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HRT

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Below, left: G4KYU on SANGRIA. Coronado Club 760.

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CQ de G8IYA

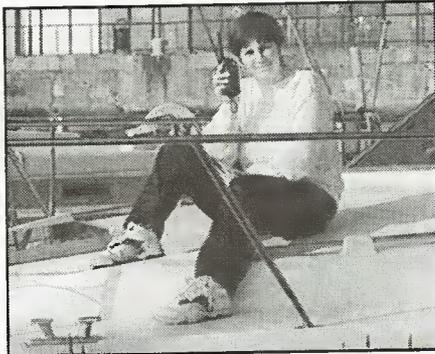
This Year's HRT 'Amateur of the Year' Award Winner

The mobile rally and exhibition season is now upon us, as you read this at ASP we'll all have been getting busy preparing for our many annual visits to these events. Our front cover this month also shows 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 R8E receiver kindly donated by Nevada Communications. Many pages of photocopies of nominations, and the accompanying information (this sometimes 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 collating 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 his arm to be photographed!

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LETTERS

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 decries 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' membership of many clubs — and often on Committees.

I have led an Electronics Club for

young teenagers within a Kent Youth Centre (in Thanet), for a decade or so now. Many of the youngsters have passed RAE exams and GCSE Electronics and one non-selective school lad went off to university and passed his B.Sc. in electronics. I was invited to act as Hon. Kent Novice Coordinator (probably because of this Youth Leadership experience). The Kent team of instructors have had more than one get-together at Canterbury, some of the considerable number of keen amateurs we have raised in Kent, travelling a long distance.

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,

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.

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 gobbledegook 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.

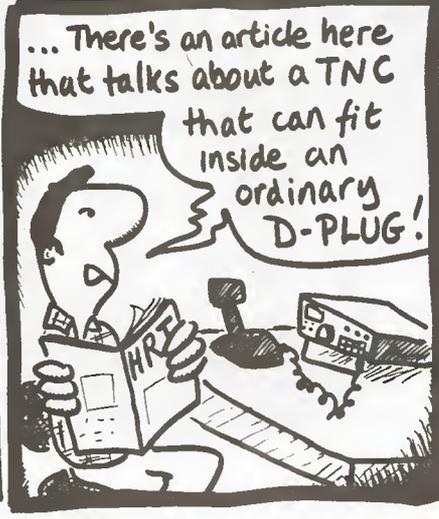
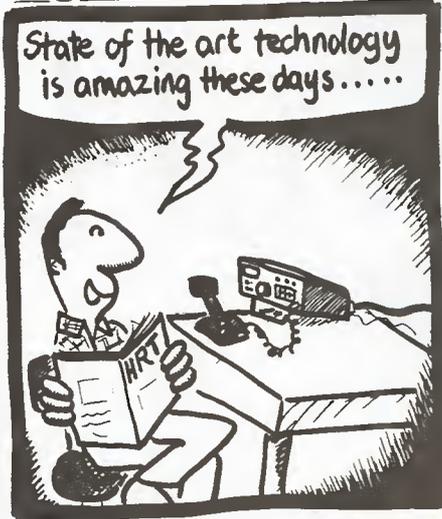
Yes there must be an exam, I do not dispute this at all. Amateur Radio must not go the same way as the now totally abused CB radio, but you only have to listen on 2m and hear loads of RAE licensed hams abusing the system. Is it alright to do this when you have your licence? I think not!

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 of nothing but electrical theory, not for me. Now if I had been 30 weeks, 2 hours a week, practical operating procedures, safety, educating me on how to

"TONE" BURST



By GOMEN



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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Watch this space for more news, 73's

Chris G8GKC, Gordon G3LEQ and John G8VIQ.

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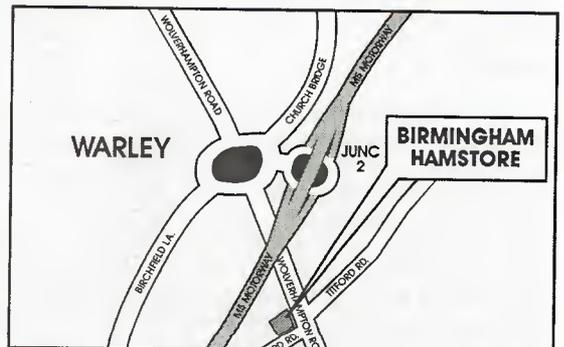


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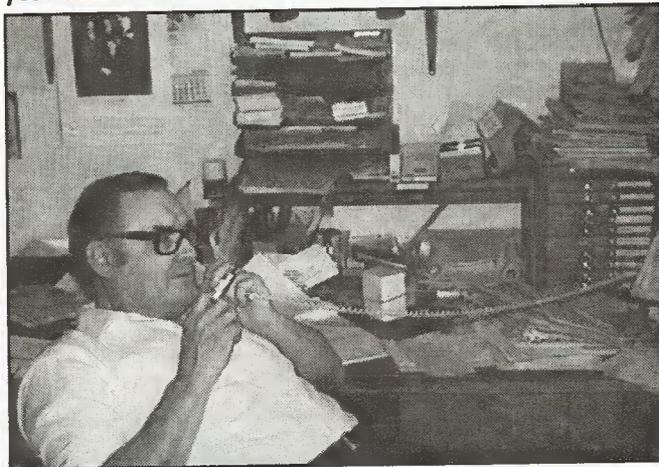
RADIO TODAY

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 G6DLJ 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.

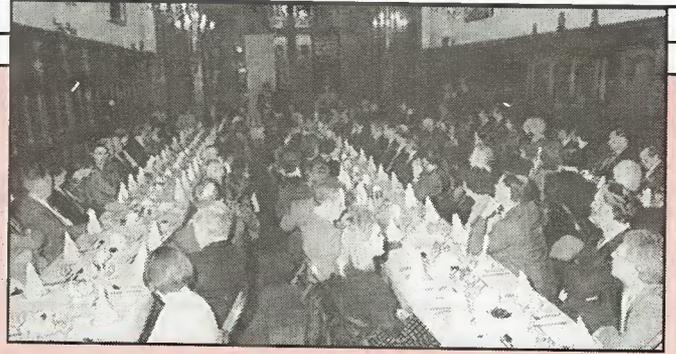


58th RSGB Presidential Installation

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 G13USS, 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, G13XRQ, 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 G13KYP, 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 G13XEQ.

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 GB8OEB. 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, 8 Chalkpit Road, Paulsgrove, Portsmouth, Hampshire PO6 4EX

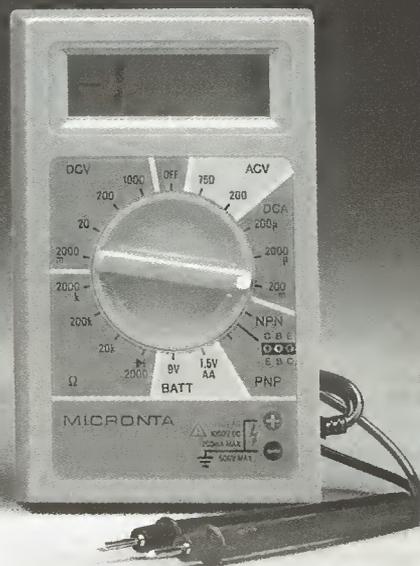
The Operation Euro-Baby team, (back left) Kevin Taylor, (right) Richard Hook G8LVB, (front left) Tony Sinclair, (right) Alan Hartill, all shown here with mascot 'Whitie'.



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Autoranging. Large display plus 32-segment bargraph. Data hold, range control, diode and continuity check. Measures to 1000 VDC, 700 VAC, 10A AC/DC, resistance to 30 megohms. With moulded rubber holster. Requires 2 "AA" batteries. 22-167 **£49.95**

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MINI DMM

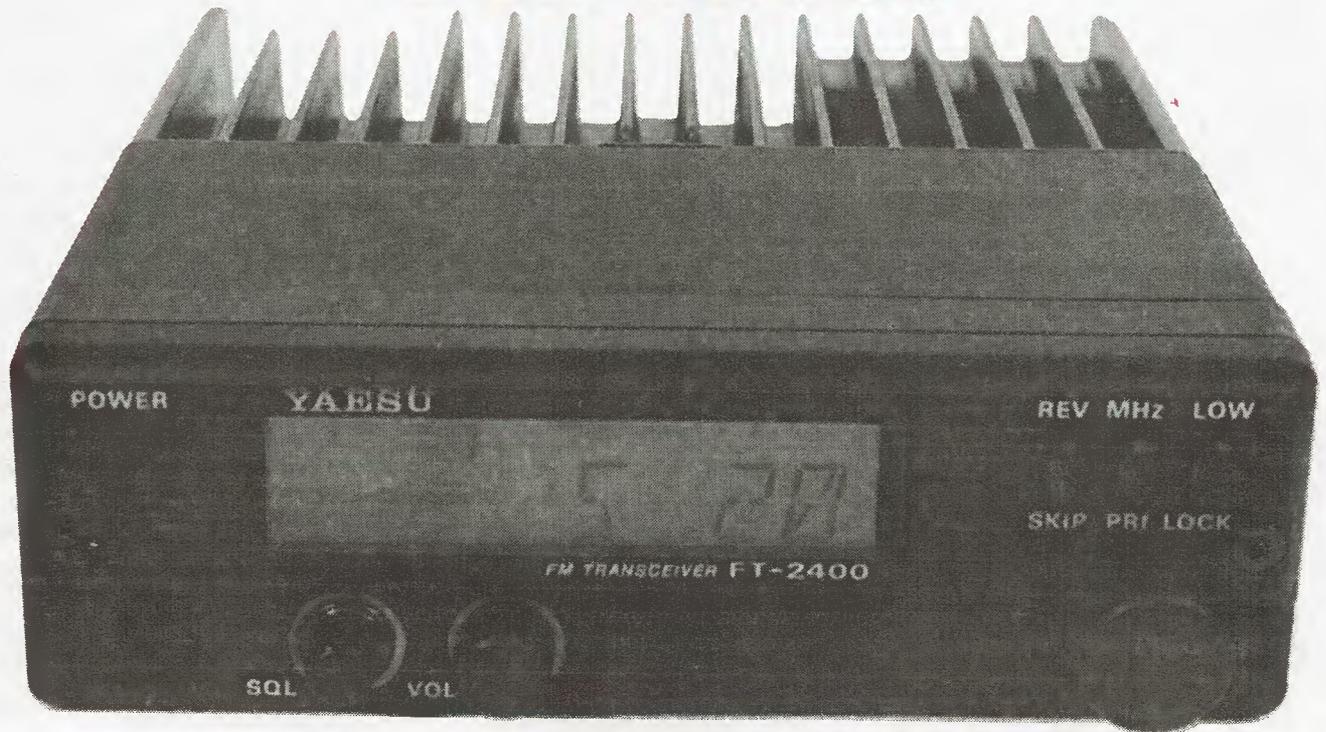
£22⁹⁵

Mini DMM. With built-in test leads. Measures 1000 VDC, 750V AC, 200mA DC current. Resistance to 2 megohms. Built-in transistor checker NPN/PNP hFE, 1.5 and 9v battery checker. Requires 9v battery. 22-9022 **£22.95**



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Yaesu FT-2400H Review



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.

Something New?

Each time I review rigs, I come to the conclusion that in most cases the trend in technical performance is becoming higher and higher each year. But sets often get smaller and smaller, with their associated small knobs and a plethora of tiny buttons which you're supposed to try and use on the move. Another problem which comes from the ever-increasing use of radio communication in our cities is that of receiving the signal of the station you're trying to communicate with without blocking and intermodulation problems from other users of the spectrum. Often when driving in a city

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?

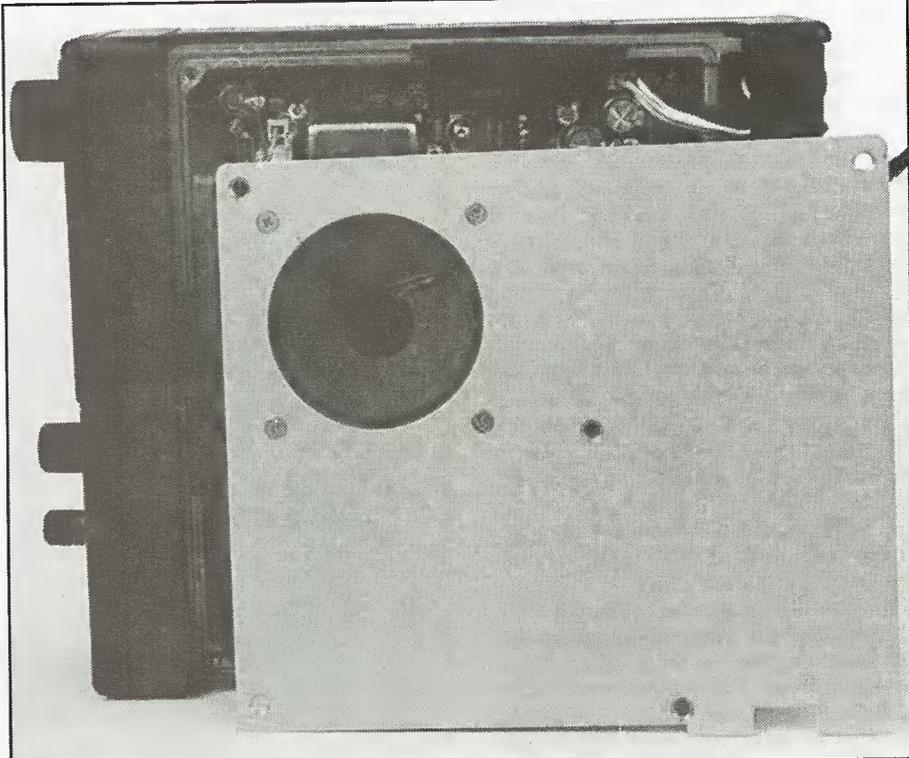
Bells and Whistles

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 'dial'

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



RF section screened by a large internal metal screwdown lid

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.



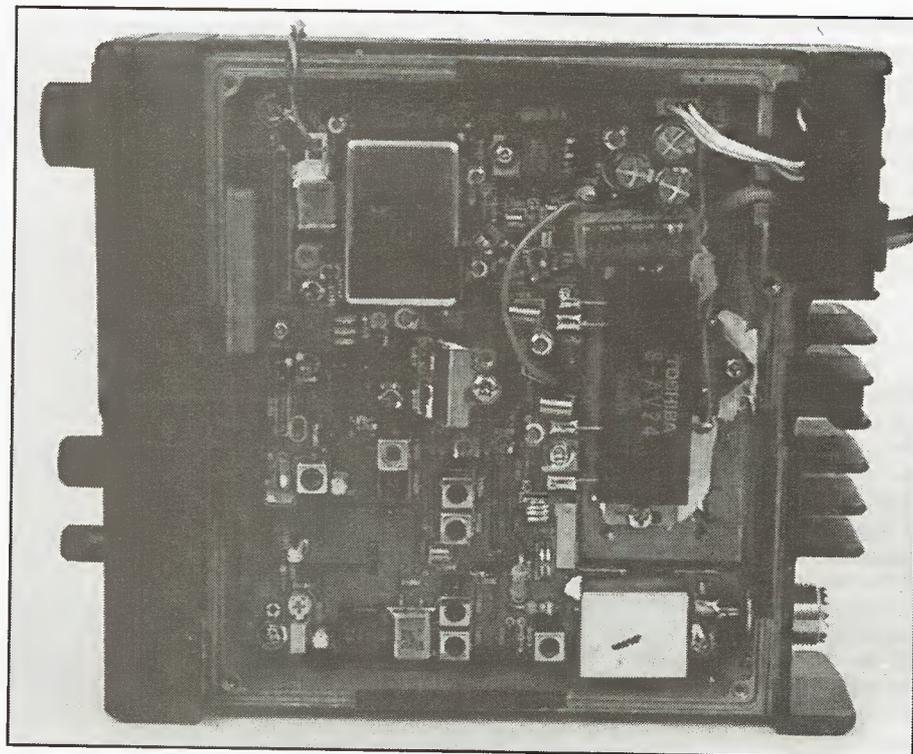
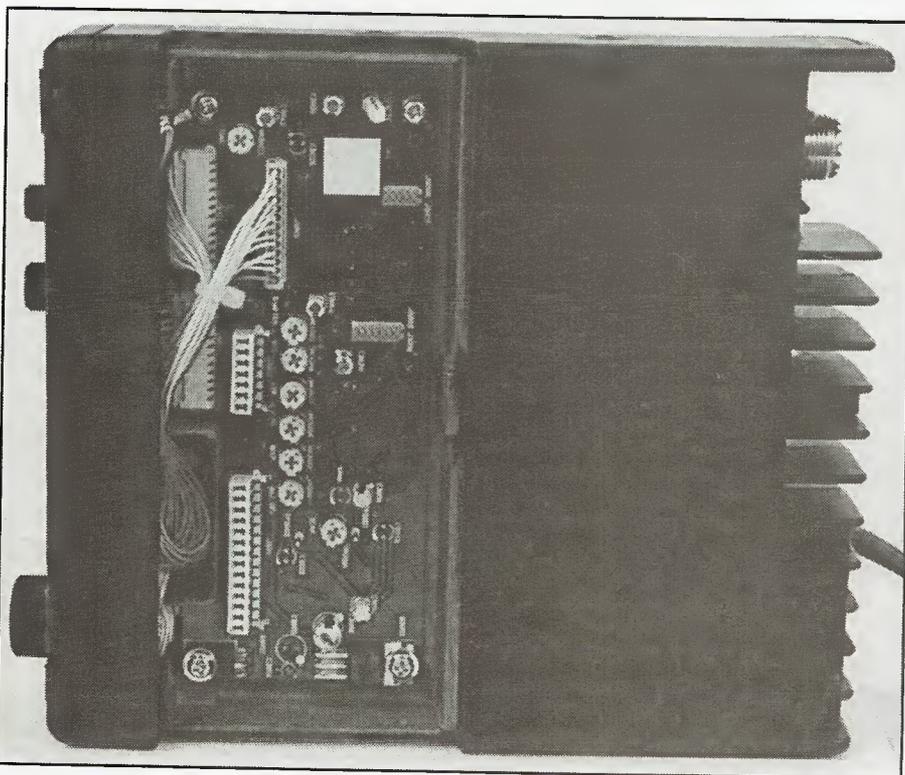
In Use

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 alphanumeric '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

Control Interface PCB



RF circuitry

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;

Sensitivity;	
<i>Input level required to give 12dB SINAD;</i>	
144MHz;	0.170uV pd
145MHz;	0.170uV pd
146MHz;	0.160uV pd

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 fascia 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;

<i>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;</i>	
+12.5kHz;	63.5dB
-12.5kHz;	52.5dB
+25kHz;	78.5dB
-25kHz;	78.5dB

Blocking;

<i>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;</i>	
+100kHz;	91.5dB
+1MHz;	93.5dB
+10MHz;	96.5dB

Intermodulation Rejection;

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

Maximum Audio Output;

<i>Measured at 1kHz on the onset of clipping, 8 ohm load;</i>
2.27W RMS

Image Rejection;

<i>Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signal;</i>
90.5dB

TRANSMITTER

TX Power and Current Consumption;

Freq.	Power	10.8V Supply	13.2V Supply	15.6V Supply
144MHz	High	34.2W/8.1A	55.6W/10.1A	58.1W/10.9A
	Mid	27.8W/7.3A	27.8W/7.4A	27.8W/7.6A
	Low	4.93W/3.7A	4.87W/3.8A	4.98W/3.9A
145MHz	High	32.9W/7.9A	52.5W/10.1A	58.1W/10.9A
	Mid	32.9W/7.8A	27.5W/7.4A	27.8W/7.5A
	Low	4.93W/3.7A	4.87W/3.8A	4.98W/3.9A
146MHz	High	31.1W/7.5A	50.5W/9.8A	56.6W/10.4A
	Mid	27.0W/7.0A	27.2W/7.4A	27.5W/7.3A
	Low	4.87W/3.6A	4.80W/3.7A	4.87W/3.8A

Harmonics;

2nd Harmonic;	-65dBc
3rd Harmonic;	-70dBc
4th Harmonic;	-71dBc
5th Harmonic;	-75dBc
6th Harmonic;	-68dBc
7th Harmonic;	-61dBc

Peak Deviation;

4.92kHz

Toneburst Deviation;

4.04kHz

Frequency Accuracy;

-150Hz

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

FT-1000

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- * General coverage Rx.
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16M20M60	60ft mobile tower£3031.50
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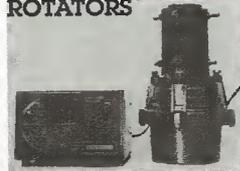
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36ft versions of above.
1 extra section add £45.83

All towers except mobiles are available from stock 13M20 and 16M20 series all supplied with auto brake winches. All are supplied with H2R head unit drilled to take GS-065 bearing. Holding down bolts for BP and FB towers are available at £29.38 per set extra.

Alternative winches and head units are available at extra cost. Delivery is by quotation dependent upon distance.

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G-1000SDX	Bell type 450 deg. var. speed.....£376.00	C
G-2000RC	Bell type round controller.....£454.68	C
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G-500A	Elevation meter controller.....£203.32	C
G-54008	Azimuth/elev. dual control.....£383.16	D
G-56008	Azimuth/elev. dual control.....£444.00	D
RC5-1	Bell type round controller.....£223.76	C
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RC5B-3	Bell type var. speed. & preset.....£689.68	D

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GC-038	Lower mast clamp G-400, 600 etc.....£17.32	B
9523	Channel master bearing.....£20.39	B
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MC1	Lower mast clamp RC5 series.....£35.76	C

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RC5W	5 way G-250, 400, 600, RC XR500 per mtr. £0.74
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RS40X	1-15v Variable	32A/40A max.....£109.00	D

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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 HRT, 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.

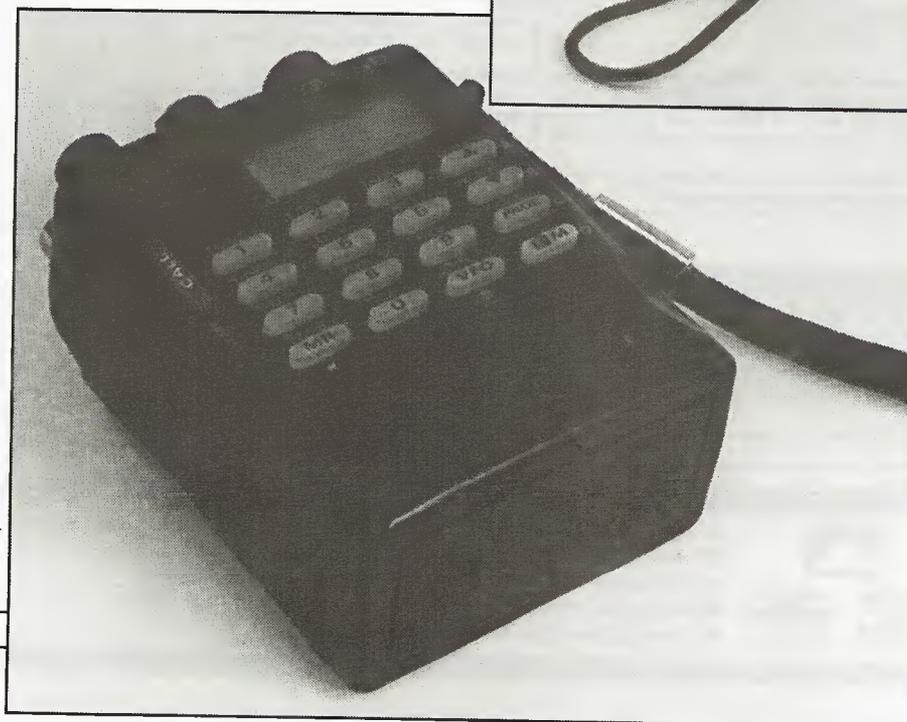
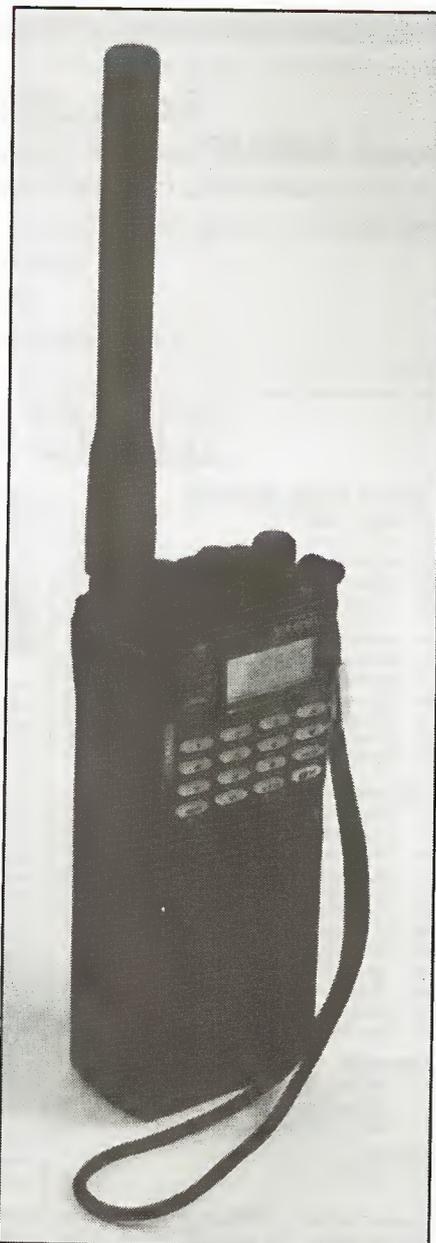
The set gives a nominal 2W output (1.5W for the 70cm FT-815) from the supplied 7.2V battery, and 5W from an optional 12V battery, also having a plug-in facility for an external supply of 5.5V-16V for mobile use and the like. A three-level switchable low power mode on transmit lets you conserve the nicad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

You can lock the keypad if you need to with a simple two-button action, thus leaving frequency control to just the tuning knob. 41 memory channels are available for storing your favourite frequencies, including a quick-access programmable 'call' channel which you get to by pressing the bar at the left of the keypad controls. By a press of the 'MR' buttons, any of the normal memories may be used as 'tunable memories', where you use the normal tuning knobs/buttons to QSY from the channel whilst retaining any programmed repeater shift, CTCSS tone and the like. Two of the memory channels may be used as upper and lower frequency limits for a programmed frequency scan, the set again automatically switching in a repeater shift for you when in the appropriate frequency range. Likewise the entire VFO range may be scanned in your selected frequency step sizes (5, 10, 12.5, 15, 20 or 25kHz), or of course you can scan your selection of memory channels. The scan in each case halts when the receiver squelch raises, and can be set to resume either when the signal disappears, or five seconds after stopping regardless of the squelch state.

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:

Sensitivity;

Input level required to give 12dB SINAD;

144MHz;	0.120uV pd
145MHz;	0.120uV pd
146MHz;	0.120uV pd

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 chan-

Squelch Sensitivity;

Threshold;	<0.06uV pd (<3dB SINAD)
Maximum;	0.15uV 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;	57.5dB
-12.5kHz;	55.0dB
+25kHz;	73.0dB
-25kHz;	72.5dB

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;	84.5dB
+1MHz;	95.0dB
+10MHz;	96.0dB

Intermodulation Rejection;

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product;

25/50kHz spacing;	70.5dB
50/100kHz spacing;	70.0dB

Maximum Audio Output;

Measured at 1kHz on the onset of clipping;

3 ohm load;	295mW RMS
8 ohm load;	255mW RMS
15 ohm load;	170mW RMS

Image Rejection;

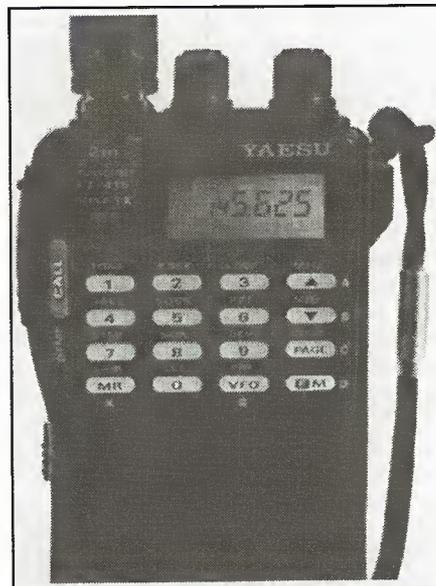
Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signal;

58.3dB

Current Consumption;

Measured with battery economiser disabled

Standby, economiser on;	11.5mA average
Standby, sq. closed;	44mA
Receive, Mid Volume;	68mA
Receive, Max Volume;	112mA



nel). Together with this, a CTCSS 'bell' function may be used, where the set may be set to beep 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 noisy on other handhelds. 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 12V 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

TRANSMITTER;

TX Power and Current Consumption;			
Freq.	Power	7.2V Supply	12.0V Supply
144MHz	High	2.33W/1.07A	5.66W/1.43A
	Low 1	610mW/495mA	610mW/500mA
	Low 2	1.66W/790mA	1.66W/780mA
	Low 3	2.33W/1.07A	3.08W/1.05A
145MHz	High	2.28W/1.06A	5.50W/1.38A
	Low 1	610mW/480mA	610mW/490mA
	Low 2	1.62W/730mA	1.62W/750mA
	Low 3	2.28W/1.06A	2.98W/980mA
146MHz	High	2.21W/1.04A	5.76W/1.38A
	Low 1	580mW/480mA	580mW/485mA
	Low 2	1.58W/730mA	1.58W/700mA
	Low 3	2.21W/1.04A	2.93W/945mA

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



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 'blinking 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

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.



G4KYU on Sangria, Coronano Club 760

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.

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. G4KYU 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 anything other than a channelised radio. It is impossible to concentrate on tuning and sailing at the same time.
- e) Ensure that all radio equipment is securely fixed in the boat and if possible is kept away from direct contact with water.
- f) If using a handportable ensure that the radio is attached to your person by some means, most radios don't like being in salt water! Waterproof covers are available for most handportables, and these certainly should be used.

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 everyday 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 distress 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 professionals 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 knowledge for the simple examination is relatively 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 an emergency situation.

Silence Periods

In the early days of Maritime radio communications, when spark transmitters and receivers with very little sensitivity or selectivity were used, it was very difficult to hear a weak distress signal. Silence periods were imposed on an international basis so that if a vessel

hadn't received a response to a distress call it could be certain that during the designated silence period no other vessels would be transmitting, and all operators 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 periods are still maintained on certain frequencies.

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 keeping watch on frequencies in the authorised bands between 415 and 535kHz must, during their hours of service, take the necessary measures to ensure watch on the International radio telegraph distress frequency, 500kHz for three minutes twice each hour beginning at xh.15 and xh.45 (UTC): those normally keeping watch on frequencies in the authorised bands between 1605 and 2850kHz must during their hours of service and as far as possible take steps to keep watch on the International radio telephone distress frequency 2182kHz for three minutes twice each hour beginning at xh.00 and xh.30 (UTC)".

It is therefore certainly **mandatory** to keep radio silence **if you are using 160m**, which of course is shared with maritime stations, and in order to avoid the possibility of causing interference to distress traffic it is suggested that all HF operators working /MM should observe the radio silence periods. Of course if you have a modern HF rig it will be possible to monitor both 500kHz and 2182kHz.

Other Signals

Remember that in addition to a wide range of two-way communications equipment that is installed on a modern



10m and 2m dipoles at the top of Sangria's mast

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 endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with relevant government requirements". Also it's worth remembering that "when Maritime Mobile, the licensee shall cease to operate the station on the demand of the vessel's master".

Equipment which may be installed includes:

- Decca Navigation*: A position fixing system that operates in the 70-130kHz band.
- Loran C*: A long range position fixing system. Uses frequencies in the 100kHz region.
- Omega*: Very long range navigational system. Uses a frequency of 10kHz.
- EPIRB*: Emergency Position Indicating Radio Beacons, operating on 218kHz, 121.5MHz, 243MHz and 406MHz.
- Radio Beacon Receivers*: Used for navigation purposes, operating in the band 283.5-315kHz.
- Navtex*: A weather and navigational message system. Uses frequencies in the 500kHz band.
- 500kHz CW* is still being used.
- Other electronic systems such as *echo sounders, radar, engine control systems*.
- Various *satellite* navigation and communication 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 frequencies may cause 'blocking' problems with Global Positioning System receivers using the nearby L2 frequency*).

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 permission 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 without a special licence. The only documentation that you need to take is your valid UK licence and the booklet BR68. CEPT stands for European Conference of Postal and Telecommunications Administrations, or if you like it better 'Conference Europe des Administrations Postal et Telecommunications'.

At the time of writing, the following

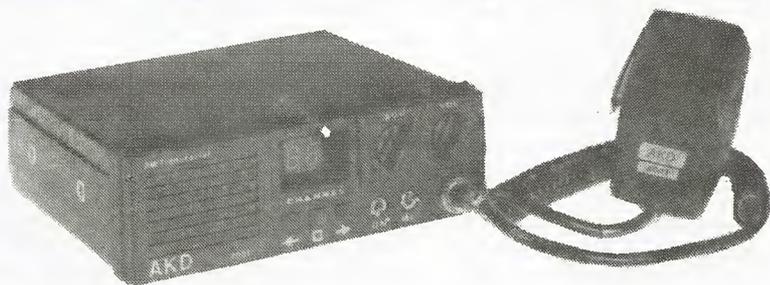
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countries have implemented CEPT recommendation T/R 61-01: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Spain, Sweden,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

There is no general guide to which of these countries allow maritime mobile operation, so do again check before going. The amateur licence states that visiting amateurs shall "comply with the requirements applicable to the use of wireless telegraphy at the location of operation in the host country". The call-sign however *does* become quite a mouthful; F/G3LWM/MM!

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.

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



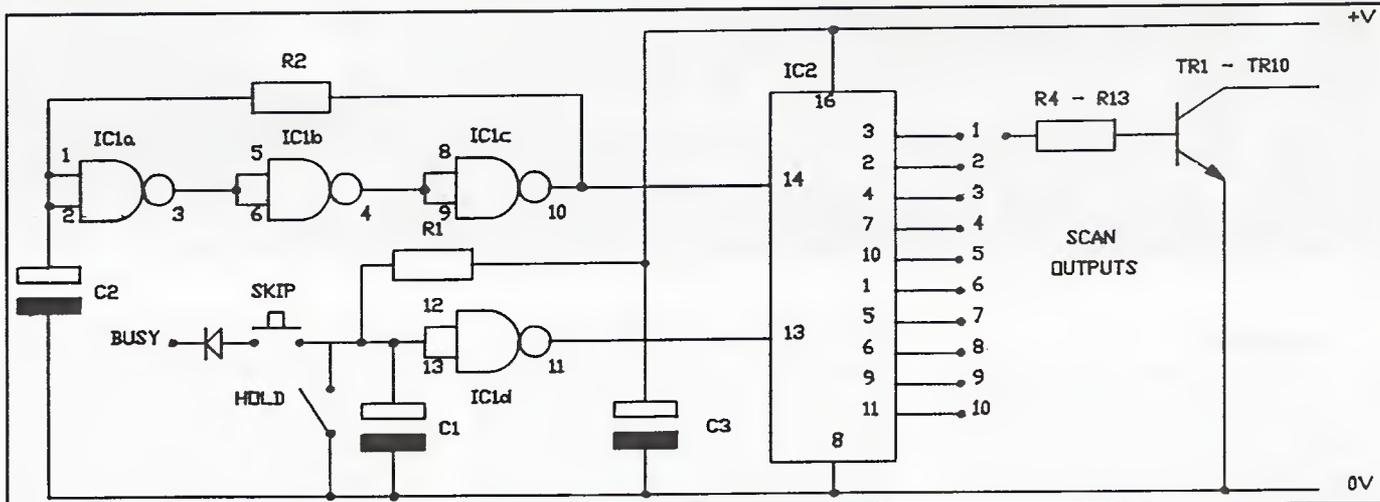
Project - Channel Scanner

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

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-

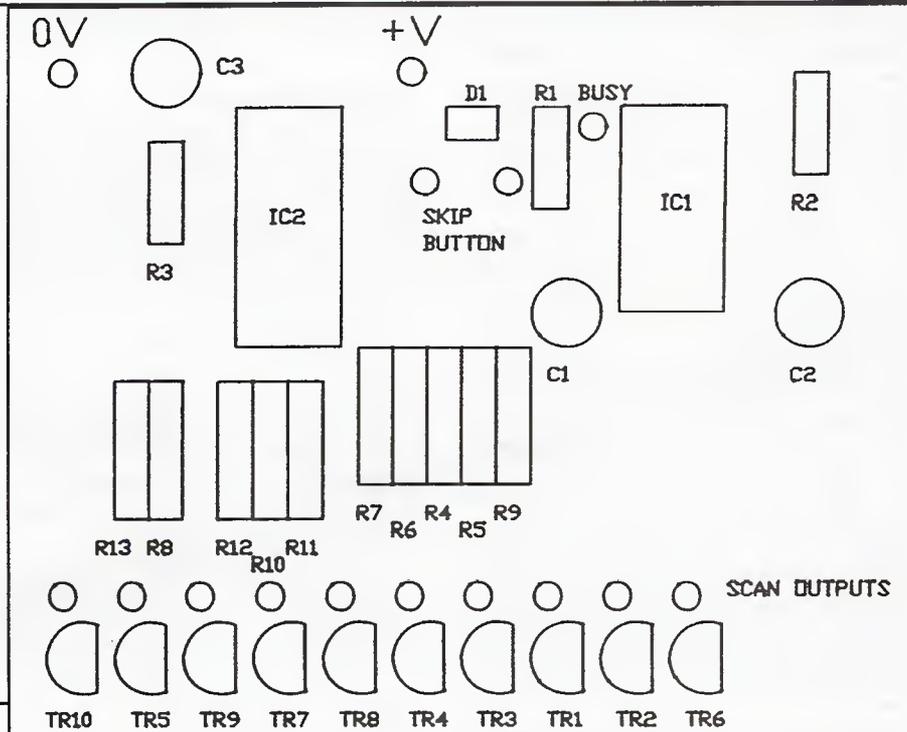
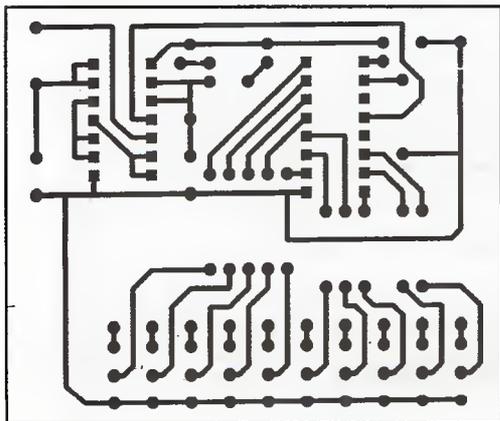
twisting operations, that I decided I'd better design another! The result is the following very simple-to-build circuit. This may either be built up on the PCB described, or more simply, as I did originally, on Veroboard or similar for the given circuit, using a layout to suit your own requirements and 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

Printed circuit board, full size, shown from track side



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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 is present to introduce a delay of around two seconds after the receive signal dis-

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

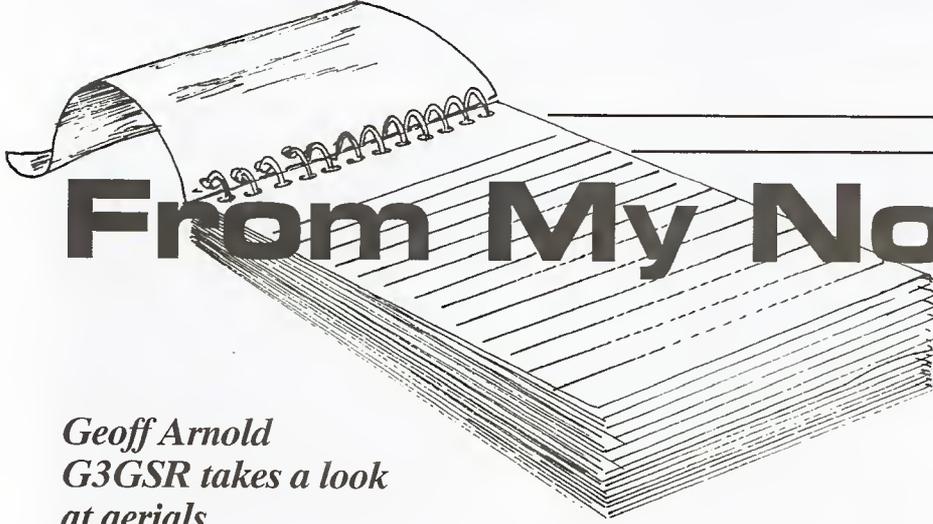
Apart from the ICs, which must of course be the correct types, none of the component values are critical, thus allowing 'junk box' or 'surplus' components to be used if available. R2 and C2 control the scanning speed, thus slight

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

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



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 radiate energy. 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 in series with it, near 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-shortening 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 aeriels for amateur use, especially in reduced-size dipoles or Yagis and in verticals (ground-plane aeriels), 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 induc-

tive 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 aeriels. 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 us to an understanding of why 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 aeriels 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 (1.6mm 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 aeriels, 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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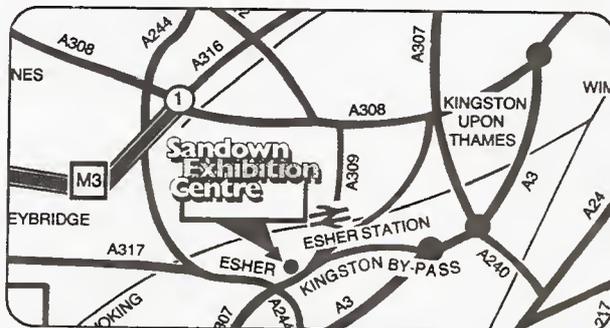
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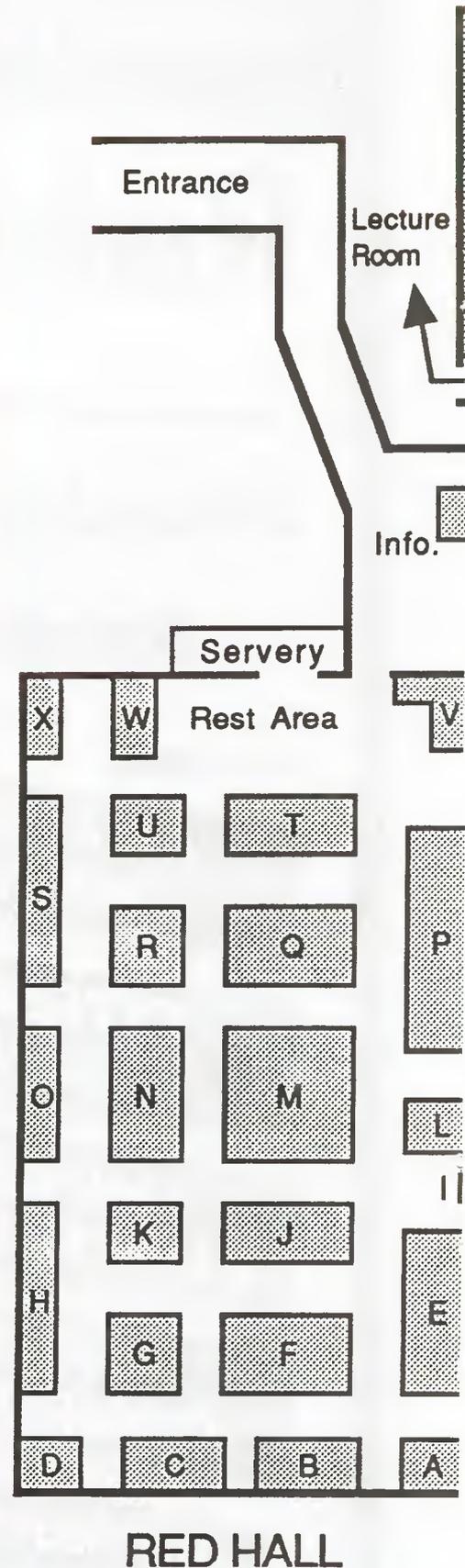
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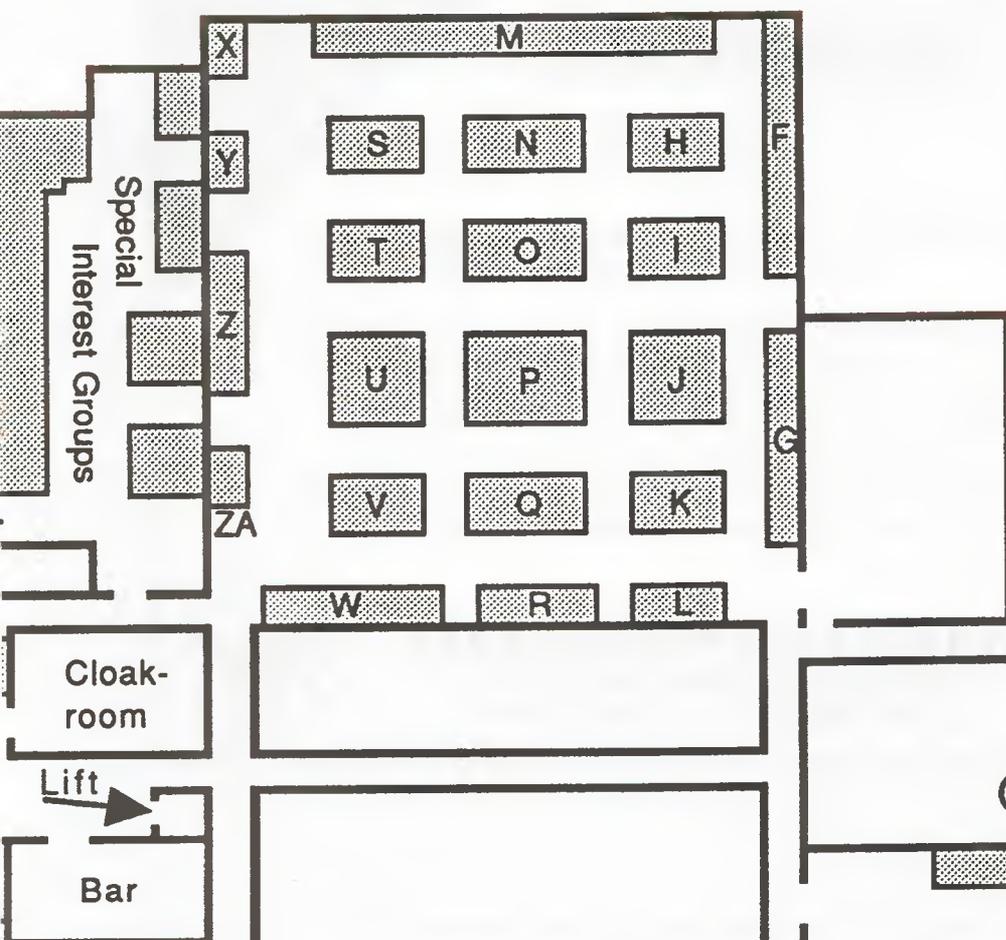
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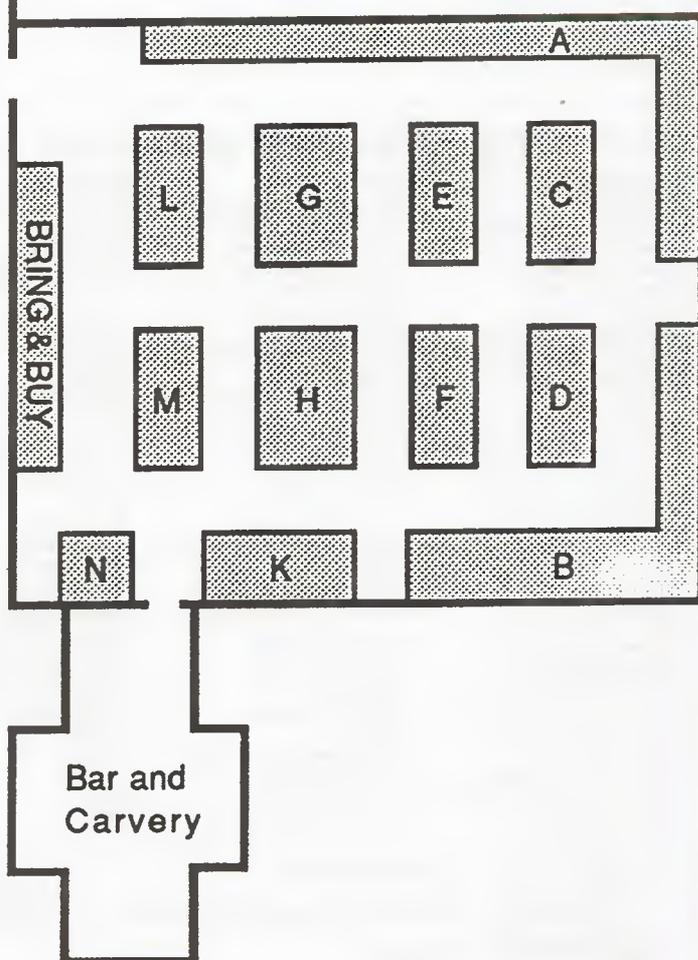


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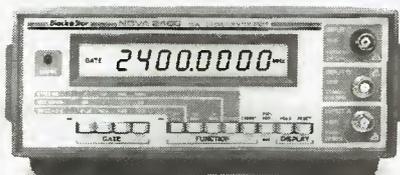
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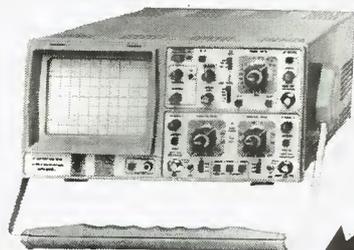
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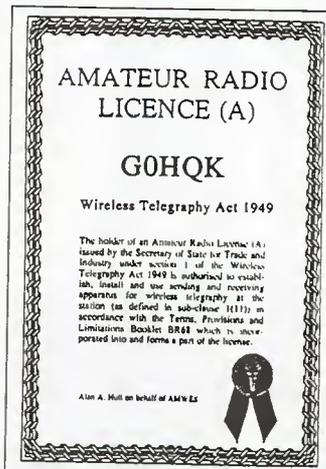
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New from AOR

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 the way 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*).

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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.

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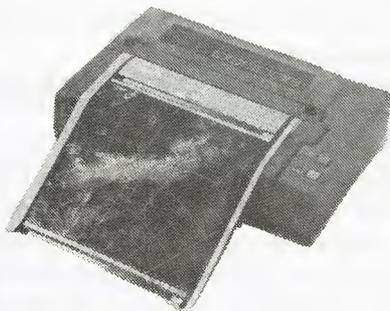
The **NEW WX-2000** is a stand alone radio facsimile terminal designed to produce hard copy images from various facsimile services including Weather charts, Maps, News media and even Satellite pictures from NOAA, GOES and METEOR etc. The WX-2000 simply requires an audio signal from a shortwave or satellite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

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SCANNERS

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, it's 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

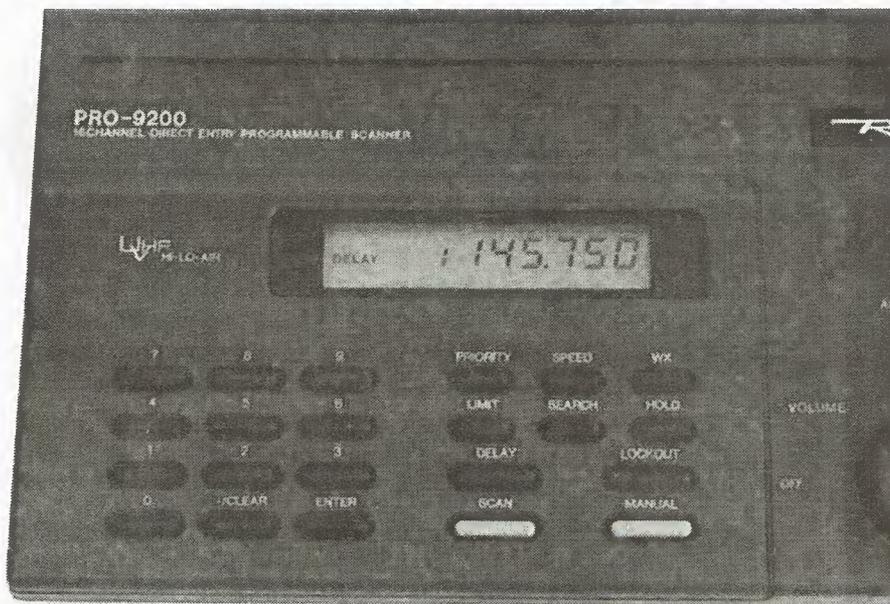
As detailed, the scanner covers the VHF and UHF range including the VHF aircraft band on AM, the set tuning in 5kHz steps on VHF FM, 25kHz steps on Airband, and 12.5kHz steps on UHF. It's USA origins can therefore be seen, as UK PMR users employ 12.5kHz steps and AM is also used on some PMR frequencies.

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 being shown 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





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 colinear, all to good effect.

The only real problem I found was that of image reception, i.e., signals received 21.7MHz (twice the IF) below the tuned fre-

quency, 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 'technofear' 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.

LABORATORY RESULTS:

Sensitivity;	
<i>Input signal level required to give 12dB SINAD;</i>	
Freq. MHz	Sensitivity
68	0.26uV pd
78	0.29uV pd
88	0.35uV pd
108	0.69uV pd (AM)
120	0.68uV pd (AM)
136	0.60uV pd (AM)
145	0.43uV pd
160	0.45uV pd
174	0.48uV pd
406	0.41uV pd
435	0.41uV pd
450	0.39uV pd
470	0.40uV pd
512	0.79uV pd

Adjacent Channel Selectivity;	
<i>Measured on 145MHz FM 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;</i>	
+12.5kHz;	9.5dB
-12.5kHz;	8.5dB
+25kHz;	63.5dB
-25kHz;	64.0dB

Image/IF Rejection;	
<i>Increase in level of signal at first IF image frequency, over level of on-channel signal, to give identical 12dB SINAD signals;</i>	
RX Freq.	Rejection
145MHz;	21.0dB
435MHz;	3.0dB

Blocking;	
<i>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 SINAD on-channel signal;</i>	
+100kHz;	76.5dB
+1MHz;	90.0dB
+10MHz;	96.5dB

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

Squelch Sensitivity	
<i>Signal level required to raise receiver squelch, 145MHz FM</i>	
Threshold;	0.49uV pd (14db SINAD)
Auto;	0.78uV pd (22db SINAD)
Tight;	1.75uV pd (30db SINAD)

Buyers Guide

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 Air-band 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.

Make	Type	Freq Coverage	Modes	Mem Ch.	Typ. Price	Reviewed
Alinco DJ-X1	H	500kHz-1.3GHz	AM/FM/WFM	100	£298	
AR 800E	H	75-105 118-174 406-495 830-950	AM/FM	20	£169	HRT Sep 88
AR 900	H	108-174 220-280 300-380 406-470 830-950	AM/FM	100	£199	HRT Aug 89
AR-950	B	60-88 108-136 137-174 220-290 291-380 406-470 830-950	AM/FM	100	£254	
AR 1000 MkII	H	0.5-600 805-1300	AM/FM/WFM	1000	£249	SI No.3
AR 1500	H	0.5-1300	AM/FM/SSB	1000	£299	
AR 2000	H	0.5-1300	AM/FM/WFM	1000	£259	
AR-2002	B	25-550 800-1300	AM/FM/WFM	20	£487	HRT Oct 86
AR-2500	B	0.5-1500	AM/FM/WFM/SSB	1984	£395	

AR-2800	B	0.5-600 800-1300	AM/FM/WFM/SSB	1000	£375	SI Jan 92
AR-3000	B	0.1-2036	AM/FM/WFM/CW/SSB	400	£759	
AR-3000A	B	0.1-2036	AM/FM/WFM/CW/SSB	400	£765	
Bearcat UBC50XL	H	66-88 136-174 406-512	FM	10	£100	HRT No search Apr 88
Bearcat BC55XLT	H	29-54 136-174 406-512	FM	10	£99	No search
Bearcat BC70XLT	H	66-88 118-174 406-512	FM AM Air	20	£199	HRT Jul 88
Bearcat UBC100XL	H	66-88 118-174 406-512	FM AM Air	16	£179	SI No.1
Bearcat UBC100XLT	H	66-88 118-174 406-512	FM AM Air	100	£199	HRT Apr 87
Bearcat UBC175XL	B	66-88 118-174 406-512	FM AM Air	16	£169	
Bearcat UBC200XLT	H	66-88 118-174 406-512 806-956	FM AM Air	200	£229	SI No.1
Bearcat UBC760XLT	B	66-88 108-174 350-512 806-956	FM AM Air	100	£235	
Bearcat BC800XLT	B	29-54 118-174 406-512 840-912	FM AM Air	40	£149	
Bearcat UBC950XLT	B	29-54 118-174 406-512 806-956	FM AM Air	100	£235	SI No.1
Black Jaguar MkIII	H	28-30 50-88 115-178 200-280 360-520	AM/FM	16	£199	HRT Jun 88

Make	Type	Freq Coverage	Modes	Mem Ch.	Typ. Price	Reviewed	Make	Type	Freq Coverage	Modes	Mem Ch.	Typ. Price	Reviewed
Fairmate HP-100	H	15-550 805-1300	AM/FM/ WFM	1000	£249	HRT Apr 90	Realistic PRO-2024	B	68-88 108-136 136-174 380-512	FM AM Air	60	£100	
Fairmate HP-200	H	0.5-600 805-1300	AM/FM/ WFM	1000	£269		Realistic PRO-2025	B	68-88 136-174 406-512	FM	16	£99	SI No search Oct 91
Fairmate HP2000	H	0.1-1300	AM/FM/ WFM	1000	£269		Realistic PRO-9200	B	68-88 108-137 137-174 406-512	FM AM Air	16	£130	SI Apr 92
Icom IC-R1	H	0.1-1300	AM/FM/ WFM	100	£329	SI No.2	Regency HX850E	H	60-89 118-136 140-174 406-495	AM/FM	20	£179	
Icom IC-R100	B	0.1-1800	AM/FM/ WFM (SSB opt.)	100	£499	SI No.2 (No.3)	Regency HX-2000	H	60-89 118-174 406-512	AM/FM	20	£99	HRT Jan 87
Icom IC-R7000	B	25-1300	AM/FM/ WFM/SSB	99	£925	HRT Feb 89	Revco RS-3000	B	26-32 60-90 118-180 380-512	AM/FM	50	£225	
Icom IC-R9000	B	0.1-2000	AM/FM/ WFM/ SSB/ CW/FSK	1000	£3995		Shinwa SR001	B	25-1000	AM/FM/ WFM	200	£299	SI May 91
JIL SX-200N	B	28-88 108-180 380-514	AM/FM	16	£325		Signal R535	B	108-143 220-380	AM	60	£255	
JIL SX-400N	B	26-520	AM/FM/ WFM	20	£649		Sony AIR7	H	0.1-2.2 76-136	AM/FM/ WFM	30	£229	HRT Sept 87
Jupiter MVT6000	B	25-550 800-1300	AM/FM/ WFM	1000	£369		Sony ICF PRO80	H	0.15-108 115-223	AM/FM/ SSB	40	£299	HRT Dec 87
Kenwood RZ-1	B	0.5-905	AM/FM/ WFM	100	£465	HRT May 88	Sony ICF 2001D	B	0.15-30 76-108 116-136	AM/FM/ SSB	32	£279	SI No.1
Nevada MS1000	B	0.5-600 805-1300	AM/FM/ WFM	1000	£279		Standard AX700	B	50-905	AM/FM/ WFM	100	£545	
Realistic PRO-34	H	68-88 108-136 136-174 380-512 806-960	FM/ AM Air	200	£249		WIN108	H	108-143	AM	20	£179	
Realistic PRO-35		68-88 108-174 406-512	FM AM Air	100	£180	SI Feb 92	Yaesu FRG9600	B	60-950	AM/FM/ WFM/SSB	100	£520	HRT Jul 87
Realistic PRO-37		68-88 107-174 380-512 860-960	FM AM Air	200	£170		Yupiteru VT125	H	108-142	AM	30	£149	SI Aug 91
Realistic PRO-38	H	68-88 136-174 406-512	FM	10	£99	No search	Yupiteru VT150	H	142-170	FM		£159	
Realistic PRO-2005	B	25-520 760-1300	AM/FM	400	£329	SI No.1	Yupiteru MVT5000	H	26-550 800-1300	AM/FM	100	£229	HRT Nov 89
Realistic PRO-2006	B	25-520 760-1300	AM/FM	400	£330	SI Jun 91	Yupiteru MVT6000	B	25-550 800-1300	AM/FM	100	£279	
Realistic PRO-2022	B	68-88 108-136 136-174 380-512 806-960	FM AM Air	200	£200		Yupiteru MVT7000	H	1-1300	AM/FM WFM	200	£289	SI Sep 91
							Yupiteru MVT8000	B	8-1300	AM/FM/ WFM	200	£299	

QRP CORNER

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 88 Moscow' tags on the end of QSOs.

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 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 G3CQR as under)

This year, in the lunch break between the talks they are running the Receiver Challenge'. Take along a

Dick Pascoe G0BPS with the latest QRP news

receiver that you have built yourself. The rules are very simple; it must use not more than one diode and one three 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 Burrige G3CQR on 0935 813054. 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 G8PG at 37 Pickerill Road, Greasby, 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 owners 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 Beeding, Steyning, W Sussex (or packet via. GB7VRB).

Talking about Ten-Tec, I understand they are very aware of the hole left in the amateur market following the demise of the Heath range of equipment. They've been sending out a questionnaire asking QRP operators what kind of transceiver they would be interested in purchasing, and what facilities would be required,

asking if a really budget transceiver, without *any* bells or whistles, would be of interest. This transceiver would be about 5W output, perhaps only with an analogue readout. A range of different facilities were 'offered' at varying prices. This would certainly fill the hole previously filled with the HW-7/8/9 series so sadly missed. Watch this space for more details.

It was very strange to see that, at the same time that my guide to prices for second hand QRP rigs appeared in this column in the January issue of HRT, that I found both an HW-8 and an Argonaut 515 at the same rally and both for the rough price quoted! I was amazed to see the 515 sitting there, as I only spotted it late with it having sat on a trader's stand all day with no takers. Obviously no QRP enthusiasts saw it before me! Needless to say, it didn't stay there very much longer.

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.

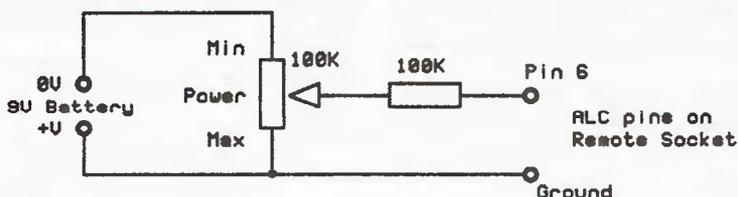
What may not be so well known is that this modification will work on many rigs, a small negative voltage on the ALC line will provide for lowering the available power out. Even that supplied by a small 9V battery will suffice.

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 Leak G0BXO. He can be found at Flat 7, 56 Heath Crescent, Free School Lane. Halifax. 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 GB7SEK.

Power reduction on TS440S



Reproduced courtesy of G-QRP Club

Satellite Rendezvous

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

Shuttle News

This month, *INSPIRE*, the Interactive NASA Space Physics Ionosphere 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 will prevent auto-updating 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 0.27544157).

Oscar 13

Some changes to the 'normal' schedule for this satellite have recently been needed for Attitude 180/0, which lasts to March 14. The sun angle will be between 30 and 45 degrees up to this date, which means a solar illumination of 70-87%. The satellite's power production can only support mode-B under these conditions.

The schedule for Attitude 180/0, from March 14 onwards is still being

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 apogee.

Oscar 10

In December DB2OS 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 FMing.

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.

Table 1. UO-11 Downlink Schedule

The schedule for the UO-11 downlinks is as follows:

145.825MHz

From 00:00 Thur to 23:59 Tue (UTC)

ASCII Telemetry	45s
ASCII Status Message	15s
Binary Telemetry	30s
ASCII Bulletin	90s
Binary SEU Dump	30s
Binary Engineering Frame	30s
ASCII WOD	180s
Binary WOD	120s
Binary Telemetry	45s
DCE Titles	60s
TOTAL	645s

From 00:00 to 13:59 Wed (UTC)

Binary Telemetry	45s
ASCII Telemetry	150s
ASCII Status Message	15s
TOTAL	210s

From 14:00 to 23:59 Wed (UTC)

ASCII WOD	120s
ASCII Status Message	15s
TOTAL	135s

435.025MHz

*From 00:00 to 12:00 Sunday (UTC): 4800 Baud DSR Data
From 06:00 to 14:00 Wednesday (UTC): 4800 Baud DSR Data*

Because of power budget constraints, the 435.025MHz transmitter is off at all other times.

Note: This schedule is often interrupted during one AM (UTC) pass on weekdays (except Wednesday) for routine operations from the UoS Ground station. During these operations the downlink will be on 435.025MHz 1200 baud and 145.825MHz will be off.

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 for automated operation. PG is on its way out, since downloading and directories are now better served with PB, and the PB directory system is *not* compatible with PG's.

There's a new program loader on UO-14 and UO-22, "tick tick tick" and other new packets on the downlink now appear while reloading is taking place. The new loader uses bitmap acknowledgements 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 microsats. Its GB7LAN, run by G8TZJ, 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 Bulletins will be generated on a fortnightly basis at UoS (edited by Greg Jones G0/W5IVD) and AMSAT-UK (edited by myself), reporting respectively on current events at UoSAT and other news.

A new version of the forth diary sof-

ware 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.

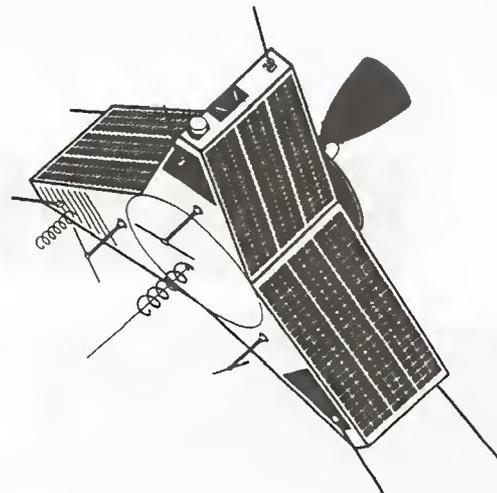
The new software now transmits additional survey headers every 32 frames, and the entire dump is transmitted in a number of smaller sized windows as a continuous sequence. These two corrections should reduce the possibility of not receiving the binary WOD and eliminate the need for very long binary WOD 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.

UoSAT-OSCAR-14

At the end of October last year, CREDO (the Cosmic Ray Effects and Docimetry Experiment) observed a large solar flare proceeded by a significant decrease in cosmic ray flux. Users with access to UO-14 can monitor the radiation data by using the CPE/TOE software, which is available there.

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 around the world. UoS plan to make available some of the more outstanding pictures on the AMSAT-UK/UoSAT BBS in the near future for those without



direct satellite access.

UoS are doing extensive tests of the High Power Amplifier following some unspecified problems. Although amateur stations can receive UO-22 well, stations with omni-directional aerials can have difficulty receiving the satellite. Since UO-22 will be supporting SatelLife operations from portable stations in remote locations, operation of the high power amplifier is important to a successful mission.

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 Broadbent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets membership info. As always, SWLs as well as licensed amateurs are very welcome.

Keplers

SAT:	OSCAR 10	UoSAT 2	AO-13	UO-14	FO-20	INFORMTR-1	UO-22	RS-10/11
EPOC:	91348.86640177	91350.56174047	91333.49594371	91350.23784474	91345.83470322	91351.33734191	91349.18822284	91351.29672196
INCL:	25.9380	97.8771	56.6796	98.6554	99.0536	82.9431	98.5268	82.9270
RAAN:	109.0657	28.5836	57.8015	68.5283	294.4712	98.2367	61.5613	283.5351
ECCN:	0.6067227	0.0011823	0.7264022	0.0011713	0.0540087	0.0036418	0.0008180	0.0013020
ARGP:	301.8195	314.6846	271.2361	356.6723	259.1568	106.9586	132.1634	42.4017
MA:	13.0981	45.3443	14.4191	3.4388	94.8325	253.5567	228.0357	317.8134
MM:	2.05883935	14.67847675	2.09697804	14.29402396	12.83198385	13.74438310	14.36358540	13.72240057
DECY:	-1.08E-06	2.001E-05	2.18E-06	5.45E-06	1.9E-07	1.42E-06	9.45E-06	1.75E-06
REVN:	3596	41619	2652	9899	8634	4418	2169	22470
SAT:	PACSAT	DO-17	WO-18	LO-19	RS-12/13	Mir		
EPOC:	91338.71341375	91350.72072494	91351.73670983	91351.21119394	91349.97558489	91352.98490832		
INCL:	98.6609	98.6615	98.6612	98.6610	82.9233	51.6026		
RAAN:	57.5321	69.5471	70.6090	70.1700	329.3385	79.3814		
ECCN:	0.0012946	0.0012738	0.0013045	0.0013419	0.0029803	0.0002717		
ARGP:	32.3383	357.5363	355.1026	356.5743	130.3476	222.0560		
MA:	327.8588	2.5755	5.0026	3.5346	230.0289	138.0208		
MM:	14.29464942	14.29584655	14.29602628	14.29682043	13.73949271	15.60908275		
DECY:	5.45E-06	5.89E-06	5.28E-06	5.31E-06	1.06E-06	4.1243E-04		
REVN:	9735	9907	9922	9915	4310	3339		

Packet Radio

—Roundup—

HRT's SysOp G4HCL with news from the networks

pliers Siskin Electronics (0703 207587) for the provision of the review copy.

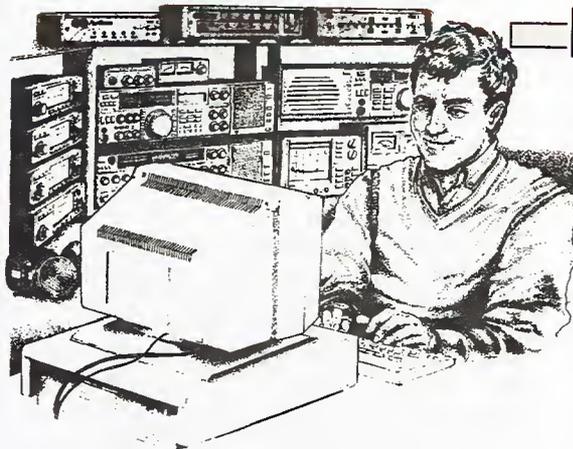
New Software — TLHCLUST

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 BPO 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 TLHCLUSTs 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 auto-



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 sup-

Practical Guide to Packet Operation in the U.K.



BY
Mike Mansfield
G6AWD

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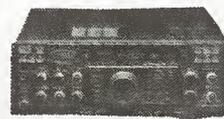
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- Pye M293 'A' band AM +Mic +L/S £78
- Pye M212 Olympic 'T' band, 1 channel, ideal 70cms + ccts £30
- Storno 4000 UHF h/held +batt. No ant., info on way - we hope £25
- Racal MA675, 9m fibreglass mast, with accessories, case, new £145
- Pye-Vogad units, VOX +constant line level units ... £20
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The good news is that Mini-Pak sells for under £80 built & tested with software. The even better news is that the whole think is a built into the inside of a standard 9 way D plug using the latest surface mount techniques and an especially modified licensed version of the German Baycom PC software.

SEE MARCH 91 HRT REVIEW!

ICS FAX II...

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matically, who may send and receive messages just as if they were using the main program system console, but remotely on their portable packet system. Could this find a use in emergency communication I ask? I'll be interested to see how it gets on.

Cluster News

The latest issue of the *Cluster Duster*, the quarterly newsletter of the UK Cluster Working Group, recently came through my letter box. This well put-together twelve page illustrated newsletter is edited by Maurice G3XKD on a 'non-profit' basis, available by subscription. This latest issue features a network report, news from the various cluster SysOps, a feature on G3NOH's DX trip to the Maldives, a comparative article between the TS-850 and the TS-930, and a review of the 'Shacklog' logging program. You can get further details (subs are currently £4.00 per year) by sending an SAE to Maurice King G3XKD, 15 Glebe Road, Prestbury, Cheltenham, Glos. GL52 3DG.

I today learnt that a further Packet-Cluster has been licensed, with the NoV issued to Martin G7JCJ for operation in Dorset. As I write this I'm informed the

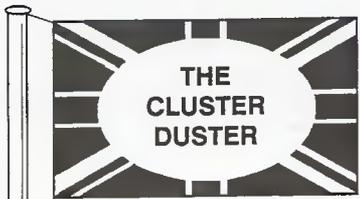
linking of this cluster to the network will be discussed at the UK Cluster Working Group meeting on February 23.

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 G8TJZ received the NoV for his mailbox GB7LAN, along with the node LANC72:G8TJZ, on December 24 as a nice Christmas present, that's it for this month. Please keep me in touch with what you're doing, I can be reached either by 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 @ GB7XJZ.

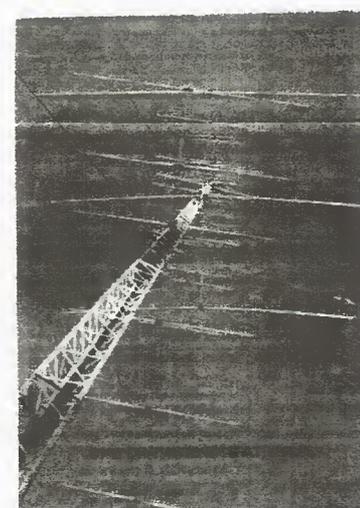


THE NEWSLETTER
OF THE
UK CLUSTER
WORKING GROUP

Volume 1 No. 4

DECEMBER 1991

Issue 4



No 1 CONTEST STATION

WHO'S WHO ON THE CLUSTERS

NETWORK NEWS

NEW SOFTWARE

DX-PEDITION

TS 850 REVIEW

YOUR LETTERS

SPOTS CHARTS

IS THIS YOUR LAST ISSUE?

VHF/UHF Message

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, IW5AVM, IV3HWT (59++), I4XCC, DG6MGP, F6DRO, I1DMP/JN35 (must have been good to get locators as well), I5JUX, IW2BNA, YT3ET, OK10A, 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 hand-held 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,

JCC-0203 ZONE-25

AOMORI JAPAN

JH7EKS

-G.L.: QN00-

MEMBER OF JARL, JAG

TO RADIO	CONFIRMING OUR QSO						
	DAY	MONTH	YEAR	UTC	MHz	RST	2-WAY
GJ4ICD	14	OCT	1989	09:31	50	59	SSB

RIG: TS-680 ANT: 5 ELE YAGI, DP, GP, INV PSE QSL THX

OP: KAZUO SHIMODAIRA
QTH: 35-5 TODOROKI, ICHIKAWA, HACHINOHE-CITY, AOMORI, 039-22 JAPAN

Arrangements by QSL REPORT

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.

CHIBA JAPAN

JH1DLZ

ALSO AH6JJ, ex NH6NT, WH6BST

GL: PM95XU

TO RADIO	CONFIRMING OUR QSO						
	DAY	MONTH	YEAR	UTC	MHz	RST	2-WAY
GJ4ICD	6	3	91	0943	50	429	CW

TS950+TRV 20ml 11el Yagi FB DX 73. LEO PSE QSL THX

OP: MORIKAZU GOTOH
QTH: 115 KOMAGI, HAGAREYAMA-CITY, CHIBA 270-01, JAPAN

MY 1st GJ on 50MHz!
Leo

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 openings to the USA continued, but Christmas was coming closer and reports were few and far between.

However a welcome opening to central America occurred on the 21st, with P43FM on the Island of Aruba working into the UK. Other stations worked and heard were YV5ZZ, HC5K, PZ1AP, and the W1 and W8 areas. Christmas arrived, and, you would think all radios would be switched off for a rest. Wrong again! Would you believe that VK3OT was worked in Europe on Christmas day, OZ and SM had this good Christmas present, and Boxing day brought 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 G10TC had QSOs with ES5MC, 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 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 50.091MHz 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

ISHIKAWA JAPAN GL:PM86

JA9SJI

Confirming Our QSO U Reception Report

DATE: 9/11/86 09:51 RADIO: GJ4ICD RST: 559 50 2-WAY: CW

Rig: FT655 Ipt: 120 W. Ant: 5m 1.5m 1.5m 1.5m

Rmks: FBAX 6m 1 Pse QSL Trx QSL # Trx FD QSO

Mitsuru Iyoki
440-7, Yokoe-cho, Matto City, Ishikawa 924 JAPAN

Yes, JA can be worked on VHF!

called 'how to come on six and finish working Europe in a day'. OK1DIG was my 117th country on the band, it didn't stop there, the usual lunch time opening occurred with KP2A, HC1BI, NP4NP, KP4A, P43FM, KP4EIT, and then KM1E/C6A (another new one). Then the opening moved north with all US call areas coming in down here in Jersey. One station in France around 250km south of me worked over 400 USA stations, I managed 94 from all areas W0 to W9. The 'Es'

W7, and G4ASR reports working strings of W5s and Os. The 7th continued with P43FM, YV4AB, KP2A, W1, 2, 3, 4, 5, 0, 9, 8, HI8A, 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 28.890MHz he said the only stations he'd managed to work were; G3KOX, G3WOS, G4IGO, G6ION, G3ZYU,

JCC-4701 G.L.-PL36TE

OKINAWA JAPAN

JR6WXY

TNX FER QSO CU AGN Koko

TO RADIO	CONFIRMING OUR QSO						
	DAY	MONTH	YEAR	UTC/JST	MHZ	RST	2-WAY
GJ4ICD	14	oct	1991	9:52	50	559	CW

FIG: FT-901+FTV-001+AMP ANT: Gole, JGole, Yagi PSE QSL TNX

OP: Kyoko Myojin "KOKO" *I'm glad to meet you. You are 1st GJ!*
QTH: 22 Miyagi, Naha-city, Okinawa 901-01 JAPAN *Tnx. Tnx 23!*

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

and GJ4ICD.

The 9H1SIX beacon is now back on the air, using a frequency of 50.026MHz and not its old frequency of 50.085MHz.

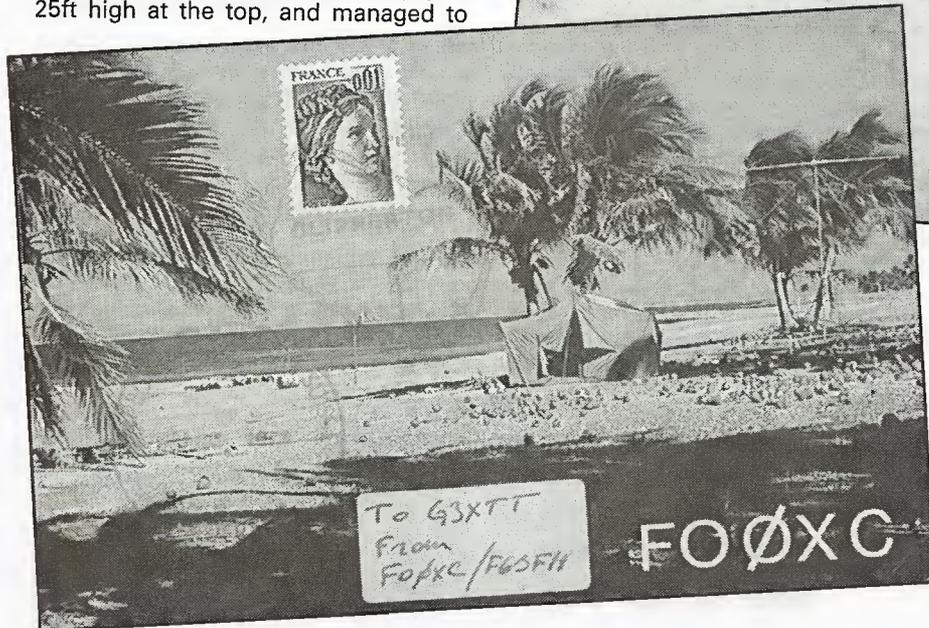
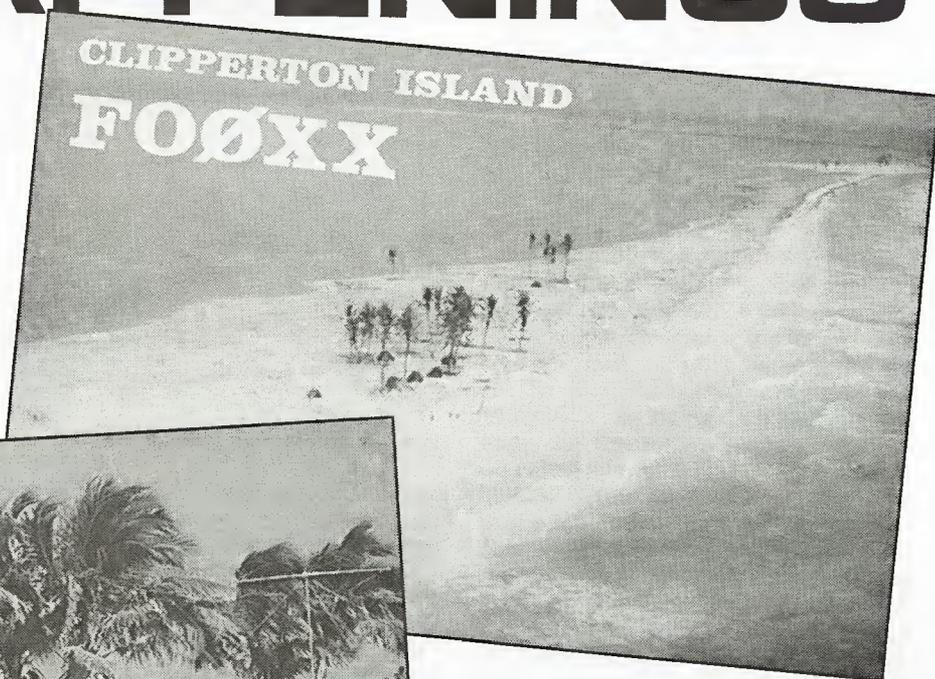
VK6RO mentioned on 28.885MHz that it had taken him 42 years to work 56 countries on 50MHz!

That's it for this month, thanks very much for the info received. Any news please, to be with me by the 6th of each month, to; Geoff Brown GJ4ICD, TV Shop, Belmont Rd, St Helier, Jersey JE2 4SA, Telephone/Fax 0534 77067, or late news on 0860 740727 Cellnet.

HF HAPPENINGS

*Don Field G3XTT,
gives hints and tips on HF
contesting*

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 HI8A, VP5/WA2TMP, SU1HV, FY5FP, VQ9QM, J79DX, FM5WD and KL7U. Gotaways (heard but not worked) included J37XC, PJ8AD, HK7/SM5HV, 5N0SKO, 5U7M 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. Clip-

QSL cards from previous Clipperton Island operations

perton Island is an atoll, just 1.6 sq km in 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, HI8A, 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 where I am sure they were made 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 and going all out to win, 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 ARRL 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, find-

Not the most attractive of QSLs, but this is a rare QSL from LU3ZY, the last operation from South Sandwich.



ing 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 you are eligible to work, and the contest exchange. If all else fails, ask one of the stations you work during the contest, but someone who is out to get a high score won't thank you for slowing him down by asking for lots of information.

Inevitably contests are something of a rough and tumble, just like any other competitive activity, whether it be motor racing or rugby football. There will be times when other contesters cause you interference, or vice versa. This is something you will have to learn to live with! Where the motor racing metaphor falls down, though, is that racing cars do not share the same stretch of tarmac with family motorists (or at least not at the same time). Radio contests take place on the same bands that are being used by

those who just want a casual ragchew. While a certain amount of mutual interference between contesters may be acceptable, it is certainly not acceptable knowingly to cause interference to casual band users. If you find that you have done so accidentally, then you should have the courtesy to move. In order to minimise problems all contests sponsored by IARU member societies (including the RSGB) require contesters to operate within 'contest-preferred segments' of the bands. This leaves space elsewhere on the bands for those who are not taking part. Do ensure that you follow this rule to the letter.

Contesting can quickly become addictive, and many contest sponsors now encourage casual participation by giving certificates, pins, or whatever to those entrants making a certain minimum number of contacts. This is a practice which I wholeheartedly endorse. 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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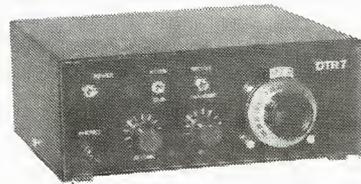
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— VISA AND ACCESS WELCOME —



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. 0296 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 GI4LZS. Further details from club Chairman Des Kernaghan GI3USK, Tel. Bangor 460251

Bristol (South) ARC meet every Wednesday at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol. Club events; Mar. 18th Beginners in packet radio — Dave G4WRW. Mar. 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, University of Bristol. Club diary; Mar. 30th Use of Bristol Group's test gear — Malcolm G8KGH. Apr. 27th RSGB Morse testing system — Phil G3ZJH. 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, Kechill Gardens, Hayes, Kent. Club event; 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 Lickey End Working Mans 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 546075



Bromsgrove and District ARC meet on Friday nights at the Avoncroft Art Centre, South Bromsgrove, HWR. 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 Merfyn Jones GW4NNL, 72b Princes Drive, Colwyn Bay, Clwyd LL29 8PW, Tel. 0492 530725 or Ray Jones GW3MDK.

Cornish ARC meet at Perranwell Village Hall, Perranwell Station, Perranwell, Nr. 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 Tresithney Rd, Carharrack, Redruth, Cornwall TR16 5QZ, Tel. 0209 820836

Dragon ARC meet on the first and third Mondays of each month at the Fourcrosses Hotel, Menai Bridge. Club events include; Mar. 16th Amateur Television — John GW3JGA. Apr. 2nd The Grand Debate — a visit to Conwy Valley ARC. Apr. 6th The Royal Charter — Robert GW3CGN. Apr. 20th Easter Bank Holiday — A general discussion. Further details from the Secretary Tony Rees GW0FMQ, Tel. 0248 600963

Echelford ARS meet on the second and fourth Thursday in each month, 7.30 for 8.00pm, at The Community Hall, St Martin's Court, Kingston Crescent, Ashford, Middx. Club events include; Mar. 12th When the balloon goes up — Ian G8RWH. Mar. 26th Bring and buy sale. Apr. 9th AGM. Further details from Secretary P. Townshend, Tel. 0344 843472

Halifax and District ARS meet on the first and third Tuesdays in the month at 'The Running Man' public house, Pellon Lane, Halifax, 7.30pm prompt. The first Tuesday is an informal 'Noggin and Natter' night, third Tuesday events as follows; Mar. 17th QRP — George Dobbs G3RJV. Apr. 21st Marconi 'The Vision Realised' — H. C. Scott M.B.E. Further details can be obtained from David Moss, Tel. Halifax 202306

Hambleton ARS 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 G0LEL. Apr. 6th Club project night. Further details can be obtained from Nigel Robertshaw G0NHM, Tel. 0609 776608

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 Brains trust. May. 7th EMC update. Further details from S. W. Swain, Tel. 0705 472846

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. 073784 2150

Keighley ARS 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 — G7HJT. Apr. 9th Junk sale. Apr. 30th Moxon Slopes — G3FDW. Further details from Kathy Conlon G1IGH on 0274 496222

South East Kent (YMCA) ARC meet every Wednesday, 7.45pm, at the Dover YMCA, Leyburne 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 Bevrige G7HXJ, Tel. 0304 372656

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 G4YTU, Tel. 0634 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. 3/4/5th Weekend on the air — Sherwood Forest Award.
Further details from Mary G0NZA, Tel. 0623 755288

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. 12th Packet Radio for the Beginner, by a beginner.
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 733740

Poole RAS meet on the second and last Friday of each month, at Lady Russell Coats House, at the rear of the Jelico 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

Powys (South) ARC meet on the first Tuesdays most months, 7.30pm at the RAFA Club, The Struet, Brecon, Powys. Club talk and event;

Apr. 7th Bring and Buy sale
Further details from the Chairman, Bob Price GW3ECH, Tel. 0874 84266

Reading and District ARC meet on the 2nd and 4th Thursdays, 8.00pm, at The Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading, Berks. The club diary of events;

Mar. 12th British WW2 radio design.
Mar. 26th Spring junk sale.

Apr. 9th Understanding transceiver specs — Gary G0BRK.
Apr. 23rd G5RV and other aerials — John G3WFM.
Further details can be obtained from Nick Challacombe, Tel. 0734 722489

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

Mar. 16th Build your own computer — Dave GW4DMR.
Further information on the club may be obtained from the secretary Ken Padley GW7IAR, Tel. 0745 338276

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

Mar. 16th 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 32502.

Southgate ARC meet at 7.30pm in the Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. Forthcoming events;

Mar. 12th Talk by Mike Dennison G3XDV from the RSGB.
Mar. 26th Club debrief after London Show, videos and photos.
Apr. 9th Surplus equipment sale.
Apr. 23rd Club construction project.
Further details from Brian Shelton G0MEE, Tel. 081 360 2453

Stourbridge & District ARS meet every first and third Monday each month (except August), at the Robin Woods Community Centre, Scotts Road, Stourbridge, commencing at 8.00pm. Events include;

Mar. 16th AGM.
For further details contact Dennis Body G0HTJ, 53 Grove Road, Wollescote, 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.
Mar. 23rd Pacific crossing on operation Raleigh — G4AAL.
Apr. 13th AGM and surplus sale.
Apr. 27th Whats on 80m — John Allen G4PDP.
Details from A. Beasley G0CXJ, Tel. 060 882 495.



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 8.00pm 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. 14th RSGB national VHF convention. Mar. 19th Constructional contest. Mar. 28th S&CRS annual dinner. Apr. 16th Junk sale. For further details, Tel. 081 644 9945



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 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 — G3JWI.
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; Mar. 17th AGM.
Further details from Martin GW0KYT or Ruth GW7FNR, Tel. 0978 266887



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

National and International



G-ORP Club publish a quarterly magazine devoted to low power communication, and hold regular get-togethers. Their secretary is Rev. G. Dobbs, St. Aiden's Vicarage, 498 Manchester Road, Rochdale. Lancs. OL11 3HE. Tel. 0706 31812.



International Short Wave League who as well as running an International QSL 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 EI4BZ, 12 Castle Ave, Carrigtwohill, Co Cork. Tel. (Eire) 021 883555



Radio Society of Great Britain are based at Lambda House, Cranbourne Road, Potters Bar, Herts. EN6 3JE Tel. 0707 59015. 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 Teledata Group (BARTG) have a quarterly magazine, hold 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 or via packet, G4ATG @ GB7BAD. To join BARTG contact Peter Adams, G6LZB, Tel. 0923 220774

British Amateur Television Club (BATC) 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 Lawton, Grenehurst, 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, on the 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 mobile snack bar. Further displays and full refreshment facilities in the club room bar, which is open throughout the day. Doors open at 10am, talk-in on S22. Further information from G4TSW, Mid Devon Rally, PO Box 3, Tiverton, Devon.

March 22nd

The Magnum Radio and Computer Rally run by Cunninghame and District ARC takes place in the Magnum Leisure Centre, Harbourside, 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 GM0FCI, or Ian GM0JOE, Tel. 0294 212854

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. Traders, bring and buy, licensed bar, bookstall, car boot spaces available. Talk-in on 2m. Further details can be obtained from G0NQE, Tel. 0977 677006 or G0AAO, Tel. 0977 643101

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 6th 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 7am. Doors open at 10.30am, and talk-in on S22. For more 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 G6COQ, 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, bar 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 598173

Free Readers Ads!

FOR SALE

HRO-500, first class receiver, £350. Eddystone 940, VGC, £150. **FRG7**, £100. **FRG8800**, **FRV8800**, boxed, £450. **Grundig 650**, £275. **Grundig Satellit 600** professional, memories, preselector, direct entry, mint condition, £230. **Philips D2999** world band receiver, £150. **Icom R-100**, £280. **Contact R. Rai** (Middx), Tel. 081 571 5759

FT-790R, nicads, charger, mobile mount, **Alinco 30W** linear, mast-head preamp, **MBM48**, boxed and unmarked, £350. **Spectrum 128+3**, games, tape recorder, Joystick, PSU, £130. **Green monitor**, VGC, £20. **Sinclair ZX81** plus 16k RAM, £30. **ST5MC** creed 2300 teleprinter, £40. **Ham-master 4200** base mic, £10. **Contact T. Cooling** (Lincoln), Tel. 0522 595051

Sony ICF2001D full coverage VHF airband shortwave receiver, 150kHz to 136MHz, with all accessories and manual, £130. **Contact Mr. K. Potter** (Whitby), Tel. 0947 603293

Microwave Modules 2m transvertor, £70. **Microwave Modules 2m** linear, £80. **Amiga A590**, hard drive, 2 meg RAM, includes software, utilities etc. £280. Please contact **Keith Gibbons** (Washington), Tel. 091 415 1550.

FRG-7700 plus two **FRV-7700** and **FRT-7700** in very good condition, manuals included, £275. **Contact Les Beckwith** (Wilts), Tel. 0380 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 52822 evenings or weekends.

Yaesu FT-101E CW/SSB filter, immaculate, spare new PA valves, £295. Also **KW Easimatch ATU**, £30. **Contact G. Grieveson** (Coventry area), Tel. 0203 307272
Icom IC-R71E HF communications receiver, fitted FM board, remote control handset, **Yaesu FRT-7700 ATU**, mono headphones, as new and boxed, £680. **Contact Mr. S. Clifton** (Llandudno), Tel. 0492 878107

Yupiteru MVT5000 scanner, AA4 active aerial, scanner books, **Saisho** shortwave set 500kHz-30MHz, £185 the lot, no offers. Local interest preferred.

Contact K. Wadcock (Wigan, Lancs), Tel. 02575 2001 after 7pm.
MFJ 948 MkII 300W versa tuner, as new, £100. **ERA** microreader MkII, CW/RTTY, send and receive practice letters and numbers, as new, £120 no offers. **Contact John Robinson** (Bognor Regis), Tel. 0243 266849

Uniden 2830 10m multimode transceiver, digital readout, 30W output, scanning, mike, box and instructions, immaculate condition, £240 ono. **Contact Mr. S. Hawkins** G4TVR (Solihull), Tel. 021 745 8222

Fremar/Raycom 2m thumbwheel hand portable (IC-2E?) with ni-cad, charger, **Icom HM-9** speaker/mic, and **Icom DC-1** 12V adaptor for mobile/base use, boxed, £110. **Contact Mr. G. Pitt** G7KXX (Walsall), Tel. 0922 57136

FT-726R, 6m, 2m, 70cm, sat board, £825. 2m FM mobile, 25W, £100. **Standard C528** dual band hand portable, 2m/70cm, extended receive, case, ni-cad, £325. 6m linear, 50W, £90. 2m linear, 100W, £75. **Alinco** dual band mobile, remote head, £450. **BBC B** computer, disc drive, colour monitor, £225. All in excellent condition. **Contact Peter Wallace** (Telford), Tel. 0952 613080

Mosley V3 vertical aerial, 20m/15m/10m, excellent condition, £25. **Contact John Talbot**, Tel. Coventry 465328 6.00-7.00pm.
ORO HF linear amplifier, 2 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, £30. **DNT** 10m FM transceiver, inc. aerial. **Contact David White** (Sheffield), Tel. 0246 414995

Yaesu FT-707 HF mobile transceiver, 100W output, matching **FC-700 ATU**, mobile mounting bracket, manual, service manual, plus an all-band G-whip with tow bar mount, all in GWO, £500 ono. **Contact Mark Taylor** G0LGJ (Norfolk), Tel. 0362 691099

NRD 535 with ECSS unit, as new, £920. **AR2800** scanner, £275. **Contact Mr. P. Willars** (Northampton), Tel. 0604 718707
Tokyo HC-200A 8 band ATU. **SWR/PWR** meter, two coax and one wire inputs plus bypass position, 200W PEP max power, size 90 x 210 x 220mm, as new, £75. **Contact John Robertson** G0KJU (Bognor Regis), Tel. 0243 869180

Realistic PRO-34 scanner, PSU, nicads, Teleant rubber duck, VGC, £150. **Contact R. Brown** G3GZH (Dunstable), Tel. 0582 873267
Trio JR599 communications receiver, 1.8-29MHz, 144-147MHz, good as new, £165. **WUV** band Uniden 2830 transceiver, new, £300. **Contact J. Thomas** (Herts), Tel. 081 207 0706

KW Vanguard transmitter, AM/CW, 50W output, good condition. Also valves; **QQV06-40A** and **TY2-125** with bases, **QQV03-10**, and others. **CRTs**; **3BP1**, **2BP1**, and others. Also 'Nixies', flash tubes, etc. 19 inch rack mounting **FM** broadcast tuner (valved), offers? **Contact Simon Brown** G0NZQ (Orpington, Kent), Tel. 0689 822102

Icom 32E 2m/70cm hand held, (138-174, 400-479) CTCSS encoder fitted, complete with 7.2V and 12V nicads, desk top fast charger, **VOX** headset, hand mic and soft case, all Icom products and in mint condition, boxed and hardly used, £300. **Contact Simon Cockayne** (W. Midlands), Tel. 0562 882360

Realistic PRO-2005 scanner, AM/FM, covers 25-520MHz, 760-1300MHz, £180 ono. **Contact S. Thompson** (Deptford), Tel. 081 692 0944

Sagra 600 2m twin 4CX250B valved linear, 600W, brand new and unused, £650. **Icom 575H** 100W 28/50MHz transceiver, mint, £850. **Back numbers of HRT** (enquire). **Contact Paul G4XHF** (Crawley), Tel. 0293 515201 anytime.

Yupiteru MVT-5000, mint and boxed, nicads, car lighter adaptor, telescopic aerial, soft case, £130. **Contact James Trutwein** (Maidenhead), Tel. 0628 27505
Trio TW4000A dual bander, mobile safety mic, duplexer, boxed and in good condition, £325. **Trio 700S** 2m all mode transceiver, boxed and in good condition, £325 no offers please. **Contact Raymond James** (Suffolk), Tel. 098681 582

Marco double conversion receiver, 145kHz-470MHz in 12 switched bands, AM/SSB/FM, £100 to first caller. **Contact S. Brown** (Manchester), Tel. 061 766 5265

Zetagi B300P amplifier, SSB/AM, new and boxed, any reasonable offer. **Contact A. Oughton** (Southend-on-Sea), Tel. 0702 587253

ERA processor, £90. **Sinclair ZX** microdrive, new, offers. **Sinclair** microdrive cartridges 4, 2LZX

Spectrum. **Contact G. Farrer** (Kent), Tel. 0634 856853
Realistic PRO-2006, 400 memories, 25-1300MHz, new condition, boxed, £200. **Wanted Trio 1000** or similar general coverage receiver, must be in good condition. **Contact Trevor Evans** (Swansea), Tel. 0792 898961

JIM scanner pre-amp with switchable filters, £35. **Alinco ELH24B** 2m 30W amplifier with pre-amp, seldom used, £35. **R-535** VHF/UHF airband receiver, £180. **Ranger AR-3500** 10m multimode, variable power scan, memories, split, speech processor, £250. All mint condition. **Contact Mark McIntyre** (Belfast, N.Ireland), Tel. 0232 795783

Kenwood AT-200 and **Kenwood SP-520**. **Wanted** — **Yaesu SP901P**. **Contact B. Tuffrey** (Doncaster), Tel. 0302 859451

Yaesu FT-707 HF transceiver, good condition, complete with manual, buyer collects, £275 no offers. **Contact Mr. J. Cook** (Southampton), Tel. 0703 736210

Alinco DJ-X1 hand held scanner with case, seven days use, illness forces sale, £230. **Contact Mr. R. Williams** (Grantham), Tel. 0476 66047

Bremi BRL200 linear amplifier, mains powered, 100W AM, 200W SSB, 26-30MHz, plus **Radio Shack** field strength/SWR tester, separate aerial matcher. **Contact M. Brewer** (Grimsby), Tel. 0472 240119

Sommerkamp FR-100B valved communications receiver, 3.5-30MHz, instruction manual, complete and in good condition, £50 or offers. **Contact Brook Verrall** (London area), Tel. 081 882 4110 answerphone if out.

Realistic PRO-2006, 400 memories, plus discone aerial, Securicor delivery, £290, will haggle. **Contact Chuck Alberga** (Peterborough), Tel. 0733 241290 home or 0733 315456 work.

Racal RA17MkII with cabinet, £195. Another without cabinet, £125. **RA37** LF converter, 12-980kHz, £55. **RA63** SSB adaptor, £60. **RA180** servo-tuned RF/mixer, £30. **Pye CAT** marine receiver, 60kHz-31MHz, £30. **Contact Ned Cartwright** (Suffolk), Tel. 0728 860904 answerphone before 8pm.

Kenwood TH-25E hand held FM transceiver, with PB6 battery pack 600mAh, PB7 1100mAh, charger, rubber helical, DC adaptor, speaker/mic, two soft cases for 600mAh/1100mAh packs, handbook, all in mint condition with original box, only £265. Contact K. Middleton G4EJH (Bristol), Tel. 0275 843897

PRO-34 VHF/UHF handheld scanner, 200 channels, 68-88, 108-174, 380-512, 806-960MHz, good condition but no instructions, hence £100 including a set of nicads. Contact Mark Dowle (Bucks), Tel. 06285 24911 or 06285 20811 evenings.

Yaesu FT-200, 100W five band HF transceiver, £100 ono. Fortop TVT432 plus TVCS435/40 70cms ATV transceiver, £60. Wood & Douglas 70PA2/S 70cm masthead preamp, £20. FT-730R 70cm 10W mobile, £190. PF2, RB2/3, batteries, charger, £40. Contact Jamie Powers G0JNK (Derby), Tel. 0773 857386

Yaesu FTDX401 SSB HF transceiver, 3.5-30MHz, 560W PEP, external VFO and speaker, spare valves, £250. Will exchange for multimode or high power FM 70cms transceiver. Contact R. Smith (Eastbourne), Tel. 0323 23365

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Realistic PRO-2024 base scanner, 60 channels, 68-88MHz, 118-136MHz, 138-174MHz, 380-512MHz, as new, boxed with manual, £55 ovno. Contact Richard Maycock (Chesterfield), Tel. 0246 272346 daytime, or 0246 208974 evenings.

Sommerkamp FL200 transmitter. FR100 receiver modified to receive top band, interconnection leads for transceive operation, manuals/circuits, mint condition, ideal starter set up, £120. Contact Ron White (Birmingham), Tel. 021 459 8662

Kenwood MC50 desk mic, as new and still in box. Contact Philip Lock (Aldershot), Tel. 0420 475855 daytime, or 0252 332035 evenings.

Grundig 600, computer control tuning, 60 memories, similar to Grundig 650, £230. FRG-7, VGC, £115. Icom ICR-100 mobile and base scanner, 550kHz-1800MHz, mint, power pack, aerial, save £200 sale £280. Eddystone 940 restored, excellent performance and condition, £150. Exchange

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Kenwood Trio 215E 2m hand held, 500mA battery pack and charger, soft case, hand book, good working order, £160. Write to; Mr West, Flat 2, 27 Alma Terrace, Hastings, Sussex TN37 6QT

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Manual/circuit information for Nordmende Bornholme model 3125A L. M. S. plus FM receiver. Any expense promptly refunded. Write to; Mr. D. N. Wellings, 'Nordheide', Shurton, Stogursey, Bridgwater, Somerset TA5 1QE

Cheap digital receiver needed by very poor SWL (with XYL and sidebands) to carry on listening, will travel to collect. Contact Dave Smith (Powys, Mid Wales), Tel. 0597 824111

Kenwood TS-850S, cash waiting. Write to; Thomas Brejnak, 13/2 Wauchope Place, Edinburgh, Scotland EH16 4NR

Marconi TF2361 sweeper, TM9692, TF1026/1, TF1026/3, TF1026/6 wavemeters, Sony RM-450 edit controller, handbook for colour monitor 6123/C19, Marconi television equipment, WHY? Contact Brian Summers G8GQS (Middx), Tel. 081 998 4739 answerphone

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

FT-207R interconnection wiring details, to allow rebuild of 12.5kHz channel model, any information gratefully received.

Write to; Steve Best, 19 Dene-garth, Ovingham, Northumberland NE42 6AW

ZX Spectrum book on how to set up, please can you help. Write to; Mr. E. Farrer, 108 Colne Rd, Twickenham Green, Middlesex

Global ATU-1000 in good condition and reasonable price. Contact John Chapman (Manchester), Tel. 061 445 5110

Philips UHF PFX hand held, or Philips UHF PF85 multi channel hand held, must be U band 440-470MHz. Contact Mr. M. Anderson (Burnley, Lancs), Tel. 0282 39547

Grundig Satellite 2100 radio receiver, must be in very good condition and working order. Contact Pete Tankard (Sheffield), Tel. 0742 422131

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KW Viceroy or similar HF transmitter, working or faulty. Contact W. Fletcher G4JNG (Worcs), Tel 0299 401711

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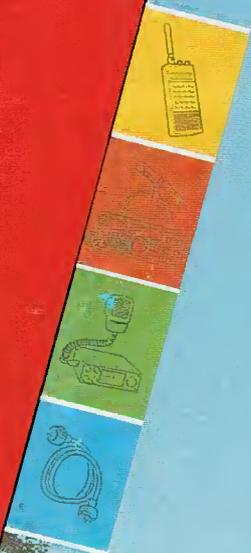
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