pm — 10.00pm, course tutor is Keith G4YTL, Tel. 0534 831504. Morse tuition is available every Friday at 8.00pm, Novice classes every Wednesday, but first contact Martin GOLCH, Tel. 0622 744545. For further information about the club contact the Secretary C. Roberts, Tel. 0622 670936

Mansfield ARS meet on the first Thursday of each month, at the Polish Catholic Club, off Windmill Lane, Woodhouse Rd, Mansfield, for a 7.45pm start. Dates for your diary;

Apr. 2nd Construction contest and guest speaker.
Apr. 5th/6th Weekend on the air — Sherwood Forest Award.
Further details from Mary GONZA, Tel. 0623 765288

Norfolk ARC meet every Wednesday at 'The Norfolk Dumpling', The Livestock Market, Harford, Norwich, 7.30 for 8.00pm start. Club dates;

Mar. 11th Real radio evening.
Mar. 18th Informal and Committee meeting.
Mar. 22nd Surplus equipment auction / bring and buy.
Mar. 25th Weather satellites — Richard Gedge.
Apr. 1st AGM — please support your club!
Apr. 8th Radar — talk by Officer from RAF Neatishead.
Further details can be obtained from Jack Simpson G3NJQ, Tel. 0603 747992

Nottingham ARC meet every Thursday, 7.30pm. In the Sherwood Community Centre, Mansfield Road, Nottingham. Forthcoming events include;

Mar. 19th Constructors' cup competition.
Mar. 26th Shortwave listening — Martin G6ABU.
Apr. 2nd AGM.
Apr. 9th Forum.
Further details from Rex Beastall G1LRI, Tel. 0602 732740

Poole RAS meet on the second and last Friday of each month, at Lady Russell Courts House, at the rear of the Jellico Theatre, Poole College of Further Education, Constitution Hill Rd, Poole, Dorset. Meetings start at 7.30pm. Dates for your diary;

Mar. 13th Introduction to satellites — Peter G7AZP.
Mar. 27th On Air, construction projects, and CW practice.
Apr. 10th AGM.
Further details can be obtained from Mr. V. Cotton, 45 Branksome
Hill Rd, Bournemouth, Dorset BH14 9LF Tel. 0202 760231

Pwys (South) ARC meet on the first Tuesdays most months, 7.30pm at the RAF Club, The Street, Brecon, Pwys. Club talk and event;
Apr. 7th Bring and Buy sale
Further details from the Chairman, Bob Price GW3ECH, Tel. 0874 94266

Reading and District ARC meet on the 2nd and 4th Thursdays, 8.00pm, at The Woodley Pavilion, Woodford Park, Hadden Drive, Woodley, Reading, Berks. The club diary of events;
Mar. 12th British WW2 radio design.
Mar. 26th Spring junk sale.

RhyL and District ARC meet in the committee room of Bodlwydan Castle, Clwyd, on the first and third Mondays of each month. A date for your diary;

Mar. 10th Build your own computer — Dave GW4DMR.
Further information on the club may be obtained from the secretary Ken Padley GW7JAR, Tel. 0745 338276

Rhodcell and District ARS meet every Monday at T. S. Froebisher, Greenbank Rd, Rhodcell. The society have a regular programme of events planned, including the following;

Mar. 10th Hams and libraries.
Mar. 23rd Construction night.
Mar. 30th EGM — elect a new committee.
Further information from Brian (Secretary), Tel. 061 653 8316, or Dave (Chairman) Tel. 0706 32602.

Southgate ARC meet at 7.30pm in the Winchmore Hill Cricket Club Pavilion, Fir Lane, Winchmore Hill, London N2. Forthcoming events;

Mar. 12th Talk by Mike Dennison G3XDV from the RSGB.
Mar. 26th Club debrief after London Show, videos and photos.
Apr. 2nd Construction contest.
Apr. 16th Construction contest project.
Further details from Brian Shelton G0MEE, Tel. 081 360 2453

Stourbridge & District ARS meet every first and third Monday of each month, at the Robin Woods Community Centre, Scotts Road, Stourbridge, commencing at 6.00pm. Events include;

Mar. 16th AGM.
For further details contact Dennis Body G0HTJ, 53 Grove Road, Walscott, Stourbridge, W. Midlands DY9 9AE.

Stratford upon Avon & District RS meet at the Home Guard Club, Main Road, Tiddington, Stratford upon Avon, at 7.30pm. Club dates include;

Mar. 9th Open evening.
Apr. 13th AGM and surplus sale.
Apr. 27th Whits on 80m — John Allen G4PDP.
Details from A. Beasley G0GCKJ, Tel. 0603 882 495

Mid Sussex ARS meet every Thursday in term time, 7.45pm, at Marle Place Further Education Centre, Leylands Road, Burgess Hill, West Sussex. Club event;
Apr. 16th Spring junk sale.
Further details from John Fuller G0OIO, Tel. 0444 450957

Sutton and Cheam RS meet on the 3rd Thursdays each month, 7.30pm for 6.00pm at Downs Lawn Tennis Club, Holland Ave, Cheam, Surrey. Natter nights are on the first Monday of each month in the Downs Bar. Other events;
Mar. 28th RSGB national VHF convention.
Mar. 19th Construction contest.
Further details can be obtained from Nick Challacombe, Tel, 0734 722489

Thornbury and District ARC meet every Wednesday at the United Reform Church, Chapel Street, Thornbury commencing at 7.30pm. Talks start at 8.00pm, CW practice sessions are held 7.30—8.00pm. Club events;

Mar. 11th General meeting/natter/operating night.
Mar. 18th Technical discussion.
Mar. 25th VHF/HF activity/natter night.
Further details can be obtained from Tom Cromack G0FGI, Tel. Thornbury 411096

Three Counties ARC meet every other Wednesday, 8.00pm, at the Railway Hotel, Liphook. Club diary of events;
Mar. 11th Cellular Telephones and Personal Communications.
Mar. 25th Demonstration of packet radio.
Apr. 8th Long distance microwaves.
Apr. 22nd AGM.
Vange ARS meet every Thursday, 8.00pm, in the main hall of Barstable Community Centre, Long Riding, Basildon, Essex. They have a junk sale each first Thursday in the month, other events are;
Mar. 12th EMC — G3JWl.
Mar. 19th Film — The Catch that Nobody Wants.
For further details contact Tony Howe G3PLF, Tel. 0268 762496.

Verulam ARC meet at the RAF Association Headquarters, New Kent Road, St. Albans, at 7.30pm for 8.00pm on the second and fourth Tuesdays of each month. On the second Tuesday there is an activity evening and on the fourth Tuesday the monthly main meeting. Club talk;
Mar. 24th The annual G3PAO memorial lecture — EME Techniques.
Further details from Walter Craine G3PMF, Tel. 0923 262180.

Wimbledon and District ARS meet on the second and last Friday of each month in St Andrews Church Hall, Herbert Road, Wimbledon SW19. The second Friday is normally a general activity evening, other events and talks are;
Mar. 27th Surplus equipment sale.
Apr. 24th Oscillators — George Cripps G3DWW.
Further details from the club secretary Chris Frost G0KEB, Tel. 081 397 0427.

Wrexham ARS meet at Maesgwyn Road Community Centre, Wrexham. A date to remember is April 16th — Video — The secret listeners.
Further details from Martin GW0KTY or Ruth GW7FNR, Tel. 0978 268887.

Yeovil ARC meet every Thursday at The Red Cross HQ, Grove Avenue, Yeovil, Somerset. Many of the meetings are construction and operating evenings, other events are;
Mar. 19th Constructors contest — adjudication.
Apr. 2nd How to DX — G3NOF.
Apr. 16th Video — The secret listeners.
Apr. 23rd AGM.
Further details can be obtained from Mike Woodford G0JVG, Holm Wood, 5 Orchard Close, South Petherton, Somerset TA13 5DX.

Verulam ARC meet at the RAF Association Headquarters, New Kent Road, St. Albans, at 7.30pm for 8.00pm on the second and fourth Tuesdays of each month. On the second Tuesday there is an activity evening and on the fourth Tuesday the monthly main meeting. Club talk;
Mar. 24th The annual G3PAO memorial lecture — EME Techniques.
Further details from Walter Craine G3PMF, Tel. 0923 262180.

National and International

G-QRP Club publish a quarterly magazine devoted to low power communication, and hold regular get-togethers. Their secretary is Rev. C. Dobbs, St. Alden’s Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE, Tel. 0706 3812.

International Short Wave League who as well as running an International GSL bureau for amateurs and SWLs, have a monthly newsletter and regular get-togethers at their rally stands. For details send an A4 sized SAE to: ISWL HQ, 10 Clyde Crescent, Wharton, Winsford, Cheshire. CW7 3LA.

The Irish Radio Transmitters Society send out regular newsletters giving details of local activities, the contact man for this is Dave Moore E4MBZ, 12 Castle Ave, Carrigtwohill, Co Cork. Tel. (Eire) 021 893555.

Radio Society of Great Britain are based at Lambda House, Cranbourne Road, Potters Bar, Herts. EN6 3JE Tel. 0707 50015.
They have a unique blend of full-time staff at Potters Bar coupled with many volunteer officials around the country. Potential Novices — contact them for details of your local Novice course.
They also publish books, maps, and look after special event call-signs.

British Amateur Radio Telescope Group (BARTG) have a quarterly magazine, held two contests and a rally each year. For information on the group contact their Secretary and Publicity Officer Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ via packet, G4ATG @ GB7BAD. To join BARTG contact Peter Adams, GB2LB, Tel. 0923 220774.

British Amateur Television Club (BACiC) is run for those interested in television transmitting, receiving, video, and SSTV, they also hold an annual rally. For further details contact the membership secretary, Dave Lawson, Grenelhurst, Pinewood Road, High Wycombe, Bucks HP12 4DD.

To include your club, or rally, in this feature, make sure you send us your events details early. We’ll then make sure our readers know exactly what you’re up to each month. Note we only list active clubs, i.e. those who regularly send us details of their planned talks/events, so if they’re not listed here they’re obviously not very dynamic! Dates to be included in the issue published on the first Friday in May must reach us by the 13th March, addressed to ‘HRT Club News’ at P. O. Box 73, Eastleigh, Hants, SO5 5WG.

Rallies

March 15th
7th Annual Wythall Radio Club Rally will be held at Wythall Park, Silver St, Wythall (near Birmingham, A435, 2 miles from junction 3 on the M42). The rally is open from 11.00am to 5.00pm, admission is 50p. There will be the usual traders in three halls, bar and refreshments, and a bring and buy run by the club. Further details can be obtained from the rally organiser Chris G0EYO, Tel. 021 430 7267.

Tiverton South West Radio Club Rally will be held at The Pannier Market, Tiverton, Devon which is located minutes from junction 27 on the M5. There will be two halls of trade stands, bring and buy stall and a mobile snack bar. Further details contact Walter Craine G3PMF, Tel. 0923 262180.

Pontefract and District ARS Annual Components Fair and Spring Rally will be held at Carleton Community Centre, Carleton, Nr. Pontefract, 11am to 4.30pm. Admission will be by prize programme, free prize draw for lady visitors.转动ers, bring and buy licensed bar, bookstall, car boot spaces available. Talk-in on 2m. Further details can be obtained from G0QNE, Tel. 0977 677006 or G0DAO, Tel. 0977 643101.

March 22nd
The Magnum Radio and Computer Rally run by Cunningham and District ARC takes place in the Magnum Leisure Centre, Harbourne, Irvine, Ayrshire. Doors open 11am (10.30 for disabled visitors). Entry is £1.50 by lucky programme. Trade stands, bring and buy, raffle, bar, refreshments, free parking. For further details contact Peter GM0FCD or Ian GM0UOE, Tel. 0294 212854.

March 28th and 29th
Argus Specialist Exhibitions 1992 Radio and Electronics show will be held at Sandown Park. See this months HRT for show guide.

April 5th
Launceston 8th Amateur Radio Rally will be held at Launceston College, Launceston, Cornwall. There will be two large halls with bring and buy, well known traders, Official Morse testing (applications through RSGB usual channels please), and hot snacks from 7.00am. Doors open at 10.30am, and talk-in on S22. For further Information contact Maggie, Tel. 040921 219 or Rodney and Joy, Tel. 0566 775167.

April 12th
Cambridgeshire Repeater Group Amateur Radio Rally is being held at Philips Communications Systems Catering Centre, St Andrews Road, Chesterton, Cambridge, with a wide range of items to interest all radio and electronics enthusiasts. There will also be a large junk sale and bring and buy auction. Doors open at 10.30am.
Further details can be obtained from Mike G6COC, Tel. 0223 440373.

April 19th
The Centre of England Easter Sunday Radio and Electronics Rally will be held at the National Motorcycle Museum, Bickenhill, near the NEC, junction 6 M42. There will be over 60 traders in three large halls, ample free parking, bring and buy and restaurant facilities. Doors open at 10.30am (10am for disabled visitors). Admission is £1 with concession for RAIBC members and senior citizens. Further details can be obtained from Frank Martin G4MUF, Tel. 0952 589173.
FOR SALE


Sony ICF2920D full coverage VHF airband shortwave receiver, 150kHz to 136MHz, with all accessories, boxed and manual, £130. Contact Mr. K. Potter (Whitby), Tel. 0947 603293.

Microwave Modules 2m transverter, 70. Microwaves Modules 2m linear, £80. Amiga A590, hard drive, 2 meg RAM, includes software, utilities etc., £280. Please contact Keith G1COM (Washington), Tel. 091 41 1650.

FRG-7700 plus two FRV-7700 and FFT-7700 in very good condition, manuals Included, £275. Realistic PRO-2006 (Essex), Tel. 0208 850586 after 6.00pm.

Tandy PC6/8K scientific pocket sized computer and combined calculator, moving display, memory storage, many modes of operation, cost £99 accept £40 ono. Contact Nicholas Byron (Cleveland), Tel. 0287 52622 evenings or weekends.

Yaesu FT-101E CW/SSB filter, immaculate, spare new PA valves, £295. Also KW Eastismatch ATU, £30. Contact G. Griesenow (Coventry area), Tel. 0203 307272.

Icom IC-R71E HF communications receiver, fitted board, remote control handset, Yaesu FR-7700 ATU, mono head-phones, as new and boxed, £650. Contact Mr. S. Clifton (Llandudno), Tel. 0492 878107.

Yupiteru HVT504 scanner, AA4 active aerial, scanner books, Salish shortwave set 500kHz-30MHz, £15 the lot, no offers. Local interest preferred.

Contact K. Wadcock (Wigan, Lancs), Tel. 02575 2001 after 7pm.

MFJ 948 MKii 3000W versus tuner, as new, £100. ERA microreader SA-438, new and boxed. Contact John Robinson (Bognor Regis), Tel. 0243 268648. Yaesu FT-101E CW/SSB filter, £325. FT-707, 6m, 2m, 70cm, sat board, £825. 2m FM mobile, £5, £100. Standard C528 dual band hand portable, 2m/70cm, extended CW/RTTY receive, case and nicad, £325. 6m linear, £130. £100, 75W. Alinco dual band mobile, remote head, £450. BBC B computer, disc drive, colour monitor, £225. In excellent condition. Contact Peter Wallace (Telford), Tel. 0902 613080.

Moyley V3 vertical aerial, 20m/15m, excellent condition, £250. Contact John Talbot, Tel. Coventry 465328 £60-700pm.

QRO HF linear amplifier, two x 813 valves grounded grid, full legal output power, includes PSU, compact and reliable, four spare valves, £220. York (Cybernet) 10m FM transceiver, inc. aerial, £15. DNT 10m FM transceiver, inc. aerial. Contact David White (Sheffield). Tel. 0246 414995.

Yaesu FT-707 HF mobile receiver, 100W output, matching FC-700 ATU, mobile mounting bracket, manual, service contract, plus an all band G-whip with top- bar mount, all in GWO, £500 ono. Contact Mark Taylor G0LJG (Norwich). Tel. 0206 821099.

NRR 5B with ESS unit, as new, £920. AR280 scanner, £276. Contact R. P. Williams (Northampton), Tel. 0604 718707.

Tokyo HC-200A 8 band ATU, £185. SWR/PWR meter, £350. Contact John Robertson GOKJU (Bognor Regis), Tel. 0243 898100.

Realistic PRO-34 scanner, PSU, £160. Contact G. Farrer (Kent), Tel. 0564 856883.

Realistic PRO-2006, 400 memories, 25-1300MHz, new condition, boxed, £200. Wanted Trio 1000 or similar general coverage receiver, £250. Contact Trevor Evans (Swansea), Tel. 0792 889861.

JIM scanner pre-amp with pre-amp, seldom used, £35. Realistic PRO-2005. Alinco ELH24B 2m 30W amplifier with pre-amp, second hand, £100. Contact John Pett (Llanelli), Tel. 9600 432.

Kenwood AT-200 and Kenwood SP-520, Wanted — Yaesu SP801P. Contact B. Tuffrey (Doncaster), Tel. 0302 695461.

Yaesu FT-707 HF transceiver, good condition, complete with manual, £150. Wanted with £250 no offers. Contact Mr. K. Potter (Whitby), Tel. 0947 603293.

Realistic PRO-2005 scanner, AM/FM, covers 25-520MHz, £180 ono. Contact S. Thompson (Deptford), Tel. 0208 692 9204.

Sagra 600 2m twin 4CX250B valued linear, 600W, brand new and unused, £650. Icom 756H HF transceiver, digital readout, 30W output power, includes PSU, £300. Contact Simon Brown G0NZQ (Orpington, Kent), Tel. 0892 859222.

S. Thompson (Deptford), Tel. 081 760-1300MHz, £180 ono. Contact Simon Brown G0NZQ (Orpington, Kent), Tel. 0892 859222.

W.A.A. 9000000 2m 100W 28/50MHz transceiver, £75. Alinco dual band mobile, remote head, £450. BBC B computer, disc drive, colour monitor, £225. In excellent condition. Contact Peter Wallace (Telford), Tel. 0902 613080.

Moyley V3 vertical aerial, 20m/15m, excellent condition, £250. Contact John Talbot, Tel. Coventry 465328 £60-700pm.

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JIM scanner pre-amp with pre-amp, seldom used, £35. Realistic PRO-2005. Alinco ELH24B 2m 30W amplifier with pre-amp, second hand, £100. Contact John Pett (Llanelli), Tel. 9600 432.
Kenwood TH-25E hand held FM transceiver, with PB6 battery pack 600mA, P9T 1000mA, charger, rubber helical, key, headset, book, chart, manuals, and training, condition excellent, £105. Contact Mr. J. R. Brown (Middlesbrough), Tel. 0342 853539.

Transverters:
- For FT-200 & FT-240 types 23/17/30cm, EME station 70cm, two 4CX250 linear 2m, PSUs, miscellaneous, condition fine, £50 each. Contact A. J. Peake (Northwich), Tel. 0262 242324.
- Realistic PRO-2024 base scanner, 60 channels, 68-88MHz, 118-136MHz, 136-174MHz, 380-512MHz, as new, boxed with manuals, £205. Swap for Yaesu FT-730R or similar. Contact A. J. Peake (Northwich), Tel. 0262 242324.

Kenwood Trio 215E 2m hand held 500mA battery pack and charger, two soft cases, condition good working order, £160. Write to: Mr. W. J. Black, 22 Alma Terrace, Hastings, Sussex TN37 6QG.


WANTED

Info on Radiovision Commander serial number F798 Leicester. Can anyone tell me anything about it, age etc. It is a valve job but works great. Contact John Redmond, 38 Queensdown, Tillicoultry, Clacks, FK13 6JD Scotland.

Manual/circuit information for Thomson Model 3125A L. M. S. plus FM receiver. Any expense promptly refunded. Write to: Mr. D. N. Wellington, 'Nordhills', Shipton, Sturbridge, Somerset TA10 8UD. Eddyadson solid state broadcast receiver serial number F794 in excellent condition, with power unit, cash, could collect. Contact Peter Lepino (Tillicoultry), Tel. 031 245 4301 any time.

G600 round type rotator. Also Kenwood SM-220 scope. Contact Dave Fox (Warley), Tel. 0121 568 3522.

Triro 9R-58DS manuals and/or circuits required by young SWL and trainee amateur, photocopies accepted, reasonable costs and postage refunded. Write to: Mike Palmer, 4 Kingsley Close, Wellingborough, NN8 2TH, Wiltshire. Sussex BN5 1ED. No callers please.

KW Viceroy or similar HF transceiver, working or faulty. Contact W. F. L. Churchill (Wimbledon), Tel. 0181 998 4739.

6m module to fit FT-726R. Contact V. F. Ranell, Tel. Rotherham 850517.

Write to; Steve Best, 19 Dene-garth, Ovingham, Northumberland NE25 3GN, or in the ZX Spectrum book on how to set up, please can you help. Write to; Mr. E. Farrer, 10 Colne Rd, Twickenham Green, Middlesex TW3 3940-1000 in good condition and reasonable price. Contact John Chapman (Manchester), Tel. 061 445 6110.

Philips UHF PX2 hand held, or Philips UF785 multi channel hand held, must be U band 440-470MHz. Contact Mr. M. Anderson (Burnley, Lancs), Tel. 0292 395457.

Grundig Satellite 2100 radio receiver, must be in very good condition and working order. Contact Pete Tankard (Sheffield), Tel. 01722 793938.

Details please to; Douglas Byrne G3KPO (Ryde, IOW) Tel. 0983 67865.

EXCHANGE

ERA MkIII Microreader and Realistic PRO-35 scanner, both still boxed, Christmas gifts, mint condition, for Yaesu FT-9600. Contact John Redmond, 38 Queensdown, Tillicoultry, Clacks, FK13 6JD Scotland.

Yaesu FT-480R multimode, sale or exchange for Uniden 2830. Contact M. Julians (Nottingham), Tel. 0302 531927.

Concorde MkIII converted to 6m with DTI authority, plus 6m beam, CTS 1600 hand held, speaker and charger. Swap all for receiver 0-50MHz with frequency reader, Yaesu FT-717, ham radio 70cm. Contact Mr. V. Lowe (Doveston), Tel. 0302 531927.

Icom IC-1050 converted to 10m with repeaters, Tristar 777 multimode converted to 10m, 10m line 100W. Exchange for communication receiver, base scan, or 2m rig. Contact John England (Bramham), Tel. 0937 844197.

Base radio receiver, UHF/VHF multi band with any accessories, wanted in exchange for Yaesu FRG-9600. Contact M. Julians (Nottingham), Tel. 0302 531927.

An example promptly refunded. Exchange for Yaesu FT-7400RH, Standard CS608D, or any similar dual band mobile. Contact Adrian G7WV (Maidstone), Tel. 0222 813080.

Amstrad GT2200 monitor module MF1, Amstrad 464C PC colour. Exchange for FRG-7, SRCX-30, DX302 receivers. Contact N. Beadsworth (N. Ireland), Tel. 0207 4674742. Londondeerry 4674742 after 7.00pm. Icom 551 50MHz transceiver, mint condition and boxed, with manual and mike. Exchange for FT-757GX. Also Yashica TL electric 35mm camera, extra lenses including Pentax 4/300mm, exchange for FC-770 auto ATU or WHY? Contact Ian Duffin (London), Tel. 0622 580202.

For ERA MkIII Microreader with RS232 display, I will swap my Olympus A24 35mm SLR camera, teleconverter lens to 200mm, Cobra bag to fit, built-in flash, and zoom lens, cost £400 new. AZ4 in A1 condition and little used. Will consider an alternative adder that could be used with a small monitor. Write to: Mr. P. Willmott, 59 Thirlemere Rd, Partington Urmston, Manchester M31 4PR.

Kenwood TR-751E 2m multimode with extended receive coverage, plus mobile mounting bracket, boxed and in good condition, £290. Contact A. Allcott (Solihull), Tel. 021 382 4331.

Philips UHF PF85 multi channel hand held, or exchange for Uniden 2830. Contact Mr. M. Anderson (Burnley, Lancs), Tel. 0292 395457.

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