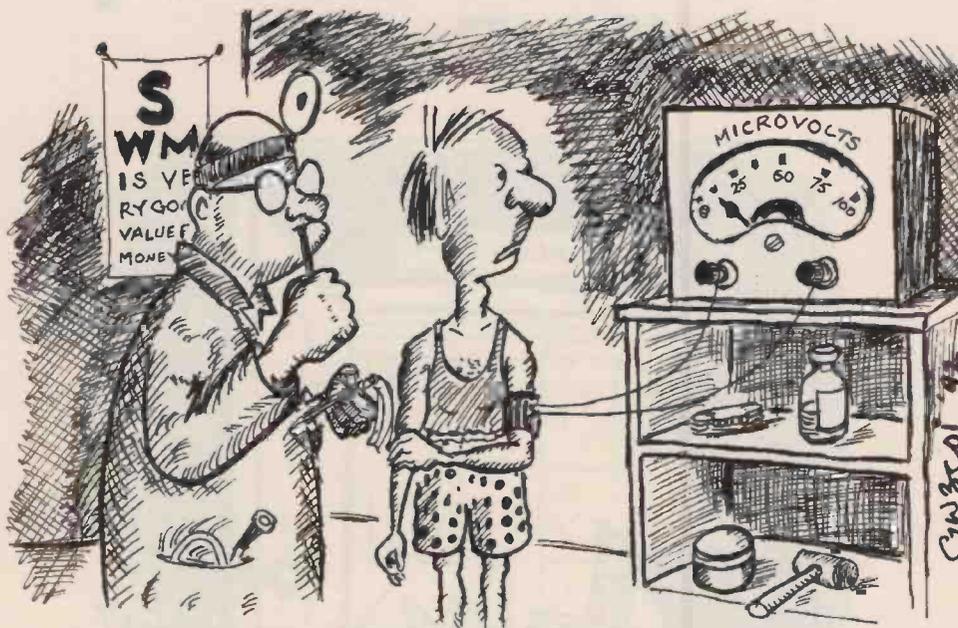


allowed to flow through them, and when electric belts were worn by patients suffering from a variety of ailments. In the 1890s Tesla discovered that bombarding tissue with a high frequency alternating current of a wavelength somewhat longer than the longest radio wave would heat living tissue.

Nagelschmidt coined the term diathermy which means heating through treatment between two condenser plates when passing a continuous short wave through them, warming the tissue and increasing metabolism and circulation to the area. Radio waves can also burn and destroy tissue."

Kilocycle Ken listened sympathetically. He knew about diathermy because some old machines operating on 27MHz caused interference to land mobile radiotelephone services. The machines wandered in frequency, they had harmonics, so consequently he knew every old diathermy in hospitals and private physiotherapist's rooms, and in doctors' rooms. Their harsh rasping note was a pain to him although they might be curing somebody's pain elsewhere.

Mr Smith said, "Until the late 1960s the idea that the bodily functions on a cellular level are electromagnetic in origin had been dismissed as little more than a figment of a few rather eccentric imaginations, even NASA now know that the body's cells are indeed electrically charged. Many scientists now believe that electromagnetic energy is the organising force behind cell structure and function. Although the normal charge varies from one kind of cell to another, scientists using a micro pipette inserted directly



## .. MALFUNCTIONING CELLS CONSIDERABLY LESS.

into a single cell have shown that a healthy cell has an electrical charge of around 90 microvolts, damaged or malfunctioning cells considerably less."

"I see," Kilocycle Kensaid thoughtfully. "But how can we help you. Has your problem become worse lately?"

"It has worsened because the radio spectrum has become increasingly crowded, more and more transmitters on all frequencies, more energy fields." He was shouting.

"I suggest you direct your complaint to the Minister of Science, we only deal with interference to radio and television reception, your problem is not really our field."

Mr Smith looked sadly at them. "They are all fools. I thought you would understand. You are radio people. You control the radio spectrum. You could shut down all radio transmitters."

"Very difficult," Kilocycle Ken said with a shake of his head. Young Golly said, "You could build yourself a house totally enclosed by anti radio wave material, block out all the electromagnetic spectrum."

"I might have to do that."

"What about air?" Kilocycle

Ken asked.

"Air conditioning and filtration."

They departed.

"A screwball," Young Golly said.

"There is something in what he says."

Young Golly laughed. "If he's so knowledgeable, why call the Radio Inspectors in? He's a nutter."

"Not entirely," Kilocycle Ken said firmly. "Most of us older Radio Inspectors were radio operators in our younger days, that's the way we were recruited, and we worked around radio transmitters. I remember once we did a count of the children born to ex-radio operators and most of them were girls, far too many girls to be a coincidence. You could almost predict that if a radio inspector's wife was pregnant it would be a girl."

"And you think it is radio waves?"

"Once I was a radio operator on a ship which visited the South Pacific kingdom of Tonga and I was taken to see the old French Bishop of Tonga. He was retired and when he was told that I was a radio operator he warned me about the danger of working with radio waves. Never forgotten it, although it

was decades ago. It was eerie, you know, bright sunshine outside, tropical hot, and here I was in this dim presbytery room with pictures of saints staring down at me from the walls, plaster statues of the Virgin Mary, rosary beads, religious books, and this incredibly old man, he must have been over 90, in a very worn black soutane, some of the fabric

covered buttons missing, whispering to me about radio energy."

"Why would he say something like that?"

"I don't know. But I think he was right. There's the Russian and American over the horizon radar which runs through the spectrum, enormous power, blanketing the earth. Who can say what effect it has on a human being. Scientists don't really know."

"What that guy needs is shock treatment in a mental hospital."

Kilocycle Ken sighed. "He probably is unbalanced, we get a few complainers like him every year."

"Eat drink and be merry," Young Golly said. He leaned forward and switched on the car radio. "Parliament, that would drive any man barmy." He punched a button and Madonna sang.

"You write up the complaint for the record." Kilocycle Ken ordered. "Perhaps we are lucky that we don't have time to worry about the effects of radio waves on our bodies."

"And brains." Young Golly laughed, rather inanely, started to write on the clipboard.

Kilocycle Ken crashed the gears of the old Hillman car, as usual.

"My pen jumps off the paper as I write!" Young Golly cried. ■

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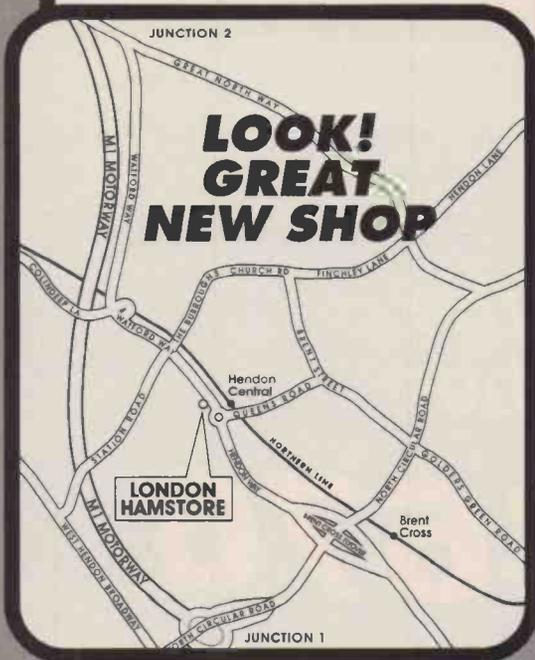
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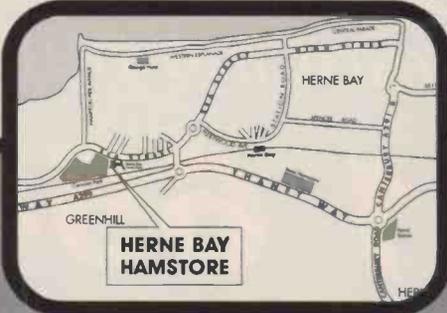
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**short wave magazine**

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January 9  
sees the  
first edition  
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# Propagation

by Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

**W**hen possible, I try to piece together reports in order to demonstrate the cause and effect of a particular disturbance. This time I have given pride of place to the groups of sunspots observed by Ford White (Portland) on October 24 & 26 and drawn by Patrick Moore, Fig. 1, at his observatory in Selsey at 1020 on the 28th.

There is no doubt in my mind that some form of solar eruption, associated with these sunspots, was responsible for the report from Tony Hopwood (Upton-on-Severn) that the earth's magnetic field was 'very disturbed' on the 26th and 'disturbed' on the 27th. Tony also heard auroral reflected radio signals on the h.f. bands around 2200 on the 26th. The idea is for you to compare your own logs with any of the 'special' periods that I mention to see if it explains anything unusual that you noted at the time.

## Solar

Looking back to the end of September, Ron Livesey (Edinburgh) using a 2.5in refractor telescope with a 4.0in projection screen, located 3 active areas on the sun's disc on the 29th and 7 on the 30th.

The daily relationship between solar activity, measured in flux units, and the variations in the earth's magnetic field for September are shown in the computer print, Fig. 2, kindly sent by Neil Clarke (Doncaster). Neil points out that the magnetic index reached storm levels on the 29th & 30th and that the average solar flux and magnetic 'A' index for the month was 116.9 and 20 respectively.

The radio telescopes operated by Cmdr Henry Hatfield (Sevenoaks) recorded small bursts of solar noise at 136 & 1297MHz on October 2 & 5. It is most likely that these bursts were associated with the 'spread' of sunspots, Fig. 3, drawn by Patrick Moore on his projection screen, at 1300 on the 1st. Despite poor weather conditions in October, Ford White managed to check the sun on the 23rd, 24th & 26th and located one, three & two sunspot areas respectively. In Bristol, Ted Waring counted 14 sunspots on October 1 and 12 on the 19th.

## Auroral

The auroral co-ordinator for the British Astronomical Association, Ron Livesey, received reports of 'unspecified aurora' for the overnight period on September 27/28, 'all sky' on 28/29, 'active pulsating & flaming' on 29/30 & 30/01, from

Beacon	August							September																						
	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DKOTEN																	X													
DLNGI	X	X													X	X	X	X						X				X	X	
EA3JA															X	X						X		X				X		
EAGRCM															X															
HG5CEW												X	X									X								
IY4M															X	X	X	X				X	X	X	X				X	
KA1NSV			X											X	X							X	X	X						
KB9DJA	X																					X	X	X				X	X	
KD4EC											X				X	X														
KJ4X	X	X	X							X												X		X	X	X		X	X	
KW7Y																														
LASTEN																X														
LU1FHH																													X	
NX2O			X												X									X	X	X	X	X	X	
N4MWW	X																													
ODSTEN			X	X						X	X			X	X		X	X				X	X	X	X	X			X	
OH2TEN							X						X	X								X	X	X	X		X		X	
OHSTEN													X	X									X	X		X	X	X	X	
PT78CN										X	X				X									X					X	
PY7AMI	X	X		X						X					X		X	X				X	X	X	X	X	X	X	X	
SK2TEN																													X	
SKSTEN											X			X														X	X	
SV3AQR									X				X	X	X						X	X	X	X	X	X	X	X	X	
VE3TEN																							X						X	
VE3TWO																									X				X	
VK2RSY																													X	
VK4VF			X	X																				X						
WC8E	X	X								X																				
WJ8Z													X																	
W3VD	X	X								X				X	X								X	X	X	X	X	X	X	
W8UR			X																											
W8UXO			X							X																				
Z21ANB				X						X							X	X				X	X	X	X	X	X	X	X	
SB4CY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

## Propagation Beacons

First, my thanks are due to Gordon Foote (Didcot), Henry Hatfield, Ted Owen (Maldon), Ted Waring and Ford White for their 28MHz beacon logs which, after combining their efforts, enabled me to prepare this months chart, Fig. 4, of the beacons heard in the UK.

A couple of new ones this time, VE3TWO was copied by Ford White and KB9DJA was heard by Ford and Ted Waring. Maybe the increased solar activity in late September and October is the reason for more American and Australian beacons appearing this time.

## Tropospheric

Details of the tropospheric disturbance on October 7 & 8 and the daily changes in atmospheric pressure for the period September 26 to October 25 can be seen in my Television column elsewhere in this issue.

observers in North Dakota. The events on the 29th & 30th were also seen from Southern Ireland & Lerwick respectively.

## Magnetic

The various magnetometers used by Tony Hopwood, Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle) and Tom Rackham (Goostrey), between them, detected magnetic 'storm' conditions on September 28, 29 & 30. Tony also recorded magnetic disturbance on October 1, 2, 3 & 12.

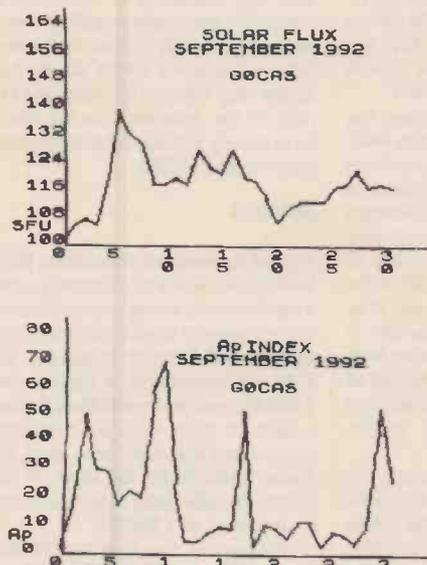


Fig. 2.

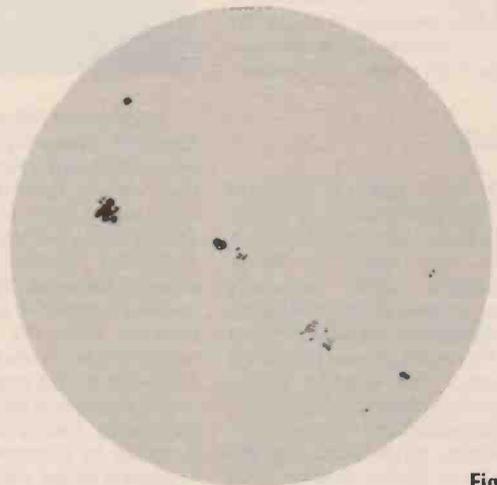


Fig. 1.

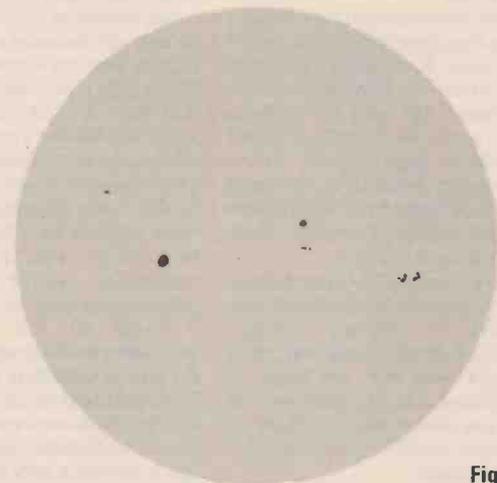


Fig. 3.

# Bandscan

EUROPE  
Peter Shore

**E**uropean international radio certainly has its ups and downs these days. As one station expands its operations, others are threatened with reductions or closure. In the last European edition of 'Bandscan', I reported that Radio Luxembourg's English service is carried in stereo on a sub carrier on the Astra satellite.

But your last chance to hear this station will be on the penultimate day of 1992, as the English satellite stream will be axed that night. It seems that it is not attracting a large enough audience to keep advertisers happy and without advertisers, the show cannot go on. Perhaps one of the station's biggest problems has been the lack of advertising supporting the satellite service, a problem faced by several of the stations operating, or thinking about using, Astra for radio to Europe.

Many people simply do not realise the numbers of stations able to be received via satellite in high quality. Another casualty in recent weeks has been the Zurich based classical music station, Opus Radio. It ceased in late October, shortly after another Zurich station, Radio E Viva! started. The new station, operating on Astra transponder 9, (the same one that carries Swiss Radio International), features the interesting mixture of Swiss folk music and good ol' country and western music.

## UK Gold

Keep an ear on audio sub carriers of the UK Gold transponder (number 23): BBC Radio Four and World Service in English may soon be there. Negotiations were reportedly underway as this column went to press in mid-November. The use of Astra by Radio Four would alleviate some of the complaints from listeners on the continent in the daytime coverage area of the long wave transmitter on 198kHz in Droitwich, earmarked for the new rolling news service (labelled Scud FM during the Gulf War) that will start in April 1994.

Another station that bit the dust not so very long ago was BRT International in Brussels. But Belgium's overseas voice did not disappear as the station was relaunched with the perhaps rather parochial identity of Radio Vlaanderen International. At an immense launch party in September at the veteran Wavre transmitting station outside Brussels, the new logo, jingle and name were unveiled.

The aim, according to the station's director, Jacques Vandersichel, is to promote the identity of Flemish-speaking Belgium abroad and not to compete with the 'big boys' in international radio in providing world news and current affairs. And one of the station's aims? To secure a satellite audio channel!

Antennas at the Wavre transmitting site of Radio Vlaanderen International.



Neighbouring Holland, however, is currently reviewing its external broadcaster, Radio Netherlands. The Dutch Media Council published a report on the future of the station in October noting that whilst the station's budget has increased by leaps and bounds to the current US\$44 million, its mission statement has not been updated since the 1950s. Is it worthwhile to maintain the station's role in the current political climate?, the report asked. Or should the station collaborate closely with, say, the Belgians to promote the region throughout Europe and beyond?

And further north, in Norway, the English service is under threat. With output doubled to two days a week not so long ago following an increase in funding from the Norwegian Foreign Ministry, the government now believes that there may be better ways of promoting Norway abroad. Since the announcement that funding was to be withdrawn (the Norwegian service is funded by the domestic licence fee), many listeners have been writing to the station, and to Norwegian embassies around the world, protesting the decision.

Could all this interest in international radio by satellite rekindle the idea of something like the World Radio Network? Regular readers may recall that this was a venture set up by some BBC domestic radio staff in their spare time in the early part of 1992. An

audio sub carrier on the Astra satellite carried the English services of a number of disparate stations from Radio Australia to YLE Radio Finland, the Voice of America to Swiss Radio International. World Radio Network ran for a few weeks as a test, but since then no more has been heard. However, radio stations in Europe may be about to capitalise on the concept. Deutsche Welle and Deutschlandfunk staff are interested in launching a composite international radio channel on satellite, with proper continuity between station's output. Could this be the way forward for international radio in the developed world? We'll have to wait and see what transpires in the course of 1993.

## Albania

Back on conventional steam radio, BBC World Service has now started to use a medium wave transmitter in Albania to carry some of its programmes in the Serbian and Croatian languages. At 2200, the transmitter in Lushnje on 1.458MHz is on the air with Bush House output for thirty minutes. Albanian transmitters are also being used by Trans World Radio for some of its output. At 2030 there is an hour long transmission on 1.395MHz.

Staying in the Balkans, Radio Bosnia-Herzegovina is still heard on short wave on a variable frequency around 7.238MHz.

## QSL card from Radio Netherlands

A summary of English language services from European stations:

**YLE Radio Finland, Helsinki**  
0530-0550 on 15.44, 11.755 & 6.12MHz (Sunday only)

0745-0800 on 11.755, 9.56 & 6.12MHz  
1930-2000 on 11.755, 9.73, 6.12MHz,  
963 & 558kHz

2215-2245 on 11.81, 11.74, 9.73MHz,  
963 & 558kHz

**Radio France International, Paris**  
1230-1300 on 21.645, 15.365, 15.195,  
15.155, 11.67 & 9.805MHz

1400-1500 on 17.65, 15.405 &  
11.91MHz (via China)

1600-1700 on 17.85, 17.795, 17.62,  
15.53, 12.015 (via Africa No 1), 11.705 &  
6.175MHz

**Radio Budapest, Hungary**  
0300-0400 on 11.91, 9.585 &  
5.975MHz

2200-2300 on 11.91, 9.835 & 6.11MHz

**Radio Netherlands, Hilversum**  
0730-1025 via Bonaire on 11.865,  
9.72 (0930-1025) & 9.63MHz (0730-0830)  
1130-1325 via Flevo to Europe on  
5.955MHz

1300-1625 via Flevo to Asia on 17.61,  
13.77 and via Madagascar on 15.15 &  
9.895MHz (1430-1625)

1730-2125 via Bonaire to Africa on  
21.59, 21.515 (to 1930), 17.605 (from 1930)  
& via Madagascar on 9.605 & 6.02MHz  
(both to 1930)

2330-0125 via Bonaire on 11.835  
(from 0030), 6.165 (to 0030) & via Flevo  
on 6.02MHz (until 0030)

**Radio Yugoslavia, Belgrade**  
0100-0130 on 9.58MHz  
1230-1300 on 21.605 & 17.74MHz  
1930-2000 on 7.20 & 6.10MHz  
2200-2230 on 9.505, 7.20 & 6.10MHz

# Satellite TV News

Roger Bunney, 33 Cherville Street,  
Romsey, Hants SO51 8FB

**T**here's currently available on the surplus market large quantities of BSB equipment, receivers, 'Squarials' and conventional BSB 350mm offset dishes. Prices - considering the technology that can be purchased - are a gift! Andrew Howlett G1HBE from Dukinfield has kindly passed on modification details relating to the Ferguson 'Squarial' that will allow the unit with its inbuilt LNB tune into the Telecom satellite band - 12.5-12.7GHz.

Despite the antenna being designed for left-hand circular reception and most Telecom band signals being plane polarised (that is vertical or horizontal), signal levels, particularly from the French Telecom satellites, are very high and good reception will be obtained, especially in the south UK. The 'Squarial' has a wider beam-width than, say, the Astra dish and there is the chance of co-channel interference from adjacent slotted satellites. However, the relatively simple modification does allow good use of an otherwise useless antenna, so it's worth doing! I will summarise the modification data as supplied by Andrew for the Ferguson 'Squarial'.

1: Disconnect the F plug antenna feeder, peel off the serial number sticker, which will reveal a screw that holds the back cover in place - now remove all 9 little screws (and spring washers) that hold the converter back plate and remove said plate.

2: Examine the internal layout and note a square die cast block on the right-hand side. Protruding from this block is a locknut, which is the frequency adjustment for the LNB local oscillator. Now remove the locknut assembly, which is in one piece.

3: Take one of the 9 little screws as above but without the spring washer and screw it completely into the now-empty local oscillator hole. It will fit exactly.

4: Replace the rear cover plate, connect the F plug with down-feeder and point the Squarial towards Telecom 2a at 5°E. Tune the satellite receiver, adjust the Squarial and you will eventually find a signal, readjust the antenna for optimum results.

Andrew reports that he can receive ARTE, TF1, Ant 2 and Canal J and relating radio channels. Thanks to Andrew for advising of these simple yet effective modifications.

## Orbital Sightings

The American Presidential Election in early November caused a flurry of activity across the Clarke Belt with many satellites carrying news reports, 2-way interviews, comments and assessment. The run-up to the election had been producing many news items with the candidates on whistle-stop tours - election day and evening brought on-stage the experts with

evaluations of the voting and the possible implications of the result. Intelsat K at 21°W had been particularly busy with feeds on the leased Brightstar transponders - many in European languages - as was the EBU permanent lease on Intelsat 601 27°W.

What is so interesting with the video reports from the various parts of the United States - usually provided by a local TV station - is that often the news item offered is preceded with their local test card (usually colour bars + ident), at times local news programmes are offered from which the client (the European broadcaster) will extract and edit the required item, adding their own introduction later.

Whilst discussing 'local programming', Olympus, that oft neglected satellite residing at 18.8°W, has been seen carrying French CBC news and programming ex Quebec at 12.52GHz left-hand circular. This signal is noise free on my 1.5m dish in plane polarisation - I cannot run circular. Best time to look is mid evening around 2030UTC onwards - much original programming and commercials are left intact, though last night (November 11) video was cut and replaced with a 'CBC North' ident. The *Transponder* bulletin reports that this frequency has also been seen used by the BBC SNG unit 'UK1 23' with various news programme inserts. (*Transponder* bulletin - details PO Box 112, Crewe, Cheshire CW2 7DS - include an s.a.e. for details). I've monitored UK1 23 on 16°E recently for the record!

With all the main French programmes now transferred to Telecom 2a at 5°W, it's the hottest bird in the sky in that direction, at least 7 channels have been monitored down-linking at high levels, some scrambled and the others in the clear, together with a variety of sub-carrier radio programmes.

RTT Tunisia is now down-linking from Eutelsat II F3 16°E (11.658GHz vertical) with full programmes and test card, mainly in Arabic though with a few opt-out French offerings. TV7 currently airs on this bird for approx. 8 hours daily and with 2 sub-carrier radio channels, again French and Arabic for the Radio Tunis International service - sub-carriers at 7.02 and 7.20MHz.

Country Music fans will rejoice at 'CMT-EUROPE', a new music channel presented for cable operators by United Artists which appeared mid October via Intelsat 601 27°W at 11.51GHz vertical. Most of the videos screened are of very recent production and show an interesting backdrop of American scenery. Meanwhile the nearby 'Kanal Markets' test card on 601 is still present, origin suspected ex Turkey, check out on 11.66GHz vertical.

HISPASAT, the new Spanish satellite, is testing intermittently at 31°W, this essentially Ku band bird carries transponders for FSS, DBS and



The distinctive test card as used by Middle East Broadcasting over Eutelsat II F1 at 13°E.

Telecom bands and will eventually offer spot beam coverage into the Iberian peninsula, the Canaries and across into the Americas. In early November it has been testing at 12.30GHz.

The weekend of the 24th saw TVP Poland down-linking from Eutelsat II F3 16°E at 11.55GHz, not the start of their projected regular service (anticipated March '93) but a celebration for the 40th anniversary of Polish TV. Programming including considerable input from veteran staff of TVP and interestingly using PAL - though Poland has used SECAM for many years, shortly the country will change to PAL throughout her terrestrial network.

Hungary is now operating from 16°E, during mid October programmes and test cards were carried for the Budapest Europa Telecom exhibition October 11-18. These transmissions ceased, but in early November transmissions returned - the test card (PM5544) carrying the identification 'ANTENNA' and 'HUNGARIA'. Try 11.59GHz horizontal.

October 16 saw the *Kilroy* programme originate from one of HM Prison establishments. For this offering, satellite linking was utilised for the broadcast with the help of SISLink's SNG truck UK129. Transmissions over Eutelsat II F4 at 7°E (10.98GHz vertical) included part of the rig, rehearsals and the actual transmission. Interesting to see one of my old work colleagues from TVS in shot during rehearsals and now employed with a new company!

Even with a small operational dish, there is really lots to see throughout the 24 hours.

## Orbital News

Yet another new scrambling technique is to be introduced - this time by Red Hot Dutch - the UK's Continental TV adult entertainment channel up-linked from Holland to prevent the UK authorities terminating the transmissions (due to the nature of the programming content!). 'Enigma' will be used from early 1993 and will offer improved security against piracy. The system is decoder addressable over air and does not rely on a customer Smart Card, many levels of encryption

are available and the company suggest that it is unhackable. It is said that the decoder 'code book' has up to 4 billion variations with a further plug-in back-up code book to further increase encryption levels and options. It's claimed that Enigma is more secure than Sky TV's Videocrypt, which recently was hacked - though this has been overcome by Sky with an improved Smart Card.

GE Astro-Space Division, New Jersey have won the order for supplying AsiaSat 2 to the Hong Kong based Asia Satellite Telecommunications Ltd (AsiaSat 2), which will slot at either 77 or 100°E in Autumn 1994 and with a further craft available in 1995. On board loading will include 24 x 55W C Band transponders and 9 x 100W Ku band transponders. Another satellite order is for Luxembourg based SES Astra who have awarded Hughes Aircraft with the contract for Astra 1E, again slotting at 19.2°E with 18 x 85W transponders plus 6 spares.

There is considerable discussion in the satellite industry over LEOs (Low Earth Orbit) satellites, Italy, France and Spain all have LEO projects in the design stage with French company Aerospatiale ready with a 4-stage solid fuel rocket to launch into a 500km orbit. The French TAOS lightsat project will feature communication platforms in the 137-138 and 148-150MHz bands. Even the Russian/Ukraine are proposing to enter the LEO market with their Ariadne project.

Our Sri Lankan contact Bandula Gunasekera has spoken the PTI office at Colombo regarding the Indian Press Association's attempts at using the Russian Ekran u.h.f. satellite (714 or 754MHz) for programme transmissions. These were projected mid 1992 and to date nothing has been seen! The PTI advise that transmissions will go ahead, but there have been licensing problems in India over AsiaNet. This latter service opened August 26 last over a Gorizont bird with programming 0700-2300UTC daily (1100-2100 Sundays) with Hindi films, shows and light entertainment. I hope to be advised shortly on the PTI opening so I can make readers aware of the situation and the interesting DXTV challenge that the u.h.f. satellite will present.

# DXTV Round-up

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

**F**irst, may I wish all of you and your families, a very happy Christmas and an active and prosperous new year.

## Electronic Thermometer

On the subject of Christmas, what about a gift of an inside/outside thermometer, Fig. 1, or a talking calculator, Fig. 2, for the scientifically minded person who seems to have everything? Although intended for use in a car, the instrument in Fig. 1, is currently installed on a shelf in my office. It's powered from a 1.5V 'button' cell, has a sensor on the front (bottom left) for inside temperature and another on a lead to place in a convenient position for outside measurements.

My office is upstairs, so I have taken the lead (lower side left) up through the ceiling and fixed it under a roof-tile. The tile protects the sensor from direct contact with wind and rain. The internal/external detectors are selected by a switch (lower right) and a press of the long bar below the liquid crystal screen reveals the time. These are made in China for Ron imports Ltd. (Ref. No. GW 239) and are available from Halfords and no doubt other accessory stockists for around £10.99.

## Talking Calculator

The time came for me to replace my 20 year old desk calculator and, after a good look around at the wide range available, I chose Tandy's 'Talking Calculator'. Apart from hearing the result of my entries, its convenient size (approximately 177 x 130 x 30mm) and shape appealed to me, as did the 54 x 20mm liquid crystal display and the relatively large keys. The instrument is powered by two 'AA' batteries and the unit is switched on and off by the respective green buttons, at the lower right. The speech from the 35 x 14mm speaker grill, top right, is 'clean' and distinct. The sound volume is controlled by a three position switch just below the display. Now for a working example, if you press 9 x 3, the voice reproduction says 'nine times three equals twenty seven'. Press 'AC' and it says 'all clear', 'M+' and it responds 'memory plus' and so on.

There is yet another option, say an answer to a sum is 538, it will say 'five three eight' or, by changing a command, 'five hundred thirty eight'. When the symbols '+', '-', '.', and '%' are pressed the machine replies 'plus', 'minus', 'point' and 'percent' respectively. If required, there is a useful 'REP' key, by the 'off' button, to repeat the answer. This calculator retails for £19.95 and is no doubt available from your local Tandy store.

## Company Station

My thanks to **Ian Hume** (Bournemouth) for telling me that the test-card, scribed

'HZ22TV Channel 3', seen in my November column (Fig. 4), received by Lt. Col. Rana Roy (Meerut, India), "is the callsign test card for ARAMCO (Arabian American Oil Co.), Saudi Arabia." The signal from its 5kW transmitters in Dhahran is intended for company employees over an area of about 80km radius. "They were getting out pretty good that day," said Ian.

## Poor October Conditions

"I have looked around on most days, but nowt!," wrote **John Woodcock** (Basingstoke) about DXTV for the month prior to October 23. Although they did a bit better, similar comments came from **David Ashley** (Norwich), **Bob Brooks** (Great Sutton) and **Simon Hamer** (New Radnor). Their locations provide a cover for almost all of the UK and their reports show only a few outbreaks of Sporadic-E during the month. However, there was some compensation when a moderate tropospheric opening occurred while the atmospheric pressure was high on the 7th and 8th.

## Band I

The first of the winter 'F2' reports came from **Simon Hamer**, who received unidentified 'smearly' pictures in Band I at 0730 and 1230 on October 27 & 29 respectively. He also logged pictures from Iceland (RUV) on Ch. E4 (62.25MHz), Norway (NRK) on Ch. E2 (48.25MHz) and Sweden (SVT1) on Ch. E3 (55.25MHz) during a short burst of Sporadic-E at 1330 on the 5th. While comparable openings were in progress during the mornings of the 14th, 15th & 30th, **Bob Brooks** saw programmes and/or test-cards from Denmark (DR Teletext), CIS, Hungary (MTV Teletext), Italy (RAI) and Spain (TVE), plus a few unidentified signals. Earlier in the year **Bob** received the 'Dagger' logo from Tallin, Fig. 3. During a late Sporadic-E, in November 1991, Lt. Col. **Rana Roy** (Meerut, India) logged Bangkok TV, Fig. 4, on Ch. E3.

## Satellite TV

"Another satellite channel on Astra Transponder 23, UK GOLD," wrote **Simon Hamer** just after a report came from **Peter de Jong** (Leiden, Holland), sent a photograph, Fig. 5, of its test-transmissions. **Peter** received this on October 17. He also sent a photograph of ITN World News, from London Fig. 6, which he took as he received it from Eutelsat 1 'F4' in December 1991.

## Weather

The variations in atmospheric pressure for the period September 26 to October 25 were recorded at my home in Sussex and the readings, Fig. 13, were taken daily from my barograph chart at noon



Fig. 1: Inside/outside thermometer.



Fig. 2: Talking calculator.



Fig. 3: Tallin.



Fig. 4: Bangkok.



Fig. 5: UK Gold.



Fig. 6: ITN World News.

and midnight. I recorded 3.24in of rain in October, compared with 2.69in for the same month last year. Hail and thunder occurred overnight on the 19th/20th and again for most of the evening of the 28th.

One violent flash of lightning, early on the 20th, caused a 'click' to come from the speaker of the Tandy calculator that was sitting, switched off, on a shelf. A marked change in atmospheric pressure was clearly drawn on my barograph chart, Fig. 13, when gales, with rain squalls, crossed Southern England on Sunday the 25th. The lowest point of 997mb (29.5in) came around 2000. Squalls can provide a lot of rain in a short time and usually pass through very quickly as did the one that I photographed in May this year, Fig. 8.

"Very bad weather here with Force

10 gales," wrote **Ford White** from Portland on October 27 and, "wet and cold", was the way **David Ashley** described the month's weather for the Norwich area.

"Best October for skiing for 30 years, said the Grampian news programme tonight," wrote **David Glenday** (Arbroath) on November 2. **David** added, "The hills here have been covered with snow since early October...the second half of the month has seen lots of low pressure systems. Last night we had gale warnings. Around noon today the pressure dipped below 29.0in (982mb)".

## Tropospheric

**Simon Hamer** received pictures from Denmark (DR) and Norway in Band III and Belgium (BRT), Denmark (TV2),

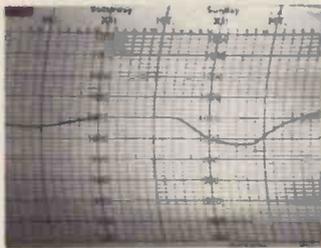


Fig. 7: Barograph chart.



Fig. 8: Squalls in May.

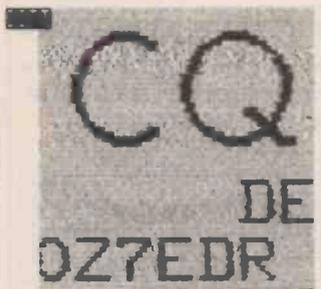


Fig. 9: Demark.



Fig. 10: France.

Eire (RTE), France and Holland in the u.h.f. bands during a tropospheric opening on October 8.

David Ashley noted some heavy co-channel interference on the normally strong Sandy Heath and Sudbury transmitters early in the



Fig. 11: Sweden.

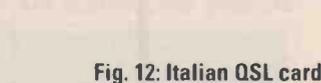
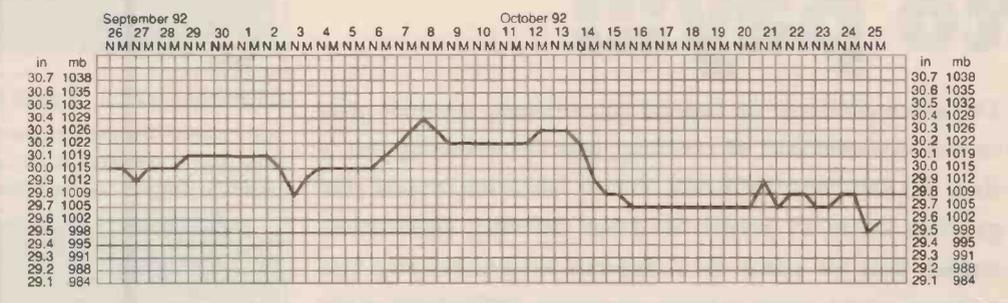


Fig. 12: Italian QSL card.

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Fig. 13.



month. Bob Brooks logged good colour pictures and sound, on Ch. E10 (210.25MHz), from Denmark on the 7th and 8th plus Ireland's 'RTE', on their Ch. H (207.25MHz), all day on the 8th.

While this event was in progress, David Glenday received pictures from Denmark on Chs. E5 (175.25MHz), 7 (189.25MHz) and 10 and Germany (ARD1) on Chs. E9 (203.25MHz) and 11 (217.25MHz). He also added Denmark (TV2), Germany (ARD1, HR3, NDR3, SAT1 & ZDF) and Holland (NED2 & 3) on several spots in Bands IV and V. "Tropospherics until 1630 [on the 8th] when a cold front passed over," said David.

During a telephone conversation with Garry Smith (HS Publications, Derby) at 1800 on the 7th, Andrew Jackson (Birkenhead), learnt about the opening and immediately checked the television bands. Garry told him about the strong signals coming from

Scandinavia but as he tuned through the higher v.h.f. and the u.h.f. channels he found pictures from Belgium (BRT1 & RTBF1), France (CANAL+), Germany (ARD1, MDR3, NDR3, RTL+ & ZDF) and Holland (NOS2 & 3) and on the 8th, Denmark, Holland and Germany.

Both Andrew and David Glenday reported seeing many unidentified stations from Germany and, during the evening of the 7th, Andrew's DXing was handicapped because Germany's 'ARD1' "took over Band III with very strong signals."

#### SSTV

"I have just fitted the Lowe Electronics long wire balun and it works very well, quite a considerable difference, less noise and a small boost on signals received," wrote John Scott (Glasgow). John reports that the 14MHz band came alive again in October [see

my Propagation column elsewhere in this issue] and that the England Wales slow scan television net, on 3.730MHz, is active most nights.

During the month, John copied strong colour pictures from the United States stations K2EVY and WA3WZC who were taking part in a slow scan net on 14.230MHz. In addition he copied 'CQ' captions from stations in Denmark, Fig. 9 and France, Fig. 10 plus an amusing cartoon transmission from SM5EEP in Sweden, Fig. 11. Although it can be "rather busy at times around 3.730MHz, with QRM and slow scan signals," John managed to receive pictures from DK2AN in Germany. I bet that took some careful tuning John.

The well illustrated Italian QSL card, Fig. 12, from Marino Tinelli I0MKW acknowledged David Glenday's report of the 14MHz FAX signals that he received from Marino on October 19.

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3. Is the serial no. logged with the official U.K. distributor for possible contact on updated mods? If so, ask WHAT IS THE SERIAL NO?
4. Is the supplier authorised by the OFFICIAL DISTRIBUTORS IN THE U.K. TO SELL YOU THE EQUIPMENT, guaranteeing you spares, latest mods, and full accessory back-up? THIS IS IMPORTANT -whatever you are told, there are good reasons why retailers are not "appointed" to sell you U.K. approved equipment. Contact the distributors for a full explanation.
5. Do you see an advertised price, phone to place an order, ONLY TO BE TOLD THAT THE LAST ONE WENT THIS MORNING, but encouraged to SEND A DEPOSIT, and you'll get it sometime in the future?
6. See an advertised price, go to place an order and told to ADD 3.5% HANDLING TO USE YOUR CREDIT CARD?
7. Visit the supplier to view your latest probable purchase, only to find NO STOCK WHATSOEVER -not even empty cardboard boxes!
8. Ask about accessories only to be told that "SUPPLY ISN'T AVAILABLE".

The list is endless, use your discretion. There's nothing wrong with shopping around, I do it. Who doesn't? Remember .... "THE BITTER TASTE OF POOR SERVICE REMAINS LONG AFTER THE SWEET TASTE OF LOW PRICE IS FORGOTTEN!..."



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# SSB Utility Listening

Peter Rouse, Barcroft, Rohais de Bas, St. Andrews, Guernsey.

**H**ere we go into our third year of this column...my how time flies. Along the way I have been asked several times to recommend receivers and antennas and how to set up the best station given a modest budget.

Obviously the most important item is the receiver and a good second-hand communications type receiver will generally perform better and have controls that are easier to operate than some of the very small but inexpensive portables that are now available. If you can afford to buy a new receiver then, to my mind, the British built HF-150 and HF-225 receivers from Lowe offer the finest value for money available (an opinion shared by several leading reviewers).

Antennas are a difficult choice for our hobby because we need to tune a multitude of bands that are not harmonically related. The G5RV dipole is one option that has been covered several times in the past and another alternative is the simple long wire.

The third vital component in a good station set-up is an antenna tuner because the best way of ensuring that the receiver is allowed to do its job properly is by not blasting it with strong out-of-band signals.

Compact active antennas are ideal for flat dwellers or those who cannot mount external antennas. However, you will need to invest in a good one (Datong and Dressler are two examples). Some of the cheaper versions and kits now available can, and do, suffer from the most appalling overload problems. This largely appears to be a result of omitting vital filtering in order to achieve maximum possible bandwidth (in some cases from 1.6 to 2000MHz). The kit from Maplin is an exception because it is fully tunable.

## What You Say.

On to the logs and Paul H. reports that the USAFs Air Combat Command (formerly SAC) have now changed their

primaries to 6.738 & 8.967MHz for nights and 11.176, 11.243 & 17.975MHz during the day. Paul adds that NORAD seems unaffected by the changes and their primaries are still 9.023, 11.214, 13.207 & 18.027MHz.

Paul also mentions that ARINC (Air Radio Incorporated) in New York are experimenting with compression/expansion techniques on their 5kW transmitters that are used to provide long distance communications for airlines. The 'Link Plus' system they are trying out is supposed to increase signal to noise ratios and make the audio punchier. You can check-out ARINC on 6.640, 11.342, 17.925 & 21.964MHz.

Mr C. Farquhar of Cannich in Invernesshire confirms that 'Quid' is a USAF KC-135 air to air refueling tanker based at Mildenhall and says it is on temporary duty in Europe. Other tanker call signs to listen-out for are Blue, White, Brown and Lager. Mr Farquhar also casts light on the submarine rescue heard on 5.680MHz by Philip Murphey. He says this was part of a major exercise involving forces from NATO, Australia, Canada and New Zealand mostly operating out of Kinloss.

Ken Chilcott of Pontypridd queries the call signs Hilda, Raymond 7 and Raymond 9 and the US Navy call sign Estimate all heard working on 11.176MHz via Ascension. Hilda is Air Mobility Command HQ at Scott Air Force Base in Illinois and as Raymond 10 is Langley Air Force Base in Virginia I suspect Raymond 7 and 9 are aircraft based there.

Graham Tanner has discovered that 'Grove Control' is the call sign for the Fleet Requirements and Air Detection Unit (FRADU) who direct Hunter and Canberra jets towards Royal Navy ships for defence exercises. FRADU is based at the Navy Air Station at Yeovilton in Somerset. Graham's logs include two USAF EAM broadcasts on peculiar frequencies. Both 6.796 & 11.266MHz were used.



Lowe HF-225 communications receiver.

The callsign Table-Lamp was heard and Graham thinks at least one of the broadcasts may have been a retransmission by the US Navy.

On September 22 an RAF helicopter ditched in the North Sea and Graham monitored a lot of traffic relative to this incident that readers may recall attracted national television coverage. He also monitored a rescue operation in North Eastern Australia on 9.027MHz with call signs Wombat, SAR 727 (Sydney) and LSL. Graham believes the latter is VH-LSL a SA.365 Dauphin helicopter belonging to the Northern Region Life Saving Association of Australia.

Fritz Nusser is a regular reader who lives in Obfelden in Switzerland and he has been monitoring multinational UN operations on 5.310MHz. These are the UN forces operating in war-torn Yugoslavia and the net, which appears to include ships and aircraft, on this frequency reports shipping approaching Yugoslavia. 3 digit call signs are the norm and the net is run along similar lines to the USAF ones. Fritz would be interested to hear the observations of any other readers who are regularly monitoring this net.

Keith Elgin has found several frequencies for the proposed Earthwinds project that will attempt to circumnavigate the world on a two

week trip using hot air balloons. The project has already been postponed several times, but there are still hopes that this project will go ahead in the near future. Lift-off will be from Akron in Ohio and reports will be sent three times in each hour on any of the following: 3.347, 13.993, 14.6635, 20.994 or 28.3045MHz. Note that all those frequencies are US MARS allocations.

## Submitting Logs

I am having some slight problems with the logs that are submitted for this column. First of all let me say that I have no objection at all to you sending me your entire month's log, either as a photo-copy or computer print out just as long as you do not expect me to use all your entries. Naturally I pick-out the unusual, the rare or the topical. Some readers very kindly copy out their logs in longhand for me and I suggest they save themselves some time and effort by concentrating on their more interesting entries rather than including run of the mill loggings such as regular NAT track and shipping communications.

The other problem concerns the substantial mail I get now and even though my paperwork is filed fairly carefully it is not unusual for logs to get separated from their cover letters. Can I ask you all to just jot your name at the top of each log sheet so that I have a double check on which log belongs to which reader. I have one excellent log at the moment that I cannot use for the very reason that its cover letter has gone missing in this month's pile.

## Finally

Next month I am going to have a recap on some of the topics we have covered in a sort of *ad hoc* way lately. Subjects covered will include the Civil Air Patrol Again and how some of the round the world yacht racers are now using Portishead for h.f. communications. I will also have details of a brand new and inexpensive balun designed specifically for use with our beloved G5RV antenna.



The new Lowe HF-150 communications receiver - as reviewed in this issue.

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The AR3000A is powered from 13.8V DC, a suitable mains power supply is provided with the receiver. Other accessories include a telescopic whip, DC lead and comprehensive operating manual. **RRP £875.00 including VAT.**



## COMPUTER CONTROL

*Two AOR software packages are available - AORSC Spectrum Coordinator and ACEPAC3A. Both software packages offer extensive memory, search and scan facilities plus much more. Note: Scan and search speeds are slower under remote control than offered by the receivers in 'real mode'. P&P on software £2.00*

AORSC is a powerful program for the IBM PC (and 100% compatible) computer which allows control of the AR3000A, AR3000 or AR2500 receivers via the computer's RS232 serial port. A text display is used to present information regarding operation of the software. The status of the receiver and software is shown above a list of memory channel contents. The bottom line of the screen contains a menu giving a list of options representing the main facilities which the software offers.

The keyboard of the computer may be used to select the frequency and mode using dual VFOs, it is possible to switch instantaneously between the two VFOs with a single key press. A fixed VFO offset may be entered into the system and the VFOs locked together using the "tracking" facility so that a fixed offset is maintained while tuning across the receivers spectrum.

Three thousand mode sensitive memory channels are provided in each memory file, each with dual VFOs and a 50 character comment. Multiple memory banks may be used so that the total number of stored channels may be several thousand! A selection of memories are displayed on the computer's screen so that you may easily review memory contents. Of course AORSC features comprehensive programmable search and scan facilities, it is possible to up-load and download memory channels to and from an AR3000A/3000. Automatic memory store is also possible.

Activity histograms may be printed (automatically if you wish) and the package has a fully integrated bandplan data-base and logbook. Other facilities include offset simplex reconstruction, detailed single frequency watch, reject frequency list and even a simple spectrum analyser style graphics display... [a detailed 8 page sales booklet is available upon request]. AORSC is supplied on both 3.5 and 5.25 inch media. Although it is possible to run the software on a twin 720k floppy machine, installation is recommended on a hard drive. **RRP £75.00 including VAT.**

ACEPAC3A is available to those with a larger budget. The package is designed to compliment the AR3000A and AR3000 receivers. Facilities are similar to AORSC but the spectrum style display offers greater facilities. Multiple banks of 400 simplex memory channels are available with character comment. Download of memory channels to the receiver is possible. **RRP £129.90 including VAT.**

Enhanced model - AR1500E - the World's first true compact hand-held wide range receiver offering SSB as standard has been made even better. Coverage is from 500 kHz all the way to 1300 MHz without any gaps in the range. Channel steps are programmable in multiples of 5 kHz and 12.5 kHz up to 995 kHz, the BFO will allow tuning between these steps for SSB operation. All popular modes are provided NFM, WFM, AM and SSB (USB, LSB and CW) with the BFO switched on.

The receiver is supplied with a comprehensive selection of accessories: DA900 wide band flexible aerial, NiCad pack, Dry battery case (for use with 4 x AAA alkaline cells), Charger, DC lead fitted with cigar lighter plug, Earphone, Soft case, SW aerial wire terminated in a BNC connector for shortwave reception and Operating manual.

Versatility is excellent. The AR1500E may be powered from its internal NiCad pack, spare dry batteries may be carried for extended operation and used with the dry battery case, the set may also be plugged directly into the cigar lighter socket of a motor vehicle (external input range 11 - 18V DC). **RRP £299.00 including VAT.**

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# Amateur Bands Round-up

Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ

Let's kick off this time with a long letter-full of questions about the G5RV antenna, from Nigel Alford in Larkfield. Nigel uses one, but is troubled by electrical noise both from the house and local power lines.

His first question is that of height, and the quick answer is 'the higher the better' for any horizontal antenna. The desired low angle radiation is a function of height; if you consider it from the transmitter point of view, the lower the angle at which the signal is squirted out, the fewer the number of 'hops' required to reach a distant point. In addition, the low angle at which the signal leaves the ground also implies that it strikes the refracting layer of the ionosphere at a shallow angle too. The only time anyone will reduce antenna height is maybe in a contest where this may pick up some nearby countries for multipliers. Getting it higher gets it out of the noise field of the house too.

As for the angle at which the feeder leaves the wires, this should be at right-angles as far as possible; for minimum pick-up of signal from the wires on to the feeder. To feed the centre of the wire span with coaxial cable would be a bad mistake. As to which direction the wires should run, the angle of radiation on the lower bands is at right angles to the wire, but at the higher frequencies it will tend to show more radiation off the ends. Rather than modifying the G5RV by giving it a balun at the feed point, I would suggest coming all the way down in 300Ω line, and connecting it to the receiver by way of an antenna tuner or a t.u. All that being said though, more height is always useful!

Finally, normal ribbon feeder doesn't like water. Either cut most of the 'web' away leaving just enough to maintain spacing, or polish it with silicone polish. Better, make your own open-wire feeder as shown in the old texts.

## Power Line Noise

Turning to the power-line question, in general the lower-voltage lines seem to kick up more rumpus than the very high-voltage ones. One can, of course, complain to the local electricity board IF it is bad enough to affect broadcast or TV reception. If a fault occurs that makes the line extra noisy, you might be able to spot the precise spot by eye or d.f. if you walk along the power line after dark.

Does anyone out there have a slow-scan program that will run on an Amstrad CPC 464? If so, please drop Michael King a line at 12 Rushlake Way, Lowestoft, Suffolk NR33 8SA.

Next to Simon Griggs in Chelmsford, he is on the look-out for a Spectrum now! 28MHz yielded ZD8SA, EA8AT, LU1FOW, 9Y4SRR & D44BC on 'phone, 7P8SR, TJ1GG, KG40, LU8DZJ, PU2PAH, LU9EDY, FM/OH1MA &

LU4GPL on c.w. Down to 21MHz and s.s.b. from 7X2VFK, CN8NS, plus c.w. from EA8AT, PR7BC, KP4SJ working N3MUR, IS0YTA, PY20W, FY5YE, 9X5HG, JA6WAL, JE5CXD, 9Y4S, EA9KD, 6W6/K3SDK, KA9UM, EA8BWN, while on 3.5MHz by contrast only AM6AAK was noted. 7MHz seems to have been popular with WB2DHY, PP7JR, UL7BAY, VE1ZZ, 4X1KP, SV2BBJ, UA9AB, CM7EH, WA8YVR, W1GUE, KA2DFD, UJ8JI, OD5/SP1MHW, W4XJ, UA9AB, KP4TK, PY3ZY/PY0F (location not mentioned), and on s.s.b., VP5JM in contact with HK2JFF.

## Penguin Island

Grant Goss writes from Beaconsfield regarding the hearing of ZS5GRG by Ron Pearce in Bungay. Grant holds ZS5GRG and also G0RKS, and he writes to say he has never been to Penguin Is, but has operated as ZS5GRG/UA3X and ZS5GRG/UC2I for his own version of a dxpedition!

On 1.8MHz, Gerald Bramwell in Manchester, has most of Europe, 24 on sideband, plus 11 on the key. At 3.5MHz he had PI4AA on RTTY, plus W1, W2, W8, W9, VE1, VO2AA, various European, ex-USSR signals, VKs, JAs, 4X6DK, 4Z4UT, CN8GI, TA3D, TA3C, JY1AVN & the usual crop of Europeans, mostly s.s.b. but a scattering of c.w. Now 7MHz where once again a crop of W1-4, KG4W, RA9LZ, UH8EA, UV9WZ, UL7LS, UJ8JMM, RL7GEL, 4J1FM, RY8I, 3A2LU, 9A2TI, T70A, S55AA, 4U1ITU, EP2MHB, 4Z5AC, EA8BYL, EA9IE, A92BE, 4Xs, CN8HR, XU3UN, JW5NM, JAs, FR5ZN, ZS4JDS, HS1HSJ, VK6LK, P30ADA & 5N0MUE. 14MHz saw more of the RTTY stuff, with K0FW/2, KB2ZP, NA0Y, FG4FV, CN8NP & 4M5RY all booked; the sidebanders included W1-4-8-9-0, G6ACN (wonder what he was doing on 14MHz?), EA8, FR5ZN, CU2T, PY2PE, ZD7XY, ZS9A, P43LJM, EA8BTA, PT7CQ, HC0E, 8P9Z, VK8AV, VP5S, YV5BUK, V47KP, OD5WS, 8R1K, V47NS, LU6AMW, EA8BGY, PJ1B, VP50, VP8ROT, LU8HDU, C9RJ, not to mention smaller fry. At 18MHz we see W1AW on RTTY, (this is the ARRL HQ station), VE7IM, east Coast Ws, PJ8AD & Europeans. Lots more RTTY on 21MHz including W8VLK, WA1MPB/4,

VE3EQF, W9KDX, LU8EKL, FG4FI, K2SHL/KP2, 8P9HR & Europeans. A fine assortment of N Americans included W6QHS, VE7IM, KB7MJ and East Coast types plus Europeans and KP8HUX, 4X5BF, 5V1GB, EA8BPC, S79KMB, JX2EX, OA4ANR, 8P9Z, PJ1B, PY1NEZ, 4X6SJ, HF0POL, VP2EY, J69JB, C07JC, ZD8Z, PY1NEZ, VP2EC, PU0F & VP5S.

On 24MHz an assortment of Ws, RY0U, 4X6ZK, HC2RG, ZP5JCY, ZS1ACY, 4X1M0, AM9TL, SU1AL/2. Finally 28MHz and here we see some NBFM signals; SV5TS & K2UFM most notably sideband came from various Ws, KQ4AX, KC4DWT, KG1D, LU1H00, EA8ABQ (c.w.), PY0F/PY5CC, LU1KBP, C53GB, J28YCF, LU9MBY, ZS6TW & EA9PX.

Our next letter comes from Iceland, where Geoff Crowley has been for a couple of years. Being so far north they have only four hours of daylight in midwinter. Geoff says his best 'conditions pointer' is the presence of the northern lights - when they are visible he doesn't bother to look! Geoff starts his all-s.s.b. list on 28MHz, for K02Y, N20FY, VE1PZ, CU8AH, KS1A, K1DJI, KS1A, Z23JO, VE1RMG, N5TNV, then went to 80m for GM3TCW, E18H, GI4BGB, OE6MBG & YZ3RY. 7MHz gave with OE6CLD, EA8BET, DL8TCC, PA3DFU, TF3CW, CT3FF, G0RTJ, G4LNR, OH3NZW & DL3AK. At 14MHz on the dial WA1HMMW, JA9AA, JL1PWQ, JA8HVG, JA7LMZ, UA0ZDD, AH9B/VO2, UL7CC, IT9CFG, 5N0DRB, UA6JAJ, W8IMF, W2BLV, K1MAN, N20FY, KC3AU, K4MUJ & TF3TF. At 18MHz Geoff found WA2IBX, ZF1UK, ES8ZD & W2FJ with a severe echo. 21MHz & W1TAK, W5WMMU, W11DT, WB4AGR, CE7HNR, N40GS; leaving 24MHz for VP9MN, W9UK, K4FDP, W9UK, W9MVX, U5WF, ZP5JCY & K3VIY.

## Europeans

Andrew Fryer in London SW16 has a Lowe 225 to some 30m of wire, untuned. Andrew listens to the ZL4KF/ZL2JR/ZL1CCR group on 3.5MHz every morning, plus VO1FG, CN8GI & T14CF. 7MHz c.w., especially around midnight, revealed Europeans, plus 4L0FXC, 4N5GB, JB2B, JA4A0, RW6AF, NR1R, TF3GCN, RY8I, A01DJE, 9X5HG,

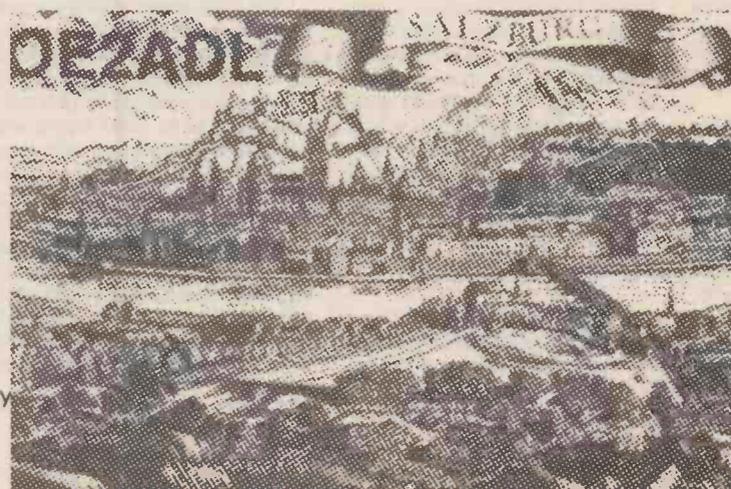
PP6AMW, JA0BCO, 4J4G0, PJ5JP, HK1HHX, 4L1FJ, AA4GQ, UJ8JI & NQ1K, plus sideband from CR1A, 4Z5AC, FY5FY, P4/WB1CTO, LU1IV, YV1G0T, CM6CV, YV5MRR, P30ADA, PJ2HB, 4X4WH, KP4GY, HJ7TMK & FP/SP5XAB/P. 14MHz c.w. produced CU2QN, PJ2AM, J88BX, KP4UD, PR7BC, PZ1EAT, plus the telephony of YV5ENJ, K1NAN, VK3DMA, VK3BCY & CE4LFO/P. Andrew noted 21MHz as being mostly dead when he could spend time there, but he did log c.w. from 5U7M, ZD8LI, VP5P, 4N5RB, AB4WB/VOA, VP500 & s.s.b. from UW9VA, V21AS, YB8CIS (Macassar) & HL2KAT.

Now Don Robertson, up north of Wick; Don has been weather-observing for the Met Office, and he notes that they have had only 12 dry days since July 1. Don notes c.w. on 7MHz of CM2MA, CM2QN, CO8RCE/B, ZL4AU, 5B4/G3HFG/P, PY0F/PP1CZ, UJ8JI, JU830C/6, HS1CDX, UL7RDD, ZL1CON, P30WN, RA9LE, PY1BZH, UL7YAD, UL7IDB, VU2LO, VK6LW, J88BX, U550BS, PY4UM, LU6EF, OH1AF/OH0, VE5ZX, 4J1FM, VK3RP, FT5TP, ZL2ALJ, S57KV, KC4/W6REC, VP5/N4CD, CE0Y/SM0AGD, lots of JA, W6, W7. On 10MHz Don found 9V1YS, 3DA/G3TXF, TA7/KU0J, ZA1W, ZA1D, ZA1J, ZA1C, OH3ES/OH0, 4X4MU, V73DO, UA90BW, VR2/WX3N, JAs, W6 & W7s. Up to 18MHz to locate VU2LO, EU10, ZA1C, T77C, OH1AF/OH0, EV1S & RL8PY. 21MHz accounted for VP5P, ZA1Z, UZ0LWC & EH4MC while on Ten Don noted 3DA/G3TXF again.

Ted Trowell used sideband only on Top Band for ON7BW & ON7SF, not to mention c.w. with UA2DK/MM off Ullapool. EU0A on 7MHz claimed to be Moldavia, while on 10MHz the keying of 4L1AB, ZA1J, ZA1F, UM8MBA, & FY5FX were copied. 14MHz c.w. accounted for US50BS, BV4CT, ID9/W7SW, N4LTR, 4K3/UA1ZFO & OH1NOA/OH0. On 21MHz there was a character keying 'UTVJWL' who simply sent 'Crimea', plus HL1AVS, YB6TI, 5N0ZKJ & K9BG, leaving just C9RJ for 28MHz.

So - there it is for another month. Always aim for the beginning of the month for your letters, and use the address given above.

QSL card received when Practical Wireless put on a Special Event Station from an exhibition.



# Airband

Godfrey Manning G4GLM  
c/o The Godfrey Manning Aircraft Museum,  
63 The Drive, Edgware, Middlesex HA8 8PS

**A**s befits the time of year, I present my annual Christmas Quiz. All (I) you have to do to enter is to tell me the aircraft type shown in the photo. If there is more than one correct entry, then I will consider the tie-breaker for which I require the name of the aerodrome where the picture was taken. If there is still more than one correct answer, random selection (draw or coin/die toss) will decide the outcome. Answers must be on a postcard, sent either separately or enclosed with that interesting letter you've been meaning to write to me. Closing date is the February 5 deadline.

The winner will be announced in the April issue and will receive a 10-channel v.h.f. radio controller of a type fitted to Canberras and Chipmunks. My decision is final and no correspondence can be entered into. Go on, have a try! If you spotted the aircraft, have a guess at the location. You never know your luck.

## Question Time

Because **Bernard Greatrix** (Burton-upon-Trent) asks so many questions of general interest, it will be easiest if I answer them in order. Frequencies such as 121.025MHz originate at the London Air Traffic Control Centre, West Drayton (immediately north of Heathrow) and are distributed around the country by land-lines. Remote antenna/transceiver equipment (called relays) actually send and receive the radio signals and serve different parts of the country. Bernard's local relay is at Grantham.

So, what are ATC frequencies? Bernard has seen these 'labelled' as such but doesn't say where. ATC is a generic abbreviation for any Air Traffic Control facility. One example is **Approach**, where a controller monitors an airfield's arriving and departing flights by radar. Sometimes the same controller also co-ordinates traffic transiting through the aerodrome's control zone. **Ground** is the ATC function that co-ordinates movements of aircraft and vehicles on the apron and taxiways, but not on the runway - that's the function of Aerodrome Control, more commonly known as **Tower**. Rarely does Tower have radar; this is a visual function, but a simple distance-to-touchdown radar display is sometimes available at larger airports to help Tower know the spacing of the incoming stream.

Another ATC function is to operate the v.d.f. (v.h.f. direction-finder). When an aircraft calls on a v.d.f.-equipped frequency, the controller sees a read-out of the compass bearing of the aircraft from the aerodrome and this information helps to confirm the pilot's position. Rarely is it used for guidance on approach to an aerodrome.

Bernard has found the locator outer marker for East Midlands runway 09

**Godfrey's Christmas Quiz.**  
**Identify the aircraft type and where the picture was taken.**

*Photo. Chris Mlynec.*



(more about runway numbers later). There's a low-powered non-directional beacon (n.d.b.) on 393kHz with the Morse call sign EMW. It looks like a vertical mast. By following a cockpit instrument called a radio-magnetic indicator, pilots can fly towards the locator n.d.b. when beginning their approach. On overflying the beacon, a signal is received from the outer marker and this causes a blue light to flash in the cockpit and Morse dashes (pitch 400Hz) to be heard in the headset. All markers transmit on 75MHz. The skyward-pointing Yagis are for the marker beacon; you have to fly directly overhead to receive their signal (or stand close to them on the ground).

D.m.e. beacons give distances, not bearings, so it is not possible to 'steer' a heading by them. But they are often co-located with v.o.r. beacons that do enable magnetic tracks to be followed. Steering a particular track by a v.o.r. would keep the aircraft going towards the beacon in the given direction, passing overhead the beacon, and continuing onwards - all in a straight line.

Lastly, the pilot who told Bernard that Tatenhill's frequency is 122.2MHz is correct, but beating up the field to attract attention is most definitely wrong and the pilot concerned should stop doing this before getting into trouble - or worse! The aerodrome is 'prior permission required' and that means landing permission has to be obtained prior to departure. Don't 'buzz' - 'phone.

What can Bernard (and other readers) do to help things become a little clearer - apart from keeping specific questions coming into this column, that is? Send off to the Editorial Office in Poole for a free copy of Airband Factsheet (enclose a reply envelope). Buy *Pooley's Flight Guide*. Although expensive, it gives good detail especially in the case of small aerodromes. The Factsheet gives addresses of companies that sell the guide. Finally, if down my way, make an appointment to see my museum where radio-navigation can more easily be demonstrated.

## Receiver Hardware

**Laurence Frankel** (E. Berkshire) has a memory longer than mine: he believes we went to the same school but,

embarrassingly, I don't remember! Laurence wants to choose a scanner and, of those he shortlists, I have only tried out two myself. As regular readers will know I just daren't stick my neck out and recommend anything because my opinions and tastes are just as personal as, and different to, yours. So I confine myself to general advice.

First decide on the frequency coverage and required modes. For example, h.f. coverage isn't much good unless s.s.b. can be resolved (also c.w. if you're able to read it and want to hear the best amateur DX). Then shortlist those that meet the requirements and determine which you can afford (this latter is the hard bit for most of us these days). The really wideband scanners (something like 100kHz-1.3GHz) are tempting but, because they have to receive everything in this range, tend to have an inherent design limitation. They are wide open to strong signals and this means risking spurious breakthrough. There is a trade-off between sensitivity and rejection of strong interference. My preference is to avoid the really wide-coverage radios and, in any case, buy attenuators (say 10dB) to put between the receiver and the antenna in case of breakthrough trouble. If you want h.f. and v.h.f./u.h.f. then two dedicated receivers is the best (and most expensive) choice. All replies appear in this column for every reader to share.

## Follow-Ups

Where does Eastern Radar transmit from (November)? Local **Tim Christian** (North Walsham) has spotted a likely candidate in the form of a u.h.f. antenna immediately to the north of Neatishead.

Also in November's *SWM* was one author's personal experience of a balloon flight. Whereas 129.9MHz is available for balloon-to-recovery talk-back, it is also occupied by other talk-backs such as for glider towing and parachute dropping. Balloons have two simple controls: burn to go up, open the vent at the top of the envelope to go down! How can direction be controlled? The balloon is carried along by the wind and there's no control over that. However, wind direction changes with height and this change is itself varied by the effects of terrain. By trying different heights and observing

the resulting direction, a particular landing site can be targeted.

Back in October I described the routing of the ever-popular Concorde. Finer details come from **John Kilduff** (Co. Mayo). After working LATCC, Shanwick may be contacted on 127.9MHz prior to going h.f. (often 5.649MHz). In-between LATCC and Shanwick, though, it is possible to contact Shannon on 135.6MHz (known as Shannon High Level).

## Frequency & Operational News

The 10/92 *GAS/L* from the CAA announces new n.d.b. frequencies (kHz) at Beccles Heliport (BE, 357), Caernarfon (CAE, 320) and Yeovil (YVL, 343). The Ipswich n.d.b. (PSW, 328) is sometimes overpowered by the signal from Merville (MVC), a similar beacon in northern France. Following the mention in November's 'Airband' there are now low-powered d.m.e.s at (with ground-response frequency in MHz) Fair Oaks (FRK, 1122), Great Yarmouth (GYM, 1123), Shoreham (SRH, 1123) and Yeovil (YVL, 1114).

Here are some airspace changes from the same source. Kent Radar, the Cross Channel Control Area and Manston Cross Channel Zone have all been withdrawn as have the MATZ and LARS participation at Wattisham. Manston's MATZ has been extended for runway 11.

Also from the CAA, *AIC 83/1992* contains varied news. The Restricted Area over Gartree Prison (south of Leicester) has now been deleted. On a historical note, Daventry is no longer a dangerous area of high intensity radio transmissions; as reported previously in *SWM*, Daventry has ceased to transmit short wave broadcasts. And finally a frequency change for Tain Range, originally 118.9 but now 122.75MHz.

Magnetic north is constantly moving nearer to true north (it is still slightly to the west as measured in the UK). Because of this, *AIC 90/1992* gives the realignment of Kirkwall's 10/28 runway; it has now become 09/27. The same effect has happened at Ronaldsway as local Mrs B. reports. Runway 09/27 becomes 08/26; 04/22

CONTINUED ON PAGE 49 ➔

# Scanning

Alan Gardener  
PO Box 1000, EastleIGH, Hants SO5 5HB.

**A**s this issue of *SWM* marks the start of a New Year I thought that it would be an opportune moment to look into my crystal ball and see what 1993 is likely to hold in store for scanning enthusiasts. As is the case with all predictions, some may never happen, but they do serve to indicate the way in which technology is advancing and it may be only the current economic climate that delays their arrival.

Following the series of scandals that occurred as a result of eavesdropping on cellular telephones during the last year, cellular operators are likely to offer speech scrambling as an option to customers who are prepared to pay for it. Special cellular phones are likely to be required with the scrambling function selected at the base station by means of a special button on the phone. Even with this system available I am sure that newspapers will continue to feature stories based on information gained by some form of electronic eavesdropping.

The police are another group of radio users who will start to use speech scrambling on a more regular basis during the New Year. Several forces have got the go ahead to purchase equipment and should be starting to take delivery soon.

On the plus side radio may also be increasingly used to help fight crime. A new system which will allow the Police to track stolen motor vehicles is due to be launched in 1993. The system will use digitally transmitted signals to switch on a tracking transmitter concealed within the vehicle of any owner who is subscribing to the service. The car can then be located by use of special direction finding equipment fitted inside selected Police vehicles.

Personal communications will become more affordable as several new systems are scheduled to start operating during 1993. As the economy is not likely to improve substantially in the near future, system operators may well be forced to offer special deals in order to attract new customers, forcing the cost down.

Frequencies will begin to be allocated on a less insular basis, with the eventual harmonisation of European radio systems in mind. Current examples of this include the new ERMES 169MHz and Hutchison 466MHz Pan-European paging systems.

Data communications systems are likely to expand as more companies take advantage of radio linked personal computers to keep in touch with an increasingly mobile workforce. The expansion in the number of data transmissions is likely to generate increased interest amongst scanning enthusiasts in decoding equipment and terminal units.

Several new scanning receivers

are likely to be launched during the coming year. Most of these will be based on existing models with some restyling of the case and enhancements to the operating system. However at least one manufacturer will introduce a high performance top of the range model incorporating innovative new features. Several scanning accessories are also likely to make an appearance including a new type of antenna.

How many of these predictions are likely to come true? Well I have been playing it pretty safe - but only time will tell.

## Finding Signals

Several readers have asked me about methods of finding locally transmitted signals in order to be able to programme them into their scanners. The reasons for wanting to be able to do this vary, but detecting bugs, tracing interference and determining frequencies in use feature amongst the enquiries.

## Spectrum Analysers

The best method of quickly performing all these functions is to use a spectrum analyser. This is a piece of test equipment widely used in the communications industry for all sorts of measurements on radio equipment. A typical spectrum analyser looks rather like an oscilloscope with a cathode ray tube display and a whole range of control knobs that can be used to set the various display parameters.

The main difference between an oscilloscope and a spectrum analyser is that the scope displays the amplitude or strength of a signal vertically on the screen and against a horizontal axis of time. A spectrum analyser on the other hand still displays amplitude on the vertical axis but against a horizontal axis, which is calibrated in terms of frequency.

You can imagine the display being rather like a tuning scale on an old domestic radio receiver but with signals being indicated at various points along the dial depending on their frequency and received signal strength. It is rather like having a scanner that can search over an enormous frequency range in a few fractions of a second.

As an example, most modern scanners can search at a rate of around 20-30 channels per second, with a spectrum analyser you can search at a rate equivalent to approximately 160 000 channels per second. As you can imagine this allows you to find new signals practically instantaneously.

In addition some analysers can be programmed to lock onto signals that are stronger than a preset value and then automatically measure the exact

frequency and demodulate the signal so that you can listen to it on an internal speaker. As you would expect the price of such equipment is not cheap, with a typical model costing between £8-10 thousand pounds. Although prices are beginning to fall a little I think that it will be several years before they reach the level at which hobbyists will be able to afford one.

## Frequency Counters

The next best option is to use a frequency counter. Providing that the signal is strong enough the counter will lock onto it and give a frequency readout that can then be programmed into a scanner. There are lots of different models available with prices for hand-held models with internal NiCad battery packs costing around £150-200. Frequency counters do have one disadvantage, because they do not tune to individual frequencies in the same way as a scanner or spectrum analyser they can only accurately measure one frequency at a time, if there is more than one signal present the digital frequency dividers become confused and produce a false reading.

This is not too much of a problem if you are only interested in measuring the frequency of a hand-held transmitter for example. However, if you want to take measurements at a site where a lot of signals are present you will almost certainly not be able to obtain a true reading, especially if there is a high power broadcast TV or radio transmitter operating from the site. Under ideal conditions with a reasonably sensitive counter you should be able to accurately measure frequencies up to about 10m from a handheld v.h.f. transmitter and 100m from a typical base station, at u.h.f. the range is likely to be a little bit less than this.

One other problem in using a counter is that you have to be looking at the display when a transmission is present, some manufacturers have added a 'hold' button to freeze the display once a transmission has been detected but what is really needed is an automatic capture facility which will warn the user that a transmission is occurring and then retain the frequency so that it can be read later.

I have modified my own counter to 'bleep' when a signal is present and then freeze the display on the last reading when a transmission ends. This allows me to leave the counter operating inside my jacket pocket, the 'bleep' tells me when I am within range of a transmitter and I can then read the display at my leisure. The counter I modified was not particularly sophisticated, but I would imagine that one of the models fitted with a l.c.d. bargraph signal strength display would be much more suitable for modification as the threshold at which the counter

started to measure frequencies could be made adjustable so that only strong signals would be captured.

## Modulation Meters

I also use an automatic modulation meter to receive local signals and demodulate them. I got this idea after reading about a bug detector which was based on an automatic modulation meter made by Racal. The unit will lock onto the strongest local signal and demodulate it so that the transmission can be positively identified. In practice my modulation meter will allow me to listen to any transmissions within a radius of approximately 0.5km just using a telescopic antenna plugged into the front panel. I have tried using a larger antenna but the unit tends to lock onto f.m. broadcast band transmissions which reduce its effectiveness.

## New Product?

Several readers have said that they would like some sort of hand-held unit that is a cross between a frequency counter and a scanner. The device would detect strong local transmissions, display and store their frequency and demodulate the signal so that it can be heard on an internal loudspeaker.

I have mentioned this to a couple of scanner manufacturers but they both felt that such a unit would only have a very limited market. Things may change as I notice that Optoelectronics, one of the main manufacturers of hand-held frequency counters, has just started to sell a device which they call an 'FM Communications Interceptor'. This is a broadband hand-held receiver, which is basically a simple automatic modulation meter with a built in amplifier. The unit is pocket sized and is supplied with internal nicad batteries but unfortunately costs \$359, which makes it a bit on the expensive side. However combining this unit with one of their frequency counters would form the ideal basis for a new product.

## Log Periodic Antennas

J. Taseland of Northants has written querying the performance of his log periodic antenna. He has found that it does not perform any better than a discorn at frequencies below 200MHz and he wonders of this may be due to the metal mounting pole passing in-between the vertically polarised elements.

I would guess that this is almost certainly the case. A log periodic antenna is a directional beam type array. The boom of the antenna acts like a transmission line with tapered length dipole elements connected at particular points along the boom. At any particular frequency only a few of

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Further publications available are *Air and Meteo Code Manual*, *Guide to Facsimile Stations and Radioteletype Code Manual* (12<sup>th</sup> editions). We have published our international radio books for 23 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see Mike Richards G4WNC in *Shortwave Magazine* 292, 7/92 and 10/92. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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Many Radio Amateurs and SWLs are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know - but what about the many other signals?

**HOKA ELECTRONICS HAVE THE ANSWER!** There are some well-known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It's up to you to make the choice - but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640k of RAM. The Code3 hardware includes a digital FSK Converter unit with built-in 230V AC power supply and RS232 cable, ready to use. You'll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £299!

- Morse - Manual/Auto speed follow. On screen WPM Indicator
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- AX25 packet with selective call sign monitoring, 300 Baud
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- Twinplex - 100 Baud F7BC Simplex ARQ
- ASCII - CCITT 5, variable character lengths/parity

- ARQ6-90/98 - 200 Baud Simplex ARQ
- SI-ARQ/ARQ-S - ARQ1000 simplex
- SWED-ARQ/ARQ-SWE - CCIR 518 variant
- ARQ-E/ARQ1000 Duplex
- ARQ-N - ARQ1000 Duplex variant
- ARQ-E3 - CCIR 519 variant
- POL-ARQ - 100 baud Duplex ARQ
- TDM242/ARQ-M2/4-242 CCIR 242 with 1/2/4 channels
- TDM342/ARQ-M2/4 CCIR 342-2 with 1/2/4 channels

- FEC-A - FEC100A/FEC101
- FEC-S - FEC1000 Simplex
- Sports Info. 300 Baud ASCII F7BC
- Hellsreiber - Synch./Asynch.
- Sitor RAW - (Normal Sitor but without synchronisation)
- ARQ6-70
- Baudot F7BBN
- Pactot - coming soon!

All the above modes are pre-set with the most commonly seen baudrate setting and number of channels which can be easily changed at will whilst decoding. Multi-channel systems display ALL channels on screen **at the same time**. Split screen with one window continually displaying channel control signal status e.g. idle Alphas/Beta/RQ's etc, along with all system parameter settings e.g. unshift on space, **Shift on Space**, multiple carriage returns Inhibit, auto receiver drift compensation, printer on, system sub-mode. Any transmitted error correction information is used to minimise received errors. Baudot and Sitor both react correctly to third shift signals (e.g. Crylllic) to generate ungarbled text unlike some other decoders which get 'stuck' in figures mode!

Six options are currently available extra to the above specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/real time. Great for tuning and analysis. £29. 2) Piccolo Mk 6. British multi-tone system that only we can decode with a PC! £59. 3) Ascii Storage - Save to disc any decoded ascii text for later processing. £29. 4) Coquelet - French multi-tone system, again only on offer from Hoka! £59. 5) 4 Special ARQ and FEC systems i.e.. TORG-10/11, ROU-FEC/RUM-FEC, HC-ARQ (ICRC) and HNG-FEC. £69. 6) Auto-classification - Why not let the PC tell YOU what the keying system is?! £59.

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the dipole elements which happen to be close to resonance provide any gain, the rest of the elements can practically be ignored. The effect of this with a very wide band log periodic antenna is that the 'active' region of the antenna moves along the boom depending on the frequency of interest. So at u.h.f. the front part of the antenna is important and at v.h.f. the middle or rear elements become more important and the front elements less so. If a metal support mast runs in-between some of the elements in the same plane as the elements it can seriously reduce the gain and directional qualities of the antenna.

Because of the way in which the 'active' region moves along a log periodic antenna this may only effect the performance below certain frequencies. It all depends upon where the pole passes through the antenna and the resonant frequency of the elements closest to it.

Experiments performed many years ago by Pye Telecommunications proved that the gain of a vertically

polarised Yagi antenna could be reduced by as much as 4dB depending on the position of the mounting pole. The best way of mounting a vertical beam antenna is by clamping the boom to the mast behind the largest of the elements. This is not too practical for most of us as it does not balance the weight of the antenna evenly on the mast and can result in either the antenna sagging or the mast bending.

The next best option is to mount the antenna at the top of the mast so that the mounting pole only passes through one half of the elements. This has a much less significant effect on the antenna gain and still provides even weight distribution. Reducing the diameter of the mast can help but using a non-metallic support is even better. I use a glass-fibre pole to support my log periodic antenna and find that this has very little effect on the gain or polar response.

One problem with using glass-fibre tube for this purpose is that the walls of the tube can start to crush or crack when the mounting clamps are

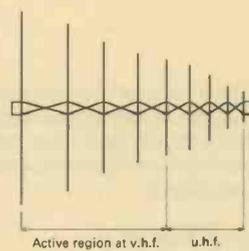
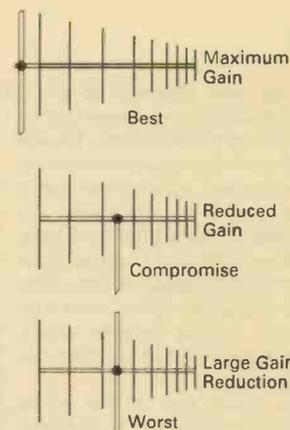


Fig. 1: Basic log-periodic antenna.

Fig. 2: Effect of mounting pole on antenna. Top - best position, centre - compromise position, bottom - worst position.



tightened. A short length of wooden dowelling or filling the tube with expanded polyurethane foam will prevent this occurring.

One final point worth noting is that the polarisation of the antenna can make a huge difference. Most mobile radio services use vertically polarised antennas. If these stations are received with a horizontally polarised antenna

the signal strength will be vastly reduced as only a small proportion of the cross polarised signal will be captured by the receiving antenna - so be warned.

As I said at the beginning, this is the last issue written for 1992, so may I take this opportunity to wish you all a Happy and Prosperous New Year.

Until then - Good listening.

## Airband CONTINUED FROM PAGE 46

becomes 03/21 and 18/36 becomes 17/35. The runway numbers are the magnetic headings, with the final digit dropped. Hence, a heading of 123° would be runway 12 and runway 34 would have a heading close to 340°. Because runways are straight, the headings onto the two ends are 180° apart and so one runway designation number is always 18 greater than the other.

Mrs B. asks if any runways in England have been affected. A few years ago, this happened to The Big Ones: Heathrow 10/28 became 09/27. True headings never change, of course, and at Heathrow these happen to be 090°/270°. The crosswind runway, 042°/222° true, will presumably change from its 05/23 designation to 04/22 if magnetic north moves by more than 3°. At a rate of about 10' eastwards per year, there's a couple of decades to go yet! If you want to know the variation between true and magnetic north, look for the isogonals on aeronautical charts. This gives a fraction over 4°W for Heathrow. To visualise the change in magnetic heading as variation decreases, imagine taking a sighting along the runway with a compass. Then think how the reading would alter if someone were to twist the compass card slightly clockwise.

### Useful Sources

I'm glad that Mrs B. has read so many *SWM*s that she needs a folder for them. I can suggest the very thing - although

it's a little late for Christmas presents! Look on the 'Editorial' and 'Letters' page in any issue for the current price of the PW Publishing binders.

Tim Christian has produced the latest edition of his book *World HF Aeronautical-Mobile R/T Frequency Allocations*, which has an updated 1992 appendix. No, it's not a 1993 appendix: Tim doesn't believe in assigning a date that hasn't happened yet! So, rest assured, £6.99 (including UK postage, an extra £1.83 should get it to anywhere in the world airmail) buys you the latest edition and pays for Tim's considerable time and effort in verifying and validating each entry. Order from (and cheques payable to) Isolethics, 157 Mundesley Road, North Walsham, Norfolk NR28 0DD England.

I mentioned *Airlines and Airports Coding and Decoding* last month. Mike Bennett (Slough) bought his copy at The Aviation Hobby Shop, 4 Horton Parade, Horton Road, West Drayton, Middlesex UB7 8EA. Tel: (0895) 442123.

### Ghostly Tales

An appropriate topic for Christmas, I suppose, but as always there's bound to be a logical explanation. Up in Scarborough, Robert Hardacre's local newspaper carried a story about an interception mission flown by a Lightning over 20 years ago. Unfortunately, the paper doesn't quote a source and so I can't comment on the completeness, accuracy or authenticity of the story. Also, why the

interest now - so long after the event?

Anyway, the intercepted object painted on radar and, when contacted visually, was very bright. It was also capable of accelerating to enormous speeds. After contact, the pilot was ordered to ditch and not land. Reputedly, the pilot was never seen again despite a search and rescue operation; also, some of the aircraft's instruments were later tampered with. The implication was that these anomalies were official, but secretly, perpetrated. You, too, can think of various explanations for the observed phenomenon ranging from ball

lightning to a guided missile and there's no prize. As for me, well, I raise my (already high) level of scepticism whenever I'm about to open a paper!

The next three deadlines (for topical information) are January 8, February 5 and February 26. Replies always appear in this column and it is regretted that no direct correspondence is possible.

All letters to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. Genuinely urgent information/enquiries: Tel: 081-958 5113.

### Abbreviations

AIC	Aeronautical Information Circular
CAA	Civil Aviation Authority
c.w.	continuous wave (Morse)
dB	decibels
d.m.e.	distance measuring equipment
DX	long-distance reception
E	east
GASIL	General Aviation Safety Information Leaflet
GHz	gigahertz
h.f.	high frequency
Hz	hertz
kHz	kilohertz
LARS	Lower Airspace Radar Service
LATCC	London Air Traffic Control Centre
MATZ	Military Aerodrome Traffic Zone
MHz	megahertz
R/T	radiotelephony
s.s.b.	single sideband
u.h.f.	ultra high frequency
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range
W	west

# Info in Orbit

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

The rapid approach of winter manifests itself in many ways that we can see from WXSAT images. The Gulf of Bothnia divides Sweden and Finland, and its northern waters often start to freeze over during late autumn. On November 8 the METEOR 3-4 pass, travelling northwards over this region around 1128UTC, showed the first signs of ice formation at the north-east extremity around Hailuoto Island, where some 100km of coastline was frozen over.

For those new to the art of interpreting WXSAT pictures, studying this area will show that both fog and ice can be recognised by their tendency to remain in the same place for days at a time. Comparison with an atlas allows their identification.

A hard northern winter will quickly cause the widespread formation of ice throughout Bothnia, and also the nearby Gulf of Finland, which may stretch into Lake Ladoga. A few clear skies over this region will reveal all of this on both NOAA and METEOR WXSATS images.

Watch the Denmark area, where the sea can freeze, completely blocking the waterways. In past years, the Russians have always operated their OKEAN oceanographic satellites during these times. The OKEAN series carry sideways-looking radar, and during both northbound and southbound passes, these satellites have transmitted a.p.t. imagery containing radar images of the icebergs and surrounding terrain, enabling ships to have safe passage behind the icebreakers. It remains to be seen whether the enormous political changes that have taken place will fund the continued operation of OKEAN satellites.

The new generation of WXSAT monitors have yet to receive OKEAN pictures - invariably transmitted on 137.40MHz. These oceanographic satellites date back to 1983 when COSMOS 1500 was launched, and transmitted images in a.p.t. format - surprising many people with different types of picture. At that time (only nine years ago) the Russian satellite scene was still cloaked in secrecy.

Later satellites identified as being of a similar type, included COSMOS 1602, 1766 and 1869. I have collected images from most of these during the years. In 1988 OKEAN 1 was launched, followed by OKEAN 2 in 1990 and OKEAN 3 in 1991, and all of them used 137.40MHz to transmit a.p.t.

Two more superb prints came in from Matt Taylor of Woking. One was taken last April - see Fig. 2 and shows the icebergs and snow sheets around the western coast of Greenland near Baffin Island. During these winter months we shall be able to see this area freeze over again, assuming that the METEOR satellites are operating their infra-red sensors. The NOAA

WXSATS are not quite high enough to allow reception of their signals while over this region. Matt uses a Yagi and comments that this is the furthest west that he can monitor.

## Current WXSATS

By late October, the CIS (Commonwealth of Independent States - formerly Russia) had only one WXSAT operating - METEOR 3-5 on 137.85MHz. This was producing good quality images, though with some banding when near the terminator (that region dividing day and night). The scanner aperture is then changing size most rapidly - either opening or closing, and often results in slight over or under-exposure.

The official line from the CIS is that they intend to keep two or three WXSATS in operation at any one time. Consequently we can expect further activity!

In early November, a few minutes after switching off my scanner at 1145UTC I received a call from Brian Dudman of Harrow checking to see if I had just heard METEOR 3-4 come back on!

On November 4, METEOR 3-5 was switched off, leaving only METEOR 3-4 operating, and this only during sunlight passes. As it approaches the dark northern terminator, the transmission abruptly cuts off. Its 2.4kHz sub-carrier is also drifting,

resulting in a lack of picture synchronisation with some hardware.

Coincidentally, both NOAA 9 and 10 are off as at mid-November, while their passes coincide with the priority WXSATS NOAA 11 and 12. So just for the present we have only three polar WXSATS operating.

## NOAAS 9 & 10

I mentioned last month about the possibility of the American WXSATS NOAA 9 and 10 having some of their instrumentation switched off. This has been clarified further and it appears that the a.p.t. will not be affected.

## METEOSAT For Beginners

Many people start their WXSAT operations by buying METEOSAT receiving systems and then purchasing more equipment to allow the reception of the polar orbiting satellites, as funds permit. Others start off with basic NOAA systems and then move on to METEOSAT. For those right at the beginning, I thought that a look at some choices of equipment facing the newcomer could be helpful.

## Antennas

All of the geostationary weather satellites (GOES, METEOSAT, etc.) use the 1691MHz band for transmitting

images, whether WEFAX or the higher resolution (PDUS) type. If you see the operation manuals for these craft you will find that they also transmit a considerable amount of other weather-related information - sometimes coded - in nearby frequency bands.

The first piece of hardware required to receive METEOSAT weather data is therefore an antenna suitable for the 1691MHz band. In fact, there are two such types - the Yagi and the dish - see Figs. 3 and 4. Both types can be constructed and I know of a number of people who have built Yagis and/or dishes and use them with success - including me! I generally avoid construction projects, but necessity required me to build a dish in the mid-eighties, or spend hundreds of pounds buying one.

## Dishes

Very attractive patio-style dishes (Fig. 3) can now be bought from some WXSAT equipment suppliers for within the hundred pounds budget, but you must ensure that everything is included! As well as a dish, you need a suitably designed 'coffee tin' signal collector, or a dipole. My home-built dish uses a dipole, whereas the dish that I bought a few years ago, uses a cylindrical collector. I receive similar signal strengths from both.

For WEFAX use, a one metre diameter dish will suffice. Theoretically, a larger size should be used for noise-free WEFAX reception, but such has been the improvement in the technology of pre-amps that this diameter is probably sufficient.

Ensure that your dish includes a properly mounted feed, which should be adjustable. The signal sensor (dipole or probe) will need to be adjusted to a nominally horizontal position for METEOSAT 4 (or 5). If you move the dish to point at METEOSAT 3 (which is going to be moved within weeks) the sensor will have to be rotated to compensate for the changed received polarisation of the geostationary satellite.

Finally, your dish should be fitted to a pedestal, or other support, not simply rested against a wall.

## Yagis

Yagis for METEOSAT can be bought from a few of the usual suppliers, but good quality ones can be expensive. Optimum gain is achieved using about 40 to 50 directors (Fig. 3). Like dishes, they are highly directional, so must be pointed carefully at the satellite and adjusted for maximum received signal.

With patience and a good design, you can build a Yagi, as has been done by many radio enthusiasts, and designs are occasionally published in amateur magazines.

The main benefits of using a Yagi



Fig. 1: NOAA from Mark Pepper

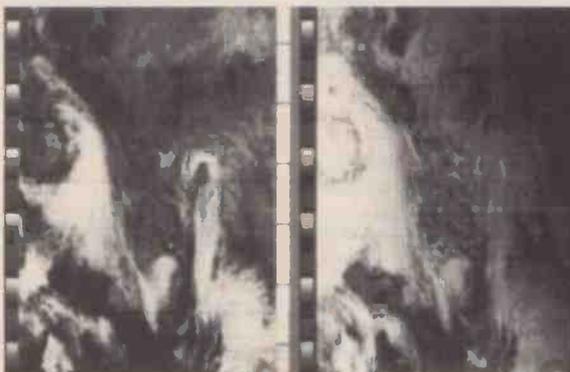


Fig. 2: METEOR 3-4 from Matt Taylor

instead of a dish, include the aesthetic appeal (neighbours are less likely to notice it), and the lower wind resistance.

### WEFAX/APT

The important feature of METEOSAT WEFAX is that it contains weather information coded in exactly the same way as is used by the polar orbiting satellites. This is unlike other utility signals, such as RTTY, which can incorporate any of a multitude of 'coding' methods. Picture information (consisting of a range of grey levels from white cloud to black sea) is amplitude modulated (a.m.) on to a 2.4kHz sub-carrier, which then frequency modulates (f.m.) the main carrier - 137.50MHz (for NOAA 12), or 1691.0MHz (for METEOSAT). By international agreement, CIS WXSATS, and those launched by the Chinese also use this method of picture encoding.

To allow the proper display of a decoded signal, your software/hardware unit will have settings for METEOSAT, NOAA and METEOR, and changing these will only affect the display format of each decoded line of picture. The NOAA option will cause the hardware to look for (and synchronise the picture display with) either the tone burst preceding the visible portion of the picture, or that preceding the infra-red portion. More on this topic next month.

### Letters

**Mark Pepper** of Camberley kindly sent some pictures for the column. Mark found that the advice that he received on the suitability of scanners for WXSAT use was not quite correct. He was advised that a (certain) general purpose receiver would be fine for WXSAT imagery. In practice, WXSAT signals require a considerably larger bandwidth for proper image decoding. General purpose receivers are fine for just listening purposes - I use one myself.

Since then, Mark has built a Cirkit receiver, with help from a radio ham at Birmingham University. Mark is using decoding interfaces from Pixel Plus Developments and the PROsatII unit from Timestep Weather Systems.

He processes images by reading them into 'PhotoStyler for Windows'. 'Windows' is an alternative operating system which many computer users prefer to use instead of MS-DOS, on the more advanced '386' or '486' computers. The images were cropped, equalised and then averaged, resulting in the printing of 256 grey levels on his Star laser printer - see Fig. 1.

It's worth pointing out that Mark has carefully processed just the picture portion - not the vertical grey scales and minute markers! So you won't

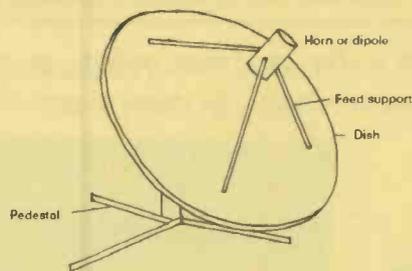


Fig. 3: A typical dish

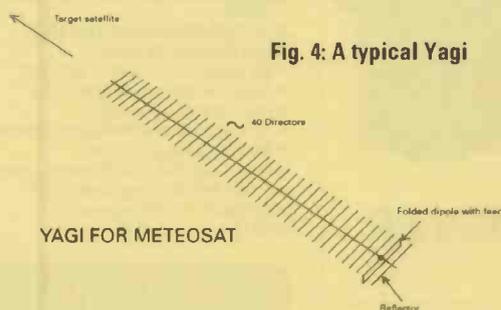


Fig. 4: A typical Yagi

see images like this from live transmissions!

Studying this full format NOAA 11 picture reveals the information that we hear during the half-second of each a.p.t. scan. The classical NOAA sounds of 'tick-tock' are actually the brief tones transmitted before each of the two halves of the picture. Note how the right side, (the visible light image,) shows darkening near the top right-hand portion. This is where the late afternoon sun is getting low.

**Peter de Jong** of Holland continues to monitor the WXSATS from his Leiden home, and has also been investigating ERS-1 data. Looking at the User's Handbook for ERS, Peter comments that it seems like an IQ test to use the satellite. I can sympathise with that comment having studied the handbooks of other satellites.

**Andrew Freeman** of Wallasey has recently taken an interest in WXSAT operations, as well as using h.f. FAX programs. He mentions a problem locating h.f. schedules; I believe that Mike Richards (who writes the 'Decode' column) has these available, so check out his offers for h.f. utility listings.

**Hans Olander** of Sweden is one of several readers who have expressed an interest in seeing the design (an i.f. strip) built by Ray Howgego for modifying the ICR-7000 receiver for WXSAT use. I have forwarded his, and other letters to Ray, to whom I send my thanks.

**David Powley** of Alveston recently got his first WXSAT picture using his Mapsat system and an Amstrad CPC464 computer. This first picture showed an intense depression in the western Atlantic. Since then he has seen the western part of Britain clear of cloud! (which day was that - I must have blinked.)

David comments that he had to modify the software code provided by Maplin in order to get recognisable pictures, but he can now collect images from north Africa to Iceland.

**Ron Harvey** of Weston-Super-Mare uses a WXSAT antenna on the side of his house. I tried that some years ago but found that although I got good pictures from WXSATS over the Atlantic, I did not receive signals from anywhere else - and nothing while the satellites were passing over Britain. I now use one roof-mounted antenna, with a second one on the top of the washing line feeding my general purpose receiver. This latter one does not see anything of Europe.

Pictures awaiting publication in future editions have been sent in by **F Slater**, **Peter de Jong**, **Brian Dudman**, **Brian and Matt Taylor**, **Roger Ray** and others.

### Solar Eclipse

Back in June there was a total eclipse of the sun, visible from south America and moving eastwards across the Atlantic. Viewers on earth saw the Moon slowly cross the brilliant disc of the sun, producing a deep shadow which raced eastwards.

The view from space was rather different. From the vantage point of METEOSAT 4, the eclipse was seen as a circular cone of darkness, moving eastwards, and with the benefit of being able to receive whole disc images of the earth every half hour, using my Primary Data User System I collected four images. Unfortunately the contrast of the photographed colour images is not high enough to reproduce here.

### Astronomy

My interest in getting WXSAT pictures has always gone far beyond simply monitoring weather patterns. Like many other SWM readers, I have always had an interest in astronomy, so when a relative recently financed the purchase of a telescope, the weather pictures took on a new meaning!

Using the animation feature of both

my Primary Data METEOSAT system and its WEFAX companion I have been able to spot every hour's worth of clear night sky, enabling me to use the telescope in a manner that wasn't possible before. Using the PDUS infrared images, one can monitor the movement and direction of banks of cloud during the evening. This has allowed me to see when clear skies were likely. WEFAX images are good enough for this type of analysis and allow you to estimate the timing of the passage of fronts. One consequence has been that personal forecasting for the next few hours becomes exceedingly accurate, often more so than the official predictions.

### The Book

Many readers have asked for information about the publication date of my forthcoming book. All I can say is that SWM will get it into print just as soon as time and man-power allows. You, the readers, will be amongst the first to hear!

### ISY

International Space Year ends this December, having involved many space-related activities taking place throughout Britain and elsewhere. It has provided space groups with the opportunity to bring their activities to the public, and one of the most consistent of these has been the reception of weather satellites and the decoding of their pictures.

For further information on British involvement in space, write to the British National Space Centre - BNSC, Dean Bradley House, Horseferry Road, London SW1P 2AG; Tel: 071-276 2688.

### Kepler Elements

I will send a print-out of the latest elements upon receiving an s.a.e. and separate stamp. All known weather satellites are included, together with their transmission frequencies if operating. This data is supplied courtesy of NASA, via Paul Wilson of Macclesfield.

### Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; METEOR 3-4 on 137.30MHz; Other METEOR frequencies: 137.40, 137.85MHz; FENGYUN series: 137.04, 137.80MHz.

### Finally

Seasonal greetings and thanks to all of the readers of this column who have sent in such excellent pictures and interesting commentary. It is all appreciated. My best wishes for a prosperous New Year to everyone.



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# Decode

Mike Richards G4WNC  
200 Christchurch Road, Ringwood, Hants BH24 3AS.

**T** Cassie from Edinburgh has written with what is quite a common problem. He has an Easy Reader DM-1000 decoder that he's using with a Sony 2001D receiver. Before I go on I ought to explain that the problem is nothing to do with either of these items of equipment. Mr Cassie is suffering intermittent decoding problems when using the record out from the Sony. He's tried using the external speaker output, which does provide a solution to the decoding problem. The only snag is he can't hear what's going on! The problem is all tied-up with signal levels.

Unfortunately, the signal from the record output of many receivers is not powerful enough to reliably drive a decoder. This is compounded because most decoders are designed to be connected to the external speaker socket. The solution is to use what's known as a Y adaptor. This handy little device comprises a 3.5mm jack with two sockets wired in parallel. For anyone with soldering skills, it's dead easy to make yourself. To use the adaptor you just plug it into the external speaker jack. The decoder then plugs into one socket and an external speaker in the other. If you want to get really clever you could fit an on/off switch or volume control to the external speaker.

Neil Peppe of Chippenham has an interesting question relating to RTTY weather transmissions. Quite simply, he asks why is the phrase 'Code Zero' used? I don't have an explanation - can anyone help? If so, just drop a line to the address at the head of the column.

Arthur Owen G2FUD of Hale writes with some advice for those contemplating buying the *ITU Ship's Callsign Lists* I mentioned last month. The comment he makes is very valid and worth an airing here. The key point is the large number of ships that will change name, owner, country of registration, or be relaunched. In addition, ships will be scrapped, damaged or sunk! The journal *Marine Newslists* in the region of 500 changes every month. The point about this is that there's no way the ITU lists can be fully up-to-date. This doesn't mean the list is useless - just don't expect it to be 100% accurate.

Peter Finn of Milford Haven has developed a particular interest in DX FAX reception. To date, he has had success with Diego Garcia, Hawaii and the latest which is Canberra. Peter's equipment comprises a Kenwood R-5000 receiver coupled to a 286 based personal computer. The decoding package is the popular HF-FAX from Comar Electronics. Like many readers, Peter is not able to put up lengthy external antennas and has to rely on a loft mounted active unit. The current set-up uses the Dressler h.f. active antenna.

Those interested in new decoding systems may remember the Australian

High-Tech system I mention recently. Bill Atkinson of Manchester has written to them and supplied the following details. The main product of interest to utility listeners is called Listening Post II. This unit is supplied in kit form and includes hardware and software. The package relies on a computer for the decoding and versions can be supplied to work with IBM clones featuring CGA/EGA/VGA/S-VGA or Hercules displays. There is also a version for the Commodore Amiga. With all versions FAX, RTTY and c.w. signals can be displayed on the screen. You can also store images/text to a disk for processing or printing at a later date. The basic price for the Listening Post II is \$75 (\$Aust). When Bill enquired, post and packing to the UK was an additional \$10. If you'd like more details High-Techs address is 39 Pillinger Drive, Fern Tree, Tasmania, Australia 7054.

Crois Luc from Belgium has written with a host of information including details of his station. Crois uses two portable receivers - a Sony ICF-7600D and Supertech SR-16HN (Sangean ATS-803A in UK). The antenna is a Datong AD-270 that's mounted against a window just 2.5m above the ground. To overcome the overload problems often associated with portable receivers, he uses a Yaesu FRT-7700 tuner unit. Not only does this provide some additional filtering, but it has a very useful attenuator. For coverage of the l.f. bands, he has a home built



Sparks on duty at Robert Hall's station.

converter that handles 0-150kHz. He also uses a Datong FL2 audio filter to tidy-up the signal before it's presented to his Kantronics KAM terminal unit. The computer is an Amiga 500 that's been extended with a KCS Powerboard. In addition to the KAM, Crois uses a FAX program from Volker Wertich. Apparently this is similar to the ICS Amiga-FAX.

To support his listening activities he is a member of DX-Antwerp. This is a short wave listeners' club with about 250 members and a magazine that's published about every four months. It's here that Crois uses his artistic talent to good effect - he illustrates the front covers. I've shown an example of his handiwork in the column.

## VYZYVAET!

No it's not a typing error, but more decoding info. Following my section on TASS in the November issue many readers wrote with additional information. The contentious issue was not so much the possible return of

TASS, but the word at the head of this section. In the column I admitted that I didn't see how the word fitted in with the transmission. Just to help those of you who didn't see the original feature, the message went thus:

R Y R Y R Y R Y R I T A R T A S S  
M O S K V Y V Y Z Y V A E T K A B U L I T A R  
T A S S R Y R

According to all who wrote in, the word VYZYVAET is a transliteration of the Russian word Bzbizbaet, to call. So the message reads - Kabul calling Moscow. The word order being inverted to emphasise Kabul.

My thanks to: G.R. Cawthra, John G3UIK, Chris Jones, P.J.K. Tither and Udo Deutscher for supplying the correct translation.

## Photo Call

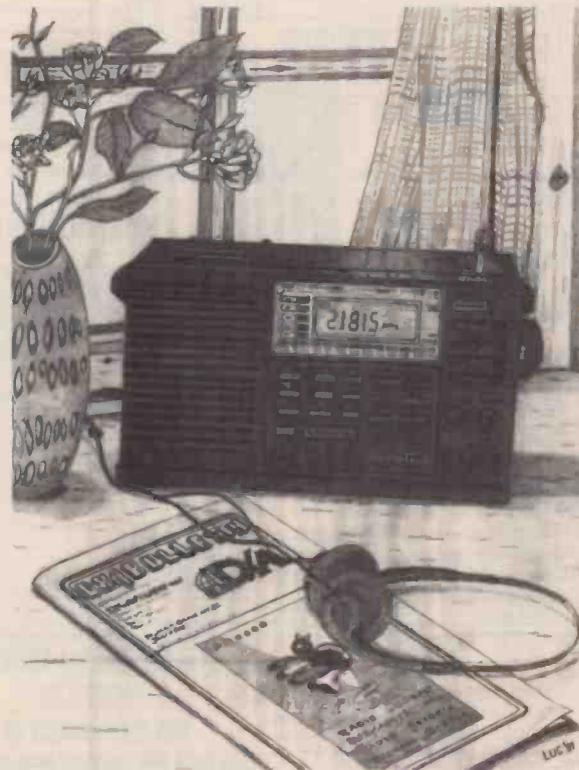
The victim for this month is Robert Hall from South Africa. Robert's roots lie in the UK, but he has lived in South Africa for many years. He is a keen utility enthusiast and a regular contributor to most of the world's 'listening magazines'. As you would expect, Robert has a very comprehensive monitoring station. You will see I've included a photo of his impressive main work station. The system centres around an Icom R-71E h.f. receiver with the Universal M-7000 communications terminal handling the decoding. For computer support Robert has a Falcon AT with a Seikosha printer.

Additional receiving facilities are provided with a Kenwood RZ-1 covering the v.h.f./u.h.f. spectrum. For broadcast reception he uses a Hitachi Hi-Fi system that also provides a cassette recording facility. To help with the supply of letters and logs to yours truly and other columnists, he has a Smith Corona word processor.

As you would expect, Robert uses a comprehensive array of antennas. The current set-up comprises a 25m long wire, 50m delta loop, 11m ZSRX vertical and a discone. In the photo please note the duty operator - Sparks!

If you're not already green with envy, there's more to come. As most experienced operators know, all the best DX is to be found in the wee small hours. Robert's answer to this problem is a second station in the bedroom! This smaller set-up employs Sony 2001D and Icom R71E receivers.

My thanks to Robert Hall for taking the trouble to write with this information. If you would like your



Crois Luc.

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# Long Medium & Short

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

## Medium Wave Chart

**H**appy New Year and welcome to this first edition of LM&S in 1993. This year promises to be an interesting one for the broadcast listener. Several m.w. community stations will start operation and some new s.w. transmitters will be brought into service by international broadcasters. More use will be made of relays and some programmes will be carried by satellite.

Keeping up with the ever changing broadcast scene is difficult and preparing 'LM&S' is no easy task - it would be almost impossible without the support of the many listeners who send along reports on their latest reception. My sincere thanks to all concerned. New contributors are always welcome - simply send details of your reception to the above address.

### Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs compiled during the four weeks ending October 31.

When the 646m high mast radiator at Konstantinow, Poland collapsed in August '91 an old reserve transmitter was brought into service at Raszyn, so that Polish R-1 could continue on 225kHz. To enable a recently installed l.w. transmitter at Raszyn to be brought into service, there was a break in transmission between October 12 & 26. During this gap, Roy Merrall (Dunstable) checked the frequency with some surprising results! At 1840 on October 23 he picked up clear central Asian music and Asiatic language, broadcast via Altai, Mongolia (150kW). He could also hear Surgut, Siberia (150kW), which parallels Burg on 261. The signals via Altai were heard again next day. On October 25 a low power test transmission from the new transmitter at Raszyn was received at 1945.

Over in Co. Down Eddie McKeown (Newry) found what he describes as 'hidden treasures' in this band. Under the sideband splatter from BBC R-4 on 198 he picked up Azilal, Morocco on 207. He logged it as SINPO 21211 at 2305. Later, he was surprised to hear Orenburg, CIS under Topolna, Czechoslovakia on 270, the 40kW transmission rated 21222 at 0227.

### Medium Wave Reports

Rather unfavourable conditions for m.w. transatlantic DXing were noted during October by Jim Willett in Grimsby. He says, "The non-appearance of transatlantic signals gave me a bit more sleep than I usually get". However, signals from CJYQ in St. John's on 930kHz were heard by Ron Damp in Worthing on October 21. Their signal, rated 32223 at 0001UTC. Despite careful checks, no other transatlantic signals could be heard.

In contrast, sky wave signals from some m.w. stations in N. Africa reached the UK quite well after dark, see chart.

A number of low power stations in Spain have been heard here in the evening. Some UK local radio stations were heard in Iceland by Geoff Crowley (Hafnarfjörður) after dark!

During daylight, the ground wave signals from some UK local radio stations have reached distant places. In Largs, John Stevens has listened to BBC R.Kent via Ruthorall 1602 (0.25kW) every morning until about 1015, when their signal faded out. He can receive BBC R.Cornwall via Redruth on 630 (2kW) all day! Tim Bucknall (Congleton) informs me that ILR Signal on 1170 will become Signal Gold in January.

Note: Entries marked \* were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

#### Listeners

- A: Vera Brindley, Woodhall Spa.
- B: Tim Bucknall, Brittany.
- C: Tim Bucknall, Roscoff.
- D: Geoff Crowley, Hafnarfjörður, Iceland.
- E: John Eaton, Woking.
- F: P.R. Gunuprasad, Swartuggens, S. Africa.
- G: Francis Heame, Bristol.
- H: Simon Hockenhill, E. Bristol.
- I: Simon Hockenhill, Lymouth.
- J: Sheila Hughes, Morden.
- K: Rhoderick Illman, Oxted.
- L: Mark Jones, Peterborough.
- M: Cyril Kellam, Sheffield.
- N: Eddie McKeown, Newry.
- O: Roy Merrall, Dunstable.
- P: George Millmore, Wootton IOV.
- Q: Sid Morris, Rowley Regis.
- R: Harry Richards, Barton-on-Humber.
- S: Steve Smith, Cwmbran.
- T: Tom Smyth, Co Fermagh.
- U: Cliff Stapleton, Torquay.
- V: John Stevens, Largs.
- W: Phil Townsend, E. London.
- X: Edward Turnbull, Gosforth.
- Y: Michael Williams, Redhill.

Freq kHz	Station	Country	Power kW	Listener
520	Hof-Saale	Germany	0.2	N*
531	Ain Belda	Algeria	600	P*
531	Torshavn	Faroe Is.	5	O*
531	Leipzig	Germany	100	E*,N*,P,R*
531	Oviedo	Spain	10	N*,P
540	BRT-2 Wavre	Belgium	150/50	E*,K,N*,P,Q,R,W
540	Solt	Hungary	2000	N*,R*
540	Sidi Bennour	Morocco	600	N*,P*
549	Les Trembles	Algeria	600	E*,N*,P*
549	DLF Bayreuth	Germany	200	N*,P,Q,R*,W
558	Rostock	Germany	20	N*
558	Valencia	Spain	20	E*,N*,P,U*
567	Berlin	Germany	100	N*
567	RTE-1 Tullamore	Ireland (SI)	500	A*,B,D*,E*,H,K*,P,Q,R*,T,U,W,Z*
576	Stuttgart	Germany	500	N*,W
576	RNE-5 Barcelona	Spain	20	P*,R*
585	FIP Paris	France	8	N*,P,W
585	RNE-1 Madrid	Spain	200	A*,E*,M*,N*,P*,Q*,R*,U*
585	Gafsa	Tunisia	350	P*
594	Frankfurt	Germany	1000/400	N*,P*,R*,S*,U*,W
594	Oujda-1	Morocco	100	P*
594	Muge	Portugal	100	E*,N*,P*
603	Lyon	France	300	P
603	Sevilla	Spain	20	N*,P*,U*
603	BBC-R4 N'castle	UK	2	N*,R
612	RTE-2 Athlone	Ireland (SI)	100	B*,C*,D*,E*,G*,K*,P,Q,R,T,Y*
612	Lerida	Spain	10	P*
621	RTRF-1 Wavre	Belgium	80	A*,N*,P,Q,R*,W
621	Barcelona	Spain	10	P*
630	Vigra	Norway	100	D*,N*
630	Tunis-Djedeida	Tunisia	600	N*,P*,U*
639	Praha	Czech	1500	N*,R*
639	La Conina	Spain	100	E*,J,K,N*,P*,Q,U*
648	Orapa	Botswana	50	P*
648	P. de Mallorca	Spain	10	N*
648	BBC Orfordness	UK	500	N*,P,Q,R*,U,W
657	Burg	Germany	250	N*,P*,S*
657	RCE-2 Madrid	Spain	20	P*,R*
657	BBC-R,Wales	UK	2	N*,O*,W
666	Bodenseesender	Germany	300/180	D*,N*,P*,R*,U*
666	Lisboa	Portugal	135	P*
675	Marseille	France	600	N*
675	Hilversum-3 Looze	Holland	120	A*,N*,P,Q,R*,U,W
684	RNE-1 Sevilla	Spain	250	D*,N*,P*,R*,U*
684	Beograd	Yugoslavia	2000	N*,P*,R*
693	Berlin	Germany	250	N*
693	BBC-R5 Drottwich	UK	150	A,Q,T,U,W
702	Prasov	Czechoslovakia	400	R*
702	Aachen/Flensburg	Germany	5	P*
702	Monte Carlo	Monaco	300	N*
702	Zamora	Spain	5	N*
711	Rennes 1	France	300	B,N*,P,Q,R*,W
711	Heidelberg	Germany	5	N*
720	Norte	Portugal	100	N*
720	BBC-R4 Lots Rd	UK	0.5	P,R*,T
729	RTE-1 Cork	Ireland (SI)	10	I,N*,P,Q
729	Oviedo	Spain	50	N*,P*,R*
738	Paris	France	4	N*,P
738	Poznan	Poland	300	R*
738	RNE-1 Barcelona	Spain	250	N*,P*,U*
747	R. Baltika	CIS	?	D*
747	Hilversum-2 Flevo	Holland	400	D*,N*,P,Q,R*,U,W
747	Gobabis	Namibia	100	P*
747	R. Cadena, Cadiz	Spain	10	N*
756	Brunswick	Germany	800/200	A*,D*,J,N*,P*,R*,U*
756	BBC-R4 Redruth	UK	2	B,P
765	Sottens	Switzerland	500	N*,P*,R*,S*,U*
774	BBC-R4 Enniskillen	Ireland (NI)	1	N*
774	RNE-1 S. Sebastian	Spain	60	N*,P*,U*
783	Burg	Germany	1000	N*,Q*,R*,U*
783	R. Porto, Miramar	Portugal	100	N*,P*
792	Limoges	France	300	D*,J,N*
792	Lisboa	Portugal	5	P*
792	Sevilla	Spain	20	N*,P*,R*,U*
801	M'chen-Ismaning	Germany	300	N*,R*,U*
801	Burgos	Spain	10	N*,P*
810	SER Madrid	Spain	20	N*,P*
810	BBC Burghhead	UK	100	A*,C,D*,U*
810	BBC Westerglen	UK	100	C,J,K,N*,Q,R*,T,X,Y*
819	Toulouse	France	50	D*,N*
819	Warsaw	Poland	300	P*,R*
819	San Sebastian	Spain	5	N*
828	SER Barcelona	Spain	20	N*
828	Mongu	Zambia	10	P*
837	Nancy	France	200	J,N*
837	R. Popular, Sevilla	Spain	10	N*,P*
846	Rome	Italy	540	D*,N*,P*,Q,R*
865	Berlin	Germany	100	D*,N*
865	Murcia	Spain	125	M*,N*,P*,R*,U*
884	Paris	France	300	N*,P,W
873	AFN via Frankfurt	Germany	150	A*,J,N*,P,Q,R*,U*,Y*
873	Swarzruggen	Switzerland	20	N*
873	R.U.ister	UK	1	N*
882	COPE Malaga	Spain	5	N*
882	BBC Washford	UK	100	B,C*,L,N*,P,Q,R*,T,W
891	Algiers	Algeria	600/300	N*,P*,Q*,R*,U*
891	Hulsberg	Holland	20	N*,P
900	Pilsen	Czechoslovakia	40	N*
900	Milan	Italy	600	N*,P*,R*
908	Palma de Mallorca	Spain	10	N*
908	BBC Brookmans	UK	140	O
909	BBC-R5 Clevedon	UK	50	I
909	BBC-R5 Moorside	UK	200	D*
918	Meezan	CIS	100	N*
918	R. Intercont.	Spain	20	N*,P*,R*
918	R. Ljubljana	Slovenia	600/100	P*
927	BRT-1 Wolvenem	Belgium	300	D*,N*,P,Q,R*,W
927	Bremen	Germany	100	D*,N*,P*,R*
936	Venezia	Italy	20	P*
936	SER Lerida	Spain	2	N*

Freq kHz	Station	Country	Power kW	Listener
945	Toulouse	France	300	J,N*,P*,R*
954	Dobrochov	Czechoslovakia	200	N*
954	RCE Madrid	Spain	20	N*,P*,R*,U*
963	Sofia	Bulgaria	150	N*
963	Pari	Finland	600	D*,K*,N*,P*,Q,R*,K*
963	Paris	France	8	P*
972	Hamburg	Germany	300	D*,N*,P*,R*
972	Nikolayev	Ukraine	500	M*
981	Alger	Algeria	600/300	P*,Q*,D*
990	Berlin	Germany	300	D*,N*
999	R Popular, Madrid	Spain	20	N*,R*
999	Kishinev	CIS	100	D*
1008	Hilversum-5 Flevo	Holland	400	D*,N,P,Q*,R*,W
1017	Rheinsender	Germany	600	A*,D*,N*,P*,R*,U*,W
1017	RNE-5 Burgos	Spain	5	N*
1026	Graz-Dobl	Austria	100	U*,N*,P*
1026	SER Reus	Spain	10	R*
1035	Prog.3 Lisbon	Portugal	120	N*,P*
1035	Tallinn	USSR	500	R*
1044	Oresden	Germany	250	A*,D*,N*,P*,R*,U*
1044	Seba-Aroun	Morocco	300	P*
1044	San Sebastian	Spain	10	N*
1053	Babylon	Iraq	1000	D*
1053	COPE Zaragoza	Spain	10	N*
1053	BBC-R1 Orortwich	UK	150	D*,L*,Q,R*,W
1062	Kalundborg	Denmark	250	D*,N*,P*,R*
1071	Brest	France	20	J,N*,P,R*
1071	Lille	France	40	W
1071	Riga	Latvia	50	D*
1080	Katowice	Poland	1500	D*,N*,P*,R*
1089	BBC Brookmans	UK	150	L*,Q,R*,U
1089	BBC-R1 Moorside	UK	150	D*
1098	Nitra	Czechoslovakia	1500	P*
1098	RNE-5	Spain	10	N*
1107	AFN via Munich	Germany	40	D*,J,N*,P*,R*,U*
1107	RNE-5 Barcelona	Spain	20	N*
1116	Barl	Italy	150	D*
1116	SER-Pontevedra	Spain	2	J,N*
1125	La Louviere	Belgium	20	N*,P,W
1125	RNE 5	Spain	10	N*
1134	Valencia	Spain	10	N*,P*
1134	Zadar	Yugoslavia	1200	D*,N*,P*,Q*,R*,U*
1143	AFN via Stuttgart	Germany	10	J,N*,R*,U*
1143	Messina	Italy	6	N*,P*
1143	Kaliningrad	Russia	150	D*
1152	RNE-5	Spain	10	N*
1161	Strasbourg (F.int)	France	200	N,U*
1170	Krasnodar	CIS	500	N*
1179	Sanfago	Spain	10	N*
1179	Visingsborg	Sweden	800	A*,C*,D*,H*,M*,P*,Q,R*,U*,Y*
1188	Kaume	Belgium	5	K*,N*,P,W
1188	Szolnok	Hungary	135	D*
1197	VGA via Munich	Germany	300	A*,D*,K*,L*,N*,P*,R*
1206	Berlinax	France	100	D*,J,N*,P*
1208	Wroclaw	Poland	200	A*,D*,N*,P*,R*,S*,U*
1215	Kaliningrad	Russia	500	N*
1215	COPE Castellon	Spain	2	N*
1224	Vidin	Bulgaria	500	D*,N*,P*,R*
1233	Liege	Belgium	5	N*,P*
1233	Nitra	Czechoslovakia	40	A*,N*,R*,T,U*
1242	Marseille	France	150	N*,R*
1251	Mercali	Hungary	500	R*
1251	Huisberg	Netherlands	10	N*
1280	Valencia	Spain	20	N*,P*,R*,U*
1289	Neuminsten	Germany	600	D*,K*,N,P,Q,R*,U*
1278	Strasbourg	France	300	N*
1278	RTE-2 Dublin/Cork	Ireland (SI)	10	A*,D*,N*,P*,Q,U,Y*
1287	Ltomysl/Libice	Czechoslovakia	300/200	N*,P*
1287	Melnik	Czechoslovakia	400	D*,R*
1296	San Sebastian	Spain	5	N*,P*
1296	BBC Orfordness	UK	600	N*,P,R*
1296	Loznica	Yugoslavia	10	D*
1305	Rzeszow	Poland	100	D*,N*,U*
1305	Ornese (RNE5)	Spain	5	N*
1314	Kvitsoy	Norway	1200	A*,D*,N*,P,Q,R*,U*,W
1323	R. Moscow	Germany	150	N*,R*
1332	Rome	Italy	300	D*,K*,N*,P*,R*
1341	Lalinyeg	Hungary	300	N*
1341	BBC-Ust. Llanegwyl, Ireland (NI)	UK	100	D*,K*,P,Q,R*,U
1350	Nancy/Nice	France	100	N*,P*,R*,U
1359	Tirana	Albania	50	D*
1359	Berlin	Germany	250/100	D*,N*,R*
1368	Manx Radio	IOV	20	D*,G*,J,N*,U*,V
1377	Lille	France	300	B*,C*,E*,J,N,P,Q,R*,W
1386	Kaliningrad	Russia	500	C*,N*,P*,R*,U*,W
1385	R. Tirana	Albania	1000	A*,N*,Y*
1404	Brest	France	20	J,K,N*,P,R*
1413	BBC via Masirah	Oman	1500	F*
1413	RCE Zaragoza	Spain	20	N*,P*,R*,T
1422	Hresweller	Germany	1200/600	A*,D*,N*,P,Q,R*
1431	Desudin	Germany	250	N*,U*
1440	RTL Marnach	Luxembourg	1200	A*,D*,N*,P,Q,R*
1449	Berlin	Germany	5	N*
1467	TWR Monte Carlo	Monaco	1000/400	A*,C*,D*,N*,P,Q,R*,W
1476	Wien-Bisamberg	Austria	600	D*,N*,P*,Q,R*
1494	Clermont-Ferrand	France	20	J,N*,P*,Q,R*
1494	St.Petersburg	Russia	1000	N*
1503	Stargard	Poland	300	D*,N*,R*
1512	Wolvenem	Belgium	600	A*,D*,J,K,N*,P,Q,R*,W
1521	Kosice	Czechoslovakia	600	D*,N*,P*,R*
1530	Vatican Radio	Italy	150/450	A*,C*,N*,P*,R*,U*
1539	Maintzingen	Germany	700	D*,N*,P,Q,R*
1539	Valladolid	Spain	5	N*
1557	Nice	France	300	J,N*,D
1566	Radostantsiya	CIS	?	D*,P*
1566	Sarnen	Switzerland	300	N*,R*,U
1575	Burg	Poland	250	D*,N*,R*
1575	Genoa	Italy	50	J
1584	SER Ornese	Spain	5	K
1593	Langenberg	Germany	400/800	A*,C*,D*,N*,P,Q,R*,W
1602	SER R. Cartagena	Spain	2	J
1602	Victoria	Spain	10	P*

# Long Medium & Short

## Local Radio Chart

Freq kHz	Station	ILR	e.m.r.p. (kW)	Listener	Freq kHz	Station	ILR	e.m.r.p. (kW)	Listener
558	Spectrum R.	I	7.50	C*,G,H*,K,L,S	1161	R.Tay	I	1.40	J*,Z*
585	R.Solway	B	2.00	J,M,N*	1161	Viking R.(Gt.Yks)	I	0.35	J*,M
803	Invicta Snd(Coast)	I	0.10	G,I,K,Q,S	1170	GNR Teeside	I	0.32	M
830	R.Bedfordshire	B	0.20	G,H*,K,L,M,Q,S	1170	Ocean Sd (SCR)	I	0.12	G,J*,K,S
830	R.Cornwall	B	2.00	B,K,P,S	1170	R.Orwell (SGR-FM)	I	0.28	Q,S
857	R.Clywd	B	2.00	G,H,J,K,L,M,S	1170	Signal R.	I	0.20	L
857	R.Cornwall	B	0.50	B,K	1170	Swansea Sound	I	0.58	J*,Z*
866	DevonAir R.	I	0.34	B,E,G,H,K,S	1242	Invicta Snd(Coast)	I	0.32	G,H*,Q,S
666	R.York	B	0.80	A,J*,M	1242	Isle of Wight R.	I	0.50	J*,K,S
729	BBC Essex	B	0.20	G,I,K,Q,S	1251	Saxon R. (SGR-FM)	I	0.76	L*,Q,S
738	Hereford/Worcester	B	0.037	G,K,L,Q,S	1260	GWR (Brunel R.)	I	1.60	F,K,S
756	R.Cumbria	B	1.00	J,M	1260	Leicester (Gem AM)	I	0.29	K,L,Q
765	BBC Essex	B	0.50	G,J*,K,Q,S	1260	R.York	B	0.50	M
774	R.Kent	B	0.70	G,K,M*,Q,S	1260	Sunrise R.	I	0.29	S
774	R.Leeds	B	0.50	J*,M,S	1278	Pennine R.(Gt.Yks)	I	0.43	M
774	Severn Sound (3CR)	I	0.14	D*,K,L,S	1305	R.Hallam (Gt.Yks)	I	0.15	M
792	Chiltern R.	I	0.27	G,I,K,L*,M,Q,S	1305	Red Dragon (Touch)	I	0.20	J*,K,S
801	R.Devon	B	2.00	G,H,J*,K,Q,O,S	1323	R.Bristol (Som.Snd)	B	0.63	J*,S
828	Chiltern Radio	I	0.20	G,I,Q,S	1323	S'them Sound(SCR)	I	0.50	G,H*,J*,K,Q,O,S
828	R.Airel(Magic 828)	I	0.12	M	1332	Hereward B.(WGM/S)	I	0.60	A,L,J*,M,Q,S
828	2CR	I	0.27	K,S	1332	Wiltshire Sound	B	0.30	J*,K,S
837	R.Furness	B	1.00	J*,R	1359	Essex R.(Breeze)	I	0.28	G,H*,I,Q,S
837	R.Leicester	B	0.45	A*,G,I,K,L,M,Q,S	1359	Mercia Snd(Xtra-AM)	I	0.27	L,S
855	R.Devon	B	1.00	B,E,F,K,S	1359	Red Dragon (Touch)	I	0.20	D*
855	R.Lancashire	B	1.50	J,M	1359	R.Solent	B	0.85	K
855	R.Norfolk	B	1.50	A,G,M,Q,S	1368	R.Lincolnshire	B	2.00	M
855	Sunshine R.	I	0.15	S	1368	R.Sussex	B	0.50	G,K,Q,S
873	R.Norfolk	B	0.30	A,G,K,M,Q,S	1368	Wiltshire Sound	B	0.10	K
936	GWR (Brunel R.)	I	0.18	K,S	1413	Sunrise R.	I	0.125	G,K,Q,O,S
945	R.Trent (GEM-AM)	I	0.20	J*,K,L,M,Q,O,S	1431	Essex R.(Breeze)	I	0.35	G,H,Q,S
954	DevonAir R.	I	0.32	G,J*,K,O,S	1431	R.210 (Cl. Gold)	I	0.14	G,K,S
954	R.Wyvern	I	0.16	L,S	1449	R.Peterboro/Camb	B	0.15	A,M,S
990	WABC (Nice & Easy)	I	0.09	L,S	1450	GLR	B	50.00	G*,K,M*,O,S,Z*
990	R.Aberdeen	B	1.00	J*	1450	R.Cumbria	B	0.50	J*
990	R.Devon	B	1.00	E,F,G,K	1450	R.Devon	B	2.00	R,K,S
990	Hallam R.(Gt.Yks)	I	0.25	A,I,M,S	1476	City Snd(1st Gold)	I	0.50	G*,J*,K,Q,S
999	R.Solent	B	1.00	E,G,K,Q,S	1485	R.Humberside	B	1.00	A,M
999	R.Trent (GEM-AM)	I	0.25	M,S	1485	R.Merseyside	B	1.20	J,S
999	Red Rose R.	I	0.80	J	1485	R.Sussex	B	1.00	G,K,Q,S
1017	WABC Shrewsbury	I	0.70	K,L,M,S	1503	R.Strike-on-Trent	B	1.00	R*,J*,K*
1026	Downtown R.	I	1.70	O	1521	R.Mercury (City Snd)	I	0.84	D*,G,J*,K,Q,S
1026	R.Cambridgeshire	B	0.50	A,G,M,Q,S	1530	Pennine R.(Gt.Yks)	I	0.74	J*,M,O
1026	R.Jersey	B	1.00	B,G,K,S	1530	R.Essex	B	0.15	L,Q,S
1035	R.Kent	B	0.50	G,K,Q,S	1530	R.Wyvern	I	0.52	K,L
1035	R.Sheffield	B	1.00	M	1548	Capital R. (Gold)	I	97.50	G*,K,Q,S
1035	West Sound	I	0.32	J	1548	R.Bristol	B	5.00	F,J*,K
1107	Moray Firth R.	I	1.50	J*	1548	R.Forth (Max AM)	I	2.20	J*,P
1107	R.Northampton	B	0.50	K	1548	R.Hallam (Gt.Yks)	I	0.74	M
1118	R.Derby	B	1.20	A,J*,L,M,S	1557	Chiltern R.(Gold)	I	0.76	J*,L*
1116	R.Guernsey	B	0.50	B,G,K,S	1557	Ocean Sound (SCR)	I	0.50	G,J*,K,S
1152	BRMB (Xtra-AM)	I	3.00	L,S	1557	Yending R.(Mellow)	I	?	S
1152	GNR Newcastle	I	1.80	M	1584	R.Northingham	B	1.00	A*,G,J*,M,S
1152	LBC (L.Talkback R.)	I	23.50	G,J,O,S	1584	R.Shropshire	B	0.50	G,L
1152	R.Broadland	I	0.83	A,D*,J*,S	1584	R.Thrap	I	0.21	J*,P
1161	GWR (Brunel R.)	I	0.16	J*,K,Q,S	1602	R.Kent	B	0.25	G*,J*,K,P,Q,S
1161	R.Bedfordshire	B	0.10	S					
1161	R.Sussex	B	1.00	G,K,S					

- Listeners:**  
A: Vera Brindley, Woodhall Spa.  
B: Tim Bucknall, Brittany.  
C: John Eaton, Woking.  
D: Francis Heame, N.Bristol.  
E: Simon Hockenhill, E.Bristol.  
F: Simon Hockenhill, Lynnmouth.  
G: Sheila Hughes, Morden.  
H: Rhoderick Illman, Oxted.  
I: Mark Jones, Peterborough.  
J: Eddie McKeown, Newry.  
K: George Millmore, Wootton, IOW.  
L: Sid Morris, Rowley Regis.  
M: Harry Richards, Barton-on-Humber.  
N: Steve Smith, Cwmbran.  
O: Tom Smyth, Co.Fermanagh.  
P: John Stevens, Largs.  
Q: Phil Townsend, E.London.  
R: Edward Turnbull, Gosforth.  
S: John Wells, East Grinstead.  
Z: Geoff Crowley, Hafnarfjordur, Iceland.

The test transmissions from Sunshine Radio, the new Shropshire Community station on 855kHz, were noted in several reports. Sid Morris (Rowley Regis) rated them SIO555 during daylight, but unreadable after dark. During the afternoon John Wells has been able to receive them quite well in East Grinstead. He can still receive R.Devon or R.Norfolk on the same channel by turning his loop, but the reception of R.Devon is now more difficult.

### Short Wave Reports

Seasonal propagational changes have resulted in improved reception, particularly in the h.f. bands. The number of disturbances from solar activity was less than expected.

Daily propagation variations were evident in the 25MHz (11m) band, but the signals often reached their intended target well. In his latest report from S.Africa, P.R.Guruprasad (Swartruggens) noted potent signals from UAER, Abu Dhabi on 25.690 (Ar to ? 0900-1600) typically 55434 at 1030. He also logged R.Norway Int, Oslo 25.730 (Nor to Asia, Aust. 0800-0830 & 0900-0930, Norw\* to W.Africa, Europe [\*Eng Sat/Sun] 1300-1330) as 45333 at 0808 and RFI via Issoudun on 25.820 (Fr to E.Africa 0700-1550) as 35223 at 0811. In contrast, very weak signals were received from R.Australia via Darwin on 25.750 (Eng to Japan, China, N.Eu 0800-0900).

The signals from UAE R (25.690) and RFI (25.820) have also been reaching Iceland. They were heard in Hafnarfjordur at SIO555 and SIO253 respectively at 1028.

A marked improvement in 11m reception has been noted in Canada by Alan Roberts (Quebec). Propagation deteriorated towards the end of April and remained poor until late September, when east/west paths began to open up again. Since then he has logged DW via Julich 25.740 (Ger to M.East, E.Asia 1100-1355) as 35333 at 1140; UAER (25.690) as 35333 at 1215; R.Denmark via RNI 25.730 (Da to W.Africa, Europe 1330-1400) as 45444 at 1335; also RFI (25.820) as 35333 at 1430. He says, "R.Australia signs off nearly three hours before Montreal sunrise and can't be heard".

R.Australia's broadcasts on 25.750, which are beamed on a trans-polar (Arctic) route from Darwin, have reached the UK some mornings. They were SIO333 at 1040 by Philip Rambaut in Macclesfield. The Sunday morning church service broadcast by R.Nederlands (Du 1030-1115) has been moved from 25.940 to 25.970. Kenneth Buck (Edinburgh) logged it as SIO355 at 1040. Typical UK ratings for the others were UAE R. (25.690) SIO323 at 1045 in Largs; RNI (25.730) 44433 at 1344 by Rhoderick Illman in Oxted; DW (25.740) 34444 at 1118 by Chris Shorten in

Norwich; RFI (25.820) SIO233 at 1400 by Phil Townsend in E.London.

Good reception of R.Australia's 21MHz (13m) broadcasts has been noted in the UK during the morning: Darwin on 21.525 (Eng to SE.Asia 0200-0800) was a potent SIO544 at 0715 by Cyril Kellam in Sheffield, 21.725 (Eng to S.Asia 0800-1300), SIO433 at 1100 by Bryan Kimber in Hereford, also received in Swartruggens, S.Africa and rated 54344 at 1250; Carnarvon on 21.590 (Eng to Pacific areas 0100-0900), 34433 at 0825 by Richard Radford-Reynolds in Guildford.

Also logged here during the morning were R.Japan via Moyabi 21.575 (Eng, Jap to Eu 0700-0900) 54344 at 0715 in Norwich; BBC via Tsang Tsui 21.715 (Eng to C.Asia 0100-0900) 35222 at 0745 by Chris Haigh in Huddersfield; R.Pakistan, Islamabad 21.520 (Eng to Eu 0800-0845) 35543 at 0917 by David Edwardson in Wallsend; R.Moscow WS 21.615 (Eng to Asia ?-1100) 22222 at 0930 by Sheila Hughes in Morden; BBC via Limassol 21.470 (Eng to M.East, E.Africa 0430-1615) 32333 at 1000 in Worthing; R.Austria Int via Moosbrunn 21.490 (Ger, Eng to Aust. 0800-1100) SIO353 at 1039 in Hafnarfjordur.

After mid-day, the BBC via Ascension Is 21.660 (Eng to Africa 0900-1745) was 35443 at 1317 by John Nash in Brighton; UAE R.Dubai 21.605 (Ar, Eng to Eu 0615-1645) SIO444 at 1340 by Bill Clark in Rotherham; R.Kuwait

21.675 (Ar to Eu, USA 1300?-1800) 45444 at 1424 by John Eaton in Woking; RAI Rome, Italy 21.690 (It to Africa 1410-1730, Sun Only) 43443 at 1440 by Vera Brindley in Woodhall Spa; RCI via Sackville 21.545 (Eng to Europe 1515-1530) SIO455 in Edinburgh; Voice of

Greece, Athens 21.650 (Gr, Eng, Sw to USA, Sweden 1500-1550) 53443 at 1530 by Darren Beasley in Bridgwater; R.Portugal Int via S.Gabriel 21.515 (Eng to M.East 1530-1600) SIO333 at 1557 by Ted Walden-Vincent in Gt.Yarmouth; R.Nederlands via Bonaire 21.590 (Eng

### Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Donebach	Germany	500	A*,B,C,G*,I*,K,L,M*,D,Q,R
153	Brasov	Romania	1200	B,I*,Q
162	Allouis	France	2000	A*,B,C,D,I*,K,L,M*,N*,O*,P,Q,R
162	Agri	Turkey	1000	J*
171	Kaliningrad	Russia	1000	B,C*,G*,I*,K,L,M*,R
171	Medi 1-Nador	Morocco	2000	Q
177	Oranienburg	Germany	750	A*,B,C,G*,I*,K,L*,M*,Q
183	Saarouis	Germany	2000	A*,B,C,G*,I*,K,L,M*,P,Q,R
198	Warsaw 3	Poland	200	E*
198	BBC Droitwich	UK	500	A,C,D*,F*,G*,I*,K,L,M*,O,P,Q,R
198	BBC Westerglen	UK	50	B
207	Munich	Germany	500	A*,B,D*,E*,G*,I*,K,M*,N*,Q,R
207	Azija	Morocco	800	I*
207	Kiev	Ukraine	500	J
216	RMC Roumoules	S.France	1400	B,C,G*,I*,K,L*,M*,Q,R
216	Oslo	Norway	200	B,I*,J,P
225	Altai, Gobi	Mongolia	150	J*
225	Raszyn Resv TX	Poland	?	C*,I*,J*,K,L*,M*
225	Surgut	Siberia	150	J*
234	Beidweiller	Luxembourg	2000	B,C,D*,F*,G*,I*,K,L,M*,P,Q,R
234	St.Petersburg	Russia	1000	I*
243	Kalundborg	Denmark	300	A*,B,C,G*,I*,K,L*,M*,P,R
252	Tipaza	Algeria	1500	E*,G*
252	Atlantic 252	S.Ireland	500	A*,B,C,D*,E,F,G,H,I,K,L,M*,N*,P,Q,R
261	Plovdiv	Bulgaria	500	J
261	Burg	Germany	200	A*,G*,J,K
261	Moscow	Russia	2000	B,I*,M*,P,R
270	Topolna	Czech	1500	A*,B,C*,D*,I*,J,L*,M*,P,Q,R
270	Orenburg	CIS	15	I*
279	Minsk	CIS	500	B,J,K,M*,Q

Note: Entries marked \* were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

to Africa 1730-2025) SIO444 at 1730 in Macclesfield.

Later, WYFR via Okeechobee 21.500 (Eng to U, Africa 1700-1900) 43444 at 1851 by Ken Milne in Basinstoke; DW via Trincomalee 21.560 (Ger to Africa, Eu 1800-2000) 33323 at 1900 by Ron Galliers in N.London; HCJB, Ecuador 21.480 (Eng to Eu 1900-2000) 43443 at 1925 by Robert Connolly in Kilkeel; also 21.455 (Eng, world-wide u.s.b.+ p.c.) 33333 at 2035 by Peter Pollard in Rugby.

The 17MHz (16m) signals from R.New Zealand Int to Pacific areas have reached the UK some mornings. Their 100kW signal from Rangataiki, N.Island on 17.770 (Eng 2130-0655) peaked SIO333 at 0655 in Rotherham. It was also logged in Iceland as SIO222 at 0650. R.Australia's broadcast to Asia via Carnarvon on 17.750 (Eng to 0000-0400, 0700-0900) was logged in Hereford as SIO333 at 0845. Their transmission from Darwin on 17.630 (Eng to Asia 0700-0900) reached Iceland at SIO222 at 0730.

Some signals to Europe in this band stem from R.Pakistan, Islamabad 17.900 (Eng, Ur 0800-1105) SIO444 at 0800 in Sheffield; Voice of Israel, Jerusalem 17.545 (Fr, Eng 1000-1200, also to USA) 45444 at 1025 in Woking; R.Sofia, Bulgaria 17.830 (Ger 1100-1145) 55555 at 1100 by Edward Turnbull in Gosforth; Voice of Greece, Athens 17.525 (Eng, Gr 1500-1550, also to USA) 44344 at 1535 in Woodhall Spa; WCSN, Maine 17.510 (Eng 1400-1555) 42444 at 1552 by Martin Dale in Stockport; HCJB, Ecuador 17.790 (Cz, Sw, Ger, Fr, Eng, Sp 1800-2230) 44433 at 1931 by Peter Polson in St.Andrews; WYFR via Okeechobee 17.500 (Fr, Eng, Ger 1800-2200, also to Africa) 32222 at 1938 in N.London; R.Havana Cuba 17.705 (Eng 2100-2200) SIO212 at 2100 by Tom Smyth in Co.Fermanagh; also 17.770 (Sp 2100-2200) 43333 at 2120 in Kilkeel.

There are many signals to other areas, some have been heard here: R.Pyongyang, Korea 17.765 (Eng to SE.Asia 0700-0750) 33333 at 0700 in Norwich; BBC via Meyerton 17.790 (Eng to Africa 0700-0730) SIO444 at 0710 in Macclesfield; Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) SIO333 at 0800 in Grimsby; KHBI Saipan 17.555 (Eng to NE.Asia, Russia 0800-1200) 34333 at 0915 in Morden; R.Yugoslavia, Belgrade 17.740 (Eng to USA 1230-1300) 44433 at 1230 in Oxted; R.Tunis via Sfax 17.500 (Ar 0700-1800) SIO444 at 1250 by John Coulter in Winchester; RFI via Issoudun 17.795 (Eng to N.Africa 1600-1700) 32232 at 1630 in Newry; R.Japan via Yamata? 17.775 (Eng to ? 1700-1800) 43444 at 1705 in Worthing and 43333 at 1750 in Swartruggens; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1930-2030) 54444 at 2020 by Ernest Randall in Dalton; VOA via Greenville 17.640 (Fr to Africa 1830-2300) 44444 at 2055 in Rugby.

Two of R.Australia's 15MHz (19m)

Freq MHz	Station	Country	UTC	D/Xer
2.310	ABC Alice Springs	Australia	1700	U
2.325	ABC Tennant Creek	Australia	1701	U
2.560	Xinjiang	China	2256	H,P
3.205	AIR Lucknow	India	1730	H,P,U,3
3.215	R Orange	S.Africa	2310	I,3
3.220	CPBS 1, Beijing	China	2200	P
3.220	R.Togo, Lome	Togo	1950	U,3
3.240	TWR	Swaziland	1650	3
3.255	BBC via Massaru	Lesotho	2100	I,J,R,X
3.265	RTV Brazzaville	Congo	?	P
3.270	SWABC 1, Namibia	S.W.Africa	2128	P,X,3
3.275	AIR Srinagar	India	1733	H
3.278	RRI Jakarta	Indonesia	2115	P
3.279	La Voz del Napo	Ecuador	0314	I
3.280	R.Reims	Mozambique	1840	P
3.290	SWABC 2, Namibia	S.W.Africa	2320	D
3.295	Reykjavik	Iceland	1845	I,O,P
3.300	R.Cultural	Guatemala	0300	S
3.315	AIR Bhopal	India	1717	P,U
3.315	SLBS Freetown	Sierra Leone	2141	P,U
3.320	R.Orion	S.Africa	2230	I,P,S,3
3.320	R.Suid Afrika	S.Africa	1850	P,U
3.325	FRCN Lagos	Nigeria	2100	B,O
3.330	R.Kigali	Rwanda	1715	P
3.345	AIR Yamou	India	1700	P
3.345	ZBS Lusaka	Zambia	2330	D
3.355	R.Botswana	Gaborone	2130	K,P,S,X
3.365	R.Rebekke, La Jolie	Cuba	0400	S,3
3.365	AIR New Delhi	India	1716	H
3.365	GBC Radio 2	China	2125	B,I,J,O,R,U
3.370	R.Tezulurden	Guatemala	0347	I
3.375	AIR Gauhati	India	1722	K,U
3.375	RRI Medan	Indonesia	2320	3
3.380	R.Malawi	Malawi	1620	K,P
3.390	R.Candio Binia	Zaire	1720	P
3.390	IRB Kamalabad	Iran	0400	L
3.395	CPBS Taiwan 1	China	2358	P
3.395	AIR Delhi	India	1706	J,P
3.395	BBC Kranji	China	2320	P,U,2
3.395	PBS Dinghai Xining	China	2320	P,U
3.395	BBC Skelton	England	2110	A,B,C,D,E,G,H,I,J,M,D,Q,V,W,Y,Z
3.980	RFE/RL Munich	W.Germany	1855	P
3.985	RFI Paris	France	2115	B,C,D,G,I,J,L,M,O,R,V,Y,Z
3.970	R.Buaz	Cameroun	2245	P,S
3.970	RFE Munich	W.Germany	2100	G,I,L,D,P,Y
3.975	BBC Skelton	England	2000	I,O,Y
3.980	VOA Munich	W.Germany	2000	A,B,C,D,I,M,D,P,R,Y
3.985	R.Beijing, China	via Sri Lanka	2137	A,B,C,I,O,Z
3.985	SRI Bienne	Switzerland	1905	C,G,I,J,L,M,N,O,P,R,Y
3.990	Xinjiang	China	0035	P
3.990	RFE Munich	W.Germany	1910	I,P
3.995	DW Cologne (Julich)	W.Germany	2000	A,D,G,I,L,M,O,P,Y,Z
4.020	China R. Beijing	China	1940	P
4.035	PBS Xizang Lhasa	Tibet	2315	P,3
4.040	R.Moskva 2 (Khanly-M)	CIS	0400	P
4.040	R.Yerevan 1	CIS	1745	P
4.065	R.Moskva 1 (Kalinin)	Russia	2120	B,D,I,L,O,R,Y,2
4.080	R.Ulan Bator	Mongolia	2330	P
4.130	V. of the Strait 1	China	1950	P
4.190	CPBS Minority Sce	China	2200	P
4.220	PBS Xinjiang	China	0001	P
4.330	PBS Xinjiang	China	0001	P
4.485	R.Moskva (Ufa)	Russia	1905	I
4.485	Patm'sk Kamchatskay	CIS	2148	A
4.500	Xinjiang	China	2300	G,I,O,P
4.520	R.Moskva 2 (Khanly-M)	CIS	1906	I,P
4.600	R.Parla del Acre	Bolivia	0215	F
4.635	R.Dushanbe	Tadzhikistan	0135	L,O,P,3
4.650	R.Santa Ana	Bolivia	0100	3
4.735	Xinjiang	China	2321	B,D,H,O,P,U
4.740	Ashtabed	Russia	2352	I,M,O
4.750	PBS Hailar	China	2210	P
4.750	PBS Xizang, Lhasa	China	2310	J,P
4.755	R.Hararain	Brazil	2355	D
4.760	Yunnan Kunming	China	2308	H,P,U
4.760	AIR Port Blair	India	1640	P
4.765	Brazzaville	PR Congo	2025	B,D,F,G,I,J,L,N,O,R,S,T,U,Y
4.770	FRCN Kaduna	Nigeria	2035	A,B,G,I,J,M,O,P,R,S,T,U,Y
4.775	R.Amerale	Brazil	2325	F
4.780	RTD	Djibouti	1910	F,P,T
4.783	RTM Bamako	Mali	2300	D,F,O,U
4.785	PBS Zhejiang 1	China	2158	P,U
4.795	R.Tanzania	Tanzania	1922	I
4.795	R.Baku	Azerbaijan	1748	P,T,H
4.790	AIR Shillong	India	0129	P
4.790	Azad Kashmir R.	Pakistan	1700	H,P,U,1
4.790	TWR Manzini	Swaziland	1745	M,P,U,1
4.795	R.Douala	Cameroun	2145	B,O,R,U,3
4.795	R.Nueva America	Bolivia	0315	S
4.800	PBS Xinjiang	China	2200	P,U
4.800	R.Popular Cuenca	Ecuador	0125	P
4.800	Kazakh R. Yakutsk	CIS	0125	P
4.805	R.Nac. Amazonas	Brazil	2355	O,S
4.810	R.Yerevan	Armenia	2129	A,B,I,L,O,S,U,Y
4.815	R.Beijing	China	2325	P
4.815	R.diff TV Burkina	Ougandougou	2050	B,D,R,U
4.820	La Voz Evangelica	Honduras	0348	S
4.820	AIR Calcutta	India	1640	P
4.820	R.Moskva 4 (Khanly-M)	Russia	2050	B,I,O,P,U
4.825	R.Cancao Nova	Brazil	2312	G
4.825	R.Moscow (Yakutsk)	Siberia	2115	B,L,O,Y,2
4.825	Ashtabed	Turkmenia	2130	G,P
4.830	Gaborone	Botswana	0025	K,M,P,3
4.830	R.Tachira	Venezuela	0010	D,R,S
4.832	R.Rioj	Costa Rica	2115	S,Y
4.835	RTM Bamako	Mali	2025	A,B,D,G,I,J,M,O,P,R,T,U,Y,3
4.840	Heilongjiang. Harbin	China	2240	P
4.840	R.Valera, Trujillo	Venezuela	0001	D

### D/Xers:

- A: Charles Beantland, Gibraltar.
- B: Darren Beasley, Bridgwater.
- C: Vera Brindley, Woodhall Spa.
- D: Robert Connolly, Kilkeel.
- E: Geoff Crowley, Iceland.
- F: Antonio De Abreu-Teixeira, Evesham.
- G: John Eaton, Woking.
- H: David Edwardson, Wallsend.
- I: Steve Ferringer, Oxford.
- J: Ron Galliers, N.London.
- K: P.R. Gururadas, Swartruggens, S.Africa.
- L: Chris Haigh, Huddersfield.
- M: Sheila Hughes, Morden.
- N: Rhoderick Ilman, Oxford.
- O: Eddie McKaown, Newry.
- P: Roy Merrill, Dunstable.

Freq MHz	Station	Country	UTC	D/Xer
4.845	R.Fides, La Paz	Bolivia	0420	S
4.845	ORTM Nouakchott	Mauritania	2025	A,B,D,I,L,O,P,R,S,T,U
4.850	R.Yaounde	Cameroun	1925	A,B,F,O,P,T,U,Y
4.850	R.Luz y Vida, Loja	Ecuador	0250	S
4.850	AIR Kohima	India	2074	B,I,L,M,O,P,T
4.850	R.Tashkent 2	Uzbekistan	2100	O,P,R,U,3
4.860	EP da Lunde-Sul	Angola	1935	P
4.860	AIR New Delhi	India	1928	I,P,U
4.860	R.Moscow	Russia	1905	B
4.862	V. of Zaira, Bukavu	Zaire	?	P
4.865	PBS Lanzhou	China	2310	A,H,J,O,P,U
4.865	V. of Cinaruco	Colombia	0205	F
4.865	R.Mozambique	Mozambique	1734	P
4.870	R.Cotonou	Benin	2027	A,B,I,J,O,P,R,T,U,Y
4.875	R.Thilim	Georgia	1910	P,U
4.885	Em Reg Zaire	Angola	1925	P
4.885	R.Clube do Para	Brazil	0005	O,I
4.885	R.Difusora Acreana	Brazil	0415	S
4.885	R.Beijing	China	2327	P
4.885	Voice of Kenya	Kenya	1900	P
4.890	RFI Paris	via Gabon	0414	I
4.895	Voz del Rio Arauca	Colombia	0215	F,S
4.895	R.Moscow (Kalinin)	Russia	1927	M,O,T
4.895	R.Moskva 4 (Tyumen)	Siberia	1655	P,3
4.895	Hanoi 1	Vietnam	0120	3
4.900	V. of the Strait 2	China	2204	H,P,3
4.900	RTG Conakry	Guinea	1650	I,T
4.905	R.Regio. Rio	Brazil	0200	S
4.905	R.Nat. N'djamena	Chad	1912	B,O,R,S,T,Y
4.910	V. of People Kampuchea	Cambodia	2227	P,U
4.910	V. de la Mosquitia	Honduras	0225	F
4.910	R.Zambia, Lusaka	Zambia	2050	K,P,T
4.915	R.Antanguera	Brazil	2315	B,F,P
4.915	R.Nac Macapa	Brazil	0040	F
4.915	PBS Guangxi, Nanning	China	2150	P
4.915	GBC-1, Accra	Ghana	2030	A,B,D,F,H,I,J,M,O,P,R,S,T,U,Y,3
4.915	Voice of Kenya	Kenya	1747	T
4.915	R.Cora, Lima	Peru	0417	P
4.920	ABC Brisbane	Australia	1530	T
4.920	R.Ouro	Ecuador	0230	K,P
4.925	AIR Madras	India	1640	P
4.925	R.Nacounal, Bata	Eq. Guinea	1940	P
4.930	R.Moscow	Russia	1932	A,B,M,O,T,Y
4.935	R.Capanaba	Brazil	0305	P
4.935	Voice of Kenya	Kenya	1932	K,U,R,I,U,Y,3
4.940	R.Kiev 2	Ukraine	2000	A,B,F,G,I,L,M,O,R,T,U,Y
4.940	R.Moskva 2 (Yakutsk)	CIS	0011	T
4.950	R.Nac Luanda	Angola	1934	T
4.955	R.Marajara, Belem	Brazil	0015	F,S
4.958	R.Baku	Azerbaijan	0044	A,L,O,P,U,Y
4.970	PBS Xinjiang	China	0205	P,S
4.970	R.Rumbos, Caracas	Venezuela	0255	D,F,S,3
4.975	PBS Fuchou	China	1555	Y
4.975	R.Uganda, Kampala	Uganda	0030	Y
4.975	R.Dushanbe	CIS	0010	A,D,J,M,O,S
4.980	PBS Xinjiang	China	2330	P
4.980	Ecos del Torbes	Venezuela	2335	B,F,I,J,O,P,U,Y,3
4.985	R.Brazil Central	Brazil	2245	D,G,U
4.985	RIJ Kishimabad	Iran	2240	F
4.990	AIR via Madras	India	0045	P,S
4.990	FRCN Lagos	Nigeria	2301	B,D,O,R,U,Y
4.990	R.Ancash, Huaraz	Peru	0010	D,S
4.990	R.Moscow (Yerevan)	CIS	0016	O
5.005	R.Nacounal, Bata	Eq. Guinea	1940	F,R,T
5.010	R.Garoua	Cameroun	2030	B,J,L,O,T,U
5.010	SBC Singapore	Singapore	2315	P
5.015	R.Brazil Tropical	Brazil	2325	P
5.015	R.Moskva 2 (Khanlyngelsk)	CIS	2116	B,D,O,P
5.020	PBS-Jiangsu Hanchang	China	2340	P
5.020	La Voz del Sahel	Niger	1800	P
5.020	ORTM Niamey	Niger	0647	U
5.020	SLBC Tamil Home Sce	Sri-Lanka	1535	K
5.025	R.Panikou	Benin	2032	D,S,T,U
5.025	R.Rebekke, Habana	Cuba	0020	P
5.025	R.Uganda, Kampala	Uganda	2118	O,P
5.030	R.Catolica, Quito	Ecuador	2300	D,F
5.030	RTM Kuching	Sarawak	2235	P
5.030	R.Continente Caracas	Venezuela	2240	F,P
5.035	R.Aguascalientes	Brazil	2305	F
5.035	R.Educacao Rural	Brazil	2140	F
5.035	R.Bangui	C.Africa	2130	B,I,J,P,2
5.035	R.Alma Ata	Kazakhstan	2135	B,F,O,P,U
5.040	Voz del Upano, Macas	Ecuador	2135	2
5.040	R.Thilisi 1	Georgia	2100	A,B,E,I,L,P,R,T,U,Y
5.045	R.Cultura do Para	Brazil	2345	D,F,G
5.047	R.Togo, Lome	Togo	2301	A,B,D,F,H,J,O,T,U,Y
5.050	GBC Nanning	China	2125	F,T
5.050	AIR Aurzawal	India	0040	P
5.050	SBC Singapore	Singapore	2204	H
5.050	R.Tanzania	Tanzania	2059	B
5.055	Faro del Caribe	Costa Rica	0240	R,S
5.055	RFY Cayenne(Matoury)	French Guiana	0025	D
5.060	PBS Xinjiang	China	0020	D,P
5.065	R.Candio, Binia	Zaire	0043	I,3
5.075	Caracol Bogota	Colombia	0230	D,F,H,I,O,S,Z,3
5.083	R.Mundo, Guazo	Peru	2245	F
5.085	Ortarian R.	?	2145	F,O
5.097	R.Eco, Iquitos	Peru	0040	D
5.160	R.Nuevo Continente	Peru	0030	D
5.163	R.Beijing	China	2110	F,P
5.260	R.Alma Ata 2	Kazakhstan	0030	B,D,I,L,M,O,U,Y
5.290	R.Moskva 1 Krasnoyarsk	Siberia	2344	I,O,P
5.320	R.Beijing	China	2128	P
5.420	PBS Minority Sce	China	2205	P
5.440	PBS Xinjiang	China	0001	P
5.800	PBS Xinjiang	China	0030	P

- Q: Ken Milne, Basingstoke
- R: Sid Morris, Rowley Regis
- S: John Nash, Brighton
- T: Fred Pallant, Storrington
- U: Peter Perkins, Hemel Hempstead
- V: Peter Pollard, Rugby
- W: Peter Polson, St.Andrews
- X: Philip Rambaut, Macclesfield</

**BBC Radio Cleveland, Broadcasting House, Newport Road, Middlesbrough, Cleveland TS1 5DG.**

**ILR Signal Radio, Stoke Road, Stoke-on-Trent, Staffordshire ST4 2SR.**

**AWR-Africa, 08 PO Box 1751, Abidjan 08, Ivory Coast.**

**Latvijas Radio, PO Box 266, LV-1098 Riga, Latvia.**

**Radio Cancao Nova, CP 57, 12630 Cachoeira Paulista, Brazil.**

**Radio KGEI, Box 0927, San Carlos, California 94070, USA.**

broadcasts have often been heard here in the early morning: 15.240 from Shepparton (Eng to Pacific areas 0030-0830) 32233 at 0747 in Woodhall Spa; 15.170 from Darwin (Eng, Chin to Asia 0900-1400) SIO322 at 0930 in Macclesfield. Some evenings R.New Zealand's broadcast to Pacific areas via Rangataiki, N.Island on 15.120 (Eng 1900-?) has reached the UK. In Dalton it was 34233 at 2005.

Among the signals to Europe in the logs were HCJB, Ecuador 15.270 (Eng 0700-?) 44444 at 0744 in Basingstoke; UAE R.Dubai 15.435 (Eng 1030-1050) SIO333 at 1031 in Edinburgh; R.Tashkent, CIS 15.470 (Eng 1330-1400) 43433 at 1330 in Brighton; Voice of Turkey, Ankara 15.325 (Tur 1000-1700) SIO444 at 1337 in Winchester; RNB Brasilia, Brasil 15.265 (Port, Eng, Ger 1630-2050) 44444 at 1835 by Darran Taplin in Brenchley; WCSN, Maine 15.665 (Eng 1800-2200?) 55444 at 1837 by Jim Cash in Swanwick; SLBC via Ekala 15.120 (Sin, Eng 1900-1930?) 33333 at 1900 by Tony Singh in Hitchin; RAE, Argentina 15.345 (Ar, Eng, It, Fr, Ger, Sp 1700-0100) 34543 at 2101 in Wallsend; WWCN, Nashville 15.690 (Eng 1000-0000) SIO333 at 2102 in Gt.Yarmouth; RTL via Junglinster 15.350 (Eng 24hrs, also to E.USA) SIO333 at 2201 by Julian Wood in Elgin; WINB Red Lion 15.145 (Eng 2245-2345) 22222 at 2255 in Kilkeel.

Quite a number to other areas were also noted: VOA via Tangier? 15.205 (Eng to M.East, N.Africa 0600-0700) 44444 at 0630 in Morden; BBC via Tsang Tsui 15.280 (Eng to C.Asia 0100-0915) 23223 at 0830 in Oxted; DVV via Antigua 15.205 (Port to S.Am 1000-1050) SIO424 at 1030 in Largs; AIR via Aligarh 15.050 (Eng to NE.Asia, Pacific 1000-1100) 53534 at 1048 in Guildford; R.Finland via Pori 15.400 (Eng to USA 1225-1255) 33422 at 1240 in Huddersfield; SRI via Sottens? 15.505 (Eng to C/SE.Asia 1500-1530) 35333 at 1508 in Woking; R.Netherlands via Talata Volon 15.150 (Eng to SE.Asia 1530-1630) 33443 at 1550 in Newry; VOIRI, Iran 15.260 (Russ to CIS 1600-?) SIO444 at 1615 by Antonio De Abreu-Teixeira in Evesham; KTBN, Salt Lake City 15.590 (Eng to E.USA 1600-0200) SIO322 at 1810 in Rotherham; Voice of Greece, Athens 15.630 Gr, Eng to Africa 1800-1850) 43443 at 1840 in St.Andrews; VOA via Greenville 15.580 (Eng to Africa 1600-2200) SIO444 at 2000 in Sheffield, via Ascension Is 15.160 (Eng to Africa 2000-2030) SIO333 at 2013 by Michael Williams in Redhill; TWR Bonaire, Ned.Antilles 15.375 (Port to S.Am 2155-0030) SIO444 at 2200 in Hereford; BBC via Ascension Is 15.400 (Eng to W/C.Africa 1500-2315) 34413 at 2315 by Simon Hockenull in E.Bristol.

Propagation conditions in the 13MHz (22m) band enabled three of R.Australia's Carnarvon broadcasts to reach the UK: 13.605 (Eng, Chin to SE/N.Asia 0900-1400) SIO323 at 0920 in Largs; 13.755 (Eng to Asia 1300-1800)

44444 at 1700 in Hitchin; 13.705 (Eng to S.Asia 2200-2300) 24433 at 2230 in E.Bristol.

Although meant for other areas the signals from DW via Julich? 13.610 (Eng to W.Africa 0600-0650) were 23222 at 0650 by Robin Harvey in Bourne; SRI via Sottens 13.635 (Eng to SE.Asia 1300-1330) 32424 at 1311 in Stockport; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1600-2200) SIO433 at 1731 in Macclesfield; BBC via Skelton 13.660 (Arto Africa 1215-2100) 55344 at 1931 in Swartruggens; WCSN Scotts Corner 13.770 (Eng to Africa 2000-2300?) 44444 at 2130 by Charles Beanland in Gibraltar and 32233 at 2208 in Rugby; UAE R, Abu Dhabi 13.605 (Eng to USA 2200-0000) 33233 at 2340 in Worthing.

Some broadcasters use this band to reach listeners in Europe. They include UAE R.Dubai 13.675 (Eng 1030, 1330 & 1630) SIO355 at 1031 in Edinburgh; ISBS, Iceland 13.855 (Ic 1855-1930) 55555 at 1900 in Brighton; WHRI South Bend 13.760 (Eng 1700-0000, also to Canada) 44434 at 2015 by Harry Richards in Barton on Humber;

R.Kuwait 13.620 (Eng 1800-2100, also to USA) SIO222 at 2040 in Redhill; RCI via Sackville 13.650 (Eng, Fr ?-?) 44444 at 2049 in Basingstoke; Croatian R, Zargreb 13.830 (Cr) 32332 at 2140 in Kilkeel.

Among the 11MHz (25m) logs were R.Tunis via Sfax 11.550 (Ar to Eu 0430-2300) SIO444 at 1435 in Winchester; FEBC via Bocaue 11.995 (Eng to SE.Asia) SIO333 at 1516 in Rotherham; AIR via Bangalore? 11.620 (Eng to Eu 1745-1945) 45554 at 1832 in Wallsend; BBC via Limassol 11.730 (Arto M.East, Africa 1615-2100) 55454 at 1902 in Swanwick; R.Japan via Moyabi 11.925 (Eng to Eu 2100-2200) SIO344 at 2100 in Co.Fermanagh; China R, Beijing 11.500 (Eng to Eu 2000-2200) 54343 at 2130 in Bridgwater; R.Damascus, Syria 12.085 (Eng to USA 2110-2210) SIO333 at 2138 in Elgin; RCI via Sackville 11.940 (Eng to S.Am 2300-2329) SIO333 at 2300 by Francis Hearne in N.Bristol.

In the 9MHz (31m) band, R.Japan via Skelton 9.695 (Eng 0500-0600) 43444 at 0545 in Dalton; TWR, Ned.Antilles 9.515 (Port to N.Brazil 0655-0940) 43433

at 0745 in Guildford; R.Jordan, Al Karanah 9.560 (Ar, Eng, Fr 1420-0030) 53323 at 1715 in Swanwick; Polish R, Warsaw 9.525 (Eng to Eu 1830-1855) 54444 at 1832 in Brenchley; R.Australia via Carnarvon? 9.510 (Eng to Asia) 31332 at 2110 in Bridgwater; R.Cairo via Abis 9.900 (Eng to Eu 2115-2245) 33333 at 2115 in Hitchin; R.Cancao Nova, Brazil 9.675 (Port 24hrs) SIO322 at 0045 in Evesham.

Some 7MHz (41m) signals come from distant places: WJCR, Kentucky 7.490 (Eng to E.USA 0640-1200) SIO322 at 0840 in Rotherham; KTBN Salt Lake City 7.510 (Eng to USA 0200-1600) SIO222 at 0911 in Macclesfield; AIR via Aligarh 7.412 (Eng, Hi to Eu 1730-2230) 43333 at 1930 in Basingstoke; WYFR via Okeechobee 7.355 (Eng, Sp to Eu, Africa 2000-2300) SIO433 at 2150 in Hereford.

The 6MHz (49m) signals to Europe include RAI-RTV via Caltanissetta 6.060 (It [R.Uno] 0400-2230) 32322 at 0459 in N.London; R.Japan via Skelton 6.025 (Eng 0700-0800) SIO444 at 0745 in Sheffield; SRI via Sarnen? 6.165 (Fr, Ger, It, Eng 0600-2050) 44544 at 1119 in Huddersfield; R.Netherlands via Flevo 5.955 (Eng 1130-1325) SIO444 at 1130 in Co.Fermanagh; RFI via Allouis 6.175 (Eng 1600-1700) 55555 at 1600 in Brighton; VOA via Woofferton 6.040 (Eng 1800-2200) SIO1433 at 1905 in Evesham; RCI via Skelton 5.995 (Eng 2000-2030) SIO434 in Winchester; R.Pyongyang, Korea 6.576 (Eng 2000-2050) 33333 at 2013 in Woodhall Spa; R.Czechoslovakia, Prague 5.960 (Eng 2100-2125) SIO444 at 2104 in Redhill; Polish R, Warsaw 6.135 (Eng 2100-2155) SIO444 at 2115 in Hereford; REE via Noblejas 6.125 (Eng 2100-2200) SIO433 at 2130 in N.Bristol; R.Austria Int via Moosbrunn 5.945 (Ger, Eng, Fr, Sp 1700-2300) 44444 at 2145 in Kilkeel; R.Sweden via Karlsborg? 6.065 (Eng 2130-2230) 44444 at 2217 in Basingstoke; R.Budapest, Hungary 6.110 (Eng 2200-2300) 43333 at 2200 in Morden; Croatian R, Zargreb 6.210 (Eng 2200-2210) 45444 at 2200 in Woking; BBC via Rampisham & Skelton 6.195 (Eng 1500-2315) 44444 at 2221 in Gibraltar; VOA via ? 6.160 (Eng 2200-0000?) 55555 at 2300 in Bridgwater; R.Japan via Skelton 6.050 (Eng 2300-?) 21222 at 2330 in Bourne.

### Equipment Used

Charles Beanland, Gibraltar: Sangean ATS-803 + a.t.u. + 6m wire.  
Darren Beasley, Bridgwater: Philips D-2935 + Hex loop or a.t.u. + 15m wire.  
Vera Brindley, Woodhall Spa: Sangean ATS-803A + whip or r.w.  
Kenneth Buck, Edinburgh: Lowe HF-225 + l.w. or s.w. loop.  
Tim Bucknall, Brittany: Steepletone SAB9 or Toshiba 'Walkman'.  
Jim Cash, Swanwick: Kenwood R-5000 + trap dipole.  
Bill Clark, Rotherham: Sony ICF-2001D + built-in whip.  
Robert Connolly, Kilkeel: Sangean ATS-803A + 30m wire in loft or AN-1.  
John Coulter, Winchester: Yaesu FRG-7 + r.w.  
Geoff Crowley, Iceland: Yaesu FRG-7700 + dipoles + Datong AD-370.  
Martin Dale, Stockport: Codar CR-70A + 75m wire.  
Ron Damp, Worthing: Racal RA17 + Loop or Sangean ATS-803A + 2 band Window.  
Antonio De Abreu-Teixeira, Evesham: Sony ICF-2001D + magnetic balun + 12.5m wire.  
John Eaton, Woking: Lowe HF-225 + Datong A270 in loft.  
David Edwardson, Wallsend: Trio R600 + Realistic V trap dipole.  
Steve Ferminger, Oxford: Lowe HF-225 + 5m wire.  
Ron Galliers, London: Philips D-2935 + a.t.u. + 30m wire.  
P.R.Guruprasad, Swartruggens, S.Africa: Sony ICF-7600DA + built-in whip.  
Chris Haigh, Huddersfield: Lowe HF-225 + Lowe W-225 or 20m wire.  
Robin Harvey, Bourne: Matsui MR-4099 + telescopic whip.  
Francis Hearne, N.Bristol: Sharp WQT370 + r.w.  
Simon Hockenull, Lymouth: Philips D2345 + built-in whip.  
Sheila Hughes, Morden: Sony ICF-7600DS + loop or Panasonic DR48 + 15m wire.  
Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1 or Sony ICF-7600DS.  
Mark Jones, Peterborough: Saisho 5000 + 20m wire.  
Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 25m wire.  
Bryan Kimber, Hereford: Zenith R-7000 or Realistic SX190 + 25m wire.  
Eddie McKeown, Co.Down: Tatung TMR-7602.  
Roy Merrill, Dunstable: Kenwood R-5000 + 40m wire.  
George Millmore, Wootton, IOW: Sangean ATS-803A or Racal RA-17L + loop.  
Ken Milne, Basingstoke: Matsui MR-4099 + built-in whip or 6m wire in loft.  
Sid Morris, Rowley Regis: Kenwood R-5000 + 11m wire.  
John Nash, Brighton: Kenwood R-5000 + Datong AD370 or magnetic balun + r.w.  
Fred Pallant, Storrington: Trio R-2000 + r.w. in loft.  
Peter Perkins, Hemel Hempstead: Kenwood R-5000 + 20m wire.  
Peter Pollard, Rugby: Sony ICF-2001D + built-in whip.  
Peter Polson, St.Andrews: Lowe HF-225 + loop or Indoor Joystick.  
Richard Radford-Reynolds, Guildford: Sangean ATS-803A + 10m wire.  
Philip Rambaut, Macclesfield: Int.Marine Radio R-700M + r.w.  
Ernest Randall, Dalton: Lowe HF-225 + 15m wire.  
Harry Richards, Barton-on-Humber: Grundig Satellit 700 or Matsui MR-4099 + 20m wire.  
Alan Roberts, Quebec, Canada: Lowe HF-225 + 11m dipole.  
Chris Shorten, Norwich: Matsui MR-4099 + 10m wire.  
Tony Singh, Hitchin: Zenith 7000 or Grundig Satellit 3400 + built-in whip.  
Stephen Smith, Cwmbran: EX333 + a.t.u. + r.w.  
Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191 + whip.  
Cliff Stapleton, Torquay: Trio R-1000 + r.w.  
John Stevens, Largs: Hammarlund HQ-180 or Icom R-70 + loop or r.w.  
Darran Taplin, Brenchley: Yaesu FRG-7700 + FRT-7700 + 35m wire.  
Phil Townsend, London: l.f. converter + Lowe HF-225 + loop or r.w.  
Edward Turnbull, Gosforth: Philips D-8734 + a.t.u. + 15m indoor wire.  
Ted Walden-Vincent, Gt.Yarmouth: Grundig Satellit 3400 + r.w.  
John Wells, E.Grinstead: RCA AR88D + loop.  
Jim Willett, Grimsby: Trio 9R-59DS + a.t.u. + X dipole.  
Michael Williams, Redhill: Lowe HF-225 + 10m wire.  
Julian Wood, Elgin: Kenwood R-2000 + a.t.u. + 5m wire.

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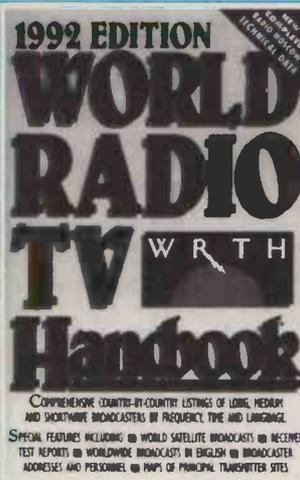
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# Off The Record

Andy Cadier, 28 Romney Avenue, Folkstone, Kent CT20 3QJ.

**T**he Italian authorities are to regulate commercial television stations following a decade of virtual chaos. Over the last fifteen years hundreds of local private TV stations have taken to the air without the need for a licence. A list of those to be given franchises exclude about 300 TV stations, 150 of which refuse to accept an instruction to close and intend to continue as pirates.

Also in Italy, the private short wave radio station European Christian Radio has moved up 10kHz. Their previous frequency of 6.210MHz, in a band designated for marine communications, was 'pinched' by the Zagreb based transmitter of Croatian Radio.

## Numbers Stations

Only one letter was received on this new topic, **John Robertson** writes from Alnwick, Northumberland. He says these stations are not exactly entertaining to listen to, but recalls an incident that took place a year or so ago. He says a female voice ceased reeling off numbers and a microphone was left open revealing a background of other numbers being read within an office environment. After two minutes a switch was obviously thrown and things returned to normal. The easiest transmissions to hear consist of a female voice with a German accent reputed to originate from Frankfurt. These have been heard with strong signals on 4.010MHz at 1900UTC; 6.235 at 0705; and 7.445 at 0415; normally in a.m. but occasionally on u.s.b.

## Going, Going, Gone!

Radiofax, the station that became something of an institution among its regular listeners, closed down on 30 September 1992. The voluntary winding-up came following a complaint from the Department of Communication in Dublin claiming this station was causing embarrassment to the Republic. The final few days on the air featured some of the hundreds of

letters and phone messages received from regular listeners.

Surrey Electronics Ltd. who ran the Radiofax project, have arranged a meeting with the Department of National Heritage, which is also to be attended by the Radio Communications Agency. Let us hope the officials concerned can produce something constructive to encourage a British business to establish a new innovative service during these economically bleak times. Supporters that wrote to the DNH requesting a licence for Radiofax received a somewhat flippant reply criticising the past use of a marine band frequency, and a suggestion that they could apply for a local radio f.m. or a.m. licence in the UK.

There was no mention of Radiofax being given the use of an authorised shortwave frequency, which they have continually requested. Station Manager, Trevor Brook, says, "In the USA there is much less of a piracy problem because when someone thinks of a new kind of radio service or radiating device, they go out of their way to allow it into the spectrum". The frequency of 6.205MHz vacated by Radiofax is now being used for the European Service of HCJB, a religious broadcaster based in Ecuador, using a power of 500kW.

You can still get a copy of Radiofax details including their interesting news sheet called *Radiofax* at September 1992. Write to Surrey Electronics Ltd., The Forge, Cranleigh, Surrey. GU6 7BG including 50p, 1 US Dollar, or 3 International Reply Coupons. They also sell T-shirts featuring an old fashioned radio design and a station logo

## More News

The German station Radio Marabu has recently started presenting a weekly programme called *Eurowide* on the Intelsat satellite. The time and channel is not mentioned in the programme schedule!

Due to open shortly is the ILR station Sunshine 855 serving Ludlow in Shropshire. This is a direct descendant



**A Radiofax transmitter undergoing maintenance during the summer of 1992.**

## Short Wave Irregular Broadcasts Chart

Freq MHz	Programme Content	Day	UTC	Monitors
3.910	American Evangelical	Dly	1502	A,D,E,F
6.200	Dutch DJ speaking English	Sun	0828	A,E
6.204	from Ruurlo in Holland	W/E	0932	A,B
6.205	American Evangelical	Dly	1501	A,D
6.220	European Religious	Dly	1930	A,B,D
6.225	British station testing	Sat	1441	A,C
6.230	Irish DJ programme	W/E	0720	A,B,F
6.233	Hot-hits with Mike Stevens	W/E	1026	A,B,C,D
6.240	Medieval Wizard, Paul Watts	W/E	0751	A,B,C,D
6.262	Various relays from Ireland	W/E	0843	A,B,D,F
6.275	Rock music	Sun	0905	B
6.280	Ionospheric protective layer	Sun	1222	A,B,C
6.290	Reading reception reports	Sun	1012	B
6.295	Advert "Loving Awareness"	W/E	0903	A,B,D,E,F
6.304	Infrequent Dutch station	Sun	0912	A,B
6.400	"We are the short wave outlaws"	Sun	0902	A,B,D,F
6.527	German clandestine service	Sun	1006	B
6.555	Continuous music, poor quality	Sat	1240	A,B
6.911	Chris Rayner Show	Dly	0730	A,B,D,F
7.360	Hallmark of Quality	Sun	1030	A,E,F
7.425	Spanish friendship	W/E	1010	A,B
7.473	French station	Sun	0723	A,B
7.480	Sweden/Benelux	Sun	0826	A,D
1.1390	Sweden	Sun	0818	A
1.1400	France rocking the ocean	Sun	0804	A

Each active frequency is only listed once, though several stations may have been heard. I am required to exclude the names of stations currently audible in the UK. Your comments and logs of irregular broadcasters are welcome at my address at the top of this page, lists should reach me by the beginning of February for inclusion in the April issue.

Dly = Monitored daily.  
W/E = Heard on both Saturday and Sundays.

### Short Wave Monitors:

A: Free Radio Monitoring, Halesowen, W. Midlands.  
B: Bob Marsh, Bexleyheath, Kent.  
C: Darran Smith, Hailsham, East Sussex.  
D: Chris Harris, Kidderminster, Worcs.  
E: Roger Lewis, Ashford, Kent.  
F: David Williams, Southampton, Hants.

of the pirate Sunshine Radio that pioneered community radio in this area during the 1980s, and was featured in a TV documentary.

Another new arrival on the 48m band (6.235MHz) is Radio Sofia, no not Caroline's sister, but the foreign service of the Peoples Republic of Bulgaria. News in English has been heard at 2000UTC.

## New Local Licences

Commencing early in 1994 the Radio Authority will be re-advertising local radio licences, this will be a gradual process with most being advertised within the following two years. An important point is that the definition of existing licence areas may not remain the same. This could open the door for smaller broadcasting groups to apply for just one transmitter serving a particular town, rather than a county-wide local radio network.

Other frequencies becoming available are those on medium wave, which are being vacated by BBC local radio. However the commercial viability of low powered medium wave stations could be hampered by the usual ghastly reception conditions after dark. Pirate stations tend to blame their status as being one forced on them due to the inability to obtain a

licence. If the RA make commercial radio more accessible to interested organisations, at a price they can afford, it could well help curtail illegal stations.

Reports received here suggest that the Israeli Government are to licence 20 local radio stations, however, no anti-pirate legislation, at least for the moment, is expected. At present three radio ships broadcast from international waters to Israel. The Voice of Peace has been there since the 70s established by Abbie Nathan, with the intention of fostering friendship and peace in the region. Arutz 7 came on air three years ago and operates from a 20-year-old ship anchored off Tel Aviv using 35kW on a.m. and 20kW on f.m. The third station is anchored off Haifa and is called Radio One, I am told the jingles have a certain familiarity too!

It will be interesting to see if the Israeli authorities invite the offshore operators to apply for licences before taking action against their ships. In the UK the marine stations were outlawed in 1967, but licensed local commercial radio did not arrive until 1973. It was during this period that rock, soul, and reggae music virtually ceased to exist on radio, so the gap was filled by land based pirates broadcasting at weekends.

# S.R.P. TRADING

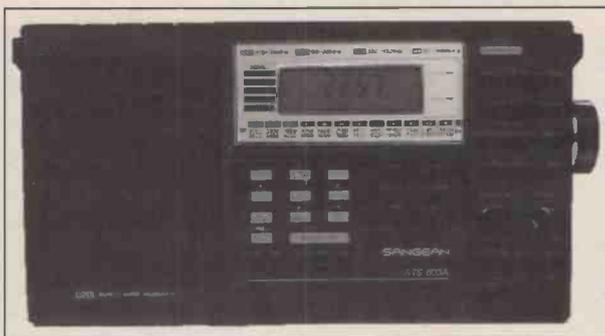
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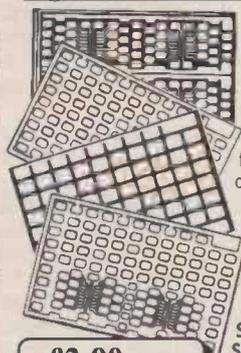
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Drawing of AB118 Modules

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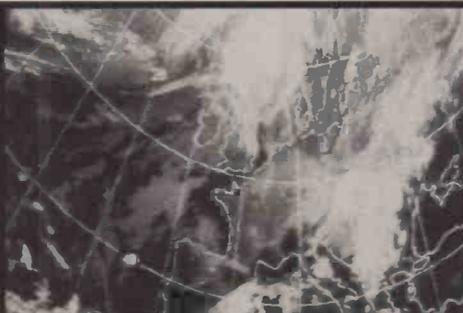
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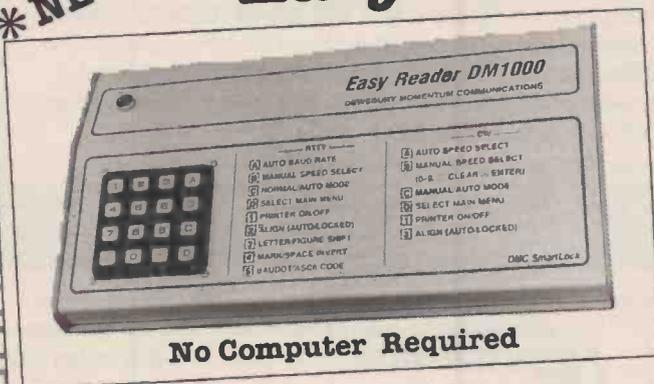
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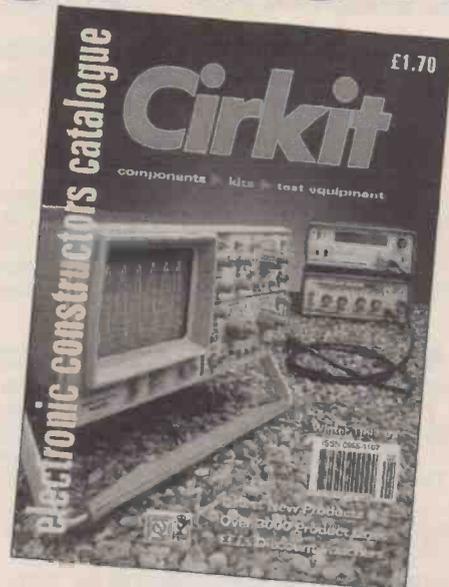
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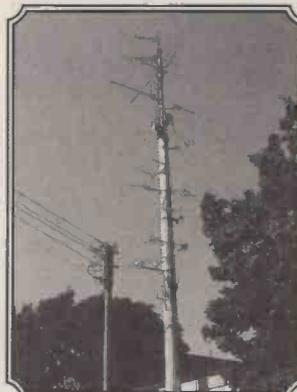
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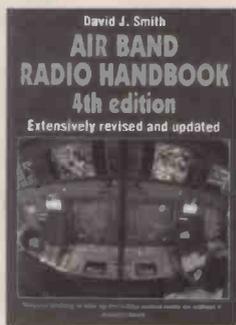
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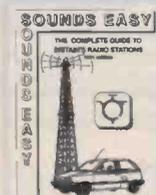
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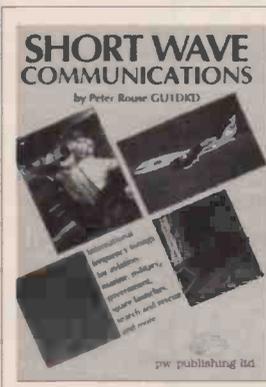
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