Short Wave Magazine

ISSN 0037-4261

£1.45

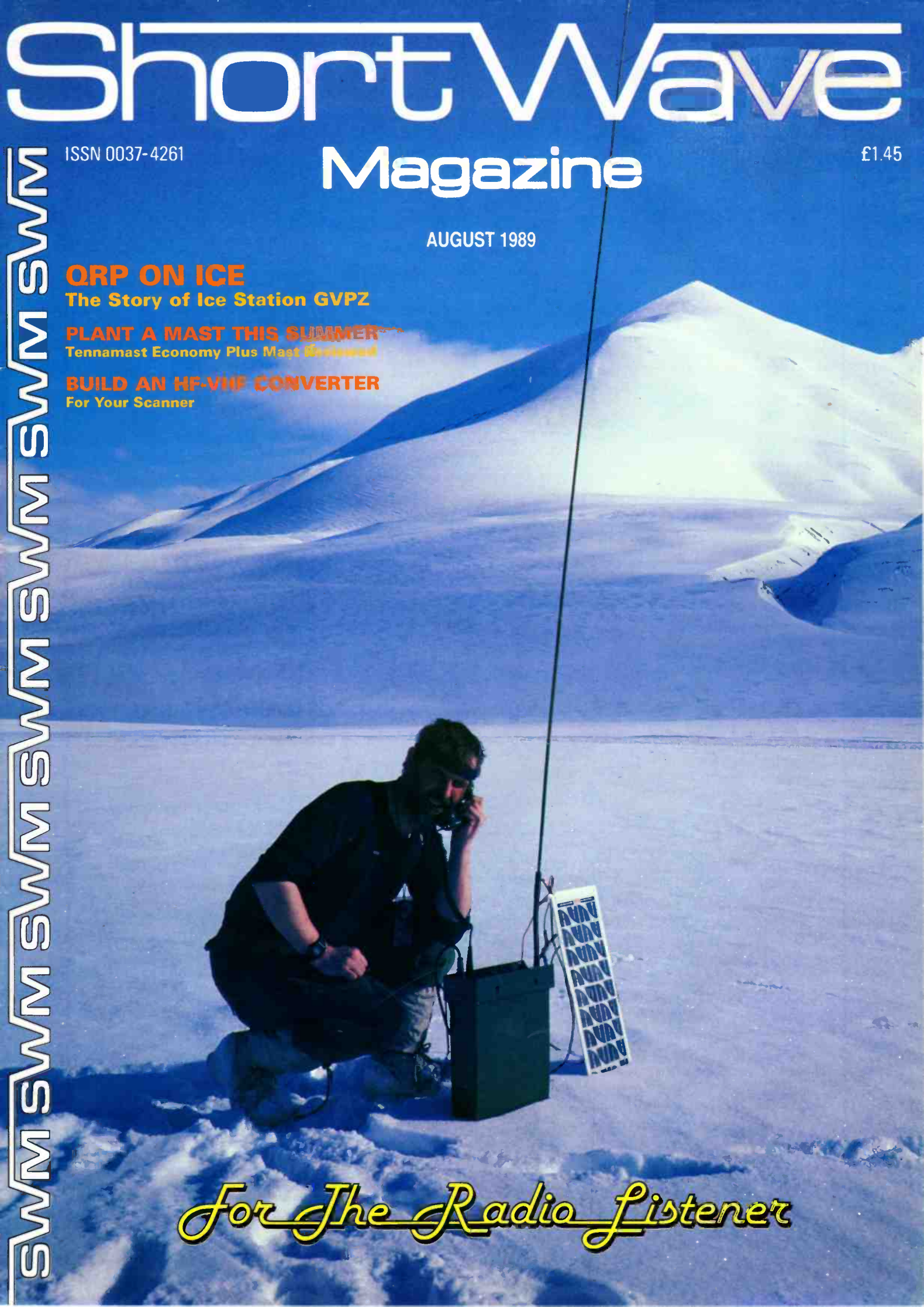
AUGUST 1989

SWM SWM SWM SWM SWM SWM SWM

QRP ON ICE
The Story of Ice Station GVPZ

PLANT A MAST THIS SUMMER
Tennamast Economy Plus Mast Reviewed

BUILD AN HF-VHF CONVERTER
For Your Scanner



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DCC 127A 12V car PSU	**£24.95**

All our Sony stocks carry UK cards and do not have serial numbers etc removed from boxes!

NEW PANASONIC RF-B65D POCKET SSB/AM SW RECEIVER

We are pleased to be able to announce the new Panasonic RF-B65D portable short wave receiver with AM & SSB. Measuring 198 x 118 x 33 mm it is highly compact, yet an excellent performer. Covering 153kHz to 30MHz plus FM broadcast it is ideal for the traveller. Electronic or manual tuning in 1kHz steps with SSB fine tune is a first in a receiver of this size. 36 memories, clock, and auto-scan add to its attractions. Supplied with AC adaptor, external antenna, case, etc., this is just the job for the bedroom, office or hotel.

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From AOR the famous VHF/UHF monitor that covers 26-1300MHz AM/FM. Highly compact. 230V or 12V DC with LCD, memories and scanning. Ideal for the serious user. A wide range of facilities and 230V AC or 12V DC.

£475 FREE SECURICOR

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£249

Carr. Free

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25MHz to 1300 MHz HANDHELD!

We don't normally announce new products prior to their availablity, but the MVT5000 looks to be something rather special. It is likely to be available before the autumn, and is a true handheld monitor covering 25MHz to 1300MHz! There is one gap between 550 and 800MHz (UK TV band). Covers the FULL military band, AM/FM, programmable steps 5 to 25kHz, 100 memories, 10 band scan memories, Battery saver, antenna, etc. We have not got final specification yet, but price will be £299. If you want full details, then just send us an addressed envelope marked "MVT5000".

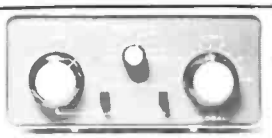
AVAILABLE AUGUST

AOR 900 SCANNER!

We are approved stockists of this latest model. Look at the range! AM/FM 108-174MHz /220-280MHz/ 300-380MHz/406-470MHz/830-950MHz. At last a decent monitor that covers military airband!

£235 + £2 p&p

AT 1000 SWL ATU



This ATU has been designed for the SWL who wants the best out of his aerial system handles all forms of aerials and simple to install.

£69 + £2 p&p

LISTENER ANTENNAS

D 130N Discone 25-1300MHz	**£82.00 (3.0)**
CLP5130 Log-peridic 105-1300MHz	**£89.00 (3.00)**
Revcone Discone 70-500 MHz	**£32.95 (2.50)**
Slim Jim 2m vertical	**£8.95 (2.00)**
G5RV 80-10m dipole 102ft	**£16.95 (1.50)**
G5RV 40-10m dipole 51ft	**£14.95 (1.50)**
Royal Blue Monopole 2-30MHz	**£29.95 (3.00)**
Sony AN-1 150kHz-30MHz	**£49.00 (2.00)**
Sony AN-3 VHF vertical	**£45.00 (2.00)**
Datong D370 Active antenna	**£69.00 (2.00)**
AT1000 ATU. 150kHz-30MHz	**£69.00 (2.50)**
AN33 way coax switch	**£7.95 (1.50)**
Airband Groundplane 118-136MHz	**£19.95 (2.50)**
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Egg Insulators	**0.75 (0.20)**
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Self Amalgamating Tape	**£4.49 (0.75)**
FRA7700 Yaesu active antenna	**£49.00 (2.00)**
FRT7700 Rx ATU 1500kHz-30MHz	**£59.00 (2.00)**

RECEIVERS (Free delivery)

R5000 Short Wave 150kHz-30MHz	**£875.000**
R2000 Short Wave 150kHz-30MHz	**£595.00**
VC20 VHF conv. for R5000	**£167.00**
VC10 VHF conv for R2000	**£161.95**
FRG8800 150kHz-30MHz	**£639.00**
FRV8800 VHF converter	**£100.00**
IC—R71 Short wave 150kHz-30MHz	**£825.00**
Sony 7600DS Short wave	**£159.00**
Sony ICF2001D band Short wave + air band	**£299.00**
Lowe HF 225 Short wave	**£395.00**
FRG9600 Scanner 60-950MHz	**£509.00**
IC-R7000 Scanner 25-2000MHz	**£957.00**
AOR 2002 Scanner 25-1300MHz	**£475.00**
Sony Air-7 VHF scanner	**£227.00**
Sony Pro-80 VHF + SW scanner	**£299.00**
R537S Air band monitor	**£69.50**
R535 Air band scanner	**£249.00**
R528 Air band xtal scanner	**£125.00**
WIN 108 Air band scanner	**£175.00**

SHORT WAVE LISTENER'S CONFIDENTIAL FREQUENCY LIST

The 1989 Short Wave Listeners Confidential Frequency List (previous editions published under the title UK Listeners' Confidential Frequency List) is now well established as the foremost economically priced guide to general world short wave frequencies. Published in the UK it is totally relevant to listeners resident in Europe, unlike some of the American publications costing much more! Superbly produced and laid out, you will find everything at your finger-tips. The first section contains some useful editorial and the main body contains world listings in frequency order. Large A4 format has been necessary to contain all the information and the manual runs to 160 pages! It's all there: broadcast, military, naval, air, shipping, press etc., with listings for CW, SSB, RTTY, TOR, FAX. Callsigns and time schedules are all included. Tremendous value, even the news media are purchasing it. In the unlikely event of you not being totally satisfied we offer a full refund if returned within 7 days of purchase. How's that for confidence!

£7.95 plus £1 post & packing.

VHF-UHF AIR-BAND FREQUENCY GUIDE

This is the third edition of the famous airband guide published by Spa Publications. Not the normal budget kind of publication produced by competitors on a home computer, this is professionaly prepared and laid out. All the information is taken from official sources, both military and commercial, and is undoubtedly the most complete airband listing generally available for the UK enthusiast. There is plenty of editorial and explanations, photographs and of course very complete frequency listings. Entries are listed both alphabetically and numerically for cross checking. The list also includes company and airway frequencies. Essential reading for any airband enthusiast and a reference book that is great value. The news media and many sectors of the aircraft industry purchase it as a quick reference. What better recommendation! Now available from stock, this July 1989 edition is bang up-to-date.

£5.95 Plus £1 Post & Packing

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VOL 47 ISSUE 8 AUGUST 1989
ON SALE JULY 27th

SEPTEMBER ISSUE ON SALE
AUGUST 24

|11| **QRP On Ice**

Cover Intreprid explorer Vaughan Purvis poses with his Arctic Wireless Station GVPZ. You can read about his exploits with QRP among the icebergs and polar bears. You can also enter our exciting listeners' contest by logging his radio progress on his next Arctic expedition in an open boat. Full details on page 5.

Antennas Part 8 by F. C. Judd has had to be held over and should appear in the next issue.

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CONTENTS

Short Wave Magazine

REGULARS

SEEN & HEARD

GOOD LISTENING

A WORD IN EDGEWAYS

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS USED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE.

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 other magazines.

Sir

I have noted with interest a number of references in your "Airband" column over the last few issues, notably February 1989, regarding the reception of h.f. transmissions on the airband mode of the Sony ICF-2001D.

I have experienced the same phenomenon and wondered if my findings might shed some light on the subject.

First of all I have to point out that the sensitivity of my receiver seems to be impressively high and wonder if this may in itself be part of the problem.

I find that throughout the airband I receive numerous a.m. broadcast transmissions mainly in the lower two thirds of the band.

I had to conclude initially that there was some internal mixing taking place, possibly as a result of some deficient or faulty screening and to this end made enquiries of my local Sony Service Centre and Sony UK both of whom indicated that they were not aware of this problem.

I am now wondering however if the problem may lie with the antenna switching (or is it matching) facility which is brought into action when external antennas are connected.

I have discovered that plugging in an external antenna to the air/f.m. socket obviously makes an improvement on these frequencies but it also pulls up the signal level of the unwanted h.f. transmission. However, I have found that by shorting out the spare external antenna adapter and plugging it into the a.m. socket, this very nearly gets rid of the problem.

This may offer a temporary solutiion for some of your readers as it has for me.

Ideally of course one should surely be able to leave an external a.m. antenna and an f.m./airband antenna connected permanently but the effect of this renders the scanning facility on the airband totally useless.

In response to your question in the February issue I am certainly coming to the conclusion that this in not an uncommon problem with these receivers, and one which may not have been recognised by the less discerning newcomer to the hobby for whom being able to receive Vatican Radio as well as Heathrow Approach on the same bit of the dial, may indeed have been seen as an added bonus.

I await with interest any further developments in your enquiries and obviously will continue in the meantime to try and get to the bottom of it myself, starting with a good look at the service manual which I am intending to purchase.

Although my letter was initially directed towards your "Airband" column, on a higher plane (please excuse the pun) your readers may be interested to hear of my success in monitoring some of the NASA Shuttle/Mission Control voice transmissions during some of the latest launches since the Challenger *disaster. NASA themselves relay these transmissions on various h.f. frequencies through a transmitter on Ascension Island and have included conversations with the crew and mission control, commentaries and press de-briefing during which technical aspects of the mission are outlined.*

As I was completing this letter I received the May issue of SWM and noted Mr A. Glassey of Dundee's letter regarding these transmissions. He was listening to the proceedings of the March mission on one of the NASA relay frequencies which tend to be around 20.192-20.197MHz (NB not always u.s.b.).

The YL that he refers to provided the aforementioned commentary. Residents of the USA no doubt also benefit from the added pleasure of listening in to the various pursuit aircraft and rocket recovery vessels which transmit on v.h.f. and u.h.f. frequencies.

As well as their own "official" transmissions, NASA's Amateur Radio Organisation also relay these QSO's and this information is part of an elaborate public relations exercise, from the Goddard Space Flight Center, Greenbelt, Maryland.

Their station callsign is WA3NAN and they point out that further information can be obtained from them upon writing.

Frequencies used by both parties vary form mission to mission but on their last mission WA3NAN used 21.395MHz u.s.b. although propagation was not very satisfactory and suffered from QSB.

I have obtained frequencies for each mission including the v.h.f./u.h.f. ones from various sources including Radio Sweden's Sweden Calling DXers, Packet Radio and WA3NAN themselves.

I work in local education as a technology teacher, currently attached to Walsall's Computer Support Service and much of my work involves promoting the use of radio communication systems such as weather satellites, WEEFAX, RTTY, etc through our Information Technology courses. Monitoring these transmissions has added yet another fascinating dimension to this work and has generated a lot of interest amongst pupils and colleagues alike, many of whom are licensed radio amateurs. I would suggest that this might be an excellent stimulus for teachers who are contemplating promoting the RSGB's Youth into Electronics via Amateur Radio - YEAR project in their schools or in any case any aspect of Science and Technology.

PHIL PEDLEY G1RLR
WALSALL

Sir

Many readers of SWM *are owners of the Matsui MR-4099 receiver, which is sold under various brand names and type numbers. The price ranges from £99.99 to about £150. I bought mine for £89.99. It covers 150kHz to 30MHz and f.m. 87.5 to 108MHz, with b.f.o. for c.w./s.s.b.; digital frequency read-out and excellent clock.*

Mine was purchased as an everyday domestic portable, which would give access to the h.f. bands while on holiday. The l.w./m.w./f.m. bands perform excellently. On s.w., using the whip antenna, the performance left something to be desired. Furthermore, on c.w., using the b.f.o., the c.w. note can best be described as wishy-washy. So a few tests were run, and the results may interest other owners of this, and similar, receivers:

1. Plugging a 10m length of thin flex into the external antenna socket made h.f. reception very acceptable. This antenna, when not in use, is wound around a beer mat, for transit in a suitcase, when on holiday.

2. Connecting the RX to a station antenna, plus a.t.u., produces quite remarkable results. It seems a pity that the instruction booklet does not suggest using a good external antenna for serious h.f. listening.

3. A pair of small hi-fi phones were purchased with the RX. However, for use on the h.f. bands a pair of old communications-type phones were rewired, and are used in lieu of the hi-fi phones. This produces an excellent crisp c.w. signal.

In fact, with the above simple ideas a quite excellent low cost communications-type RX has been produced. So much so that I am contemplating a small TX to take along on holiday to partner the 4099 for c.w. holiday operation.

RICHARD Q. MARRIS
SLOUGH

A WORD IN EDGEWAYS

Sir

Sometime ago I wrote to Brian Oddy and among other things told him a little story of what happened to a friend and I. He thought your readers might by interested. A month or so ago I went to stay for a few days with a friend who is mildly interested in radio. My pal said their is a radio club in his town let's go and have a look. We went to the venue and went in, no one took much notice of us, so I spoke to a gentlemen who seemed to be an official. I said we were interested in radio and had thoughts of joining a club, could he please give us some information. So far so good. He did not seem very interested, but he did ask me what radio I used. I told him I have a Grundig Satellit 1400SL and a Grundig RR950 Super Stereo Radio Recorder. He said "Oh we don't bother with rubbish like that" and walked away. We left feeling rather let down! I have been a short wave listener for over thirty years, ever since I left the RAF and I have always used Grundig radios. We are not all rich men and most of use what we can afford. If all clubs are like this one - it shall remain nameless - we are not going to get many people and youngsters interested in our hobby.

Thank you for a wonderful magazine.

C. S. WALDEN-VINCENT

Sir

I was very interested in your article on the MICROREADER. I have long been considering setting up to read RTTY, etc, but I have been put off by the price of gear such as the Pocom AFR100. This seems a reasonable solution, but no mention was made of any facility to feed out the data to a computer so that one may use a monitor screen or dump to disk or printer.

I have a good computer (Amstrad 1640), two communications receivers, Yaesu FRG-7 and Uniden CR-2021. What I need is some software and perhaps an interface. Does any reader know from whom I might obtain the software? Given the input and output specification I could probably produce the interface.

I noted the advertisement from Technical Software in your magazine, but on enquiry they told me that their programs are only suitable for the simple computers such as the Spectrum and BBC, and they have nothing compatible with a PC. It strikes me that it would not be such a large task to adapt the program to run on DOS - surely this would enlarge the available market considerably.

My interest in radio goes back quite a few years. I was granted my first call in 1937, 2CUW Artificial Aerial, followed the next year with a full licence, (25 watts all-bands) with the call G4CA.

I have watched your magazine with interest over the years and I think it has improved with age.

PATRICK WODEHOUSE ITALY

WHAT'S NEW

EDXC Club List

The EDXC has anounced that the 1989 version of the EDXC Club List is now available.

This 16-page booklet gives details of each of the Member and Observer Clubs, together with information about the Association of North American Radio Clubs and the South Pacific Association of Radio Clubs.

The booklet can be obtained from **The European DX Council, PO Box 4, St Ives, Huntingdon, Cambs PE17 4FE** and costs 75p or 3 IRCs worldwide.

Spectrum Software from Triple S

A range of new software is now available from Triple S, the Spectrum scanner specialists. Their software is available on tape and runs on both the Spectrum 48 and 128K computers.

VOR Beacons Listing: This gives the location and frequency of v.h.f. d.m.e. beacons in the UK in the 108 to 118MHz beacon band. The list also includes nearby European beacons that may be heard when reception conditions are good. Morse identification of any beacon can be heard by a simple input command. Cost £2.99

VHF Airband Listing: This program gives the frequency listing of the v.h.f. aircraft band from 118 to 137MHz in 25kHz steps. Simply input the frequency required for an instant readout. Cost £3.99

UHF Airband Listing: This is similar to the v.h.f. version but covers the 225 to 400MHz aircraft band in 5MHz segments. Cost £4.99.

You can buy all the programs on the one tape for £8.49. Post and packing is 50p per order.

Triple S, 98B Baker Road, Newthorpe, Nottingham NG16 2DP.

Scouts ARG

Scouts from Northampton are able to explore the world of amateur radio through their own District Scout Amateur Radio Group.

Based at Overstone Scout campsite on the outskirts of Northampton, the Group offers an annual programme of training courses including the Scout Communicator, Computer and Electronics Badges.

The well-equipped permanent station includes h.f. and v.h.f. facilities and an impressive array of antennas. As well as offering courses, the Group are sable to provide demonstration fascilities to the hundreds of Scouts and Cub Scouts at the site each year.

Rare WOB Squares

TR09 Essex square will be activated again, this time on 14, 7 and 3.5MHz. The dates to listen out on are September 8 and 9 from 0800 to 1900UTC. The callsigns will be G0KSY/P and G0JAR/P.

Penpals

George Aikins is a 17-year old with interests of football, table tennis, letter writing, music and art. He lives in Ghana and would like to correspond with UK readers. His address is: **George Aikins, PO Box 61, Nkawkaw-Kwahu, Ghana, West Africa.**

WHAT'S NEW

Radio Stations in the UK

The 8th edition of *Radio Stations in the United Kingdom* is now available from the British DX Club.

This 24-page guide lists all national, local and regional long wave, medium wave and v.h.f. f.m. transmitters in the UK, both those operated by the BBC and the IBA. As well as station details (including transmitter power and location) each entry is cross-referenced to help with identification and show any other channels that may operate in parallel. As usual, the list is right up-to-date (May 1989) and shows all the latest changes in frequency and power as well as new stations.

The booklet lists the full postal address and telephone number of each station together with background information about the broadcasters, advice on reception reports and details of major changes planned in UK broadcasting structure from 1990.

The guide is in frequency order throughout which makes it ideal for the DXer or listener interested in identifying British domestic radio stations.

Radio Stations in the United Kingdom is priced at £1.20, 4 IRCs or 3US$. and is available direct from **British DX Club, 54 Birkhall Road, Catford, London SE6 1TE.**

New Showroom

Nevada have opend new showrooms in Portsmouth. Now, amateur radio, scanner and short wave enthusiasts will be able to browse in comfort with full "hands-on" facilties over their expanded range of products.

The new showrooms are housed in the 330m² building next door to the exisistng premises. **Nevada, 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (0705) 662145.**

Snippets from Sweden

Bulgaria: 11.66MHz is used by Radio Sofia for its broadcasts in Italian at 1930.

Guam: KSDA's *DX Asiawaves* at 0230 uses 11.7MHz instead of 17.865MHz, 11.7MHz is also used for other programmes on Saturdays and Sundays.

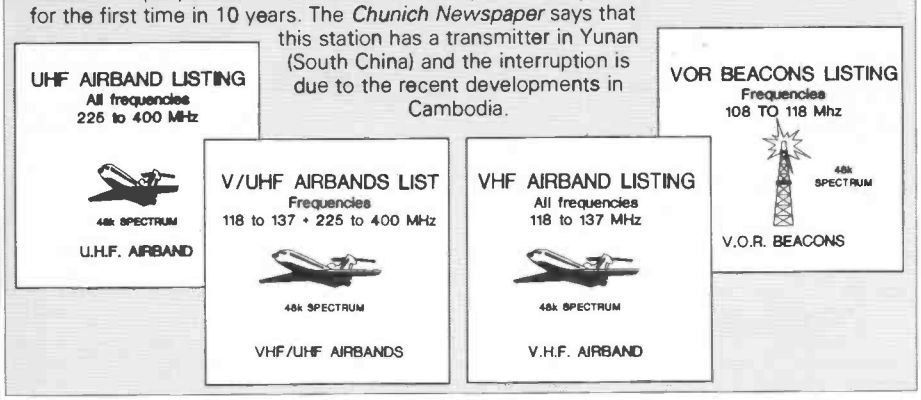
Iraq: Radio Baghdad has moved from 11.8 to 11.81MHz in English at 0130-0340 to India to avoid interference from the Sri Lanka Broadcasting Corporation. Unfortunately, 11.81MHz is already used by Radio Amman which causes interference. Best to try 11.935MHz which is directed to North America.

Ireland: Radio Dublin returned to the short waves on 6.912MHz on June 4.

Sierra Leone: The Sierra Leone Broadcasting Service was heard testing on 3.315MHz at 0150-0300. The signal was strong but there were many breaks and only one ident during the transmission.

Unofficial Radio: The American Federal Communications Commission siezed the transmitting equipment of the anti-Cuban government pirate station La Voz de Alfa-66 on May 22. An FCC spokesman interviewed on National Public Radio's *Latin File* programme said Alfa-66 was fined in 1982 and 1983. She said the station had returned to the air at the beginning of this year, causing interference on the aeronautical band.

Another famous clandestine broadcaster has gone off the air. According to Kazuya Harada in Japan, the Voice of Democratic Kampuchea suspended its broadcasts on June 8 for the first time in 10 years. The *Chunich Newspaper* says that this station has a transmitter in Yunan (South China) and the interruption is due to the recent developments in Cambodia.



Satellit 500

Thanks to the extended short wave frequency range and programmable "Intermix" channels, the Satellit 500 can tune in up to 82 worldwide stations at the touch of a button.

The Grundig Satellit 500 has 40 stations pre-programmed by the factory to receive the most important international transmitters on 156 frequencies. The user can programme a further 42 channels in the "Intermix" to store all the other stations listened to most frequently. To find a frequency the tuner has the facility to scan through its entire memory, skipping any unused channel positions.

Its clock operates in two time zones, with two programmable switch-on and two switch-off times in each 24-hour period and has a snooze facility which is programmable up to 60 minutes. Its phase locked loop frequency synthesised tuner automatically scans the f.m., m.w. and l.w. bands, as well as a continuous s.w. range from 1.6 to 30MHz. Stereo f.m. can be heard through headphones, or by connecting an external speaker to back up the built-in wideband speaker.

The illuminated l.e.d. display offers a host of vital information, including stations which can be programmed by name as well as frequency. Other features include an electronic lock, bandwidth selector, automatic gain control and a built-in s.s.b./b.f.o. section for receving single sideband and unmodulated telegraph transmitters.

The price for this new Grundig RX should be around £299.95 from your nearest Grundig stockist.

ATV Expedition

Between August 16 and 23 there will be an ATV expedition at the top of Mont Blanc using the callsign TV7SMB. The frequencies to watch and listen on are: 438.5MHz, 144.170 u.s.b. phone and 144.140 f.m. phone.

An ATV transponder will be installed at the top of the Aiguille du Midi (3800m), receiving TV signals from alpinists equipped with cameras and pocket 1.2GHz transmitters (solar powered), and transmitting TV pictures on u.h.f. with 100 watts into 4 x 21-element antenna arrays.

Several French and Belgians will climb on the top of the Alps (4807m) transmitting ATV during the ascent. They (F6ESH, F6BXC, F6HXZ, FD1MXH, ON4KBS) will also be QRV for DX on 144.330, 432.210 u.s.b.; 144.050, 432.050 c.w. and 145.525, 432.500MHz f.m.

Plan Ahead

If you've already got your 1990 diary then you can make a note of next year's Longleat Mobile Rally. The 33rd Longleat Amateur radio Rally will take place on Sunday 24 June 1990, the venue being as usual Longleat Park, Warminster, Wilts.

Full details from: **Shaun O'Sullivan, 15 Whitney Close, Saltford, Bristol BS18 3DX.**

ARCTIC POWER BOAT - GVPZ

Crossing the Atlantic in small boats has become an almost routine affair. Seafarers, searching for adventure, have rowed and sailed their way across "The Pond" from Europe to the Americas in a variety of odd craft. Rowing boats, sailing dinghies, rigid and not-so-rigid inflatables, collapsible canoes and a number of historic craft have also had their days.

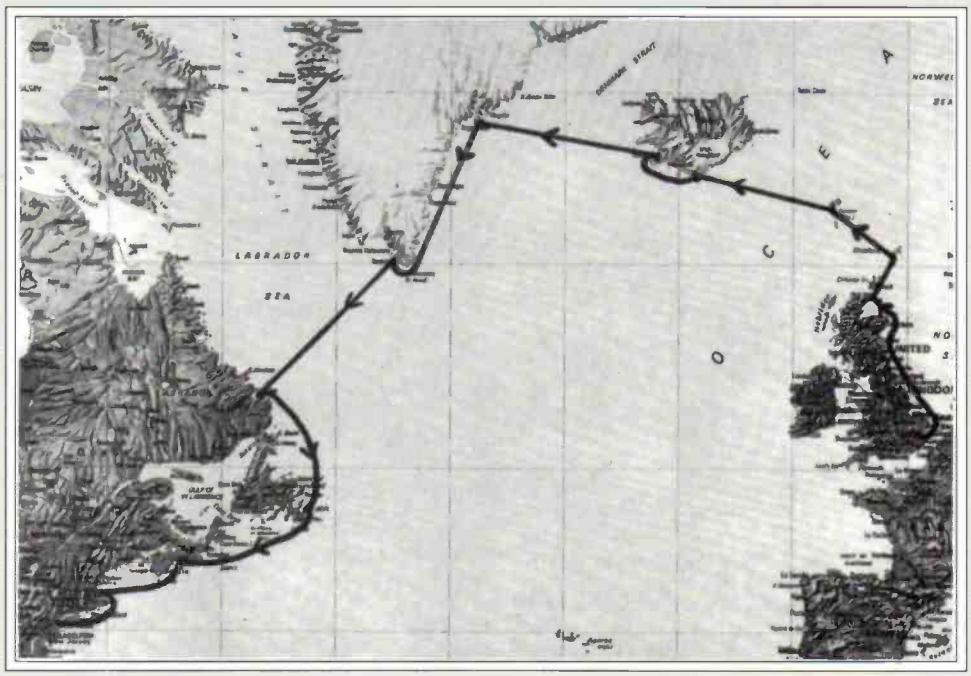
While no-one should underestimate the difficulty of these endeavours, it has become harder to work up much enthusiasm for any new variation on the old theme. There's always the nagging doubt that each succeeding effort really adds very little to what has already been done.

Few have even considered that there might be a wholly new route from Europe to the Americas that remains unpioneered, perhaps because the mere thought of an open boat journey through Arctic seas seems fraught with almost superhuman difficulties.

Such a boat would have to make its way through the chilly waters of the North Sea, only to run the gauntlet of storms that rage incessantly in the Icelandic depression. It would have to find a way through the shifting jigsaw of ice floes on the Greenland Sea, and then make its way across the Davis Straits to the freezing coasts of Labrador. Even in August, the sea water temperature will remain below zero, and big seas breaking over the boat will be laden with ice. It is a voyage that requires no exaggeration to make it interesting, nor any justification to give it meaning. It is the ultimate voyage.

Arctic veterans Vaughan Purvis and Rupert Hadow will embark on just this challenge starting in London Docklands on 2 August 1989. Piloting a Suzuki-powered Delta-boat seven metres long with a top speed of forty knots, the two men will try to set two new world standards in a single go. If they succeed, not only will they have been the first to pioneer the 6880km Arctic Sea Route to the Americas in an open boat, but they will have completed the fastest open boat journey from Europe to the Americas ever made.

Vaughan Purvis is the author of our cover story in this issue and he will be reporting on his Arctic Power Boat voyage in a future issue.



ENTER OUR ARCTIC POWER BOAT - GVPZ LISTENING COMPETITION

A prize of a *CM Howes Marine Band Direct Conversion RX Kit* will be awarded to the reader who, in the opinion of the judges, Dick Ganderton and Vaughan Purvis, logs GVPZ the maximum number of times during the voyage. Prizes of one year subscriptions to *Short Wave Magazine* will also be awarded to the two runners up.

Special *Arctic Power Boat - GVPZ* QSL Cards will be sent to all entrants submitting the **Time (UTC)** and **Frequency** on which GVPZ was heard, together with the **Name of the Station** being called by the Power Boat.

Date	Station/Callsign	Shore	Ship
August		(MHz)	(MHz)
3/4	Wick Radio/GKR	1.706	2.104
4/5	Wick Radio/GKR	2.751	2.006
5/6	Torshavn/OXJ (Faeroes)	1.778	2.056
6/7	Isafjordhur/TFZ (Iceland)	1.862	2.023
7/8	Reykjavik/TFA	1.250	2.049
9/10	Qaqortok/OXF (Greenland)	2.129	2.049
10/11	Labrador (Canada)	2.538	2.142
12/13	Sydney/VCO	2.530	2.815
13/14	Halifax/VCS	2.514	2.118
14/15	Yarmouth/VAU	2.538	2.142
15/16	Boston/WOU	2.506	2.406

In all cases *Arctic Power Boat - GVPZ* will first call the Maritime Coast Radio Stations above on 2182kHz before moving to the working frequency shown.

GRASSROOTS

Lorna Mower

Biggin Hill ARC have an Operating Evening on August 18. 3rd Tuesdays, 7.30pm at the Victory Social Club, Kechill Gdns, Hayes. Mr Geoff Milne G3UMI on 01-462 2689.

Holyhead & District ARS meet 2nd & 4th Sundays, 7.30pm at the Forresters Arms, Kingsland Rd, Holyhead, Gwynedd. D. Richards, 5 Queens Park Court, Holyhead, Gwynedd LL65 1RB.

Dunstable Downs RC have a TV Treasure Hunt on July 28, Canada by G3WLM on August 18 and a d.f./Treasure Hunt on the 20th. Room 3, Chews House, High Street South, 8pm, Fridays. Tony G0COQ on Luton 508259.

Wirral ARS have Magnetic Loop Antennas by Tony Johnston, Capco on August 2. 1st & 3rd Wednesdays, 7.45pm at Ivy Farm, Arrowe Park Rd, Birkenhead (opposite Landican cemetery gates). Alec Seed G3FOO on 051-644 6094.

Verulam ARC have an Informal on August 8 and Bring & Buy (8pm) on the 22nd. 2nd & 4th Tuesdays at the RAF Association HQ, New Kent Rd, St. Albans. George Christofi G0JKZ on 01-427 4800.

Todmorden & District ARS have a Diving film/talk on August 21. Meet in the Queen Hotel at 8pm. Mrs Esde Tyler G0AEC on Halifax 882038.

Yeovil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. August 3 is Measurement of r.f. Power G3GC, the 10th is Greyline Propagation G3MYM, the 17th is talk on Water World and the 24th is a G8AWB talk. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

South Bristol ARC have Skin Diving G3OUK on August 2, 144MHz Activity Evening on the 9th, DX Broadcast TV Activity on the 16th and Top Band Activity on the 23rd. Further details from Len Baker G4RZY on Whitchurch 834282.

Wimbledon & District ARS meet 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Rd. July 28 is Camp Planning - last minute details, July 29-August 6 is the WDARS annual camp, Chessington and August 11 is Data Transmission and Amateur Radio G8LWY. Nick Lawlor G6AJY on 01-330 2703.

Torbay ARS have Club Nights on July 28/August 4/11th and their monthly meeting on the 18th. Fridays, 7.30pm at the ECC Social Club, Highweek, Newton Abbot. Walt G3HTX on Paighton 526762.

Wyre ARS meet 1st & 3rd Wednesdays, 8pm at The Fleetwood Cricket Club, Broadwaters. Ian Broadbent G0KMT on Fleetwood 75736.

The Radio Society of Harrow meet Fridays, 8pm at The Harrow Arts Centre, Uxbridge Rd, Hatch End, in the Roxeth Room. August 4/11/18 are Activity Evenings. Chris Friel G4AUF on Ruislip 635522.

Hastings Electronics & RC meet 3rd Wednesdays, 7.45pm in West Hill Community Centre, Croft Rd, Natter Nights each Friday, 7.30pm in the clubroom at Ashdown Farm Community Centre, Downey Close. August 16 is Antique Radio 1860-1930. Reg Kemp G3YYF at 7 Forewood Rise, Crowhurst, Battle, E. Sussex TN33 9AH.

York ARS meet Fridays, 7.30pm in United Services Clubroom, 61 Micklegate, York. Keith Cass G3WVO at 4 Heworth Village, York.

Braintree & District ARS meet 1st & 3rd Mondays, 7.30pm at The Braintree Community Association Centre, Victoria St (next to Bus Park). Derek Brades G0IZW on Braintree 44908.

Basingstoke ARC meet 1st Mondays, 7.30pm at The Forest Ring Community Centre, Sycamore Way, Winklebury. Dave Deane G3ZOI on Mortimer 332777 (home).

Acton, Brentford & Chiswick ARC meet at the Chiswick Town Hall, High Rd, Chiswick, 7.30pm. On August 15 Members Problems will be discussed and hopefully solved. W. G. Dyer G3GEH at 188 Gunnersbury Ave, Acton, London W3 8LB.

Sevenoaks & District ARS meet 3rd Mondays, 8pm in the Emergency Control Centre, Sevenoaks District Council Offices. Barry Leggett G7CIC on Sevenoaks 741222 Ext. 245.

Halifax & District ARS have Martin G3ZXZ RSGB on August 15. 1st & 3rd Tuesdays, 1st Tuesdays informal Noggin & Natter nights at the Running Man Public House, Pellon Lane, 7.30pm. David Moss G0DLM on Halifax 202306.

Ipswich RC have a Morse test at Ipswich on August 10 and the Ipswich Carnival on the 12th. Red Lion, 284 Bramford Rd, 8pm. Jack Toothill G4IFF on Ipswich 464047.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Wormley. August 2/16 are Natter Nights, the 9th is Members Forum and the 23rd is Open Air Meeting - Baas Hill Common. Roger Frisby G4OAA on Hoddesdon 464795.

Farnborough & District ARS meet 2nd & 4th Wednesdays, 7.30pm at the Railway Enthusiasts Club Premises, off Hawley Lane (by M3 bridge). August 9 is Linear Amplifiers G3HEJ and the 23rd is Data Converters G4CLF. Tim FitzGerald G4UQE on Camberley 29231.

Keighley ARS meet Tuesdays, 8pm in the clubroom, rear of Victoria Hall. August 1/8/22 are Natter Nights and the 15th is Night on the Air G0KRS. Kathy G1IGH on Bradford 496222.

Stourbridge & District ARS have Informals on August 8 and 22 in the Robin Woods Centre, Beauty Bank. C. Brunn G1WAI on Hagley 885602.

Colchester RAs have a Barbeque on Saturday 5 August. Room 15, Ground floor, "C" Block, Gilberd School, Brinkley Lane, Highwoods, 7.30pm. Mike Griggs G4YJN on Layer-de-la-Haye 348189.

Fylde ARS meet 2nd & 4th Thursdays at South Shore Tennis Club, Midgeland Lane. August 10 is Crime Prevention and the 24th is a d.f. Fox Hunt. F. Whitehead G4CSA on St. Annes 720867.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Ave, Cheam, with Natter Nights on 1st Mondays in the Downs Bar. On August 18 they have Three Mini Lectures. John Puttock G0BWV on 01-644 9945.

Trowbridge & District ARC have a Social on August 2 in the TA Club, Bythesea Rd, 8pm. Ian Carter G0GRI on Bratton 830383.

Mid-Warwickshire ARS meet 2nd & 4th Tuesdays, 8pm at 61 Emscote Rd, Warwick (St. Johns Ambulance HQ). August 8 is a Family Outing to Castle Inn, Edge Hill and the 22nd is a Natter Night. Mike Newell G1HGD on Kenilworth 513073.

Reading ARC meet 2nd & 4th Thursdays at Caversham Conservative Club, Mill Rd, Caversham. Details from Jim Carter G0LHZ at 6 Beechwood Close, Goring Heath, Reading, Berks RG8 7SG.

Sudbury & District RAs meet 1st Tuesdays at the Five Bells, Bures Rd, Great Cornard. Colin S. Muddimer on Sudbury 77004 (home) or Sudbury 75131 Ext. 131 (work).

Darenth Valley RS meet 2nd & 4th Wednesdays, 8pm at Crockenhill Village Hall, nr Swanley, Kent. August 9 is Video of recent club activity evening(s) G1XWV and the 23d is Radio Amateur Invalid & Blind Club, talk by G1NMX. Mrs Sheila Hillman G1NMX on Orpington 26951.

Worksop ARS run regular Tuesday Social and Technical meeting as well as RAE and Morse classes on Thursdays. Details from John Huggins G0DZX at 59-61 West St, Worksop, Notts S80 1JP.

Dragon ARC meet 1st & 3rd Mondays, 7.30pm at the Four Crosses, Menai Bridge. August 7 is Open Forum - a chance for members to air their views and the 21st is Visit by members to County Emergency Centre, Caernarfon. Tony Rees on Bethesda 600963.

TRADING POST

FOR SALE Signal R532 airband scanner, mint condition, 18 months old, little used £160. Paul Waterhouse, 23 Winsford Rd, Birley Carr, Sheffield S6 1LA. Tel: (0742) 311923.

FOR SALE Icom R-70 receiver with instruction manual plus f.m. board and Datong FL2 filter £340. N. Barratt, 94 Patrixbourne Avenue, Gillingham, Kent. Tel: (0634) 389228.

FOR SALE Yaesu FRG-7 s.s.b. communications receiver unmarked in mint condition and in makers carton, £120 plus manual circuit plan. J. Hughes, 11 Derby Rd, Cleveleys, Lancashire FY5 1DE. Tel: Cleveleys 869925.

FOR SALE FT-290R 144MHz transceiver including muTek front end, flexi-whip, NiCads, case, etc. Mint condition, original packing £260. 430MHz mobile collinear antenna £6. John Talbot. Tel: Coventry 465328.

FOR SALE Icom IC-R71E 100kHz-30MHz general coverage receiver, excellent condition with full service info, circuit diags, etc., £645, buyer collects. Tel: 061-445 5888 (Manchester).

FOR SALE Antenna tuner, Mizuho KX-2 Sky Coupler, £39. Variable speed cassette recorder Philips D6410, £35. Buyer collects. Tel: 061-445 5888 (Manchester).

WANTED JRC NRD-515 receiver, must be in mint condition with manual and unmodified, reasonable price considered. E. F. Chorley, 93 Berkeley Rd, London NW9 9DH. Tel: 01-204 7734.

FOR SALE Yaesu FRG-7700 general coverage receiver 150kHz-30MHz, plus Yaesu 7700T tuner, plus v.h.f. 7700V converter 118-160MHz. All in very good condition. Buyer collects, £325 o.n.o. E. Stevens, 283 Fawcett Rd, Southsea, Hants PO4 0LB.

WANTED information, operating or service manuals, complete or incomplete, Regency Polaris direction finding units. Would like to hear from anyone using Doppler d.f. at v.h.f./u.h.f.. Bob Sayers. Tel: (0527) 64885 evenings.

FOR SALE Pocom AFR-210 with code expansion modules, 1, 2, 3, 4 - Moore, t.d.m. sub channels, bit invertions, FEC, SA, ARQ, EM, etc. £400. Sony PRO-80 boxed, a few weeks old. £210 o.n.o. J. Wingrove, 114 Wakehurst Rd, SW11 6BT. Tel: 01-228 4835.

FOR SALE Drake R4245 g.c. RX mint £800. Drake R4C re-valved, BC xtals £250. Liniplex F2 OSC1 sync a.m. RX £800. Hammarlund HQ180 £50. Stuart Senior, 78 Palace Rd, London SW2 3JX. Tel: 01-674 6452.

FOR SALE NRD-525 communications receiver with v.h.f./u.h.f. converter, £1400. AOR AR-2002 communications receiver 25-550, 800-1300MHz, £400. Telereader model CWR-880 c.w./RTTY decoder, £120. All as new. Mr C. Fay, 12 Range Drive, Woodley, Stockport, Cheshire. Tel: 061-430 2907.

FOR SALE Yaesu FRG-9600 v.h.f./u.h.f. receiver with box and manual, £250. Also MM-2001 RTTY decoder, £120. Peter Chalkley. Tel: Luton (0582) 422056.

FOR SALE Kenwood R5000, including optional 6kHz, 1.8kHz and 500Hz filters. Mint condition. £675. Buyer collects. Mrs A. M. Guard. Tel: (0227) 375656, after 6.30pm (Herne Bay).

FOR SALE Philips D2999 receiver 150kHz-29.99MHz, plus f.m. band, reviewed in June 89 *SWM*, brand new, purchased 2/5/89, with manuals and a.t.u., £225, will despatch or deliver locally. V. G. Tracey. Tel: 061-494 9043.

FOR SALE Realistic PRO-57, 10 channel programmable scanner, 68-88MHz, 138-174MHz, 380-512MHz, hardly used, still boxed, £60. K. H. Wright. Tel: (0403) 66228 Horsham, Sussex, .

WANTED Icom R7000 plus discone, Aurex PCX88AD cassette deck, Philips N4520 reel-to-reel tape recorder. **For Sale** ERA Microreader Mkl, £89. Tel: (0903) 205531 Ext. 296 day or (0903) 42927 night. 7 Jersey Rd, Ferring, Sussex.

FOR SALE AR88D, rack mounted, excellent condition. Collins T-Cs receiver, mint. **Swap** for WS18, WS19, WS22, WS46, WS58, w.h.y?, with cash adjustment as required. J. E. Cookson. Tel: (0562) 823674 evenings (Kidderminster).

FOR SALE Trio/Kenwood R2000 receiver, excellent condition, complete with VC10 v.h.f. converter and Global AT1000 a.t.u., £500 o.n.o. Also BBC "B" micro with two 100K Pace disc drives, Epson RX80 printer and monochrome monitor, £250 with RX-4 RTTY software and adaptor. Chris O'Neill. Tel: 061-491 1520 after 7.30pm please (Cheadle).

Complete the form in July '88 issue of *Short Wave Magazine*, or write out your advertisement in BLOCK CAPITALS - up to a maximum of 30 words plus 12 words for your address - and send it, together with your payment of £2.30, to Trading Post, Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. Advertisements will be published in the earliest available issue and *SWM* reserves the right to exclude any advertisement not complying with the rules. You must send the corner flash from this page, or your subscription number as proof of purchase of the magazine.

FOR SALE Yaesu FRG-8800 receiver in excellent condition with full documentation. £385. Will share postage or buyer collects from Guildford. Would consider Sony 2001D plus cash in exchange. S. D. Guettier. Tel: Guildford (0483) 38285 evenings.

WANTED *Amateur Radio Callbook* (International listings), fairly recent but not necessarily current, cost plus p&p. A. C. Stapleton, 130 Sherwell Valley Rd, Torquay, Devon. Tel: (0803) 605045.

FOR SALE Amstrad 8256 computer, printer, mouse, joystick, interfaces, software includes Locoscript, utilities, "Desktop" (adapted for up-to-date short wave listener's program), "Atlast" database, "Cricket", "Harrier" blank disks, back-ups. Immaculate condition, sell £210. Mr R. Hall, 23 Whithouse Court, Ushaw Moor, Durham DH7 7NH. Tel: 091-373 5112.

FOR SALE Icom R7000, 25-2000MHz + mods, "N" plugs, 12 metres of 10mm coaxial cable with log periodic or AH discone £850. Bob RS90519, Witherage Wood Lodge, Knotty Green, Beaconsfield, Bucks. Tel: (0494) 812392.

WANTED Pye PF2 pocket phone, maintenance/service manual (or photocopy) required urgently by voluntary organisation (Revcom - Cheltenham team) using sets for charitable work. All costs paid. Arnold Hogg, "Y Berllan", Old Reddings Road, Cheltenham, Glos GL51 6SA. Tel: (0452) 712720.

FOR SALE Plessey PR1553 h.f. communications receiver, solid state, digital. £300 o.n.o. F. E. Upstone. Tel: (0684) 73366 after 2pm (Tewkesbury).

FOR SALE AOR AR-2002 scanner and Aircastle interface plus books *Scanners* and *Scanners 2*, £460 o.v.n.o. Taylor. Tel: 01-891 2820 (Twickenham) evenings.

FOR SALE PRO-31 scanning receiver, about one year old, £95. **Wanted** Trio or Kenwood VC10 v.h.f. converter, working order, offers around £80-£90. J. S. Wood, Sylvania Enzie, Buckie, Banffshire, Scotland AB5 2BN.

FOR SALE AR-900 hand-held scanner, excellent condition, C/W charger, v.h.f./u.h.f. aerials, boxed, £160. J. L. Tucker, 2 Ivydene Rd, Ivybridge, Devon PL21 9BH. Tel: Plymouth (0752) 892175.

Advertisements from traders, apparent traders or for equipment which it is illegal to possess, use or which cannot be licensed in the UK will not be accepted.

SWM AUGUST 1989 TP

When you are ready to graduate to real listening Look to Lowe

The NRD-525 from JRC

Those of you who have read about the NRD-525 will recall that I gave some background information about the JRC company. What I was trying to get across was the fact that a company with such a long history in the communications business can endow its products with a host of subtle details based on actual operating experience, JRC are in many ways similar to the Marconi Company (as it was), in that they can meet every possible need of their professional customers. Any owner of an NRD-525 will rejoice that a company such as JRC decided to bring their quality to the non-professional user.

But what of the NRD-525 itself? What will it do for you as a dedicated listener? In such a limited space as this page I cannot possibly cover all its outstanding features so I will draw some extracts from the Rainer Lichte review. Here's what he says about:-

Accuracy and stability.

"The tuning accuracy and the matching display are impressive indeed. Still the more impressive is this receiver's frequency stability. Drift is virtually non-existent, it was measured at less than 5Hz/hour."

And about dynamic range:-

"ICP 3rd order (3rd order intercept point) was measured at +17dBm at 7MHz and +14dBm at 25MHz. These are excellent values, and they are not the result of decreased sensitivity. The NRD-525 is amongst the most sensitive receivers I've measured so far. . . . Dynamic range was computed to 102dB, an equally outstanding value."

All very well you may say, but what does this technical jargon mean in real life? Let me quote Rainer Lichte again:—

"The signal quality under adverse conditions is remarkable, e.g. the 40 metre band here in Europe is fairly cluttered with high-power stations and most receivers just quit when you try to extract some intelligence from a weak radio amateur signal. The NRD-525 is unimpressed and functions in a truly professional manner."

In other words, there is virtually nothing you cannot resolve. If it cannot be received by the NRD-525, it cannot be received by anything. As a final quote from the review, let me give some conclusions:-

"This receiver is a joy to operate and a joy to listen to."

"The new NRD-525 very impressively manifests itself as the No. 1 receiver outside the commercial/military bracket."

"Performance-wise, the NRD-525 is way ahead of the competition because this receiver delivers outstanding results in all modes of operation."

What you will find about the NRD-525 is that with all its undoubted performance, it is so very easy to use and never thrusts itself at you like a knob bedecked military receiver. If you want to use it as a high quality broadcast receiver, then that is what it will be. As you discover more and more about the art of listening you find that the NRD-525 contains every operating feature and convenience that you might need, and there is almost nothing you cannot hear with it even when listening conditions are really difficult.

If you want to extend the use of the receiver, you will find a range of optional accessories to broaden the horizons, including a VHF/UHF converter which extends the already impressive 90kHz-34MHz range to include 34-60MHz, 114-174MHz, and 423-456MHz. (and the converter fits inside the receiver).

When you get deeper into the art, you may decide that specialised listening requires specialised receiver bandwidths, and a range of high performance filters is available for your choice.

One final comment from Rainer Lichte with which I totally agree is his remark that the internal speaker in the NRD-525 is really only suitable as a monitor, and does not do justice to the high quality available from the receiver. This being so, if voice communications are your forte I recommend the matching JRC loudspeaker the NVA-88. If however you really want to enjoy the audio from broadcast stations, we carried out a long series of tests and decided that the Wharfedale Diamond III loudspeaker produces the most excellent sound from this and many other receivers. Normally of course these loudspeakers are sold as pairs, for stereo listening, but we split the pairs and can sell you a single Diamond III to enhance your listening pleasure.

Truly happy listening. John Wilson

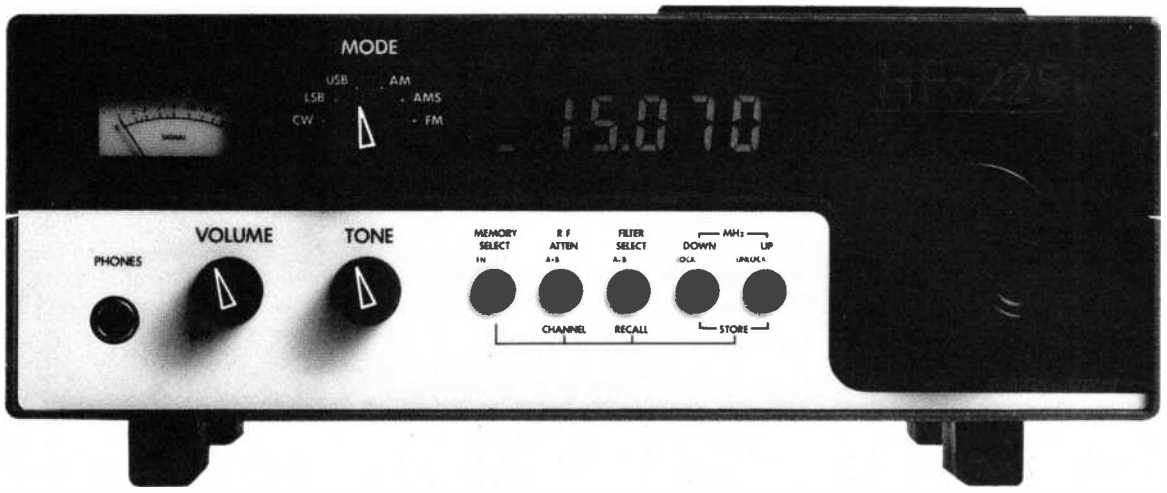
NRD-525 £1095 inc VAT

FREE

Send £1 to cover the postage and we will send you, by return of post, your FREE copy of "THE LISTENER'S GUIDE" (2nd edition), a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

LOWE ELECTRONICS LIMITED

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020 Telex 377482



The New HF-225 Receiver

I am particularly proud to announce that the new HF-225 receiver is now in production, and available from the better dealers on the short wave scene. This is the receiver designed to give you high performance under European band conditions, and dig out the weak signals under the welter of Megawatt broadcasters and jammers.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser, which gives a reciprocal mixing performance not far off that of "professional" receivers costing up to ten times the price, and that's not just advertising talk, it is really true. The synthesiser actually tunes in steps of 8Hz, which betters most other receivers and gives a smooth "VFO" feel when tuning. As one user has already commented "If you tuned the HF-225 with your eyes closed, you would believe you had a £5,000 receiver on the table".

The HF-225 has a range of low cost options which extend its appeal; such as a keypad for direct frequency entry, which simply plugs into a rear panel jack; an active whip aerial; a rechargeable battery pack for portable use; and an attractive carrying case which protects the receiver whilst allowing full operational use. The new D-225 detector option is really something special, because it gives true synchronous AM detection for dragging sensible programme quality out of a signal being affected by selective fading distortion. The same option also gives narrow band (communications) FM demodulation.

Every listener these days appreciates a receiver which offers facilities for memorising favourite or regularly used frequencies, and the HF-225 offers 30 memory channels for this purpose. Using the memories has been made particularly versatile, because the operator can review the contents of the memories whilst still listening to the frequency he is using, or alternatively in the "Channel" mode, can tune through the memory channels using the main tuning knob, listening to each frequency as it appears on the display. Just like having a bank of single channel receivers under your control. Terrific for checking HF airband channels for activity.

Unlike most HF receivers on the market, the HF-225 comes complete with all filters fitted for every mode:— 2.2kHz, 4kHz, 7kHz, and 10kHz. There is also a 200Hz audio filter for CW, and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch, but further selection can be made by the user from the front panel and the receiver remembers which filter was last used. True versatility and all built in at no extra cost. When selecting filters in use, the filter bandwidth is shown on the main display.

The display itself is a high contrast liquid crystal type, and shows frequency, filter bandwidth, detector lock (when D-225 is fitted), and whether the receiver is in memory mode. Automatic placing of the decimal point takes place as the receiver is tuned, so there can be no ambiguity in reading.

At the end of the day, what does the HF-225 offer you as a user? I can do no better than quote what was said by Rainer Lichte about the earlier HF-125:—"The HF-125 is a serious piece of equipment; don't be deceived by the unassuming front panel and the lack of spectacular features. The HF-125 will outperform most competitors. If you like an honest approach to receiver design, this is it. British understatement at its best".

The HF-225 is even better.

John Wilson

HF-225 £395

Shops in **GLASGOW** Telephone 041-945 2626, **DARLINGTON** Telephone 0325 486121, **CAMBRIDGE** Telephone 0223 311230, **BARRY** Telephone 0446 721304, **LONDON** Telephone 01-429 3256, **BOURNEMOUTH** Telephone 0202 577760
All branches are closed all day Monday.

AIRBAND

Godfrey Manning G4GLM

Godfrey takes a look at the letters you have sent him this month - plus some operational information. There are also a few cries for help; can you assist?

In Newbury, Berkshire, **Roger Ryton** would dearly like a Signal R535 - especially after a would-be vendor changed his mind about selling his second-hand set due to its apparent virtues! Roger sends some stories he read about flying in Africa. If true, they are amusing - or worrying, depending on how you look at it. For example, operations aren't always as smooth as might be expected by European standards, so one pilot was really pleased when he was able to announce to the passengers that they would be landing on time. But after a pause, he added: "Damn it. Forgot to land in Harare!" Of course, with delays to holiday destinations from the UK becoming so common, perhaps the problems of flying in remote spots don't seem so bad! On one Soviet flight the cabin crew offered the loan of computer games to while away the time. There was a stampede. Such luxury toys are almost unknown behind the iron curtain. I hope all the clock oscillators in the games didn't upset the aircraft's a.d.f. receivers!

Now on to a more serious note about passenger flights. **E. Dunlop** (Prestwick, Ayrshire) is professionally involved with airline security and points out that many airports now examine checked baggage (to be loaded in the freight hold) by X-rays. Any mysterious shadows cause the bag to be singled out and the owner must satisfy the authorities about its safety - all this can lead to delays. The advice is to place any strange equipment (including radio receivers) in hand baggage where it is easier for a check to be made. Battery operated equipment must be demonstrably working (so as to prove that the batteries are real) and it might be an idea to loosen the back of equipment and carry a suitable screwdriver with you so that the inspector can look inside.

I experienced a radio problem myself when flying in a Piper PA-28 Cherokee recently. Sitting up front with the pilot I wore a headset for intercom purposes. I also had the cabin loudspeaker switched on so that Chris (taking photos in the back) could hear the radio, there being no third headset socket. Unfortunately, although the intercom still worked and the headset microphones still functioned when transmitting on the radio, the earphones no longer picked up the receiver's output, making it hard to hear the controller. Has anyone else noticed this?

Frequency and Operational News

Starting with changes to runway headings, it would appear from Civil Aviation Authority *Aeronautical Information Circular* 64/1989 that Perth's original 04/22 runway has now been redesignated 03/21.

Some frequencies have come to the attention of **Terry Ford** (94 Everingham Road, Sheffield 5, South Yorkshire S5 7LG). He believes that 243.45MHz is exclusively used by the Red Arrows, 248.8MHz by the Sharks helicopter display flight and 255.1MHz by the Falcons parachute team. There is also a radio failure frequency used as a backup by all RAF aerodromes: 243.8MHz. Waddington's new ground frequency is 352.75MHz. Please note that I do not have any information outside of the public domain (more about this later). Anyone else with an interest in u.h.f. in Scotland or S.W. England is invited to correspond with Terry direct.

Regular **Geoffrey Powell** (Tamworth, Staffordshire) has entered in to correspondence with various foreign aeronautical organisations who have suggested some of their more common h.f. channels to him. Jan Smuts Airport (South Africa), for example, have available 5565, 8861, 13315, 17955 and 21926kHz. Tokyo Volmet is on 2863, 6679, 8828 and 13282kHz each of which runs 1.5kW.

Can You Help?

Terry likes the improved specification for the Tandy PRO-2005. At £329 it has 400 channels with 36 channel/second scan rate. Is there a reputable organisation that can modify Terry's PRO-2004 to the new standard - if indeed this conversion is possible? Details to this column for all to share, please.

An interesting piece of equipment has been acquired by **Laurie Carpenter G8ZZN** (The School House, Lewis Lane, Cirencester, Gloucestershire GL7 1EB). It is a British Communications Company BCC 81F50 dashmount transceiver, crystal controlled on six channels with a transistor receiver and valve transmitter power amplifier. Made in the late 1960s it uses the now redundant 50kHz channel spacing and, no, it doesn't scan! Now, BCC were taken over by Racal but Laurie is having problems getting details on the set. If you can help, especially if you can provide a workshop manual or circuit diagram, please contact Laurie direct.

At a recent aerojumble I was asked about a large valve, made by Ediswan, type V1505. Just looking at it I would guess it to be a fair-sized output tetrode, possibly good up to the h.f. bands. Any information would be gratefully received, such as pin connections, applications, specifications, etc. Send to me at the usual editorial address - if you require reimbursement for reasonable postage or copying expenses, please say so.

Steve Foster (Burton-on-Trent) would like to know the purpose of the radar head beside the B1159 road at Overstrand, Norfolk.

Information Sources

First, I must ask that all information sent for publication in this column is in the public domain. It is not the intention to transgress over sensitive issues in any way - I feel confident that so far I have successfully achieved this aim. However, if you are drawing attention to u.h.f. matters in particular then please from now on **quote your source.** Most u.h.f. information is available in the standard RAF Flight Information Publications which are on sale to the public. I'm sure that everybody will understand why it is necessary to be so careful in order to maintain the high standards that have so far been kept up.

Just available from the *Short Wave Magazine* Book Service is the latest edition of *Flight Routings* by T.T. Williams; £4.75 will have it winging its way to you by post. Alternatively, pick up a copy at the Woburn Mobile Rally this year; I am anticipating attending on the Short Wave *Magazine* stand. Form an orderly queue, please...

"A good source of information for Shanwick and h.f. goings-on is *High in the Sky*" in the opinion of **M. Jackson** (Invergordon, Scotland). Published by The Aviation Society, you could try calling the Manchester Airport Bookshop (061-499 0303) to order your copy.

Another book recommendation comes from **Ken Gardiner** (Doncaster) who borrowed *Ground Studies for Pilots - Vol. 1, Radio Aids* from his local library.

Shanwick Oceanic Control

Although living nearer to Kinloss and Lossiemouth, M. Jackson is also interested in the Shanwick Oceanic Control Centre. He hopes that the following will help Peter Finn (Milford Haven, Dyfed) who enquired about this in the June issue. The frequencies 123.95, 127.65 and 133.8MHz are mostly relayed from Davidstow Moor, Cornwall, and Dundonald Hill, Prestwick. On the west coast of Ireland are transmitters for an extended range 127.9MHz service.

N.A. Henderson (Mauchline, ☞18

QRP ON ICE

Vaughan Purvis GVPZ/LH5PA/LH5QA

During an expedition to discover and explore ice caves on the uninhabited island of Barentsøya near Spitsbergen in the polar sea, Arctic veteran Vaughan Purvis and his partner Rupert Hadow struggled to put up a mast every night to make contact with Flo Howell GM4DMA operating Ward Hunt Radio, 1500km away in Canada at the most northerly point of land on earth.

Digging out the wires and silicone rubber feeder cable half-buried by the latest blizzard, it was hard to believe that so little equipment could be the subject of so much paperwork. The Racal TRA921 Syncal was a lot more than just an early line of fully synthesised s.s.b. man-pack sets. According to the station documents it was "Arctic Sledge Tambourine Man GVPZ" with nearly 30 pages of official paper from the DTI to legitimise it. It was also "Aeronautical Mobile Station PZ" and Norwegian "Mobile Station LH5PA", since sovereignty in the Svalbard archipelago is vested in Norway. Our maritime mobile v.h.f. station, an Icom M5, was allocated a separate callsign for some mysterious reason, and designated LH5QA.

Since our sledge travelled over the sea, albeit frozen, the DTI had generously agreed it to be a maritime mobile station, and it was officially deemed a ship "so far as the Secretary of State is concerned". The personalised call GVPZ, incorporating my initials, was the idea of the Ships' Wireless Station Licensing Dept at Waterloo Bridge House, which I gratefully accepted. The Norwegian Televerket never fully grasped the Secretary of State's reasoning, finding it less easy to see how a 2.1m sledge pulled on skis could officially - or even unofficially - be called a ship. I browbeat them into submission with triplicate copies of the licences, authorities, dispensations and memos from Waterloo Bridge House. It was indeed a very fat A4 envelope stuffed with paper!

Improvisation

The expedition was put together on a shoe-string, which meant making most of the ancillary equipment myself. I couldn't afford Racal's own low temperature handset for the Syncal, which I had bought surplus with a crippled sideband filter, so I made my own using cold resistant silicone rubber wiring and stretching "Cling Film" over the mic insert to prevent my breath freezing up the works. Likewise, Racal's 18V NiCad battery pack for the Syncal cost about £400 - as much as I'd paid for the whole transceiver! So I decided to improvise.

I discovered that the contacts in the internal battery box were compatible with spring contacts on a 6V lantern battery, and that the battery housing would take exactly the three batteries needed to make up 18V. The problem was the zinc-carbon cells and alkaline-manganese on offer in lantern battery packs would fail below 0°C, and in any case wouldn't be able to come up with the goods currentwise on high power for more than about a minute.

I didn't know if there were NiCad units available in a lantern battery encapsulation, so I started to ring round the manufacturers. After half a dozen calls I found myself talking to the MD of NiTech who make the X-Cell, a NiCad lantern battery with an integral electronic charger. The fact that you can charge these off any voltage between 8V and 30V, either a.c. or d.c., without any further equipment, made them especially attractive for expedition use, and NiTech were kind enough to invite me to their factory with a car laid on at the station.

Keeping the NiTech X-Cells in reserve, I made a main power pack out of surplus 7Ah size "F" NiCads bought for £1 each; 16 of these monsters in series giving a nominal 19.2V at 7Ah should give me bags of room, I thought, even with the loss of battery performance I knew would take place at low temperatures. I bought a glass and resin car-body repair kit and slapped it all over the cells to consolidate them into a block and added butterfly nuts for securing the cables, arranging the 16 cells in two banks of eight. When I wanted to charge them from our 12W solar panel I would wire them in parallel, with diodes to prevent mutual discharge. For transmitter use they could then be connected in series by a jumper wire to provide, in practice, about 20V, to feed into the external power socket on the Syncal. Finally, I made up a further 2.5Ah-worth of 2V Cyclon lead-acid cells totalling 20V, and hoped they lived up to their reputation as good performers at -40°C.

Sledging camp with antenna on sea ice.

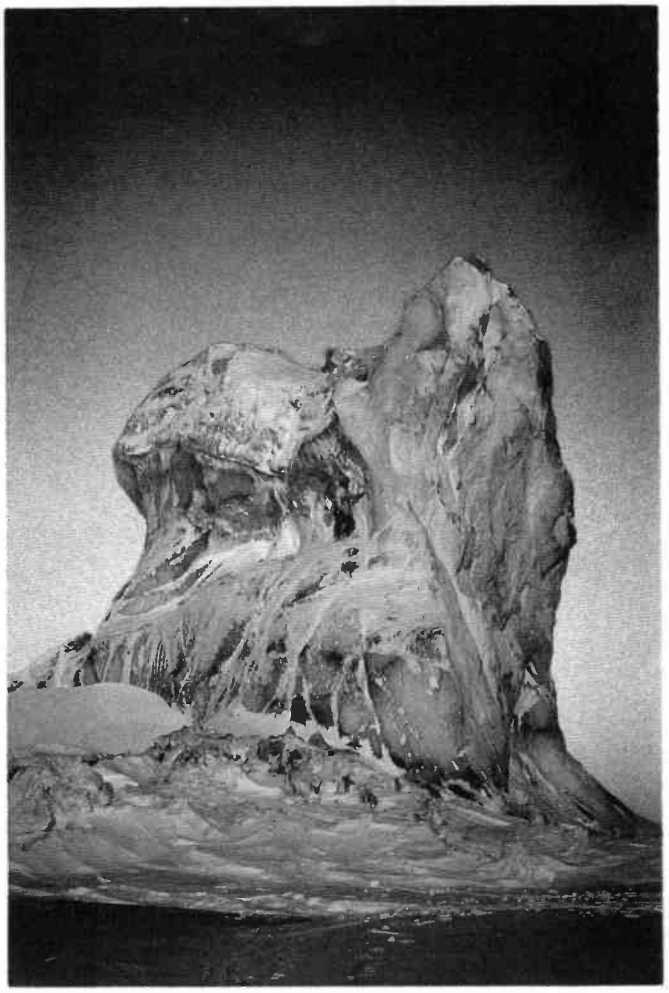
With 20V on the push-pull Fairchild U1460/3s, the Syncal gives a nominal 20W p.e.p. on high power and 5W on QRP, just enough to give you a little burn from the Morse key if you don't bother to earth it. According to the Racal handbook, the set will work down to -10°C, which I had hoped would be a conservative figure - often the way with military specs - enabling us to use it down to -20°C at a pinch. But no! Bang on -10°C the synthesiser would unlock in the 2MHz band. The problem got worse as temperatures fell, so that at about -30°C the lowest lockable frequency was 6MHz, and at -40°C it wouldn't lock anywhere within the set's 2-8MHz range. The whole transceiver would then join the batteries in Rupert's sleeping bag for four hours before the sked: condensation would stream off it into his bag while it "soaked up the celsius". If it had been especially cold during the day, even this wouldn't warm up the guts of the

QRP ON ICE

synthesiser enough to get a lock in the 2MHz band, and I would then have to hold the set over the primus stove for half an hour before attempting a QSO. The Syncal TRA921 has a plastics case, which is now warped and buckled like an old l.p. record left out in the sun.

The only bit of kit that gave no problem at all was a length of Raychem silicone rubber coaxial feeder that took the r.f. out to the antenna, though I could never get a BNC plug to stay on the end of it for very long due to the cold.

All this, added to the nightly problem of guying-up an ex-army 9m vertical, surmounted by a 5m whip, at the end of a hard day pulling the sledges, would have been a lot of trouble to go to to call somebody up - and even more trouble to contact no-one at all. During the first month of the expedition in March, the words "you are nil heard" became the station's catch phrase. Never had I heard the bands so dead.



Erecting the "Iceberg Special" antenna.

Total Silence

Skeds had been arranged with Portishead Radio GKA, Portishead Aeronautical Radio, Svalbard Radio LGS and Ward Hunt Island 2AZT, who was listening out for me on the 4.063MHz ship-to-ship frequency. 2AZT was being run by Flo Howell GM4DMA and his wife Morag GM1ILL to support Sir Ranulph Fiennes 1989 polar expedition with Dr Mike Stroud. No matter how long and hard I flattened the batteries, no matter how many uncomplaining hours Rupert warmed them up again with his feet in the sleeping bag, we "couldn't hear a sausage". (Rupert was responsible for battery warming because his bag was warmer and I was in charge...) We were so cut off on our way across the sea ice to Barents Island that we couldn't hear the propagational forecasts telling us that there was bad propagation about: a great bunch of angry-looking sun spots bashing the ionosphere with protons and wiping out all communications on the lower h.f. bands and marginalising communications higher up.

I'd never tuned across the h.f. bands and heard nothing at all in 20 years on h.f., so I began to suspect our equipment. Bigger and better antennas were tried out, including a full-wave dipole on 2.182MHz, using about 250m of hook-up wire, but all to no avail.

More height and a better earth seemed like the best prospect. A large iceberg frozen into the pack ice towered 20m above our tent, and 20 minutes of careful climbing with ropes and ice axes found me erecting the 5m whip on its summit. I threw the drum of hook-up wire we used to make antennas down to Rupert, who secured it at an angle to a ski, rammed into the snow by the tent. The "Iceberg Special" was a sort of sloping Marconi about a quarter of a wavelength long at 2.182MHz. I reckoned its radiation resistance would be pretty low, so that I would risk losing most of my r.f. in ground losses unless I could organise a pretty potent earth. The sea represents the nearest to a perfect groundplane that we can know in this earthly life - but how to get at it through the pack ice?

Dramatic Remedies

The snow over the ice was about 1.25m thick near the foot of the 'berg where the Marconi terminated, and we spent a good hour getting down to the hard, rough surface of the sea ice. Another hour with ice axes had no pratical effect on the ice, achieving only a miserable little depression half filled with snow that drifted in on the breeze almost as fast as we could dig it out.

I looked threateningly at the ice, "Right then, we'll blast a hole in it," I said, as we stood back from the hole to wipe the frost from our eyelashes. We carried a Mauser rifle and a Smith & Wesson 0.44 Magnum revolver for protection against polar bears and rabid foxes. Six bone-crunching blasts of the Magnum later, beautifully conducting sea water welled up in our hole. You could almost smell the mhos slopping about in it!

Ten metres of bare wire lowered down the hole, directly below the antenna lifted faint stations to loudspeaker volume from the handset. The "Magnum Earth" was with us!

Contact At Last

After warming up the set and batteries in Rupert's bag while I cooked our dinner, we decided to call our friendly local coast radio station on 2.182MHz just after the silence period when there ought to have been someone listening, even at midnight. Svalbard Radio was, and always remained, "nil heard" being just outside ground wave coverage about 190km to the south-west on the other side of Spitsbergen. We were just about to close down when a voice boomed in so loudly I nearly dropped the handset. It was GM4DMA operating as 2AZT on Ward Island 1500km away in Canada's North West Territories.

We went up to a working frequency of 2.246MHz and exchanged the latest news. Flo was running about 50W into a directional rhombic beam cut for a higher frequency but coming in loud and clear. However, our signal was poor.

"Your frequency varies, Vaughan. You've got some frequency pulling on u.s.b. Can you go QRP in case it's supply voltage regulation?" he asked me.

As we were using the Nitech X-Cells, which gave a combined total of only 15V, rather than the 18V needed to get full power, I supposed our QRO output can only have been about 15W p.e.p. And now Flo, 1500km away on another expedition, was asking me to go QRP. Bowing to Flo's experience as the most talented polar operator around, I flicked the switch to low power.

"That's much clearer," said 2AZT.

"How's my signal strength," I asked.

"I didn't really notice the difference," was the amazing reply.

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QRP ON ICE

I reckoned the output on low power couldn't have been more than 3.5W, so we were getting about 480km per watt, which seems a very creditable performance in the 2MHz band. I'd always thought of 2MHz as being very much an after-dark band for any kind of ionospheric propagation, but although it was midnight UTC at our QTH (about 78°30'N, 20°00'E) and late afternoon at 2AZT, there wasn't a scrap of darkness over the entire signal path, both stations basking in the midnight sun of the polar regions.

2AZT explained that inside the auroral belt around the poles, propagation on 2MHz is completely different to our experience of the same frequencies in England. While thankful for the effects of "Polar 'E'" on our otherwise diminutive little signal, I was sure that part of the reason for the success of our QSOs over the week that followed was due to the effectiveness of the Iceberg Specials and Magnum Earths, which we put up nightly at the nearest berg to our camp of the day. I reckoned that the good low angle radiation characteristics of the vertical were really proving themselves over the 1500km between the two stations, and vindicated my choice of the vertical for use in the expedition. (Having said that, I think very few people would be so lucky as to get such a low resistance as the Magnum Earth anywhere on terra-firma, and would be unable to get the kind of radiation efficiency that makes verticals pay off.)

A Bear Joins In

For six nights on the trot Flo's signal rolled into our little tent out on the ice on a rushing wave of QSB. We were just getting ready for another sked when a loud bang outside the tent told us that one of the bear alarms had gone off; this is a trip wire which fires a blank shotgun cartridge when a bear walks into it. I stuck my head out of the tent and saw, sure enough, a large she-bear with her head down the Magnum Earth hole as if looking for a seal. She looked up at us, and then started playfully yanking at the guy ropes of the vertical. Losing interest in the antenna, she started to take an interest in me and I let her come as close as possible, taking photographs all the time, till I saw her getting ready for the charge. She lowered her head, growled, and tensed up her body in order to launch herself at GVPZ. Dropping the camera in the snow, I unholstered my revolver and fired a warning shot above her head. She jumped sideways and ran off a few yards, hanging around the tent for a bit before sloping off. I could hear 2AZT calling us on 2.182MHz but couldn't answer while the bear was about. We got through the following night from Barents Island, still on QRP, and were able to pass messages to our loved ones in England.

Then the dreaded sun spots returned as the solar disc aligned them once more with our little sledge wireless station. The rolling QSB that had heralded the openings on 2MHz vanished overnight and we were left with a dead hiss, completely cut off until our return to civilisation in May. □

The polar bear among the antennas

Abbreviations

a.c.	alternating current
Ah	amp-hour
BNC	coaxial connector system
d.c.	direct current
DTI	Department of Trade & Industry
h.f.	high frequency
kHz	kilohertz
km	kilometre
l.p.	long-playing record
m	metre
mho	unit of conductance (siemens)
MHz	megahertz
NiCad	Nickle Cadmium *(battery)*
p.a.	power amplifier
p.e.p.	peak envelope power
QRO	high power
QRP	low power
QSB	fading
QSO	radio contact
QTH	station location
r.f.	radio frequency
s.s.b.	single sideband
u.s.b.	upper sideband
UTC	Universal Co-ordinated Time (=GMT)
V	volts
v.h.f.	very high frequency
W	watts
°C	degrees Centigrade

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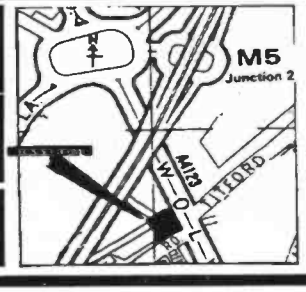

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SCANNING

Alan Gardener

New Tandy Scanner

In this month's column we take a look at a new receiver from Tandy, examine the fine print in a new DTI publication and continue our review of the radio spectrum.

For those of you awaiting further details of Tandy's new flagship scanner - look no further the PRO-2005 is here (or soon will be!).

The specification is very similar to that of the current model the PRO-2004 - but with one or two improvements. Gone is the tilted, membrane keypad, replaced by a much smaller rubber, push button panel. The casing has been restyled and now looks much more rectangular, measuring 203(w) x 76(h) x 203mm(d). Still a little on the large side for installation in the average European car, but a lot more compact than its predecessor.

Frequency coverage is in two continuous frequency bands 25-520MHz and 760-1300MHz, with selectable search increments of 5, 12.5 or 50kHz. The unit is capable of receiving a.m., n.b.f.m. and wideband f.m. all of which are manually selectable. The Scan/Search rate is about the same as that of an unmodified PRO-2004 at around 16 or 8 channels per second, depending on the rate selected. Other new features include 400 user programmable memory channels and improved receive sensitivity.

Judging by the relatively small differences in features and performance between the new scanner and the very popular PRO-2004 it would seem that Tandy find it difficult to improve on their existing design. Whether this will be sufficient to attract buyers away from some of the more exotic scanners being offered by other manufacturers only time will tell. However, the large number of Tandy stores in the UK offering the receiver to the public must mean that it is likely to be very popular.

Even now I expect someone somewhere is thinking of a modification that will further enhance it's performance - so why not share it with the rest of us? In the meantime keep an eye on *SWM* for a more detailed review of the scanner.

Future Trends

An interesting booklet has arrived on my desk entitled *Report of the Civil Spectrum Review Committee. Stage 1: 470-3400MHz.* With a title like that who else could have produced it other than a government body - in this case the Department of Trade and Industry Radiocommunications Division. Having said that, it is vastly more readable than previous offerings from the same department. Even a small amount of humour is detectable in some sections - perhaps the author has been taking notes from this column!

The report describes in detail the many different users of this chunk of the spectrum and at the back of the publication there are a number of charts showing the way each frequency band has been allocated.

As the title suggests the main body of the report deals with the various uses of the radio frequency spectrum between 470 and 3400MHz. This reaches well beyond the range of most current scanning receivers, but a lot can still be learnt about future trends in communications from the points raised in the document.

One of the main recommendations is that thought should be given to the creation of a 200MHz wide band somewhere between 1.7-2.3GHz for development of "Personal Communication" systems. These may take many different forms but one example could be the development of an enhanced cellular telephone system. By planning ahead it should be possible to use the same frequency allocations and signalling protocols throughout Europe, perhaps eventually setting a world standard. The choice of frequency has several advantages, one of which is that the propagation characteristics are such that signals only tend to travel over line of sight distances. This is very important in areas such as cities where frequencies have to be re-used many times, without causing interference between users. In addition it would allow for planned expansion - starting perhaps with a terrestrially based network and then, as new techniques and equipment are developed, they can be slotted into the existing framework, leading eventually to the goal of a pocket communicator utilising direct satellite links to provide global coverage and, perhaps by this stage beyond - beam me up Scotty!

The report also suggests that the emergency services should be encouraged to share communications resources. At present the Police, Fire and Ambulance services use separate communication systems. This often results in the duplication of radio sites and equipment, a situation that could be improved by the introduction of a single network for use by all three services. This has already happened in a few major cities in the US where interlinked or "Trunked" base stations provide communications for several separate agencies. This allows each service to communicate privately with its own staff - but in the case of a major incident can permit direct inter-servicecommunication without messages having to be passed between control operators. Additionally, a trunked type of system would permit a greater number of messages to be passed over a given number of radio channels. This is because users are allocated a communications channel automatically from a "pool" of frequencies, rather than just having one or two dedicated to each service. When one channel is busy, another one may be quiet. In a conventional system where

each user only has one channel available, when that channel is in use, no other message can be passed.

However, in a "Trunked" system, for example, if all of the channels normally used by the Fire Service were occupied - then any additional message being passed by the Fire Service would be re-routed automatically via one of the other spare channels, perhaps one that would normally only be used by the Police. In this way much more efficient use is made of the system and urgent messages can be passed much faster.

Another point raised is that it may be considered advantageous to mix emergency service communications with other systems. This would permit a cost saving to be made by allowing commercial grade equipment to be purchased "off the shelf" as opposed to the current practice of specifying especially produced items. In addition it would provide a greater degree of security against casual listening.

Altogether a most interesting publication - why not send for a free copy which is available from the Information & Library Service, Radiocommunications Division, Room 605, Waterloo Bridge House, Waterloo Bridge Road, London SE1 8UA.

What Can I Hear? (Part 6)

In this month's look at the radio spectrum we start at 156MHz and the first portion of the v.h.f. marine band. Activity on these frequencies has increased dramatically over the past few years as more and more small craft take to the water, particularly at the week-end. A couple of decades ago most radio communication within coastal waters was carried out on the short wave bands around 1.8-3.0MHz. At that time most of the traffic was of a commercial nature with various names being given to the communications by amateur radio operators who shared the 1.8MHz or "Top Band" with the "Fish Phones" operating in the "Trawler Band". As v.h.f. equipment improved and equipment prices fell many new operators discovered the joys of v.h.f. operation with clearer sounding signals and compact antenna systems. Operating a v.h.f. marine tranceiver was much less involved than its short wave counterpart and so quickly gained popularity with owners of pleasure craft. Today a much smaller percentage of the radio traffic is of a commercial nature but many large marine companies still have private channels allocated to them in the band.

Frequency Allocations 156-165.050MHz

Frequency (MHz)	Service	
156.000		160.600
	Marine - mixture of both single and dual frequency working. Paired with shore stations on	
157.450		162.050
	Marine Message Handling. Paired with	
158.400		163.000
	Marine - mixture of both single and dual frequency working. Paired with shore stations on	
158.525		163.025
	BT System 4 Radiophone, Mobile Transmit. Paired with	
159.925		164.425
	Private Message Handling, Mobile Transmit. Paired with	
		165.050
160.600		
		156.000
	Marine Shore Base transmit. Paired with	
161.0000		
	Paging systems low power reply	
161.1125		
	Marine Shore Base transmit. Paired with	
162.050		157.450
	Marine Message Handling, Base Transmit. Paired with	
163.025		158.525
	BT System 4 Radiophone, Base Transmit. Paired with	
164.425		159.925
	Private Message Handling, Base Transmit. Paired with	
165.050		160.550

When the marine band was first planned it utilised a channel spacing of 50kHz, but as the usage increased this was reduced to 25kHz, with the new channels slotted in between the old ones. This is why the channel numbering scheme seems a little unusual at first glance.

The channels are used for a variety of different purposes and in order to give some sort of order to the band many of them are reserved for specific communications. These can range from basic ship-to-ship messages, ship-to-shore navigational information or telephone traffic. Much of the communication is on the same frequency with both ship and shore station using simplex or single frequency working. However, the latter two types of communication generally use duplex operation with ships transmitting in the 156-158MHz segment of the band, and the shore stations replying 4.6MHz higher in frequency at 160-162MHz. This arrangement permits normal telephone type conversations to be held without having to release the transmit button to hear a reply. I don't intend to list all of the marine channels here, as there are plenty of publications giving the current allocations, but here are a few - 156.0MHz is used exclusively by the coastguard and rescue services, 156.8MHz is used as a general calling channel and 156.85MHz is for use by yachts, for those who wish to communicate with birthing sites (marinas). Additionally, 161.425MHz has just been allocated for this purpose.

Personally I like to try and get hold of the previous years copy of either *Reed's* or *The Silk Cut Nautical Almanac*, as these are usually sold at a fraction of their original price in bargain book shops. As well as giving lots of information about radio communications and navigational aids they also include detailed maps of Britain's coastline and ports, the ones in the *Silk Cut Almanac* being particularly clear. Additionally, emergency communications and procedures are also described, all very useful if you want to follow the action. Failing that you could try your hand at some of the more exotic knots described within the pages.

Outside of costal areas some of the channels are allocated to other services but this is generally done in a very controlled manner in order to prevent serious interference to the marine service. An example of this is the use of 161.0-161.1125MHz for low power transmitters built into paging receivers as a means of replying to a call. These only transmit with a power level of a few milliwatts and so are only audible over a short range, within a factory or hospital, for example.

SCANNING

Also lying in this part of the spectrum is the predecessor to the cellular telephone network. This is known as BT System 4 and is based on a number of paired, duplex channels. The mobile station transmitting in the region of 158-159MHz and the base stations 4.5MHz higher in frequency at 163-164MHz. Because of the choice of frequency and limited number of channels available the system was severely limited in the number of users it could accommodate at any one time. This was a major problem in large cities and limited the growth of the system. With the introduction of cellular telephones, many of the original System 4 users have changed to the new system, although in rural areas such as Mid-Wales and parts of Scotland, System 4 is still well used as it offers much greater coverage than that of the current cellular network.

In addition to BT, a few other companies were permitted to offer a limited Private Message Handling service with interconnection to the telephone network, but under operator control. These operate with the same transmit/receive frequency split as the BT service but have the mobiles transmitting at around 160MHz and the base stations at 164MHz.

Regular reader, Alister Matthews, demonstrating how to remain inconspicuous!

Although you may have thought that this sort of service had been superseded by the cellular telephone it still fulfils a useful role for people such as doctors who may spend a large proportion of their time away from the phone but require vital messages to be passed immediately.

More next time when we look at the v.h.f. Private Mobile Radio "HIGH" Band.

Letters

As I have said before, one of the most enjoyable parts about writing this column is receiving all of your letters. I thought I would take just a few lines to thank all of you who have written with your comments, questions and ideas relating to the subject of scanning. I do try and acknowledge all of your letters either in the column or by letter if you have enclosed an s.a.e. However, this can take some time as it has to be slotted in with 1001 other domestic and work commitments so please bear with me! As usual the address to send your letters to is; PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month - good listening.

Abbreviations	
a.m.	amplitude modulation
f.m.	frequency modulation
GHz	gigahertz
kHz	kilohertz
MHz	megahertz
mm	millimetre
n.b.f.m.	narrow band frequency modulation
s.a.e.	stamped addressed envelope
v.h.f.	very high frequency

AIRBAND

Abbreviations	
a.d.f.	airborne direction finder
Ah	ampere-hour
h.f.	high frequency
kHz	kilohertz
km	kilometre
kW	kilowatt
MHz	megahertz
u.h.f.	ultra high frequency
UTC	Co-ordinated Universal Time
V	volts

10☞

Ayrshire) is an air traffic control assistant at Shanwick and tells us exactly what each frequency is used for. frequency 133.8MHz (from Dundonald Hill and Winston Hill, near Cheltenham, in this case) broadcasts the latitude/longitude waypoints of the day's organised track system; operational 1000-1900UTC. Clearance delivery is on 123.95MHz for aircraft registered west of 030°W and 127.65MHz for others. As an overflow frequency, 135.525MHz is available 1100-1600UTC for British Airways and Lufthansa aircraft. Before joining the North Atlantic tracks, aircraft call delivery for confirmation of clearance of their flight plan.

Just 65km from Waterford Airport, **John Murphy** (Wexford, Ireland) is experiencing plenty of summer Ryanair traffic. John notices that Gander and Shanwick share h.f. allocations and has correctly deduced that the pilot might hear both at once. Indeed at the mid-Atlantic handover point (030°W) the pilot needn't even change frequency. The address of the Scottish and Oceanic Air Traffic Control Centres is Atlantic House, Sherwood Road, Prestwick, Ayrshire KA9 2NR.

Follow-Ups

Previous doubts about the West Malling Air Show have been dispelled by **Dave Lawrence G6HXR** (Snodland, Kent); it's on August 28 and pre-show flight arrivals will be using the airfield frequency of 130.425MHz. Dave's quick route: leave M20 J4, head south, cross A20, join new W. Malling bypass.

Recently this column has carried lots of advice on the Signal R535 after a reader said he was experiencing problems. Steve points out that the backlight can be switched off at the rear of his set. As for battery life, at least five hours is expected per charge; and it's easy to make a spare battery pack using the sort of NiCads that terminate in a solder tag. I must point out that NiCads misbehave unless charged carefully; they should certainly never be trickle charged continuously. For a perceptive account of this problem let me refer you to *Radio Communication* June '89, page 34: "NiCad Memory - Fact or Fiction?" which is part of the respected "Technical Topics" column by **Pat Hawker G3VA**.

On the same subject, **F. Bates** (Leeds) uses a 1.9Ah 12V sealed lead-acid battery. The helical antenna can be lead up the side of the receiver by using a pair of right-angle connectors, and the whole lot then slips neatly into a camera bag. I agree with the comments that the speaker is less important than the earpiece - manufacturers take note! When out and about with any radio, I hope all readers cut down on "noise pollution" by using an earpiece, but the ones supplied by the manufacturers are such poor quality.

As we "call finals" for another month I hope you've found something to think about in this column. I certainly learn a lot from reading your letters - keep them coming! □

LINIPLEX F2 RECEIVER

Peter Shore

If you are a professional broadcaster with a need to re-broadcast signals from h.f. transmissions, or simply an s.w.l. who requires high quality reception, the British-manufactured Liniplex F2 receiver with its associated OSC-1 synthesiser could be just what you require.

At first glance the Liniplex F2 receiver looks somewhat unimpressive, for it has but few of the multiplicity of knobs, buttons and switches which are usually found on semi-professional receivers of Japanese manufacture. It is contained in a pastel blue and silver cabinet, with an uncomplicated front panel from where all the functions are controlled. The synthesiser unit, which sits atop the h.f. receiver, is in a similar cabinet but with even fewer controls. Together, however, this team presents a formidable face to the outside world, with an ease of operation seen only rarely in communications equipment.

The set covers 2 to 22MHz in 5kHz steps, although it can receive signals of 2.5kHz, and with crystals on the eight fixed frequency channels the receiver frequency range is 150kHz to 26.1MHz.

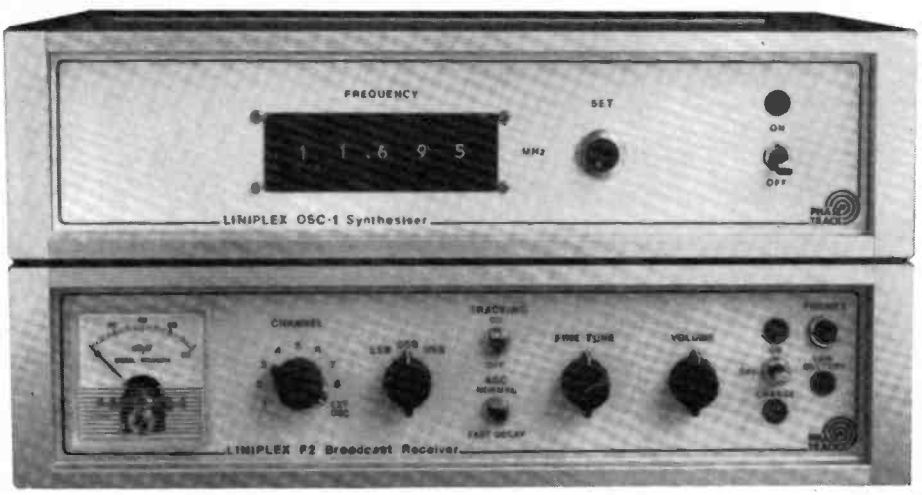
Crystals...? Yes, that's right - for essentially the Liniplex F2 is a crystal-controlled receiver, designed primarily for listening on fixed frequencies and aimed at listeners to, and re-broadcasters of, the BBC World Service. Indeed the F2, and its predecessor the F1, is in use at many radio stations throughout the world which carry the news from London, including the BFBS station in Port Stanley and several stations in Africa.

Automatic Synchronisation

A 9-position knob on the front panel provides the choice of eight pre-set crystal-controlled frequencies, whilst the ninth position allows control of the receiver by an external synthesiser which we shall look at later. Unlike most conventional radios, the F2 needs to synchronise itself precisely to the received signal. A local carrier frequency is generated inside the receiver which is then synchronised to the carrier of the incoming signal. This local carrier is then applied to an electronic circuit which multiplies it with the incoming composite signal enabling the sidebands, carrying the audio of the signal, to be translated back to the audio message which was originally input to the transmitter. This is carried out by a UK-patented "tracking phase-locked demodulator". This device is capable of following or tracking small variations in frequency caused by receiver drift or the Doppler effects in transmissions, or simply a slightly drifting transmitter (have you tried listening to RAE Buenos Aires on sideband and had to adjust your receiver constantly?).

Switching on the receiver or selecting a crystal channel initiates the automatic synchronisation process, which is completed within a second or so - although if the signal is weak or not there at all the receiver will stay silent, coming on again once a strong signal is received. If a transmission ceases, the set will fall silent after about 30 seconds and wait for the next transmission on that channel. Automatic synchronisation will happen almost instantly on reception of a good signal, so even if a transmitter has had a brief breakdown nothing will be lost when it comes back on the air.

The tracking system and its associated audio mute can be disabled through a switch on the front panel, reverting the set to conventional operation. The fine-tune control to the right of the tracking control can be left at the middle position and need not be altered when tracking is switched in. Indeed, if an operator attempts to create a frequency error by turning the fine-tune control, there will be no perceptible effect as the receiver will automatically correct any change in the transmitted frequency.



The bandwidth for a.m. reception is 3.4kHz, which is suitable for good voice audio intelligibility, and the set is designed to receive the double sideband a.m. signal which is 6.8kHz wide.

Signals may be received in double-sideband mode, or in upper or lower sideband modes. In d.s.b. mode, allowing both sidebands to contribute to the audio signal some diversity action permits inprovement to reception when one or both sidebands is impaired, perhaps through interference. When an adjacent channel sideband overlaps, the sound of the unwanted sideband is less disturbing than on a conventional receiver as it is completely unintelligible.

Circuitry

Technically speaking, the F2 is a double-superheterodyne with three translation stages. A high first i.f. of 35.4MHz allows the first image frequencies to be easily rejected with a low-pass filter at the receiver input, whilst the first translation stage uses a Schottky diode double-balanced mixer followed by a 10kHz bandwidth crystal filter to give extremely low intermodulation and cross-modulation effects. The majority of receiver gain is from the second i.f. where a crystal filter allows direct translation to 455kHz with good image rejection at the second filter. Single sideband uses a mixer system in the translation of signal to audio when two mixers are used, with an audio phase shifting device built specifically for the F2 in hybrid integrated circuit form. An active low-pass filter removes interfering noises as much as possible by shaping the audio response whilst maintaining sufficient bandwidth for good audio intelligibility. Quartz crystal oscillators are used to provide high stability.

A signal strength meter is provided on the front panel and provision is made for the connection of an external recorder. The meter is driven by a log amplifier to which a measure of the collector current of an i.f. amplifier in the a.g.c. loop is input. Measurement is of envelope voltage and not simply the carrier, with 100 per cent amplitude modulation resulting in a signal strength reading 6dB higher than with an unmodulated carrier.

Two a.g.c. positions are provided:

LINIPLEX F2 RECEIVER

NORMAL is fast attack with slow decay, and FAST DECAY is suitable during thunderstorms and so forth.

For antenna connection, two coaxial inputs are available to give a choice of balanced screened coaxial or unbalanced coaxial cable runs to the antenna. A dipole antenna 4m long is provided with the receiver, the ends requiring a piece of metal foil of about 0.3m² to be connected, producing a broadband antenna. A loop antenna is also provided for m.f. and l.f. reception and for signals up to about 7MHz; alternatively, a wire antenna 10m long can be used effectively with the F2, when an earth is required.

The F2 is powered by seven built-in rechargeable NiCad cells which, when fully charged, offer about 8 hours of operation, a red light glowing on the front panel when battery power becomes low; a battery charger is provided. Mains operation is also possible using the power adaptor, and in the event of a mains failure the internal batteries will take over.

SPECIFICATIONS:

Sensitivity:	<1.5µV (into 50Ω) for >10dB (S + N)/N [s.s.b.]
Intermodulation:	2nd order intercept >43dBm 3rd order intercept >13dBm
Spurious responses:	<-60dB
Sideband discrimination:	>35dB, 300-3400Hz
Ultimate S/N:	>53dB
Audio outputs:	500mW into external 6Ω speaker at 1% distortion; 200mW, source impedance 10kΩ, to 5- pin180° DIN connector; 3.5mm mono headphone socket, source impedance 50Ω, 1V r.m.s.
Antenna input:	50/200Ω, switchable, balanced, surge protected with ceramic gas tube
External oscillator input:	10dBm, 50Ω, mini BNC
Dimensions:	72 x 288 x 280mm
Weight:	2.4kg with batteries

OSC-1 Synthesiser

Clearly, with only eight pre-set frequencies the F2 is limited for those wishing to listen to many different stations, and it is for this reason that the Liniplex OSC-1 synthesiser has been brought on to the market.

This is designed to have very low sideband phase noise, so that demodulated noise from this source does not affect reception quality - unlike some synthesised receivers. The synthesiser is operated by a bank of five digital thumbwheel switches, controlling the frequency in megahertz in 5kHz steps.

Tuning is achieved by setting the F2 to the EXT OSC position on the channel selector and then turning the thumbwheel switches until the desired frequency has been found, e.g. 13.730MHz. The SET button is then pressed and the receiver is instantly moved to the frequency. The synthesiser processor calculates the serial code and operates the components, then ceases work - thereby eliminating any further digital activity, which is often the source of r.f. interference with some sets. The tracking system may be used with the synthesiser, but manual operation is also possible, the choice depending on the operator's preference.

Thumbwheel operation is somewhat laborious and does not permit rapid bandscans to be made; however, in employing this technique performance quality has been maintained without the increase in cost necessary for keypad control. In practice, for an s.w.l., this method of tuning is reasonably satisfactory and increases the usefulness of the F2 receiver immeasurably.

Performance

The quality of reception from the F2 receiver is superb and far exceeds the performance of semi-professional receivers currently on the market. Sensitivity is excellent and selectivity is of a similar high standard, with sideband operation providing clear and high quality audio on broadcast signals. Even using an unmatched, short, outside wire antenna very good results are possible, and during tests, weak signals from the Pacific region were heard with good quality, proving the sensitivity of the set. Audio quality, whether through the extremely impressive optional Liniplex loudspeaker or headphones, is excellent and makes listening to the noisy h.f. bands more pleasurable.

It is also possible to receive amateur transmissions, although to do so requires somewhat complex operation, necessitating a mixture of thumbwheel control and fine tuning, but is nonetheless satisfactory.

The Liniplex F2 is certainly not the least expensive piece of short wave equipment on the market, but it is one of the most effective, being carefully constructed to an exacting standard. The manufacturer, Phase Track Ltd, is a small company who prove what can be achieved in receiver design today. The Liniplex F2 receiver, less crystals, costs £855.60, with the OSC-1 synthesiser a further £755.55. The matching loudspeaker is £46.00. Crystals, made to order cost £10.35 solder sealed and £13.80 welded package.

Our thanks go to **Phase Track Ltd, 16 Britten Road, Robert Cort Industrial Estate, Reading RG2 0AU. Tel: (0734) 752666** for the loan of their equipment.

Abbreviations

a.g.c.	automatic gain control	mm	millimetres
a.m.	amplitude modulation	m.f.	medium frequency
BBC	British Broadcasting Corporation	MHz	megahertz
BNC	coaxial connector system	mV	millivolt
dB	decibel	m.w.	medium wave
dBm	decibel referred to 1 milliwatt	r.f.	radio frequency
d.s.b.	double sideband	r.m.s.	root mean square
h.f.	high frequency	(S + N)N	ratio of signal + noise to noise
Hz	hertz	S/N	ratio of signal to noise
i.f.	intermediate frequency	s.s.b.	single sideband
kg	kilogram	s.w.l.	short wave listener
kHz	kilohertz	V	volt
l.f.	low frequency	µV	microvolt
m	metre	Ω	ohm

THE STORY OF JOAN-ELEANOR

Chas E. Miller

How highly directional, low power transmitters, came to the aid of hard-pressed agents deep behind enemy lines during the last war is recounted by well-known author, Chas E. Miller.

During the second world war, secret agents were working deep inside Nazi-occupied territories, seeking out information of vital importance to the Allies. Getting this back to Britain was both difficult and dangerous. Speed being of the essence, radio was the first choice for communication, but the Nazi counter-espionage service had at its disposal the most sophisticated listening and tracking devices then available. Conventional short wave transmissions could never be safe from detection, and it was to overcome this problem that Joan-Eleanor was born - to two fathers.

Until quite late in the war the standard radio equipment for secret agents was known as the "suitcase model" (for obvious reasons), which worked in c.w. mode on ordinary short waves. The sets could be used with a fair chance of non-detection in, say, France, where they could be shifted rapidly from one "safe" house to another before Nazi tracking equipment could locate them, but even so danger was never far away.

For agents operating inside Germany the peril was much worse, as safe houses were few and far between: operating from one place for any length of time was almost certain to attract the tracking vans, which could detect an illicit transmitter from as much as 20 miles away and then pin-point its location to within a few yards. By 1944 the problem had become acute, but its solution already had been developing in the mind of one man for some years.

In peacetime, Stephen Simpson, had been one of the Radio Corporation of America's team of scientists, with a special interest in transmitter design. One of the projects on which he had collaborated was the broadcasting of Big Ben at Christmastide to New York listeners over station WJC via a short wave link. When war came Simpson became a Lieutenant Commander working for the American Co-ordinator of Information (COI), later renamed the Office of Strategic Services (OSS). His brief was to establish a communications system that would enable OSS to contact its agents throughout the world. In September 1944, Simpson was in London discussing the detection problem with other officers of OSS. From what he had been envisaging since his early days at the department, he told his companions that, given suitable men and aircraft, he was confident he could furnish a fool-proof communications system within months.

Aircraft were included in the requirement because Simpson planned on using high-frequency, narrow beam transmissions that could be aimed upwards to aircraft circling the area in which an agent operated.[1] The way in which he presented his idea was persuasive enough for him to receive an official go-ahead within 24 hours. His first action was to call on the services of another RCA scientist, DeWitt R. Goddard, at that time working in the Company's research laboratories at Riverhead, Long Island. Conferences via the transatlantic phone, and fleeting visits to New York by Simpson, produced some experimental radio equipment which Goddard - by that time himself inducted into the US Navy with a commission - brought over to Britain.

Tiny Transceiver

The Simpson-Goddard equipment worked on v.h.f. and consisted of a tiny transceiver for use by agents and a fairly large airborne unit. The ground set was astonishingly small for its period, being only 165 x 57 x 38mm; it weighed about 340g and was battery powered ("layer" types had come into use by that time, dramatically reducing the size of h.t. batteries). Although its transmitting power was low, the use of an upwardly directional antenna meant that the range need be no more than a few miles. The airborne set was less restricted in size, and in fact weighed some 18kg - about half as much again as an R-1155. To prevent errors being made in relaying messages from the agents to their home bases, the aircraft would also carry a wire recorder on which all conversations with the ground could be logged. As with almost all military equipment, a code name had to be allocated to the Simpson-Goddard gear, and Simpson came up with two girls' names. One was that of a major (Joan) in the US Womens' Army Corps, of whom Simpson thought a lot, the other (Eleanor) that of Goddard's wife. "Joan" was the ground set and "Eleanor" the airborne one.

Enter The Mosquito

The original intention had been to fit Eleanor into a B-17 "Flying Fortress" bomber, but around this time the Germans had developed a highly accurate, radar-directed, anti-aircraft gun which would have made short work of the relatively slow B-17. In the circumstances the US Air Force declined, reasonably enough, to expose its crews to what was considered the suicidal risk of "stooging around" whilst trying to contact the ground. Simpson, not being a man to give up easily, looked around for a smaller, faster aircraft to which Eleanor could be adapted. He found an ideal candidate.

It happened that the US Air Force had just one squadron of de Havilland Mosquitoes, the British, "wooden wonder" plane which, even as a bomber, was able to fly without defensive armament because its speed alone was sufficient protection against enemy fighters. Many different variants of the original design were built, making it probably the most versatile aircraft of the period; when fitted with two Rolls-Royce Merlin 72 engines it had a speed of 415 m.p.h., a ceiling of 40 000ft and a range on photo-reconnaisance missions in excess of 2000 miles. The Mosquito was thus perfectly suited to carrying Eleanor once "she" had been slimmed down a little to fit the much smaller fuselage.

Worse For Wear

It is said (with what degree of truth the reader may speculate on) that the RAF was so reluctant to pass on Mosquitoes to the US Air Force that only those in worse-for-wear condition were handed over. Neither was the "Mossie" an easy aircraft to handle for the newer generation of American pilots, particularly on landing: both its propellers rotated in the same sense thereby producing "drift" - something rarely found on US aircraft. In the event, members of the Eagle Squadron - American pilots who had volunteered for service in the RAF at the beginning of the war and had subsequently gained experience on Mosquitoes - were seconded to Watton, Norfolk, to carry out tests with Joan-Eleanor.

Although the Mosquito was famed for its lightness, Simpson wanted to get rid of anything that might be considered surplus weight. It is said that he even dispensed with their i.f.f. gear, at the risk of being attacked by their own side! It is also reported that the aircraft were in such bad shape that Simpson - himself an engineer - and a team of mechanics, had to work long and hard to get them into flying shape. How successful they were may be judged by the fact that the very first dropping of a Joan-equipped agent (code-named "Bobbie") into occupied Holland took place as early as 10 November 1944.

The First Contact

The first two attempts to contact Bobbie via Joan-Eleanor were unsuccessful. On

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(29-54, 118-174, 406-512 MHz)
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INTRODUCTION TO DX-TV

Keith Hamer & Garry Smith

Part 20

The final part of this series examines the changes in television that have occurred over the years and takes a look at the various TV systems which have come and gone.

In the near future, high-definition television will be introduced with the number of scanning lines in excess of 1000, yet 405 lines was once regarded as a high-definition.

Uniformity

Today, transmission standards are considerably more uniform than they were, say, 20 years ago. However, with the introduction of satellite standards and the proposed high-definition systems somewhere in the pipeline, we dread to think what will happen over the next few years. For terrestrial broadcasting there are now only two line standards in use world-wide: 525-lines and 625-lines. Until as recently as 1982, two other line standards existed within Europe. No-one can fail to remember the 405-line system in the United Kingdom which was finally laid to rest in January 1985. Perhaps some of our younger readers have never had the pleasure of staring at the rather coarse line structure of a 405-line television picture displayed on a 24in receiver, but they will be aware that such a system existed. Neither do we expect that anyone involved in the TV servicing trade will ever forget the 405-line standard, considering some of the dual-standard receiver problems they had to contend with, such as dodgy system switch contacts, etc.

But the system lives on. There is a 405-Line Appreciation Society in the UK which begs for material recorded on the 405-line standard during its final days. At the time of preparing this article a 405-line newsletter has hit the scene with all the 405-line memorabilia from v.h.f. days gone by. Only a stone's throw away, the French 819-line system was abandoned a couple of years before ours; could there be an 819-Line Appreciation Society on the other side of the English Channel?

Early Days

In the UK during the early Thirties, experiments in television took place using the Baird mechanical disc system with sound and vision transmission frequencies within the medium wave band. The system was limited to only 30 scanning lines repeated 12.5 times per second. The resulting low definition meant that only close-up shots and high-contrast scenes could be successfully transmitted. During this period, experimental work was being carried out on both sides of the Atlantic to try and eliminate the shortcomings inherent in Baird's mechanical method by developing an all-electronic system. Worried by the competition to produce a system with superior definition, Baird was prompted into increasing his mechanical scanning from 30 to 240 lines with 25 frames per second, scanned sequentially to improve the definition.

When high-definition broadcasts began in November 1936, Baird had just managed to attain the "high-definition" category, as defined by the Government of the day, with his mechanical approach. However, Marconi-EMI had proudly come up with the famous 405-line system with 50 frames interlaced scanning, producing 25 complete frames per second. Both systems were used on alternate weeks for a short period, but the Government's decision finally came down in favour of the Marconi-EMI system.

Europe

Before World War II, France was using a 180-line system while the Germans and Italians had adopted a 441-line standard. The main Paris 180-line transmitter in the Eiffel Tower was actually taken over by the Germans towards the end of the war and converted to their 441-line standard, which employed negative modulation with the a.m. sound carrier spaced some 2.8MHz away from the vision frequency.

The surge in the number of television services appearing throughout the world after the war brought with it various alternative standards for sending TV picture and sound information. In the UK, transmissions using the 405-line system were resumed in 1946 but elsewhere things were different.

Super-Definition

The French, being different, decided upon a system with a much higher definition. In fact it had 819-line scanning and a super-wide video bandwidth of over 10MHz! This was known as System "E". The 441-line Paris transmissions continued into the early Fifties - we vaguely recall DX reception reports of this transmitter in some of the technical magazines of the period.

The extremely wide channel width of System "E" meant that, in theory, fewer channel allocations could be accommodated within Bands I and III compared with other systems. In Band II the French developed a clever way of interleaving the channels, which meant that some sound channels were above and some were below the vision carrier frequency!

A 625-line system with positive modulation, System "L", was later introduced at u.h.f. and nowadays it fully replaces the 819-line system which once occupied the v.h.f. channels.

Belgium, Monaco, Luxembourg and Algeria all used an 819-line system at some stage during the Sixties. In early 1969, RTB, the French-language network in Belgium, changed to System "C" with positive modulation used on all its v.h.f. channels. This system was in use until 1977 when conversion to System "B" took place. Luxembourg changed to System "C" for its v.h.f. broadcasts in 1971, with an eventual conversion to System "B" in 1982/83, mainly because of its decision to broadcast to neighbouring West Germany and Belgium in the German language. It broadcasts in French at u.h.f. on both the System "L" SECAM and System "G" PAL standard. A similar situation exists in Monaco with transmissions in French and Italian in SECAM and PAL.

An 819-line system was used in Saarland until it came under the control of the Federal Republic of Germany in 1957. Algeria was still using 819 lines in 1969 although some transmitters were being converted for the System "B" standard. Togo, in south west Africa, continued to use the 819-line system until the mid-Seventies.

625 Lines

Most Western European countries decided upon a 625-line system (CCIR System "B" at v.h.f. and System "G/H" at u.h.f.). This was a West German development using negative-going vision modulation and f.m. intercarrier sound separated from the vision channel by 5.5MHz. This particular system was also adopted by Australasia, parts of the Far East, the Middle East and some African countries, but with differences in channel numbering and allocations in general.

In Russia and Eastern Europe a 625-line standard was also chosen but with a much wider vision bandwidth than the CCIR system and a 6.5MHz sound and vision spacing. This was known as the OIRT system and designated System "D" at v.h.f. and System "K" at u.h.f. There were a few exceptions, of course: Yugoslavia and East Germany eventually opted for the CCIR system.

The same technical characteristics of the OIRT system are now used by the many French-influenced colonies throughout the world. In Africa, for

instance, countries using System "K" are plentiful nowadays, although these are of little interest to the European TV DXer because only the Band III and u.h.f. channels are used at present.

UK Plans

Field tests using v.h.f. Band V took place as early as 11 November 1957 using the 405-line system from the Crystal Palace transmitter. Less than six months later more experimental transmissions took place at u.h.f., but this time using 625 lines. This was to become the standard that would be adopted for any future television networks in the UK. The system chosen was very similar to the CCIR and OIRT systems, but with a sound and vision frequency difference of 6.0MHz. It was proposed that the 405-line system in Bands I and III would eventually be phased out and replaced by the higher definition broadcasts offered by the 625-line system. The main technical hitch was that fewer channels could be accommodated within the bands because of the wider channel bandwidth required by the new system. Originally, the phasing out of the 405-line network was to be a much swifter process than actually happened, and it is doubtful whether anyone would have envisaged the system lingering on until 1985! Unfortunately, the idea for a re-engineered network in Bands I and III was eventually ditched during the Eighties when the Government, with misguided loyalties, decided to hand it over to users other than the TV broadcasters.

The UK system is also used in Eire at both v.h.f. and u.h.f. In other parts of the world this system has also been adopted: Hong Kong uses it and so do a few African countries such as South Africa and Angola.

Colour Television

Throughout the world today there are three colour systems in use: PAL, SECAM and NTSC. They all have their merits and weaknesses; many were chosen because of political influences - or even a country's topography. Some countries use variants of these systems in order to suit the technical requirements of a particular transmission system used. One example that readily springs to mind is the PAL system adopted by Brazil, where a subcarrier frequency lower than the usual 4.43MHz has to be used because of the narrower vision bandwidth of the 525-line American system which is employed.

During the Fifties, colour television was introduced to the USA using the NTSC colour encoding system. NTSC was later adopted by most countries using the 525-line system "M". This standard is used in the Caribbean area, Canada, Japan, certain countries in the Far East and South America. Some South American countries use System "N" which has 625 lines but retains the same channel arrangements and vision bandwidth of System "M". The American Forces TV Network in Europe also uses the System "M" NTSC standard. Transmission standard changes have occurred in certain cases, for instance Aramco-TV (Dharan, Saudi Arabia) changed to System "B" PAL during the Seventies; fortunately it uses channel E3 and has been received in the UK only on rare occasions.

Unsuitable in Europe

The NTSC colour system was field-tested in Europe but eventually proved to be unsuitable, mainly because phase changes in the received signal had some considerable effect on the colour - it changed it! Although the hue control on the American sets could compensate for this shortcoming, it was felt that an improved system should be developed in Europe to eliminate the need for frequent adjustment. The PAL and SECAM systems which were eventually developed were designed to overcome the shortcomings of the NTSC standard. By the end of the Sixties many European countries had come to a decision over which colour system they were going to use. In general, most Western European countries opted for the PAL system, including Yugoslavia. France decided on SECAM along with Eastern-bloc countries, including East Germany, and the USSR. Rumania has only recently introduced a colour service and, surprisingly, the PAL system was chosen. Albania, North Korea and China have also opted for the PAL system.

British Colour History

Experimental colour transmissions took place in the UK towards the end of 1955 when the NTSC system underwent field trials using 405-lines at v.h.f., but with a lower subcarrier frequency than in the original NTSC specification. There were also colour broadcasts at 625-lines during the early Sixties.

The new 625-line system at u.h.f. carried programmes for public viewing following the introduction of BBC-2 in 1964. We might add that the official opening night on April 20 was somewhat jinxed: a power failure in the public mains supply meant that Television Centre was plunged into total darkness shortly before the service was to begin. The story goes that packets of candles were hurriedly opened to provide emergency lighting in the hope that power would soon be restored. It wasn't - so the offical opening had to be postponed until the following evening.

Strange Tests

It was on 2 December 1967 when BBC-2 colour broadcasts officially began using the PAL system. Towards the end of 1969, BBC-1 and ITV broadcasts were duplicated at u.h.f. to provide a colour service on all three channels. It is interesting to note that during the early Seventies a few strange test transmissions took place, outside normal programme hours, around 200MHz in Band III using the 625-line system.

Encrypted Broadcasts

Encrypted, or scrambled, transmissions are usually associated with satellite broadcasting. However, over the past few years there has been an increasing interest by various broadcasters and governments in using encryption for existing terrestrial television networks.

The aim of encryption is to ensure that the programmes can only be satisfactorily received with the aid of a special decoder unit. Although the encrypted programmes may be intended for a specialist audience only, most of us realise that such a system is really designed as a means of selective revenue raising for individual private broadcasters. On the other hand, should encryption eventually be used during certain prime-time popular programme slots, even when the station is already financed by an annual licence fee, then this is just a well thought-out way of relieving the public of yet more money!

In the Middle East during the early Seventies, one station was reputedly using a crude form of scrambling system to prohibit viewing unless a "descrambler" unit was purchased. Basically it was a notch filter connected to the antenna input to remove a jamming signal which was designed to create havoc with the transmitted picture. Nowadays, descrambling arrangements are slightly more sophisticated.

UK Experiments

Not so long ago, night-owls watching the BBC channels after close-down encountered some fuzzy-looking pictures accompanied by a very faint sound channel, best described as a combination of footsteps crunching gravel and jingling

coins! These were encrypted test transmissions using line displacement techniques similar to the system in use by the French "Canal Plus" network. Currently, special programmes for the medical profession are being shown, but no doubt encrypted broadcasts will find their way into popular viewing hours before too long. Other countries are experimenting with encryption techniques: only recently, Belgium was observed transmitting an encrypted version of the PM5544 test pattern.

Canal Plus

France was the first country in Europe to introduce a national terrestrial television network with encrypted broadcasts for the vast majority of its programmes.

The service, Canal Plus, uses SECAM System "L" (625 lines scanning using positive video modulation and a.m. sound). Most transmissions take place in Bands I and III using re-engineered channels which were previously occupied by the 819-line broadcasts of "tf1" until the early Eighties. The majority of programmes aired by Canal Plus are encrypted, thus requiring a decoder (DISCRET 1) in order to view them. Canal Plus is a private organisation and it will supply decoders only to viewers in France. This means that in neighbouring countries such as Belgium, West Germany and Switzerland where signals are present, viewers are not allowed to subscribe to the network.

However, Canal Plus is expensive: the monthly subscription amounts to 140 French Francs (almost £14) and a deposit has to be paid for the initial installation of the decoder unit. A key or code number is required for the decoder to function and this is changed on a monthly basis. Provided the viewer has paid the latest subscription, Canal Plus sends via the mail a new code number. Since each decoder requires its own individual number, it is useless asking the next-door neighbour for theirs once the subscription expires. It's a simple case of no money, no viewing!

Customer resistance to this exorbitant monthly subscription rate had meant that many pirate decoders have been produced to satisfy public demand. Since Canal Plus commenced in 1984 the police have searched many homes belonging to electronic technicians, resulting in numerous arrests of pirate decoder designers and several court cases.

Denmark and Iceland

More recently a few Danish stations, mostly cable, have commenced broadcasts using such an encryption technique. The Minister of Culture (he's also in charge of the Danish PTT) has suggested that a nationwide movie channel may be introduced, financed from revenue from decoders. The existing direct reception network might be transferred to u.h.f. to make way for the movie channel at v.h.f., or the proposed movie channel may use the recently introduced TV-2 network when their programmes have ended; this later option is the most likely. In Iceland some encrypted broadcasts take place over the privately owned second network.

And Finally...

This brings us to the end of this series. We hope readers have found the articles of interest and perhaps provided the encouragement to become involved in the hobby of long distance television reception.

Further Reading

The 405-line newsletter called *405 Alive* is available by subscription only with four issues per year. To subscribe send four A4 s.a.e.s, each with 26p stamps, and a cheque for £5 made out to A.N. Emmerson, 71 Falcutt Way, Northampton NN2 8PH.

TeleRadio News, a magazine devoted to the DX-TV hobby, is available for an annual subscription of £6 for six issues from HS Publications, 7 Epping Close, Derby DE3 4HR.

System standards and much useful information will be found in *A TV DXers' Handbook* . R. Bunny. Bernard Babani (Publishing) Ltd. From the *SWM* Bookservice □

Abbreviations

a.m.	amplitude modulation	PAL	Phase Alternation Line
CCIR	International Radio Consultative Committee	SECAM	Sequential with memory (or Sequential colour and matrixing)
c.r.t.	cathode ray tube		
DX	long distance	TV	television
f.m.	frequency modulation	u.h.f.	ultra high frequency
Hz	hertz	v.h.f.	very high frequency
m	metre	Band I	45 - 68MHz
MHz	megahertz	Band II	87 - 108MHz
NTSC	National Television Standards Committee	Band III	175 - 230MHz
		Band V	615 - 856MHz

VERSATILE RECEIVE CONVERTER

Peter Rouse GU1DKD

The circuit described here started life as a simple h.f. to v.h.f. converter to provide general h.f. coverage in the range 30-60MHz on a scanner. During the testing of several prototypes it was realised that the circuit, with an alternative input stage could be used to extend the v.h.f. coverage of "banded" scanners. When one realises that not only is there a signal mixed with the 30MHz local oscillator but also it's harmonics, then it can be seen that quite a bewildering selection of signals can be obtained from what is a very simple item of equipment.

Having said that, it must be stressed that h.f. reception is nowhere near acceptable communications standards; the circuit really was intended more for casual listening and the performance of the unit will be governed to a very large degree by the scanner with which it used. The governing factor is the i.f. bandwidth which on most scanners is around 12.5-15kHz. This means that on crowded h.f. bands it is possible to hear several stations simultaneously even though they are on adjacent channels. However, on scanners with narrow-band s.s.b. filters such as the Yaesu FRG-9600 and Icom IC-R7000, quite acceptable performance is available.

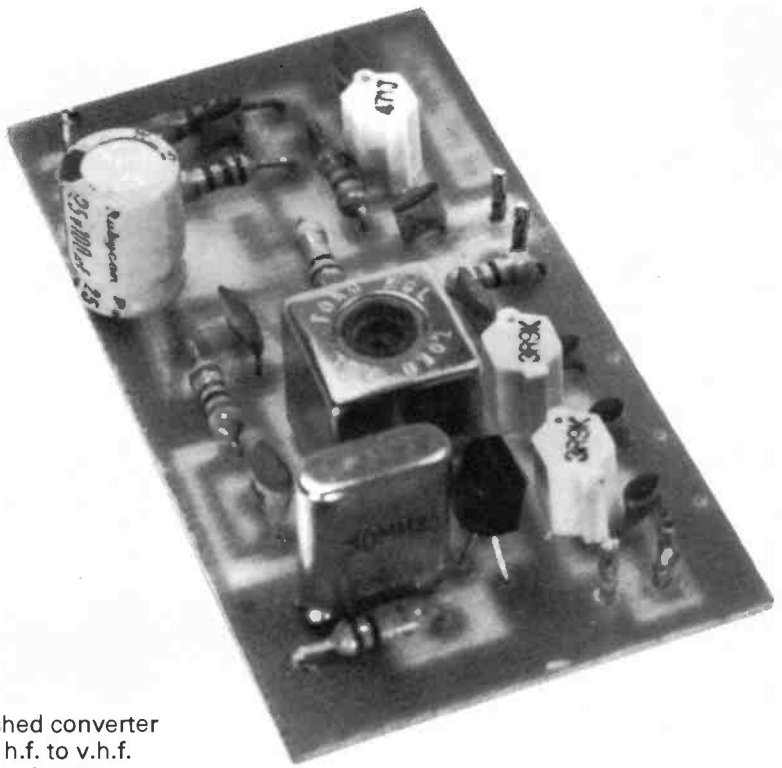
Accepting that however good the converter is the overall system performance will always be limited by the scanner's i.f. filters, it was decided that there was little point in aiming for high sensitivity and selectivity in the convertor unit. Therefore the unit presented here probably represents the simplest possible arrangement in terms of component count. It works, but don't expect miracles and if like me you are a compulsive twiddler I guarantee you will have hours of fun getting your scanner to cover frequencies its mother never told it about. Treat it as a relatively inexpensive fun item and you will not be disappointed.

Turn your scanner into an h.f. receiver or fill-in some of those missing v.h.f. frequencies with this simple, but versatile, unit.

How it Ticks

The circuit (Fig. 1)consists of little more than an input filter, local oscillator and combined mixer/r.f. amplifier. Signals presented to the unit (in the h.f. version) are first processed through the low-pass filter unit comprising L1 and L2, C1, 2 and 3 which starts to roll-off at 30MHz. An alternative variable attenuator for the input is shown and its use is strongly recommended. The r.f. amplifier/mixer can be overloaded easily because with no bandpass filtering a large number of powerful signals will be present at gate 2 (G2) of the m.o.s.f.e.t.

The local oscillator uses a standard 30MHz crystal and the arrangement shown is without a doubt the simplest possible circuit that can be constructed for an overtone crystal. The correct frequency is selected by the transformer T1 which is a standard Toko type. The local oscillator output is then fed to G2 of the mixer transistor Tr2, the same gate



Finished converter with h.f. to v.h.f. option fitted.

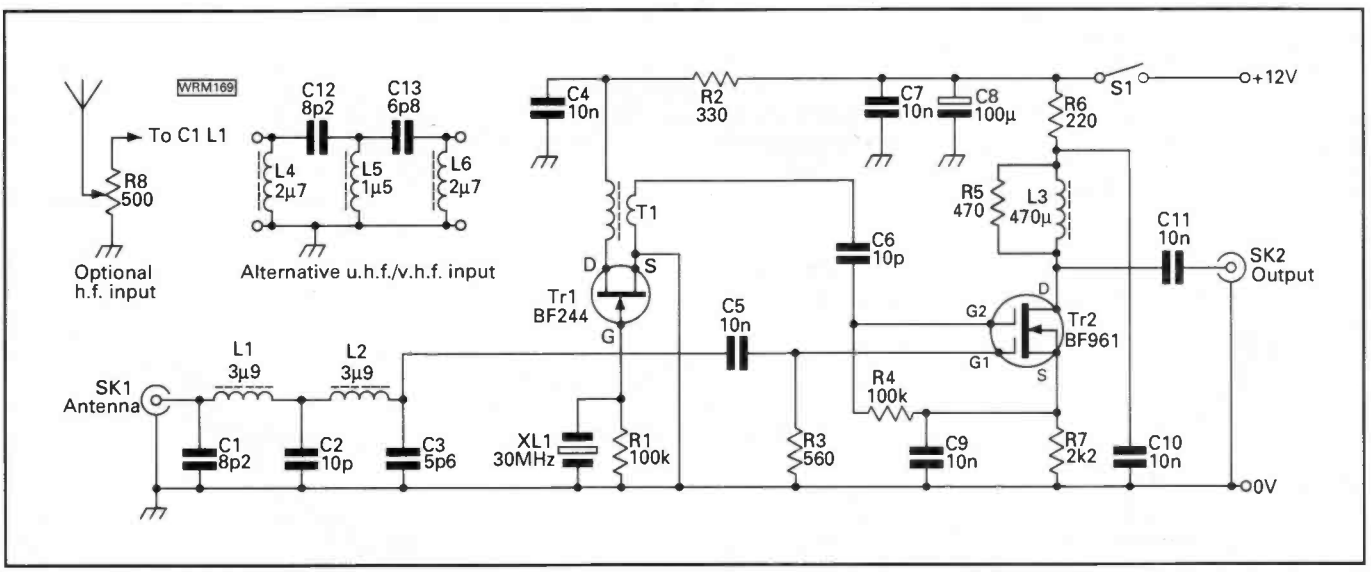


Fig. 1: Circuit diagram of h.f. to v.h.f. converter showing v.h.f. to v.h.f. options.

VERSATILE RECEIVE CONVERTER

being biased via R4. The post-filtered r.f. signal is fed to gate 1 (G1) of the same transistor and the output for the scanner is taken from the drain via C12.

Virtually any j-f.e.t. will work in the oscillator circuit, as will several different types of dual-gate m.o.s.f.e.t. in the mixer/amplifier.stage It should be noted that transistor Tr2 is soldered direct to the pads on the lower side of the p.c.b.

Construction and Testing

The circuit should be built using the p.c.b. arrangement shown in Fig. 2 The use of other construction methods such as strip-board is not recommended in this instance because of the high frequencies involved. Referring to previous comment about Tr2 being soldered directly to the foil side of the p.c.b., the leads of Tr2 will need to be bent down slightly to neatly acheive this.

The circuit should be housed in a suitable screened enclosure and fitted with input/output coaxial sockets together with the input attenuator R8, if used, and on/off switch S1.

Once assembly is complete, the alignment is very simple. With power connected, tune the scanner to 30MHz (or harmonics such as 60 and 90MHz, etc.) and check that the local oscillator is pumping out a signal. Now connect an h.f. antenna and tune for a medium wave station (this is calculated by adding the frequency of the station to 30MHz and entering the nearest frequency to the total into the scanner). If all is well the station should be heard. Now tune up or down until a weaker station is found and peak the core of T1 for maximum signal (the setting is not critical and the core should be showing slightly above the top of the screening can).

That completes the alignment of the unit and it should now be possible to tune from the low frequency end of the radio spectrum right up to 30MHz.

Assuming you are using a 30MHz crystal, then simply add to the 30 to the frequency you require and enter the total into your scanner. It should be noted that the incoming h.f. signals will also be mixing with the local oscillator's harmonics and so if you have a scanner that does not cover 30-60MHz you can use 60-90, 90-120 or 120 to 150 instead. In fact, although the signals get progressively weaker with each harmonic, they can be heard well up into the lower u.h.f. ranges.

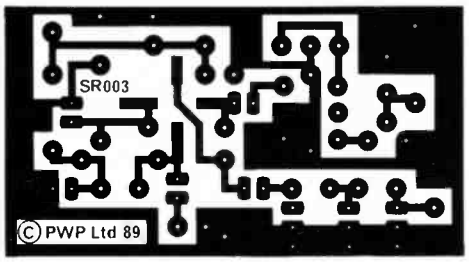
Alternative Arrangements

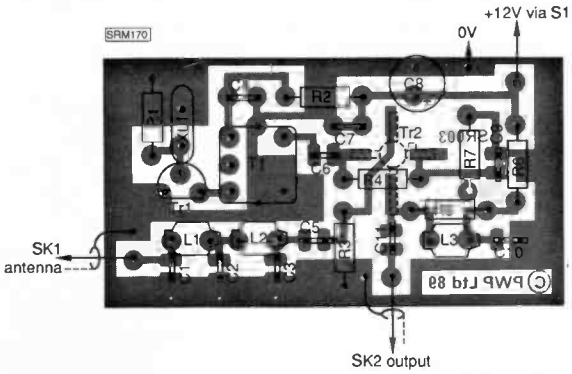
It is this ability to provide signals on the harmonics that is put to use with the alternative circuit where we can perform v.h.f. to v.h.f. conversions to fill in some of those missing gaps that appear on some scanners. Again, I must stress that performance is limited and reception will not be up to the same sensitivity as the scanner working on its intended ranges. Nevertheless, on my own set-up quite useful performance has been achieved with the following arrangement.

Replace L1 and L2, C1, 2 and C3 with the alternative filter components shown in Fig. 1 (provision has been made on the p.c.b. to accept the different arrangement). This filter is a high-pass type which cuts-off below 30MHz and it is necessary to try and eliminate these signals otherwise you will get simultaneous h.f. and v.h.f. reception and the resulting mishmash will be awful. Even as it is, the filter probably will not cope with some high powered transmissions and so don't be surprised to find the occasional h.f. station as you tune through the v.h.f. frequency ranges.

The mathematics for v.h.f. to v.h.f. conversion become a little more complicated but let us look first at the more straightforward case. We have a scanner made for the US which covers only 26-50MHz and we want to extend the range. Add thirty to the range and we get 56-80MHz so it is simply a case of entering the desired frequency plus 30.

The next highest range on the same scanner is 108 to 178MHz. Now we can not only use the additive output from the the mixer Tr2 but also the subtractive output (remember a mixer always has signal plus oscillator and signal minus oscillator on it's output and it is this effect that leads to image problems in receivers). That means if we tune our





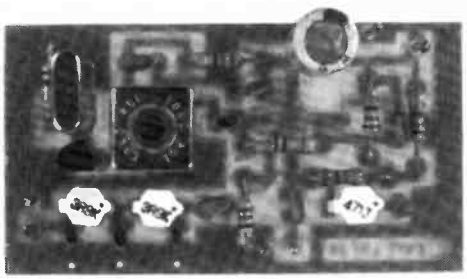


Fig. 2: Full-size, single-sided, track pattern and component placement diagram. Note Tr2 is mounted on the foil side of the p.c.b.

VERSATILE RECEIVE CONVERTER

scanner to 108MHz we will not only be receiving on 138MHz (the product of 108+30) but also 78MHz (108-30).

So on this second band on the scanner we can tune in frequencies between 78 and 208MHz although in fact at any one given time we will be tuned to two frequencies. If you are not confused already, then let me throw another spanner in the works: There will also be signals present from the products of the harmonics, i.e. plus and minus 60MHz, etc.

Surprisingly none of this really causes any real problems unless you live in an area where virtually every segment of the v.h.f./u.h.f. spectrum is in constant use.

The crystal chosen for the local oscillator was a good round number to make adding and subtracting easy. Virtually any crystal in the range 20-40MHz will work in the circuit but if you choose an odd frequency then I suggest you keep a pocket calculator and some aspirins handy when tuning around. Obviously a crystal below 30MHz will mean that when tuning through the upper end of the h.f. spectrum you will also be simultaneously going through the second harmonic and tuning-in stations at the lower end of the h.f. or m.f. as well. If you use a frequency higher than 30MHz then you may need to change T1 to a Toko KANK3335 (Pink).

Finally

There is of course nothing to stop you from fitting a simple 2-pole 2-way switch to select either filter bank so that you can use the converter either for h.f. or v.h.f.. In this instance, fit the high-pass (v.h.f. version) components on to the circuit board and use a small piece of strip-board to mount the components for the low-pass filter.

□

YOU WILL NEED

Resistors

0.25W 1% Carbon film

220Ω	1	R6
330Ω	1	R2
470Ω	1	R5
560Ω	1	R3
2.2kΩ	1	R7
100kΩ	2	R1,4

Linear carbon potentiometer

500Ω	1	R8

Capacitors

Ceramic plate

5.6pF	1	C3
6.8pF	1	C13
8.2pF	1	C1,12
10pF	2	C2,6

Disc ceramic

10nF	6	C4,5,7,9,10,11

Radial Electrolytic 25V wkg.

100µF	1	C8

Inductors

L1, 2	3µ9 choke (Cirkit part no. 34-39904)
L3	470µH choke (Cirkit part no. 34-47114)
L4, 6	2µ7 choke (Cirkit part no. 34-27904)
L5	1µ5 choke (Cirkit part no. 34-15914)
T1	Toko KANK3334 yellow (Cirkit part no. 34-33340)

Semiconductors

BF244	1	Tr1 (Cricklewood)
BF961	1	Tr2

Miscellaneous

Alloy project box; p.c.b., SWM Editorial Offices, Price £5.22; SK1, 2 coaxial sockets; S1 on/off switch; connecting wire; XL1 HC18U 30MHz crystal (Cricklewood).

Abbreviations

h.f.	high frequency
i.f.	intermediate frequency
j-f.e.t.	junction field effect transistor
kHz	kilohertz
m.f.	medium frequency
MHz	megahertz
m.o.s.f.e.t.	metal oxide silicon field effect transistor
p.c.b.	printed circuit board
r.f.	radio frequency
s.s.b.	single sideband
u.h.f.	ultra high frequency
US	United States
v.h.f.	very high frequency

Suppliers

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PLANT A TENNAMAST THIS SUMMER

Dick Ganderton

If you are into DXing in a serious way or just need to get your antennas up into clearer air, then a mast is one answer. Dick Ganderton replaced the pole on the end of his house with a tiltover Tennamast.

Masts have several advantages over other means of getting your antennas up into clear air. They also have disadvantages which, in general, are outweighed by the advantages. I found that having to clamber up the roof and work on the ridge to change the antenna or carry out maintenance work had long since become a nuisance that I could no longer live with. So, when it was suggested that I "planted" a Tennamast Economy Plus mast in my garden, I jumped at the opportunity. This is Tennamast's lowest priced, 7.6m mast but with the telescoping, upper pole left full-length to give an extra couple of metres height. It also has four bottom pulleys instead of the two fitted to the basic model so that it can cope with the increased load. The head load capacity is 18kg so that it can support v.h.f./u.h.f. or compact h.f. beams.

Construction

The mast is sturdily constructed from heavy gauge, steel tube and consists of a galvanised ground socket which is embedded in concrete 1 m^2 x 0.5m deep, a ground post which is "plugged" into the socket and carries the winch and pulley system together with the pivot for the main, telescoping mast. The lower part of this is made from 70 x 70 x 3.6mm square-section steel tube with the safety latches and pulley bearings welded on, while the upper section, which slides inside the square tube, is a galvanised, round steel tube 60.3mm outside diameter. The ground post and lower section of the main mast are welded using the MIG process and are primed and painted with two coats of Hammerite paint. The insides of the hollow sections are treated with Waxoyl to keep the rust at bay.

Operation

The mast is tilted and raised or lowered by a winch and pulley system with built-in safety features to prevent accidents. The actual raising of the mast from its horizontal resting position is a simple matter of winding the winch until the mast reaches the vertical position and the automatic bottom safety latch engages. The anti-telescoping latch is then released and held off while the winch is wound and the upper section starts to rise. When the upper section has extended to its fullest height the upper catch automatically engages and the winch can be backed off so that the strain is taken from the steel cable.

Lowering is simply a matter of raising the inner section to clear the upper catch, pulling the release cable to disengage the catch and lowering the inner section by winding the winch backwards against the friction brake. To tilt the mast requires the operator to back off the winch to give some slack to the cable, lift the spring-loaded bottom safety latch and then lift the bottom of the mast to start it tilting. It can then be lowered on the winch until it reaches the desired position. The anti-telescoping latch prevents the inner section from sliding uncontrollably out of the mast, which could be catastrophic.

1

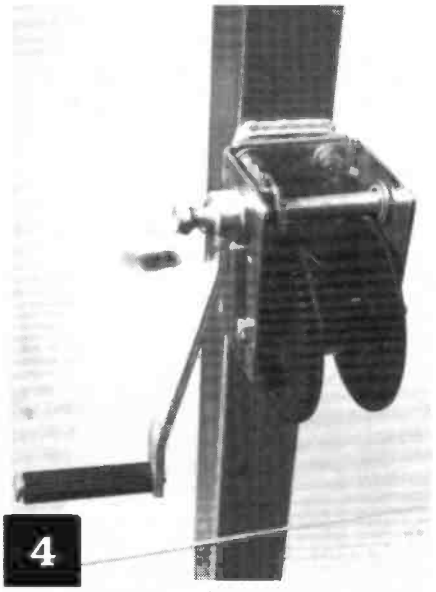
Apart from the mast and rotator cage, you will need a fine weekend, 0.5m^3 of $^3/_4$ in ballast, two bags of cement and some muscle-power. The ground post requires a concrete base 1 x 1 x 0.5m, so get digging! Keep an eye open for any drains, underground cables or pipes and position the centre of the hole far enough away from your boundary to keep the antenna from overhanging your neighbour's property and well clear of overhead lines.

2

Unless you want your mast to emulate the Leaning Tower of Pisa the ground socket must be vertical in all directions. Check with a good builder's spirit level, wedge the socket with bits of rubble and recheck. When filling the hole with concrete put a polythene cover over the open end to keep the tube clear of concrete. Don't forget to keep checking that it is vertical and carefully tamp the concrete to ensure that it is properly compacted.

PLANT A TENNAMAST THIS SUMMER

The ground post plugs into the socket - provided that you have kept it clear of concrete. Don't be too impatient - the concrete needs several days to harden. Beware of frost in winter and protect the new concrete with a thick layer of sacking. In summer cover it with a polythene sheet to prevent it drying out too quickly. Before inserting the ground post into the socket smear thick grease all over the part of the post that will be in the socket.



This is the DL800 Friction Braked Winch, which Tennamast recommend. It provides easier and safer control of the mast during raising and lowering. The winch is bolted onto the ground post, as shown here, using the three bolts and washers provided. The positions of the three holes means that you cannot get it upside down. The handle is wound onto the shaft and the spring and Nyloc nut fitted and tightened to retain it.

This is the bit that really needs an assistant (he had nippped off to take the picture). The main mast is lifted onto the ground post and the pivot bolt inserted. The instructions suggest that a temporary support is used to hold the top of the mast level while you are doing this. In my case the ground sloped upwards so I didn't bother. The assistant will probably need to move the mast around to allow the bolt to slip in easily.

With the mast tilted so that it is horizontal, the rotator and antenna system are so much easier to work on.

The Tennamast system allows you to unplug the entire mast from the ground socket if you want to - in other words the mast is not a permanent fixture - though, of course, the large concrete block is very permanent! This could be useful if you are in the habit of moving house frequently since you only need a new galvanised ground socket tube to enable you to install your Tennamast at the new site.

Cost

The Economy Plus mast is very well made, simple to install and easily raised and lowered. It looks neat and uncluttered when raised and is unobtrusive when lowered and tilted. There are other, larger, masts in the range, including trailer-mounted versions which would be ideal for the more affluent contest group. However, if you only need to get your antennas up to around 10m then the Economy Plus at £190 is a very good buy. The rotator housing will cost you an extra £35 while the friction-braked winch adds a further £35. Carriage is, unfortunately, extra at around £30 (dependent on where you live). To these prices you will need to add the cost of 0.5m^3 of ballast and two bags of cement.

The foot of the mast shown locked in the vertical position. The anti-telescoping latch is being held open to allow the winch to be operated and raise the upper section. Also visible are the spring-loaded bottom safety catch which automatically locks the mast to the ground post in the vertical postion, the lifting handle and the steel wire and nylon pulley system for raising and lowering the mast.

The rotator is housed in a galvanised steel cage which clamps onto the top of the upper section of the mast. Tennamast can supply cages drilled to suit any of the popular rotators. I used the rotator which had seen eight years service at the top of my pole. If you are using your old rotator then I recommend that you service it before bolting it in place - I didn't and the main bearings had disintegrated!

PLANT A TENNAMAST THIS SUMMER

My thanks to **Tennamast, 81 Mains Road, Beith, Ayrshire KA15 2HT Tel: (05055) 3824** for supplying one of their masts for this feature. □

Abbreviations	
h.f.	high frequency
kg	kilogram
MHz	megahertz
m	metre
m^3	cubic metre
m^2	square metre
mm	millimetre
u.h.f.	ultra high frequency
v.h.f.	very high frequency

Up she goes! The home-made 430MHz 12-element ZL Special antenna is mounted on an industrial grade, thick walled, plastics pipe which rotates in the upper bearing of the rotator cage. A 144MHz 12-element ZL Special has yet to be installed below the 430MHz one. I found it very easy to raise the mast from the tilted position, the effort required on the winch handle being a lot lower than I had expected.

8

THE STORY OF JOAN-ELEANOR

22☞

the first flight there was trouble with the Mosquito's controls and the trip had to be aborted. On the second, the aircraft reached the scheduled area without difficulty, but no contact could be established with Bobbie - and when landing back at base the aircraft was badly damaged. The third attempt proved to be lucky, however: Simpson himself flew in a replacement Mosquito and conversed with Bobbie from a height of about 30 000ft. The wire recorder worked perfectly. Since the highly directional transmissions were virtually proof against interception, plain language could be used, making possible faster and more accurate reporting from the ground, since mistakes or misunderstandings could be queried and rectified at once. This was impossible with the old c.w. system in which messages had to be encoded and subsequently decoded, as well as being translated into Morse signals. It was estimated that as much information could be transferred by Joan-Eleanor in 20 minutes as would have taken some 72 hours by c.w.

Success

With Joan-Eleanor proven to be successful, further exploits by agents followed. One of the most notable was that of two brave anti-Nazi Germans who had taken refuge in Britain and who parachuted back to Germany, close to Berlin, and were able to report back conditions in the capital itself. For all agents an unexpected bonus from Joan-Eleanor was the psychological benefit derived from actually being able to hear a friendly voice from the aircraft.

It is sad to relate that the full potential of Joan-Eleanor was not realised at first due to inter-departmental strife in the USAAF, if not sheer bloody-mindedness on the part of some of its officers. Certainly it was not the first occasion, nor would it be by any means the last, on which technical excellence has been frustrated by petty officialdom. Nevertheless Joan-Eleanor without doubt played an effective part in Hitler's downfall.

[1] It is only fair to mention that British scientists working on directional radio had earlier devised a system on the lines of Joan-Eleanor, but unfortunately the agents' set was too large to be easily carried or concealed, and the upward range was limited to about 10 000ft - inside the range of anti-aircraft guns.

Abbreviations			
cm	centimetre	i.f.f.	identification friend or foe
c.w	continuous wave (Morse)	kg	kilogram
ft	feet	m.p.h.	miles per hour
g	gram	USAAF	United States Army Air Force
h.t.	high tension	v.h.f.	very high frequency

LISTEN OUT FOR

GB2NTS, GB2NTU, GB2NTW and GB2NTE: On July 29/30 four stations will be on the air from different National Trust properties, one each in Scotland, Ulster, England and Wales. Hopefully Ireland will make up a fifth country (EI). If you live overseas and can contact two of these stations, or if you live in the UK/Ireland and contact three stations there is a Commemoration Certificate available. Overseas the cost is $1 or equivalent return postage by Air Mail, UK/Ireland it requires a 19p s.a.e. You need to send QSL cards or log extracts to: ***Scottish Tourist Board (Radio Amateur) Expedition Group, PO Box 59, Hamilton, Scotland ML3 6QB.***

GB2WW & GB4BOB: During 1989, the Bedford & District Amateur Radio Club plan to commemorate the outbreak of the Second World War by operating several Special Event Stations. The locations will include a number of former RAF and USAAF stations in and around the Bedford areas which were in use during the hostilities.
GB2WW: This station will be on the air on August 19 from Kimbolton Airfield for the Remembrance Service of 379 Bomb Gp USAAF. Then, on September 3, it will be on the air from RAF Cardington for the 50th anniversary of the start of WWII.
Further details can be obtained from the ***Special Events Manager: Ray G0EYM. 30 Cotswold Close, Putnoe, Bedford MK41 9LR. Tel: (0234)244506.***
GB4ATG: This is the talk-in station for the BARTG Rally on August 27 from Sandown Park Racecourse, Esher, Surrey.
GB4VMR: This is the talk-in station for the Vange ARS 10th Annual Mobile Rally from Basildon on September 10.
GB1RLD: Three members of Radio Link - Derby Hospital Broadcasting will be operating from the outside broadcast caravan at the City Hospital, Derby on 144MHz. The dates will be September 30 from 1000-1600, October 1 from 1000-1600.

RALLIES

July 28-31: Dataspace '89 (incorporating the RSGB Data Symposium and the AMSAT-UK Colloquium) will be held at the University of Surrey. Full details and booking forms for tickets and accommodation can be obtained from: ***Ron Broadbent G3AAJ, AMSAT-UK, London E12 5EQ or RSGB HQ, Lambda House, Cranborne Road, Potters Bar EN6 3JW.***

July 30: The Hilderstone Radio Society are holding their rally at Hilderstone College, St Peters Road, Broadstairs, Kent. There will be trade stands, a Bring & Buy, a talk-in station, raffle, refreshments, a licensed bar, etc. Contacts are: ***Alan on (0832) 593072 or Ron (0304) 812723.***

July 30:** Scarborough ARS are holding their annual rally at the Spa, on the South Shore Seafront, Scarborough. This is close to the beach and all the entertainment, so there will be something for all the family. Doors open at 11am. There will be trade stands, bring & buy, refreshments and bar, with talk-in on S22. Details from: ***G4UQP on (0723) 376847.

July 30: The Rugby Amateur Transmitting Society are holding their Amateur Radio Car Boot Sale at Lodge Farm, Walcote, Nr Lutterworth. Apparently, that's less than 2 miles east from junction 20 of the M1. Talk-in will be on S22. Pitches are available for £5 and entrance to buyers is 50p per car. The event opens at 10am. More details can be obtained from: ***Kevin G8TWH. Tel: (0203) 441590 or David G4DDW. Tel: (0455) 552599.***

August 13:** Hamfest '89 will be held at the Flight Refuelling Sports Ground, Wimborne, Dorset. Gates open at 10am and there's free car parking as well as overnight camping facilities. The day will feature radio and electronics trade stands, field displays and a craft and gift fair. More details from: ***Rob G6DUN. Tel: (0202) 479038.

August 13: The annual Derby Radio Rally will again be held in the Lower Bemrose School, St Albans Road, Derby. All the usual attractions will be there including their Monster Junk Sale. More details from ***Martin G3SZJ. Tel: (0322) 556875.***

August 20: The West Manchester Radio Club's Red Rose Summer Rally will be held in the Sports & Leisure Centre, Silverwell Street, Bolton. Admission 50p (children free) with free cash draw on the programme. All the usual traders, bring & buy, snacks and meals available all day. More details from: ***D.R. Camac on (0204) 24104.***
August 27: The Galashiels & District ARS are holding their open day at the Focus Centre, Livingstone Place, Galashiels at 11am. There will be trade stands, a bring and buy and all the usual activities. Light refreshments will be available. Talk-in will be on S22. For more details, contact: ***John Campbell GM0AMB. Tel: (0835) 22686.***

August 27: The BARTG rally will be held at Sandown Park Racecourse, Esher, Surrey. Talk-in on S22 and SU22 by GB4ATG. Admission is £1 for adults and 50p for children and OAPs (babies are admitted free). Doors open at 1030 and close at 1700. Details from: ***Peter Nicol G8VXY. Tel: 021 - 453 2676.***

August 28: The Huntingdonshire ARS are holding a junk sale at The Medway Centre, Coneygeare Road, Huntingdon. Doors open from 10.30am to 5pm. Food and drink will be available all day and you can rent a table to get rid of all your junk for £5. The contacts for the day are: ***G1YVS on (0487) 830212 or G8LRS on (0480) 56772.***

September 3: The Preston ARS 22nd Annual Mobile Rally will be held at Lancaster University, as in previous years. It will be in the Great Hall, Nuffield Theatre, Minor Hall and A35 (for the Bring & Buy). The licensed bar and snack bar will be located in the Great Hall foyer. A separate restaurant will be available at lunch time too. Contact: ***Godfrey Lancefield on (0772) 53810.***

September 3:** The Telford Amateur Radio Rally will be held in the Telford Exhibition Centre, Telford Centre, Shropshire. Doors open at 11am, 10.30am for the disabled. Usual facilities and attractions, plus specialist group stands. Catering & bar, talk-in via GB4TRG on S22. Contact ***Martyn G3UKV (0952) 255416.

September 10: The 6th National Amateur Radio Car Boot Sale will be held at the Shuttleworth Collection, Old Warden Aerodrome, near Biggleswade. Trading starts at 10am. Fly-in is available and permission can be obtained on Northill 288. Further details on the boot sale can be obtained from: ***Tony Kelsey-Stead. Tel: (0582) 508259.***

September 10: The Vange ARS Mobile Rally and Electronics Fair will be held at Nicholas School, Nicholas Road, Basildon, Essex. The rally is open from 10am to 5pm and the entrance fee is 50p, with a free raffle being held at the door. There is free parking and refreshments available as well as a bring & buy and raffle. Further details are available from: ***G4NVT. Tel: (0268) 43025 or Mrs D. Thompson. Tel: (0268) 552606.***

September 16:** The 1989 Scottish National Radio Amateurs Convention will be held at the Fife Institute of Physical & Recreational Education, Glenrothes, Fife. Doors open at 10am. Features include amateur traders, RSGB bookstall, special interest groups, lectures, Morse tests, refreshments & bar, talk-in station as well as bring & buy. Further details from: ***John Hardwick GM4ALA. Tel: (0592) 742763.

September 24: The 5th North Wakefield RC Rally will be held at Outwood Grange School, Potovens Lane, Outwood. Admission is 50p at 10.30am, disabled 10am. Free entry to OAPs, disabled and children. There will be a fully licensed bar with real ale, hot and cold food, raffle, bring & buy, usual radio, electronic and computer traders and repeater groups. Details from: ***Richard G4GCX. Tel: (0532) 622139.***

September 24: The 1989 Harlow Mobile Rally will be held in the Harlow Sports Centre. Doors open at 10am.

***Short Wave Magazine & Practical Wireless in attendance.**

If you are organising a rally and would like it mentioned in Short Wave Magazine, then drop us a line, preferably as soon as you have fixed the date but no later than six weeks in advance (marking your envelope Rally Calendar) and we'll do the rest. Please make sure that you include all essential details such as the venue, starting time, special features and a contact for further information.

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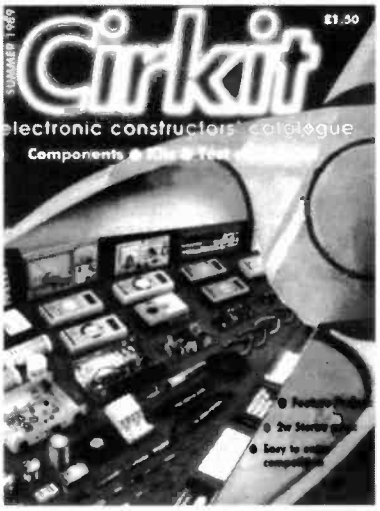

Over 3,000 product lines feature in the Summer 1989 edition of the Cirkit Constructors' Catalogue, available from most larger newsagents or direct from the company priced at **£1.50**. The latest books, an RF frequency meter, two new PSU designs, a 3.5MHz converter and a 2 Watt stereo amplifier are among the innovative new kits this issue. In the test equipment section there's a whole new range of multimeters, a bench DVM and a triple output PSU.

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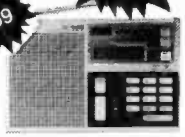

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DX LETTER FROM AMERICA

Gerry L. Dexter

So far, however, only a handful of DXers have overcome the propagational and interference problems and actually been able to hear this station. Partly it's simply a problem of low power over a great distance, but more important is the fact that Tonga's 5.030MHz frequency is also home to Radio Impacto in Costa Rica which puts forth strong signals. Although Impacto normally leaves the air and thus provides a reception "window" around the 0700-0900 period, Impacto quite often leaves its carrier on for lengthy periods after programming ends - and resumes its normal schedule just before 0900. These hours are the deepest of the night in North America (1 to 3am in the midwest, for example) so many haven't the fortitude to go after Tonga on a very regular basis. It's hoped that improved conditions to the Pacific during the summer will improve our chances at Tonga.

Speaking of Radio Impacto, this licensed, yet mysterious Costa Rican station vanished from its 5.030MHz frequency for about two weeks (which allowed some of the Tonga loggings). Frequency 6.150MHz continued while 5.030 was inactive. After 5.030MHz returned, 6.150 was off for a few days. This may have been a case of transmitter maintenance. More recently 5.044MHz has been in use some of the time and 5.030 at others.

Radio For Peace International

Another note from Costa Rica: Radio for Peace International (RFPI) has begun experimental broadcasts up on the 11metre band using 25.954MHz between 1400-1800 and 2100-1400 (sometimes also 1400-1800). The frequency sometimes slides down to 25.934MHz.

In the United States the new religious broadcaster WWCR (World Wide Christian Radio) began testing on May 13 using 7.520 and 15.960MHz where it's expected to be for its regular programming. The schedule will include a programme called *Telephone Time*, described as a chance for listeners to call in their Bible questions. This is slated for Monday through to Friday at 1405-1500. Information about the station's other programme plans is sketchy but includes *The Spoken Word of God* - New Testament readings aired in Spanish, French, German, Arabic and Hebrew, though we haven't seen a specific time schedule yet. The station says it will be the first to use a new type of audio processor designed especially for use by short wave stations so you may want to listen to see if WWCR's audio quality is better than the average. Reception reports go to 3314 West End Ave, Nashville, Tennessee 37203.

The sudden appearance on short wave of station A3Z of the Tonga Broadcasting Commision surprised North American s.w.l.s and sent them rushing to their receivers, an experience probably shared by short wave DXers everywhere.

A rather unusual situation has been noted a few times around 7.418-7.420MHz. The programme is called *Radio Free America* and is presented from the Kayla Satellite Broadcasting Network, based in the small town of Richland Center, Wisconsin and transmitted via the North America One Satellite. Someone with an earth station and a short wave transmitter has been relaying the programme - unannounced at first but, more recently, annnouncing itself as "Free Radio One" and requesting that reception reports be sent to 3434 North Pacific Highway, Bedford, Oregon 97501. Most receptions of this have been between 2200-0200 during the weekends.

Trans-World Radio

Trans-World Radio in Bonaire, Netherlands Antilles recently began airing a programme for short wave enthusiasts. Hosted by Chuck Roswell, the station's frequency co-ordinator, the programme is called *Bonaire Wavelength* and is heard on Saturdays at 1145 on 11.815 and 15.345MHz and Sundays at 0330 on 9.535 and 11.930MHz. Listeners are welcome to send in their comments and information for use on the programme.

In Venezuela, the still fairly new station Radio Continental on 4.940MHz has begun confirming reception reports with a QSL card, though the replies seem to require several months. The station's address is Avenida Marquez del Puma, Edificio Radio Continental, Barinas, 5021 Estado de Barinas, Venezuela. Long active Ecos del Torbes at San Cristobal has reactivated 9.640MHz in addition to the long-in-use 4.980MHz. La Voz de la Fe, Maracaibo, which has been active on an on-and-off basis on 3.375MHz over many years has opened up again, though now in the 60 metre band on the rather unusual frequency of 5.0679MHz and was noted signing off at 0100.

Short wave news continues to come from Colombia. Two more stations once active, then silent, have come back on the air. Emisora Meridiano 70 at Arauca returned on 4.925MHz running to around 0300 close. This station is a member of the Todelar network and announces 15kW. Ecos del Atrato at Quibdo, also silent for some time, has reopened on 5.0197MHz variable.

Radio Sutatenza

Now, 5.095MHz (and sometimes 5.075MHz) - frequencies which were used by the cultural station Radio Sutatenza in Bogota - have Colombian signals again, but the announcements now mention only Caracol, the big Colombian radio network. So it appears that Radio Sutatenza has sold its short wave facilities (at least) to Caracol. Caracol seems to be making an effort to expand its coverage of Colombia and has added two or three other short wave outlets in the past months.

Still another bit of news out of that country was the very brief appearance of a station calling itself La Voz de la Cana which was active for just a day or two early in May. Apparently this was the former Radio Tropical m.w. station on 1500kHz in Cali. The station was first noted by a couple of European DXers and North Americans, including yours truly, must be a bit red in the face to have been scooped on something which is virtually in our own backyard. This station was heard on 5.068MHz - note how close that is to the just reactivated La Voz de la Fe.

KNLS, the "New Life Station" in Alaska has added four new languages to its schedule, although each one amounts to a mere 15 minutes per week. Together, they create a one hour block of between 1500 and 1600 on Mondays only. At 1500 *Light of Life* is aired in the Cebuano language, 1515 has *Quest For Truth* in Ilocamo and *Bible Study* in Cantonese runs at 1530 and in Vietnamese at 1545. The current frequency in use at this hour is 9.750MHz.

Finally

Radio Canada International's 250kW transmitter at Sackville has taken on the additional duty of relaying Radio Austria International. This, currently, is on from 0500-0700 in various half-hour language blocks on 6.015MHz.

That covers the news from the Americans for this time. Your comments are, of course, always welcome.

Good listening! □

Abbreviations	
kHz	kilohertz
kW	kilowatt
MHz	megahertz
m.w.	medium wave
s.w.l.	short wave listener

STARTING OUT

Brian Oddy G3FEX

Such whistles can be largely eliminated with a sharply tuned filter and many modern communication receivers have a suitable filter built-in. The owners of less expensive sets can usually obtain adequate results by employing an add-on filter unit.

Although the tuned circuits in the intermediate frequency (i.f.) stages of a superhet receiver can be made highly selective, their bandwidth must be just adequate to ensure that all of the components of a wanted signal can pass through them - otherwise the demodulated signal will be distorted. The mode of transmission therefore determines the minimum bandwidth that can be used, and in the case of an a.m. transmission this will be equal to twice the highest modulating frequency. In view of these requirements any unwanted carrier which arises close to the carrier of a selected signal will also be able to pass through the i.f. passband and reach the detector, where it will beat with the wanted carrier and result in a heterodyne whistle in the demodulated audio output. The pitch of the whistle will equate to the difference in frequency between the two carriers.

Notch Filters

Fortunately these effects can be largely eliminated by either removing the interfering carrier at some point in the receiver i.f. chain with a variable frequency **notch filter**, or by using a very sharply tuned filter in the audio stages to notch out the resulting beat frequency causing the whistle.

Any interference to a broadcast can be annoying for the listener, the most objectional form being a heterodyne whistle. This type of interference is generally caused by weak signals from other broadcasters operating on or near the same frequency.

The circuit of a **bridged-T filter**, which is capable of providing a very sharp notch in the receiver i.f. response, is shown in Fig.1a. Such filters are ideally suited for use in a low frequency system, so they are usually installed at the input to the 100kHz (or 50kHz) i.f. stage(s) of a triple-conversion receiver. With care, however, satisfactory results can also be achieved in superhets using 465kHz i.f. systems.

The manner in which this type of filter affects the i.f. response of a receiver is shown in Fig.1b. Note that an extremely narrow band of frequencies within the i.f. passband is suppressed by the filter. By varying the position of a dust iron core, or **slug**, within the coil (L1) it is possible to move that narrow band of suppressed frequencies to any point within the i.f. passband. In practice the slug is usually mounted on a threaded brass shaft so that its position in L1 may be finely adjusted with a front panel control marked NOTCH FREQUENCY. A pre-set variable resistor, R1, enables the **notch depth** to be optimised, typically to -60dB below the peak i.f. response.

To ensure minimum distortion to the desired signal, some care must be exercised when adjusting the notch frequency for maximum suppression of an unwanted signal. Of course, it may be necessary to move the notch across the wanted signal in order to reach the interfering signal. This type of filter is highly effective in removing an unmodulated carrier or a keyed carrier conveying Morse code, but the nature of the interfering signal can affect the end result. For example, if the frequency of the unwanted signal is unstable it may vary beyond the narrow suppression range of the filter and still cause interference. When there are two interfering carriers within the i.f. passband it will only be possible to notch out one of them if they are more than a few hundred hertz apart. Despite these problems, this type of filter can often make an otherwise useless signal into one that is perfectly readable and acceptable.

Unfortunately, it may not be a simple matter to add a bridged-T filter to the i.f. chain of an existing receiver since some changes to the original circuit will be required and realignment may then be necessary. A wiser approach may be to employ an audio notch filter, since they may be either home-constructed or purchased as an external add-on unit.

Audio notch filters may be either **passive** or **active**. Inductors and capacitors are used to form sharply tuned resonant circuits in the passive type. Good attenuation can be achieved at the design frequency provided correct impedance matching is applied at the input and output of the filter, but losses are also introduced to the wanted signal. When a variable notch frequency is required these filters tend to be bulky, heavy and expensive. In contrast, active filters employ inexpensive resistors and capacitors in conjunction with the feedback circuit applied to an **operational amplifier**, usually abbreviated to op-amp.

An op-amp is basically a very high gain **differential amplifier** in which the output is directly proportional to the difference between the two voltages applied to its inputs. The stages are directly coupled, so they are capable of amplifying both d.c. and a.c. Initially op-amps were intended to perform mathematical operations such as summation, subtraction, integration and differentiation, but they are now used in many types of electronic equipment for other purposes.

Early op-amps used valves or transistors with discrete components, but modern technology has enabled a multiplicity of transistor elements to be included in a single **integrated circuit** (i.c.) and remarkably high gains can be

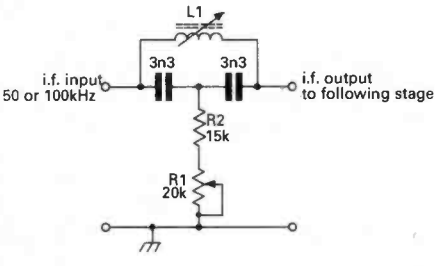

Fig. 1a

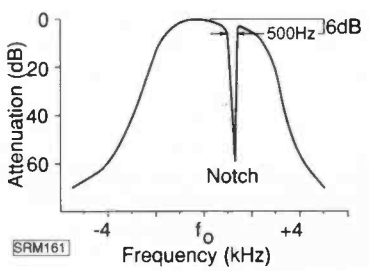

Fig. 1b

R in	Very high
R out	Very low

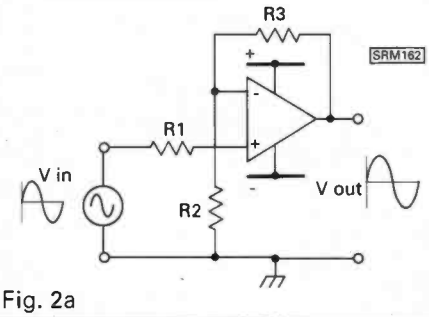

Fig. 2a

R in	R1
R out	Very low

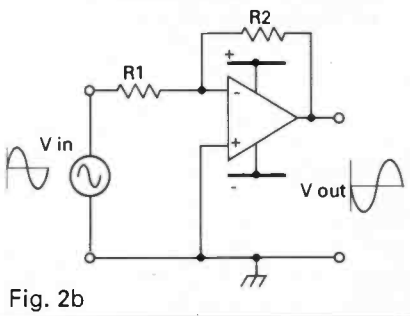

Fig. 2b

achieved - typically 100dB, which corresponds to a voltage gain of 100 000 times. Such a high **open-loop gain** can rarely be used in practice, so a substantial part of the output can be applied to the input in the form of **negative feedback**, which has the effect of reducing the gain and increasing the bandwidth provided the feedback path is purely resistive. By introducing a reactive component into the feedback path it is possible to tailor the overall frequency response, and it is this factor which is exploited in active audio filters.

Although the complex internal circuits of an i.c. op-amp are fixed, their function can be changed by means of a few simple external components and connections. In addition to their role as a differential amplifier they are frequently used as an **inverting** or **non-inverting** amplifier. Both types form the basis of active audio filter designs. The triangle symbol used to denote an amplifier is also used for i.c. op-amp, but the two input ports are marked positive and negative. The positive port is non-inverting, which simply means that if a positive-going signal is applied to it and the negative port is held at 0 volts, the output will also be positive-going (non-inverted). Conversely, if a positive signal is applied to the negative port with the positive port held at 0 volts, the output will be negative-going (inverted).

The configuration required for a non-inverting amplifier is shown in Fig. 2a. Note that both positive and negative voltages relative to 0 volts must be provided by the power supply - a requirement in most i.c. op-amp designs. In this circuit the output voltage always remains exactly in phase with the voltage applied to the non-inverting port, consequently it is sometimes called a **voltage follower**. Part of the output is applied to the inverting port via a divider formed by resistors R3 and R2, which sets the feedback ratio. The value of R2 should be made equal to the the input resistor, R1. The **closed-loop** gain, which is the gain with feedback applied, is given by the ratio (R3 + R2)/R2.

The configuration required for an inverting amplifier is shown in Fig. 2b. In this circuit the output is the inverse or "mirror image" of the input in shape. Part of the output signal is applied in anti-phase to the input via the feedback resistor, R2. The closed loop gain is set by the values of R2 and the input resistor, R1. Since the open-loop gain of the device is very high, this is equal to R2/R1. Adding a capacitor in shunt with the feedback resistor, R2, will result in an increase in feedback and a reduction in gain at high frequencies, consequently the circuit will behave as an active **low-pass filter**. Such a filter will pass all frequencies from d.c. to some cut-off frequency (fc), but beyond that point the response will roll-off at 6dB/octave until some point is reached where it becomes asymptotic to zero - see Fig. 3a. If the capacitor is connected in shunt with the input resistor, R1, it will reduce the feedback and increase the gain at high frequencies, and the circuit will act as an active **high-pass filter**. All frequencies above the cut-off frequency (fc) will be passed by the filter, but it will attenuate frequencies between fc and d.c. at the rate of 6dB/octave - see Fig. 3b. (Note: An octave is a 2:1 change in frequency)

A much sharper roll-off of 12dB/octave can be obtained in either type of filter by making both the input circuit and the ratio divider frequency dependent, since each will introduce a 6dB/octave roll-off. The manner in which feedback may be applied to a non-inverting amplifier so that it behaves as an active low-pass filter with a 12dB/octave roll-off is shown in Fig. 4a, and as an active high pass filter with a 12dB/octave roll-off in Fig. 4b.

The configuration required to produce an active **band-pass filter** is shown in Fig. 5a. By carefully selecting the components a high *Q* filter with a very sharply peaked response can be obtained, see Fig. 3c. This can be transformed into a very sharp notch by applying the input signal and the output from the filter to the summing input of an inverting amplifier, see Fig. 5b. When the variable resistor, R4, is adjusted so that the notch frequency coincides with an interfering beat note it will be attenuated by about 40dB. □

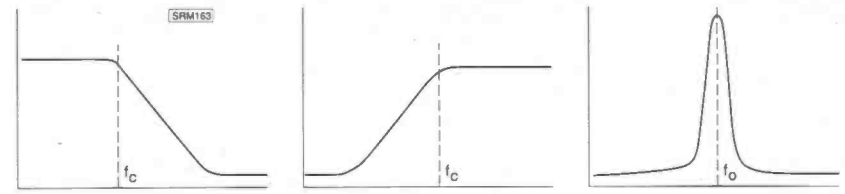

Fig. 3a Fig. 3b Fig. 3c

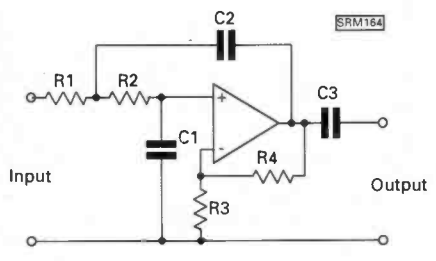

Fig. 4a

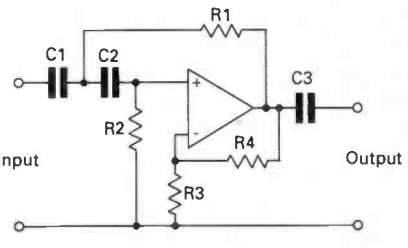

Fig. 4b

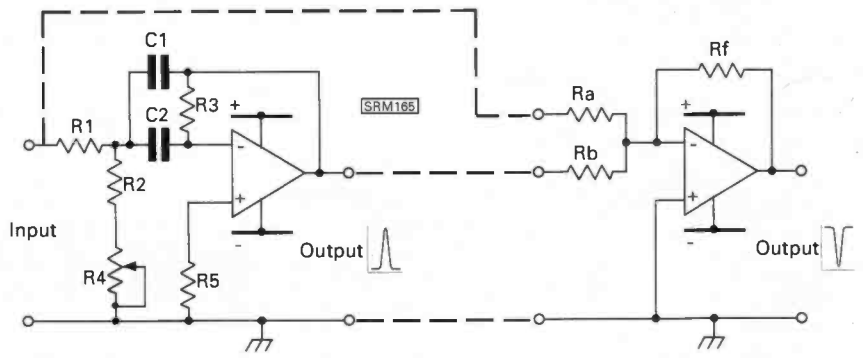

Fig. 5a Fig. 5b

Abbreviations	
a.c.	alternating current
a.m.	amplitude modulation
dB	decibel
d.c.	direct current
i.c.	integrated circuit
i.f.	intermediate frequency
kHz	kilohertz

AMATEUR BANDS ROUND-UP

Paul Essary GW3KFE
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Last time we talked about v.h.f. propagation so this time let's turn to the h.f. bands.

First, make no mistake about it, the sort of propagation modes that occur at v.h.f. are also noted on at least the higher h.f. bands. For example, those of you with beams may be able to note auroral signals, or even for an interesting case, a signal heard simultaneously by aurora and direct.

In very general terms, and talking of the intercontinental stuff, we may say that the lower frequency bands, from Top Band to around 7MHz are active at night; on the other hand, on 14MHz and above, the bands are best regarded as active in daylight. On all the bands, we may hear the local - the ground wave - signal whenever it is active. For a given signal, then, such as my own, one may say it will be audible for a few kilometres all round, then there will be an area when the signal will be inaudible - the skip zone - and then an area where once again my signal will be heard. If the signal is propagated to the Antipodes for instance, involving more than one hop, one would expect alternate areas of signal and silence. Occasionally we may find the skip zone is shortened (short-skip) so the band is full of signals normally just out of ground-wave range. The effect may even be so marked that signals on the outer limits of the ground-wave range are audible simultaneously by direct and sky-wave propagation, and the resulting phase changes at the receiver cause fading. We expect DX propagation on the low bands along an all-darkness path, on the higher bands along an all-daylight path.

Now, the reason for all the long-distance propagation is ionisation of the upper atmosphere and this, as we know, depends on the sun. Thus, in each of the ionosphere layers, the sun's energy is creating the ionisation. Up aloft is the F layer, which splits, incidentally, into F1 and F2 during daylight hours. Various atoms in it are ionised by the energy from the sun and the atmosphere is thin enough that these ionised particles can have the effect of bending a wave so that it changes direction little by little and so returns to earth. If a signal enters the refracting layer at too steep an angle it may not be bent sufficiently to return to earth but instead will be away into outer space. In the daytime the F2 layer does the refracting, at night-time the F layer. The latter is normally about 130-200km above ground, the F2 above 200km. The maximum heights are noted by W6EL as around 250-350km at our latitudes, and up to 500km in equatorial latitudes. The F layers are largely affected by drift in both space and time, not to mention the earth's magnetic field, with the maximum ionisation often occurring well after noon sometimes even into the evening hours. Below the F layer there is the E layer, around 90-130km; here the atmosphere is thicker so although the proportion of atoms ionised is a bit lower, overall there is more ionisation. This applies with even more force to the D layer, up to 90km above us. In the D and E layers the ionisation is very markedly affected by the sun's angle, greatest at local noon, and tending to change very quickly at local sunset or dawn, when the layer ceases to "see" the sun. The D layer is primarily an absorber, the E layer seems to be able to be either an absorber or to refract signals.

Now, as we well know, the sun's effect is related in general terms to the number of spots on its face. The number of sunspots appearing on the sun varies over an eleven year cycle from minimum to the next minimum, although if one allows for the way in which each eleven year cycle occurs on the opposite half of the sun, then it is a twenty-two year cycle. However the eruption of an individual spot does occur at random. Severe solar storm or flare effects can have an adverse effect on things by ejecting particles from the sun which reach us hours later and cause geomagnetic effects and aurora. Note this; we talk of an eleven year cycle, but in real terms eleven years is just the average. We'll continue the story another month.

Set Listening Period

As things turned out, I was away from a receiver on June 11, sampling the delights of Orkney, fortunately others did listen on the bands.

Comfortably ahead in first place was **A. C. Brown** (Barnet) who used three receivers: JR500S, Realistic DX-400 and Trio 9R59D; on the antenna side, a half-size G5RV in the garden, a 28MHz half-wave vertical on the roof and a random length wire in the loft, were each coupled as required to a Global AT 1000 tuner. On the output side a graphic equaliser was pressed into service to clean up the audio a bit. The equipment was good enough to score some 9320 points, through forty countries. Like all the rest, he commented that things weren't particularly good; perhaps his best loggings were AE7H at 0002Z, and JA5AQC heard at 21.35. All continents other than Oceania were noted. Incidentally, a note for the faint-hearts - this was Mr Brown's very first essay into competitive activity.

The runner-up was **Phillip Davies** of Market Drayton, who used an Eddystone 840A which he bought new back in 1958; for antenna a folded dipole 8m long in the roof space, antenna and feeder all being of the 800Ω ribbon. Phillip was quite scathing about the conditions, "Normally I'd have switched off and gone to the gardening!" but his 5652 score included 36 countries and all continents: Phillip's VK was logged at 0638Z on 14MHz. Another juicy one in ZP5JCY was snapped up on 7MHz at 2252.

So, congratulations to both, and thanks to all who sent in entries and comments. I will mention these as I go along.

Letters

First a card from **Ron Pearce** (Bungay) who comments on the use of simple receivers. He notes that ever since the first issue of the revamped *Short Wave Magazine* he has sent reports to the Broadcast Bands section using an 0-V-0 receiver; and I gather Ron is by way of a specialist in these, as his QSL is adorned by the portrait of one of his creations. Ron's latest is a circuit from the thirties, which was called The Hiker's One and which uses a single type 49 valve. During a brief tour of 14MHz, with this little gem, Ron noted 4N4EX, W3SXM, 4X4J, XM1XG, WA1KVA, PY4EY and K6UDI. If only more people would try this route to becoming listeners, numbers would again increase - building and using the simple receiver is fun!

From Muizenberg, South Africa, **Tom Davies** had a sporadic listen during the SLP and as a result logged OE3HPD, DL8PC, IK5FQY, IK3GHW, FF2LY, G4YLO, LU2FXH, W8CUR and KB4T, noting that both the Ws were in Florida. The receiver was an FRG-7, and antenna a dipole cut for the 19-metre band. Perhaps the biggest problem for Tom was that most of the signals heard were beaming to stations to the north of ZS; thus the ones logged were all at S9, but most of the stations they were working were inaudible to Tom off the back of their beams. One notable exception to the rule was 9Q5DE.

Nice to hear again from **Dave Burt** (Bideford) who is in fact a member of IRTS; Dave is a member of Appledore Amateur Radio Club. The gist of his letter is that the C45A heard by Leslie Sargent was in fact a contest call used in WPX by 5B4SA, and believed to have been operating from Nicosia.

This station is also mentioned by Philip Davies (Market Drayton) who confirms that the QSL route is to 5B4SA. Philip heard this one on 14/21/28MHz during the contest. L4H was probably a legitimate contest call from the Argentine, as L4D has been on from there before, and this year L2M was noted too. WPX of course, is a contest which by its very nature brings out new prefixes, since to hold a novel prefix makes a station more attractive than a normal prefix from a rare location. Philip mentions P33ES from Cyprus, 5H0T from Tanzania, OR0TT on Top Band, presumably from Belgium. In response to the remarks about the drop in Top Band support in the White Rose contest, Philip although he is limited in antenna terms, says he had a ball during the CQ 160 SSB contest in February, logging OK5TOP, IB8A, OY9JD who had a special permit for the band covering the contest, IV3PRK, RF6FKF, YV2IF, K1IG, VP9AD, GD4BEG, KX3Q and UZ6AXE, mostly new prefixes, all interesting catches. Top Band is a very interesting band, but to be sure, the s.w.l. who can muster up the enthusiasm to master Morse will find more than the purely 'phone listener.

Dave Gosling (Hemel Hempstead) is studying for the RAE; his listening post comprises a Heath SW7800 receiver, a Lake TU1 a.t.u., and audio processor to sharpen things up a bit, and outside a couple of dipoles and a long wire. Dave had a listen in the SLP with some degree of success, noting some 22 countries. The GK/G4SJ logged as being a query from Corsica, working another G station in EA-land I have to put down to either a mis-hearing or possibly our old friend Slim at work again! Of course mishearing is always a problem on crowded bands, between the QRM on the one hand and the need for very heavy processing late in the receiver chain; the ideal form of selectivity would be a crystal filter in the antenna lead! The reason for this is that once ANY stage overloads and so by definition distorts, it acts then as a mixer, to mix all the signals appearing at its input. The result of course is mainly noise. An attenuator helps greatly, particularly on the low bands. For example on the local 3.5MHz Sunday morning net the noise level is enough to totally smother some of the stations around the other side of the hills; but insert 20dB of attenuation in the antenna circuit, and wind in some more a.f. gain to compensate, and they become weak, but copiable.

B. Greer of Burton-on-Trent has moved from Stafford recently, where antenna problems have delayed the restart. However, operation is now by way of a Butternut HF6V which is ground-mounted, and worked against some 82 radials each of about 2-1/2 metres length; the operating area is the end 2m of the garage; the pick of the crop last month included (14MHz) JX7DFA, 4J1FS, JY6RS, T5GG, (21MHz) S0IDX, HZ1AB, FK/JH6SOR, 5N0GRC, OA4ED, HK4HHG, KM9P/KP2, (28MHz) CX3VB, 9J2WS and CP6XK.

Another SLP

So many of you seem to want this sort of thing.... so for this time try the weekend **August 12/13**. Up to three hours in each day, giving a maximum listening time of six hours in the two days. For a change, any old (amateur) band you like between Top Band and 10GHz! One point per logging on 14/18/21/24/28MHz, two points per logging on 1.8, 3.5, 7 and 10MHz. One point per logging on 144MHz, three points per on 50, 70 and 432MHz, 10 points per on each of the bands above 432MHz. Contacts logged on c.w., RTTY, AMTOR, SSTV count for double points, as will contacts logged on home-brew receiving gear or antennas. For a multiplier, add up the number of countries on each band used, and multiply by the total number of bands sampled. Final score is the sum of the logging points times the multiplier. We recommend a bucket of water to keep the calculator cool! Entries to me to arrive by **SEPTEMBER 18**, to include the log itself, a quick run-down on the gear and the antennas, plus any other comments on conditions, problems or whatever.

THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17

SEEN & HEARD

DECODE

Mike Richards G4WNC
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Readers Letters

Ray Webster, Chesterfield uses a Yaesu FRG-8800 receiver with a Datong FL3 audio filter, the RTTY signals being decoded by a Dragon 32 computer. On the antenna front Ray uses the Datong AD370 active antenna which, although an outdoor model, is currently located in the loft. Despite this restriction, Ray reports very good performance from this compact antenna. In addition to his station details, Ray has sent me a very comprehensive log which I will include in my main database.

Another point Ray makes is that of identifying the station callsign. I'm sure that any of you who have tried to positively identify a station from it's transmission will have noticed the very long periods between callsigns being sent. Ray has a tip for those of you who like to monitor press transmissions like TASS and ADN. These stations usually end their news reports with "END CAST". The trick is to stay tuned after that message and the callsign is usually sent during the following hour. An added bonus for your patience is that you will often find that the callsign direction and frequency of other transmissions from the same agency are also sent. This is obviously a good way of obtaining up-to-date info on yet more press stations. My thanks to Ray for that useful tip.

Final point from Ray concerns the shift measurement of RTTY signals, he finds his Datong FL3 audio filter very useful, as it has a l.e.d. bargraph display which shows the audio spectrum usage of the signal. It is then very easy to read the shift from the scale next to the display. Of course the main use of this filter is to let the wanted signal through unhindered whilst interfering signals are filtered out.

Peter Traynor, Selkirk has written asking for one of my frequency lists, but in his letter he has given some brief details of his station. The receiver is the sophisticated NRD-515 from JRC and this feeds a Codemaster decoder. The antenna is a simple long wire, though Peter is not very happy with the performance. His location in the Scottish Borders perhaps doesn't help but nevertheless he should be getting very good results with that line-up. I would suggest that he checks his antenna, it might even be worth experimenting an a.t.u.

Colin Perkins, Nottingham has a different problem in that he would like to use a v.l.f. (very low frequency) converter with his Sangean ATS-830A receiver. This will enable him to monitor the interesting FAX, RTTY and c.w. stations that operate below 150kHz. If you would like to try your hand at some home construction our sister magazine, *Practical Wireless*, published a design called the *PW* "TAW" in the November '86 issue. This converter frequency shifts the l.f. band up to any frequency you choose between 10MHz and 20MHz thus allowing reception of v.l.f. frequencies or your standard h.f. receiver. For those interested in this project, reprints can be obtained by sending £1.40 to the editorial offices.

If any readers are using v.l.f. converters, perhaps you would like to drop me line and let me know how you are getting on.

The rest of Colin's station comprises a Spectrum computer running J & P Electronics software, though he is currently having a few problems with computer interference. Colin speaks very highly of J & P both with their delivery and after sales service. In addition to h.f. band monitoring he also has a selection of v.h.f./u.h.f. scanners.

Ian Mason has been developing his monitoring station with some rather interesting additions. One of these was a Pocom FTU-2100 which is a RTTY selective filter terminal unit. Rather a long title, but it is used as an external demodulator and audio filter for RTTY and c.w. signals. Ian uses this between the receiver audio output and his Wavecom 4010 decoder. The object of the FTU-2100 is to provide high quality filtering which comes into its own when working under difficult r.f. conditions. The FTU-2100 also has connections allowing an oscilliscope to be used as a tuning aid. Ian reports that he is very pleased with the FTU-2100.

On the FAX side, he has just received the latest dedicated M-900 decoder from Universal Shortwave Radio. The M-900 superceeds the M-800 model that I have mentioned before in this column. One of the enhancements of the new model is that a simple RTTY and SITOR decoder has been built in. As with the previous model, received pictures are displayed on an Epson compatible printer which in Ian's case is a Brother model 1209.

Having set himself up with a very nice station, Ian is now busy learning about all the new modes that are available to him. I shall of course be expecting to see some pretty interesting logs from Ian!

Malcolm Rivers from Maidstone has just re-discovered short wave listening after a lapse of several years. His question is quite simple - what is RTTY and what do I need to receive it? A complete answer to that question would take rather more space than I have at the moment so for a simple explanation of what RTTY is try the booklet *RTTY The Easy Way* which is available from BARTG(1) price £2.50 (members) or £2.75 (non-members). Although this publication is obviously heavily biased towards amateur RTTY, the principles are the same for commercial RTTY. As far as equipment is concerned, the Sony 2001 that Malcolm is using at the moment should be OK, but he will need something to decode the RTTY output from the receiver. One of the simplest solutions is possibly to use the ERA Microreader, which seems to be popular with quite a few readers. The only snag here is that the display is quite small so I would recommend that you try before you buy. The next alternative is to go for a computer i.e. a Spectrum and some RTTY software.

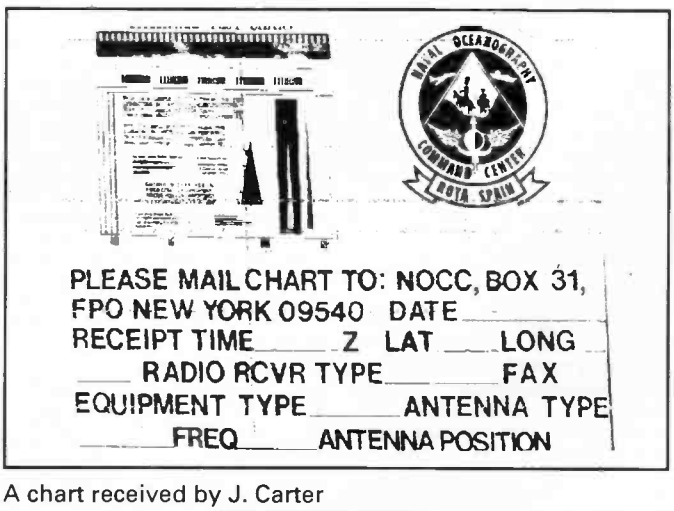
If your pocket is deep enough then one of the fully automatic decoders like the Wavecom or Pocomtor range make life very easy. The other alternative is to check out the readers letters in this column and you will soon see what set-ups are popular.

Utility Listening in South Africa

I have had several contacts with listeners in South Africa, the latest being from **Francois Steyn**, Hillbrow S.A. Francois is the Editor of the official magazine of the South African DX Club titled *The South African Short Wave Listener*. The club has been running since the early sixties and is open to anyone with an interest in short wave listening. The membership currently stands at about 110 which is quite good for a club of this type. As well as sending me some general information about the club, Francois also sent me a copy of the June magazine and I must admit that for such a small club the quality of the material was very good.

There seems to be several monitoring restrictions in South Africa but these mainly effect the v.h.f. and u.h.f. bands where the 144MHz amateur band is the only band that can be legally monitored.

So if you're interested in joining the club, sample copies of the magazine can be obtained by sending three IRCs to Francois (2), whilst full membership costs 25 IRCs and includes 11 copies of the magazine.



A chart received by J. Carter

QSLs

Some of you who are perhaps new to short wave listening may have heard of QSL cards as used by amateurs, but might be a little confused as to their use with commercial stations. In actual fact, the purpose in both cases is the same and that is to confirm reception at a particular location. The reason for the term QSL is simply that this is the Q code for confirming, or requesting a confirmation of a contact. The reason that commercial stations want these reports is that it gives them valuable information on the coverage of their station. If you are interested in FAX reception you will find that these stations will occasionally send a test chart and they usually include the QSL address and ask you to send a copy of the chart to the station.

If you would like to QSL with a station the transmission details you need to include are:

Frequency, mode, time, date, signal report, location and receiving equipment.

There are several sources of station addresses and if you use the Klingenfuss *Guide to Utility Stations* there is quite a good selection there. One of the problems of course is keeping these addreses up-to-date and there isn't really an easy answer, though as you will see in the next section I do try to publish any updates I receive.

Jan Nieuwenhuis has sent me some revised QSL addresses for stations he has received QSLs from over the past month.

NOAA, National Weather Service Office, PO Box 29879, Honolulu, Hawaii 96820. c/o Andrew K. T. Chun (Deputy Meteorologist)

Klapeida Radio, c/o Vitas Krasnickas, PO Box 673, SU-235815 Klapeida, Lithuania, USSR.

A note from Vitas Krasnickas on this one - the USSR coastal stations do not officially verify reception reports. However, he is willing to verify reports privately, if you include some Western European stamps for his collection!

Companhia Portuguesa Radio Marconi, SÁRL (CPRM), Divisao de Radio, Apartado 2778, Praca Margues de Pombal 15, P-1119 Lisboa Codex, Portugal.

US Naval Oceanography Command Centre, NOCC, Box 31, FPO, New York 09540, USA.

One final word on QSLs, you will need to be patient as some commercial stations are very slow with their replies - a bit like my mailbag really!

Station Schedules

More schedules again this month from Jan Nieuwenhuis and **J. W. Carter**.

The first is the Morroccan press agency Maghreb Arabe Presse (MAP) which transmits news reports in French and English using 59 baud RTTY.

7.8424MHz CNM20/1X + 10.213MHz CNM29 1000UTC-1130UTC and 1530UTC-1700UTC News in French. 1200UTC-1400UTC news in English.

10.5952MHz CNM36/X9 1530UTC-1700UTC News in French.

10.6341MHz CNM37 1530UTC-

1700UTC News in French.

14.5744MHz CNM59/X9 1200UTC-1400UTC News in English.

14.760MHz CNM61 1000UTC-1130UTC News in French. 1200UTC-1400UTC news in English.

15.7527MHz CNM66 1000UTC-1130UTC and 1530UTC-1700UTC News in French. 1200UTC-1400UTC news in English.

15.9999MHz CNM69/1X 1000UTC-1130UTC and 1530UTC-1700UTC news in French. 1200UTC-1400UTC news in English.

16.1341MHz CNM71/9X 1000UTC-1130UTC News in French. 1200UTC-1400UTC news in English.

18.2209MHz CNM76/X9 1000UTC-1130UTC News in French.

18.4961MHz CNM80/X11 1200-1400UTC News in English.

The second schedule is for Royal Navy Oceanagraphic Centre Northwood. This stations transmits weather FAX chart to the following general schedule.

2.81385MHz 1630UTC-0730UTC September 30 to March 31.

3.43685MHz 1930UTC-0400UTC April1 to September 29 and 1530UTC to 0830UTC for the rest of the year.

4.24785MHz continuous.

6.43685MHz continuous.

8.49485MHz continuous.

12.74185MHz continuous April 1 to Spetember 29 and 0730UTC-1630UTC for the rest of year.

16.93885MHz 0400UTC-1900UTC April 1 to September 29 and 0830UTC-1530UTC for the rest of the year.

Frequency List

As usual I have a few frequencies for you to watch out for. The format used is: frequency, mode, speed, shift, callsign, time and notes.

5.452MHz FAX 120 576 HZN 2050UTC Jeddah Meteo

7.52MHz RTTY 50 ? ? 0823UTC TASS Moscow

7.85MHz RTTY 50 ? ? 1911UTC ATA Tirana, Albania

10.292MHz FAX 120 576 NKW 2050UTC USN Diego Garcia

11.536MHz RTTY 50 ? HMF49 1915UTC KCNA Pyongyang

11.638MHz RTTY 50 ? DDK8 1728UTC Hamburg Meteo

12.73MHz FAX 120 576 NMC 0525UTC USCG San Francisco

14.547MHz RTTY 50 ? ? 1036UTC Kyodo, Japan

14.699MHz RTTY 50 ? ? 1117UTC INA Baghdad, Iraq

18.04MHz RTTY 50 ? ? 1101UTC AA Ankara, Turkey

19.9149MHz RTTY 75 AEF069 1008UTC VoA Tanger

20.736MHz FAX 120 288 LSA600 2055UTC AP Buenos Aires

20.96MHz RTTY 50 ? ? 1045UTC Kyodo Singapore

Don't forget if you want a copy of my frequency list, then just send three stamps to the address at the head of the column.

Finally, my thanks to the following who have supplied some comprehensive logs for inclusion in the frequency list: **Rob Filby, Chris Swann, Chris Norfolk,** Jan Neiwenhuis, **Gordon Spencer** and **Harry Jubb.**

1) BARTG Pat & John Beedie, Ffyonnonlas, Salem, Llandeilo, Wales SA19 7NP

2) Francois Steyn, PO Box 17260, Hillbrow 2038, South Africa

THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17

INFO IN ORBIT

Lawrence Harris
5 Burnham Park Road, Peverell, Devon PL3 5QB

There are several events to cover this month including good news on the Meteosat 4 front, news of the GOES satellites, continuing operations on the polar orbiting weather satellites and some requests for advice.

Beginners

Maarten Hoogesteger is a mechanical engineer who lives in Australia and sent a letter (addressed to me at Plymouth, UK!- well done the PO). He is very interested in receiving and tracking satellites over Australia but "only" has an IBM PC and wonders where to start. I think that the best place to start for someone who has a computer is to purchase satellite tracking software from one of the various sources and join one of the clubs that cater for this interest.

Running such software and trying out the options will give you a feeling for the different types of satellite orbit. Experiment by changing the orbital inclination, starting from nearly zero, and increase it towards 90 degrees and you will see that satellites in orbits with low inclination (near equatorial) will never pass near the UK, which has a latitude of around 52 degrees. The satellites with higher inclinations, including the Meteors and the NOAAs pass over us several times per day.

There are many sources of satellite software as a glance through SW*M* will reveal, and most computers are included. Software varies in capability but look to see how easy it is to update the Kepler elements for individual satellites and whether it displays tracking information in the way you wish - either giving pass times, directions and elevations or showing the track (footprint) superimposed on a screen map of the world.

When I first started tracking weather satellites some years ago there was no software available for my Amstrad so my son Tim and I wrote a program to calculate start and finish times plus elevation and direction. This program enables me to know exactly where any satellite is throughout a pass and I've been running it since then.

Des Watson G3YXO is the membership secretary of the Remote Imaging Group which publishes a quarterly magazine on weather satellite operations. He can be contacted at "Norton", Gote Lane, Ringmer, Nr Lewes, East Sussex.

Voyager 2 Encounter

Some exciting news from Pat **Gowen G3IOR** who writes that when *Voyager 2* does its Neptune fly-by on August 25 it will be relaying pictures to the Jet Propulsion Laboratory in Pasadena, California which will be re-transmitted on amateur slow-scan television by W6VIO, the club station of the JPL. Before, during and after the time of closest approach (TCA) they will transmit standard amateur SSTV on a frequency of 14.235MHz. Pat comments that if solar activity permits, the California to Europe path should be good at the TCA time and good pictures are possible.

MIR

An article written by Soviet scientist **Yuri Semenov** points out that during the 3 year long flight of MIR, some 5000 scientific study sessions have been held using more than 60 kinds of research equipment, involving many disciplines from astrophysics to biology. It has been manned for about 880 days out of the 1170 days or so that it has been in flight. In September, a module is scheduled to be launched carrying a new videospectral complex to be controlled by radio from earth. It will be part of a permanent environmental monitoring service. Thanks to APN for this information.

Listeners to the 143.625MHz MIR voice communication link will know that while MIR remains crewless the link is absent. Pat Gowen reminds us that MIR can still be tracked both visibly and by listening for the transponder beacon on 166.000MHz ± 125kHzwhen MIR is within range of the USSR command.

Weather Satellites

We currently have all 7 polar orbiting weather satellites in operation with just minor changes taking place from time to time.

Those listening to NOAA 10 on 137.50MHz in late May will have noticed that it sounded different compared to its normal sounds. It was outgassing its infra-red sensors and so transmitting adjacent visible pictures instead, and this could be clearly heard. NOAA 9 took its turn to transmit 2 visible pictures on June 12. Meteosat also undergoes periodic decontamination of its sensors.

NOAAs 9 and 11 which normally both transmit on 137.62MHz are once more coinciding by a few minutes, leading to some mutual interference when 9 is left on.

Mets 2/16 and 2/17 continue to transmit on 137.40MHz with some slow scan infra-red transmissions being heard on several occasions when the craft is in eclipse. For those simply listening to the satellites it may help to know that in early August, Met 2/16 will be passing northbound over the UK during mid-afternoon and Met 2/17 will pass southbound during the morning. Met 2/18 will pass northbound during the morning, and Met 3/2 will also travel northbound around late morning. Okean, the oceanographic satellite, will be passing on our eastward side during the morning, travelling northwards.

Met 2/18 was apparently off for several days during early June but I heard it on the 14th as soon as I switched on the scanner for a quick look before supper - there it was on 137.30MHz at 2112UTC. I checked my predictions to confirm that it was 2/18 and not a new launch.

Talking of new launches, for some years now the Russians have put up a new oceanographic satellite each July/August period so we may shortly hear a new transmission from one. I haven't heard Okean for months now despite regular recording checks and I am not aware of anyone else having heard it. This series usually transmits near 137.40MHz but with 2 Mets both using that frequency I would expect some other frequency to be used, or perhaps the Mets frequencies may all be swopped around?

Frequency Summary

NOAAs 9 and 11 on 137.62MHz
NOAA 10 on 137.50MHz
Met 2/16 and 2/17 on 137.40MHz
Met 2/18 on 137.30MHz
Met 3/2 on 137.85MHz
Okean, when transmitting, on 137.40MHz.

Pictures

A picture of the Peru region from a GOES-E south-east format visible-light scan is shown in Fig. 1. It shows clouds and surface material off the western coastline.

A Meteosat-3 picture, format C3D which includes Armeniais in Fig. 2, Fig. 3 is a NOAA 9 picture showing the UK, taken last summer and Fig. 4 is a close-up of the southwest UK, also from NOAA 9 last summer.

Remember to send in any pictures that you would like published in this section or I may have to keep on using my own!

GOES Operations

The GOES-E satellite carries a bulletin board which gives the latest status of each NOAA satellite. If you can't receive GOES then you can get a summary of their status by ringing Weatherwatch on 025-683-448 during the weekend or evenings.

GOES-5 is the east wefax relay satellite that you can tune into if you point your dish, or equivalent antenna for 1691MHz, towards the western

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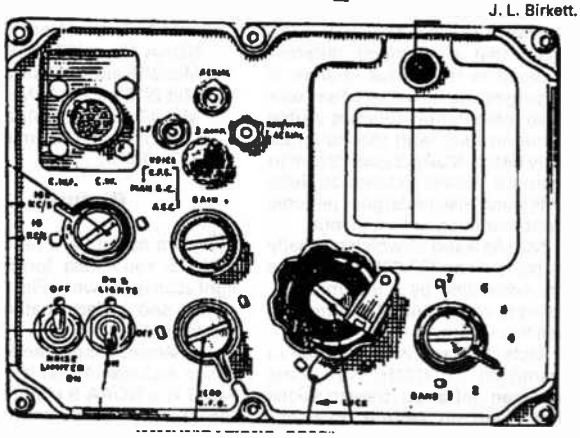

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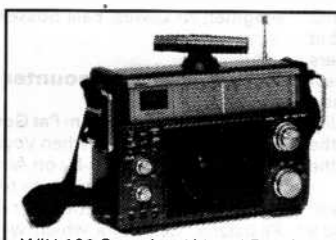

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horizon and up a few degrees. It is positioned at 65 degrees west longitude and broadcasting wefax and other pictures including its own timetable at 1055UTC. Its signal strength is rather variable!

The next GOES is currently scheduled to be launched in March 1990 but is likely to be delayed until the July. It will be three axis stabilised rather than the current spin stabilised. This column will publish more details about GOES data and operations at a later time.

Meteosat

I received a call from George of Axminster (sorry I didn't catch your surname) on June 6 asking whether Meteosat-3 was operating. In fact there have been regular tests on both Meteosat 3 and 4 for several weeks and on occasions both have been off, though not for very long. George was considering dismantling parts of his equipment to fault find so I was glad to help.

I also once spent quite some time trying to trace a "fault" when suddenly the signal returned and I realised that tests were in progress. Met-3 also had problems with some of its transmitting dipoles.

The new Meteosat-4 came into full operation on Monday June 19 giving a good, steady signal strength, and with a new transmission schedule.

In common with the other geostationary weather satellites Meteosat wefax and DCP data is now broadcast on 1691MHz, called channel A1. Digital transmissions - the high resolution images, are broadcast on channel A2 on 1694.5MHz as are the GOES relay pictures that are received at CMS Lannion. These relayed images are also increased in number.

With the good signal from Meteosat and the clear skies of recent days I have obtained some very good images of the whole earth and hope to include one in a future column.

Main Changes

There are several changes to the schedule of transmissions but the following will be of particular interest.

DTOT - the whole earth infra-red pictures are now transmitted every 3 hours starting at 0030UTC.

CTOT - the whole earth visible pictures are increased to 3 per day at 0938, 1238 and 1538UTC.

ETOT - the water vapour whole earth pictures are transmitted every 3 hours starting at 0038UTC but switching to CTOT during the day as given above.

My thanks to Mrs Valerie Newell of Weatherwatch at Lasham Ground Station for the Meteosat data and also to the National Oceanic and Atmospheric Administration for details of GOES operations.

Teletext Space News

Space and satellite enthusiasts will be aware that until recently both Oracle and Ceefax have run space news pages carrying summaries of space activities. Oracle continues to provide this service at the weekend on page 568. Sadly Ceefax stopped their coverage some weeks ago, so I enquired about their reasons and was surprised to receive a letter from Ceefax describing the removal of these pages as leading to "...a more effective News and information service". Remembering how many pages are available I am disappointed that the enthusiasm for space information is apparently to be ignored. Black mark Ceefax.

Reports

Please continue to send in reports and photographs of your satellite activities, together with any suggestions for particular items that you would like to see.

THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17

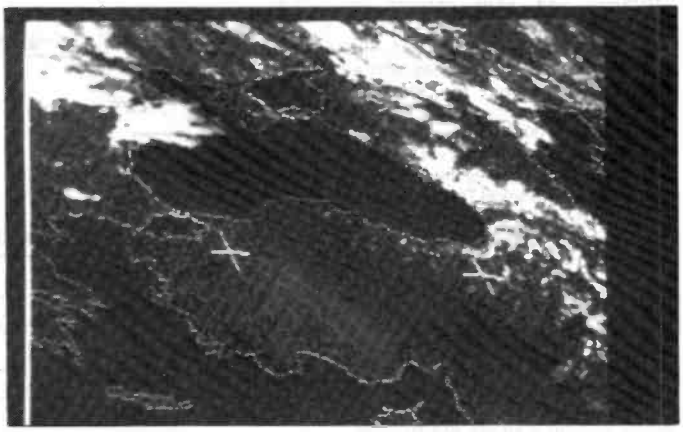

Fig.2

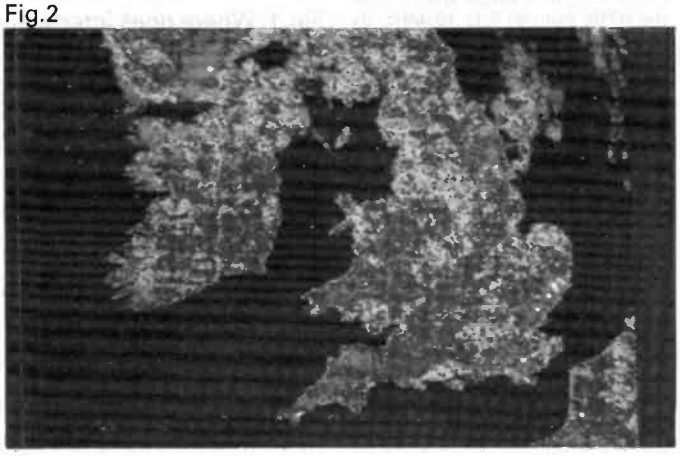

Fig.3

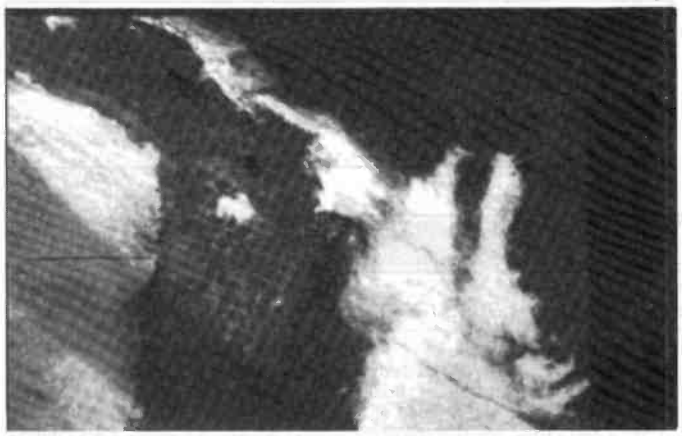

Fig.1

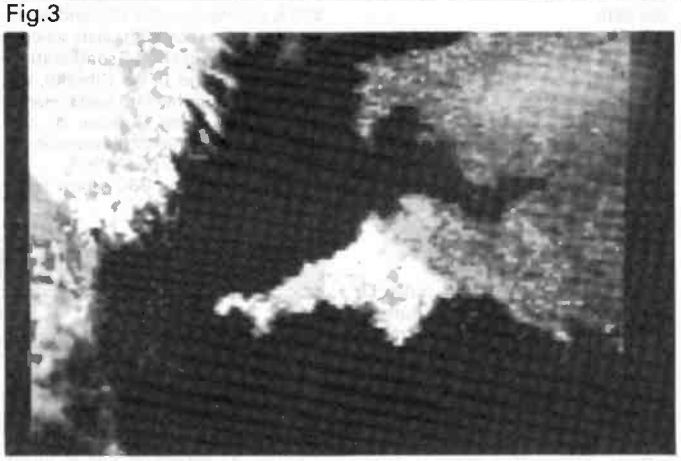

Fig.4

BAND II DX

Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

For those of you with modern scanners, ex-military v.h.f. communications receivers like the Halicrafters S36 or the R216 or the civilian Eddystone 770R may wish to check the East European f.m. broadcast band (66-73MHz) during the current Sporadic-E season. Various programme networks can be found between each megahertz from transmitters in Bulgaria, Czechoslovakia, Hungary, Poland and Romania. In addition, programmes are transmitted from Albania on 67.8 and 70.1MHz and Bulgaria, Poland and Romania have transmissions just outside this range on 65.84MHz, 65.99MHz and 65.96MHz respectively.

Between 1730 and 1800 on May 30, I logged 7 such signals, at amazing strength, with the typical deep and sharp fading produced at the beginning or toward the end of a Sporadic-E disturbance. During the evening of June 5, I counted 18 of these stations plus weak television sync. pulses on Ch. R3 (vision 77.25MHz-sound 83.75MHz) and 13, plus Ch. R3 sync. at 1830 on the 11th. However, the first really big event was still to come and it began around 1530 on the 12th when 16 East Europeans came up and, two hours later, I found 56 of them within this range, overlapping each other and exceptionally strong. In addition, there were television pictures and sound from the USSR on Ch. R3, pictures partly obliterated by co-channel interference and sound on Ch. R4 (vision 85.25MHz-sound 91.75MHz) and sync.pulses and sound on Ch. R5 (vision 93.25MHz-sound 99.75MHz). Similar openings, but with 59 and 71 East Europeans being counted respectively, plus the

SEEN & HEARD

aforesaid TV signals, occured during the mornings of the 16th and 17th.

Reports

May 19 was a fine hot and sunny day, the pressure was high around 30.2in (1022mb) and while enroute to Hartfield, Sussex, we stopped at a high point, some 200m a.s.l., in Ashdown Forest for a coffee and a spot of DXing with the Plustron TVR5D. Apart from a weak French station near 100MHz both Bands II and III were normal. However, during the afternoon, while in the grounds of Standen, a National Trust House in East Grinstead, Joan and I observed that those long wispy clouds were gathering in an otherwise clear blue sky. "Bad weather to come," said Joan, "yes and with luck a trop-opening," I replied. At 0830 next morning, Band II was open and I counted 17 very strong continentals, plus co-channel "warbles" at 90.9, 92.0 and 93.1MHz and Invicta FM and Radio WM, in a single sweep, with the R216, from 87.5 to 103MHz. By 1530, a few foreign stations could still be heard beween 99 and 103MHz.

In addition to a strong BBC Radio Bristol, various Dutch and French stations occupied several spots between 87.5 and 98MHz at 1930 on the 25th. At 0915 on the 27th, I found at least 20 continental voices scattered throughout the band.

In New Radnor **Simon Hamer** heard the Berlin relay of the BBC's World Service (90.2MHz) on the 20th, Radio Denmark's Programme 1 *News In English* on the 27th and FM Radio 4 from Limavady, BBC Radios Cornwall, Devon, Lincolnshire, Norfolk, Scotland and Ulster, Manx Radio from the Isle of Man, ILRs Broadlands, Downtown Radio (Belfast) and RTE's FM1, 2 and 3 on the 28th.

The pressure at 0800 on June 9 was 30.1in (1019mb) and although the day was bright, clouds were beginning to form and, as we left home at 1100, Joan and I saw a rather special solar halo of which two thirds was covered by individual clouds and the remainder was in clear sky

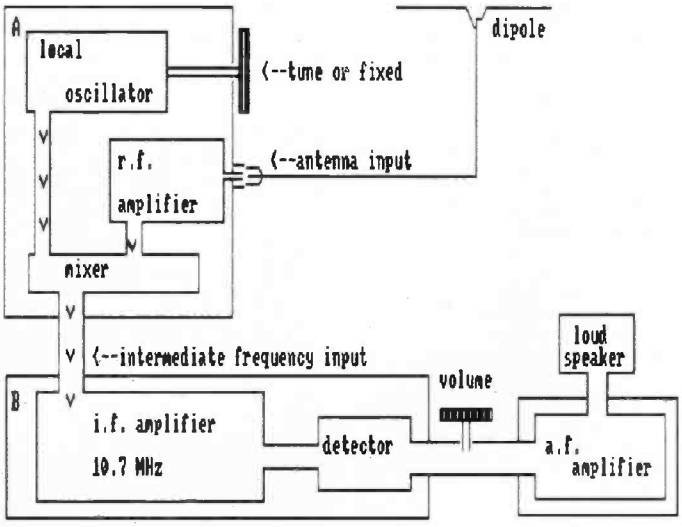

Fig.1: Where does interference come from?

displaying rainbow colours. I checked Band II while parked among trees in Surrey and heard a very strong French voice around 100MHz. Again those tell-tale wispy clouds were gathering and around 1500, while in the grounds of Polsden Lacey, we again saw this colourful solar halo. By the time we reached home the pressure was down to 30.0in (1015mb) and black rain clouds were filling the sky. At 1100 on the 10th, continental stations plus the "warbles" were heard through the band and, after an overnight mist, many of these signals were there again at 0830 on the 11th.

Simon Hamer logged stations from all Scandinavian countries and West Germany including AFN and BFBS, via tropo, on the 10th and heard Arabic, Italian and Spanish voices, plus the Gibralta Broadcasting Corporation and BFBS Gibralta, via Sporadic-E, on the 11th and Iceland, Italy, Norway and Sweden on the 12th. Several continentals were heard in Band II early on the 17th.

"Although the BBC's new local radio station CWR (for Coventry and Warwickshire) is not scheduled to start programmes until November, the BBC is testing in stereo on its new frequencies," writes **Tim Wallace** (Leamington Spa). He has heard their carrier and quarter hour announcements, "This is a BBC test transmission on 94.8 and 103.7MHz f.m."

Interference

At various times, Neil **Oakley** (Whitstable) hears sounds like "someone tapping a regular light rhythm on a drum, followed by a noise like a firework rocket falling" or "more like a computer than the same rocket noises. This is all over the v.h.f. band except where stations are broadcasting, but most clearly around 93.7MHz," said Neil. Although I have not heard these symptoms personally the problem seems typical of i.f. breakthrough. This means that signals are being picked up by the receiver at it's intermediate frequency (most likely around 10.7MHz) and then travelling through the detector and audio circuits to the speaker. The block diagram in Fig. 1, drawn with a Trojan Cadmaster light pen on my Amstrad PCW, shows an exagerated layout of a superhetrodyne receiver, where the local oscillator, in Box A, can be varied by a tuning capacitor or, as in special purpose receivers, fixed by locking it to a crystal. Whichever system is used the frequency of the incoming signal will be above or below that of the local oscillator. Both signals are fed to the mixer which in turn provides a single output, known as the intermediate frequency, to Box B. For example, if the wanted station transmits on 97.7MHz and your receiver's local oscillator is generating 80MHz, there will be an intermediate frequency of 10.7MHz. This latter signal now enters Box B and is amplified by several stages at 10.7MHz. Now take another look, if the screening between Boxes A and B was faulty then signals being transmitted around 10.7MHz could be picked up, amplified and come through your loud speaker. If this is the case then you should consult a good radio-engineer. While on this subject, it is worth asking at a large Post Office for the free copy of the DTI's publication *How to Improve Television and Radio Reception*. Even if this book does not solve your immediate problems it is definitely worth having on the technical bookshelf.

THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17

TELEVISION

Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Band I

From his home in Meerut, India, **Lt. Col. Rana Roy** received weak, fluttery, smeary and/or multiple image pictures (typical F2 propagation) from the west around Ch. E2, at 1930 on March 14, 1700 on the 16th and 17th, 1650 on the 20th, 2345 on the 21st, 1500 on the 28th and 1400 on May 2. Similar propagated signals were received from Malaysia, which he indentified by the figure 3 superimposed at the bottom of the picture, on March 10, 12, 15, 24, 26, 29, 30, 31, April 1, 2, 9 and 10. Among the items seen were adverts, films, news, plays and sport. At 2040 on April 8, on Ch. E3, he noted a rolling picture and after stabalising it with the hold controls Rana thinks it was 525-line and probably a Ch. A2 station coming from Canada or the USA. These pictures faded away at 2115 and he reports similar signals, around Ch. E3 between 1700 and 1730 on May 1. In his letter of May 31, Rana said, "There has not been much DX in May. There has hardly been any Sporadic-E. Whatever we have had has been weak and for not more than 2 hours. F2 reception has reduced considerably though we are still getting some from SE Asia." Prior to mid-June Rana, we too had only limited outbreaks at the start of the 1989 Sporadic-E season. Although, **Bob Brooks** (Great Sutton) saw a film from Italy, Breakfast TV from Spain and news from the USSR on the 18th, a cowboy film from Italy on the 22nd, news from Italy and the USSR on the 25th, Breakfast TV from Italy and Spain and test cards from Finland and Sweden on the 26th, programmes from Italy and Spain on the 28th and the Prague log from Czechoslovakia and a Russian clock caption, showing 2100, around 1800 on the 30th. In Basingstoke, **John Woodcock** received pictures from Italy and Spain on most days between May 18 and June 14 and writes, "During the early part of the month pictures were strong for short durations fading to noise with regularity, but, in the last week signals persisted for longer periods." Neil Purling (Hull) logged test-cards from Finland (YLE TV1) on Chs. E3/4 respectively at 1050 and 1250 on May 26, Sweden (Kanal1 Sverige) on Ch. E2 at 1553 and 1255 on the 24th and 30th. He saw idents from Italy (RAI) and Yugoslavia (RTV Ljubljana) on Chs. Ia and E3 between 1900 and 2003 on the 20th and the opening titles of *Santa Babra*, a soap opera from Spain's TVE, on Ch. E2 at 1030 on the 26th. In addition, Neil found the Russian news caption BPEMR on Ch. R1 around 1915 on the 25th and 1545 and 1801 on the 30th, plus CNOPT (sport) and a clock showing 3 hours ahead of UTC (Moscow area) on the 25th and 30th. Neil reminds us that the Soviet news captions BPEMR is Vremye or Time and HOBOCTN is Novosti. On the 30th he saw Mr Gorbachov's speech to the Supreme Soviet via Sporadic-E on Ch. R1 and later on BBC TV news. Like Edwina and Tony Mancini (Belper), I also received strong pictures and sound of Mr. Gorbachov's speech, followed by a music programme with a group of people playing harps. I saw news about China, possibly from the USSR, on Chs. R1/2 at 1950 on June 5 and the TSS UEIT test pattern, with deep and slow fading, during a brief opening at 0945 on June 6. Each time I heard the Ch. R1 sound, by tuning the R216 to 56.25MHz. I saw part of a Danny Kaye film from Spain, with the TVE logo in the bottom right hand corner, at 1520 on the 10th.

Pictures, often in colour, were predominant on Chs. E2/3/4 between

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Fig.1. Netherlands

Fig.2. Netherlands

Fig.3. Netherlands


Fig.4. Netherlands

Fig.5. Netherlands


Fig.6. Netherlands

Fig.7. Netherlands

Fig.8. Netherlands

Fig.9. W. Germany

Fig.10. W. Germany

Fig.11. Italy


Fig.12. Hungary

1830 and 1930 on the 11th and at 1900 I saw the caption Uppdraget Kanal 1/ Noje 10903 Stockholm. This was followed by an American film with, I assume, Norwegian sub-titles.

Mike Bennett (Slough) received test-cards and/or programmes from Finland on May 26; Italy on the 10th and 27th (opera) and June 5 (weather) and 6 (pop music); Spain (dancing, films, Madrid news, pop-music, quiz and tennis) on May 26 and 27 and June 5, 6 and 11 and Sweden on the 26th.

Among the DX gathered by the Mancinis was Czechoslovakia's CST Praha TV1 logo, the Norwegian regional Bremanger, adverts from Eeesti TV and Hungary, cartoons, children's programmes, a regional news followed by a *Falcon Crest*, sport and a variety of entertainment from Spain and the Eesti ETV and Free Eesti logos news and sport from the USSR. They reported, "We have seen our first advert on Eesti TV, it looked like a potted meat one. It came over after BPEMR at 1900 tonight (12th). Also they were pushing the Free Eesti message. Their logo is also changed to ETV Tallina."

From New Radnor **Simon Hamer** sent an extensive log covering the Sporadic-E openings on May 16, 18, 20, 26, 28, 30, June 3, 8, 10, 11 and 12. This included pictures from Albania (RTSH), Austria (ORF on Ch. E2A 49.75MHz and E3 [relay?]), Czechoslovakia (CST), Finland, France (TDF Canal+), Greece (ETP), Hungary (MTV), Iceland (RUV), Ireland (RTE), Italy (RAI and private), Norway (NRK), Poland (TVP), Portugal (RTP), Romania (TVR), Spain, Sweden (SVT), Switzerland (+PTT/SSR1 and +PTT/ SR6-1), USSR and Yugoslavia (JRT). Highlights for Simon came on the latter two days. On the 11th, the prevailing Sporadic-E extended its influence suddenly, for about 25 minutes, into the lower end of Band III when he saw Arabic programmes with captions on Chs. E5/6/7, test cards from Algeria (RTA), Libya with a clock caption on lower part, Morocco (RTM) and Tunisia (RTT) with Arabic script. Simon checked this band when he heard Arabic and Italian voices in Band II. On the 12th he logged JTV Suweileh, from Jordan, on Ch. E3.

Sporadic-E fluctuated for most of the 16th and 17th when I saw test-cards from Finland, Sweden and the USSR and frequently observed chaos on the televison channels in Bands I and II. While "having a brew" in Wakehurst Place car-park, Ardingly, Sussex, the Plustron TVR5D using its own rod antenna revealed a mixture of pictures plus a test card with the inscription 1SR-P in a pannel to the right of the circle on Ch. E2. Any ideas readers? Another typical sight around 1000 on the 17th was a cartoon film frequently changing places with a strong colour test card from Sweden. More about these events next time.

Tropospheric

"On May 22nd a large high pressure area of 1036mb (30.6in) was situated over Denmark and over much of northern Germany," wrote **George Garden** (Edinburgh) from his home near Laurencekirk. About 1700 he transported his TV gear to his favourite DXing site on Cairn O' Mounth. "It was a great opening in UK as well but a very extensive one from Europe lasting from about 2000 till late evening," said George. By

SEEN & HEARD

changing his antenna polarity from horizontal to vertical around 1800 he logged colour pictures on Ch. 29 from Border TV's Eyemouth transmitter and Tyne Tees from Bilsdale. By 2000 George noted interference on most channels so he turned his beam toward the continent and received very strong colour pictures from Germany and Holland. Many Dutch transmitters were coming up and among the programmes he saw during this memorable DXpedition were adverts, Figs. 1 and 2; followed by *Postbus 51*, Fig. 3; news on the Veronica Channel, Fig. 4, which is part of Nederland 3 and the news idents *Half 11 Journaal* Fig. 5 and *Den Hag Vandaag* Fig. 6. This opening continued throughout the following day because, at 0857, **David Glenday** (Arbroath) received a Nederland 3 caption, Fig. 7, on Ch. E30; a teletext page, Fig. 8 from the Smilde transmitter of Nederlands 2 at 1454 on Ch. E47; news (*Heute*), Fig. 9, from West Germany's ZDF at 1500 on Ch. E33 and weather from their NDR1 network, Fig. 10, at 1700 on Ch. E51.

Edwina and Tony received various pictures, including a cowboy film, from France (Canal+) in Band III on May 27, 28 and 29 and June 6 and 7. Around 0900 on May 20, I received a programme, followed by a logo and a test-card, from Belgium (RTBF1) on Ch. E8 and a test-card and later programme from BRT on Ch. E10. Overnight some u.h.f. channels suffered from co-channel interference and at 0330 I received strong colour pictures from Central TV on Chs. 24 and 29. As the high pressure varied toward the end of May and toward mid-June, I made frequent checks on Bands III, IV and V and often found programmes and test cards from Belgium and Holland in the v.h.f. band. At 0400 on the 28th, the sun was rising and co-channel interference began overpowering LWT on Ch. 21. So, during the following hour, I carefully tuned the u.h.f. band with the D100 ahead of a Panasonic v.c.r. and realised that this is a good time for DXing because most "local" stations are off air and the band is relatively clear. However, armed with the *Daily Mirror's* programme guide, I saw bits of *Garrison's Gorillas* from Anglia TV (Ch. 23), *Indy Cart Racing '88* from HTV (Ch. 61) and *Magic Magic* from Central TV around Ch. 42. At 0830 on June 11 and 17, I logged negative pictures from France (Canal+) on Ch. L5 and a test-card from Belgium on Ch. E8. I saw negative faces and text on Ch. L9, with my Plustron, while parked at 1730 on the 16th.

As usual, Simon Hamer had a good haul of v.h.f. and u.h.f. transmissions from Belgium, Denmark, France, East and West Germany including several regionals, Holland, Luxembourg (RTL Plus), Norway and Sweden during the good conditions on May 21 and 26 and June 10.

SSTV

During May, **Fred Pearce** (Driffield) logged himself slow scan pictures from two new countries, France (F3RT) and Romania (YO2IS) on 14 and 21MHz respectively. Fred's detailed reports, with photographs of signals have earned him QSL cards from stations in Italy (I3XQW) Fig. 11 and Sweden (SM5EEP). Earlier in the year he copied a QSO between stations Germany and Hungary, Fig. 12.

THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17

LONG MEDIUM & SHORT

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The time system used by international broadcasters throughout the world is known as Universal Co-ordinated Time (UTC), which for all practical purposes is the same as Greenwich Mean Time (GMT). To avoid confusion, all times in LM&S are therefore quoted in UTC.

Earlier in the year, British Summer Time (BST) commenced in the UK, which is one hour ahead of UTC and this appears to have confused some UK listeners as there is a one hour error in their reception reports. The easiest way to avoid this problem is to place a small clock by your receiver and set it one hour behind the BST shown on other clocks in the house - it will then always display UTC. Please make quite sure that you quote UTC in your reports for LM&S.

Long Wave DX

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT).

Test transmissions from Atlantic 252, the new 500kW l.w. station in S.Ireland can be expected on 254kHz during August and no doubt reception reports will be welcome. The station, which has been built as a joint venture by RTE and Radio Luxembourg, should be fully operational in September.

A holiday in Goldhanger, Essex enabled **Lez Chipperfield** (Stourbridge) to check the band from a new location. Although eight stations could be heard at any time, he found that six additional stations became audible after dark, namely Kaliningrad, USSR 171; DLF Munich, W.Germany 207; Oslo, Norway 216; Konstantinow, Poland 225; Kalundborg, Denmark 245; Minsk, USSR 281. He was surprised to find that the broadcasts from Radio Monte Carlo via Roumoules 216 became inaudible after dark.

George Millmore (Wootton, IoW) explored the l.w. DX scene while on holiday in Scotland. In Hamilton, he found that the broadcasts from Kaliningrad 171; Oslo 216; Kishinev, USSR 234; Lahti, Finland 254 and Minsk 281 could be clearly heard in that area - an unexpected result, as they are difficult to receive at his home location.

MW Transatlantic DX

A slight improvement in the conditions has been noted and some of the broadcasts from the USA, Canada and the Caribbean area have been heard. The reports indicate that only one broadcast from S.America reached our shores.

Listening in Grimsby, **Jim Willett** picked up the broadcasts from two stations in St. John's, NF before midnight (UTC), VOCM 590, rated as SIO 233 at 2330 and CJYQ 930, which peaked 333 at 0000. The majority of the signals however were logged between 0100 and 0330 and did not exceed SIO 222. **Tim Shirley** (Bristol) heard several stations in the USA, Canada and the Caribbean area, but he found that signals from S.America were noticeably absent.

Although transatlantic signals were heard on 590, 1210, 1220, 1570 and 1610 by **Mark Thompson** in Wakefield, he only managed to identify two of them. DXers are often faced with this problem, especially when weak signals are involved, because the "splatter" from other stations can easily mask the vital station ident. Some signals simply fade out before the station ident is announced. Although a clue to identity may be obtained by referring to a publication such as the *WRTV Handbook*, it is essential not to engage in "list logging" signals.

LONG WAVE DX CHART

Freq kHz	Station	Country	Power (kW)	DXer
153	Bechar	Algeria	1000	F*
153	DLF Donebach	Germany (W)	500	A,D,E,F,G*
153	Brasov	Romania	1200	F*
162	Allouis	France	2000	A,B,D,E,F,G*
171	Medi 1-Nador	Morocco	2000	F
171	Kaliningrad	USSR	1000	A*,B*,C,D,E,F,G*
177	Oranienburg	Germany (E)	750	D,G*
183	Saarlouis	Germany (W)	2000	A,B,D,E,F*,G*
189	Motala	Sweden	300	B,C,F
198	BBC Droitwich	UK	400	A,D,E,G*
198	BBC Westerglen	UK	50	B
207	DLF Munich	Germany (W)	500	A*,D,E,G*
207	Azilal	Morocco	800	F*
207	Kiev	Ukraine	500	C*
216	Roumoules	Monaco	1400	A,D,E,F
216	Oslo	Norway	200	A*,B,F,G*
225	Konstantinow	Poland	2000	A*,B,C*D,E,G*
234	Junglinster	Luxembourg	2000	A,B,D,E,F,G*
234	Kishinev	USSR	1000	B,C*
245	Kalundborg	Denmark	300	A*,B,D,E
254	Tipaza	Algeria	1500	A,D,E,F
254	Lahti	Finland	200	B*,C*
263	Burg (R.Volga)	Germany (E)	200	A,C*,F*
263	Moscow	USSR	2000	C*,D,E
272	Topolna	Czechoslovakia	1500	A,B*,D,F*,G*
281	Minsk	USSR	500	A*,B*,F

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

DXers:
A: Lez Chipperfield, Goldhanger.
B: George Millmore, Hamilton.
C: Tim Shirley, Bristol.
D: Phil Townsend, London.
E: Louis Whitfield, Luton.
F: Jim Willett, Grimsby.
G: Max Wustrau, Bedford.

Other MW DX

Although a distance of about 2744km separates Qurayyat in Saudio Arabia and Grimsby, their 1000kW transmission on 900 was rated as SIO 433 at 0100 by Jim Willett. Several of the broadcasts from N.Africa were heard by Tim Shirley and Mark Thompson.

Many high power broadcasts from the Continent were logged by Lez Chipperfield in Goldhanger, but he also heard several of the lower power transmissions from Spain. Some of the BBC Radio-4 low power relays were logged by **Leo Barr** (Sunderland), **Chris Nykiel** (Leeds) and George Millmore in Hamilton. Whilst touring, George drove to the BBC Westerglen transmitter near Falkirk and photographed the antenna masts - see Fig. 1.

MW Local Radio DX

Writing from Seaford, **George Butcher** says that the numerous broadcasts from France and local TV interference make local radio DXing almost impossible at night, so he complied his first list for the chart between 1000 and 1300. Another first report came from **Darren Beasley** in Bridgwater. He has just built the Hexagon Loop detailed in the April'89 *SWM* and he says it has made a fantastic improvement to reception. As it is very directional, it is possible to separate many of the stations which operate on shared frequencies.

Leo Barr has constructed a new rectangular former for his "Sooper Loop" - it has a perimeter of 1524mm. The main winding of 7 turns of pvc covered hook-up wire is tuned by a 1000pF (twin gang 500pF) variable capacitor. A single turn couples the loop into the original amplifier. The performance has proved to be even better than expected - some south coast stations which were virtually inaudible with the original loop now peak S3 or better!

SEEN & HEARD

MW LOCAL RADIO CHART

Freq kHz	Station	ILR BBC	e.m.r.p. (kW)	DXer
585	R. Solway	B	2.00	F,H,J,L
603	Invicta Sound(Coast)	I	0.10	C,D,E*,I,J,M,N
603	R. Gloucester	B	0.10	B,M,N
630	R. Bedfordshire	B	0.20	A,B,C,D,G,I,J,N
630	R. Cornwall	B	2.00	B
657	R. Clwyd	B	2.00	A,D,E,G,H,I,J,K,M,N
666	DevonAir R	I	0.34	B,E,M,N
666	R. York	B	0.80	D,E,F,G,I,J,K,L,M,N
729	BBC Essex	B	0.20	C,D,E*,I,J,M,N
738	Hereford/Worcester	B	0.037	B,I,J,M,N
756	R. Cumbria	B	1.00	F,J,L
756	R. Shropshire	B	0.63	B,H,I,J,M,N
765	BBC Essex	B	0.50	C,D,H,I,J,M,
774	R. Kent	B	0.70	C,D,I,M,N
774	R. Leeds	B	0.50	A,G,H,J,K,L
774	Severn Sound	I	0.14	B
792	Chiltern R	I	0.27	C,D,E,I,J,N
792	R. Foyle	B	1.00	A
801	R.Devon	B	2.00	A*,B,C,H,J,N
819	Hereford/Worcester	B	0.037	A,B,I,J
828	2CR	I	0.27	B
828	R. WM	B	0.20	H
828	R. Aire	I	0.12	A,G,J,K
828	Chiltern R	I	0.20	B,D,E,I,N
837	R. Cumbria	B	1.50	A,J
837	R. Leicester	B	0.45	B,C,D,E,I,J,N
855	R. Lancashire	B	1.50	A,G,J,K,N
855	R. Norfolk	B	1.50	A,C,D,E,I,J,M,N
873	R. Norfolk	B	0.30	C,D,EI,J,M,N
936	GWR (Brunel R.)	I	0.18	B,C,E,I,M,N
945	R. Trent (GEM-AM)	I	0.20	A,C,O,G,I,J,M,N
954	DevonAir R	I	0.32	B,C,J*,N
954	R. Wyvern	I	0.16	B,I,J,M,N
990	R. Aberdeen	B	1.00	F,L
990	Beacon R. (WABC)	I	0.09	H*,N
990	R. Devon	B	1.00	B,C,E,N
990	Hallam R	I	0.25	G,J,K,N
999	Red Rose R	I	0.80	A,F,G,J,K
999	R. Solent	B	1.00	B,C,E,M,N
999	R. Trent (GEM-AM)	I	0.25	H,J,M,N
1026	R. Cambridgeshire	B	0.50	D,E,G,I,J,M,N
1026	Downtown R	I	1.70	A,F
1026	R. Jersey	B	1.00	B,C
1035	R. Kent	B	0.50	B,C,D,E,I,M,N
1035	NorthSound R	I	0.78	L
1035	R. Sheffield	B	1.00	G,J,K
1035	West Sound	I	0.32	F
1107	Moray Firth R	I	1.50	F
1107	R. Northampton	B	0.50	C,D,E,I,J,K,M,N
1116	R. Derby	B	1.20	A,D*,I,J,K,M,N
1116	R. Guernsey	B	0.50	C,E,N
1152	R. Broadland	I	0.83	D,I,J,N
1152	R. Clyde	I	3.60	F
1152	LBC	I	23.50	C,D,E,M,N
1152	Metro R. (GNR)	I	1.80	L
1152	Piccadilly R	I	1.50	G,J,K
1161	R. Bedfordshire	B	0.10	D,I,J,N
1161	GWR (Brunel R.)	I	0.16	B
1161	R. Sussex	B	1.00	C,D,E
1161	R. Tay	I	1.40	A,F
1161	Viking Gold	I	0.35	A,G,J,K,N
1170	R. Orwell	I	0.28	D,I,N
1170	Signal R	I	0.20	J
1170	Swansea Sound	I	0.58	B
1170	TFM Radio (GNR)	I	0.32	G,J,K,L
1170	Ocean Sound	I	0.12	C,E
1242	Invicta Sound(Coast)	I	0.32	C,D,E,J,N
1251	Saxon R	I	0.76	A,C,D,E,G*,I,J,M,N
1260	GWR (Brunel R.)	I	1.60	B,E
1260	Leicester (GEM-AM)	I	0.29	I,J,M,N
1260	R. York	B	0.50	A,J,K
1278	Pennine R	I	0.43	A,G,J,K
1305	R. Hallam	I	0.15	A,G,J,K,N
1305	Red Dragon R	I	0.20	B,E,I*,N
1323	R. Bristol	B	0.63	A,B,J,N
1323	Southern Sound	I	0.50	D,E,J,N
1332	Hereward R	I	0.60	A,D,I,J,M,N
1332	Wiltshire Sound	B	?	B
1359	Essex R	I	0.28	D,E,I,M,N
1359	Mercia Snd(Xtra-AM)	I	0.27	C,N
1368	R. Lincolnshire	B	2.00	A,G,I,K,M,N
1368	R. Sussex	B	0.50	D,E
1368	Wiltshire Sound	B	?	H,M
1431	Essex Radio	I	0.35	D,I,M,N
1431	Radio 210	I	0.14	N*
1449	R. Cambridgeshire	B	0.15	C,I,M,N
1458	GLR	B	50.00	B,C,D,F,G*,I,M,N
1458	R. Newcastle	B	2.00	G,K,L
1458	GMR	B	5.00	K
1458	Radio WM	B	5.00	B,I,N
1476	County Sound(Gold)	I	0.50	A,C,D*,E,J*,M,N
1485	R. Humberside	B	1.00	G,I,K,N
1485	R. Oxford	B	0.50	I,M,N
1485	R. Sussex	B	1.00	C,D*,E
1503	R. Stoke-on-Trent	B	1.00	G,I,K,L*,N
1521	R. Mercury	I	0.64	C,D,E,M
1521	R. Nottingham	B	0.50	I,J,N
1530	R. Essex	B	0.15	C,D,E*,I,N
1530	Pennine R	I	0.74	A,G,J,K
1530	R. Wyvern	I	0.52	B,N
1548	R. Bristol	B	5.00	B
1548	Capital R.(Gold)	I	97.50	C,D,E,I,M,N
1548	R. Cleveland	B	1.00	G,K,L
1548	R. Forth	I	2.20	F
1548	R. Hallam	I	0.74	K,N
1557	R. Lancashire	B	0.25	K
1557	Chiltern R	I	0.76	A*,D*,I,J,M,N?
1557	Ocean Sound	I	0.50	C,J
1584	R. Nottingham	B	1.00	D,G,I,J,K,N
1584	R. Shropshire	B	0.50	B
1584	R. Tay	I	0.21	A,F
1602	R. Kent	B	0.25	A,C,D*,E,N

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

DXers:
A: Leo Barr, Sunderland
B: Darren Beasley, Bridgwater.
C: George Butcher, Seaford.
D: Lez Chipperfield, Goldhanger.
E: Sheila Hughes, Morden.
F: George Millmore, Hamilton.
G: Chris Nykiel, Leeds.
H: Tim Shirley, Bristol.
I: Mike Smith, Cambridge.
J: Mark Thompson, Wakefield.
K: Andrew Westmoreland, Wakefield.
L: Neil Wheatley, Newcastle-upon-Tyne.
M: Louis Whitfield, Luton.
N: David Wratten, Cambridge.

Short Wave DX

The generally excellent conditions prevailing in the **25MHz (11m)** band have attracted two more broadcasters: Radio Moscow, USSR and Radio Yugoslavia, Belgrade. They are also being exploited by RTB Brussels; RNI Oslo; Radio DW Cologne; BBC London; Radio RSA Johannesburg; RFI Paris; R.Denmark, Copenhagen; The Voice of the UAE in Abu Dhabi; Radio For Peace Int., Costa Rica; BRT External Service, Brussels.

At the time of going to press the full details of Radio Moscow's World Service transmissions on 25.780 (Eng 0500-1300) are unknown, but considerable variations in signal level have been noted which suggest that several beam headings may be involved. During the early morning **Kenneth Reece** has been monitoring their transmissions in Prenton and he noted that they varied from just audible to SINPO 55555.

The transmissions from Radio Yugoslavia 25.795 (Eng 1200-1230) were noted as 35333 by **Roy Patrick** in Derby - a fairly typical UK rating. In a very welcome first report from Oman, **Rhoderick Illman** quotes their signal as 44444. Writing from Canada, **Alan Roberts** says he received their broadcasts in Quebec during ten successive days, but they then became inaudible due to a deterioration in reception conditions.

The Voice of the UAE in Abu Dhabi are now using two frequencies in this band: 25.670 and 25.900 (Ar 0800-1600). Listening in Edinburgh, **Kenneth Buck** rated them at 1430 as 35433 and 45544 respectively. Alan Roberts says both transmissions can be heard in Quebec between 1230 and 1530. He noted 25.900 as 35555.

The broadcasts to the UK, S.Ireland and W.Europe from Radio RSA in Johannesburg, S.Africa 25.790 (Ger 0900-0956; Eng 1400-1556) are being received very well. The 44444 rating noted by **David Middlemiss** in Eyemouth at 1440 is typical of their signal in the UK during most afternoons. The latest report from **P.R.Guruprasad** in Molepolole, Botswana indicates that the reverse path is also excellent. RTB in Brussels 25.645 (Fr, Ger to Africa 1000-1545) rates as 55444 at 1500; BBC via Daventry, UK 25.750 (Eng to Africa, E.Asia 1100-1745) as 45544 at 1510; also RFI via Issoudun, France 25.820 (Fr to Africa 0900-1600) as 25333 at 1225.

Reception of the 6kW broadcasts from Radio For Peace International, Costa Rica 25.945 (Sp, Eng to E.USA, Europe 1600-2400) is generally poor in the UK. **Philip Rambaut** (Macclesfield) noted them as SIO 111 at 1900. Poor reception can also be expected in the UK from RTB 25.645; RNI via Kvitsoy 25.730; RFI 25.820; Radio Denmark, Copenhagen 25.850 and BRT Brussels 26.050 because their broadcasts are intended for other areas.

The conditions prevailing in the **21MHz (13m)** band have been generally good, but from time to time solar flares caused ionospheric disturbances. The broadcasts from Radio Australia via Shepparton 21.740 (Eng to S.Pacific 2200-0730) have been audible in the UK from 2200 during some days. They have also been heard in the early morning, **David Edwardson** Wallsend rated them as 24422 at 0615. Kenneth Reece picked up their test transmission on 21.525 at 0617 and rated it as 34433.

Some of the many other broadcasts to areas outside Europe have also been heard. They include UAE Radio Dubai 21.700 (Ar, Eng to SE.Asia, Australia 0415-0600), noted as 34323 at 0544 by Kenneth Reece; BRT via Wavre, Belgium 21.815 (Du, Eng to S.E.Asia, Australia 0630-0730) SIO 433 at 0700 by **Cyril Kellam** in Sheffield; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 0500-1615) 33323 at 0753 by Leo Barr; Radio Austria Int., Moosbrunn 21.490 (Eng to Australia, New Zealand 0800-1100), heard at 1009 by **John Coulter** in Winchester; Vatican Radio, Rome 21.485 (Fr, Eng, Port to Africa 1000-1215) 44444 at 1105 by David Middlemiss; Radio DW Cologne via Sines, Portugal 21.680 (Ger to Asia, USA 1000-1200) 55555 at 1109 by **Max Wustrau** in Bedford; Radio Sweden via Horby 21.610 (Sw, Eng to E.Asia 1200-1300) 44444 at 1230 by Rhoderick Illman; BBC via Ascension

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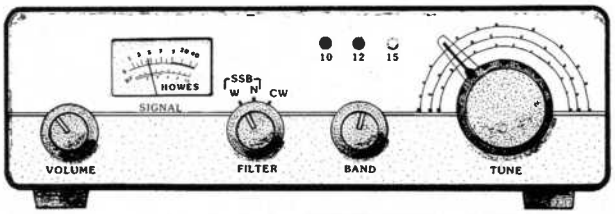

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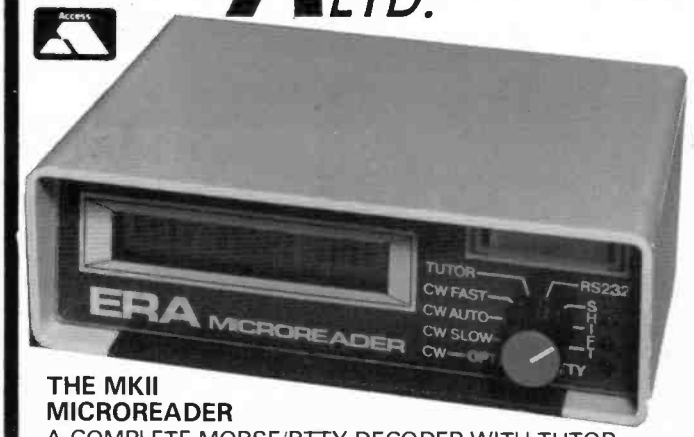

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SEEN & HEARD

Island 21.660 (So, Eng, Swa to Africa 1430-1615) 54344 at 1525 by P.R.Guruprasad; Radio Pakistan, Islamabad 21.740 (Eng to Middle East 1600-1630) 55555 at 1600 by **Chris Shorten** in Norwich; Radio DW via Cyclops, Malta 21.680 (Ur, Hi, Eng to S.Asia 1430-1650) SIO 444 at 1650 by **John Evans** in Shawforth; Radio Nacional de Espania 21.460 (Sp to USA 1930-2315) 55555 at 1930 by **John Nash** in Brighton.

Many programmes in a variety of languages are beamed towards Europe during the day. They stem from Radio Japan via Moyabi, Gabon 21.640 (Eng, Jap 0700-0900) SIO 333 at 0846 by Philip Rambaut; Radio Afghanistan via USSR 21.600 (Eng 0900-1000) 44444 at 0906 by **David Wratten** in Cambridge; Voice of Israel, Jerusalem 21.760 (Eng 1000-1030) SIO 444 at 1005 by **Neil Wheatley** in Newcastle-upon-Tyne; WCSN Scotts Corner, Maine 21.780 (Eng 1400-1600) SIO 433 at 1457 by **Alan Smith** in Northampton; Radio Japan via Moyabi, Gabon 21.700 (Eng, Jap 1500-1700) SIO 434 at 1530 by **Terry Roy** in Gateshead; Radio RSA Johannesburg, S.Africa 21.590 (Eng 1400-1600) SIO 343 at 1540 by **John Sadler** in Bishops Stortford; WHRI South Bend, USA 21.840 (Eng 1500-1700) SIO 444 at 1600 by Kenneth Buck; WYFR via Okeechobee, FL 21.615 (Eng, Ger, It 1600-1845) at 1607 by **Ron Pearce** in Bungay; UAE Radio Dubai 21.605 (Ar, Eng 0615-1730) 43334 at 1700 by **D. Carter** in Cambridge; RCI Montreal, Canada 21.675 (Eng 1800-2100) 34333 at 1845 by **Ken Whayman** in Bexleyheath; HCJB Quito, Ecuador 21.470 (Cz, Ger, Eng, Sw, Norw, Dan, Fr, Sp 1800-2230) SIO 322 at 1938 by **Mal Tedds** in Nottingham; Radio For Peace Int., Costa Rica 21.565 (Eng 1600-0000) heard at 2245 by Roy Patrick.

Good conditions have also been noted in the **17MHz (16m)** band during most days, but there have been some disturbed periods. Radio Australia's broadcasts to S.Asia via Carnarvon 17.715 (Eng 0100-0915) were noted in many of the logs from UK listeners. David Wratten quoted 33333 at 0905. Their broadcasts to E.Asia via Darwin 17.750 (Eng, Chin, Fr 0100-0800) were also logged by some DXers **Garry Judd** (Hayes) rated them as 32232 at 0623. Between 2200 and 0800 their programmes are beamed to the C.Pacific area via Shepparton on 17.795 and they have also been reaching the UK. David Edwardson noted them as 23322 at 0245. The Pacific Service from Radio New Zealand, Wellington 17.705 (Eng to Pacific areas 2345-0145; 0145-0330 (Sat/Sun only); 0330-0730 has seldom reached the UK, Alan Smith heard it briefly at 0545 and noted SIO 323, but by 0555 it was obliterated by a potent carrier.

Quite a number of the broadcasts to other areas were logged, including BBC via Tsang Tsui, Hong Kong 17.815 (Eng to C.Asia 0300-0945) 24222 at 0304 by Kenneth Reece; Radio Prague, Czechoslovakia 17.840 (Eng, Cz to SE.Asia 0730-0930) 32232 at 0741 by Leo Barr; Radio Finland via Pori 17.795 (Fin, Sw, Eng to Australia, SE.Asia 0700-1000) 55555 at 0800 by Chris Shorten; Africa No.1., Gabon 17.630 (Fr to W.Africa 0800-1600) SIO 333 at 1056 by Philip Rambaut; Voice of Turkey, Ankara 17.785 (Eng, Ur, Far to SW.Asia 1330-1500) 45544 at 1340 by John Nash; Radio Moscow, USSR 17.665 (Eng to Africa 0600-1600) 53533 at 1400 by Ken Whayman; RTM Tangier, Morocco 17.595 (Fr, Eng to Middle East, N.Africa 1400-1700) SIO 444 at 1500 by Terry Roy; Radio Nacional de Espana via Noblejas 17.890 (Sp to Africa 1300-2230) heard at 1613 by John Coulter; WSHB Cypress Creek, USA 17.555 (Eng, Sp to S.America 2200-0000) SIO 534 at 2000 by Neil Wheatley; VOA via Greenville, USA 17.785 (Eng to W.Africa 1600-2200) SIO 333 at 2015 by **Ted Walden-Vincent** in Great Yarmouth; VOA via Tinang, Philippines 17.735 (Eng to SE.Asia 2200-0100) SIO 433 at 2200 by Alan Smith.

In contrast, only a few of the broadcasts to Europe were noted: RCI via Sackville, Canada 17.875 (Hung, Cz, Uk, Russ, Eng, Fr 1800-2030) SIO 454 at 1835 by Kenneth Buck; Voice of Israel, Jerusalem 17.575 (Eng 2130-2200) SIO 434 at 2130 by Mal Tedds; Radio HCJB Quito, Ecuador 17.790 (Eng 2130-2200) SIO 433 at 2130 by **Alf Gray** in Birmingham.

From time to time the **15MHz (19m)** broadcasts from Radio New Zealand, Wellington 15.150 (Eng to Australia, Papua New Guinea 2345-0145; 0145-0330 Sat/Sun; 0330-0730) have been audible in the UK. **Simon Hamer** (New Radnor) has been hearing them at 0500.

The 19m broadcasts from Radio Australia have also been attracting the attention of listeners in the UK. Their transmissions via Shepparton to the C.Pacific area on 15.160 (Eng 2100-0700) were rated as "good" at 2100 by Tim Shirley and to the S.Pacific area on 15.240 (Eng 2100-0730) as 55555 at 0430 by Roy Patrick. Their station in Carnarvon beams programmes in English and Chinese to E.Asia on 15.395 (0100-0900) and they were rated as 33433 at 0558 by Kenneth Reece. Listening at 1756, **Jim Cash** (Swanwick, Derbyshire) picked up their broadcast to SE.Asia on 15.245 (Eng 1700-1830). Tim Shirley rated this transmission as SIO 455.

Some of the broadcasts to Europe were noted in the logs: VOIRI Tehran, Iran 15.084 (Sp, Ar, Tur, Fr, Far 24 hrs), rated as 33333 at 0945 by David Middlemiss; ISBS Rikisurvarpid, Iceland 15.770 (Ic 1215-1245) SIO 444 at 1230 by Neil Wheatley; UAE Radio Dubai 15.435 (Ar, Eng 0615-1645) 54444 at 1300 by Chris Shorten; Radio Moscow, USSR 15.540 (Eng 1100-1600) 44444 at 1405 by Garry Judd; RCI Montreal via Daventry, UK 15.325 (1315-1645) 33333 at 1615 by Rhoderick Illman; Radio Sophia, Bulgaria 15.330 (Tur, Ger, It, Fr 1600-1900, heard at 1900 by John Coulter; Voice of Vietnam, Hanoi 15.010 (Eng, Russ, Viet, Fr, Sp 1600-2130) SIO 454 at 1904 by Kenneth Buck; Voice of Israel, Jerusalem 15.640 (Eng 1900-1930) 33333 at 1915 by Ken Whayman; WWCR Nashville, USA 15.690 (Eng 1700-0200) 44444 at 1930 by **Mike Smith** in Cambridge; WINB Red lion, USA 15.185 (Eng 2003-2245) SIO 434 at 2030 by Cyril Kellam; Radio Kuwait, Sulaibiyah 15.505 (Ar 0700-2300) SIO 333 at 2104 by Mal Tedds; Radio Korea, Seoul 15.575 (Ar, It, Eng, Sp, Port, Ger 1645-2300) SIO 433 at 2120 by Alan Smith; Radio Budapest, Hungary 15.160 (It, Tur, Ger, Hung, Eng, Sp 1630-2230) SIO 222 at 2142 by **Julian Wood** in Buckie.

They also detailed some of the broadcasts to areas outside Europe, namely RFP Papeete, Tahiti 15.170 (Fr, Tah to Oceania 1600-0930), noted as SIO 444 at 0420 by John Evans; Radio DW via Wertachtal, W.Germany 15.185 (Eng, Fr to W.Africa 0600-0750) SIO 433 at 0625 by Alf Gray; BBC via Kranji, Singapore 15.360 (Eng to E.Asia, Australia 0600-1130) SIO 111

TROPICAL BAND CHART

Freq MHz	Station	Country	UTC	DXer
2.420	R.Sao Carlos	Brazil	0200	J
3.200	TWR	Swaziland	2320	D,N
3.215	R.Orange	S.Africa	0230	J,N
3.220	R.HCJB Quito	Ecuador	0359	B
3.230	ELWA Monrovia	Liberia	2110	F,J,N
3.240	TWR	Swaziland	1922	D
3.270	SWABC 1, Namibia	S.W.Africa	2030	D,J,N
3.295	SWABC Windhoek	S.W.Africa	1625	D
3.330	R.Kigali	Rwanda	1845	F,N
3.355	R.Botswana	Gabarone	1915	D,N
3.365	GBC Radio 2	Ghana	2100	F
3.905	AIR Delhi	India	1820	D
3.909	R.Beijing	China	2310	N
3.915	BBC Kranji	Singapore	2214	O
3.955	BBC Daventry	England	2220	D,O
3.965	RFI Paris	France	2224	O
3.980	VOA Munich	W.Germany	2030	J
3.995	DW Cologne (Julich)	W.Germany	2236	O
4.040	Yerevan	USSR	1630	J
4.050	R. Frunze	USSR	2322	O
4.080	R.Ulan Bator	Mongolia	2330	N
4.500	Xinjiang	China	2300	B,N
4.588	R.Rivajavin	Argentina	2315	N
4.735	Xinjiang	China	2222	B,O
4.740	R.Afghanistan	via USSR	1840	F
4.750	R.Bertoura	Cameroon	2110	N
4.755	Caracol Neiva	Columbia	0422	I,J
4.760	ELWA Monrovia	Liberia	2030	B,F
4.760	TWR	Swaziland	1830	F
4.765	R.Moscow	via Cuba	0527	I
4.770	FRCN Kaduna	Nigeria	2030	D,F,N
4.775	R.Gabon, Libreville	Gabon	2030	F,N
4.780	RTD	Djibouti	1850	F
4.785	RTM Bamako	Mali	1850	F,N
4.785	R.Baku	USSR	0010	N
4.790	R.Atlantida	Peru	0348	B
4.795	R.Moscow, Ulan Ude	USSR	2333	O
4.800	AIR Hyderabad	India	0030	N
4.800	LNBS Lesotho	Maseru	1840	B,F,N
4.805	R.Nac.Amazonas	Brazil	2237	O
4.810	R.Yerevan	USSR	0105	E
4.815	R.diff TV Burkina	Ouagadougou	2030	A,F,O
4.820	R.Botswana	Botswana	1840	D,F
4.820	La Voz Evangelica	Honduras	0415	C
4.825	R.Ashkhabad	USSR	0050	E
4.830	Africa No.1	Gabon	2030	A,B,E,F,H,I,L,N,O
4.830	R.Tachira	Venezuela	0115	E,I,N
4.835	RTM Bamako	Mali	2030	F
4.845	R.Fides, La Paz	Bolivia	0220	I
4.485	R.Kek'chi, Fray Bme	Guatemala	0140	N
4.845	ORTM Nouakchott	Mauritania	2030	F
4.850	R.Yaounde	Cameroon	2030	E,F
4.850	R.Tashkent	USSR	2304	O
4.865	R.Mozambique	Mozambique	2100	F
4.870	R.Cotonou	Benin	2050	F,N
4.875	R.Tbilisi	USSR	1935	J
4.880	SABC Radio 5	S.Africa	1920	F
4.885	Voice of Kenya	Kenya	2020	F,M
4.890	RFI Paris	via Gabon	0531	I
4.890	ORTS Dakar	Senegal	0555	N
4.895	R.Moscow, Kalinin	USSR	0008	O
4.905	R.Relogio, Rio	Brazil	0230	I
4.905	R.Nat.N'djamena	Chad	2050	F
4.910	R.Zambia, Lusaka	Zambia	1900	D,F,N
4.915	R.Anhanguera	Brazil	0330	B
4.915	R.Ghana, Accra	Ghana	2000	F,N
4.915	Voice of Kenya	Kenya	1905	F
4.920	R.Quito	Ecuador	0441	B,I,J
4.925	R.Nacional, Bata	Eq.Guinea	2030	F
4.930	R.Moscow, Tbilisi	USSR	0145	I
4.935	Voice of Kenya	Kenya	2030	B,F,I,L
4.940	R.Kiev	USSR	0238	I
4.945	Caracol, Neiva	Colombia	0330	I,N
4.965	R.Zambia, Lusaka	Zambia	1930	F
4.970	R.Rumbos, Caracas	Venezuela	0140	E,O
4.975	R.Uganda, Kampala	Uganda	1900	B,E,K
4.980	PBS Xinjiang	China	2235	B
4.980	Ecos del Torbes	Venezuela	0149	I,O
4.985	R.Brazil Central	Brazil	0241	I
4.990	FRCN Lagos	Nigeria	2030	F
5.005	R.Nacional, Bata	Eq.Guinea	2010	E,F,G
5.005	R.Nepal, Kathmandu	Nepal	0030	J,N
5.020	ORTN Niamey	Niger	1920	F,I,N
5.025	ABC Katherine	Australia	2100	J
5.025	R.Morimoto	Brazil	0156	I
5.025	R.Rebelde, Habana	Cuba	0245	I
5.025	R.Uganda, Kampala	Uganda	2030	F
5.030	R.Impacto	Costa Rica	0535	I,J
5.035	R.Bangui	C.Africa	2000	F,N
5.035	R.Alma Ata	USSR	2240	B
5.045	R.Cultura do Para	Brazil	0201	I
5.045	R.Togo, Lome	Togo	2030	F
5.050	R.Tanzania	Tanzania	2010	F
5.055	Faro del Caribe	Costa Rica	0300	C,N
5.055	RFO Cayenne(Matoury)	French Guiana	0538	I
5.055	TWR Manzizi	Swaziland	1620	D
5.057	R.Tirana Gjirokaster	Albania	1930	F
5.065	R.Candip, Bunia	Zaire	1915	F,N
5.085	R.Pakistan, Karachi	Pakistan	0100	N

DXers:
A: John Coulter, Winchester.
B: David Edwardson, Wallsend.
C: Bill Griffith, while in Tlaxcala, Mexico.
D: P.R.Guruprasad, Botswana.
E: Sheila Hughes, Morden.
F: Fred Pallant, Storrington.
G: Roy Patrick, Derby.
H: Ron Pearce, Bungay.
I: Kenneth Reece, Prenton.
J: Tim Shirley, Bristol.
K: Alan Smith, Northampton.
L: Darran Taplin, Tunbridge Wells.
M: Ted Walden-Vincent, Gt.Yarmouth.
N: Jim Willett, Grimsby.
O: Max Wustrau, Bedford.

SEEN & HEARD

at 0915 by Philip Rambaut; Radio Norway Int., Oslo 15.325 (Norw to USA 1200-1245) heard at 1200 by John Sadler; Radio Polonia, Warsaw 15.120 (Eng, Sp, Fr to W.Africa 1230-1355) 44544 at 1240 by John Nash; KFBS Saipan, N.Mariana Island 15.375 (Su, Jav, Ind, Mal to SE.Asia 1000-1300) 32332 at 1230 by P.R.Guruprasad; SRI via Schwarzenburg, Switzerland 15.570 (Eng, Fr, Ger to SE.Asia 1315-1500) 33433 at 1500 by **Louis Whitfield** in Luton; Radio Portugal, Lisbon 15.210 (Port, Eng to Middle East, S.Asia 1500-1630) 44444 at 1600 by David Wratten; Radio Finland via Pori 15.185 (Eng, Sw, Fin to E.Africa, Middle East 1505-1657) 54445 at 1645 by **Ian Bond** (Wirrel); Radio RSA Johannesburg, S.Africa 15.365 (Fr to W.Africa 1800-2000) 45534 at 1905 by David Edwardson; Africa No.1., Gabon 15.475 (Fr, Eng to W.Africa 1700-2100) 33433 at 2046 by Leo Barr; KUSW Salt Lake City, USA 15.650 (Eng to E.USA 1600-2200) heard at 2132 by Ron Pearce.

The **13MHz (22m)** band has attracted another broadcaster, the Voice of the UAE in Abu Dhabi. Their transmission on 13.605 (Eng 2200-0000) was rated as SIO 444 at 2236 by Neil Wheatley. Other broadcasters using the band include Radio Jordan, Amman 13.655 (Eng 0530-1315), rated as SIO 333 at 0904 by Philip Rambaut; SRI via Sottens, Switzerland 13.685 (It, Eng, Ger, Fr to Australia, Pacific area 0745-1030) 33333 at 1000 by David Middlemiss; WSHB Cypress Creek, USA 13.760 (Eng 1400-1600) 35242 at 1400 by John Nash; Radio Prague, Czechoslovakia 13.715 (Eng, Cz, Ar, Fr to S.Asia, Middle East 1430-2125) 33232 at 1430 by Rhoderick Illman; Radio Pakistan, Karachi 13.665 (Ur to Middle East 1315-1545; Eng 1600-1615) SIO 233 at 1500 by Kenneth Buck; Radio DW via Wertachtal, W.Germany 13.790 (Ha, Eng to Africa 1800-1950) 55344 at 1902 by P.R.Guruprasad; Radio Baghdad, Iraq 13.660 (Fr, Ger, Eng to Europe 1800-2200) SIO 434 at 1955 by Mal Tedds; Radio Nederlands via Flevo 13.700 (Eng to W.Africa 2030-2125) heard at 2030 by Simon Hamer; KSDA Guam 13.720 (Chin to C.Asia 2000-2100) SIO 323 at 2055 by Alan Smith; WRNO New Orleans, USA 13.720 (Eng to USA, Europe 2100-0000) 24333 at 2100 by David Wratten.

The conditions prevailing in the **11MHz (25m)** band have enabled many interesting broadcasts to be heard during the day and at night. Radio Australia beam their programmes to Europe via Shepparton 11.910 (Eng 0400-0630) and their transmissions have been generally well received here. David Edwardson rated them 44544 at 0610. Kenneth Reece has been monitoring their test transmissions on 11.770 around 0800, at best they peaked 32433.

Some of the other broadcasts to Europe stem from WYFR via Okeechobee, FL 11.580 (Ger, Eng, It, Fr 0400-0630) rated as 44333 at 0548 by Garry Judd; RTV Tunis, via Sfax 11.550 (Ar 0600-1800) 34434 at 0751 by Leo Barr; RFI via Issoudun, France 11.670 (Fr, Eng, Yu, Russ, Pol 0700-2145) 44444 at 1300 by David Middlemiss; Radio Finland via Pori 11.755 (Eng, Fr, Fin, Sw, Ger 1600-2230) heard at 1830 by Simon Hamer; Radio Kuwait, Sulaibiyah 11.665 (Eng 1800-2100) 44444 at 1912 by **Darran Taplin** in Tunbridge Wells; Radio Japan via Montsinery, Fr.Guiana 11.800 (Eng 2100-2130) SIO 433 at 2100 by Cyril Kellam; Radio Sophia, Bulgaria 11.720 (Eng, Ger, It, Fr 1930-2225) heard at 2130 by John Sadler; AIR via Aligarh, India 11.620 (Eng 1845-2230) SIO 433 at 2101 by Mal Tedds.

MEDIUM WAVE DX CHART

Freq kHz	Station	Country	Power (kW)	DXer
520	Hof-Saale	Germany (W)	0.2	C*
531	Ain Beida	Algeria	600	H*
540	BRT-2 Wavre	Belgium	150/50	C,H
549	DLF Beyreuth	Germany (W)	200	A*,C
567	RTE-1 Tullamore	S.Ireland	500	C,E*,F,G,H,K
576	Stuttgart	Germany (W)	300	C*,H
585	Orf Wien	Austria	600	C
585	RNE-1 Madrid	Spain	200	C*
594	HRF Frankfurt	Germany (W)	400	C
603	BBC-R4 Newcastle	UK	2	F,G
612	RTE-2 Athlone	S.Ireland	100	F,G
612	Sebaa Aioun	Morocco	300	C*
621	RTBF-1 Wavre	Belgium	300	C
621	Batra	Egypt	2000	J*
630	Vigra	Norway	100	H*
639	La Coruna	Spain	100	C*
648	BBC Orfordness	UK	500	C,G
648	R.Lotus, Maraisburg	S.Africa (Rep)	2	D*
666	Bodenseesender	Germany (W)	300/180	C*
675	Hilversum-3 Lopic	Holland	120	C,E,F
684	RNE-1 Sevilla	Spain	250	C*
684	Beograd	Yugoslavia	2000	C*
693	BBC-R2 Postwick	UK	10	C
702	Monte Carlo	Monaco	300	C*
711	Rennes 1	France	300	C
720	BBC-R4 Lisnagarvey	N.Ireland	10	A,F
729	RTE-1 Cork	S.Ireland	10	F
738	RNE-1 Barcelona	Spain	250	C*
747	Hilversum-2 Flevo	Holland	400	C,F
756	Brunswick	Germany (W)	800/200	C*
765	Sottens	Switzerland	500	H*
774	BBC-R4 Enniskillen	N.Ireland	1	F
783	Burg	Germany (E)	1000	C*
792	Limoges	France	300	C*
801	BRF via Munich	Germany (W)	420	C*
810	BBC-Scot.Westerglen	UK	100	F,G,I*
819	R.Zambia, Lusaka	Zambia	100	D*
837	R.Popular, Sevilla	Spain	10	C*
846	Rome	Italy	540	C*
855	Murcia	Spain	125	C*
864	Paris	France	300	C
873	AFN Frankfurt	Germany (W)	150	C*,G*,H
873	R.Ulster,Enniskillen	UK	1	F
882	BBC-Wales Washford	UK	70	C,F,G,I
891	Algiers	Algeria	600/300	C,J*
900	Qurayyat	Saudi Arabia	1000	L*
918	R.Intercont. Madrid	Spain	20	C*
927	BRT-1 Wolvertem	Belgium	300	C
936	Radio Bremen	Germany (W)	100	C*
945	Toulouse	France	300	C*
954	RCE Madrid	Spain	20	C*
954	R.Swaziland	Swaziland	50	D*
972	R.Botswana, Gabarone	Botswana	50	D*
972	NDR/WDR Hamburg	Germany (W)	300	C*,E*
981	Alger	Algeria	600/300	C*,J*
990	RIAS Berlin	Germany (W)	300	C*
990	SER R.Bilbao	Spain	10	C*
990	BBC-Redmoss	UK	1	A
999	R.Popular, Madrid	Spain	20	C*
1008	Hilversum-5 Flevo	Holland	400	C,E,F
1017	Wolfsheim	Germany (W)	600	C*
1026	Graz-Dobl	Austria	100	H*
1035	Milan	Italy	50	H*
1044	DDR-1 Burg	Germany (E)	250	C*
1044	Sebaa-Aioun	Morocco	300	J*
1053	BBC-R1 Postwick	UK	10	C
1062	Kalundborg	Denmark	250	C*
1071	Lille	France	40	C
1080	Katowice	Poland	1500	C*
1098	Velke Kostolany	Czechoslovakia	400	C*
1098	R.Bop, Ga-Rankuwa	S.Africa (Rep)	100	D*
1107	AFN via Munich	Germany (W)	40	E*
1125	La Louviere	Belgium	20	C
1125	BBC Llandrindod Wells	UK	1	J
1134	Zagreb	Yugoslavia	300	C*
1143	Kaliningrad	USSR	150	C*,E*,G*
1152	Cluj	Roumania	950	C*
1161	Strasbourg	France	200	C*
1170	TWR Manzini	Swaziland	50	D*
1170	Krasnodar	USSR	500	C*
1179	Solvesborg	Sweden	600	B,C*,F*
1188	Kuurne	Belgium	5	C
1197	VOA via Munich	Germany (W)	300	C*
1206	Wroclaw	Poland	200	C*
1215	BBC-R3 Westerglen	UK	50	F
1215	Tartu	USSR	50	E*
1224	Vidin	Bulgaria	500	C*
1233	Tanger	Morocco	200	C*
1251	Tripoli	Libya	500	C*
1260	SER San Sebastian	Spain	20	C*
1269	Neuminster	Germany (W)	600	A,C*,F,G*
1278	RTE-2 Dublin/Cork	S.Ireland	10	A*,C*
1287	Litomysl/Liblice	Czechoslovakia	300/200	C*,E*
1296	BBC Orfordness	UK	500	A*
1305	Rzeszow	Poland	100	C*
1314	Kvitsoy	Norway	1200	C*,F
1323	R.Moscow via Leipzig	Germany (E)	150	C*
1341	BBC-Ulst.Lisnagarvey	N.Ireland	100	A,C*,F,G*
1350	Nancy/Nice	France	100	C
1359	RBI Berlin	Germany (E)	250/100	F*,G*
1368	Manx Radio, Foxdale	IoM	20	A,F,G*,I*
1377	Lille	France	300	C
1386	Kaunas	USSR	1000	C*,E*,H*
1395	R.Tirana via Lushnje	Albania	1000	C*,F,G*
1413	RCE Zaragoza	Spain	20	C*
1422	Heusweiler	Germany (W)	600	C*
1440	Marnach	Luxembourg	1200	C
1449	BBC-R4 Redmoss	UK	2	A,F
1467	TWR Monte Carlo	Monaco	1000/400	C*,E
1476	Wien-Bisamberg	Austria	600	C*
1485	Alcoy	Spain	2	C*
1485	BBC-R4 Carlisle	UK	1	F
1476	Wien-Bisamberg	Austria	600	M*
1476	Bilbao	Spain	10	M*
1494	Leningrad	USSR	500	C*
1503	Stargard	Poland	300	A*,C*,E*,G*
1512	BRT Wolvertem	Belgium	600	B*,C*,E*,G*
1521	Kosice	Czechoslovakia	600	C*
1530	Vatican Radio, Rome	Italy	150/450	A*,C*,E
1539	DLF Mainflingen	Germany (W)	700	C*
1566	Sfax	Tunisia	1200	C*
1575	RBI via Burg	Germany (E)	250	C*
1575	Genoa	Italy	50	A*
1584	Pamplona	Spain	2	C*
1593	Langenberg	Germany (W)	400/800	C*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

DXers:

A: Leo Barr, Sunderland.
B: Ian Bond, Wirral.
C: Lez Chipperfield, Goldhanger.
D: P.R.Guruprasad, Botswana.
E: Sheila Hughes, Morden.
F: George Millmore, in Hamilton.
G: Chris Nykiel, Leeds.
H: Tim Shirley, Bristol.
I: Mike Smith, Cambridge.
J: Mark Thompson, Wakefield.
K: Andrew Westmoreland, Wakefield.
L: Jim Willett, Grimsby.
M: Max Wustrau, Bedford.

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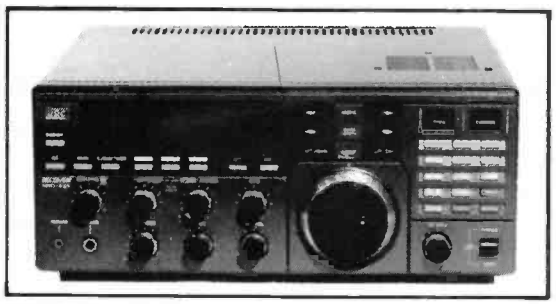

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SEEN & HEARD

There are many broadcasts to other areas, including Radio Nac. Angola, Luanda 11.955 (Port to SW.Africa 0530-1600) noted as 54444 at 0740 by P.R.Guruprasad; KLNS Anchor Point, Alaska 11.715 (Eng, Russ, Jap to E.Asia 0800-0900) SIO 232 at 0800 by John Evans; RBI via Nauen, GDR 11.890 (Ger, Eng to E.USA, E.Canada 0830-0930) 44444 at 0900 by **Sheila Hughes** in Morden; Voice of Mediterranean, via Cyclops, Malta 11.925 (Eng, Ar to N.Africa, S.Europe 1400-1600) 43533 at 1415 by John Nash; SLBC Colombo, Sri Lanka 11.800 (Ka, Ta, Hi to S.Asia 0730-1630) heard at 1740 by Ron Pearce; FEBC Manila, Philippines 11.850 (Eng to S.Asia 1300-1600) 33333 at 1412 by Rhoderick Illman; VOA via Tinang, Philippines 11.965 (Chin to C.Asia 1100-1600) SIO 433 at 1530 by Alan Smith; Voice of Greece, Athens 11.640 (Gr, Eng to Africa 1800-1850) SIO 555 at 1815 by Kenneth Buck; RFI via Issoudun, France 11.995 (Fr to N.Africa, Middle East 1800-2030) heard at 1829 by John Coulter; RAI Rome 11.800 (Eng to Middle East 2025-2045) 43443 at 2030 by David Wratten; RNB Brasilia, Brazil 11.745 (Eng to USA 0200-0250) 33333 at 0230 by Chris Shorten.

Some of the broadcasts to Europe in the **9MHz (31m)** band stem from Radio Moscow, USSR 9.765 (Eng 0400-0800) heard at 0500 by **Francis Hearne** in Bristol; WCSN Scotts Corner, Maine 9.840 (Eng 0600-0800) 55444 at 0600 by Ken Whayman; Radio Finland via Pori 9.560 (Fin, Ger, Sw, Eng 0515-0700) SIO 322 at 0645 by Alf Gray; WHRI South Bend, USA 9.620 (Eng 0600-0800) 44434 at 0750 by **Eddie McKeown** in Co.Down; AWR via Sines, Portugal 9.670 (Eng 0800-0900 Sundays) 44444 at 0803 by Sheila Hughes; Radio Australia via Shepparton 9.655 (Eng 0700-1030) 44544 at 0730 by John Nash; Radio Pyongyang, N.Korea 9.325 (Eng, Fr, Russ, Kor, Sp, Ger 1300-2150) 33333 at 1630 by Chris Shorten; Radio Jordan, Amman 9.560 (Eng 1420-2200) 44444 at 1754 by Darran Taplin; Radio Yugoslavia, Belgrade 9.660 (Eng 1830-1900) heard at 1845 by Simon Hamer; VOIRI Tehran 9.022 (Russ, Far, Tur, Ger, Fr, Eng, Sp, Ar 1530-2230) heard at 1907 by John Coulter; Radio Tirana via Lushnje, Albania 9.480 (Fr, Russ, Eng 1800-2300) SIO 222 at 2130 by Julian Wood; Radio Cairo, Egypt 9.475 (Ar 1800-2350) 33332 at 2146 by Max Wustrau; AIR via Delhi, India 9.910 (Eng 2000-2230) 43333 at 2200 by David Wratten.

While checking the **7MHz (41m)** band **Alan Smith** rated WHRI South Bend, USA 7.365 as SIO 444 at 0520; Eddie McKeown noted WYFR via Okeechobee, FL 7.355 as 54444 at 0600; Sheila Hughes logged the Int. Red Cross via Schwarzenburg 7.210 as 44444 at 1100; Ted Walden-Vincent rated AWR via Forli 7.257 as SIO 233 at 1444; Darran Taplin logged Radio Beijing, China 7.420 as 23322 at 1810; Terry Roy noted Radio Australia via Carnarvon 7.205 as SIO 433 at 1830; David Wratten logged RAI Rome 7.275 as 44444 at 1940; Francis Hearne heard Radio Budapest, Hungary 7.220 at 2025; Julian Wood heard Radio Korea, Seoul 7.550 at 2030; Mal Tedds noted AIR via Delhi 7.412 as SIO 322 at 2134; Ken Whayman noted Radio Vilnius, USSR 7.400 as 43443 at 2200; Garry Judd rated Radio Polonia, Warsaw 7.145 as 45444 at 2332.

In the **6MHz (49m)** band Ian Bond logged RFI via Allouis, France 6.175 as SIO 434 at 1600; Francis Hearne heard BRT via Wavre, Belgium 5.910 at 2100; Eddie McKeown rated Radio Japan via Sackville, Canada 5.960 as 44434 at 0200.

MW TRANSATLANTIC DX CHART

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
710	WOR	New York, NY	0130	A
770	WJMW	Athens, AL	0220	C
770	WABC	New York, NY	2300	A
840	WHAS	Louisville, KY	0130	A
890	WLS	Chicago, IL	0300	C
1010	WTXL	Jacksonville Bch FL	?	A
1010	WINS	New York, NY	0120	C
1210	WCAU	Philadelphia, PA	0105	C
1220	WGAR	Cleveland, OH	0130	C
1560	WQXR	New York, NY	0300	A
		CANADA		
580	CFRA	Ottawa, ON	0300	C
590	VOCM	St.John's, NF	2330	C
610	CKYQ	Grand Bank, NF	0100	C
680	CIYQ	Grandfalls, NF	0100	A
820	CHAM	Hamilton, ON	0300	A,C
920	CJCH	Halifax, NS	0100	C
930	CJYQ	St.John's, NF	0000	A,C
1110	CBD	St.John, NB	0110	C
		C.AMERICA & CARIBBEAN		
705	Kingston	St.Vincent	0500	A
770	R.Jamaica	Spur Tree, Jamaica	0230	C
1100	ZDK	Antigua	0130	A,C
1570	Atlantic Beacon	Turks & Caicos Ils	0120	C
1610	Caribbean Beacon	Anguilla	0330	A,B,C
		SOUTH AMERICA		
1220	R.Globo	Rio, Brazil	0100	B,C

DXers:
A: Tim Shirley, Bristol.
B: Mark Thompson, Wakefield.
C: Jim Willett, Grimsby.

Equipment Used

Leo Barr: Matsui MR4099 + internal antenna.
Darren Beasley: Steepletone MBR7 + hexagon loop.
Kenneth Buck: Home-built superhet + random wire.
George Butcher: Icom IC-R71E + random wire.
D. Carter: Matsui MR 4099 + built-in whip.
Jim Cash: Sony ICF 2001D + built-in whip.
David Edwardson: Trio R600 + trap dipole 22m long.
John Evans: Racal RA-17L + 40m wire.
Bill Griffith: Sony ICF 2002 + 9m random wire.
Sheila Hughes: Panasonic DR48 + 15m inverted L.
Rhoderick Illman: Sony ICF 7600DS + 23m wire.
Garry Judd: Saisho SW2000 + built-in whip.
Cyril Kellam: Sony ICF 7600DS + AN-1 or 5m vertical wire.
George Millmore: Tatung MR-7602 + built-in whip.
John Nash: Kenwood R5000 + random wire.
Chris Nykiel: Realistic DX-260 + random wire.
Fred Pallant: Trio R2000 + random wire in loft.
Roy Patrick: Lowe HF 125 + 20m wire.
Ron Pearce: Matsui MR4099 + random wire.
Philip Rambaut: Int.Marine Radio R.700M + random wire.
Kenneth Reece: Kenwood R5000 + delta loop.
Terry Roy: Philips D-1835.
John Sadler: DX-400 + SW loop.
Tim Shirley: Trio R600 + random wire.
Alan Smith: Matsui MR4099 + built-in whip.
Darran Taplin: Eddystone 680X + 25m random wire.
Mal Tedds: Matsui MR4099 + 25m random wire.
Mark Thompson: JRC NRD525 + 1m loop or 20m random wire.
Phil Townsend: Lowe SRX30 + SEM LW converter + random wire.
Ken Whayman: Vega 206 + built-in whip.
Jim Willett: Trio 9R-59DS + V dipole.
Julian Wood: Kenwood R1000 + random wire.
David Wratten: Trio R2000 + 30m random wire.
Max Wustrau: Datong PC-1 converter + FDK-750 2m transceiver.

Abbreviations

Abbrv	Language	Abbrv	Language	Abbrv	Language	Abbrv	Language
Ar	Arabic	Gr	Greek	Ka	Kannada	Sw	Swedish
Chin	Chinese	Ha	Hausa	Kor	Korean	Swa	Swahili
Cz	Czechoslovakian	Hi	Hindi	Mal	Malay	Ta	Tamil
Dan	Danish	Hung	Hungarian	Norw	Norwegian	Tur	Turkish
Du	Dutch	Ic	Icelandic	Pol	Polish	Uk	Ukrainian
Eng	English	Ind	Indonesian	Port	Portuguese	Ur	Urdu
Far	Farsi	It	Italian	Russ	Russian	Viet	Vietnamese
Fin	Finnish	Jap	Japanese	So	Somali	Yu	Yugoslavian
Fr	French	Jav	Javanese	Sp	Spanish		
Ger	German	Abbrv	Language	Su	Sudanese		

LW MARITIME RADIO BEACONS

Brian Oddy G3FEX
Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

The quite extensive beacon chart published in the May '89 *SWM* has encouraged ten listeners who have not contributed to this section before, to send along a log of their reception during the last three months. Their very welcome logs have been included in the lastest chart along with those from regular contributors.

Some of the latest contributors are newcomers to this aspect of our hobby and their reports indicate that they found it to be a great deal more interesting than they had expected! The fact that the beacons identify themselves by keying their callsign in Morse code has, for the majority of the newcomers, not proved to be the obstacle they first envisaged. For those who are having difficulty, a simple solution may be to jot down the dots and dashes of each callsign along with the frequency of reception and then decode them later.

Newcomers should note that most

SEEN & HEARD

LW NAUTICAL BEACON CHART

Freq kHz	Callsign	Station Name	Location	DXer
285.0	GY	Castle Breakwater	Channel Is	O
287.3	BC	Bloscow Roscoff	N.France	H*
287.3	BY	Bressey LH	Shetland Is	H*
287.3	CM	Cromer LH	Norfolk	I*,L*,P*
287.3	DG	Douglas Pier LH	IoM	F,L
287.3	EC	St.Helier	Channel Is	C
287.3	FN	Walney Island	off Lancs	D,F,I,L
287.3	GA	Outer Gabbard LV	off Suffolk	C,H*,J,P*
287.3	GR	Goeree	Holland	H*,I*,P*
287.3	LV	Dudgeon LV	off Norfolk	L*,P*
287.3	NR	Noordhinder LV	Holland	C,P*
287.3	PS	Point Lynas	Anglesey	F,H*,L,N
287.3	RS	Rosnaes	Denmark	H*
287.3	SG	Sjaellands LH	Denmark	H*
287.3	SK	Smith's Knoll LV	off Norfolk	C,H*,J,L*,P*
287.3	SL	Sletterhage	Denmark	H*,L*
289.6	LP	Loop Head	S.Ireland	H*
289.6	SM	Pte de St.Mathieu	France	H*
289.6	SN	Slyne Head	Ireland	H*
289.6	TN	Thyboron LH	Denmark	H*
291.9	CP	St.Catherines Pt	IoW	C,D*,P
291.9	ER	Pointe de Ver LH	N.France	C
291.9	FG	Pointe de Barfleur	N.France	C,H*,L*,P
291.9	KD	Kinnairds Head LH	Aberdeen	B,E,H*,L*,N,P
291.9	KN	Skrova LH	Norway	H*
291.1	MR	Montedor LH	Portugal	I
291.9	NR	N.Ronaldsway LH	Drkney Is	E,H*,J
291.9	DM	Stroma Pt LH	Caithness	H*
291.9	RN	Reykjanes	Iceland	H*
291.9	SB	Sumburgh Head	Shetland Is	H*,O
291.9	TI	Cap d'Antifer	France	P
291.9	VG	Sydosbrotten	Sweden	H*
294.2	AH	Altacarry Head LH	Antrim	E,H*
294.2	DA	Pladda LH	Is of Arran	H*
294.2	DK	Dunkerque	France	H*,J
294.2	LG	Eilean-Glas LH	Is of Harris	H*
294.2	LD	Landsort S. LH	Sweden	H*
294.2	MW	Mew Island LH	off Co.Down	E,L
294.2	DR	Digh Sgeir LH	off Is Rum	H*
294.2	RN	Rinns of Islay	Is of Islay	D,E,H*
296.5	BH	Blaavandshuk LH	Denmark	H*
296.5	FT	Cap Ferret LH	W.France	H*
296.5	HM	Hanstholm	Denmark	L
296.5	LA	Lista LH	S.Norway	C,H*,J,L
296.5	MA	Cabo Machicharo LH	N.Spain	H*,L*,P*
296.5	MY	Cabo Mayor	Spain	H*,P*
296.5	NK	Inchkeith	F of Forth	B
296.5	DH	Old Head Kinsale	S.Ireland	P
296.5	TR	Tuskar Rock	S.Ireland	H*,L,P
298.8	BL	Butt of Lewis	Is of Lewis	H*
298.8	CW	Cape Wrath LH	Sutherland	H*
298.8	DV	Djupivogur	Iceland	H*
298.8	HA	Grahara	Finland	H*
298.8	LK	Sule Skerry LH	off Drkney	H*
298.8	MF	Muckle Flugga LH	Shetland Is	H*,J
298.8	OB	Hoburg	Spain	L*
298.8	QS	Casquets LH	Channel Is	J,P
298.8	RD	Roches Douvres LH	Channel Is	P
298.8	SP	Start Point LH	S.Devon	P
301.1	BA	Punta Estaca Bares	N.Spain	H*
301.1	BG	Hatteberget LH	Sweden	H*
301.1	BJ	Bjornsund	Norway	H*
301.1	BN	Svenska Bjorn	Sweden	H*
301.1	CN	Cregneish	IoM	D,E,F,L,N
301.1	GE	Skarvoy Egersund	Norway	H*
301.1	HD	Hirsholm Main LH	Denmark	H*
301.1	IA	Llanes LH	N.Spain	H*
301.1	NF	North Foreland LH	E.Kent	H*,J,L*,P
301.1	PS	Cabo Penas LH	N.Spain	G
301.1	PY	Point of Ayre LH	IoM	D,E,F,G,H*,L*
301.1	RG	Raufarhoefn	Iceland	H*
301.1	SR	Skerries LH	Anglesey	G,H*,L*
301.1	SU	South Rock LV	Co.Down	E,H*,L*
301.1	TD	Isola del Tinto	Italy	H*
301.1	TU	Trubadvren	Sweden	H*
301.1	VS	Grosser Vogelsand	Germany	C
301.1	WK	Wicklow Head Light	Co.Wicklow	C,D,E,G,H*,L*,N
303.4	BT	Belle Ile Goupar	France	N
303.4	FB	Flamborough Hd LH	E.Yorkshire	A,C,E,G,H*,L,N,P*
303.4	FP	Fife Ness Point	Fife	B
303.4	LK	Pointe de la Coubre	France	N
303.4	LM	Isle of May	off Fife	A
303.4	MA	Malariff	Iceland	H*
303.4	SF	Stora Fjaederaegg	Sweden	H*
303.4	SJ	Souter Light	Sunderland	A,E,H*,L,N,P*
305.7	CB	Corbiere	Jersey C.I	C,H*,L,P
305.7	CS	Calais Main LH	N.France	H*,J,L,M,P
305.7	DA	Dalantangi Is	Iceland	H*
305.7	FS	Fall's LV	off Kent	C,H*,J,L*,M,P
305.7	KY	Oksoy LH	Norway	H*
305.7	LS	Hirtshals	Norway	L
305.7	OE	Ostende	Belgium	M,P
305.7	ON	Oesterngarn	Sweden	H*
305.7	SW	Skagen	Norway	H*
305.7	TO	Torungen	Norway	H*
305.7	WH	West Hinder	off Belgium	P
308.0	BD	Barra Head LH	Is of Barra	D,H*
308.0	BM	Braemoen	Sweden	H*
308.0	CA	Pointe de Creach	France	H*
308.0	DB	Deutsche Bucht	Germany	H*
308.0	DG	Drogden	Denmark	L
308.0	GL	Eagle Island LH	W.Ireland	E,H*
308.0	HE	Hestehoved	Denmark	H*,L
308.0	HK	Texel	Germany	L
308.0	KP	Kylmaepihlaja	Finland	H*
308.0	KS	Stora Karlso	Sweden	H*
308.0	MZ	Mizen Head LH	S.Ireland	H*
308.0	RC	Cabo Roca LH	Portugal	H*
308.0	RR	Round Island LH	Nr Cornwall	H*,J,L,P
308.0	ST	Stevns Klint Lt	Denmark	H*
308.0	TY	Tory Island LH	N.Ireland	H*,L
308.0	VL	Vlieland	Norway	L
310.3	AL	Pointe d'Ailly LH	France	P
310.3	DU	Dungeness LH	S.Kent	C,H*,J,L,P
310.3	FI	Cabo Finisterre LH	NW.Spain	H*
310.3	GD	Girdle Ness	Aberdeen	B,E,H*,L
310.3	LR	Laeso Rende LH	Denmark	C,H*
310.3	PH	Cap d'Alprech	France	H*,J,L,M,P
310.3	VI	Cabo Villano	Spain	L*,P*
312.5	AK	Akmenrags	USSR	H*
312.5	BK	Baltiysk Rear LH	USSR	H*
312.5	BT	Mys Taran Lt	USSR	H*
312.5	KA	Memel/Klaipeda	USSR	H*
312.5	WW	Ventspils	USSR	H*
312.6	FN	Feistein	Norway	H*,L
312.6	FR	Faerder Lt	Norway	H*
312.6	GU	Geltungane	Norway	H*,L
312.6	KH	Kish Bank	E.Ireland	L
312.6	MA	Marstein	Norway	H*
312.6	NB	Nab Tower LH	off Sussex	C
312.6	PT	Souter Pt	Durham	E,L
312.6	RB	Cherbourg	France	C,H*,L,P
312.6	SF	Skaroesfjara Lt	Iceland	H*
312.6	UK	Sunk LV	off Essex	P
312.6	UT	Utsira	Norway	H*
312.6	VR	Utvaer	Norway	H*
312.6	YE	Ile d'Yea LH	France	H*
313.5	BS	Port en Bassin	France	J
313.5	PQ	Ile Porquerolles	France	L
316.0	IN	Ingolfshofdhi Lt	Iceland	H*
318.5	KL	Kolkasrags	USSR	H*
318.5	KR	Kubassaar	USSR	H*
318.5	OR	Ossmussaar	USSR	H*
318.5	SY	Soerve	USSR	H*
318.5	WD	Vilsandi	USSR	H*
319.0	LEC	Stavanger	Norway	B,D,G,H*,K,P
344.0	KUL	Kullen High LH	Sweden	H*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

of the Maritime Radiobeacons around our shores operate in groups on shared frequencies. The beacons in a group transmit sequentially during a six minute period. At the end of the six minute period the whole sequence is repeated. Where there are six beacons in a group, each will transmit a Morse ident for 20 seconds, a single tone for 25 seconds and a final ident in Morse for 20 seconds during the cycle. When there are fewer beacons in a group each may transmit more than once during the cycle. As far as the DXer is concerned this means that it should be possible to log more than one beacon without altering the tuning of the receiver, so having logged a beacon do remember to listen for the other beacons in the group on the same frequency.

Most of the beacon groups operate continuously 24 hours a day, but a few beacons outside a group may only be active during a period of six minutes twice, or four times, an hour. A certain number only operate during fog. Another point to bear in mind when seaching for new beacons is that most of the Maritime Radiobeacons have a two letter callsign - the beacons with three letter callsigns are generally associated with aircraft navigation and are outside the scope of this series.

THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17

DXers:
A: Leslie Biss, Knaresborough.
B: Kenneth Buck, Edinburgh.
C: John Coulter, Winchester.
D: Robert Cowell, Blackpool.
E: David Edwardson, Wallsend.
F: Simon Holland, Douglas, IoM.
G: Cyril Kellam, Sheffield.
H: John Macdonald, Thurso.
I: Tim Shirley, Bristol.
J: Alan Smith, Northampton.
K: Mal Tedds, Nottingham.
L: Mark Thompson, Wakefield.
M: Philip Townsend, London.
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