ANTENNA SPECIAL ISSUE

BUILD A SIMPLE LOOP ANTENNA

DIFFERENTIAL MATCHING AMPLIFIER

REVIEWED AOR LA320 ACTIVE LOOP & UNIVERSAL M1000 DECODER

THE CASE OF THE FLUSHING TOILET

Plus Regular Features Covering

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NEVADA COMMUNICATIONS
189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (0705) 662145 Fax: (0705) 690626
Cover:
Our cover this month shows the antenna arrays of the Hillbillies Contest Group. The inset picture shows a community telecomms mast somewhere in Germany. This type of tower carries antennas for just about every type of radio service imaginable.

DISCLAIMER. Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. Short Wave Magazine advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available.

The Publishers of Short Wave Magazine wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

BOOK OFFER
OCTOBER 1993

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good listening
Earlier this year it was decided to re-vamp RadioLine in an attempt to revitalise the service. This was Short Wave Magazine's own '0898' telephone information service that, initially, had proved to be popular with readers. Unfortunately it took a lot of editorial staff time to update it weekly - time that, with a limited staff, simply was not available. My primary aim must be to ensure that your favourite magazine appears on the bookstalls on time, every month - a target that has been met ever since we took over the title in 1987.

The new style RadioLine should have been a success - it had everything going for it. But it has not! The listening figures have not approached those enjoyed by the service when it was first launched and the cost of having it professionally produced has ensured that it makes a loss! It is with regret, therefore, that I have decided that RadioLine has to be withdrawn. RIP.

**Leicester ARS**

The two-day show at the Granby Halls, Leicester on 29 & 30 October should prove to be as successful as in previous years. Two years ago we experimented with a clinic, run by the late Peter Rouse, on SSB Utility Listening. It proved to be so successful that we repeated the experiment last year with Mike Richards and Decode. This year it is the turn of Godfrey Manning and Airband. Godfrey will be available during the show to offer help, information or just natter about anything to do with Airband. Even if you are not into Airband, it is still well worth visiting the show.

**SWM SERVICES**

**Subscriptions**

Subscriptions are available at £21 per annum to UK addresses, £23 in Europe and £25 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £38 (UK) £39 (Europe) and £41 (rest of world).

**Components for SWM Projects**

In general, all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for SWM projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.

**Back Numbers and Binders**

Limited stocks of most issues of *SWM* for the past five years are available at £2.80 each including P&P to addresses at home and overseas (by surface mail). Binders, each taking one volume are available for £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for back numbers, binders and items from our Book Service should be sent to: PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH11 8PW. Orders may also be sent by telephone to Broadstone (0202) 659890. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (0202) 659890.

**Brickbats and Bouquets**

Dear Sir

I would like to thank ERA and Mr Bill Green for their excellent service I have been given. I purchased from them a new Synoptic decoder that has a few bugs in the firmware. I returned it to them the day after the Cardiff post strike finished and the received the unit back with a new version (1.3) chip in four days and free of charge.

Thank you again ERA.

R. Evans

Gwent

Dear Sir

I recently purchased a Heathkit Receiver Kit and I have a problem that I have tried to solve for some time. For some reason the receiver will not go into Oscillation when I connect my loop antenna. I have tried using a variable capacitor in the circuit, as well as using a large inductor in the grid circuit and a large capacitor in the plate circuit. However, none of these methods worked. I would be grateful if you could provide any advice on how to solve this problem.

J Fairgrieve

Edinburgh

**Morse & the RAE**

Dear Sir

I read with great interest the letter from Allan Young on Tonbridge, whose comments I heartily endorse.

My suggestion regarding Morse and A and B licences is as follows:

I would first propose that all those who sit for the RAE and pass should eventually be allowed to become A licence holders. Initially, those who pass the Morse A should be B licence holders for a period of, say, three years, after which time they should then be allowed to apply for an A licence.

For those who wish to use Morse in addition to having an A licence, they should take the Morse test as usual and be given the advantage of having a suffix after their callsign for identification and recognition, i.e. G3??CW.

I think this system would allow the new licence holders to have a period of apprenticeship of three years to acquire the necessary skills to become competent operator A licence holders.

H R Hawkins

East Sussex

Dear Sir

I agree the c.w. mode using Morse is useful, but what has this got to do with must for an ‘A’ licence?

R Johnstone

Inverness-shire

**Letters**

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to any other magazines. The views expressed in letters published in this magazine are not necessarily those of Short Wave Magazine.

**Vintage Radio**

Dear Sir

John Tuke, with his Thirties radio, suffers from pulling and wind-wobble. He should try the effects of putting a small variable capacitor in the antenna lead. This would, of course, reduce signal strength, but it would improve selectivity and reduce or eliminate the other troubles.

For s.s.b. reception, it often helps matters to use a much smaller grid leak. This prevents ‘squegging’, and gives better control of the re-inserted carrier, thus allowing strong, as well as weak signals to be resolved.

C.R. Eve (Jersey) cannot oscillate at all. I suggest that he should have a large grid leak, say 5MO, returned, not to cathode, but to h.t. In this way, I persuaded an L63 triode, in a Hartley circuit, to go into oscillation with only 4.5V on the anode, the h.t. and i.t. supply being a 6V motor cycle battery.

H.S. Stevens

Buckinghamshire
Dear Sir

Eric Westman’s article “Mystery Man of the BBC” in the August issue hardly does Leslie Lambert, A.J. Alan, justice. He was not a ‘nonentity’, nor was he merely a ‘civil servant’. This was official dis-information.

Around 1909 Lambert was a good conjurer, attending several society and royal functions. Early in 1914 he had given a performance at Marlborough House and had met Queen Alexandra. It is thought that by this time he may have had an amateur licence. When WW1 started in August 1914, he was already involved in Naval Intelligence (‘Room 40’), and in September 1914 he joined a primitive interception station at Hunstanton. The qualifications required included faultless Morse operation at a minimum of 25 words per minute. This station quickly became a key station in DFing and intercepting German naval communications.

One day, Queen Alexandra unexpectedly visited Hunstanton when Leslie Lambert was on duty. She immediately recognised him, and greeted him cordially - leaving the other ratings open-mouthed! Lambert refused to tell them how he knew royalty. He was clearly an accomplished W/T operator at this time. There is thus the mystery of why and when he became an experienced radio operator before WW1, since he does not appear to have gone to sea in either the Merchant or Royal Navies.

After WW1, Lambert was inducted into GC&CS - the forerunner of GCHQ. GC&CS stood for ‘Goverment Code and Cypher School’, and came into operation in 1920. His name appears in the GC&CS staff list for 1922. (Public Record Office, File CAB/63/29). He was still engaged in radio intelligence duties.

Around 1921, GC&CS discovered by interception and crypt analysis that the new Soviet government was helping Indian Nationalists and funding the Communist Party of Great Britain. The decrypted texts of some of these incriminating signals were published. Lambert certainly played a part in this operation.

In May 1927, the Metropolitan Police raided the London offices of the All Russian Cooperative Society (AR COS), which was a commercial front for large-scale intelligence operations. Much incriminating material was discovered. Again, Lambert was involved in intercepting the signals traffic. The result was the destruction of much of the Soviet spy network.

In 1930, an illicit radio transmitter link between the Comintern in Moscow (Communist International) and a terraced house in London was operating. Lambert and another GC&CS technician did the DF, and another GC&CS staff member successfully decoded the traffic. Some time in the 1920s, Lambert obtained an amateur radio licence with the callsign G2ST. He later had a QSL card in existence?

Lambert continued to serve British radio intelligence for many years, and became a cryptographer. His life at Bletchley Park early in the Second World War was one of motorous regularity. He died in late 1941 in a Norwich nursing home, after having had an operation for, I believe, cancer. Leslie C. Lambert, *alias* A.J. Alan, was not only a mysterious man, he was also a man who liked mystery.

Now for something different. I would like to add to the article by S. Pope on the T1154/R1155 equipment.

The R1155 was my first ‘professional’ short wave receiver. As a schoolboy s.w.l. in the 1950s, it took me a whole year to save up to buy a brand new one in its original transit case. My parents bought me the external power supply/loudspeaker unit.

The R1155M was really an R1155A, but during production a corrosive soldering flux was used in error. As this would eventually give rise to serious problems, the R1155M was restricted to ground use only. Not a good surplus buy!

The R1155C was modified for use in Coastal Command aircraft need, f.f.; f.d. (‘Huff-duff’) on the highest frequency range of 7.5 to 18.5MHz. They were used for locating German U-boats by DFing their h.f. communications and also DFing the f.l.; f.m. homing signals used to attract other U-boats to an Allied convoy, before attacking it. This set would now be extremely rare.

The trap circuits mentioned for the R1155A, E and M were called ‘Athlone Traps’ because they prevented i.f. breakthrough from this Irish broadcasting station operating around 560kHz. To aircraft flying at 10000 feet or so, this station gave a surprisingly high field-strength! The i.f. bandwidths in all R155s was about 4.5kHz for 6dB ‘down’ and 18kHz for 60dB ‘down’.

The low power testing of T1154s in grounded aircraft was picked up by German radio intelligence. The differing pattern enabled them to determine whether a heavy raid was likely that evening. For safety, the radio testing was usually done before the bombs and ammunition were loaded into the aircraft during the afternoon. If the testing was spread out through the working day, then RAF activity that night would probably be light.

The ‘Key Type F’ Morse key used with airborne T1154s was hideous - the spark retardent foam inside made the key ‘soggy’, and the ‘upside-down’ internal construction made it difficult to adjust and operate properly. I tried one on my amateur radio TX and almost immediately gave the key away in disgust!

An early aircraft/flying boat Marconi communications and DF equipment was described in Short Wave Magazine in November 1938, pages 26-27, in an article by C.A. Rigby. It’s not hard to see that this is the ‘grandaddy’ of the T1154/R1155 equipment.

The T1154/R1155 was called ‘Marconi Geep’ and a total of about 80000 equipments were built in the war. So many were required that production was divided between the Marconi Company and four or five other firms, including Ekco at their ‘shadow’ factory at Aylesbury.

After the war, the T1154/R1155 was produced for several years as the AD67/802B civilian equipment by The Marconi Company.

Individual manufacturers of wartime equipment can sometimes be identified by internal test and inspection stamps, as these may carry the initials of the manufacturer. Of course, sub-assemblies could be made at one factory and used at another, just to confuse things and improve security!

Finally, the complete RAF technical manual for the T1154 and R1155 equipments is *AP 2548 Volume 1* now as rare as the Dead Sea Scrolls!

Further Reading


Further Reading


George Saunders G3OYN Caversham

Reading
rallies

**AVON**

RSGB City of Bristol Group: last Mondays, 7pm. The Small Hall, Queen's Building, University of Bristol, University Walk, Bristol. October 25 - AGM. Dave. (0272) 671214.


**BUCKINGHAMSHIRE**

Atari RG: G. Rayer, 38 Brockhurst Avenue, Chesham HP5 3JR.

Cheshire


**CORNWALL**

Cornish RAC: 7.30pm. The Village Hall, Perranwell Station, Perranwell, Nr Truro, Cornwall. October 7 - Multipliers, 11th - Computer Section. Geoff. (0209) 820836.

**DERBYSHIRE**

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. October 6 - Junk Sale. Mrs Rayley Winchfield, 2 Hills Cottages, Crich, Matlock, Derbyshire DE4 5DQ. (0773) 856904.

**DEVON**

Torbay ARC: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. October 22 - Peter Chadwick G3RZP, 30 Albert Crescent, Newport on Tyne. D00 DDT.

**DORSET**

Dorset Police ARC: 1st Thursdays and 3rd Tuesdays at Head Quarters, in the Bar & Social Club, PCO15 Richard Newton. (0203) 223931 or PC828 Bob Knight. (0203) 552096 ext 2031.

**EAST SUSSEX**

Southdown ARS: 8pm Chasely House for Disabled Ex-Servicemen, Southciff, Bolsover Road, Eastbourne, East Sussex. October 4 - Equipment Sale. Jane G4XNL. (0233) 412699.

**ESSEX**


**FIFE**

Dundee ARC: Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. October 5 - Holiday, 12th - Construction Night, 19th - Members Night, 26th - Construction Night. G4MFS, 30 Albert Crescent, Newport on Tyne. D00 DDT.

**GREAT LONDON**

Aerconwy Conference & Exhibition will be held at the Bolton Sports & Leisure Centre, University of Bolton, University Walk, Bolton. October 25 - AGM. Dave. (0272) 671214.

**HAMPSHIRE**

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. October 7 - AGM. S. Swain (07051 472846).

**HEREFORD & WORCESTER**


**HERTFORDSHIRE**

Dacorum AR & TS: 1st (informal) and 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. October 19 - Talk by Mike Darmson G3XDV. Dennis Booth. 8 Juniper Green, Warrams End, Hemel Hempstead, Herts HP1 2NQ.

**HUMBERSIDE**


**KENT**


Medway ARBTS: Fridays, 7.30pm. Tunbury Hall Colman Close, Tunbury Avenue, Walderslade, Chatham. October 1 - Junk Sale, 15th - Interference by G0DAT J. Gloria. (0354) 710023.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Alton Road, Tunbridge Wells, Kent. October 1 - Informal Meeting, 15th - Crowborough Radio Station by G3FET John Taylor G3DIN (0892) 664960.

**LANCASHIRE**

**LANCASHIRE**


**NORFOLK**


**NOTTINGHAMSHIRE**

Mansfield ARS: 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Lane, Mansfield. October 11 - Construction Competition, 13th - Desaster Refiel Operations by G0KRJ, Manufacture of GBEHX and GCUX. Mary G5NZA. (0462) 753928.

**SURREY**


**WARWICKSHIRE**


**WEST MIDLANDS**

South Birmingham RS: West Heath Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham, B31 2EN. 021-4743714.

**WILTSHIRE**

Trowbridge & DARC: 3rd Wednesdays. The Southwick Village Hall, Southwick, Trowbridge. October 6 - Earthquake Disaster Relief Operations by G0KQJ, 27th - Antenna Systems Matching by G0DAB Ian GOGRI. (0225) 864698.
American Forces News

Following Mark Jones' recent enquiry about reception of this station, John Parry has written in with some extra information. Apparently, American Forces News (AFN) began its days back in 1943 after US troops arrived in this country to support the war effort. The US military managed to persuade the UK government to allow them to install a network of low power radio transmitters. These were set up on many of the larger US bases to broadcast entertainment to the local troops.

The developments continued when in June 1944 the Allied Expeditionary Forces (AEF) program was introduced. This used a high power (100kW) transmitter based in Crowborough and became very popular. Towards the end of hostilities, the AFN set up a pair of transmitters in southern Germany which became the basis of today's transmissions. One of their more famous programmes was Midnight in Munich that had a very large UK audience and played requests until late in the night. During the mid forties the station expanded its range of frequencies with 100kW transmitters in Munich and Stuttgart and short wave frequencies of 8.565MHz and 6.080MHz. Sadly this has now changed somewhat and the station has to compete with an array of high power continental stations. Thanks to John Parry for this interesting report.

Guide to the Galaxy!

With so many different services now becoming available over satellite based systems, it's surprising how little information there is about what's up in the skies. Fortunately, Radio Sweden have come to the rescue with the excellent DXers Guide To The Galaxy by George Wood. This forty-eight page, A5 book provides a very good overview of the current satellite systems.

The first section deals with the TV Receive Only (TVRO) systems that are used primarily for domestic broadcasting. This section contains a listing of just about every satellite in current use. The coverage is world-wide, but with particularly extensive listings of American and European systems. The listings also give details of the frequency bands and the range of services being transmitted. This extends to cover the rapidly growing transmission of radio stations over satellite. The book concludes with a review of the other services that make use of satellites. These include the weather, military and amateur services. One of the problems facing the author is that of producing an up-to-date listing as the satellite scene is constantly changing. The current edition (5.4) was printed in February of this year so is reasonably accurate.

Perhaps the most surprising feature of this excellent book is its price - it's free! To order your copy just write to George Wood DX Editor, Radio Sweden, S-105 10 Stockholm, Sweden.

Channel Africa

In the August column, I mentioned a QSL address for Channel Africa. They were very quick off the draw and replied straight away with full station details. The station used to be called Radio RSA, but its work as the external arm of the South African Broadcasting Corporation continues as Channel Africa. As you would expect from a major broadcaster, they run a very comprehensive transmitter network.

They have a total of 58 antennas all operating with either 250 or 500kW short wave transmitters. The frequency range covered is 3 to 27MHz with four basic types of antenna used. The antennas themselves are pretty sophisticated with gains from 17 to 20dB. When you match that to the powerful transmitters, that makes for an awful lot of radiated power! If you would like to try and catch this station, English language broadcasts go out as follows:

- 5.96MHz at 0158-0355UTC
- 3.995MHz at 0258-0455UTC
- 7.23MHz at 0358-0455UTC
- 9.695MHz at 0458-0555UTC
- 15.22MHz at 0558-0655 & 1558-1655UTC
- 17.805MHz at 0958-1055UTC
- 9.73MHz at 1058-1155UTC
- 4.945MHz at 1558-1755UTC
- 11.75MHz at 1658-1755UTC

Channel Africa can be contacted at PO Box 91313, Auckland Park 2006, South Africa.

World DX Monitoring Service

Hank Bennett W2PNA has written sending me details of the World DX Monitoring Service. The service started as an individuals effort to learn just how many DXers there are. In the interim the service was taken over by a magazine and has since matured into the present monitoring service. As part of the registration process you are given a unique identity rather like an amateur callsign. This identity can then be used in your correspondence with other listeners and broadcast stations. You also get an impressive registration certificate. For full details of the service and registration details contact Hank Bennett, WDX Monitoring Service, PO Box 3333, Cherry Hill, New Jersey 08034, USA.

SHORT WAVE MAGAZINE, OCTOBER 1993
Since 1963, Keith Hamer has built up a collection of BBC archive material covering many topics such as graphic design, engineering achievements and anything associated with BBC Trade Test Transmissions. To coincide with the 30th year if the establishment of Keith’s unique BBC Archive Collection, he has recently launched the BBC Test Card Club. Members receive a quarterly magazine called Test Cards, this 20-page A4 magazine covers many aspects of BBC Engineering (past and present).

The annual subscription to Test Cards is £8.50 (£11 world-wide via airmail). A leaflet is available by sending an s.a.e. to Keith.

Keith Hamer, 7 Epping Close, Mackworth Estate, Derby DE3 4HR. Tel: (0332) 513399.

Frequency Schedule

We have received some details of Radio New Zealand's schedule for the period 2 October 1993 to 19 March 1994.

<table>
<thead>
<tr>
<th>UTC</th>
<th>Freq (MHz)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-2136</td>
<td>9.55</td>
<td>Monday-Friday</td>
</tr>
<tr>
<td>2137-0658</td>
<td>15.120</td>
<td>Daily</td>
</tr>
<tr>
<td>0659-1206</td>
<td>9.700</td>
<td>Daily</td>
</tr>
<tr>
<td>1207-1648</td>
<td>9.510</td>
<td>Occasional Use</td>
</tr>
</tbody>
</table>

WXSAT Late News

The American WXSAT NOAA 13 stopped transmitting during early September, apparently due to electrical problems with its on-board timing system. It appears this fault is similar to the one which may have disabled the Mars Observer 1 probe.

The new CIS METEOR 2-21 WXSAT was launched around late August/early September. Early Kepler elements for 2-21 may have contained an error, leading to possible mis-identification of the WXSAT. Transmissions on 137.40MHz received in Plymouth on 1 September matched closely the current elements for METEOR 2-18. Positive identification should have been made by the time this is published. The signal appears unusually weak.

Radio & TVDX News

Cellular phones are now operating in Greece, Panafon (Vodafone + France Telecom) and Stet Heelas (Nynex and others). Stet covers Athens with over 30 base stations and Panafon covers both Athens and Attica and intends to cover all of Greece and Crete by 1996. The Telecoms boards of both the States of Guernsey and Jersey have signed with STC Submarine Cables for two undersea fibre optic cables to be laid by an operational date of September 1994. The system will provide a ring network around the islands and improved UK contact. At the present time, a Dartmouth - Guernsey fibre optic link is in operation and plans are afoot for connection onwards to Goonhilly providing full global communication.

'S-PLUS' is the new Swiss 4th channel which opens late September 93 is intended to keep the younger generation tuned to the local Swiss channel rather than viewing the German language alternatives such as RTL, SAT-1, etc. Another defection to the UK standard Ceefax Teletext system with Belgium dropping their own Percival system. And the new transmitter now under construction at St. Pieters-Leuven (15kW SW Brussels) will be a mega-power transmitter replacing the Walave Ch. E28 transmitter. The 'Tele 21' service from Walave and Tournai (Ch.EB3 vert) transmitters is now called 'Sport 21' whilst Anderlues Ch. E61 transmits the 'ARTE 21' scrambled channel.

And in brief 'Televise Samoa' is now on-air thanks to TV New Zealand who assisted with the planning and installation for the 6th Pacific Nation TV service. In South Korea 4 religious radio stations (rather than TV stations) have been allowed to go on-air. These are the Buddhist Broadcasting System (BBS) with stations in Kwangju and Pusan, the Protestant-Christian (CBS) in Chunchon and the Roman Catholic Pyonghwa Broadcasting System (PBC) in Taegu. And in nearby Thailand the government have allowed the first privately owned TV station to be opened and franchise applications are now awaited.

New Kenwood Dealer

Kenwood have appointed a new amateur radio dealer in the south west. Based in Weston-super-Mare, QSL Communications is run by Graham Patterson. Graham has many years of experience in the amateur market and has built his reputation on the wide range of high quality QSL cards that he prints. QSL Communications will also be attending many of the rallies up and down the country.

QSL Communications, Unit 6 Worle Industrial Centre, Coker Road, Worle, Weston-super-Mare BS22 08X. Tel: (0934) 512757.

Malaysian Radio News

The South Midlands Communications team who were recently in Sabah Malaysia (9M6) providing communications for the Camel Trophy event have scored more points.

With great help from the Sabah licensing authorities, Richard Diamond G4CVI received permission to operate on 50MHz as G4SMC/9M6. SMC have also donated a 50MHz beacon to Sabah, which will be sited on the Sabah Medical Centre using the callsign 9M6SMC on 50.014MHz.
BARTG AGM

The BARTG AGM will take place on Saturday November 13 at 2pm in The Green Wine Bar and Restaurant, The Green, Mere Green Road, Four Oaks, Sutton Coldfield.

Topics to be discussed will include the subs for 1994, plans for the BARTG 1994 rally, the direction for BARTG and data comms in the next few years, highlights and hiccups of 1993 and the election of a new committee.

If you intend to go to the AGM, please contact: Ian Brothwell G4EAN, 56 Arnott Hill Road, Arnold, Nottingham NG5 6LQ. Tel: (0602) 262360.

QTI have Landed

QTI Talking Newspaper Association have finally come to rest in Cockermouth and a name change to QTI Tape Magazine Association. This charity is dedicated to the production of an audio tape magazine for radio enthusiasts who are unable to read articles in print. The QTI Tape Magazine is compiled so as to help them keep in touch with modern radio communications, to benefit their training as radio amateurs, to entertain them with stories of radio and rigs and so that they can enjoy articles in print that most of us take for granted.

Each issue of QTI contains articles from current radio magazines, including Short Wave Magazine. This is virtually a 'one-man-band' outfit run on a shoe-string. They are always in need of financial help, but there are no salaries or perks to fund. If you think you would like to help in any way, contact: QTI Tape Magazine, Towers Cottage, Towers Lane, Cockermouth, Cumbria CA13 9ED.

SMART Winners

ICS Electronics Ltd., are pleased to announce their success in the 1993 SMART award competition for research and development funding to small companies, sponsored by the DTI.

Nationally, 180 awards were made from 1400 applicants and within the south-east of England, 34 awards were made from 401 applicants.

ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD. Tel: (0903) 731101.

Radio! Radio!

The second edition of Radio! Radio! by Jonathan Hill has now been published. It is a profusely illustrated history of the British radio receiver. There are 244 pages, A4 containing nearly 1000 photographs of classic British radio sets spanning the late 19th Century right through to the 1970s.

This book costs £25 post free from the publishers, Sunrise Press, 2-4 Brook Street, Hampton, Devon.

The Yupiteru MVT-3100

The Yupiteru MVT-3100 covers the frequency range 143-162, 347-542 and 830-960MHz with 100 memory channels assigned to cover marine, p.m.r., military aircraft and 900MHz u.h.f.

Costing just £199, the handheld is available from: Nevada, 189 London Road, North End, Portsmouth PO2 9AE. Tel: (0705) 690626.

Anniversary Bargains

Technical Software are ten years old this year. To celebrate their first decade of producing amateur radio and s.w.l. systems, they are offering their best products at bargain prices.

For BBC computers, you can get the RX-8 program (FAX, SSTV, RTTY, c.w., AMTOR, packet, UoSAT & ASCII receive system) at the bargain price of £159, a saving of £100. Or the GX-2 program (FAX, SSTV transceive system) at £159, a saving of £50.

Anyone who buys one of their popular TX-3 or RX-4 programs gets a Morse Tutor, Logbook or Locator program with it free!

These offers are available on purchases made in October and November 1993 only. Technical Software, Fron, Upper Llandrorg, Caernarfon, Gwynedd LL54 7RF. Tel: (0286) 891886.

DXpedition

On the weekend of October 2 & 3, a group of radio amateurs will undertake a small expedition to the island Pampus. The Island Pampus is a fortress-island near Amsterdam. It was built in 1895 as a part of the 'Position of Amsterdam' - a circle of 42 fortresses around Amsterdam.

The Pampus Foundation is trying to restore the fortress to its original state. Therefore, this group of amateurs have created a new award - The Pampus Award. The profits from the award will be used to help the Pampus Foundation continue its work.

The locator they will be operating from is JO22MI, which is unusual and there are no normally radio contacts from this locator. Two special call signs will be in use, PA6PAM and PA6PUS. If you hear/work both stations you can apply for the Pampus Award by sending an extract from your log to: Award Manager Pampus Award, Rob de Visser PA3AGT, Gloriantstreet 17-3, 1055 CV Amsterdam, The Netherlands.

The cost of the award is £2.50 or $5, No IRCs please. The application period is open until December 31. A QSL will be sent for every contact.

The operating times will be October 2 1100UTC until October 3 1100UTC on the following frequencies. 3.650-3.7, 7.050, 14.190, 21.250, 145.375MHz f.m. and 144.375MHz s.s.b.

Power Supply

The Ambassador Centurian p.s.u. enables 12V d.c. equipment to be used easily from a mains supply. It provides up to 20A of current and will give a no-break uninterupted back-up of up to 12 amperes hours.

Design features fitted include three colour coded i.e.d.s on the front panel, and you can opt for a fan to be included.

If you would like the full details on this piece of equipment, contact: Diplomat Communications Systems, Unit 3 Summerlea Court, Herriad, Basignstoke, Hants RG25 2PN. Tel: (0256) 381656.
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In that little lot, you’ll find Shortwave receivers, scanners and specialist airband receivers, together with power supplies, rotators, aerial hardware, datacoms equipment including decoders for FAX, RTTY, Morse etc., filters, connectors and connecting leads, antenna accessories like wire, baluns and low-pass filters, books, maps, videos, software, pre-amps, TNC’s and other datacomms equipment, test gear, ATU’s, HF beams and verticals, VHF beams, verticals and mobile mounts with a huge range of mobile antennas - if it is worth having, you can be sure we’ve got it - and we can support it!

Leicester’s here once again and you’re all hoping for fantastic bargains. Well, look no further, we’ve got ‘em all! We’ve really butchered the opposition for the last few years and this year we will do the same again - but maybe we’ll do it differently. See you there, I hope!

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In the last of this series of Universal decoder reviews, Mike Richards looks at the compact M-1000.

Unlike the other decoding systems in the Universal range, the M-1000 is computer dependent and needs an IBM compatible PC. However, for those who already own such a computer, the M-1000 represents a very attractive and economic way of entering the world of decoding. The excellent range of modes supported places it in competition with decoders at many times the price. Included in its arsenal are standard RTTY, Morse, Packet, SITOR plus five extra ARQ modes, data analysis and a comprehensive FAX system.

Installation

Installation proved to be very straightforward - both hardware and software giving no problems. The operations are very well described in the manual, which gives the operator a step-by-step guide. For the hardware installation you simply have to insert the supplied full length ISA card into a vacant eight or sixteen-bit expansion slot. Although the manual covered this well you would be well advised to consult your computer's operating manual. In the case of the review model, the card fitted neatly into my aging Amstrad PC2086 with no problems. Once installed, you just have to connect the phono socket to the audio output of your receiver. As the M-1000 is happy to work with input levels of around 200mV, it should work with the fixed audio output of most receivers. This saves having to use the external speaker socket. To obtain the best performance from the M-1000, the input level needs to be set to match the requirements of the decoding program. This is done by adjusting a small pre-set potentiometer on the front plate of the M-1000 card. The software installation also proved to be very simple - just copy all the files from the supplied floppies to the required directory on your hard disk. For those without a hard disk, the programs could run from floppies with no problems. As there is no copy protection on the software, you are free to make your own back-ups. With the software installed, the final task is to run the initialisation program. This let you configure the package to run with your hardware set-up. The adjustments covered video modes and preferences, port addresses and printer port. Once the set-up had been completed, the details are stored in a disk file for future use. One unusual feature of the M-1000 is the provision of a separate FAX decoding program, I'm not sure why it couldn't have been integrated with the other decoding routines, but I'm sure Universal have their reasons. An interesting problem found during the review concerned the use of mouse drivers. My own machine, like most, is configured to load the mouse driver as part of the start-up routine. However, the M-1000 is not really designed to use a mouse so if you're not careful you'll tend to find the selection cursor flying around adjusting various parameters. The simple solution is either not to run the mouse driver or to make sure the mouse is safely tucked away before you run the program! Aside from this minor oddity, the decoding programs are very easy to use. The main options are selected and changed by moving a highlighted cursor along a bar at the bottom of the screen. Once the required option is highlighted the Up and DOWN arrow keys are used to adjust the setting. There are also a number of short-cut keys available to take you straight into the required mode. This technique is used both for the main decoding program and the FAX system. For the new user there is a very convenient status line help facility. Once activated this gave a short summary of each option as it is selected. The only other point to watch is that hitting the Escape key gives an immediate exit from both programs. I was caught out by this on several occasions as most commercial programs ask if you really want to quit before throwing you out. This can be particularly disastrous of your part way through a FAX chart.

Operational Features

To help the operator get the best from the various different signals and reception conditions, the M-1000 is equipped with a number of useful facilities. One of these is the ability to change the alphabet used in the decoding process. The M-1000 featured ITA 2, Telex, Military and Literal. The Telex and Military modes are useful for providing a more accurate decode of this type of signal. The provision of the Literal...
alphabet is really for use with the ARQ modes. By selecting this mode the various alpha, beta and other control codes are displayed. This information can be useful when decoding new or unusual stations. Next came what now appears to be a standard Unshift On Space function for helping to reduce errors when receiving normal text. The M-1000 gave the operator particularly good control of the audio tones used in the decoding process. In addition to opting for either the standard Low or High tones you had wide control over the shift. This could either be set in 5Hz increments from 60 to 1200Hz or stepped up through the standard shifts by pressing the Up and DOWN keys. This offered great convenience for the operator. A further sophistication is the addition of automatic filter tuning. Provided you are reasonably close with your initial settings, the M-1000 would carefully match the mark and space frequencies of the decoder to that of the incoming signal. At the end of the process not only are the filters altered but the resultant shift is shown on the main display. This can prove very useful for signal identification as the various signal types tend to use standard shifts. The final sophistication is the ability to alter the bandwidth of the detection filters. The M-1000 also included a number of useful post detection features to help reception under poor conditions. The Automatic Threshold Control helps to overcome problems caused by the variable propagations effects found on the h.f. bands. Those of you experienced in RTTY reception will no doubt have come across occasions when the mark or space tone is obliterated by an adjacent signal. The M-1000 can tackle this problem by decoding from just the mark or space tone. This is a very powerful and effective option for the serious DX listener. One of the problems facing newcomers is establishing the baud rate of the various utility signals. The M-1000 has this taped with a special speed measurement facility. Perhaps the final sophistication is the combination of the speed read-out and filter tuning to create the AUTO-TUNE mode. Providing the manual settings are reasonably close, the M-1000 will automatically measure the speed and shift, set the decoder to those settings and display the result. This is a very powerful package both in terms of convenience and station identification. It should also be noted that you cannot expect the analysis to work properly when dealing with very weak or noisy signals. You also need to ensure that you have a healthy audio level.

**Tuning Aids**

A common problem when dealing with utility stations is finding the optimum tuning point. Not surprisingly there have been a wide range of different systems developed over the years. The M-1000 includes a number of different options to make the operator's life easier. As you would expect all the options are displayed on the computer screen. I was very pleased to see that Universal have done a very good job here in providing very quick response times. I've seen plenty of on-screen tuning aids that end-up being far too slow for practical use. There's none of this with the M-1000 as all the options proved to be extremely effective. The main aids comprise a pair of vertical bargraphs located in the bottom right hand corner of the screen. The first of the two configurations uses one bar as an input level indicator and the other as a tuning point indicator. This gives a maximum display at the ideal tuning point. The alternative set-up uses the bars to represent the decoded mark and space respectively. Not only does this help show the correct tuning but it's very good for setting up the shift. To achieve this all you do is trim the receiver tuning and shift setting to achieve maximum displacement of the bars. The bargraph is supplemented by a Datascope facility that draws an oscilloscope type display on the screen showing the incoming signal crossing the centre point of the tone detectors. The optimum tuning point is shown by the maximum deflection of the trace.

**FAX Reception**

As mentioned earlier, FAX reception required the use of a separate decoding program. This is not particularly inconvenient as both the Decoder and FAX programs loaded very quickly. It would be very easy to write a small batch file or configure your disk manager to make this operation even simpler. Once into the FAX program you are presented with a screen very similar to that used for the main decoder. In addition to setting the main polarity, speed and IOC parameters you also have access to the displayed pallette. This could be set to one of four options which are Black and White (for charts), Monochrome (General) plus three pseudo colour presentations. One of the particular attractions of this program is the inclusion of an a.m. reception mode for orbiting satellites. Automatic FAX reception is supported, but with a few limitations. Reception would stop as soon as the screen is full. This meant you would lose the bottom from most h.f. charts. The M-1000 FAX is also set to stop when an idle is detected instead of using the more conventional stop tone. This can create a problem with some chart types that have areas with little information. I really don't see why Universal don't use the stop tone like every one else - it would save the inconvenience of having your decoder stop part way through an image. However, this may all be academic as the program's limitation of just receiving a screen full, means that charts from most stations will be stopped before the stop tone anyway. These limitations mean that the FAX program's auto reception is limited to a single chart. Having received your image you have the option to print or store to a disk file. The images are stored in .PCX format so can easily be manipulated with standard graphics packages. A basic print routine is included, though you may get better results by using a commercial graphics program. Despite my moans about the auto FAX reception, the displayed results, using a VGA screen, are very good.
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Short Wave Magazine, October 1993
**Morse Reception**

The Morse decoding mode of the M-1000 proved to be very quick and effective. There are three speed ranges provided but I found that the MEDIUM setting is fine for most signals. Correct tuning is shown by the word ERROR flashing on the display in time with the incoming signal. Although slightly unusual, it proved to be a very fast and accurate tuning indicator. The centre frequency of the Morse decoder could be set of an extremely wide range from 500 to 1500Hz in 50Hz steps. This means the centre frequency can be matched precisely to that of the c.w. filters in your receiver. Synchronisation and tracking of signals is really very good indeed and made Morse a pleasure to monitor. The excellent internal filtering of the M-1000 meant that it could also handle poor quality signals very well.

**RTTY/SITOR**

These are perhaps the two most monitored modes, so performance in these areas is critical. The M-1000 fared very well through a wide range of operational conditions. The good input filtering and post detection controls proved very useful when trying to dig a station out of the noise. Providing the input level is adequate and the tuning close enough the Auto-tune is a great way to match the decoder to the required signal. The basic SITOR ARQ modes are covered with three reception modes. Probably the most used will be the AUTOR mode that automatically detects the type of signal and quickly locks on. For the occasions when you want to stick with a particular mode and not be distracted you can manually select either ARQ mode A or B. If you want to monitor amateur Packet transmissions a standard implementation is provided in the M-1000. Both h.f. and v.h.f. packet is catered for with baud rates of 300 and 1200 baud respectively. For the very small number of stations that run with both channels active. A good example of this is the brazzville aeronautical transmissions on 8.123MHz. This station frequently has flight plans running on both channels.

**Advanced Facilities**

Supporting the wide range of decoding options are a number of advanced features. One of these is the built-in mode memory system. This provided ten programmable memories that could store the full mode settings. Another aid to rapid mode selection is the pre-programmed short cut keys. These enable any mode to be selected with a single key press. There are also a number of data flow controls of which the Selcall is the most interesting. This emulated the system used on the M-8000 and could be set to start decoding following receipt of a key word. A typical example would be the monitoring of press stations. You could set the system to start printing after the start signal (ZCZC) and stop at the end of message (NNNN). To help capture all the valuable messages, the M-1000 can store the decoded text to a disk file. The system is effective, if a little clumsy - it just dumps a file named TEXT?? into the root directory. However, it's a simple matter to recover these files and tuck them away safely.

**Summary**

The M-1000 proved to be a very fast and versatile decoding system that interfaces well with the computer. The range of modes provided covers all the most popular systems as well as a few interesting variants. There are a few rough edges that could do with some attention - especially the FAX program. I was very pleased to see that the on-screen tuning indicators are fast enough to be useful - many programs fall down here. The M-1000 is also particularly good when working under the poor conditions. Despite my grumbles, the M-1000 represents good value and will I'm sure be very popular with computer users. The M-1000 decoder costs £379.95 and can be obtained from Martin Lynch, 286 Northfield Avenue, Ealing, London W5 4UB. Tel:081-566 1207. My thanks to Martin for the loan of the review model.

**Specifications**

<table>
<thead>
<tr>
<th>Modes:</th>
<th>ASCII: 110, 150, 300, 600 &amp; 1200baud</th>
<th>Packet: 300 and 1200baud</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baudot: 45, 50, 57, 74 and 100baud plus variable 40 - 200baud in 1 baud steps</td>
<td>Sitor: Mode A and B plus AUTOR 100baud</td>
</tr>
<tr>
<td></td>
<td>ARQ: M2 &amp; M4 two channel 86, 96, 100, 172, 192 &amp; 200baud four channel 172, 192 and 200baud</td>
<td>ARQ-E: 48, 64, 72, 86, 96, 144 and 192baud</td>
</tr>
<tr>
<td></td>
<td>ARQ-E3: 48, 64, 72, 86, 96, 100, 192 and 200 baud</td>
<td>Morse: 5 to 120 w.p.m. auto ranging</td>
</tr>
<tr>
<td></td>
<td>Data Bit: synchronous and asynchronous 45 to 200baud</td>
<td>Facsimile: a.m. and f.m. 60, 90, 120 and 240 i.p.m.</td>
</tr>
<tr>
<td></td>
<td>IOC: 288, 440 and 576</td>
<td>IOCS: 13</td>
</tr>
</tbody>
</table>

**Demodulators:**

- Radioteletype: Microprocessor controlled switched capacitor filters for channel and post detection
- Morse: Envelope detection using A/D convertor
- Indicators: On-screen bargraph of level, filter tuning and mark/space radio
- Input: 4-8000 200mV p-p nominal
- Board size: 8-bit 305mm length

Short Wave Magazine, October 1993
It was an ordinary 1930s bungalow, but not exactly in the best part of town, and it hadn't become gentrified and trendy. The concrete path to the front door was badly cracked. Under the eaves was an ancient brush radio aerial, a mass of wires splayed out from the insulator, like a broom gone wrong.

"This house is old enough to have power wiring in conduit, and that could be the trouble," Kilocycle Ken the senior radio inspector said to Young Golly the radio inspector trainee.

Though it was idle speculation until they talked to the complainant, and had a look at her radio. It could be a faulty set.

Kilocycle Ken twisted the metal turn-type knob of the front door bell. An old woman wearing an orange floral smock, her hair in curlers, opened the door. She had an ancient fire shovel in her hand, defensively.

Kilocycle Ken launched into his patter. "Good morning, we are radio inspectors, called about your radio interference complaint to the Post Office."

She brightened, lowered the shovel and invited them inside.

The sitting room had the original high ceiling height reduced artificially by cords looped backwards and forwards, the plaster painted black, a fashionable trick, years ago. There were paper flowers, a wooden tea wagon, a carpet square with a surround of bare varnished floor, ferns, browned photographs of people, an old 78r.p.m. HMV gramophone with a stack of thick black disks in brown envelopes. There was a photograph of Michael Joseph Savage, the 1930s Labour Prime Minister on the wall, and a silver-paper passe-partout picture.

The radio was an old Pye with a short wave band.

"Don't see many of these around anymore," Kilocycle Ken complimented the old lady. "Good tone, 6V6 valves in the output, as I remember."

The old lady preened. "My husband bought it years ago, shortly before he died."

"And now you are getting interference on it," Kilocycle Ken said kindly. He noticed the wire for the aerial entered the house through a black tube with a brass screwed rod and protected by a brown porcelain lighting arrester, an ancient arrangement used when wireless was wireless and not radio.

Preserved in Time

Most radio interference complaints were from elderly people, at home all day, the radio their only companion. He'd been in many houses like this, preserved in time in a different age, with oak dining room suites, three piece lounge suites and probably in the bedroom would be an oak bedroom suite with a wardrobe, a double bed and a couple of chests of drawers.

"I see by the complaint sheet that your problem is very personal." Kilocycle Ken looked at the woman.

The complaint tittered, then whispered, "It's the toilet. I flush it - and the noise on the wireless! It's something terrible. I didn't know what to do. It's very upsetting - and mysterious, and - embarrassing."

"It's not particularly unusual," Kilocycle Ken said quickly, reassuringly. "Quite common in ageing houses. What happens is that when you pull the chain the rush of water through the pipes causes them to vibrate, thus upsetting your radio reception, probably by earthing your corrugated iron roof, which is acting as your aerial, despite your brush type aerial outside."

"My husband swore by that brush aerial, he could get America on short wave."

"Wonderful," Young Golly said vaguely, cynically. Kilocycle Ken frowned at him. "But to work to check the theory, could we have the wireless switched on, please?"

She turned a knob. They waited. It had to warm up. No instant transistor sound here.

"You don't get interference on your hi-fi," Young Golly said suddenly.

The complainant looked at him. "It's a gramaphone," she said sarcastically.

Kilocycle Ken asked, "Have you got any George Formby records? I like his music, but they never play it on wireless anymore."

"No," she said regretfully. "Gracie Fields is one of my favourites. 'We'll Meet Again'."

"Elvis Presley?" Young Golly asked.

"Did he make 78 r.p.m. records?" the old woman snapped.
RC818 (SSP £199.99)
Multi-band Digital Preset Stereo World Radio with Cassette Recorder
This flagship model demonstrates the leading edge of Roberts technology. With a clear LCD display of all functions, it has 5 tuning methods, 45 preset stations, dual-time display, standby and clock/ alarm plus a cassette section for timed recordings from the radio. Provision is made for single sideband and CW transmissions as well as stereo FM on headphones and stereo record/playback of cassettes. Comes complete with mains adaptor.
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- 45 memory presets
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- Radio standby function

R817 (SSP £169.99)
Multi-band Digital Preset Stereo World Radio
Offers all the outstanding features of the RC818, minus the cassette section.

R808 (SSP £119.99)
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The R808 has all the advanced features of the R817 with the exception of BFO (Beat Frequency Oscillator) but in a more compact case specially designed for the regular traveller.

R621 (SSP £59.99)
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Short Wave Magazine, October 1993
NOW THATS WHAT I CALL

SHORTWAVE EQUIPMENT

Kenwood R5000
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Deposit only £99.00 and 12 payments of £75.00. Total £999.00 or with v.h.f. converter, deposit £149.00 and 12 payments of £87.50. Total £1199.00 Zero APR.

Yaesu FRG100
Now one year old, the FRG100 has proved itself to be the hot favourite for mid-priced shortwave receivers.
Deposit only £50.00 and 12 payments of £45.75. Total £599.00. Zero APR.

Drake R8E
The only receiver fitted with all optional filters as standard, the Drake is still one of Lynch's best sellers. Offered with v.h.f. converter or not, the R8E is a firm favourite for computer control or a top of the range desk top receiver.
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Lowe HF150
Still continues to be the best budget selling shortwave receiver. Offered with NiCads and telescopic whip, the HF150 is the ultimate for compact listening.
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Icom ICR72E
Typical Icom quality, the new ICR72E still shows the others how to offer a top quality receiver at a lower than normal selling price.
Deposit only £79.00 and 12 payments of £65.00. Total £859.00. Zero APR.

Yaesu FRG8800
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M8000
Reviewed as the best decoder in Short Wave Magazine last month, the M8000 is the ultimate in stand alone codecrackers for your receiver.
Deposit only £319.00 and 12 payments of £80.00. Total £1279.00. Zero APR. 14" SVGA Monitor required at £199.00.

M900
Baby brother to the M8000, the M900 is offered with a video card enabling on screen fax display, in addition to the RTTY/Sitor and c.w. modes.
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M400
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Auders
Famous Five

reception of RTTY/Sitor. FAX (to printer), Pocauq, Golay, DTMF, CTCSS and DCS. As reviewed in August SWM.

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MVT7100

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AR3000A

Still the best selling Base/mobile scanner, the AR3000A from AOR will make the most of the receiving equipment in your shack redundant. Special offer this month only: LOW DEPOSIT and pay over a whole 18 months!

Deposit only £149.00 and 18 payments of £44.44. Total £949.00. Zero APR.

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Short Wave Magazine, October 1993
"Before his time," Young Golly said. "They don't make records like they used to," Kilocycle Ken said nostalgically. "They are mostly my husbands, Caruso and classical orchestral. He did like music."

The radio was tuned to the National Network programme.

"I used to love the old morning serials," she said. "Portia Faces Life, Doctor Paul, but all gone."

"Where is the bathroom?" Kilocycle Ken asked gently. It had a copper geyser, a cracked pedestal basin, a tin bath, a canary in a cage, a Shanks lavatory pan with a plain wooden scrubbed toilet seat.

Kilocycle Ken gravely fondled the dangling porcelain handle on the old-fashioned chain of the overhead cistern. "Antique, probably worth a bit of money." He tugged the handle.

The plumbing clanked and roared and hissed. In the sitting room the old wireless almost leapt off the table with the vibration from the old-electro-magnetic speaker.

Real Man's Job

"Dear, oh dear," Kilocycle Ken said. "You do have a problem, but I think we can fix it for you. Have you got a step ladder?"

"Only got kitchen steps."

"High enough. I'll see if I can find the pipes causing the trouble, tie them together so they don't rattle, solve your problem."

He got a pair of khaki combination overalls from the car and a small transistor radio.

The man-hole for the ceiling space below the roof was in the bathroom. Kilocycle Ken balanced on top of the steps to reach the access.

"Why don't you send the boy up?" she asked.

"This is a real man's job," Kilocycle Ken said gravely.

Young Golly yawned.

"You don't see tradesmen like you used to," the old woman said.

"We are not tradesmen," Young Golly said stiffly. "We are professional radio interference investigators."

"Have you got a torch?" Kilocycle Ken asked unprofessionally.

She had a small plastic torch which gave a weak glimmer.

He hoisted himself up. "Any mice?" he called.

"There are no rodents in this house," she snapped.

"Any borer in the house?" Young Golly asked.

"Why?"

"All wooden houses have borer."

"Not this one, my husband had it treated."

Kilocycle Ken crawled across the rafters. He sometimes wondered why he crawled around ceilings.

Was that what life was about?

He found the pipes. The torch died. He rattled the water pipe and the metal electrical conduit pipes, which were touching, listened on the transistor radio. The noise was loud.

He had a small coil of soft copper wire in the overalls pocket.

He bound the two pipes together, very tightly, by feel. "Flush the toilet," he called.

The woman hesitated. Young Golly did the deed. The toilet roared and there was no reaction on the wireless. The old woman almost smiled.

Kilocycle Ken didn't really know how it happened. He was trying to go backwards towards the man-hole when he got his leg caught in the joist, and his foot went through the ceiling.

He could see daylight.

Young Golly sneezed.

A Procedure

The old woman let out a roar, surprisingly loud for such a person. "Come down out of there, young man. Oh what have you done!"

She sat on the toilet, moaned, "Oh my ceiling."

"Easily repaired," Young Golly said. "Bit of plaster stuff, comes in a packet, mix it with water."

It was a few minutes before Kilocycle Ken reappeared. Then he was wearing a bowler hat.

"Charlie Chaplin?" Young Golly asked.

"My husband used to wear that! I wondered what had happened to it."

"One finds many strange things in the ceilings," Kilocycle Ken said.

"My ceiling?"

"Such accidents are not unknown. There is a procedure. Somebody will call to inspect the damage and it will be made good. Just as good as new. Better than new."

"I should have endured the radio interference," she moaned.

Kilocycle Ken said, "Can't agree with that. Your programmes from now on will be received crystal clear."

She sighed. "Thank you - anyway."

"She must be very lonely," Kilocycle Ken said, outside. "She should take in boarders."

"Nobody boards today," Young Golly said scathingly.

"But she should turn the house into flats. You've already started her on the road to renovations."

I suppose steam radio had gone out of fashion when you were being trained!
A DIFFERENTIAL MATCHING AMPLIFIER FOR LOOP ANTENNAS

David Porter G4QYX describes an amplifier to improve the sensitivity and selectivity of a loop antenna.

With both night-time and day-time DXing becoming popular, night-time for overseas stations and day-time DX for the reception of UK and Eire 'local' radio stations, there is an incentive to construct a loop antenna. It might be one of the many 'standards', such as a 500mm or 1m diameter type, or one to your own design.

It is generally acknowledged that the signal pickup of the 500mm and smaller loops is considerably reduced compared to the signal obtained from the 1m loop. Having said that, verbal harassment to a 50cm loop user is also considerably reduced. After all they're sometimes not appreciated in quite the same vein by other members of the family!

In order to increase the signal from the 500mm loop, making it in effect, electrically equivalent to a 1m loop, I've added a differential matching amplifier (d.m.a.). This latest design differs from earlier versions, in that the output is accurately matched to 50Ω to suit modern communication and portable receivers. Provision is made for a self contained preset gain control to be incorporated.

Adjustment of the gain control ensures that overloading, and possible cross-modulation effects inherent in modern receivers, may be neatly avoided.

Circuit Explained

Referring to the circuit diagram, shown in Fig. 1, you will see that the loop antenna is connected directly to the amplifier, without matching or secondary loops being needed. The two field-effect transistors (f.e.t.s) Tr1 and Tr2, are used in a long tailed pair configuration. The d.c. bias to these f.e.t.s, determined by potential divider R1 and R2, is fed directly via a 1MΩ resistor, to the gate of Tr1 (a J309 type), and via the actual loop winding itself to the gate of Tr2 (another J309 type).

The input impedance of the amplifier is greater than 1.5MΩ, and so ensures negligible loading to the tuned circuit. This keeps the loop antenna Q high, and so gives better selectivity and excellent efficiency. Using high tolerance (2%) balancing resistors, R4 and R7 (1kΩ each), and the common resistor R5 (4.7kΩ), ensures an accurate current balance in Tr1 and Tr2. This balancing of the currents gives good differential amplification.

The d.c. bias on the gates of the f.e.t.s is arranged so that, the voltage at the drain of Tr2 is about 0.6V above
the half supply voltage, (5.1V). With the base to emitter volt drop, a nominal 0.6V in Tr3, its emitter quiescent output voltage is at half supply voltage (4.5V). When set at this point, the transistor acts in a wide range linear fashion, and reproduces faithfully the signals input to its base.

It is also the action of Tr3, an emitter follower, that enables 50Ω loads to be driven.

The control of overall gain is by means of the preset resistor R6. This control shunts 'excess' signal away, via C3 on the slider of the gain control. The combination of R9 and C5 act as both 50Ω matching and d.c. block respectively.

The 9V supply, from a PP3 or 6F22 battery, is decoupled, at r.f. by C2, a 0.1µF ceramic type and at lower frequencies by C4, an electrolytic capacitor. Overall current consumption is 5-7mA and an alkaline battery is recommended. Do not be tempted to use a mains power supply as noise from the mains can find its way on to the output amplifier and spoil otherwise good reception.

**Construction**

The amplifier may be constructed on the printed circuit board as shown in Fig. 2. Or it may be constructed on 0.1in matrix board. Miniature components are used, throughout, 30V disc ceramic capacitors and metal film 0.6W resistors are recommended. Suppliers of components and equivalents are given in the component list.

After fitting the the components to the board and soldering, the board is carefully checked for solder bridges etc., and is secured in the box by 2x2.5mm nuts and bolts.

In the prototype, an abs plastics box, measuring 150x80x50mm, was used, with the on/off switch (S1) located in the lid. The connections to the loop antenna are by two leads - crocodile clips on one end and 2mm plugs on the other. Two 2mm sockets are mounted in the ABS box. The layout will depend on the box you choose.

The output socket could be a Belling Lee TV 'surface' type, and then URM76 or URM202 coaxial cable can be used with a standard TV antenna plug. The connections to the receiver, will be to suit the plug/socket on the receiver itself.

The coaxial output lead may be up to 10m long without detriment to the signal, but 2-3m is sufficient to allow the loop orientation, and tuning to be within easy reach whilst sitting at the receiver.

**Voltage Readings**

Voltage reading should be taken using an high-impedance multimeter. I find a digital meter easiest, and the low loading of the multimeter doesn’t change the readings much. If you are using an Avo or similar low(ish) impedance (20kΩ/V) meter, the

continued on page 29
THE FERRI-TEN EXPERIMENT

The Ferri-Ten is a small, external ferrite loop, receive antenna for the 28MHz band. It is one of a series of ongoing experiments, conducted by Richard Q Marris over the years looking into the RX and TX performance of various ferrite rod materials, at v.h.f. and u.h.f.

The circuit (Fig. 1) is as simple as possible. The construction is physically simple, and clearcut, but must be carried out with extreme care to achieve good results. The cost is minimal, in fact, apart from the ferrite rod, the whole thing can be made up from bits and pieces from the junk box or surplus market.

The Ferri-Ten covers up to approximately 45MHz. Its peak performance is targeted in the Ten Metre band (28-30MHz), although it also covers 21MHz, where the performance is falling off, due to the adverse LC ratio for that band.

The ferrite rod used is an Amidon type R61-050-400 (100mm long x 12mm diameter). This is made of a nickel-zinc material with a permeability of 125, and said to be useable up to 10MHz for ferrite rod antennas. However, it has been found that this can be 'stretched' up to the lower v.h.f. frequencies with careful design and construction of the windings.

The antenna consists of an inductance, L1, resonated with a 60pF variable capacitor, C1. As the 28MHz band resonates with the plates of C1 approximately 20% enmeshed, it is obvious that the value of C1 could be reduced. Also on the rod is a coupling coil L2, which is connected to the RX, via a series coupling capacitor, and a short length of RG58 feedline. With most RXs a pre-amplifier will be required, and it is suggested that this should be wide-band with an adjustable gain up to about 20dB.

The chassis was made from a piece of 3mm thick Perspex measuring 115 x 75mm. Onto this is mounted the rod and coil assembly, using a suitable Terry clip at either end, the variable capacitor (C1) fitted with an insulated extension shaft, a small tag strip and a length of RG58 feedline held with a cable clip. All screws are countersunk, underneath the 3mm thick plastics chassis. This layout can be seen on Fig. 1, and the photographs. A further refinement would be a slow motion drive on C1.

Coil L1 consists of three full turns, of 16 AWG Thermoleze insulated wire, located at the centre of the rod and wound so that there is no physical contact between the wire and the ferrite rod. This is achieved by winding four closewound turns of wire, around the rod, and letting it unwind to 3½ turns, the result being a coil with a 1.5mm air gap between wire and ferrite rod. The ends of the wire are carefully bent to three turns (opened to about 2.5mm apart) for soldering to C1, with short leads. With careful mounting of the rod, and C1, the air gap between the coil and rod can be achieved. The wire ends are approximately 10mm long. One end is soldered direct to the metal body of C1, the other to the stator solder tag, giving a very rigid coil assembly. Attempts to use a coil former resulted in a lower frequency range and a drop in sensitivity.

The coupling coil, L2, is one turn of pvc covered, stranded 7/0.2mm wire, wound onto the rod, with the ends secured by a short piece of heat shrink sleeving. In series with L2 is a 100pF silver mica coupling capacitor. The position of L2 is critical. On the prototype it is 16mm from the outer turn of L1. Individual layouts may differ, and L2 positioning should be adjusted, as described later. The whole assembly should be rigid. On the first mock-up the 1.5mm thick chassis used was found to be slightly flexible, and altered the tuning. For this reason the chassis should be a minimum of 3mm thick plastics. It is suggested that a spot of epoxy adhesive should be applied, where necessary, to ensure component rigidity, but not onto L1.

Using the antenna for the first time produces quite adequate signals, on a high gain RX, without a pre-amplifier. To adjust L2 it is necessary to tune to a captive signal source, or a 28MHz beacon, and move the single turn of wire, slightly inwards and out for optimum coupling. Overcoupling produces a wideband, double hump effect. Undercoupling produces a peak, with a loss of signal strength. The optimum coupling point can be found by moving L1 outwards, minimally, from the point where overcoupling can first be detected. Once settled, L2 should be held in position with a spot of hot candlewax.

The coaxial RG58 feedline used has an impedance of 50Ω. Should any other impedance type be used, then it is suggested that alternative values of C2 be tried and L2 coupling adjusted as required. Other forms of coupling have been tried, but the described method has been found to be the best for this application. It has been found that this antenna, being directional, can be rotated to reduce QRM, QRN and domestic electrically generated noises.

You Will Need

**Capacitors**

- **Air-spaced variable**
  - C1: 60pF (see text)
- **Silver mica**
  - 100pF: 1
- **Miscellaneous**
  - Ferrite rod 100mm long x 12mm diameter; Amidon Type R61-050-400; Thermoleze insulated wire, 16AWG; Amidon; 115 x 75 x 3mm (minimum) Perspex, or other plastics, chassis
  - Terry Clips to hold ferrite rod (2); RG58 coaxial feedline; Nuts, bolts, cable clip etc.
  - Amidon Associates, 12035 Otsego Street, North Hollywood, California, USA.
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GLOBAL AT-1000

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excellent and is the sure way to improve your aerial matching problems when using random wires, balancing feeders or even coaxial fed systems. No aerial can hope to be a good match over the whole spectrum and you will only get maximum transfer of signal into your receiver when the aerial load presents a 50 Ohm impedance. This is just what the AT-1000 does. It also has provides the added bonus of improving the frost end selectivity. An essential item...

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ACEPAC3A For those with a larger budget, ACEPAC3A is also available for the AR3000A & AR3000 receivers. Installation is recommended on a hard drive but can be run from 3.5 or 5.25 inch floppy's depending on machine compatibility. Features are similar to AORSC but ACEPAC3A has a more versatile spectrum graph type display. A descriptive leaflet is available to request. Suggested Retail Price £139.00 plus £2.00 P&P

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Differential Matching Amplifier for Loop Antennas
continued from page 23

I'm sure you will find the combination of a loop antenna and this amplifier to be useful. The amplifier functions efficiently and offers useful gain up to 10-12MHz. The project was originally designed for use with a large wooden framed loop antenna but will work just as well with a ferrite rod antenna. The original winding, through the d.m.a., produced excellent results on feeding it to the receiver.

I'm indebted to Trevor Brook G3WBQ, of Surrey Electronics for his help with the original circuit, and to testers, Derek Bell of Preston, and Barry Davies of Warrington, for trying the prototypes.

Operation
Mount the boxed amplifier on a suitable part of the frame of the loop antenna. Try to locate the amplifier as near as possible to the tuning capacitor, keeping the leads to less than 300mm. Connect the output of the d.m.a. to the receiver using coaxial cable and ensure that the preset potentiometer is fully clockwise.

Switch on the d.m.a. and tune the loop to a strongly received signal. Adjust the preset resistor R6, until overloading does not occur in the receiver on this strong station. The project was originally designed for use with a large wooden framed loop antenna but will work just as well with a ferrite rod antenna. The original winding, through the d.m.a., produced excellent results on feeding it to the receiver.

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G4BVZ

G开阔 Short Wave Magazine, October 1993 29
A SIMPLE RECEIVING LOOP ANTENNA

Several years ago Len Buck GODLR bought a Yaesu FRG7700 receiver. This was a useful addition to the shack, except after dark, when hordes of medium wave signals appeared to swamp the higher h.f. bands with whistles and other intermodulation products. The simple loop antenna described in this article was built to overcome these problems.

The recent upsurge of interest in small loop antennas led me to think that the inherent narrow bandwidth of this design would be the solution to the i.m.d. problem, and so a simple and rather 'Heath Robinson' loop was made up using a short length of H100 coaxial cable. This provided a loop about one metre in diameter, supported by a cruciform wooden structure and tuned by a 3-gang capacitor liberated from a decrepit broadcast radio. Coupling was by a 200mm diameter loop of the same cable. The results on the 14MHz band were impressive, with stations that were totally lost under a welter of i.m.d. noise when switched to a 11m long wire, being received in the clear when using the loop.

Aesthetically Pleasing

Spurred on by these encouraging results a start was made on a more aesthetically pleasing version that would sit on top of the receiver and grace the shack. It was decided that the material for the main loop would be 10mm diameter copper tubing, partly because this would be self-supporting and partly due to the fact that there was a bent and battered piece, several metres long, buried in rubbish at the bottom of the garden!

This was disinterred and straightened and provided a good usable length of 2.4 metres that was duly bent into a loop approximately 800mm in diameter. It was found that the ends of the tube could, with a little filling, be fitted into a standard PL259 plug body. When soldered into place these provide a neat way of terminating the ends. The centre pins of the plugs are shorted out to the bodies with suitable wire links.

Some plastics boxes that had seen previous service were found in the junk box and it was decided to use two of these measuring 150 x 80 x 45mm deep. One is inverted and used to mount the loop and house the capacitor and the other as the base. A pair of SO 239 sockets are mounted on opposite sides to accept the ends of the loop, and a third socket is situated on one end to act as the output connection.

The tuning capacitor in my prototype is fitted with its spindle emerging from the bottom panel and one section is connected to each of the loop sockets, providing, in effect, a split stator component. This helps prevent hand capacity effects when tuning the loop. The capacitor that I used was too large to allow the use of the original box lid, and therefore the second box was needed to

continued on page 33 ➤

Fig.1: Circuit diagram of the simple receiving loop antenna.

Fig.2: Layout of the box. The box must be a plastics type to ensure that the tuning capacitor and sockets are isolated.
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From Canada

"...my choice fell on the HF-150, an excellent choice indeed. Great size, Great features; a quality receiver and simple but complete features at a reasonable price, in short - a little jewel. You have managed to put in all features of top models like the R-5000 and Drake R-8 in the HF-150. The tuning knob is super smooth and I find its reception capabilities equal if not superior to the R-5000; the sound quality and ability to stay on frequency to be excellent. The clarity of reception is exceptional and portability superb."

From Merseyside

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A personal recommendation
When asked to recommend the best book for the short wave listener, I unhesitatingly say “Passport to World Band Radio”. This book is absolutely the best accessory anyone can have. Every section carries the unmistakable authority of the world's best shortwave companion, and there are almost 400 pages of information including 50 pages of receiver reviews by Larry Magne, probably the best informed reviewer in the world. This outstanding publication costs a mere £12.95 (+£1.55 p&p) and is available from stock at all times. If you own a short wave radio, you simply must have “Passport” by your side.

Send 4 first class stamps to cover postage and we will send by return your FREE copy of "The Listeners Guide", a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will give you a good read, but underneath the humour lies a wealth of expertise. Don’t forget to ask for my “ATU or Preselector” leaflet at the same time.

Lowe Electronics Chesterfield Road, Matlock, Derbyshire DE4 5LE
Tel: 0629 580800  Fax: 0629 580020
complete the enclosure. However, various two section capacitors are available which may be compact enough to allow the use of a single box. The value should be 10 - 565pF per section - with the loop described this will provide a tuning range from about 8 - 30MHz.

**Coupling Loop**

With the loop connected to the sockets the next step is to mount the coupling loop. This is made of RG58 coaxial cable formed into a single turn, 200mm diameter, with the inner and outer connected together at each end. This is attached to a piece of plastics sheet by small wire ties, with suitable terminations being provided by 2BA nuts and bolts. The assembly is suspended at the top of the main loop using a coupled of small plastics cable clips bolted to the corners of the plastic sheet. A length of RG58 coaxial cable, connected to the coupling loop, is taken down to the output socket through a small hole in the capacitor housing.

The antenna is now complete and it only remains to fit the base. In my case, this was of course the second box, which was stuck in place using Araldite. However, whether one or two boxes are used, the loop will be found to be top heavy and eager to fall over at the least provocation. A simple wooden base is the simplest cure, as shown in the photograph.

**Sharp Tuning**

The loop should be connected directly to the receiver and not through a matching unit. The tuning is sharp, but not so sharp as to create difficulties. My own loop gives coverage from 8 - 35MHz and despite the capacitor having too low a voltage rating for normal h.f. transmitting use, it has proved to be quite satisfactory when used with low power. A s.w.r. of better than 1.5:1 is achieved with careful adjustment. However, because of the high Q factor, this only holds over a narrow bandwidth without retuning. The radiation pattern is along the planes of the loop, so this is a directional antenna, though it is not discernable when used for h.f. reception.

---

**Listen with Grandad**

By Leon Balen and David Leverett

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Minature 30x40x15mm, any frequency in the range 400-2000MHz, up to 50dB main.

<table>
<thead>
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</tr>
<tr>
<td>2MHz</td>
<td>£12.21</td>
</tr>
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Arbiter 118-124MHz (excl. gain due to frequency spread). Other frequencies in the range 40-2000MHz to order...

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34 Short Wave Magazine, October 1993
Strip the screen away for about 10mm at this point.

Fig. 1: Details of the new screened coupling loop.

John Wells offers some practical modifications to the John Ratcliffe designed Hexagonal Loop Antenna to improve its performance.

The Hexagonal Loop Antenna that I built to John Ratcliffe's design, described in SWM April 1989, did not seem to work very well. The null was disappointing, being only about one 5 meter point less than the maximum! On the plus side, the loop tuned sharply, too sharp for comfort with direct drive to the tuning capacitor even with a 75mm knob, sloving the Q was good, and it covered the correct frequency range.

I came to the conclusion that the antenna was acting as much as a vertical antenna as it was a loop. It needed screening, but as this is not very practical with this design I choose an easier method.

Faraday Loop

The first step is to screen the coupling loop, replacing the open wire with a 'Faraday Loop'. First, remove the inner coupling loop completely, together with its coaxial cable. Measure 40mm from the innermost turn of the tuned winding and make a pencil mark on each of the six support points. The pencil marks are the position of the new loop to be used for coupling. Carefully measure the required circumference, mine was 2160mm, add the required length for a lead-in cable, arriving at a total length for the coaxial cable needed for the new element of about 4 metres.

The coaxial cable selected should be of a type with a well filled outer braid - I used UR43. The type described as 'Low-Loss' TV cable is not necessary. In fact it is undesirable, as the outer braid is often not well filled in these cables.

At one end of the cable remove both the outer and inner insulation for about 60mm, 'tailing' the braid in the process. You should have about 50mm of the inner conductor protruding. Measure 2160mm - the circumference of your loop - from the end of the inner insulation and remove 10mm of the outer insulation, 5mm each side of your mark. Be very careful not to nick the braid while doing this. Bend the cable round into a loop and wrap the end of the inner conductor, together with the braid 'tail' around the middle of the exposed braid. Solder both in place - as quickly as possible to avoid melting the inner conductor.

Now measure halfway round the loop and mark. Remove the outer insulation and the braid as well this time, for about 5mm each side of the mark, leaving a 10mm gap in the braid. The drawing makes this clear, I hope! Make absolutely sure that there are no braid 'whiskers' straying into the gap!

Now install the new loop inside the coupling loop. Mark the position of the new loop to be used for coupling. Carefully measure the required circumference, mine was 2160mm, add the required length for a lead-in cable, arriving at a total length for the coaxial cable needed for the new element of about 4 metres.

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Now install the new loop inside the original tuned winding, over the pencil marks, fastening it to the frame with Nylon P-clips and 12mm No. 6 screws. You may find it easier to tape the loop in place temporarily to ensure a good tight fit with the clips once installed. Keep the loop well stretched to ensure straight sides evenly spaced from the winding. Terminate the far end of the coaxial cable to suit your receiver.

Tuned Winding

Since the tuned winding can't easily be balanced, it must be balanced. Carry out the following experiments. Connect the loop to your receiver and tune in a fairly strong local radio station. It should be fairly near to ensure ground-wave reception with no fading. Don't expect any marvellous nulls yet! However, the loop should work with about the same signal strength as the original design, when the loop is tuned. Now, using about 150mm of wire with a croc-clip on each end, connect one side of the tuning capacitor to the earth junction point on the braid of the coaxial cable pick up loop. You will need to reduce the setting of the tuning capacitor to peak the signal. Now remove the croc-clip and re-connect to the other side of the tuning capacitor. You will probably now need to re-tune again. Note the difference between the two settings.

Now un-solder the tuned winding ends from the tuning capacitor, reverse them and re-solder. Repeat the croc-clip experiment.

Connect the tuned loop wire whichever way round gave the least difference between the two croc-clip pairs of settings. This is the right way round for minimum imbalance in the stray capacity of the loop.

Now take a small capacitor, say about 20-30pF. Solder one end to the braid junction point. Now, with the croc-lead, connect the other side of the trimmer to the end of the tuned loop - the outside turn - at its junction with the tuning capacitor. Now try the antenna for a null. Adjust the trimmer for the best null, continually retuning the loop and rotating it. The final setting of the trimmer is very critical - probably to less than 1pF - but you will now get nulls down to noise level even on the strongest signal! If it appears that the trimmer needs to go below minimum, reconnect the croc-lead to the other side of the capacitor used for tuning.

Finally, replace the croc-lead with wire and critically re-balance the trimmer. You will find that the same trimmer setting will serve over the whole band, but its setting will be more critical at the h.f. end, so use that end for the final 'tweak'.

Good Hunting!

Fig. 2: Circuit diagram of the modified Hexagonal Loop Antenna.
Whilst receivers and power supplies have been getting ever smaller, the antenna problems facing the listener on the move remain. Mike Richards has been looking at the AOR LA320 active antenna system.

Even the best receivers are hopeless without an effective antenna. The AOR LA320, reviewed here, is designed to overcome many of the problems. As you can see from the photo, the LA320 uses the loop antenna system that has proved so popular with broadcast enthusiasts. One of the main advantages of this system is its directional properties, giving the operator the facility to null-out any interfering signals.

Getting Started

The LA320 arrived very well packaged with all the necessary bits and pieces required to get on the air quickly. There was even a 9V PP-3 size battery and a BNC - BNC lead for connection to the receiver. It's worth remembering that you will probably need an adaptor to convert between the BNC and the connector used on your receiver. Despite the fact that few receivers feature BNC connectors, there are probably many adapters available for this series of plug, so it's a good choice. In standard form, the LA320 covers 1.6 to 15MHz using two plug-in antennas. The higher frequency antenna is enclosed in a 215mm diameter aluminium loop and covers 5 to 15MHz. For coverage of the frequencies above 15MHz, AOR recommend using a simple whip antenna. Coverage from 1.6 to 5MHz utilise an encapsulated bar antenna. For those with an interest in the lower frequencies, there are two optional bar antennas available covering 0.2 to 0.54MHz and 0.54 to 1.6MHz respectively. Changing between the various antenna options is easy thanks to the use of a standard 6.3mm stereo jack to make the connection. Not only does this give a simple and strong mounting facility to null -out some interfering signals.

Product Details

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<tr>
<td>320S</td>
<td>Element 5 0-15.0MHz</td>
</tr>
<tr>
<td>320H</td>
<td>Coaxial patch lead</td>
</tr>
<tr>
<td>BNC - BNC</td>
<td>600mAh 9V dry battery</td>
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<table>
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<tr>
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<td>Element 0.2-0.54MHz</td>
</tr>
<tr>
<td>320M</td>
<td>Element 0.54-1.6MHz</td>
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</table>

Operation

With the battery fitted and the appropriate antenna plugged-in, operation could hardly have been easier. The only control is the combined rotary power and tuning knob mounted on the front panel of the base unit. The tuning system used a pair of voltage controlled Varicap diodes to adjust the loop frequency. The requirement to tune the antenna can be particularly helpful when the system is used with cheaper receivers. These often have poor front end selectivity and can suffer badly from strong local signals. The use of a tuned antenna system, such as the LA320, can often help to alleviate the problem. Getting back to the operation of the LA320, the tuning control proved to be extremely easy to use throughout the frequency range. The knob is not calibrated, you just set it for maximum signal strength. Although the tuning is very sharp, the sensitivity of the control is just about right.

On The Air

So what is it like to use? To give the system a realistic test I used it with the excellent Lowe HF-150 receiver. This powerful little receiver doubles as a very good portable running off of eight internal Ni-cads. The LA320 antenna is connected to the standard 50Ω antenna socket with the sensitivity set to normal. The sensitivity of this combination proved to be very good indeed. It is equally at home with utility signals as it is with broadcast stations. The directional properties of the bar antennas are particularly sharp and great for cutting out many of the annoying heterodynes that often spoil short wave reception. The 5-15MHz loop antennas did show directional reception, but nowhere near as distinct as with the bar antennas. The only drawback with active loop systems such as this is that of local interference. If you attempt to use the system next to a computer or TV you will find most signals are swamped by interference. However, for its intended use the system is very good.

Summary

The AOR LA320 performed extremely well throughout the review. The sensitivity is excellent and likely to satisfy the needs of all travellers. The only disadvantage is the number of antenna units required to give full coverage. However, if your interest is limited to the short wave bands you can manage with the two standard units and a simple whip. The AOR LA320 costs E119.00 inclusive of v.a.t. while the 520L (0.2-0.54MHz) and 320M (0.54-1.6MHz) optional antennas are priced at £29.90 each. Carriage is extra on all these prices. The LA320 can be obtained from AOR (UK) Ltd, Room 2, Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbys DE4 4BG.

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Short Wave Magazine, October 1993
The Man from Marconi

Joan Ham was delighted when Ted Owen visited the Chalk Pits Museum in person and she was able to take time by the forelock and sit him down in the new library for a chat about his interesting past.

sepi picture, illuminated by a neon tube, was the size of a postage stamp. Ted reckons that the mechanical scanning in use made it almost impossible to resolve, but they saw part of the callsign, WX... and 'a man in a JR hat' for just a few seconds. This was achieved at Marconi's station at Broomfield, near Chelmsford, in the Research Department.

At this stage I asked Ted about propagation conditions that had brought about this prototype DXVT, and although this was not immediately recalled, did say that in 1937-8 he could cover all the UK with 3.5MHz using 1 watt of power. The firm was not really doing much in the way of television at that time and although they knew about transistors and had developed printed circuits in the 30s their potential and significance seems to have escaped notice and little was being done with them either.

Ted's career with Marconi took him to the outposts of Empire - in fact, he put two Marconi stations on the old Empire Air Routes so that their flying boats could keep in touch. He also installed transmitters at Entebbe, Dar-Es-Salaam and Lindi in Africa and Jioivani, India. In 1932, he joined the newly formed Royal Navy Wireless Auxiliary Reserve, in which he was No. 25. They were trained to the required Morse speed of 30w.p.m. at the Admiralty, where Hungarian was transmitted at them to ensure accuracy!

The War overtook Ted as he was on his way out to India. He remained a civilian in this reserved occupation, but says that as soon as the other British passengers were clear of Europe, they all seemed to become brigadiers and lieutenants! Returned to this country, Ted continued installing equipment, especially d.f. stations, at RAF bases. As might be supposed, his unique expertise was also utilised in other ways during the war. After 1945, the amateur world changed as did life in all other aspects. Not only was a new call sign launched - G2SF - but with an increase in power from 10 to 100 watts. Still active in this field, his interest returned to reception and especially to terrestrial magnetism. He has built a magnetometer producing results which he is gratified to find agree with the official stations at Eskdalemuir and Hartland. He contributes his findings monthly to the British Astronomical Association.

I found it irresistible to ask Ted, with a long life in the experimental side of a famous country, how he compared old and modern amateur equipment. He expressed high praise for the best of the home-built sets. He once took an amateur receiver of the detector - i.f. - self excited reaction type and found it so sensitive that it could not be measured. The signal was still there when it should have cut off.

Professionally, The Marconi Company was still doing things by hand as late as the 1970s and without the aid of computers. He was amused to recall that their first computer cost over £400, weighed 40lbs and could not do square roots! When I asked what it could do, he compared it to today's £5 pocket calculator.

I asked him what he thought there was left for amateurs to do. It always seems, when talking to old-timers, that all the excitement and discoveries have already happened, but Ted felt that there would always be room for the experimental amateurs, although there might not be as much scope for them to contribute. Their real value, he said, was in collecting reception data and confirming its quality in various conditions.

Short Wave Magazine, October 1993
The top end of the world band radio market has for many years been dominated by Japan's Sony Corporation. But today, other companies are entering with products that are less expensive, yet probably equal in many respects to the sets produced by the giant manufacturer. Peter Shore has been looking at the new Roberts R817 receiver.

One example amongst the top-end products is the Roberts R817 receiver, sold by the long-established British family firm, but manufactured by the Taiwan-based Sangean company, who also make sets for Siemens of Germany. It is very loosely based on the original Sony 2001 (the predecessor of the 2001D), but both the circuitry and design have moved on considerably since the days of Sangean's first imitations of the early Sony product. The R817 is a large, table-top radio set, with all the functions that have now become commonplace on receivers in the higher price bracket. The UK Roberts' specified R817 offers continuous coverage from 150kHz through to 29.999MHz, as well as Band II v.h.f., 87.5 to 108MHz, with stereo reception if listening through headphones.

The design is not startling. The set measures 296mm wide x 192mm high and 68mm deep, so it is quite large. The finish of the radio is steel grey, with white for the labelling of the controls. The front panel is conventionally divided into two almost equal halves, with the loudspeaker grill to the left, taking up a little under 50% of the surface, and the operational area to the right. This is where the liquid crystal display is located, together with the 35 main buttons and knobs that allow the user to control the receiver. Time is constantly displayed in the i.c.d., and this can be switched between two clocks, allowing local time and UTC to be selected.

Frequency is shown in megahertz on the short wave and f.m. bands, and in kilohertz on long and medium waves. There is a signal strength meter in a horizontal bar on a purple background, with a numeric scale from one to seven along the top of the bar is at the base of the display. Other parts of the display show various additional functions, including the memory number.

A long 7-section, telescopic antenna is situated on the top of the receiver. A pull-out stand on the back allows the set to be used at an angle on a desk-top.

Using the radio

Switching the set on, the display immediately shows the frequency to which the set is tuned, and the signal strength is shown, provided a station is operating on that channel. Volume is adjusted by a rotary knob on the right-hand side of the radio. Tuning is possible in the usual variety of ways offered by modern receivers: four buttons allow band selection while a large tuning knob, a little way above the volume control, allows a band to be searched manually. The speed of manual tuning using the knob can be altered - a small control on the right-hand side switches from slow to fast and allows the knob to be locked. In fast mode, the set tunes in 100kHz steps on v.h.f., in 9kHz steps on long wave and medium wave, and 5kHz steps on short wave. Selecting 'slow' changes the steps to 50kHz on v.h.f., and to 1kHz on long, medium and short waves.

As an alternative manual tuning is possible by two buttons on the front panel marked ^ and v. Frequencies may be directly entered using the keypad below the display. It is necessary to press the button marked FREQ first - something that I find annoying - followed by the frequency in either kilohertz or megahertz, and then a single depression of the ENTER key.

The tuning speed of the buttons is fixed to 100kHz on v.h.f., 9kHz on long and medium wave and 5kHz on short wave.

When the set is being tuned on short wave, a beep sounds each time the top or bottom frequency of a broadcast band is reached. Automatic scanning is available: holding down either the ^ or v keys for half a second or more starts the set tuning along the band, stopping when a signal is received. It is necessary to restart the scanner once the set has stopped on a frequency where a signal is present. If scanning is started within a short wave broadcast band, the set will scan only within that band, moving to the opposite end of the band when the top or bottom frequency is reached. Outside the bands, the set scans until the next broadcast band is reached, when it will beep and scan within the frequency range of that band.

When using automatic tuning, there is a major problem on long wave: the old long wave channels are the only ones which can be tuned! 200kHz is selected instead of 198kHz, and so on, even though it is some years even though it is some years since the channel allocations were altered.

The broadcast bands can be quickly accessed by pressing METRE and then the number key which relates to the appropriate band - all 13 broadcast bands are programmed for rapid selection. The handbook which accompanies the set suggests that a random frequency within the broadcast band is tuned under...
these conditions. But I found that selecting a band, the last frequency received on that band was recalled - useful for rapidly comparing signals, for example, of a broadcaster using two different channels.

The set has switchable bandwidth on long, medium and short waves, giving narrow and wide positions.

Memories

Today's digital receivers, almost without exception, offer memory facilities and the R817 is no exception. 18 frequencies can be stored on short wave, and nine on each of the three other bands. Storing a frequency, and subsequent accessing of a stored channel is straightforward: to store, the user needs to select the frequency, either directly via the keypad, or manually using the tuning knob or buttons, and then press the button marked M and the number of the memory position that is to be used. Recall is just a matter of selecting the wave band and tapping the number of the memory (1 - 9 - and on short wave only, 01 to 09).

SSB

Single sideband reception of non-broadcast signals is possible as the R817 is equipped with a beat frequency oscillator, or b.f.o. When an s.s.b. signal is encountered, the b.f.o. switch can be moved to ON and reception is adjusted by rotating the b.f.o. knob on the front panel. Used in conjunction with the a.m. r.f. gain control, quite good results can be achieved when listening to radio amateurs.

Other facilities

As I mentioned earlier, there is a dual time clock, which also acts as an automatic timer, switching the receiver on at predetermined time, or sounding a buzzer, depending on one's preference. It is easy to set the alarm time: depress the STANDBY button, and enter the time such as 74 5 for 0745 or 2 2 1 5 for 2215. Headphones can be connected by means of a standard 3.5mm stereo plug, and this allows f.m. signals to be heard in stereo. An external antenna can also be connected, also with a 3.5mm plug.

Performance

I have been checking the set's performance on short wave, and overall the results have been good. Sensitivity, the ability to receive weak signals is fairly good, measuring -86 to -94dB for 15dB S+N/N ratio. As for selectivity, the ability of the set to discriminate between the signal one wants and others on adjacent channels, with the filter is wide position, the test results were 29dB down at ±5kHz and 68dB down at ±10kHz, which is fairly good. In narrow, the results were 54dB down at ±5kHz and 71dB down at ±10kHz, equating to good performance.

Strong signal handling is fairly good, but image rejection is about 38 to 46dB, depending on the frequency, which can only be described as moderate.

The current drawn from the battery is 139mA, which is high, but is compensated by the fact that 4D size batteries are used to power the set. In addition, 3AA size cells are needed for clock and memory back-up. It is advisable to use a mains adapter to power the receiver to reduce running costs: the model I have been testing was not supplied with an adapter, although the handbook lists one under 'accessories'.

Overall assessment

The set is attractive and well-built. It is heavy, weighing some 1.6kg without batteries, so it is not really suitable for the globe trotting businessman or leisure traveller. At home, however, the R817 offers good value for money. Performance is generally good to very good, and the connection of an external antenna helps to pull in weaker signals. The radio is easy to use, with large controls, so will not be unattractive to anyone with physical disabilities. The absence of a raised 'blip' on the S-button keypad will, however, be frustrating for people with impaired vision.

Sound quality from the relatively large loudspeaker is good (a nominal 800mW), and through headphones the ability to receive stereo is a positive point. The incorrect channels on long wave is annoying, but not disastrous since manual slow tuning with the rotary tuning knob is in 1kHz steps, thereby allowing the correct frequency to be tuned.

The provision of a b.f.o. is useful, although I do hope that any successor model has switchable u.s.b. and i.s.b.

The R817 is a receiver that I would not mind owning, and using regularly. The number of memories on short wave is, perhaps, a little limited in this day and age when several hundred are offered by competing models. But at around £170 this is probably not a major point against the receiver.

I must, however, comment on the Wave Handbook, which fell out of the box. The index lists AFRTS, the American Armed Forces Radio and Television Service, Page 20 of the handbook lists AFRTS on short wave. They went over entirely to satellite five or six years ago! Perhaps I should offer to compile an up-to-date booklet....
The South Downs Astronomical Society's annual public exhibition was held on July 11 at their observatory in the old RAF wireless station on Trundle Hill, overlooking the Goodwood racecourse. Their display of astronomical telescopes, high-powered binoculars and various mounts included a refractor telescope with a solar projection box fitted below the eyepiece, Fig. 1. The sun's image is displayed on a paper screen at the base of the box in Fig. 1 and any sunspots are pencilled in. Because it is so DANGEROUS TO THE EYES AND BRAIN to look directly at the sun, similar methods to this are used by all regular sunspot observers.

Solar Reports

In June, Ron Livesey (Edinburgh), using a 2.5in refractor and a 4.0in projection screen, located three active areas on the sun's disc on days 6, 8, 9, 26 & 27. Despite broken or wispy clouds on some days in the month, Cmdr Henry Hatfield (Sevenoaks), using his spectrohelioscope, located one sunspot group, 11 filaments and eight small quiescent prominences on the 8th; 18fs and 10 small qps on the 15th; 15fs and 8qps on the 20th, 29fs and six qps on the 23rd; one grp, a slightly active plage, on the 27th; and six small qps on the 29th.

Magnetic

The various magnetometers used by John Fletcher (Tuffley), Tony Hopwood (Upton-on-Severn), Karl Levenback (Seattle), Ron Livesey, David Pettitt (Carlisle) and Tom Rackham (Goostrey), between them recorded some form of disturbance on June 3-12, 16, 17 & 20-29 inclusive, with magnetic storms on the 4th, 10th & 11th.

Propagation Beacons

First, my thanks to Gordon Foote (Didcot), Henry Hatfield, Ian McDermid (Comrie), Ted Owen (Maldon), Ted Waring and Ford White (Portland) for their 28MHz beacon logs from which I prepared the chart seen in Fig. 3. Henry reports that the signals from EASLJ were 'very loud' on July 8, 14, 15, 18 & 20. While Ian was idly tuning through the 28MHz band at 2220 on the 17th, he found it dead except for some strong signal from the Italian beacon IY4M. Between them they added CTOAPO, IK1PCB, OH9TEN and S55ZRS to Fig. 3 this time.

Band II

Dave Coggins (Knutsford), using a Grundig Satellit 700 RDS receiver, heard stations from Italy and Spain, in Band II via Sporadic-E, during the first week in July, Mercia Cymru on 94.2MHz, almost daily, and TFM (Independent Radio Transmitter) in Morocco, on 87.6MHz.

Tropospheric

While trying a new Panasonic receiver on Cairn 'O Mount on June 29, George Garden (Edinburgh) received a signal 'coming in waves' from a German station on 96.3MHz and strong signals from Metro FM (Newcastle area) and TFM (Independent Radio Transmitter). Dave Coggins logged BBC Dymeru on 94.2MHz, almost daily, during the first week in July, Mercia FM (97.0MHz) at 2117 on the 6th and Ireland's RTE on June 27, July 1 & 6. Daily atmospheric pressure readings for the period June 26 to July 25 can be seen in my 'Television' column elsewhere in this issue.

Figure 1: A refractor telescope fitted with a solar projection box below the eyepiece. This enables the sun to be studied in complete safety.
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ith the recent publicity in the UK media concerning leaks of a John Major interview and personal 'chat' lifted from reception which then became public knowledge, a great deal of interest has been apparent as to the potential viewing of 'non-broadcast TV' by satellite enthusiasts - I have already been approached by one respected national paper and a TV programme maker seeking details of 'what can you see and how can it be done.' Having formerly worked in broadcasting for many years, I respect the privacy of TV workers and their 'behind the studio scenes' informal matters amongst themselves and their guests. I'm not happy to encourage eavesdropping as a nation-wide hobby for the population as a whole, though the unusual news feeds, outside broadcasts and TV links are a part of the sat-zapping pastime.

Having given an almost policy statement I mention satellite enthusiast, John Locker by name, came across a quite remarkable SNG rehearsal recently whilst checking across the 12.5GHz segment of Eutelsat II F1 at 13°E. Activity on screen related to a recent death with live interviews and feeds in around the UK with mentions of a Mrs. Robinson and a link from Caithness - in the pouring rain. The Sunday People the following weekend told the story. The rehearsal was for the future death of the HRH Queen Mother as to be carried by ITN and called 'Operation Mrs. Robinson' via the same bird are EBU European Union Television (EUTV) programming. This is received from Moscow and uplinked onto 11°W Gorizont 11°W often can be seen with mentions of a Mrs. Robinson the following year again for the '95 World Cup. Sad as it may seem, all noted personalities have prepared obituaries, ready for any untimely end, reading the VTR libraries of broadcasters.

I had a letter the other day from Bandula Gunasekera in Sri Lanka. He is very active with C Band satellite reception and from the Gorizont satellite at 40°E our very own Super Channel program has recently been carried on occasions for test purposes, followed some days with the World Cup football programme. This is received from Eut. II F1 13°E in Moscow and then uplinked onto the 40°E bird. Also via the same bird are EBU Moscow feeds. band Russia's satellite Eastern bound for Tokyo. Just as an aside, Gorizont 11°W often can be seen downlinking various Astra channels. These are received in Moscow and uplinked onto 11°W for downlinking across Europe in Ku FSS band 11.525GHz on the Louch transponder. This same satellite is well worth checking out for the occasional test card, WTN Westbound news feeds out of Moscow and various other video offerings! The diet of neighbouring 14°W is rather more staid being usually Visnews feeds and the occasional 2 way interview.

In Bahrain veteran TVXO Bud Lloyded-Bennett has migrated to the microwave bands, not with direct satellite reception but the terrestrial microwave service (MMDS) offered by Bahrain TV. Several satellite channels are received and transmitted over the 26GHz band MMDS system for reception at home using small dishes (around 500mm maximum). Bahrain retransmit CNN, TV5, Star Sports, MTV and Dubai Satellite TV with more upcoming (Wot, No BBC WSTV?!). Satellite reception is now allowed in Bahrain subject to government permission. A UK offshoot called 'Satlink' have a local subsidiary offering C Band installations from a 2.3m dish upwards to 5m. The cheapest 2.3m dish installed runs to £1000 and the 5m with tracking hits a hot £7500.

It's amazing, the poor technical quality of some satellite linked programmes, August 11 saw an attractive female presenter as told the story. The rehearsal was for the future death of the HRH Queen Mother as to be carried by ITN and called Operation Mrs. Robinson on-screen activity was excellent but the radio mic audio was appalling, if not completely unsuable, how such quality can actually hit the air is beyond me! At the end of the live offering the OB crew very rapidly cut carrier (a fast derig!) and the transponder resumed after some time. The OB crew very rapidly cut carrier (a fast derig!) and the transponder resumed after some time. The OB crew very rapidly cut carrier (a fast derig!) and the transponder resumed after some time. This same days' rehearsal resulted in an upgrade from an SNG connection to a satellite connection.

If you're up early in time for the BBC/ITV Breakfast Show offerings then often live interviews are carried on several satellites and its just a case of seeing them out. The Big Breakfast leaves Eutelsat I F1 25°E on a daily basis and GMTV often use 13°E I was delighted to see Norman Wisdom and GMN often use 13°E for GMN often use 13°E for GMTV and France Telecom offering the OB crew very rapidly. The OB crew very rapidly cut carrier (a fast derig!) and the transponder resumed after some time. This same days' rehearsal resulted in an upgrade from an SNG connection to a satellite connection.

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Reports were still coming in about the June openings after I had completed my work for the September issue, so, because it is important to make a record of these disturbances, I will open with them this time.

**Band I**

Within the 33 day period between June 24 and July 26 inclusive, Bob Brooks (Great Sutton) found Sporadic-E disturbances, influencing the paths of television signals, throughout Band I, on 28 of those days. Spread through the active periods, he logged pictures from Denmark (DR Danmark), Finland (YLE TV1), Germany (ARD), Hungary (MTV), Iceland (RUV), Italy (RAI-Un), Norway (NRK), Poland (TVP), Portugal (RTPI), Romania (RTV), Spain (TVE & regions Barcelona & St. Lucia), Russia (NTA) and Sweden (STV).

In addition to adverts, cartoons, clock-captions, various logos, test-cards and programme schedules, he saw athletics, ballet, dancing, such films as *As Time Goes By, Birds, Elephant Boy, Laurel & Hardy* and *High Chapperal*, football, news -specials from Germany (ARD1), Hungary (MTVI), Russia (2nd Programme on Ch. R1 and 1st Programme on Ch. R2, in colour) and Spain (TVE1) on June 11, Norway (NRK), Poland (TVP1) and Russia on the 22nd, Portugal (C-1) and Spain (TVE1 & 2) on the 28th and Poland and Spain on the 29th. David tells me that Russian TV is now so commercialised. He has seen adverts for Cadbury's Fruit 'n Nut, Hewlett-Packard computers, Kodak film, Schweppes, Sony electronic goods, Twix and various brands of shampoo.

In June Neil Purling (Hull) noted Sporadic-E openings on days 8-12, 15, 21 & 22. Among those days he saw a variety of adverts, logos, news (Tagesschau and Hirek) and sport, programmes and test-cards from stations in Austria (ORF), CIS, Germany (ARD1), Iceland (RUV Island), Italy (RAI), Norway (NRK & the regionals Melhus fighting with Steigen), Poland (TVP), Spain (TVE1 & 2) and Sweden (Kanal-1, Sverige).

While using his JVC receiver, with its own rod antenna, on Cairn O' Mounth at 1726 on June 28, George Garden (Edinburgh) watched a comedy programme from Spain's TVE.

The July Sporadic-E log from Simon Hamer (New Radnor) includes Albania (RTSH), Austria (ORF-1), Czechoslovakia (CST/CTV), CIS stations on Chs. R1, 2, 3, 4, Denmark (DR), Finland (YLE), France (TDF), Germany (ARD1), Hungary (MTV), Iceland (RUV), Italy (RAI-Un), Norway (NRK), Poland (TVP), Portugal (RTPI), Romania (TVR), Spain (TVE1 & 2) and Sweden (SVT) spread through days 8, 15, 18 & 25.

**Picture Archives**

From Leiden, Holland, Peter de Jong sent a couple of 'announcements' that he received from the satellite Astra 1C, Figs. 3 & 4. From Meerut, India, Lt. Col. Rana Reya sent photos he took in 1992 of a test-card that he received from Iran, Fig. 5, on Ch. E2, via Sporadic-E, on May 11 and a Band III programme from Pakistan (STN), Fig. 6 during a tropospheric opening on November 6.

**Weather**

"The weather here has been mostly hot and dry, with very little rain," wrote David Ashley (Norwich) at the end of June. John Woodcock reported thunderstorms in his area on July 19.

Joan and I watched a very stormy weather front coming in from the southwest, Fig. 7, while we were near Hardings pier on the 13th. Note the empty beach for a 'summers' day, hi. The falling pressure from midday onward on the 13th, as this storm came in, is clearly shown on the pressure chart, Fig. 14. The atmospheric pressure readings for that chart, covering the period June 26 and July 25, were taken at noon and midnight from my own barograph.

In July, I recorded 3.17in of rain compared with 3.28in for the same period in 1992. The heaviest amount, of 1.0in, fell on the 19th and the 29th saw the month's highest relative-humidity of 82%.

**Tropospheric**

David Glenday found improved tropospheric conditions almost daily throughout June. He logged pictures from Denmark.

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Fig. 1: Germany.

Fig. 2: Russia.

Fig. 3: From Astra 1C.

Fig. 4: From Astra 1C.

Fig. 5: Iran.
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(DR), Germany (ARD1), Holland (NED1), Norway (NRK) on Chs.6,7 and (TV2) on E12) and Sweden (Kanal1) in Band III and Belgium (BRTN1 & 2), Denmark (TV2), Germany (ARD1 Plus, MDR3 with "mdr SPUTNIK" logo, NDR3, RTL+, SAT1, VOX, ZDF and 3SAT1), Holland (NED1, 2 & 3), Norway (NRK) and Sweden (TVZ) on many channels in the u.h.f. bands.

"The beginning of June saw continental tropospheric DX on 11 of the first 14 days", wrote David on July 2 and continued, "the DX from the evening of the 28th, through the 29th, to the early hours of the 30th was some of the best I’ve seen". He saw test-cards from Denmark (DR) overpower BBC1 from Craigkelly on Ch. E31 and their TV2 overpower Ch4 from Angus. In addition, Dave saw Norway’s TV2, on Ch. E37, with the TV2 Norge 5534 test-card for the first time and Sweden’s TV-2 obliterate Scotland TV from Craigkelly on Ch. E24. Sounds a muddle readers but that often happens during a good tropo-opening.

The first week in June brought new DX for David Ashley when he added Norway 2, Sweden’s SVT 1 & 4 and signals from Grampian’s Durris transmitter to his u.h.f. log. During the month he logged Belgium (BRT1) on the 5th and 30th, Denmark (TV2) on days 3-6 & 30, France (TF1) on the 3rd, Germany (ARD1, N3, SAT1, ZDF) on the 3rd-6th, 29th and 30th, Holland (NED1,2&3) on days 1,3-8, 29 & 30, Norway (CH2) and Sweden (SVT1&4) on the 4th and from the UK, Carlton, Central, Grampian, Meridian, Tyne Tees and Yorkshire TV spread over the days previously mentioned.

During his expedition to Cairn O’ Mounth on June 28, George Garden, using a JVC610 and a wideband multi-director antenna, received coloured pictures in Band III from Denmark and Germany (TV2) and Germany (ZDF) in the u.h.f. bands. He decided on this outing when he noted a ridge of high pressure was gradually intensifying over the North Sea and as it moved eastward it began to decline.

On the 29th, Simon Hamer received pictures from Denmark (DR) and Germany (ARD) in Band III and from Denmark (TV2) and Germany (N3, West3 & ZDF) in the u.h.f. bands. "Two German regional stations familiar to TVDXers are now on Astra 1C satellite", said Simon and explained that, "WEST-3 is on transponder 39 and Bavaria’s BRF-3 can be found on transponder 45, in crisp clear colour".

SSTV

When home at weekends, John Scott (Glasgow) enjoys tuning around the slow-scan television segments of the h.f. amateur bands. In June he copied calling captions from stations in France,
If you can cast your mind back a few years, you may remember that Radio Tirana broadcast some of the most bizarre, and boring, programmes to be heard on short wave. Of course, if you were a student of the Marxist-Leninist school then you were doubtless riveted by the commentaries on the Albanian Clothing Workers Resistance to the Imperialist Attempts to Destabilise the Marxist-Leninist Principles of Revolutionary Albania, or titles of a similar style.

But reality has caught up with Albanian broadcasting who have decided that, despite savage cuts to the overseas service, reducing the number of languages on the air to 12, further pruning is necessary. Now Radio Tirana is down to just 8 languages, and the English service is reduced from an hour a day to just 45 minutes. The second half-hour programme has been halved to 15 minutes a day. The broadcasts can be heard, beamed to Europe, at 1430 to 1500 on 9.76 & 7.153MHz and at 2200 to 2215 on 11.815, 9.76 & 1.395MHz, and to the Americas at 0130 to 0200 on 11.84 & 5.88MHz and at 0230 to 0245 on the same frequencies.

BBC World Service Television got something of a shock at the beginning of August when Rupert Murdoch's global News Corporation bought over 60% of Hutchison, the parent company of STAR-TV in Hong Kong. World Service Television's Asian service was launched in November 1991 as one of five channels on STAR-TV, with a ten-year contract. At the time, STAR's ultimate owner was a Hong Kong Chinese entrepreneur, but Murdoch, keen to get his hands on a Hong Kong-based broadcaster, and frustrated in his attempts to buy another commercial operation based in the colony, bid over US$500 million for STAR.

What this means for the London-based BBC World Service Television channel is unclear. Already a number of Asian leaders have protested about Murdoch's acquisition of STAR, fearing interference in the internal affairs of Asian countries.

World Service is sanguine, saying only that the deal confirms that STAR-TV has enormous potential and therefore it was right to go into partnership with the company. However, will Murdoch try to launch a rival news service, perhaps based on SKY News seen in Europe, or will he try and influence the BBC? Time will tell.

Morse code is not the most commonly used means of communication these days, but it seems that the news has not reached the former Soviet republic of Lithuania. Radiocentras, a commercial broadcaster in the capital Vilnius has been carrying out test transmissions on 9.40MHz in upper sideband. The power of the transmitter is just 5kW, but the station has put in good signals across much of Europe. Reports on the slow-speed Morse tests are welcome, and should be sent to Radiocentras, Box 1792, Vilnius, Lithuania. Make sure that you include a couple of international reply coupons for a verification.

Radio Vilnius, the international service of the Lithuanian republic, has announced that a commercial organisation in Lithuania is sponsoring overseas broadcasting until at least the end of 1993. The station's finances have been extremely shaky in recent months, and there was some doubt whether or not it would be able to remain on the air.

With no sign to the end of the conflict in Bosnia, Radio Netherlands began a programme for Dutch troops serving in the region with UN peace-keeping forces. The weekly, 55 minute programme, is in Dutch and beamed from the station's transmitting station on the Flevoland polder on 9.59 and 11.73MHz at 0830UTC.

An interview with a senior member of Radio Austria International's management carried on Radio Japan revealed that because of objections by environmentalists, the station can only use one of its two 500kW transmitters at its Moosbrunn site at any one time. There are also two 100kW senders at Moosbrunn and there seems to be no problem using both of those together, and in tandem with one of the two 500kW. The matter has been referred to Austria's High Court, and the outcome is pending.

This story has similarities with one that has affected another SW broadcaster, Swiss Radio International. Environmentalists have managed to prevent the station from building a new short wave transmitting station in recent years to replace existing sites at Schwarzenburg, Sottens and Sarnen. Nobody in Alpine countries seems to want high powered transmitters and their associated antennas anywhere near their homes!

Meanwhile, you can tune in to Radio Austria International from Vienna at 0530, 0830, 1030, 1230, 1530 & 1930 on 13.73 & 6.155MHz.

One service to Europe has ended and one has merged into another in the past three months. The BBC's French Service to Europe ended abruptly on July 2, after more than 50 years on the air. It was down to just a medium wave service by the time it closed, and it appears that almost no one was listening to it.

Back in October last year, the French section Bush House started a digital music and news stream, fed by satellite, to local stations in France who could buy all or part of the output. This seems to be the only way to reach listeners across the country, unless they are die-hard DXers. The BBC's French Service continues to broadcast on short wave to Africa, where there are many more people who tune to the high frequency bands.

Meanwhile, Deutschlandfunk closed down at the end of June. Deutschlandfunk was the European international broadcaster of West Germany, but with the reunification of the country, it was doubtful whether it was efficient to run both DLF and its sister operation, Deutsche Welle, which broadcasts in non-European languages outside the continent.

On July 1, DW took over DLF's European language services, announcing in the English service that it was "Deutsche Welle - English for Europe". The station continues to use the medium wave frequency of 1.268MHz at 1915UTC, as well as the Astra satellite. Astra 1C is now successfully transmitting on several of its transponders, and a number of new radio stations are on the air. Virgin 1215 AM is on the Sky News transponder, and there are three new Spanish stations - the first on Astra - on transponder 3D. Look out for World Radio Network relaying some National Public Radio programmes from the USA within a matter of weeks, as well as a number of international radio stations.

Back to good old fashioned steam radio, and news that one of Britain's last remaining wireless set manufacturers, Roberts Radio of West Molesley in Surrey, has introduced the Roberts Revival. The set is ideal for everyone keen on nostalgia, or who simply wishes to be reminded of the good old days. The radio's case is an authentic replica of an early Roberts set (probably still around in a good many homes even today), made of solid wood with leathercloth covering. Inside, though, it's all new, with f.m., medium wave and long wave, complete with modern circuitry. It runs on a PP9 or via a mains adapter. The only draw back is that it does not have short wave. But if you want to tune in to what's left of European medium wave radio, and hark back to the days of the Ovaltines on Radio Luxembourg, the Revival is perhaps just up your street.
Just a brief word about anonymity. Several letters that I have received recently have asked that I keep the senders name out of the magazine. I am happy to do this, my policy is to use only a writers name and not mention a place name, although in some cases I will use an initial and place name. If you want to be completely anonymous, please say so in your letter.

**USAF KC-135s**

During 1991, the US Air Force underwent a major change in its structure. One part that seems to have remained unchanged was the Air National Guard (ANG). Each US State has at least one ANG unit operating either combat, transport or tanker aircraft. Many States operate different types and several operate all three. It is the latter two that are of interest, since the large aircraft types are more likely to venture overseas, and they are also more likely to operate on h.f. This month, I have a list of callsigns used by KC-135 refuelling aircraft (Table 1) operated by various ANG units. Each of the units is based within the State, and many of them use callsigns that relate to the State (the abbreviation ARS is for Air Refuelling Squadron).

As you can see from the list, some of the unit callsigns are still unknown, generally because the unit has just changed from one aircraft type to another. Another non-active-duty organisation is the Air Force Reserve (AFRes). They also operate three squadrons of KC-135 refuelling aircraft; these are the last five units in the listing. These are often heard on the usual USAF HF frequencies, and are several of the NAT and CAR networks. During times of crisis, these aircraft often support long range operations.

**Round the World**

A letter from Keith Elgin mentioned the 1993/4 Whitbread Round the World Race, which is due to start in late September 1993. I have received a 'press pack' from the organisers and the following will be of interest to those who wish to monitor race progress.

The first leg of the race starts from Southampton on September 25, and is due to end about nine months later back at Southampton. New technology from BT means that live (or pre-recorded) video pictures can be beamed back from boats in the race; this will be accomplished using the INMARSAT-A satellite system. Also, each yacht in the race will be fitted with a SatCom-C unit that will transmit the yachts position whenever Race HQ 'calls' them; this will be translated and tabulated by BT for the media, and you can see this in newspapers, on TV and on Teletext.

According to the organisers, there is a very good chance that the yachts will use h.f. for various other communications during the race; these are most likely to be national radio networks from the country of each competitor. The UK legs of the race (the first and last legs) will probably use Portsheild Radio for this kind of contact, so keep a lookout on their calling frequencies. This calling frequencies for the Portsheild maritime service were listed in the February 1993 issue of this magazine, so I won't repeat them here. Keep a good watch on these frequencies, and be ready to QSY to other frequencies as the yachts and shore station jump to a working frequency.

So that you know which yachts to listen for, a list of names and countries is given below (Table 2).

Your Letters

Ian Lockwood writes with his usual extensive log full of interesting and varied stations. His equipment comprises an ADR 150D3X with a 16m wire antenna in the loft. He reports hearing naval 'tri-graph' callsigns (e.g., 'JHU' and 'C3T') and code-word callsigns on 7.000 MHz, and suggests that this may be another frequency being used in the UN blockade of the former Yugoslavia. Station 'ICEMAN' said that he was patrolling various areas, and there was talk of boarding some ships. This certainly sounds like one of their frequencies, but without further reports it is difficult to be certain; it's certainly a frequency to watch though.

**Table 1 - Air National Guard KC-135 callsigns**

<table>
<thead>
<tr>
<th>Callsign</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>108thARS</td>
<td>Chicago, O'Hare, Illinois</td>
</tr>
<tr>
<td>116thARS</td>
<td>Fairchild AFB, Washington</td>
</tr>
<tr>
<td>117thARS</td>
<td>Togepika, Kansas</td>
</tr>
<tr>
<td>126thARS</td>
<td>Milwaukee, Wisconsin</td>
</tr>
<tr>
<td>132ndARS</td>
<td>Bangor, Maine</td>
</tr>
<tr>
<td>133rdARS</td>
<td>Pease AFB, New Hampshire</td>
</tr>
<tr>
<td>141stARS</td>
<td>McGuire AFB, New Jersey</td>
</tr>
<tr>
<td>145thARS</td>
<td>Rickenbacker AFB, Ohio</td>
</tr>
<tr>
<td>146thARS</td>
<td>Selfridge ANGB, Michigan</td>
</tr>
<tr>
<td>147thARS</td>
<td>Pittsburgh, Pennsylvania</td>
</tr>
<tr>
<td>150thARS</td>
<td>McGuire AFB, New Jersey</td>
</tr>
<tr>
<td>151stARS</td>
<td>Knoxville, Tennessee</td>
</tr>
<tr>
<td>153rdARS</td>
<td>Meridian, Mississippi</td>
</tr>
<tr>
<td>169thARS</td>
<td>Rickard AFB, Ohio</td>
</tr>
<tr>
<td>188thARS</td>
<td>Elson AFB, Alaska</td>
</tr>
<tr>
<td>191stARS</td>
<td>Salt Lake City, Utah</td>
</tr>
<tr>
<td>190thARS</td>
<td>March AFB, California</td>
</tr>
<tr>
<td>197thARS</td>
<td>Phoenix, Arizona</td>
</tr>
<tr>
<td>203rdARS</td>
<td>Hickam AFB, Hawaii</td>
</tr>
<tr>
<td>63rdARS</td>
<td>Selfridge ANGB, Michigan</td>
</tr>
<tr>
<td>72ndARS</td>
<td>Grissom AFB, Indiana</td>
</tr>
<tr>
<td>74thARS</td>
<td>Grissom AFB, Indiana</td>
</tr>
<tr>
<td>314thARS</td>
<td>Beale AFB, California</td>
</tr>
<tr>
<td>338thARS</td>
<td>March AFB, California</td>
</tr>
</tbody>
</table>

**Table 2 - Whitbread Race Yachts.**

<table>
<thead>
<tr>
<th>Yacht</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrum Justitia</td>
<td>France</td>
</tr>
<tr>
<td>Brookfield</td>
<td>Germany</td>
</tr>
<tr>
<td>Yamaha</td>
<td>Italy</td>
</tr>
<tr>
<td>Kawasaki</td>
<td>Japan</td>
</tr>
<tr>
<td>Galicia 83 Pescanova</td>
<td>Spain</td>
</tr>
<tr>
<td>Hetman Sahaidachny</td>
<td>Ukraine</td>
</tr>
<tr>
<td>Odessa</td>
<td>Ukraine/USA</td>
</tr>
<tr>
<td>Dolphin &amp; Youth W60</td>
<td>UK</td>
</tr>
<tr>
<td>Winston</td>
<td>USA</td>
</tr>
<tr>
<td>US Women's Challenge</td>
<td>USA</td>
</tr>
</tbody>
</table>

**Table 3 - Whitbread Race Dates and Course**

<table>
<thead>
<tr>
<th>Start date</th>
<th>Distance (naut miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Sept 93</td>
<td>5938</td>
</tr>
<tr>
<td>29 Sept 93</td>
<td>5758</td>
</tr>
<tr>
<td>3 Jan 94</td>
<td>3272</td>
</tr>
<tr>
<td>2 Feb 94</td>
<td>5914</td>
</tr>
<tr>
<td>2 Apr 94</td>
<td>5475</td>
</tr>
<tr>
<td>21 May 94</td>
<td>3818</td>
</tr>
</tbody>
</table>

**Left:** Alaska ANG KC135 at RAF Mildenhall during September 1991. It used the callsign Chena 94 when it flew back to Alaska.

**Right:** A close-up of the nose of a KC135 of the New Jersey ANG - hence the nose-art of a blonde 'Jersey Girl' (the nearest to a 'page 3' girl that the magazine editor would publish!).

Graham Tanner, 42 David Close, Harlington, Middlesex UB35EA

Short Wave Magazine, October 1993
Letters

Mel Thruby had only been going for six weeks when he wrote at the end of July, as he has bought an FT-747GX, I can guess he needs a new amateur era long in the Barton-upon-Humber district! The antenna is an omnidirectional Antmon 99. Seeing my mention of the YLs expounding to VP3M, Mel was pleased to locate a string of Europeans working VP3M/AB6MP around 0850UTC on 14.25MHz. I also noted this same operator at the much more "normal" time of mid-evening. 0715 was the time for VE8RCS working V01TED/VE8 on Elelesmere Island plus Europeans and KH6XQ. Of course, one of the last call, Mel identified NHX6KM in Hawaii only a few moments later. Among the Europeans, Mel is as puzzled as any of us by the present state of prefix changes, but a copy of Geoff Wett's "Lists" will be the right answer. Write, with a s.a.e., to Geoff Wett at 82 Belmore Road, Norwich for the details.

Three possibilities exist. 1. An antenna in the loft (or indeed anywhere indoors); 2. an "invisible" wire outside; and 3. give up!

Option 1. Since our anguished correspondent is aiming at a licence soon, the discusors discard the otherwise obvious active antenna. Indoor antennas can be useful and should be tried first; if results seem good, then stick with it; if not, stay with a single element. However, the electrical ORM may be overpowering.

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As for efficiency - no antenna at all is very inefficient!

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Short Wave Magazine, October 1993 51
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Short Wave Magazine, October 1993
Fifty years on, one Shorts Sunderland flying boat remains in airworthy condition. This example is an MR5, G-BJHS, which carried the military serial ML 814 and was named Islander. Unfortunately, like so many important aircraft, its future does not lie in Britain where we don’t seem to cherish our aviation heritage as strongly as do the Americans. In early August, the aircraft arrived in the care of Kermit Weeks in the USA. I spoke to its pilot-in-command for that historic trip, Ken Emmott (Farnham). Kermit, who now takes over flying the aircraft, also went along for the experience.

Powered by four Pratt and Whitney R1830 radials of 1200hp each, the aircraft is only capable of operation from water. Beaching gear is provided, to enable the machine to be pulled out onto a slipway for safe keeping, and you can see these wheels attached to the example on static display in the over flying the aircraft, also went (Farnham). Kermit, who now takes historic trip, Kermit Weeks in the USA. In early August, the aircraft is only capable of operation from water. Beaching gear is provided, to enable the machine to be pulled out onto a slipway for safe keeping, and you can see these wheels attached to the example on static display in the RAF Museum Battle of Britain Hall, Hendon. The 36 hour (airborne) Atlantic crossing had therefore to be delayed via suitable stretches of water.

The route was as follows: Calshott (Southampton), Lough Derg (River Shannon, Ireland), Richardson (Iceland), Goose Bay (Canada), Toronto, Lake Winnepago (Oshkosh). I don’t need to remind readers that Oshkosh hosts what must be the world’s biggest fly-in rally! Towards Iceland, a patrolling RAF Nimrod (the Sunderland’s modern-day counterpart) joined up in an impromptu formation. Unfortunately, the next sector was delayed for four days due to restricted visibility and low cloud at the Canadian end. On the way into Toronto, Ken’s son arrived in formation in a Piper Malibu and there was also an escorting fleet of airborne photographers - all trying to formate on the relatively unmanoeuverable Sunderland. At Oshkosh, the Sunderland’s flypast was the opening item of the display!

In June next year, the aircraft will appear in further displays before moving to its new, permanent home on Lake Agnes at Polk City, Florida, where it will remain airworthy as part of Kermit’s Florida of Flight theme park.

What problems are there in ferrying a vintage aircraft? Triplicated Global Positioning Systems were installed, which compute their position from satellite transmissions. Ancient technology, consisting of an astrocompass and an optical drift sight, provided a cross-check. Although the example on static display in the over flying the aircraft, also went (Farnham). Kermit, who now takes historic trip, Kermit Weeks in the USA. In early August, the aircraft is only capable of operation from water. Beaching gear is provided, to enable the machine to be pulled out onto a slipway for safe keeping, and you can see these wheels attached to the example on static display in the RAF Museum Battle of Britain Hall, Hendon. The 36 hour (airborne) Atlantic crossing had therefore to be delayed via suitable stretches of water.

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You Are Clear to Display

Kevin Earwicker (Bournemouth) saw the Red Arrows arrive the evening before their display in early August. During a display, Squadron Leader Adrian Thurley, in Red One, grewls at the other eight pilots on 243.45 with 242.2 and 377.6MHz also available. You could hear this on the soundtrack of the TV coverage of the IAT Fairford display. I was struck with how calm the Italian Frecce Tricolore team sounded in comparison!

There are in fact ten Hawks making up the Arrows of which nine fly in each display. They have a spare aircraft - but not a spare pilot! The Team Manager (who also often comments) flies the extra aircraft to each venue. The Arrows are not just a public relations exercise; they are an operational ‘shadow’ squadron and need to practise their routine flying skills in case of going on active service in time of war.

Chris and I saw the Arrows perform at Silverstone. Not being interested in Grand Prix racing (to me, aircraft have more appeal than cars), although this is not familial as my five-year-old nephew Adam disagrees! we watched the event from a nearby public road. After a most agreeable pub lunch, with plenty of helicopters passing overhead on their way to the racetrack, we were able to view a part of the Arrows’ display that is normally ignored. After each pass, the formation has to change to the next figure - perhaps from Diamond Nine to Concorde Turn. This repositioning takes place away from the crowd and is perhaps the tricky bit. Also, the other seven aircraft need to hold off whilst the Synchro Pair perform. To land after a display, the fighter pilot’s run in and break is necessary to separate the formation. Having overflown on runway heading, the Arrows peel off to the downwind leg in turn, thus achieving a tidy separation.

Information Sources

Have you got Airband Factsheet? (Issue 2) yet? Or it are the addresses of AERAD and the RAF (see next paragraph). All you need to do is to send a stamped, self-addressed envelope (capable of holding one A4 sheet) to the Broadstone editorial offices and make sure that you mark it clearly as being a request for the Airband factsheet.

Tracey Gardner (Leicester) wants me to clarify the differences between the En Route Supplement as produced by AERAD and the RAF 1 AIDU. Both are available to the public by mail order, see the addresses on Airband Factsheet. I have just bought the Europe & Middle East AERAD publication for £3 plus postage. The nearest RAF version covers the British Isles and North Atlantic. AERAD is intended for civil operators and doesn’t tell you about u.h.f. channels. It is notable for a decode list of ICAO indicator letters. The RAF publication deals with airfields likely to be visited by military flights and is good on u.h.f.; it also shows offshore oil/gas installation navigation aids. Unlike AERAD, it has a look-up table from which the details of beacons can be found if only the Morse ident is known.

Tracey is disappointed that not all beacons are listed. Certainly, the RAF publication might gloss over those serving the smaller civil aerodromes but, in the case of beacons like Fenland (FNL, 401kHz) there is a further explanation. With a reliable range of only 15mm, this beacon is known as a terminal n.d.b. It is not really suitable for en-route navigation. Having arrived in

Fig. 1: Boeing PT-13D at the PFA Rally, Wroughton
Photo: Chris Mlynek

Fig. 2: Chipmunk G-BBMV at the PFA Rally, Wroughton
Photo: Chris Mlynek

CONTINUED ON PAGE 55
A large number of the letters I receive are concerned with local transmissions causing interference to weaker signals on completely different frequencies. This tends to be a common problem, particularly when continuous coverage, handheld, scanners are used with external antennas. I have covered this subject before in the December 1990 and April 1992 columns but readers have been asking for specific design information so this month I thought that it would be a good idea to take a more detailed look at simple filter circuits.

Interference problems usually occur because the r.f. stages of the scanners have only been designed to cope with the relatively small signal levels which are normally anticipated when the supplied antenna is used. The much higher signal levels produced by a base station antenna overload the receiver and produce unwanted spurious signals on other frequencies.

**FM Broadcast Band**

The most common problems seem to be associated with f.m. broadcast stations operating in the 88-108MHz band. One of the reasons for this is that most antennas designed for use with scanning receivers are optimised for use in the 108-15MHz v.h.f. aircraft band. However they also work reasonably well only a few MHz away in the f.m. broadcast band, where the radiated signal power can be 2500 times stronger than that normally found in the aircraft band.

If you are only interested in one group of frequencies such as the v.h.f. airband one solution would be to fit a bandpass filter (such as the AOR ABF 125) between the antenna and the receiver. Bandpass filters are a combination of high and low pass filters which are designed to only allow frequencies in one specific range to pass to the receiver. This is a good method if you are only interested in one small band of frequencies, but if like me, you want to be able to monitor several different frequency bands some other solution is required.

**Notch Filters**

One way is to fit a filter designed to reject a specific interfering signal. This type of circuit is usually referred to as a notch filter, several of which can be cascaded in order to give the required rejection. The simplest notch filter would just consist of either a parallel or series tuned circuit connected in line with the antenna feed to the receiver.

The parallel tuned circuit produces a high impedance path to the signal at its resonant frequency whereas the series tuned circuit presents a low impedance path shunting the unwanted signal to earth.

The basic circuit configuration and formula for component values is shown in Fig. 1. In the case of the f.m. broadcast band, a capacitor value of 10pF gives a good starting point, and an inductance of 0.26µH should make the circuit resonant in the middle of the band at around 98MHz. You may have to adjust the inductor slightly to get the best rejection of the strongest signals, which tend to be the BBC national services at the low frequency end of the band.

By adding additional sections it is possible to increase the amount of rejection produced by the filter and so improve its effectiveness. An example where series and parallel circuits have been combined and the component values chosen to give a compromise between maximum rejection of the f.m. broadcast band whilst minimising any loss of signals in the adjacent frequency bands is shown in Fig. 2. In really bad cases it may be necessary to use several single notch filters tuned to individual frequencies. For example the circuit shown in Fig. 1 could be repeated with each stage tuned to a slightly different frequency. e.g. National radio services such as Radio 1, 2, 3, 4, Classic FM and any local stations which may be present.

**Short Wave Interference**

If the problem is due to short wave broadcast stations or CB transmissions overloading the receiver, fitting a 30MHz highpass filter in line with the antenna feed will reject frequencies below 30MHz whilst allowing those above to reach the receiver. Alternatively strong u.h.f. TV signals or cellular telephone base stations can be rejected by fitting a lowpass filter tuned to 470MHz.

Simple high and lowpass filter designs are shown in Figs. 3 & 4. These are just intended to be examples but it is possible to cascade several different filters together to give the required response, e.g. a band pass or band reject filter can be produced by combining the high and low pass sections in series or parallel with the correct choice of cutoff frequencies. Alternatively they can be used to combine or split different frequency bands as I described in the January 1992 column.

**Construction**

When constructing any r.f. circuits it is important to follow a few simple rules. The first (and as far as I am concerned the most important) is to keep all component leads as short as possible, including connections to plugs and sockets. This is vital, as even a few millimetres of component lead can act as a tuned circuit that can cause all sorts of unpredictable results. For this reason it is a good idea to use the smallest components you can find, surface mount capacitors are ideal for this purpose - if you can see them!

When more than one inductor is used in a circuit care must be taken to stop any signals being coupled between them. One way to do this is to mount the inductors at right angles to each other or provide screens between them. If the components are mounted on a piece of copper p.c.b material this can be used to provide a common earth connection and all the sections of the circuit connected to the enclosure earth plane. Sections can then be screened from each other by soldering small pieces of copper p.c.b. material at right angles to the earth plane.

The circuit should be built inside some form of screened enclosure. Small diecast metal or screened plastics boxes are ideal for this purpose. Alternatively, if you want to save money or make the unit as small as possible, you can use more pieces of copper p.c.b. soldered together to make a neat housing.

**Aligning Circuits**

Once you have built your circuit...
the next problem is to check that it is working correctly. The actual resonant frequency of circuits will vary slightly from the design values due to the method of construction and the loading effects of external circuits such the antenna or receiver. All of these factors will add additional inductance and capacitance to the input and output ports of the circuit which will de-tune the resonant frequency slightly. This can be compensated for by varying the component values to bring the circuit onto the correct frequency. In order to simplify tuning, I have only used variable inductors in the examples shown. In order to be able to do this it may be necessary to use parallel combinations of capacitors in order to obtain the correct values.

The easiest way to tune a filter circuit is to use a receiver with a signal strength meter. If your scanner hasn’t got one then you will just have to rely on your ears to judge signal strengths. Tune your receiver to the interfering signal and connect the circuit with your antenna. Slowly adjust the coil until you can detect a reduction in the signal level. Keep on turning the core until the signal starts to increase again. Turn the core back in the opposite direction until you have found the point at which the signal is at a minimum, the circuit is now tuned.

I hope that these simple examples give you some ideas for experimentation and help to solve any interference problems you may have.

Back to the more usual format next month, so until then - Good Listening.

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
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<tr>
<td>GASIL</td>
<td>General Aviation Safety Information</td>
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<td>h.f.</td>
<td>high frequency</td>
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<td>hp</td>
<td>horsepower</td>
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<td>IAT</td>
<td>International Air Tattoo</td>
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<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
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<td>kHz</td>
<td>kilohertz</td>
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<tr>
<td>LATCC</td>
<td>London Air Traffic Control Centre</td>
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<td>MHz</td>
<td>megahertz</td>
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<tr>
<td>n.d.b.</td>
<td>non-directional beacon</td>
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<tr>
<td>n.m.</td>
<td>nautical miles</td>
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<tr>
<td>QTI</td>
<td>Quotations of Technical Interest</td>
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<tr>
<td>u.f.h.</td>
<td>ultra high frequency</td>
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<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
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Fig. 3: A Beagle Bulldog at the PFA Rally, Wroughton. Photo: Chris Mlynek
JAVIATION
THE AIRBAND SPECIALISTS

The cover of the new 1994 10th Anniversary edition of Passport To World Band Radio proudly proclaims that it is the 'World's #1 selling shortwave guide!' It certainly is one of the most popular books in the Short Wave Magazine Book Service and is eagerly awaited each year by a growing number of followers.

Inside Passport To World Band Radio you will find details of the world's radio stations listed by country in alphabetical order offering interesting notes, where applicable, local languages and target areas in ascending frequency order.

From the comments we receive I would like to think that our guides are the most comprehensive and accurate listings available, if you are not familiar with them then please give them a try, we are sure you will find them both informative & interesting. They include airfield, en-route ATCC centres, Range, Ops, Display and other frequencies whilst also giving Stud/channel tie ups.


SUBSCRIBERS’ OFFER
If you are a subscriber to Short Wave Magazine you can get your copy of Passport To World Band Radio 1994 edition for £11 inc. P&P (UK), £11.75 inc. P&P (overseas), giving you a further saving of £1.50, by filling in the coupon on page 83.

The closing date for this offer is 28 October 1993 (UK), 25 November (overseas).
NOAA 13

I write this near the middle of August, having recently picked up the first weather pictures from the new American WXSAT NOAA 13 transmitting a.p.t. on 137.62MHz. It is always exciting to collect such pictures from a new WXSAT, and we had an early indication of the launch - see later. Two callers also confirmed reception.

I recorded both signal and picture, and will be happy to provide copies of the images to anyone who wants them - formats available include PCX and Timestop's NOAA. Both that image (of Europe) and the following one (which includes the UK) are available. Both contain twin visible light pictures, characteristic of soon-after-launch NOAA transmissions before the infra-red sensors are operational. They show slightly different spectral responses, suggesting that they were not from the same sensor.

Overnight signals from NOAA 13 (southbound around 0100UTC), produced, as expected, two blank images containing only non-image data (calibration and minute markers). Just send a formatted disk with return s.a.e. and one extra stamp.

Current WXSATs

At the beginning of August, I found NOAA 9 unexpectedly off when it would normally have been transmitting. This suggested that launch of NOAA 13 was imminent because it was going to use the same frequency. However, NOAA 9s 137.71MHz beacon continued to transmit on each pass. It later ceased transmissions, but I unexpectedly picked it up again while writing this column.

Subsequently NOAA 13 became operational as reported above. The American WXSATs NOAA 11 and now 13 both transmit a.p.t. (pictures) on 137.62MHz and have beacons on 137.77MHz. These beacons contain a considerable amount of data themselves, but that is another story! NOAA 11 passes Britain travelling northbound around 1530UTC each day - see Fig. 1 from Roger Ray of Telford. It travels southbound over Britain around 0300UTC. NOAA 13 follows a similar orbit but passes us around midnight (southbound) and then mid-day (northbound). We shall see pictures like Fig. 1 but brighter, from NOAA 13, around 1300UTC each day, the sun being higher in the sky.

The saga of the CIS WXSAT METEOR 3-4 continued during July with sporadic visible-light pictures being transmitted on 137.30MHz, alternating with almost blank images. Transmissions then became erratic.

During the second half of July, METEOR 3-4 was near the terminator - the night/day boundary. I used the InstantTrack program to display its orbit, then selected the option that gives a birds-eye (global) view of the footprint. This allowed me to monitor its distance from the terminator during a 24 hour period. Comparing this with the live image, the WXSAT could be seen to be almost following along the terminator, never straying too far into sunlight.

The bars seen along the edge of a METEOR picture represent the dilution of the aperture, and therefore change with the brightness of the scene below. Instead of altering, they remained fixed, suggesting a fault condition.

On July 28, METEOR 3-4 was finally switched off, leaving just METEOR 3-3 operating (continuously) on 137.85MHz. Further METEOR launches are planned during the next few months.

METEOSAT 5

received a call asking for confirmation that METEOSAT 5 (MOP-2) was transmitting around 1 August. Checking with my small, portable antenna I received strong transmissions from both METEOSAT 4 and 5, the two being separated by several degrees. EU METSAT is the organisation that controls METEOSAT operations.

METEOSAT 4 (officially called MOP-1) was manoeuvred a few degrees to the east of longitude 0° with MOP-2 being manoeuvred a few degrees to the west. They were some 10° apart. I was pleasantly surprised to find that MOP-2 was also transmitting Primary Data at high signal strength and I collected some of the best images that I have ever received. Meanwhile further MOP-2 tests are being scheduled.

METEOSAT encryption

Details of the proposed future encryption of METEOSAT Primary and Secondary data arrived on my desk just a few hours before its deadline! A very quick glance reveals that some Primary Data (PDUS) will be encrypted from 1994, with full encryption from 1995. Major changes to WEFAX transmissions are also scheduled. Full details will be published next month.

Letters

A number of correspondents have sent several pictures - perhaps I might be able to persuade Editor Dick Ganderton to give extra space sometime to publish several at a go? Meanwhile Fig. 2 is from Laurence Patton of Perth and shows an edited image of the entrance to the St Lawrence River near Quebec. Laurence is a keen s.w.l. as well as a WXSAT monitor and has bought several well-known programs for decoding and image processing. He has added in place names before screen photography.

The existence or otherwise of 'WeatherWatch', is queried by B. Berman of Burton-on-Trent, who has been trying to make contact. This organisation was based at Alton in Hampshire some years ago, and provided a telephone number from which current information about WXSATs could be obtained. I have not had any response from the organisation, to my letters, and others report similar experiences. If any reader can provide further information about 'WeatherWatch' I will include it.

Modems

Computers communicate with each other in various ways, the most usual being the use of a common standard of disk to transfer information. Direct communications between computers are accomplished by connecting a compatible cable between interfaces on the back, usually the serial port. To connect the computer to a remote machine, the usual method is to use a telephone line.

Before signals can be transferred through this network they have to be converted to a compatible form, which involves modulating the signal at one end, and therefore de-modulating it at the other. The unit which does this is called a modem.

The rate at which data can be transferred depends mainly on the quality of the telephone line. Bursts of noise heard so often during enquiries. Those readers who are interested should send a letter with s.a.e. to Roger, to my address - see top of column. Mark it for Roger's attention, and I will be happy to forward all correspondence.

JVFAX 5.2

A second kind offer for readers of this column has come from James Burns. He has the latest version of JVFAX, and permission from the author to make copies available to anyone who sends either a 5.25 or 3.5in disk with return postage and packing included, and one extra stamp. Write to James at 110 Park Road, Calderbank, Strathclyde ML6 9TD.

WXSAT BBS

Many hobbyists are using modems fitted to their computers to collect data, and I receive requests for the telephone numbers of BBSs (Bulletin Board Systems) carrying WXSAT information. Before describing what's on offer, it might help beginners to explain what is involved.

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The rate at which data can be transferred depends mainly on the quality of the telephone line. Bursts of noise heard so often during
normal telephone conversations have the effect of corrupting any signals being transmitted, so normal practice is to use some form of error checking program - referred to as the baud rate - to transmit bits of information per second. My modem uses a baud rate of 2400.

I logged into the three main UK BBS for WXSAT users - Dartcom's, RIGs, and Timesteps', with some interesting results. One use for such BBS is the supply of recent Kepler elements, ideally covering all current NOAA and CIS WXSATs and preferably some of the 'stand-by' craft. Older series two WXSATs are unlikely to be re-activated.

Other useful services can include programs and data files for down-loading. It is important to realise that logging on to such BBS is generally free (other than the cost of the call), and is effectively a service provided by the system's operator (sysop). That is why larger firms, like Timestep Weather Systems and Dartcom, are currently providing them. The other BBS is maintained by the Remote Imaging Group for the benefit of its members (of which I am one) and is funded by them.

Modem Facilities

The communications program normally has an option to retain transmitted and received data files containing all information received from the server computer. This allows you to subsequently plan future communications sessions - usually down-loading files in the minimum of time, and therefore cost. Data can be examined later at leisure. Using this facility I reduced the time taken to download a large list of WXSATs from a remote computer, to about 90 seconds - costing within 15p!

Dartcom BBS

This BBS is at the offices of Dartcom, a supplier of WXSAT equipment based near Tavistock in Devon. I have not received any product details from them for several years, so have assumed they are catering for a different market.

I called up their BBS during July - access was very quick (you are requested to give a password) and within seconds I was scanning their file list. The introductory screen advises you of their general equipment set up and an occasional message - a sort of quote of the day - was periodically printed but was of no interest to me. What did confuse me was a request by their software to transmit an average of one file for each ten of theirs that I down-loaded. I was quite happy to do this, in fact after I had seen their list of current WXSAT transmissions, which was not accurate, I prepared a file containing an up-to-date list. Unfortunately their software did not appear to have any facility to allow me to send it. I contacted Dartcom by phone and was told that they did not actually accept file input because of the virus risk!

Dartcom advise that they update their Kepler element list at the beginning of each month so I logged in on August 2 and down-loaded BULLETIN.TXT that contains the data for many satellites in NASA 2-line element format. For beginners, it is worth mentioning that this is probably the most common format for all satellite Kepler elements, consisting of just two lines of data containing each parameter in a fixed position, and can be read by most predictions programs.

I was pleased to see that this data was current and would recommend this file to anyone wanting a comprehensive collection of elements. Transfer was completed by the Dartcom 'server' computer that transmitted the file in ASCII format - straight on to the screen! Transmission took about 40 seconds.

Dartcom's BBS number is (0922) 8249.

RIG BBS

The Remote Imaging Group operates a BBS for members, with access currently permitted to all. The first signing-on procedure seemed rather long in comparison with the other BBSs, and I would recommend users enter NO to the offer of ANSI graphics, otherwise this takes some unproductive seconds to display. The board carries Kepler elements 'pinched' (fit saved) from the Timestep board. The file T W O L I N E . N E W contained elements from the previous week, but unfortunately with no warnings (see Timestep BBS). During this and later contacts I did notice a number of data transmission errors occurring; this had been pointed out to me by other users of the system.

The file list was quite comprehensive, containing several programs and data files that will be of interest to WXSAT monitors. The recently changed METEOSAT schedule was included. There were other Kepler element files, one of which I down-loaded without noticing that it was over nine months old!

I was surprised to see that RIG, like both the other BBSs, contained an inaccurate WXSAT operating status. It was date stamped yet stated that NOAA 10 was off when in fact it had been transmitting for nearly two weeks. I logged back on to the BBS and sent a copy of my own observations. After a few days I again logged on, but found there had been no correction - NOAA 10 was still described as being off. A few days after NOAA 9 was commanded off I logged on and found that both NOAA 8 and 9 had a wrong status given.

The availability of several useful programs and files plus recent Keplers makes this a useful service for members. The RIG BBS number is (0945) 85666. Membership enquiries to Ray Godden G46CE, Wayfield Cottage, The Clump, Chorleywood, Herts WD3 4BG.

Timestep BBS

When I first logged on to this board I got an unwelcome surprise! It starts by warning users that legal action will be taken against anyone distributing the data it contains. I receive large numbers of requests, from both newcomers and more experienced people, for printouts of recent Kepler elements, and it had been my intention to use these elements for that purpose. The data originates from US Space Command and is normally issued on a 'free-to-all' basis; additionally, I receive this same information from NASA on a weekly basis through another route, and this is the data that I normally distribute. I hope to obtain clarification!

As with the RIG and Dartcom BBSs, the WXSAT status was not accurate, so I transmitted a copy of my current observations. It was not used. By early August, however, the BBS had been updated to show the correct status of NOAA 9 and 10. The board contained several useful files including a more comprehensive satellite listing, plus some picture files. I was particularly impressed with the file TW O L I N E . T H I S that is updated late on Friday nights with elements within about 24 hours old. As yet, I daren't distribute them!

Finally, the BBS warns that it will be withdrawn soon to except those users that have registered a password on the system. Well worth registering.

Abbreviations

a.p.t. automatic picture transmission
AOS Acquisition of signal
AVBR Advanced Very High Resolution Radiometer
BBS Bulletin board service
CGA Colour Graphics Adapter
DOS Disc Operating System
EGA Enhanced Graphics Adapter
EMS Expanded Memory
ESA European Space Agency
GOES Geostationary Operational Environmental Satellite
GOMS Geostationary Operational Meteorological Satellite
h.p.t. high resolution picture transmission
LDS Loss of signal
NASA National Aeronautics and Space Administration
PDUS Primary Data User Station
SVGA Super VGA
VGA Video Graphics Array

BBS System Operators

I welcome any comments from these, or any other BBS operators, or others, for inclusion in this column. All the above comments are based on my own recorded communications with those systems. If anyone knows of other BBSes carrying WXSAT or indeed any type of satellite information, please let me know so I can pass the word along.

Kepler Elements

Paul O'Brien is a teacher at a school in Co. Antrim where they have recently acquired a WXSAT tracking system, and wanted a source of Kepler elements to update their program. I can send printouts of the latest elements upon receiving an s.a.e. and extra stamp towards the cost of data collection. Transmission frequencies are included if operating. This data originates from NASA.

Peter Rouse

Like many other SWM readers and contributors I was deeply saddened to hear of the passing of Peter. Just prior to his entering hospital, he had rung me to say that he had some unused WXSAT hardware which he felt might be of use to readers of this column. Sadly this was superseded by events. Kindness was one of his many qualities which I will not forget.

Frequencies

NOAAs 11, 13 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.56MHz; NOAA beacon on 136.77 and 137.77MHz; METEORS 3-4 or 3-5 may use 137.30MHz and METEOR 3-3 on 137.85MHz.

Fig. 3: METEOSAT 4 image from Roger Ray.
PROsat II is used by most leading Weather Satellite enthusiasts. Lawrence Harris, Roger Ray and Brian Dudman are just a few who have come to rely on the vastly superior features of PROsat II. Features such as 1,000 frame full screen full colour animate, 3D, direct temperature readout and Windows export make Timestep products preferred by most users. All satellites are catered for including the awkward Japanese GMS and the very infrequent Soviet Okean series. All current SVGA cards are supported. NOAA images contain full resolution visible and infrared data in a stunning 2.4Mb file!

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L
ike most people, my name seems to appear in all manner of mailing lists and hence I get my fair share of junk mail. However, now and again something really interesting appears that makes it all worthwhile. An example of this was a catalogue from Pasternack Enterprises from the USA. The mailshot comprised a plain envelope with a fairly cheaply produced catalogue and no covering letter. I had half a mind to throw it in the bin until I thumbed through the pages. I could hardly believe my eyes as the catalogue comprised fifty-nine pages crammed full of coaxial products. Instead of the usual seven specifications of around seventy-first part of the book provides brief annual updates of two Klingenfuss stations and Air and Meteo Code stations such as Bracknell Met on 4.489MHz. The problem with these stations is that the data has been encoded to facilitate processing by computer. This means that it's back to be difficult for us mere mortals to decode! The obvious solution is to use a computer based decoding system. There are a few excellent systems available such as Skyview and ICS-SYNOP and the hardware Synoptic Decoder from ERA Ltd. However, not everyone can justify the additional expense of such systems and so a manual alternative is required. Although you can perform complete decoding manually, it's a very tedious task that few have the patience to do. What we can do is pick out a few items of information that are likely to be of interest and ignore the rest. To further simplify the task, we could only look at SYNOP and SHIP reports. These are by far the most common reports and also likely to be of most use to the listener. Because of all these reporting systems send their data in a pre-defined order, it's comparatively easy to pick out the required information. I will attempt to show you how you can extract the following from each report: date, time, weather station, wind speed and direction, temperature and current weather. This should be enough to give an idea of the weather patterns at a number of locations.

I always find the best way to understand this type of decoding is to look at a few examples so here we go!

The first is a report received from Bracknell on 4.489MHz.

When you look through the O'1 file for the Soft Wave Magazine Book Service price £18.00 for Guide to Facsimile Stations and £18.00 for the Air and Meteo Code Manual. See the Book Service pages for the appropriate post and packing rates.

New Books
This month sees the release of annual updates of two Klingenfuss publications - Guide to Facsimile Stations and Air and Meteo Code Manual. This is a good opportunity to review these two popular books. The Guide to Facsimile Stations does exactly as the title suggests and provides comprehensive information for the FAX listener. The first part of the book provides brief specifications of around seventy-seven decoding systems and accessories. Although there is a strong continental slant, all the main UK products are represented. For the technical minded, there are descriptions of the FAX transmission process along with details of all the standard start and stop tones. This is particularly useful for anyone thinking of producing their own FAX decoding systems. If you're into satellites, you will find detailed information on the various weather satellite systems as well as decoding information for the AFTN and ATS message systems that are in common use for the communication of aircraft flight plans. As with the meteorological section, there were plenty of worked examples to help the newcomer understand the way in which the code is used. To further help with decoding there were approximately 130 pages of location indicators, addressees designators and aircraft type designators.

As you can see, the Air and Meteo Guide provides a comprehensive range of information. Although this information can be obtained from other 'official' (and expensive) sources, its concentration into one document makes the Air and Meteo Code Manual an excellent reference.

Both the books covered here have just been released in their thirteenth edition and are available from the Short Wave Magazine Book Service price £18.00 for Guide to Facsimile Stations and £18.00 for the Air and Meteo Code Manual. See the Book Service pages for the appropriate post and packing rates.

Simple WX Decoding
Ronald Still of Bournemouth writes asking if there's a quick way of decoding the RTTY weather stations such as Bracknell Met on 4.489MHz. The problem with these stations is that the data has been encoded to facilitate processing by computer. This means that it's back to be difficult for us mere mortals to decode! The obvious solution is to use a computer based decoding system. There are a few excellent systems available such as Skyview and ICS-SYNOP and the hardware Synoptic Decoder from ERA Ltd.

Fig: 1: An example of poor clock synchronisation.
readings were taken. To work out the station details you will have to use to a reference book such as the Klinkenfus Air and Meteo Code Manual.

In this example 0309 is Coldroo. We now need to skip the next five digit group and look at the last four digits of following group (50905). These tell us the direction and speed of the wind. In this case the direction is 090 degrees and the speed 55 knots. To establish the temperature we move to the next group that starts with the number 1. The following digits shows whether the temperature that follows is positive or negative (0 for +1 for -). The final three digits show the temperature to one decimal place. In our example this is 18.4C.

To capture the weather at the time of the reading we need to skip to the eighth or ninth group which should start with the number 7. The next two digits show the weather using a comprehensive coding system. Rather than go through this in detail, I’ll just show the broad categories here:

00-49 No precipitation
50-59 precipitation
60-69 snow
70-79 snow
80-89 precipitation
90-99 snow

Complete details can be found in the Air and Meteo Code manual or Admiralty List of Radio Signals Vol 3.

Our example shows no precipitation.

As practice makes perfect, here’s another example for you to try.

03585 31562 11403 10230 20186
40116 57021 70511 81101 333 81820=

Here’s another example for you to try:

40116 57021 70511 81101 333 81820=

JVFAX Update

Now that a number of readers are using this excellent FAX program, I’m starting to receive a few queries that I can answer in this column. One important point BEFORE you contact us to check for synchronisation is to tune into the Rugby MSF time signal on 60kHz. This produces a very precise one second pulse that’s ideal for setting-up FAX decoders. First set your FAX unit to 120 lines per minute and an IGC of 28B. Then tune into the Rugby signal and adjust your receiver until you start to see a vertical line appearing on the screen. Using the instructions for your decoder you then need to adjust the clock frequency so that the line stays parallel to the edge of the screen.

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ICSS News

I’ve just received a hot press release from ICS Electronics giving details of new products and updates. The first concerns the release of PACTOR updates for decoders in the AEA range. PACTOR is that burst mode signal which looks at the picture information. The JVFAX decoding system can process this type of information, but Peter Lee reports very little success. Having looked at Peter’s set-up I can see that the problem is the interface that’s being used. Like most people, Peter is using the simple comparator approach that connects to the serial port of the computer. Although this works quite well for f.m. signals, it cannot work for a.m. This is because the comparator is effectively an overload amplifier and swings between its positive and negative limits.

Whilst this helps with f.m. reception, it completely eliminates any a.m. information present in the signal! The only solution is to use one of the more sophisticated interfaces that are described in the JVFAX documentation. The only snag here is that all the ready-built units only appear to be available in Germany. Can anyone help with a supplier of analogue interfaces for the JVFAX decoder? If you can, please write to the address at the head of the column.

The second JVFAX topic is also relevant to many other computer based FAX programs and concerns clock speeds. I’ve seen many examples of charts received on systems that do not have the clock speeds optimised. I’ve shown an example to illustrate the point. As you can see in a bad case you end up with a very badly skewed image. This is due to the computer’s internal clock being out of synchronisation with that of the transmitting station.

Although ICS FAX programs have facilities to correct this error, it’s often overlooked. One good way to check for synchronisation is to tune into the Rugby MSF time signal on 60kHz. This produces a very precise one second pulse that’s ideal for setting-up FAX decoders. First set your FAX unit to 120 lines per minute and an IGC of 28B. Then tune into the Rugby signal and adjust your receiver until you start to see a vertical line appearing on the screen. Using the instructions for your decoder you then need to adjust the clock frequency so that the line stays parallel to the edge of the screen.

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Frequency
6.443MHz
7.929MHz
7.75MHz
7.842MHz
7.88MHz
7.955MHz
8.165MHz
10.973MHz
12.0625MHz
12.110MHz
12.180MHz
12.886MHz
13.9958MHz
14.912MHz
18.972MHz
19.357MHz
19.8215MHz
20.734MHz
Speed
RTTY
RTTY
RTTY
RTTY
RTTY
RTTY
RTTY
ARQ
ARQ
ARQ
ARQ
CW
RTTY
RTTY
FEC-A
ARQ
ARQ
Shift
50
50
50
50
50
50
50
50
50
50
50
50
50
96
100
100
170
170
Callesign
FAX
FAX
FAX
FAX
FAX
RTTY
FAX
FAX
FAX
FAX
FAX
CW
FAX
FAX
FAX
FAX
FAX
Notes
GVA
RAV7B
CMN201X
WORKS
SBC23
SYD
YOM21
1525

Frequency
Notes
6.555
RN Northwood
1819
TUNJUG press
1800
Swiss Embassy
1855
MAP Redress
1230
U.S. Military
1913
IRNA Tehran
1192
Nairobi
1145
Swiss Embassy
2235
U.S. Military
1114
Nigerian Embassy
1742
JANA Trigoli
1919
Madrid
2030
Khartoum
1425
Yugoslav diplo
1545
MFA Belgrade
1324
Nigerian Embassy
1330
U.N Geneva
10818
U.N Geneva

This month’s log has been compiled from reports from the following: Day Watson, Lee Williams, Gavin Jones and Andy Keddie.
GUIDE TO FACSIMILE STATIONS
13th edition • 400 pages • £ 22 or DM 50

The recording of FAX stations on longwave and shortwave and the reception of meteorological satellites are fascinating fields of radio monitoring. Powerful equipment and inexpensive personal computer programs connect a radio receiver directly to a laser or ink-jet printer. Satellite pictures and weather charts can now be recorded automatically in top quality.

The new edition of our FAX GUIDE contains the usual up-to-date frequency lists and precise transmission schedules - to the minute! - of 90 FAX stations and meteo satellites. This includes Blacknetell Meteor, Royal Navy London, METEORSAT; and a detailed description of the new Blacknetell and Washington meteolex telefax polling services! It informs you with full details about new FAX converters and computer programs on the market.

The most comprehensive international survey of the “products” of weather satellites and FAX stations from all over the world is included: 337 sample charts and pictures were recorded in 1992 and 1993! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, topographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else. Additional chapters cover abbreviations, addresses, call sign lists, description of geostationary and polar-orbiting meteo satellites, regulations, technique, and test charts.

Further publications available are Guide to Utility Radio Stations (11th edition), Radioteletype Code Manual (12th ed.) and Air and Meteo Code Manual (13th ed.). We have published our international radio books for 24 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, SW listeners and telecom administrations worldwide.

Please ask for our free catalogue, including recommendations from all over the world. For a recent book review see the Decode section in Shortwave Magazine 3/93, and RSGRs RadiCom 6/93. All books are published in the handy 17 x 24 cm format, and of course written in English.

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| 7dBi to 200 MHz | 16dBi to 2000 MHz |
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Short Wave Magazine, October 1993
### Medium Wave Chart

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Station</th>
<th>Country</th>
<th>Power (W)</th>
<th>Listen-in</th>
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<tbody>
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<td>520</td>
<td>Hofstatt</td>
<td>Austria</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>500</td>
<td>Alte Glance</td>
<td>Germany</td>
<td>50</td>
<td>A</td>
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<td>430</td>
<td>Neuruppin</td>
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<td>410</td>
<td>Reutlingen</td>
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<td>5</td>
<td>A</td>
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<td>390</td>
<td>Wurzburg</td>
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<tr>
<td>380</td>
<td>Kassel</td>
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<td>A</td>
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<tr>
<td>370</td>
<td>Mannheim</td>
<td>Germany</td>
<td>100</td>
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<td>A</td>
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<td>330</td>
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<td>Germany</td>
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<td>Schwartburg</td>
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<td>A</td>
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<td>Halle</td>
<td>Germany</td>
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<td>A</td>
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<td>Hanover</td>
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<td>A</td>
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<td>170</td>
<td>Detmold</td>
<td>Germany</td>
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<td>A</td>
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<td>160</td>
<td>Paderborn</td>
<td>Germany</td>
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<td>A</td>
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<td>100</td>
<td>A</td>
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<td>Germany</td>
<td>100</td>
<td>A</td>
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<td>Vallendar</td>
<td>Germany</td>
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<td>100</td>
<td>A</td>
</tr>
<tr>
<td>100</td>
<td>Münster (Dillberge)</td>
<td>Germany</td>
<td>100</td>
<td>A</td>
</tr>
</tbody>
</table>

Note: I. & m. w. frequencies in kHz, s.w. in MHz, Time in UTC (+GMT). Unless stated, logs compiled during the four week period ending July 31.
Local Radio Chart

<table>
<thead>
<tr>
<th>Freq kHz</th>
<th>Station</th>
<th>Power (kW)</th>
<th>Modulation</th>
<th>Listener</th>
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</thead>
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<td>956</td>
<td>Piccadilly Radio</td>
<td>1.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
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<td>958</td>
<td>West Sound</td>
<td>1.00</td>
<td>E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>961</td>
<td>Central</td>
<td>0.50</td>
<td>A,E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>965</td>
<td>Radio Lincoln</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>966</td>
<td>Radio Leeds</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>967</td>
<td>Radio Sheffield</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>969</td>
<td>Radio York</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>970</td>
<td>Radio Manchester</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>971</td>
<td>Radio Lancaster</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>972</td>
<td>Radio Preston</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>973</td>
<td>Radio Wirral</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>974</td>
<td>Radio Chester</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
<tr>
<td>975</td>
<td>Radio Shrewsbury</td>
<td>0.50</td>
<td>A.E.I., V</td>
<td>Listener</td>
</tr>
</tbody>
</table>

Notes: Emissions marked * were logged during darkness. All other emissions were logged during daylight or dusk in volunteer.

They come from UAE R. Abu Dhabi 25.690 (Ar to Far East 0900-1050) SI0152 at 1000 by Kenneth Back in Edinburgh; DW via Julich, 25.060 (Eng to E.Asia 1100-1355) 2322 at 1341 by Garry Haynes in Bushhey Heath; RFI via Issoudun 25.820 (Fr to Africa 0900-1455) 2521 at 0930 by Eddie McKewon in Newry.

More reliable reception from R.Australia has been evident here in the 21MHz (13m) band. Their broadcast to SE Asia via Darwin on 21.525 (Eng 0200-0800) 55444 at 0649 in Bushhey Heath, to Pacific areas via Carnarvon on 21.595 (Eng 0900-0900) was 3543 at 0853 by Tim Allison in Middlebrough; to Asia via Darwin 21.745 (Eng 0800-07) 34433 at 1115 by Rhoderick Ilman in Oxford.

In the morning, occupants of this band include DW via Trincomalee 21.640 (Ger to Australia, NZ 0700-1000) 34553 at 0703 by John Parry in Northwich and SI0333 at 0915 by John O'Halloran in Harrogate; via Julich 21.610 (Eng to W.Africa 1100-1150) 4444 at 1143 by Chris Shorten in Norway; R.Prague, Czech Rep 21.705 (Eng to Pacific areas 0730-0000) 43443 at 0736 by Robert Connolly in Kilkeel; Radio Pakistan, Islamabad 21.105 (Eng to Eu 0900-1130) 44333 at 1130 by Tony Rambaut in Sunderland; R.Austria Int via Moosbrun 21.490 (Eng to Australia 0800-0900) 15343 at 0830 by Eric Shaw in Chester; R.Japan via Moyobi 21.575 (Eng, to Japan, Eu.East 0700-0800) 45123 at 0756 in Middlesbrough; to Asia via Darwin 21.705 (Eng to Asia 0900-1200) 55444 at 0850 by Darren Beasely in Bridgewater; R.Tunisia via Stax 21.535 (Ar, Home Service) 0700-1800) SI0111 at 1145 by Philip Kigfose in Massafledd.


Later, VOA via Greenville, 21.485, (Eng to Africa 2200-2300) was 42442 at 2156 by John Eustis in Woking; VDFC via Okeechobee 21.720 (Eng to Eu.East 2200-2300) SI0322 at 2210 by Michael Williams in Redhill and 45534 at 2343 in Hafnarfjordur, Iceland.

The 18MHz (15m) band is being used by Catholic broadcaster WEENV in Birmingham, USA. Their 5000W amplitude modulated (a.m.) transmission on 19.830 (Port), Eng, Sp to Eu 1200- 2155) rated 34563 at 1855 in Northwich. This
Long Medium & Short

**Long Wave Chart**

<table>
<thead>
<tr>
<th>Frequent</th>
<th>Station</th>
<th>Country</th>
<th>Power (watts)</th>
<th>License</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>153</td>
<td>Busua</td>
<td>Ghana</td>
<td>1200</td>
<td>A.E.G.</td>
<td>1450</td>
</tr>
<tr>
<td>154</td>
<td>Fanci</td>
<td>Jamaica</td>
<td>1500</td>
<td>A.E.G.</td>
<td>1900</td>
</tr>
<tr>
<td>165</td>
<td>Bahamas, Providenciales</td>
<td>Turks &amp; Caicos Islands</td>
<td>2000</td>
<td>A.E.G.</td>
<td>2500</td>
</tr>
<tr>
<td>171</td>
<td>Kempton Park</td>
<td>South Africa</td>
<td>3000</td>
<td>A.E.G.</td>
<td>3500</td>
</tr>
<tr>
<td>172</td>
<td>Komoro</td>
<td>Djibouti</td>
<td>4000</td>
<td>A.E.G.</td>
<td>4500</td>
</tr>
<tr>
<td>173</td>
<td>Demnaghard</td>
<td>Germany</td>
<td>5600</td>
<td>A.E.G.</td>
<td>6100</td>
</tr>
<tr>
<td>174</td>
<td>Berne</td>
<td>Switzerland</td>
<td>8000</td>
<td>A.E.G.</td>
<td>8500</td>
</tr>
<tr>
<td>175</td>
<td>Geneva</td>
<td>Switzerland</td>
<td>10000</td>
<td>A.E.G.</td>
<td>10500</td>
</tr>
<tr>
<td>176</td>
<td>Genova</td>
<td>Italy</td>
<td>12000</td>
<td>A.E.G.</td>
<td>12500</td>
</tr>
<tr>
<td>177</td>
<td>Zürich</td>
<td>Switzerland</td>
<td>15000</td>
<td>A.E.G.</td>
<td>15500</td>
</tr>
</tbody>
</table>

*Note: Extinct marked * were logged during de-activated. All other entries were logged during effective on Air.*

Practical Wireless, October 1993
### Tropical Bands

<table>
<thead>
<tr>
<th>Station</th>
<th>Country</th>
<th>UTC</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US Navy, NBC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWV, HD, in 2MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W0, 0800 to 1600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWVH, HD, in 1.5MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W0, 0700 to 1800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWV, HD, in 5MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W0, 0000 to 0300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWVH, HD, in 10MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Radio Rowan</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>North America</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Asia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Africa</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>South America</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Australia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>New Zealand</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pacific</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Quartz Frequency List

<table>
<thead>
<tr>
<th>Country</th>
<th>Station</th>
<th>Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honduras</td>
<td>4030</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Venezuela</td>
<td>4040</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Cuba</td>
<td>4050</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Colombia</td>
<td>4060</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Ecuador</td>
<td>4070</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Kenya</td>
<td>4080</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Cameroon</td>
<td>4090</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>4100</td>
<td>B, DJ</td>
</tr>
<tr>
<td>India</td>
<td>4110</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Japan</td>
<td>4120</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Egypt</td>
<td>4130</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Brazil</td>
<td>4140</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Nigeria</td>
<td>4150</td>
<td>B, DJ</td>
</tr>
<tr>
<td>Australia</td>
<td>4160</td>
<td>B, DJ</td>
</tr>
<tr>
<td>South Africa</td>
<td>4170</td>
<td>B, DJ</td>
</tr>
<tr>
<td>China</td>
<td>4180</td>
<td>B, DJ</td>
</tr>
</tbody>
</table>

### Practical Wireless, October 1993

- **The 7MHz** (4m) band WVCW Nashville 7.435 (Eng to 0000-1000) rated 3433 at 0000 in Ronson-Wey, WEVN Birmingham, USA 7.425 (Eng to 0500-1000) 3433 at 0000 in Bushes Heath, WHRF South Bend 7.315 (Eng to E.U.S.A. 0000-1000) 3443 at 0000 in Woking, KTBN via Salt Lake City 7.510 (Eng to 0000-1000) 3132 at 0040 in Rutherford, U.V.P. 7480 (Eng to E.U.S.A. 24hrs) 3111 at 0958 in Macclesfield, R.Australia via Camberon 7.260 (Eng to S.Africa 2340) 3232 at 1945 in E.Bristol, AIR via Aligareh 7.412 (Eng to E.U.S.A. 2343) 2332 in Sterling, RTM Sarawak 7.160 (Eng to Ch.In.S.E.A.Sia 2300-1500) 3222 at 2300 in Kikilel, WRNs N.5.35 (Eng to E.U.S.A. 2300-0400) 2322 at 0004 in Newbury. Some broadcasters use relays in the 6MHz (49m) band to reach Europe. They include VOA via Wofferton 8.045 (Eng 0400-0700) 3045 at 0000 in N.Rijal, W.Via Skelton 6.050 (Eng, Ger 0700-0800) 30155 at 0700 in Sheffield, VOA via Wofferton 6.040 (Eng 1630-2230) 3544 at 1930 in Chester; RTM via Skelton, 5.995 (Eng, Fr 1300-1900) 3444 at 2010 in Winchester.

---

**Notes:**
- **US** includes stations transmitting in the 49m (6MHz) band to the Americas.
- **Europe** includes stations transmitting in the 49m (6MHz) band to Europe.
- **Africa** includes stations transmitting in the 49m (6MHz) band to Africa.
- **Asia** includes stations transmitting in the 49m (6MHz) band to Asia.
- **Australia** includes stations transmitting in the 49m (6MHz) band to Australia.
- **South America** includes stations transmitting in the 49m (6MHz) band to South America.
- **India** includes stations transmitting in the 49m (6MHz) band to India.
- **Pakistan** includes stations transmitting in the 49m (6MHz) band to Pakistan.
- **Bangladesh** includes stations transmitting in the 49m (6MHz) band to Bangladesh.
- **Philippines** includes stations transmitting in the 49m (6MHz) band to Philippines.
- **Singapore** includes stations transmitting in the 49m (6MHz) band to Singapore.
- **Japan** includes stations transmitting in the 49m (6MHz) band to Japan.
- **Australia** includes stations transmitting in the 49m (6MHz) band to Australia.
- **South America** includes stations transmitting in the 49m (6MHz) band to South America.
- **Canada** includes stations transmitting in the 49m (6MHz) band to Canada.
- **Mexico** includes stations transmitting in the 49m (6MHz) band to Mexico.
- **Central America** includes stations transmitting in the 49m (6MHz) band to Central America.
- **South America** includes stations transmitting in the 49m (6MHz) band to South America.
This quarter we are making a brief visit to a radio jingle factory, well actually a production studio. During the 1990s and 70s British music stations used American jingle producers who had accumulated many years experience in this field. Pams of Dallas were one of the most common suppliers to Britain's gradually expanding broadcast industry. As local radio grew, composer/musician Alan Fawkes and Steve England - a radio commercial industry. Many years experience in this field. Producers who had music stations used American jingle during the 1960s and 70s which to park your car. Customers can buy a custom-built jingle package specially composed for their own particular personalisation with DJs' names. In the 70s jingles were heavily into synthesisers and drum machines, now sounds tend to be softer with a larger emphasis on melody. Musicians and session singers record the same jingle many times, while the producer constructs the sound, feeling and quality his client requires. Stations tend to use jingles as part of their corporate identity, they identify the broadcast, highlight program features and create breaks. The continued use of jingles does suggest they are indeed good for the broadcasting business. Radio stations play their jingles on instant start digital cartridge machines using tape, floppy disk or CD formats. Pictured is a part of Alphasounds impressive facilities at St. Martin's Studios in Greenbank Road near Sale in Cheshire.

Did You Know?

Radio Caroline have approached Manx Radio, at the Isle of Man, regarding the possibility of using their 28kW 1366kHz transmitter to carry Radio Caroline North programmes. They sent a demonstration recording and are now awaiting a decision from the Iohl Government who at present own the station. Free Radio Monitoring sent me an unconfirmed report that Radio Seagull Ltd. are to apply for a licence to broadcast from a ship moored at London's Docklands. It is a fact however that the Radio Authority are advertising several m.w. frequencies in the Capital.

Recently I was given a tour around Caroline's MV Rose Revenge at Dover Harbour where I discovered most of the gear returned by the Dutch authorities, following the raid in 1989, has now been refitted. The exception is an amp transmitter that will require a total re-build if it is ever to be used again, the components are in a huge heap on the transmitter roof!

John Burch has written a book called Wheel Turned Full Circle in which he recounts the events surrounding Offshore Radio 1984kHz. This is a restricted service to a licensed station that broadcast from the MV Galaxy during August 1992 from Frinton in Essex. John is now involved with Iain Johnson in the production of an audio magazine called Tender-Trip.

The radio ship Droite de Parole, off Yugoslavia, is reported to have ceased transmitting its 'Radio Brood' programmes. It was initially stated that they had difficulties with their teleporter reception and ship-to-shore communications while their 50kW transmitter was in use. European anti-pirate broadcasting legislation may have finally drifted quietly into the Adriatic.

Feedback

Following last quarter's comments about foreign m.w. stations John Perry writes giving a brief history of American forces radio in Europe. I wonder how many other readers remember AFN's Mithite In Munich programmes just after the war? Talking about memories Bob Marsh says he enjoyed the 'underground' music played on Radio Geronimo in the late 60s. As a result he bought a number of King Crimson LPs. Radio Geronimo broadcast from the transmitters of Radio Monte Carlo from midnight onwards. Leo Barr writing on this same subject says I made no mention of the English m.w. broadcasts provided by Swedan, Finland, Norway, Italy, Germany, Russia or Albania.

He says these transmissions are there but you need to know when to listen. Mike Gaffmann is seeking information on the Tyrolean music station on 6.425 and 6.550MHz in the mid-70s. He also asks where Reflections Europe comes from? Mike also says during the 70s he Dfed the Lincolnshire Poacher transmissions to a site in Buckinghamshire.

6.6MHz Echo Charlie Band

Bob Marsh and several other readers say 6.6MHz is known as the Echo Charlie Band, but does anyone know why? He also recalls the days of s.s.b. when m.w. stations used frequencies around this area. Charles Vassili says he has been monitoring this band for some time and has heard operators referring to the use of amateur band equipment connected to a transverter. Simon Parker also mentions the use of transverters obtained from areas of Europe where radio regulations are barely enforced. He says at one time s.s.b. CB sets like the Cobra 148 and the Stalker 9 were used, but these have given way to Kenwood Yaesu transceivers or people using home-brew equipment. John Clark writes saying he has just monitored 6.600MHz and finds the general style of conversations to be more like licensed radio amateurs than typical CBers. Geoff Crowley of Hafnarfjordur in Iceland says he also receives these operators on frequencies around 3.4, 13.9 & 25.26MHz.

Mike Le Vesconte mentions he has heard illegal operators boasting that they were 'uncatchable'. He also sent a list of examples where air traffic controllers and authorised users have been obliged to change channels to avoid illegal transmissions. Mike is also concerned at the general conduct of some licensed amateurs and the irresponsibility behind the misuse of air traffic and marine radio frequencies.

The next 'Off The Record' appears in the January issue of SWM. If you wish your letter or irregular station log to be included please ensure it reaches me by November 1.
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<td><strong>Sony 7600</strong></td>
<td>£85. Realistic PRO30 hand-held scanner, £35. Realistic DX302 h.f. receiver, £65. Tel: Rochdale (0706) 45424.</td>
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<td><strong>Yupiteru MVT-7000</strong></td>
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<td><strong>Uniden Bearcat UBC, 200XLT scanner</strong></td>
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<td><strong>ICS FAX1</strong></td>
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<td>A Green Bandspread Dipper</td>
<td>June 93</td>
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<td>SR018</td>
<td>Experimental VHF Receiver</td>
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Short Wave Magazine, October 1993
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And See What's On Offer At The Biggest Amateur Radio Show In The World.

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Book your seat on the PW 1994 Hamvention Holiday for only £630 per person, sharing a twin bedded room. Single rooms are available for an extra £205. The price includes the return flight and meals on the aircraft, coach transfers, seven nights' accommodation, two day excursions by coach and admission ticket to the HamVention. We return home on Monday May 2, arriving at Gatwick on Tuesday morning.

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