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Instant finance available subject to status. Written details on request.



|34| SWM Review



**Cover** Realistic's latest scanner, the PRO-2004, is the subject of our in-depth review.

|37| NEXT MONTH

**Cover** Aeronautical Radio. A new series giving you the information you want on this popular branch of the listening hobby.

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# A Word in Edgeways

Sir

As a short wave listener and a member of the RSGB, I was delighted to read your editorial in the February issue of the SWM I agree with you that the needs of the s.w.l. have been sadly lacking over the years. I am very interested in amateur radio, but as a listener and not an operator, in fact I am at the present time taking a Morse code course to help further my listening.

I look forward to the new style magazine as I am sure many other listeners will. I wonder whether you will have a readers letter section where we can ask questions and swap ideas. I enclose with pleasure my renewal subscription cheque for 12 months from April 87. Good luck with the magazine, I'm sure it will be a great success.

R E WOODWARD  
ESSEX

I have received many letters regarding the change of format of SWM, most of them in favour. A minority, however, were very much against any change to their favourite magazine and some were almost in the "poison pen" category! I selected this letter as being typical of those in favour and also because it gives me the opportunity to show that we will be having a regular readers' letters section where you can air your views on anything to do with radio or TV.

ED

Sir

In the February edition of Short Wave Magazine, on page 449, in the right-hand column immediately under the item on CDXN Deadlines is the statement that G3SEJ/MM is en route to the Falkland Islands to participate in certain activities.

As the holder of the call-sign G3SEJ, I would assure you that I am **NOT** en route to the Falklands, and do not anticipate being so in the near future.

I have received "bon voyage" messages, and others, from well-wishers which, in some cases, have been amusing.

Yours faithfully  
E. C. John G3SEJ  
WALLASEY  
MERSEYSIDE

# First Word

## THIS IS IT!

Well, this is the new, revamped *Short Wave Magazine*. In its pages I hope that you will find plenty to interest you, and whet your appetite to get into the shack and try your hand at pulling in some rare DX or perhaps try out a mode that you have not considered before.

With this issue the magazine says goodbye to its regular columnists, some of whom have been providing their copy come rain or shine for many years. Paul Essery G3KFE and Norman Fitch G3FPK have moved their columns over to our sister magazine *Practical Wireless* where they will continue to report on the amateur radio scene in their own special ways. Glen Ross G8MWR has also gone to *PW* with his "Practically Yours" feature. I am sure that you would like me to wish them, and Nigel Cawthorne G3TXF, of "Oblast Corner", all the best and to say a big "Thank You" for all their past efforts.

We welcome to our new feature, "Seen & Heard", some well-known names from *PW*'s "On the Air" section. Ron Ham and Brian Oddy G3FEX are both well respected as is Pat Gowen G3IOR. Mike Richards G4WNC is a new name to readers and he will be providing reports and information on all forms of radio involving data transmission — RTTY, AMTOR, FAX, etc. All four will be eagerly awaiting your letters and reports, without which they will find it difficult to provide you with the sort of columns that you are looking for.

The other name in the "Seen & Heard" columns is Justin Cooper. Already well

known to readers of *SWM*, he will be keeping you in touch with the world of amateur radio.

Brian Oddy will be providing a monthly article aimed at the beginner to the world of listening, giving help and encouragement as well as explaining the elementary, but essential, technical side of the hobby.



Peter Laughton, who has been an occasional contributor to *PW* in recent years, will be contributing a column looking at the background to international communication developments, focussing on broadcasting station news.

With this issue the "Readers Free Advertisements" have been dropped. They will be replaced in the near future with a section based on the "Swap Spot"

concept in *PW*. Also planned for the near future are two regular sections, alternating with each other, called "What Scanner" and "What Receiver". There you will find details of scanners and receivers that are currently available in the UK.

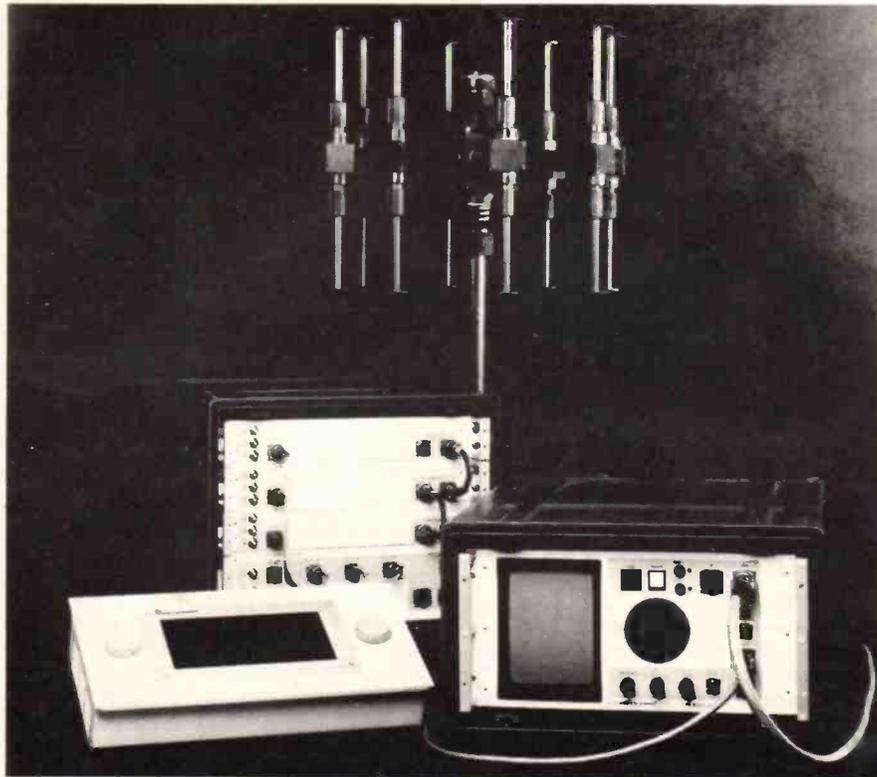
As far as the editorial stance of the new magazine is concerned, we are prepared to acknowledge, and look at, some of the greyer areas of listening. We hope to be able to provide readers with information and articles on all forms of radio communications, unless it is specifically prohibited. We will be prepared to campaign to clarify the existing legislation as it purports to affect the rights of the listener. This does not mean that we will be going all-out to encourage readers to break the law — far from it.

But what harm does it do for enthusiasts to listen to, say, the airbands? As long as they do not divulge the information heard, or use it to "pirate" another person's business, have they really done a dastardly deed?

Some services already acknowledge that enthusiasts find their transmissions interesting and, for a small fee, will give permission for their transmissions to be received for non-commercial ends. Weather FAX transmissions fall into this category, for instance. With the spread of the scanning receiver covering, almost, d.c. to light the problem is going to increase so far as the authorities are concerned.

I hope that you find the new magazine to your liking — please do let me know.  
DICK GANDERTON

# What's New



## Search and DF System

This item is a bit different from your average scanner set-up, and is included for its interest value rather than as a new product! Rhode & Schwarz have sent details of their PA 2000 system for the interception of short-duration signals in the h.f. to u.h.f. ranges.

Intended to cope with the frequency-agile transceivers which can change transmission frequency up to 1000 changes per second, the PA 2000 covers the frequency range 2 to 512MHz and can cope with transmission durations of as short as 1ms. It can be used for both mobile or fixed applications as well as for remote control and may be used with other PA 2000s in a network.

To cover the entire frequency range of the receiving system, four antenna systems connected in an Adcock configuration are used. For 2 to 30MHz two systems are available depending on whether it is for mobile or fixed-station use. The other two antennas are for either 30 to 174MHz or 174 to 512MHz.

The m.p.u. controlled search and d.f. system is controlled via the touch-sensitive soft keys of a plasma display, the operator being offered a set of displayed control options for each case. Live display of the digital target bearing information and real time signal analysis are presented on a colour c.r.t.

## Media Network

Media Network is a weekly survey of communication developments. It runs on enthusiasm, building on more than 25 years of experience in this field of programming. It is fast becoming one of the most popular programmes between 3 and 30MHz, reflecting the trends within the media business.

Radio Netherlands have sent us advance information on their programmes schedules for April which will be of interest to readers.

**April 2:** Crystal Clear. Following three very successful programmes on vintage radio last year, they are continuing the occasional series with a look at very early receivers. Gerald Wells will take up some of the questions raised in the programme last October.

**April 9:** News Update. The programme will concentrate on the latest developments in the media. Arthur Cushen will be filing his monthly look at Pacific media news.

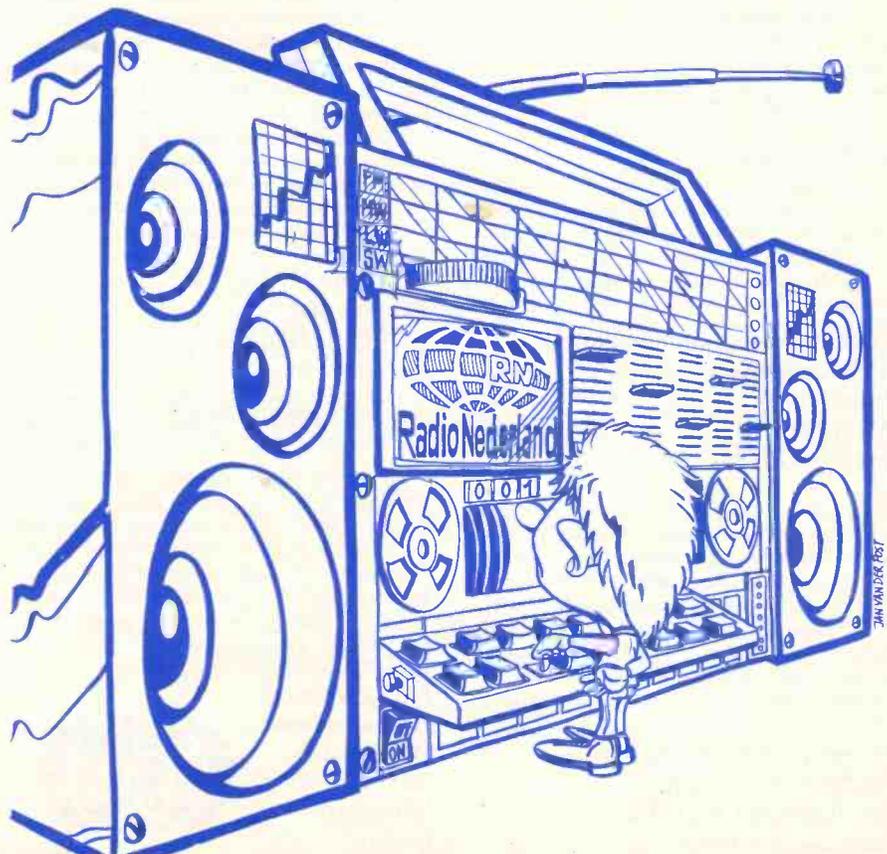
**April 23:** A current affairs orientated edition, with Andy Sennitt looking at the news received by the WRTH editorial office, in the course of moving to Amsterdam.

**April 30:** Back to the Future. A look at developments towards Satellite radio. What ever happened to France's DBS plans? The programme will also include a media contribution from Victor Goonetilleke in Sri Lanka.

## Publications

Radio Netherlands have produced the 9th edition of their *Receiver Shopping List*. The booklet which is free for the asking covers 36 pages and includes information on surplus receivers, addresses for further information and a current radio list split into travel portables, serious s.w. receivers, hobby receivers, specialist receivers and semi-professional receivers. You should write to Radio Netherlands if you are interested in this booklet.

Radio Netherlands  
English Section  
Postbus 222  
1200 JG Hilversum  
The Netherlands



# What's New

## Free Literature Available

There was an interesting piece in the Jan/Feb '87 issue of *Radial* — the magazine of the Radio Amateur Invalid & Blind Club.

The following publications which, if requested, will be sent free of charge, I'm not sure whether they are talking magazines for blind listeners or not.

*Hello friends* is published by Deutsch Welle. Besides background information about the Federal Republic, this magazine gives you, the listener, a full survey of all English programmes. For a regular copy, write to:

Deutsch Welle Public Relations Dept  
PO Box 100444  
5000 Kolin 1  
Federal Republic of Germany



## Modified FRG-9600 Scanner

R. Withers Communications have sent us details of their latest h.f. mods for the Yaesu FRG9600 scanner. When fitted with these mods, which represent months of development, the scanner's coverage becomes continuous over the frequency range 100kHz to 950MHz, the S meter is improved and the typical receiver sensitivity (h.f.) is better than 2µV p.d. At frequencies of 60 to 950MHz the sensitivity improves to better than 1µV (12dB SINAD).

RWC fit a high performance h.f. front end made for them by AKD. This is fitted internally with switching circuits and a small toggle switch on the rear apron to enable band changing with the display reading actual frequency (100kHz to 60MHz).

The standard SO239 connector is replaced by an "N" type for the higher band of frequencies from 60 to 950MHz and an SO239 fitted for h.f. coverage.

The fitting of an "N" type connector means that it is now possible to use a wide-band discone antenna such as the Icom AH700 which is fitted with low-loss cable and "N" type connectors as standard. A dipole or long wire antenna can be used for the h.f. coverage.

As well as being able to modify your present FRG-9600, RWC can also supply new models, already converted, in two versions. Option 1 is an FRG-9600 Mk 2 series 2 with 60 to 950MHz "N" type connector for £519.00 plus £5.00 carriage. Your standard FRG-9600 can be modified by RWC for £40.00 inc. VAT and return insured carriage.

Option 2 is an FRG-9600 Mk 3 with internal switchable h.f. mods (100kHz to 950MHz), actual frequency readout, "N" type connector for 60 to 950MHz and SO239 for h.f. This costs £625.00 plus £5.00 carriage. Modifying your own set to this level will cost you £129.00 inc. VAT and return carriage. In this case the 950MHz extended coverage will be fitted at the same time. If you already have the Mk2 then fitting the new h.f. mod will set you back £99.00 inc. return carriage.

All mods are fully guaranteed for twelve months from purchase or modification providing RWC's mod seals are unbroken.

R. Withers Communications Ltd  
584 Hagley Road West  
Oldbury  
Warley  
Birmingham B68 0BS  
Tel: 021-421 8201

## Kit News

For those readers interested in kit construction we have just received copies of three companies' kit catalogues.

### Cambridge Kits

The first is in the form of a newsletter — *Kit News* — from Cambridge Kits. This is a small four-page leaflet with ideas, tips, modifications, etc. as well as news of new kits from the company. The kits described are useful additions to the shack covering such projects as a 60kHz Rugby MSF receiver, a v.l.f. receiver and a range of useful converters. An s.a.e. will send your free copy winging its way to you.

Free Kit News  
Cambridge Kits  
45 Old School Lane  
Milton  
Cambridge CB4 4BS

### C. M. Howes

The Update to the Winter 86/87 Catalogue from this well known kit manufacturer contains descriptions and technical info on the wide range of kits for the radio enthusiast. Their kits are of excellent quality and well worth further investigation.

C. M. Howes Communications  
139 Highview  
Vigo  
Meopham  
Kent DA13 0UT

### Kit Cat

Greenweld have just sent me a copy of their latest, free catalogue, called simply *Kit Cat*. This is a single source for an extensive range of electronic kits covering all abilities and interests.

Amplifiers, pre-amps, transmitters, power supplies and other interesting projects are included together with a range of interfaces for popular computers and kits utilising plug-in breadboarding systems.

Greenweld Electronics Ltd  
443 Millbrook Road  
Southampton SO1 0HX  
Tel: (0703) 772501

### EDXC Helsinki

The 1987 EDXC Conference will be held in Espoo, Finland from June 5 to 8 at the Hotel Korpilampi, and hosted by the Finnish DX Association.

The provisional agenda shows a reception on the Friday evening followed by items covering m.w. propagation, the role of a foreign service broadcaster, North American DXing, a video presentation of a DXpedition and a presentation of Peru with slides.

Saturday sees the official opening of the conference, and this will be followed by a number of workshops. In the afternoon there will be the EDXC Forum (exhibition), a volleyball tournament and the results of the workshops. The evening has a panel discussion of EDXC 20 years and the EDXC Banquet.

Sunday has the Annual Meeting of Finnish DXers, and this will be followed by a progress report on WARC '87. Later in the morning there will be a Broadcasters Panel and a group on Computers in DXing. The afternoon is taken up with sightseeing. The evening has a film presentation, a broadcasters meeting — How has DXing developed over the years — and a presentation of Finnish DXing. On the Monday morning before the closure of the conference there will be a presentation of Radio Finland and of Finnish local commercial radio.

EDXC 87  
PO Box 454  
SF-00101 Helsinki  
Finland

The latest 1987 receiver guide is now available from the Dutch World Service. Dozens of sets are listed according to price and performance. Some of the receivers mentioned have been put through their paces in the Hilversum Studios. The same organisation distributes a booklist and titles range from everything in the electronic field to shortwave radio. The address for these booklets is:

Media Network  
Radio Nederland  
PO Box 222  
1200 JG  
Hilversum  
Holland



Everyone who listens on s.w. knows about VOA, but they also publish and distribute *Voice Magazine* every two months. If you like hearing programmes about the USA, then this is the magazine for you. Besides programme times and frequencies, there is editorial and feature articles — many of which are related to current daily programmes. For a free subscription, write to:

Voice Magazine  
PO Box 400  
Washington  
DC 20044  
USA

# What's New

## Award Hunting?

If you like collecting awards, either as an amateur or s.w.l., then Sue Squibb has written the booklet for you.

Her booklet details over 250 awards that you can try for. Included in the information is all you need to know, the requirements, addresses, rules, etc.

It costs £3 by post, US \$8 or 15 IRCs, well worth it for the awards chaser.

**Sue Squibb**  
36 Frogal Gardens  
Teynham  
Sittingbourne  
Kent ME9 9HU

## RAOTA

I have received some very interesting information on the Radio Amateur Old Timers' Association.

Membership of RAOTA is open to all licensed amateurs and short wave listeners who have been actively interested in amateur radio for 25 years or more.

A certificate is available to all licensed amateurs and s.w.l.s who have contacted 50 RAOTA members, with increments for each additional 15 stations.

Members may also receive *OT News* on tape if they prefer.

You should contact the Hon. Secretary/Treasurer for more details.

**Sylvia Havard G4USN**  
"Altonswood"  
Merricks Lane  
Bewdley  
Worcs DY12 2PA

## QRP Convention

The Yeovil Amateur Radio Club is holding its third QRP Convention on **Sunday May 10**. Normally the event is held in October, but unfortunately seemed to clash with too many other events.

Entrance is £1, including programme with lucky-draw number. There will be GB2LOW operating QRP on h.f. and v.h.f. bands, as well as displays of QRP and home constructed equipment (bring yours too). The G-QRP Club will be there as well as retail kits and component stands, light refreshments are available at the convention.

The programme is as follows:

**0900** Talk-in commences on S22 (G8YEO/A)

**0930** Convention Opens

**1030** Lecture "The theory and incidence of chordal hop propagation" G3MYM (followed by a discussion)

**1200-1400** Lunch Break

**1400** Lecture "Construction techniques" G4BUR (followed by a discussion)

**1600** Prize Draw

**1700** Convention Closes

**Yeovil QRP Convention**  
The Preston Centre  
Monks Dale  
Yeovil

## DATACOM Cassettes

*DATACOM*, the newsletter of BARTG, is now available on cassette for the visually handicapped. It will be produced on 3 C90 cassettes and will cost £5 for the year's issues (cassettes and wallets provided). Thanks to RAIBC for the information. Subscription to:

**Roy G3LAZ**  
Tel: 0582 583996 (day)

## SARCON 87

This year, the Scottish National Amateur Radio Convention will be held in Europe's largest leisure centre. The organisers have also broken the tradition of holding the convention on a Saturday in favour of **Sunday September 13** to cater for amateurs who have to work a six day week.

The choice of venue, the Magnum Leisure centre in Irvine, Ayrshire was taken to make SARCON '87 a day out for the whole family. The centre has two swimming pools and also twin flumes — the first giant water slides to be opened in Scotland. There is a skating rink, indoor bowling greens, bar and catering facilities and a theatre for the lectures.

The Magnum is situated in a vast beach park with boating facilities, river and sea fishing. It is also close to Sea World, a unique sea life centre which is attracting visitors from all over the world.

Talk-in for the convention is being organised by RAYNET and will probably be on the AY or CS repeater and a 144MHz channel. There is ample and secure car parking around the Magnum and the railway station is only a few minutes walk away. A day out for all the family.

**Bob Low GM0ECU**  
2 Craigie Place  
Crosshouse  
Kilmarnock  
Ayrshire KA2 0JR

A free booklet entitled *BBC Radio Transmitting Stations 1986* is full of information on topics like f.m. reception, stereo test-tones, m.f., l.f. and BBC Local Radio.

**BBC Engineering Information Dept**  
Broadcasting House  
London W1A 1AA

## Multimeters

Hung-Chang multimeters offer the hobbist a range of low-cost meters.

The latest additions to their range are two digital multimeters which they claim offer facilities matching those of much more expensive d.m.m.s.

The HC 5010 EC has all the usual voltage and current ranges as well as being equipped with diode and transistor testing facilities, an audio-visual continuity tester, capacitance and temperature, as well as resistance ranges.

Capacitance measurement is provided in three ranges: 200pF, 2µF and 20µF with accuracies of ± 1.5 per cent on the lowest range and ± 2 per cent on the other two ranges. Conductance is measured in the 200nS range with an accuracy of ± 1.5 per cent and the temperature range is -20 to +135°C at ± 3 per cent. The HC5010EC costs £52.50 plus VAT.

The other new model is a pocket-size auto-ranging digital voltmeter which has high and low power resistance and a.c./d.c. current ranges. It also has a memory mode which can be set manually as well as overload protection. It has a 3½ digit l.c.d. auto-polarity and mode display and battery state indication. Ranges are: d.c. volts 200mV, 2, 200 and 1000V, a.c. volts 2, 20, 200 and 750V and accuracy is ± 0.75 per cent. The price is £33.50 plus VAT.



**Cirkit Distribution**  
Park Lane  
Broxbourne  
Herts EN10 7NQ.  
Tel: (0992) 444111

## SHORT WAVE RECEIVERS



		Price	Carriage
<b>HF125</b>	General coverage receiver made in Britain by Lowe Electronics, 30 kHz to 30 MHz	£375.00	£7.00
<b>Options</b>			
<b>K125</b>	Optional frequency entry keypad	£59.50	
<b>D125</b>	FM and synchronous AM detector	£59.50	
<b>P125</b>	Portable pack, includes internal nicads, charging system and active whip antenna	£69.50	
<b>R2000</b>	TRIO general coverage receiver 150 kHz to 30 MHz	£637.26	£7.00
<b>Options</b>			
<b>VC10</b>	VHF converter, adds 118 to 174 MHz	£170.76	£2.50
<b>YG485C</b>	500 Hz CW filter	£116.62	£1.00
<b>R5000</b>	TRIO general coverage receiver, 100 kHz to 30 MHz	£895.00	£7.00
<b>Options</b>			
<b>VC20</b>	VHF converter, adds 108 to 174 MHz	£176.32	£1.00
<b>YK88C</b>	500 Hz CW filter	£48.59	£1.00
<b>YK88CN</b>	270 Hz CW filter	£57.62	£1.00
<b>YK88SN</b>	1.8 kHz SSB filter	£49.29	£1.00
<b>YK88A1</b>	.6 kHz AM filter	£50.68	£1.00
<b>SP430</b>	Matching speaker	£43.04	£2.50
<b>VS1</b>	Voice module	£34.02	£1.00
<b>NRD525</b>	JAPAN RADIO COMPANY general coverage receiver, 90 kHz to 34 MHz	£1195.00	£7.00
<b>Options</b>			
<b>CMK165</b>	Optional VHF/UHF Converter, adds 34-60, 114-174, 423-456 MHz	£391.35	£7.00
<b>CMH530</b>	Internally fitted RTTY demodulator	£102.19	£1.50
<b>CMH532</b>	Internally fitted RS232 interface	£91.75	£1.50
<b>CC232</b>	Cable for CMH532 interface	£60.25	£2.00
<b>CFL231</b>	300 Hz crystal filter	£126.37	£1.00
<b>CFL232</b>	500 Hz crystal filter	£126.37	£1.00
<b>CFL233</b>	1.0 kHz crystal filter	£126.37	£1.00
<b>NVAB8</b>	Matching loud speaker	£62.86	£2.50

## DATA DECODING EQUIPMENT

(read RTTY, CW or AMTOR using a UHF television or monitor)

<b>CD600</b>	Decoder for CW/RTTY/TOR/AMTOR	£215.14	£7.00
<b>CD660</b>	Decoder for CW/RTTY/ASCII/TOR/AMTOR	£264.97	£7.00
<b>CD670</b>	As CD660 but with built-in dot matrix two line display	£327.77	£7.00

## VHF/UHF CONVERTERS

(use your short wave receiver to listen to VHF/UHF signals, check with us before you buy that your receiver is suitable).

<b>MMC5028S</b>	6 metre converter, uses 10 metre IF	£37.95	£1.25
<b>MMC14428</b>	2 metre converter, uses 10 metre IF	£37.95	£1.25
<b>MMC14428HP</b>	as MMC14428 but higher specification	£47.84	£1.25
<b>MMC43228S</b>	.70 centimetre converter, uses 10 metre IF	£44.85	£1.25

## HEADPHONES

<b>HS7</b>	TRIO miniature head phones	£16.66	£1.00
<b>HS6</b>	TRIO lightweight headphones	£25.68	£2.00
<b>HS5</b>	TRIO de luxe headphones	£39.57	£2.00

## WORLD CLOCK

<b>CWTC</b>	CASIO world time clock	£15.95	£1.00
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## AERIALS AND ACCESSORIES FOR SHORT WAVE LISTENING

<b>HF5</b>	80-10 metres vertical aerial	£83.39	£7.00
<b>HF5R</b>	Radial kit when HF5 mounted on chimney etc	£54.81	£7.00
<b>TRAPKIT</b>	Trap dipole kit, inc. 7MHz traps	£22.51	£2.50
<b>KX3</b>	MIZUHO aerial tuning unit	£67.28	£2.50
<b>AL1</b>	Lightning and static protector	£34.71	£1.00
<b>CS201</b>	2-way 50 ohm coax switch 0-500 MHz fitted with SO239 sockets	£21.90	£2.50
<b>CS201G</b>	As CS201 but with N-type sockets	£35.01	£2.50
<b>CS401</b>	4-way version of CS201	£69.09	£2.50
<b>CS4</b>	4-way coax switch BNC connectors	£30.39	£2.50
<b>CX3A</b>	3-way coax switch 0-30 MHz only	£7.35	£1.50

## COMPONENTS FOR BUILDING SHORT WAVE AERIALS

		Price	Carriage
<b>CUWIRE</b>	25 metres of 14 SWG copper wire	£8.50	£1.50
<b>CPC</b>	Centre piece insulator for dipole aerial	£4.96	£0.75
<b>UR43</b>	50 ohm coaxial cable	£0.30	
<b>UR67</b>	50 ohm coaxial cable	£0.85	
<b>PL259</b>	Coax plug for UR67	£0.66	£0.50
<b>REDUCER</b>	Reducing sleeve for PL259 for use with UR43	£0.15	£0.50
<b>TWIN 300</b>	300 ohm twin feeder	£0.20	
<b>TWIN 75</b>	75 ohm twin feeder	£0.20	
<b>EIS</b>	Small ceramic egg insulator	£0.61	£0.50
<b>EIL</b>	Large ceramic egg insulator	£0.79	£0.50

## VHF/UHF MONITORING RECEIVER

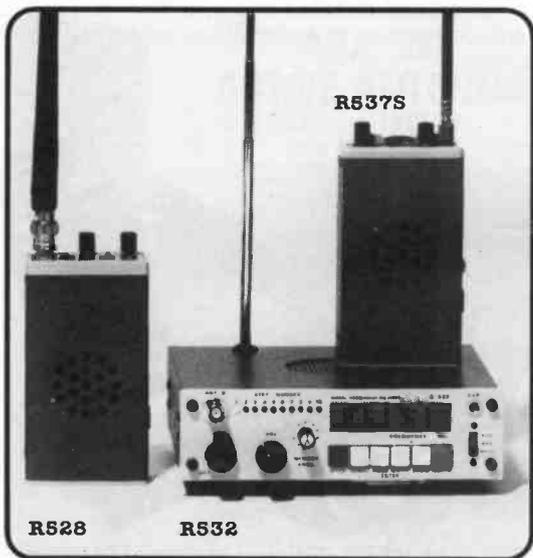


<b>AR2002</b>	Scanning receiver from AOR covering 25-550 MHz and 800-1300 MHz	£487.30	£7.00
<b>Options</b>			
<b>RCPack</b>	RS232 Interface for computer control	£255.63	£2.00
<b>RCAD</b>	RC Pack adapter for use with AR2001	£25.45	£1.50
<b>MB2001</b>	Mobile mount	£11.34	£1.00

## AERIALS, CABLE AND CONNECTORS FOR VHF/UHF RECEIVERS

<b>REVCONE</b>	Discone aerial, 30-500 MHz	£31.50	£7.00
<b>D130</b>	Diamond wide coverage aerial, 25-1300 MHz	£79.34	£7.00
<b>UR43</b>	50 ohm coaxial cable	£0.30	
<b>UR67</b>	50 ohm coaxial cable	£0.85	
<b>BNCPLUG</b>	50 ohm connector for UR43 cable	£1.50	£0.50
<b>PL259</b>	Standard coax plug for UR67	£0.66	£0.50
<b>REDUCER</b>	Reducing sleeve for PL259 for use with UR43	£0.15	£0.50

## AIRBAND RECEIVERS



<b>R537S</b>	Airband receiver, tunable 118-136 MHz plus 2 crystal controlled channels crystals extra	£69.51	£2.00
<b>Options</b>			
<b>RB537</b>	Rubber helical aerial	£4.60	£0.50
<b>R528</b>	Scanning airband receiver, 6 channels crystal controlled, crystals extra	£125.36	£2.00
<b>Options for both R537S and R528.</b>			
<b>PS9</b>	Mains adaptor	£8.50	£2.00
<b>R537L</b>	Soft case	£3.68	£0.50
<b>RX22</b>	Rechargeable nicad battery	£6.98	£1.00
<b>CH122</b>	Charger for RX22 Nicad	£8.50	£2.00
<b>CRYSTAL</b>	Plug-in crystal (state frequency required)	£4.60	£0.50
<b>R532</b>	Synthesised airband receiver, 100 memory channels, covers 110-139.995 MHz	£224.05	£7.00
<b>Options</b>			
<b>PS12</b>	Mains adapter	£8.50	£2.00
<b>BP532</b>	Rechargeable nicad battery pack	£32.68	£2.00
<b>CH532</b>	AC Charger for BP532 battery pack	£8.50	£2.00
<b>LC532</b>	Soft case	£9.86	£1.00
<b>BNC6</b>	Telescopic whip for portable use	£7.46	£0.50
<b>RB144</b>	Rubber helical aerial for portable use	£5.44	£0.75

## AIRBAND AERIALS

<b>LAB</b>	Airband ground plane	£18.42	£2.50	<b>UR43</b>	50 ohm coaxial cable	£0.30	
<b>MG125</b>	Car aerial, magnetic base	£16.42	£2.50	<b>UR67</b>	50 ohm coaxial cable	£0.85	
<b>HG3FA</b>	5/8 REVCO mobile whip	£7.50	£7.00	<b>BNCPLUG</b>	50 ohm connector for UR43 cable	£1.50	£0.50
<b>SCC</b>	Base for HG3FA	£6.50	£1.00	<b>PL259</b>	Standard coax plug for UR67	£0.66	£0.50
<b>SCCB</b>	As SCC but with quick release	£7.80	£1.00	<b>REDUCER</b>	Reducing sleeve for PL259 for use with UR43	£0.15	£0.50
<b>2065</b>	5/8 ground plane adjustable 118-180 MHz	£31.50	£7.00				

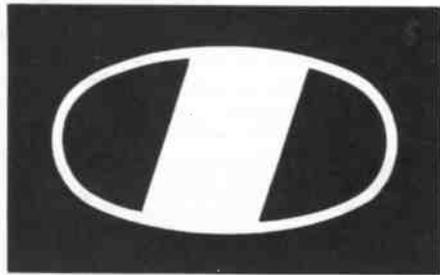
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Other features include dial-lock, noise blanker, attenuator, display dimmer and S meter and optional RC-12 infra-red remote controller, voice synthesizer and HP1 headphones.

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The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard frequency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional FM. Twin VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter. With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control. Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.

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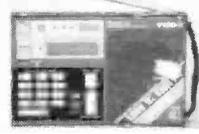
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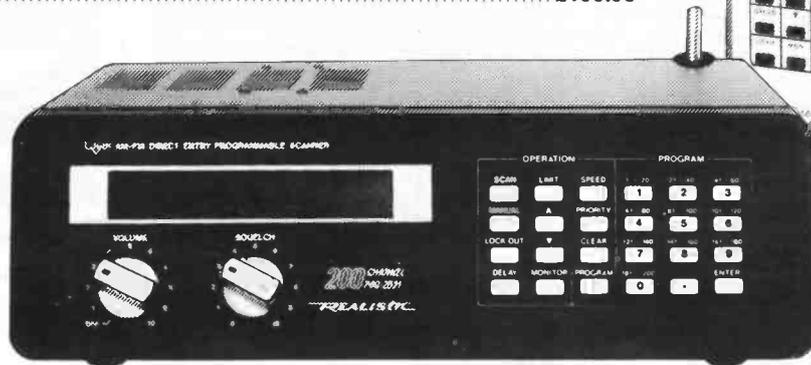
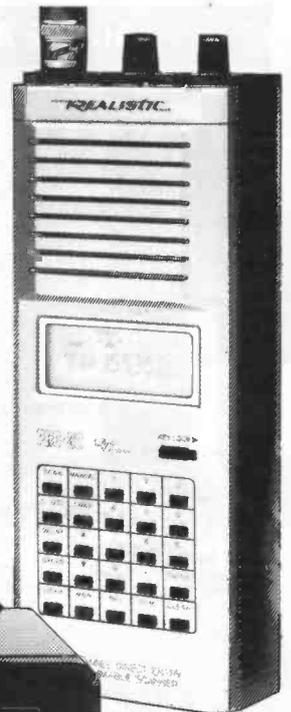
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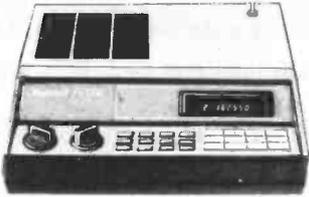
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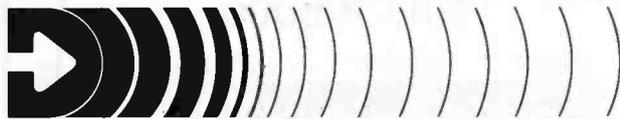
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Previously, people have paid over £30 for separate RTTY, CW and SSTV programs which do not have the performance, facilities and convenience of **RX-4**. We are offering this amazing software for the low price of only £25 on tape, £27 on BBC or CBM64 disc.

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Just to round up, if you read on you'll find our current price list. Please remember, when you go to your local emporium ask for one of our products by name. Don't settle for second best and regret it. You will receive a factory warranty with any of our products to give you peace of mind. If your local emporium can't or won't supply you with Microwave Modules, speak directly to the factory, we will be pleased to give all of our customers the service that they rightly deserve.

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		Prices Incl. VAT	Post Rate			Prices Incl. VAT	Post Rate
MML28/100-S	10m 100W Linear, 10W input	129.95	C	MMT220/28-S	220 MHz Transverter, 15W o/p	139.84	B
MML144/20-LS	2m 30W Linear, 1 or 3W input	98.90	B	MMT432/28-S	70cm Linear Transverter	195.50	B
MML144/50-S	2m 50W Linear, 10W input	106.95	B	MMT1296/144-G	23cm Linear Transverter	258.75	D
MML144/100-S	2m 100W Linear, 10W input	149.96	C	MMX1268/144	1268 MHz Transmit Up-Converter	195.50	D
MML144/100-HS	2m 100W Linear, 25W input	159.85	C	MMC50/28	6m down to 10m Converter	37.95	A
MML144/100-LS	2m 100W Linear, 1 or 3W input	169.97	C	MMC144/28	2m down to 10m Converter	37.95	A
MML144/200-S	2m 200W Linear, 3, 10, 25W input	369.84	D	MMC144/28-HP	2m High Performance Converter	47.84	A
MML432/30-L	70cm 30W Linear, 1 or 3W input	169.05	C	MMC432/28-S	70cm down to 10m Converter	44.85	A
MML432/50	70cm 50W Linear, 10W input	149.50	C	MMC432/144-S	70cm down to 2m Converter	44.85	A
MML432/100	70cm 100W Linear, 10W input	334.65	D	MMK1296/144	23cm down to 2m Converter	129.95	B
MMC435/600	70cm ATV Converter, UHF output	35.65	A	MMK1691/137.5	1690 MHz WX Satellite Converter	144.90	B
MTV435	70cm ATV 20W Transmitter	197.80	B	MMG144V	2m RF Switched GaAsFET Preamp	37.95	A
MM2001	RTTY to TV Converter	188.83	B	MMG1296	23cm GaAsFET Preamplifier	74.98	A
MM4001-KB	RTTY Transceiver with keyboard	299.00	D	MMG1691	1690 MHz GaAsFET Preamp	129.95	B
MMS1	The Morsetalker	129.95	B	MMD1500P	1500 MHz Divide by 10 Prescaler	119.60	A
MMS2	Advanced Morse Trainer	168.82	B	MMR/25	2 dB 25 Watt Attenuator	19.78	A
MMT50/28-S	10m to 6m Transverter	289.80	B	MMR7/3	7dB 3 Watt Attenuator	19.78	A
MMT50/144	2m to 6m Transverter	289.80	B	MMR15/10	15 dB 10 Watt Attenuator	19.78	A
MMT144/28-R	2m Linear Transverter, 25W o/p	289.80	B				
MMT144/28	2m Linear Transverter, 10W o/p	139.84	B				

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### HF Receivers

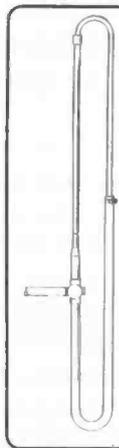
	P&P
Trio R5000 NEW HF general coverage receiver	£895.00 (7.00)
Trio VC20 VHF converter for R5000 108-174MHz	£176.32 (3.00)
Trio R2000 general coverage receiver	£637.26 (7.00)
Trio VC10 VHF converter for R2000 118-174MHz	£170.76 (3.00)
Yaesu FRG8800 general coverage receiver	£639.00 (7.00)
Yaesu FRV8800 VHF converter for FRG8800 118-179MHz	£100.00 (3.00)
Icom IC-R71E general coverage receiver with keyboard entry	£825.00 (7.00)
Icom IC-R11 remote control unit for R71E	£ 62.00 (2.50)
Icom EX257 FM board for R71E	£ 41.00 (2.00)

**NEW:**

HF125 general coverage receiver. British built, 30kHz-30MHz, AM, USB, LSB, FM and synchronous AM optional. Keyboard entry. 30 memories	£375.00 (7.00)
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### VHF Receivers and Scanners

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Icom IC-R7000 VHF/UHF scanner 25-2000MHz all modes	£957.00 (7.00)
Icom IC-R12 remote control unit for R7000	£ 62.00 (2.50)
AR2002 VHF/UHF scanner 25-550MHz and 800-1300MHz	£487.00 (5.00)
Yaesu FRG9600 VHF/UHF scanner 60-950MHz	£525.00 (5.00)
Yaesu PA4C AC power supply for FRG9600	£ 16.50 (2.50)
Video card for FRG9600	£ 15.00 (2.00)
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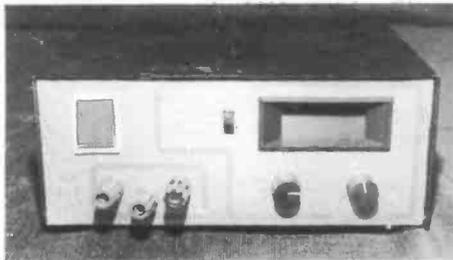
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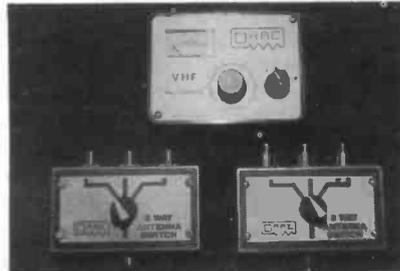
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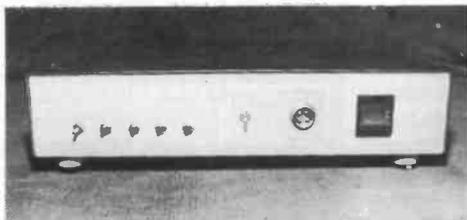
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# THE VOICE FROM ENGLAND

Joan Ham

*"I, together with millions of others, not only in Australia but scattered throughout the world, particularly in places where the British flag is flying, wish you every success and much good luck in your fine pioneering effort,"* wrote C. D. Roberts from Sydney, New South Wales in 1927 to Gerald Marcuse of Caterham, Surrey. The event which sparked off the letter began five years earlier in 1922.

## 1922

It was a time when people's entertainment was usually live – concerts, theatre, outings and local events. Few people had cars, some had gramophones, but the wireless for the lucky few was probably built by father and the family listened through headphones. A loudspeaker for them to hear in comfort was expensive and meant extra valves and batteries. The programmes were no more than a few hours daily – 2LO from London, the Marconi Company's 5XX from Chelmsford and a few others which could be picked up with very careful tuning. The enthusiast who wanted more – and everyone who builds a wireless set is an enthusiast of sorts – built a short wave set, strung long antennas around his garden or picture rail, spent hours of patient tuning around to dig a distant station out of the atmospheric noises, commercial traffic, whistles, whines and Morse code that his insensitive receiver picked up indiscriminately. To tune in enough of a transmission to identify is a thrill that makes all the hours of building, testing and listening to near-intolerable noises in the headphones well worth while.

## Gerald Marcuse

Gerald Marcuse was an amateur of the finest kind, who built his first short wave transmitter and receiver before WWI. His first experimental licence was issued in 1913, and the first GPO amateur licence for wavelengths below 200m was issued in 1922. This was when the idea of Empire Broadcasting to his world-wide circle of friends of the air was born.

A station at Eindhoven (PCJJ) had gained enthusiastic listeners in the Dutch Colonies and elsewhere, and the clamour began for something similar from Great Britain. The BBC, under pressure from the Dominions and Colonies as well as the press, declared that there was no demand. Short wave was experimental, and they were planning improvements for their licence-paying home listeners.

Gerald Marcuse did not share their view and decided to do something as a private individual. *"I want to give Britons overseas a bit of England. I am sure that it is feasible."* Despite being refused a permit to broadcast in case it infringed copyright, he steadily recorded several notable "firsts" as an amateur, including contact with the steamer *Arctic*, 9700km away off the Canadian Islands.

*This is the story of Empire Broadcasting, from the listener's side for a change.*

In 1923/4, tests began that were to lead to his Empire Broadcasts; he showed imagination and flair immediately, making the most of opportunities. A transatlantic chess match was arranged between Oxford and Haverford College, relayed from Pennsylvania by the Haverford College Radio Club to Gerald G2NM in England. *"The game is assuming quite large proportions, and has already broken into headlines in the local papers. The news syndications in this country are very enthusiastic about the idea, and they want photos of the stations and persons sharing the event,"* wrote 3BVN from Haverford.

Tests were arranged on 2.3MHz (120m), but successful contact was not maintained until they changed to 3.45MHz, when 2NM *"... came in like a ton of bricks and we can easily copy you 'til 3.30 our time ..."* Excitement mounted as the great day drew near, and *"... I understand that cameramen from several motion picture news corporations are going to take pictures here, and also on your side ... You will probably hear from Pathe News very shortly."* But under the headline, "Chess by Wireless" the *Daily Mail* reported on 23 December 1924, *"The Postmaster General has refused to permit a game of chess being played across the Atlantic by means of wireless between Oxford University and Haverford University USA ... The Post Office decision is that ... an exchange of messages relating to a chess match could not be regarded as a bona fide experiment in wireless telegraphy."*

## After Disappointment

Gerald, putting such disappointments behind him, soon established new records in "reradiocasting" BBC programmes and concerts from the Savoy Hotel to Eastern Canada and the States. *"Mr Marcuse has received reports from many of these stations that the vocal part of these reradiocasts have proven particularly satisfactory and lifelike in their quality"* said the *Christian Science Monitor* of Boston in January 1925. In that optimistic New Year, the Empire Broadcasting dream turned east, and Gerald sent a cable to E. Benzie in Cachar, India.

*"Recommencing tests Wednesday until further notice. ... advise all amateurs ..."* In April, following the passing of an urgent telegram between No. 63 Squadron RAF based in Mosul, Iraq, and the Air Ministry in London, Gerald set up a test schedule with J. F. Hall in Mosul, who reported that his new Wireless CO was *"... a jolly decent sort. He has caught the s.w. fever and is full out for it."*

## Radio Globetrotting

The antenna globetrotting reached New Zealand in June; Jack Orbell of the Thames Valley Electric Power Board of the Aroha, wrote, *"... My outfit is on high ground but is practically on the side of Mt. Aroha which is very steep (3000ft) ... European sigs here are best in the early morning our time ... I am using your Mullard OM and she's a beauty – better than my M-O valve. I never put over 12 volts on the fil and so far only 15000 volts on plate though I'm going to make a 1000V generator to run in series shortly. I am very careful with that Mullard OM as you can guess ... Have you heard FX1? He's a US army experimental outfit at Honolulu ... also have you heard Schnell on American Pacific fleet NRRL? He's very good here and is using a crystal controlled outfit on 39m approximately with a peculiar whining QSB and is on nearly all the evening."*

The *New York Herald Tribune* reported in the following month that Gerald Marcuse had established a world record telephony contact on 6.6MHz (45m) with Lieutenant Schnell on the US cruiser *Seattle*, 12 900km away. The British Marconi Company's beam station conversed by telephone with Australia, but used an extremely high power commercial set. The amateur achievement was *"... a remarkable feat"* said W. E. Downey, radio expert of the Department of Commerce.

Gerald followed this with a concert programme to the *Seattle*, by then in Wellington Harbour, New Zealand, some 20000km distant. Records of Caruso, Heifetz and jazz were *"... All heard excellently aboard the American warship,"* said the *New York Times*. The Marconi and Osram Company used drawings of Gerald's transmitter and the *Seattle* to advertise the reliability of their valves in a full-page advert in *Popular Wireless*. 2NM then provided the link for a 22500km press conference between a newspaper correspondent and Commander Crosse of the *Seattle*; there was no pre-arrangement and contact was established in less than one minute. The antenna set-up was a 22.8m pole with antenna of the same length, and as the *Daily Mail* reported, *"This required ½ kW of power compared to 25kW used by the big stations."*

The next path of contact was with Radio 6ZK – J. Spillard of "Signals", Ramleh in Palestine, who had been ordered to stop working on 6.6MHz (45m) and experiment on 12-15MHz (25-20m), but had applied for permission to arrange tests with Gerald. One problem he and others east of Suez frequently experienced was *"... heavy QRM from electric fans between 1530 and 2130GMT."* In spite of "deafening QRM", 2NM's speech was heard at loud speaker strength. The garrison engineer at

# THE VOICE FROM ENGLAND

Abbottabad on the North West Frontier sent a report after hearing Gerald asking if "fone" could be received. *"It certainly could have been received pretty well perfectly here. I should think that the 45m wave would be ideal for getting broadcast speech and music into India. . . . although I have only recently dabbled in short wave reception I am hopeful of being able to supply English music via loudspeaker to one of the Messes here or to the Club. . . . sometime this winter. I should therefore be interested in any further telephony test you may be arranging to make on these lower wavelengths."* It was signed N. R. Swales, Lt. R.E.

owing to electrical storms, but easily heard the QSO between 2NM and Newfoundland, although his own apparatus was next to the main high wave station with a charging set on the other side, and *"... short wave was not worth living!"*

## Excitement

An idea of the early broadcast listener's excitement comes over with a letter from Mrs Grosvenor Tucker, Hamilton, Bermuda, whose notepaper advertised Real Estate, Victor-Victrolas from \$14 to \$100 and a stock of 2000 records and English Bicycles for hire. *"I have a tube Radiola III with earphones - I had hardly*

that path. Regular tests were held with an Indian station on the North West Frontier, "never any difficulty", and reradiocasting British and Continental stations. He had a regular schedule of telephony tests on 6.6MHz and welcomed all reports.

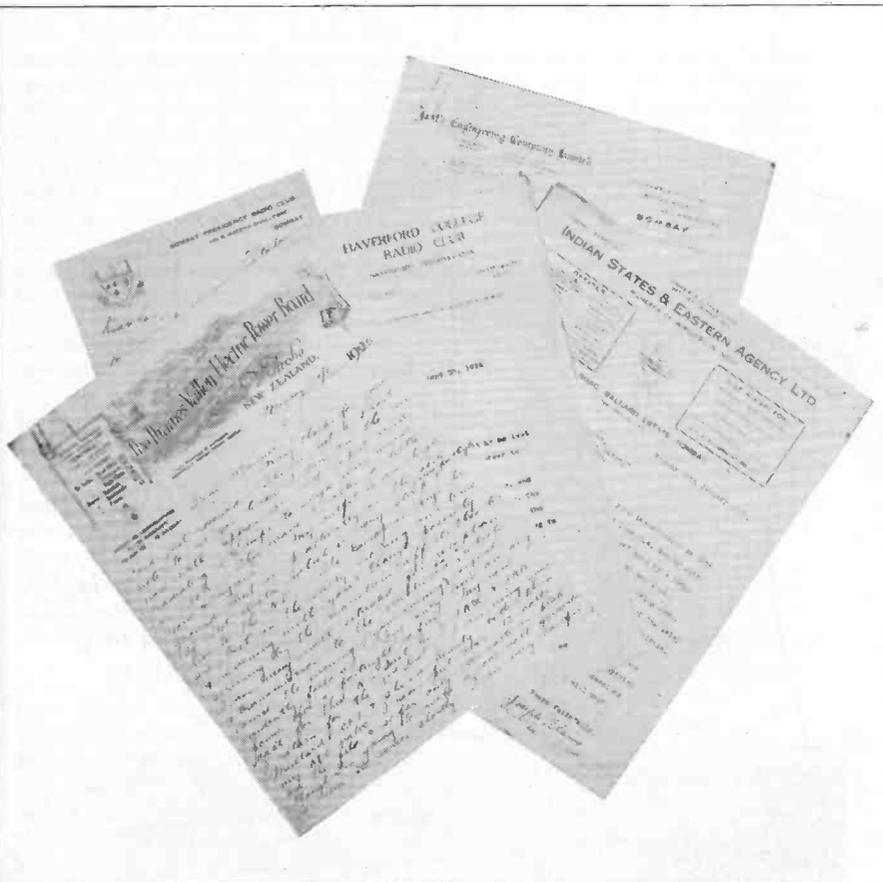
E. J. Rockall, Amman, Transjordan, *"... Those were decent days down at 6ZK. I might mention I had some very enjoyable nights from your relays of 2LO ..."* 6ZK was the control station of all RAF commands in every country and only worked traffic, and he himself was an unofficial station. 2NM had been warned not to work RAF stations, because, the letter continued, *"I'm glad to see you are trying to make them see that you have a claim to working RAF stations. It really is a shame because you have done a lot for us."* He offered to continue testing privately.

## Reception Down Under

Down under, the anticipatory thrill of receiving England and the pressure for regular broadcasting was voiced by T. H. Harris of New South Wales. *"... at 5.15am Sydney time I heard your carrier good and heard you say 'Hello 2N Emma testing' I hopped on to Det. and 2 audio and shoved the speaker in and easily heard out of the speaker, 'Hello'. Then I rushed in and woke the family up (mother, cousin and brother) and they came in as quickly as possible, and I thought I was in for some good 'fone'. Your carrier was heard for a minute or two, evidently you were testing something, for no more was heard ... We hung on expecting you to connect up with someone but our luck was hard ... so the family went back to bed ... Now OM what about reserving the time, or some of it, between 7 to 8pm GMT on Sunday nights ... for special 'fone' to Australia - NZ ... if you can and are allowed to send out 'fone' say, for 15 minutes at a stretch, great success is assured ... Now if your concerts were put on the air regularly at the times stated - I venture to say it would not be long after you started before your concerts would be rebroadcast by some of the Aussie BC stations ..."*

## Hong Kong

A valuable correspondent in tests was W. G. H. Miles, Stonecutters W/T station, Hong Kong, who sent a detailed analysed log of two years' radio traffic with a letter, reporting: *"Your set continues to prove a great success and it certainly made the Signal School experts open their eyes when they saw it ... it was about the tenth of the size they consider necessary and yet gives results as least as good as, if not better than, Cleethorpes ... I recently got a reply back to the Admiralty to a message of theirs within 1 hour 20 min of their time of origin, and they sent out a special message of congratulations."* A few months later, he wrote, *"... I do*



Mr Paterson writing from the Kanan Devan Hills in South India sent a circuit obtained from the "Zenith Reinartz people" for Gerald's opinion of its merits and his recommendations for two transmitting valves and other components he had ordered. Many people stranded on the fringes of British Dominions and Colonies turned to this noted "amateur" for technical advice, components and circuitry, and he never failed them.

The year ended with 2NM's relay of a play at the Savoy theatre, broadcast by the BBC from 2LO. It was received in Halifax, British Columbia. In January of 1926, T. H. Harris of NSW in Australia sent a detailed log. He received speech *"... easily but distorted"* and heard on various days 2NM calling the Philippine Islands and Australia and detected music and speech. He also offered to co-operate in tests. J. Spillard in Palestine had difficulty in making contact

*picked up the phones when I heard 'Ber' announce that he would endeavour to relay 2LO London - I then heard a voice announce from the Savoy Hotel orchestra and then dance music burst in, I heard it quite clearly at intervals but the local ships in our dockyard had a great deal to say which ruined an otherwise good reception - It was an exciting moment and I would gladly have ordered those ships to stop talking if only I had the authority - Then came over the wonderful notes of 'Big Ben' striking the midnight hour - you are doing a great work ... with best of luck in your enterprise, before long we shall be talking with England daily."*

In March 1926, Gerald Marcuse wrote an article for the *Christian Science Monitor* on his short-wave experiments. He was operating regular scheduled tests with America and Canada to try and solve the problem of difficult telephony over

# THE VOICE FROM ENGLAND

want to thank you for the receiver. We like the condenser control very much and also the antenna coupling condenser, which makes it very selective; we also find it materially more sensitive than other Reinartz type receivers we have built up as it gives results with two valves that generally need three." How much the ties with home meant to this outpost may be guessed from the information, "Matters at Shanghai are quite quiet and we have enough troops there now to protect ourselves, but all business is coming to a standstill . . . I am afraid things will never be the same again out here, and it will be years before China evolves a stable government . . . 'Claude' your transmitter is full of life still, as you can probably hear: I am making up a rival 'Felix' to him."

In July 1927 *The Brisbane Courier* carried a short report revealing plans to give a nightly talk for an hour. "Mr Marcuse's enterprises has given rise to an enquiry as to how far the British Broadcasting Corporation's plan in the same direction has progressed. The corporation's experts say that the difficulty is not a matter of transmission from London, but reception in the Dominions."

The answer to that was contained in 2NM's August mailbag. C. D. Roberts reported from Sydney, NWS; "Your test this morning was well received . . . Unfortunately you are in the middle of the Australian and NZ band, and consequently QRM very bad . . . Nevertheless I heard enough to be able to say that your modulation is excellent . . . the speech and music are both very clear, the former even better than PCJJ and that's saying a lot . . . your test would appear to have been a success in every way except regarding the interference. I think that if your programmes are to be quite successful, the wave will have to be lower than at least 31m or preferably below 30m, 2NM was the first English station I ever heard . . . one and half years ago. One year later . . . 1926, 2NM was the first English 'phone station. Now 2NM is to be the first English broadcasting station received by me. Congratulations."

From Albany, the southernmost part of W. Australia, C. H. Vernon: "I would like to tell you that amateurs all over this state have been greatly interested by your intended Empire Broadcasting and we wish you the greatest of success. Your strength on this occasion was equal to the American 2XAD on 20.02m and practically the same as regards 2XAF on 32.77m but your modulation seemed superior to either . . . once again an amateur leads the way."

W. A. Bousfield, Tasmania, congratulated Gerald and said, "Although we Britishers out here do not like to criticise the BBC at home, I think that even if only to maintain British prestige, a short wave broadcast should have been established some time ago. We receive

many s.w. BC here . . . and it can safely be said that your transmission compares very favourably with their commercial broadcasters . . . Why not rebroadcast 2LO and 5XX . . . ?"

Ex-patriots elsewhere expressed similar feelings. " . . . I heard your first attempt on s.w. BC on Sept 1st," wrote R. W. Browne, Assistant Works Manager of the Nigerian Railways from Ebute-Metta,

When Empire Broadcasting first began, many of those who heard the transmissions from Gerald Marcuse G2NM not only wrote him letters but sent him QSL cards too.

They came from all over the world, and from those at sea as well.



The cards shown here came from (top to bottom) F. H. Schnell on the USS Seattle, Australian-New Zealand Cruise of US Fleet; G. W. G. Benzie from the Urrunabund Tea Estate, India; C. J. Curtis, Royal Air Force, Iraq; G. H. Jolliffe, Ceylon and J. Spillard Palestine.

"You have no idea how pleasing it is to hear England in a busy country like Nigeria, and I must say the reception was perfect except for occasional fading . . . I am looking forward to a regular service from England in the near future." R. G. Ellis, Buenos Aires, quoted programme content — "This is 2NM calling on 32.5m . . ." and musical items; F. G. Cornish on the Gold Coast fought his way through heavy atmospheric and weak signals to pick up a little music and a strong carrier, and ended his letter, "I wish you every success. I am sure we shall be very grateful to you if you can send us out the latest news from home if it is only once a week . . . what a treat it would be."

Enthusiasm abroad marched with caution and caveats at home. Gerald was warned of copyright problems if he broadcast music and other material planned, but such was his popularity with the listening audience of the world that the *Brisbane Courier* reported, ". . . it is now certain that the best talent will be available. A first-class orchestra from 'Dance Land' and theatrical and Music Hall artists are offering freely. Talks and plays will be included.

"I am working primarily for the Dominion listeners," Gerald told the *Evening Standard* in August "For the past three years I have been in regular communication with hundreds of lonely wireless men in every part of the British empire. These Empire settlers have been asking for the BBC programmes to be relayed to them. I was quite willing to do that at my own expense, but the BBC objected, and in the end the Post Office allowed me to broadcast if I would provide my own programmes."

The Post Office licence, issued on 1 September 1927, was specific and limited. "Mr Marcuse is authorised to transmit music and speech for a period not exceeding six months, by means of wireless transmission with power not exceeding one kilowatt and waves of 23 and 33m. The understanding is that continuous transmissions will not take place for more than three days weekly, and will not exceed two hours on each occasion." Gerald, at his own expense, set up a "secret studio" in a friend's music room for his broadcasts and rented two Post Office lines to link with his transmitter. The world's press eagerly awaited the event.

The first historic Empire Broadcast was transmitted from the Columbia Gramophone Co studio and included Captain Ian Fraser MP, vice-president of the RSGB and the Australian High Commissioner, Sir Granville Ryrie, then attending the League of Nations meetings in Geneva, who returned to London especially for the broadcast to Australia. Letters and cables praised the achievement; A. R. Maclean in Pointe-a-Pierre, Trinidad, reported exceptionally clear and strong 'phone reception of

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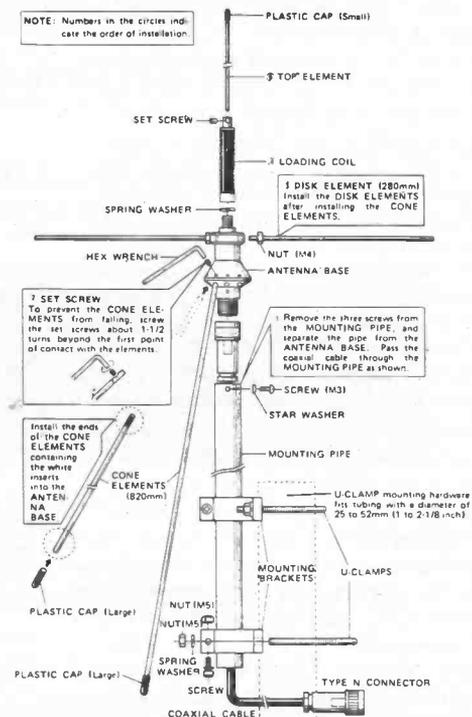
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**YAESU FRG9600 Service Manual** (inc Cat Prog) @ £12.50 inc post.

**Raycom VHF-UHF Discone** 60-600MHz SO239 connector @ £27.50 inc carriage.

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# THE VOICE FROM ENGLAND

signals calling Australia and NZ — the first telephony signal received there from England.

"Our Wireless Correspondent" visited station 2NM and wrote, "*Half a dozen switches were thrown over, the valves glowed into life and 2NM was at work. It was hard to realise that experimenters in New Zealand were looking at their watches and saying, 'Hello! 2NM ought to be starting up now'. Yet so it is; they switch on their receivers and pick up the British station with almost the certainty with which we get Daventry. I looked through a pile of letters — over 100 I should think . . . There is practically no place from which they do not come.*"

Gerald endeared himself to his distant listeners, making them feel close to home and a part of the great adventure by acknowledging their letters and cables in his programmes. The thrill of hearing their name and country called up, and told that their reports were received and appreciated, cannot be imagined in these times of routine phone-ins. A cable arrived in Bombay announcing that Mr Gerald Marcuse proposed to broadcast a special programme for India on the previous day! Although only four days in transmission, his programme was already ancient history long before news of it arrived. Jost's Engineering in Bombay arranged to take reports of his Indian broadcasts. A telegram via Imperial Wireless Services came from the Ballard Estate, Bombay. "*Transmission received not strong fading bad nevertheless very enjoyable stop. Nobody Bombay succeeded getting Chelmsford. Herring.*" The new link with India was quickly utilised when greetings were broadcast to Mr Valentine in Cawnpore from his son in England. Every enthusiastic listener relayed the message, which Mr Valentine received from several people.

J. C. Standen in Tranvatore, S. India, congratulated 2NM on his broadcast and hoped that he would persuade "*The powers-that-be to permit you to relay at least Big Ben if we cannot have one of their programmes per week. It would certainly cheer the lonely Britisher . . . Although I can get the correct GMT from your pips it is not like Big Ben and that is what most of us want to hear. It brings us nearer home.*" Mr Herring, sending reports received by Jost's Engineering Company, said that Chelmsford were carrying out tests, but although they were transmitting a 25kW signal, it was not received, whereas 2NM's 1.2kW signal was tuned in without difficulty.

In November, Gerald received a letter and detailed log from A. Haworth, British Consulate, Teneriffe, who listened from 1.45pm to after 9.30pm and gave precise signal reports. His covering letter had referred to an event, ". . . searching the papers from England for reference to this but nothing has appeared in them. Anyway, it commenced a few days ago on

24m . . ." The event of such interest appeared at the end of the log. "*Soon after this, all transmission went right out including yours and I did not hear your again at even good phone strength. IKDKA and 2XAD were impossibly weak and a most peculiar silence seemed to come over the whole band between 15m down to about 17m and those stations which were audible, one or two code ones, had a most peculiar empty effect with them . . . some outside effect is the cause.*" The early listener had healthy scientific curiosity and their observations provide valuable data. (Ron, my husband, recognised this as a typical radio blackout caused by a solar event, the "outside event" suspected by Mr Hawthorn.)

## Link With Home

Gerald knew it was the link with home that the Colonials were so eager to hear. *The Times* of India reported in the November 21 issue, "*in the early hours of Saturday the Empire Broadcast of the British Legion concert at the Albert Hall, London, was heard at the Bombay Presidency Radio Club . . . Mr Atkins heard the whole of the programme with the exception of the first half-hour as follows . . .*" and the programme content was quoted. Mr Herring also heard it. G. H. Joliffe (7VX) in Ceylon phoned the local radio station when he picked up the transmission, and they were able to relay it, while M. G. Eber in Singapore wrote, "*I need hardly mention the disappointment arising out of the failure of the BBC to, at the last moment, cancel their proposal to broadcast this programme . . . to my intense delight I heard you . . . your transmission was superb, considering the immense distance and the 1kW power . . . the Armistice programme must have come over to you by landline since it was not broadcast. Please inform me whether this is so.*"

## Thus Ended The First Year

So ended the first momentous year of Empire Broadcasting. The project continued, and letters of appreciation and thanks came from all over the world. R. G. Collingwood, Heliopolis, Egypt, said that the bells of St Martins filled the house when Gerald broadcast a Sunday morning service. Reverend G. H. J. Horam (OC0BK) asked for details of the transmitter, and informed him that he built a superhet and sent a very detailed four month log. The change from summer conditions meant very heavy QRM, ". . . almost like machine guns . . ." at times, and on one occasion it was too painful to persist in trying to listen-in, but the early Empire Broadcast audience was obstinately determined to hear the Old Country. "Hello Reverend Horam, Syria" heard between periods of dead silence was reward enough, and the following Sunday; "*I had a postcard of Westminster*

*before me for the chimes of Big Ben and my heart went right way home for a few minutes. Thanks OM.*"

Another interesting and possible solar event was recorded when Albert Wheeler in Pinjarra, W. Australia noted in May 1928, "*Clear reception, but rolling static like waves,*" a perfect way of describing the hiss of a solar burst. 2NM was very well known in Australia, and Gerald Marcuse expressed appreciation at hearing from their kith and kin and homeland.

R. T. Stamton in Christchurch, New Zealand recorded yet another pioneering experiment when he heard 2NM calling New York and saying, "*I will now change over to the Rayfoto picture,*" at R7. He put the signal on his loudspeaker and "*heard the picture*"; which made this particular listener's day; it was his half-century of telephony stations in seven months. The Rayfoto picture was also heard by B. Vermehren in Berlin.

The programmes to which listeners devoted such time and effort were compiled from a library of 50 records, well known artists and personalities, special "outside broadcasts" like church services and dance bands. The 1930 programme book, now in Chalk Pits Museum library along with other fascinating documents, lists record programmes, relays of continental broadcasts, announcements, piano and organ music, plays and talks. A lady announcer brought in many complimentary reports, and a relay of the Dempsey-Tunney fight allowed Mr Haworth at the consulate, Tenerife, to send a full report to the local paper before deadline. Gerald Marcuse rebuilt his station to transmit on 20.9m, and a thermostatically-controlled crystal to keep the wavelength accurate was another pioneering milestone . . . He spent £6000 and untold hours of night duty on his Empire Broadcasting, often finishing with blackbirds and thrushes singing in the garden relayed across the world.

In 1932 the new BBC transmitter at Daventry was inaugurated, consigning him to the archives of amateur radio history — but to British settlers in the far corners of the world, Gerald Marcuse had blazed the trail. "*You ought to have seen the faces of an old couple at Ealing when I brought them news of their son,*" he told *The People*. It summed up his whole philosophy of Empire Broadcasting. He just wanted to keep people in touch.

A newscutting from 1924 really sums it up; "*G2NM is to be congratulated on his pioneering in the realms of high frequency telephone transmission via amateur radio. There is no doubt that the future broadcast station will operate on the low waves, perhaps in a fraction of a metre, and when that time comes we only hope that the listeners of that time will give due credit to the amateurs who worked day and night to enable the successful operation of radiotelephone on the short wave lengths.*" □



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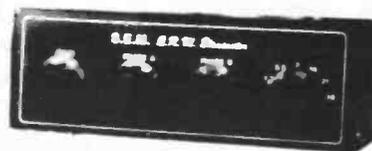
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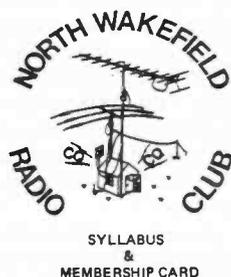
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Club life is an important part of many radio enthusiasts' life. Listener or licensed amateur, you can get more out of your hobby by participating in your local club.

The club news this month may look a little different than normal as we are looking at ways to give readers the best information possible, without devoting too many pages of the magazine to the many letters we get from radio clubs. Bear with us, we'll try to please all (eventually).



In the compact little programme booklet for the **North Wakefield Radio Club** are details of some interesting lectures and visits. On April 2 they have an ever popular junk sale when members have a chance to swap surplus gear, April 9 brings some vital information — First Aid for the Shack by Tony Dixon — a subject we could all do with knowing more about. A talk by the Radio Interference Service is scheduled for April 16, which should bring a packed house. The most interesting lecture in the near future is Bee Keeping by Dave Marriot, down for May 21 — sounds intriguing.

Meetings at The White Horse, Fall Lane, East Ardsley, Wakefield 8pm (G4RCH on Morley 536633 for more details).

The newsletter from **Chelmsford Amateur Radio Society** documents some of the fun and games they get up to from month to month. Their d.f. hunts really sound like fun, foxes loading up the top strand of two security fences as an antenna! They have two more d.f. events lined up in the immediate future, one on March 27 and the other April 7. Other interesting notices include details of some good lectures — April 7 is Short Waves and Beams by J. S. Woods and May 5 is How to Work v.h.f. DX by Meteor Scatter by G8VR.

Meetings start 7.30pm at the Marconi College, Arbour Lane, Chelmsford (G3PMX on 0245 360545 for more details).

## Up & Down the Land

The March 1987 issue of *The Cornish Link* makes for interesting reading. Meetings mentioned are the AGM on April 2 and Crime Prevention & the Radio Amateur by Sergeant Richards. The computer

club has a meeting scheduled for April 13 on Data Storage in the Future by G3VWK. The **Cornish Radio Amateur Club** and Computer Section meets in the Church Hall, Treleigh on the old Redruth bypass (G4ZU) on Stithians 860572 for more details).

Plenty of advance notice for a visit organised by the **Midlands Amateur Radio Society**, but as it's a restricted party going you should book early. The visit to the Droitwich transmitter is now going ahead on August 18. You should contact G8GAZ on 021-357 1924 for more details.

On to the **South Bristol Amateur Radio Club** — there's nothing like a quiet sprint up and down the country! They have got an interesting line up awaiting club members and visitors, April 29 is a lecture on the Bristol f.m. TV repeater GB3ZZ and May 6 is a lecture and demo on packet radio.

Meetings are at the Whitchurch Folk House, East Dundry Road, Whitchurch (G4RZY on Whitchurch 834282 for more details).

The first issue of *Radio* (Reading And District Information Outlet) has landed in the office. It is a new publication for the **Reading & District Amateur Radio Club**, and has taken over from the Reading ARC Newsletter. It will appear four times a year, three of those dates are: Jan 20 (the copy we have), June 23 and Nov 10 — the fourth date has yet to be decided. It is packed with interesting information which unfortunately there isn't space to tell you about much. Forthcoming events which look interesting are March 31 with Problems with e.m.c. by G4IWS of the RSGB's e.m.c. committee, and an Alignment Evening to get that project tweaked up or the rig back to spec on April 28.

Meetings are held at the White Horse, Emmer Green, North Reading (G4CCC QTHR for more details).

Firefighting on North Sea Oil rigs by Ray Kepper is on the cards for members and visitors to the **Stockport Radio Society's** meeting on April 8. They meet at 8pm in the Blossoms Hotel, which is at the junction of Bramhall Road and the A6. More details from G4FFW on 061-224 7880.

All **Warrington Amateur Radio Club** members should note in their diary (if they haven't already done so) the AGM is on April 7. The following week they have a lecture on photography by G4SCI and then on the 21st there is an Inter-club Quiz against Bury ARS for the Challenge Shield.

Meetings are held at the Grapenhall Community Centre, Bellhouse Lane, Grapenhall at 8pm (G0CBN on 0925 814005 for more details).

Check Your Coax — an original approach by G1EUP sounds an interesting subject, but you'll have to go along to the **Derby & District Amateur Radio Society** meeting on April 15 to find out more. An illustrated talk by G4UWK on Commercial Satellites on April 29 sounds well worth a visit too.

The club meets at 119 Green Lane, Derby at 7.30pm every Wednesday (G3KQF on 0332 772361 for more details).

The **Fareham & District Amateur Radio Club** have a good idea on May 20 — Members "lectettes" with G3CCB on I did it my way. It is good to see club members being encouraged to "have a go" at talking to the club. Meetings are held in the Porchester Community Centre, Westlands Grove, Fareham at 7.30pm (G3CCB on Fareham 288139 for more details).

A Satellite Television talk and demo by G6AHX is what's in store for the members of the **Vale of Evesham Radio Amateurs Club** on May 7. This meeting is in the Round of Gras, Badsey (G0DXX on Evesham 831508 for more details).

The ever popular event — the surplus equipment sale — is what the **Southgate ARC** have planned for April 23. They meet at 7.45pm in the Holy Trinity Church Hall (upper), Greens Lanes, Winchmore Hill, London N21 (G4YLL on 0992 30051 for more details).

**Welwyn Hatfield Amateur Radio Club** have changed the venue for main meetings (1st Mondays) to Lemsford Village Hall, Brocket Road, Lemsford, nr Welwyn Garden City. The venue for the 3rd Mondays stays the same. Forthcoming attractions are lectures on Basic Power Supplies (April 6), contesting (May 4), Radio Control Demonstration (June 1) and the Ten Metre Band (July 6). G4WLG on 0707 335162 can give you all the details.

## Visitors Welcome

Visitors are welcome to our club meetings says G3UJV about the **Verulam Amateur Radio Club**. They have a lecture by G3OSS entitled Amateur Rigs of the Year on April 28. They meet at the RAF Association, Headquarters, New Kent Road, St Albans and G3UJV on 01-449 5352 will have more details for you.

The **Bury Radio Society** meets at the Mosses Youth & Community Centre, Cecil Street, Bury each Tuesday. On the programme of forthcoming events is Maths with Maurice by G0BWN on May 12 and the every popular Surplus Equipment Sale on July 13. Club members and visitors who wish to have more details should contact G1VQE, 29 Harrow Close, Blackford Bridge, Bury.

The **Acton, Brentford & Chiswick Amateur Radio Club** have

two interesting lectures lined up. A Demonstration of Modern RTTY by G4JLU on April 21 and a discussion on Aerials for Restricted Spaces on May 19. The club meets at the Chiswick Town Hall, High Road, Chiswick (G3GEH at 188 Gunnersbury Avenue, Acton for more details).

You should be reading this just in time to remind members of the **Radio Society of Harrow** about their AGM on March 27. It will be held in the Roxeth Room, The Harrow Arts Centre, High Road, Harrow Weald (G0DIN on 01-861 0419 for the latest info).

Following the AGM of the **Nene Valley Radio Club**, Paul Byles remains their Secretary, he told us about their programme for the coming months. April 8 has G4ENB on Slow Scan Amateur TV and the 15th will be G0AUO on v.h.f. mobile from 1945. G6UWS on 0933 71189 has all the details for you.

The **Yeovil Amateur Radio Club** have details about their lectures for the next few months, May 14 is The 2-element Yagi by G3MYM, 21st is A Cascode J-f.e.t. r.f. Amplifier by G3MYM and June 4 is How to use a Smith Chart again by G3MYM. The club meets every Thursday at 7.30pm at the Recreation Centre, Chilton Grove, Yeovil (contact G4EVI on 0935 75920 for more details).

Another club with junk sales on the cards came to light when we opened the **Sutton & Cheam Radio Society's** Newsletter. Theirs is on April 17. The club is celebrating their Ruby Anniversary with a special event station GB2SAC throughout the month of May. Congratulations. They normally meet on 3rd Fridays, at the Downs Lawn Tennis Club, Holland Avenue, Cheam at 7.30pm (G4FKA is the club secretary and no doubt has more details).

## In Brief

Just before deadlines we received news of a few more clubs, so here are brief details.

**Surrey Radio Contact Club** (G8IYS on 01-657 0454), April 6 — AGM and May 11 — Club Constructional Contest.

**Dorking & District Radio Society** (G3AEZ on 0306 77236), Bonsai Aerial Farm by G3OLM on April 14.

**Coventry ARS** (G3UOL on 0203 414684), 50 years of Amateur Radio by G3BA on April 3, Radio Communications & the Police by Ch. Insp. Hornbrook on the 10th.

## Missed Clubs

If there are any clubs we have missed, sorry. Your details may not have reached us by the deadlines, the new address to send material to is: Shortwave Magazine, Club News, Enefco House, The Quay, Poole, Dorset BH15 1PP. □

# A Simple Antenna Tuning Unit

Rev. G. C. Dobbs G3RJV

Some time ago I had a telephone call from a local pensioner who, having decided to return to short wave listening had bought a general coverage receiver. Then disaster — most of the time his signals were masked by a strong hash-like sound. I looked at his set-up. Ideal. A nice receiver, comfy chair, and a long wire antenna down the garden. However, a street away was an oriental takeaway establishment and the noise seemed to correspond with their opening hours! We tried various combinations of the receiver controls to no avail, so I turned up the next day with an antenna tuning unit (a.t.u.). We added it to the receiver and the problem almost entirely vanished when the wire was matched to the listening frequency.

The a.t.u. is one of the simplest pieces of radio equipment. There are several on the market but most a.t.u.s are so simple that there is little excuse for not building your own. The literature is full of circuits of antenna matchers of various kinds. Many of these are merely variations on a theme but the variety can be confusing for the unwary. Most receiving stations, and indeed many transmitting stations, use a single long, or longish, wire fed against ground. Experience over the years has shown me that a very effective a.t.u. for such a set-up is the L-match. The L-match also has the good fortune to be the simplest of a.t.u. circuits.

## The Circuit

The L-match has only two main components, a capacitor and an inductor and is so named because these are connected in an L formation. The usual arrangement for the L-match is shown in Fig. 1(a). The inductor is in series with the antenna and the capacitor between the antenna end of the inductor and ground. This circuit, with variable capacitance and variable inductance, can match a wide range of antennas with impedances of over  $50\Omega$  to the usual  $50\Omega$  impedance of communications receivers. This is called the L/C configuration. Placing the capacitor at the receiver end of the inductor gives the C/L configuration. This is suitable for matching impedances lower than  $50\Omega$  to the receiver. Although the L/C configuration is probably suitable for most wire antennas, it is a relatively simple matter to switch the circuit to provide either facility.

The circuit of the a.t.u. is shown in Fig. 2. This is an L-match circuit with a switchable inductor, L1, adjusted by taps selected by a switch S1. Another switch, S2, allows either the L/C or the C/L configuration to be selected. S1 is a single pole, 12 way switch and S2 a two pole 3 way switch. The extra switch position on

*To attempt to run a short wave monitoring station without matching the antenna is rather like forgetting to tie your shoe laces — you may get somewhere but it won't half be sloppy.*

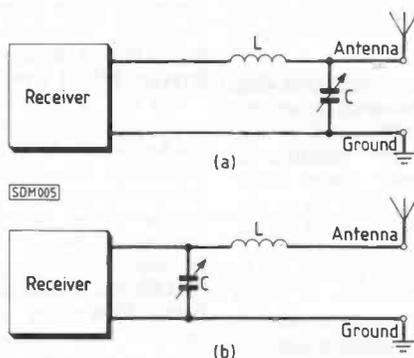
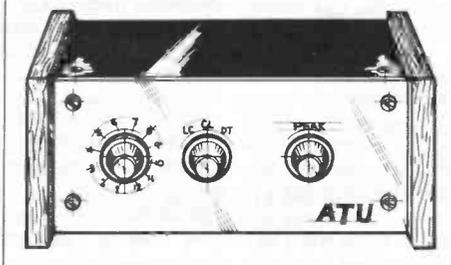


Fig 1

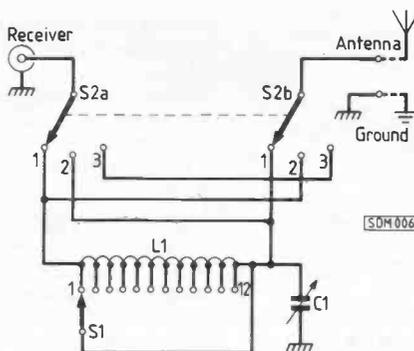


Fig 2

S2 allows direct switching between the receiver and antenna which cuts the a.t.u. out of the antenna line. Although the switching appears to make the circuit diagram look complicated, a switching layout is given which makes the wiring very simple.

## Components

The problem with some circuits is finding suitable components but with this circuit the constructor is in luck, as the two main components are available from one source. I have also admired those nice air-spaced inductors which are available in the

USA as "B and W Stock". These are coils wound with solid copper wire spaced in Perspex and can be bought in various sizes to cut to length to give the desired value of inductance. Sadly they are not available in the UK, but recently I came across a well engineered coil, designed as the inductor for a.t.u. applications, made for, and sold by, J. Birkett of Lincoln.

Fig. 3 shows the construction of the Birkett a.t.u. coil. It is based on a Perspex former of about 32mm outer diameter. This has thread grooves cut at a pitch of ten turns per inch to accept a winding of 18 s.w.g. copper wire. This winding has taps which can be selected to vary the inductance. The whole construction is solid and rigid and would also be suitable for transmitting applications.

The variable capacitor, which has a value of 300pF can also be bought from J. Birkett. Currently he stocks a rather sturdy two-gang variable type, the gangs being 200pF and 100pF. Joining these in parallel gives the required 300pF. In the prototype a.t.u. I used an old variable capacitor salvaged from a broadcast receiver. The main tuning capacitors in these usually have two gangs of 300 or 500pF each and one of these gangs can be used for C1. The two switches are standard items; a single pole, 12 way wafer switch and a 4 pole, 3 way wafer switch although only two poles of the 3 way switch are used.

## Construction

The most complex part of the construction is the wiring of the switch connections, and Fig. 4 shows how the switches are wired. Before beginning the wiring of the circuit decide upon an enclosure for the a.t.u. The case I used was one I had in stock which had been used before but a mask on the front panel covered the previous holes. However, Minffordd Engineering's J14 equipment case, which measures 203 x 152 x 76mm would make a suitable and smart housing for the a.t.u.

When the position of the components has been decided the coil taps can be wired to S1. The wires, being stiff are easy to place around the connections on the switch, but adjacent wires must not touch. The switch will have 12 contacts around the circumference and the wiper contact of the switch arranged inside one of these. This contact goes to the connections on C1 and S2. The outer contact adjacent to this connects to Tap 1 on the coil as shown in Figs. 1 and 4. Tap 1 is made to the end of coil winding which has the smallest spaced tappings. Looking at the coil you will notice that Tap 2 is 2 turns along the coil, Tap 3 is 4 turns and so on to the end with the widest spaced tappings.

# A Simple Antenna Tuning Unit

## Caution

A word of caution here. If the wafer switch is of the type which lets you see the action of the wiper moving around the contacts then all is well. But many modern switches are moulded in such a way that the wiper position can not be seen. If this is so determine which position of the switch gives Contact 1, using a multimeter on the ohms range. I mention this because once all the coil taps have been wired to S1 it will be impossible to find which switch position is which with a meter. Make a couple of marks with a felt-tipped pen on the moving part of the switch and the frame to show this position. With this information the switch positions can be numbered on the front panel. In practice it is not too important what the markings on the front panel are as long as it is possible to return to the correct settings for various bands.

When L1 and S1 have been wired, C1 and S2 are then added to the circuit. The wiring around S2 is shown in Fig. 4. The switch has 4 poles, only two of which are used. Again the constructor will have to either inspect the switch action or use an ohmmeter to find the switching combinations. The wiring of S2 is very simple

because, with the exception of the input and output leads, all the interconnections are between contacts on the switch. Fig. 4 shows the relative positions of the two switch sections, S2(a) and (b) and how the connections are made.

The a.t.u. will require terminations for the receiver and antenna. The lead between the a.t.u. and receiver is coaxial cable and I used a cheap phono plug and socket for this connection, but any suitable screened plug and socket arrangement will serve. A couple of screw or plug and socket terminations are required for the Antenna and Ground — we oldies like to call them Aerial and Earth — connections.

## Using the ATU

Using the a.t.u. with a receiver is a trial and error process. The a.t.u. is placed in line with the antenna as shown in Fig. 1 and the required band tuned with C1 set to about half-mesh. Using S1, select taps on L1 until the signal strength increases. At the loudest position, adjust C1 to peak up the signals. Once this has been done, it is a good idea to try peaking C1 on the S1 switch position, either side of the one selected. There may be more than one

peaking position for L1/C1 combinations so choose the one which gives the best results.

Experiment with the a.t.u. on various bands trying a range of control settings. For the average "bit of wire down the back yard" only the L/C position on S2 will be required. If a very long wire is used the C/L combination may give better results.

Make notes of the settings of L1 and C1 which give the best results for the frequencies and bands which are in common use. It is a good idea to make up a table of settings so that when changing band the settings for the a.t.u. are known in advance.

The L-match is the simplest of circuits, but what an improvement it can make to any receiving set-up. □

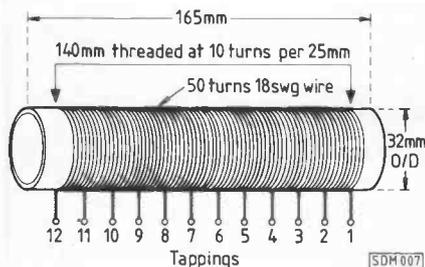


Fig 3

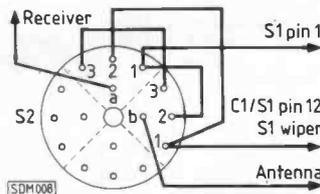


Fig 4

## YOU WILL NEED

### Capacitors

300pF variable 1 C1 (1)

### Inductors

Tapped a.t.u. coil 1 L1 (1)

### Switches

Rotary wavechange

1p 12w 1 S1

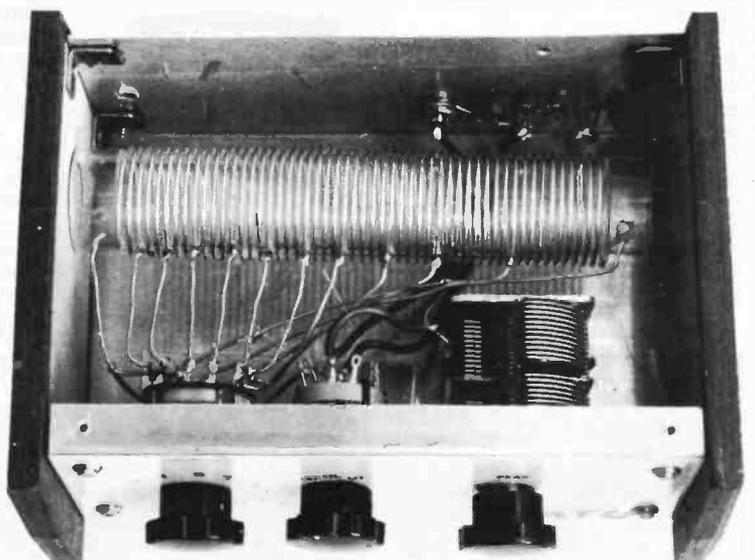
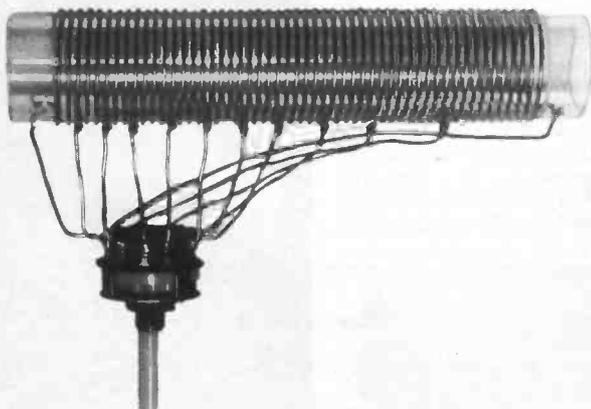
4p 3w 1 S2

### Miscellaneous

Minffordd J14 Equipment Case 203 x 152 x 76mm (2); Knobs to fit S1,2; 18 s.w.g. tinned copper wire; Terminals and sockets (see text).

(1) J. Birkett, 25 The Strait, Lincoln LN2 1JF. Tel: (0522) 20767.

(2) Minffordd Engineering, Sun Street, Ffestinog, Gwynedd. Tel: (076676) 2572.



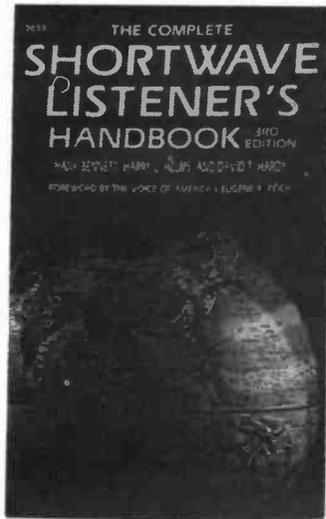
**THE COMPLETE SHORTWAVE LISTENERS HANDBOOK 3rd Edition**  
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 130 x 208mm, 294 pages. Price £15.30 (paperback ISBN 0 8306 2655 7)

Shortwave listening is becoming evermore popular, and enthusiasts are always on the look out for more books to help them in the hobby. The newcomer to the hobby always has so many questions they want answered, but where do these answers come from?

Obviously in the States the same thing is happening and that's why this book has been written. Readers in other countries do need to bear in mind the book is primarily written for the American market. When it comes to talking about periodicals and societies, they are all American addresses given.

Other subjects covered are radio receivers, antennas, radio waves and propagation, f.m. DXing, TV DXing, and logbooks to name but a few.

So, if you have unanswered questions, this reference book could very well be of help to you. EKR



**BETTER RADIO/TV RECEPTION A Non-technical Approach**  
 by Ash Nallawalla, Arthur T. Cushen MBE & Bryan D. Clark  
 Published by Ashley Publishing  
 209 x 280mm, 125 pages. Price £9.95 (paperback)  
 ISBN 0 9588532 0 7

This book has been written with the s.w.l. and DXer in mind.

If you have been in the hobby for a while, you may find the book a little too simplified, yet it really is an enjoyable and easy read. Although written by an Australian it isn't overly biased towards that continent.

The opening chapter, "An Overview", outlines and explains many of the words associated with radio and TV reception. It also contains a mini glossary of radio terms, abbreviations and jargon, which lists one or two I'd not come across before.

Other chapters include sections on receivers — choosing one, the different types available, prices, problems, features and controls, etc; antennas — terminology, types of antennas, connecting the antenna, tuners, etc; major and minor broadcasts to detail just a few.

The Appendices are very useful, they include sample log sheets, time



difference charts and useful addresses.

So, if you're interested in "having a go" at DXing, then this book should start you off in the right direction. EKR

## OLD TELEPHONES

by Andrew Emmerson

Published by Shire Publications Ltd

150 x 210mm, 32 pages. Price £1.25 (paperback)

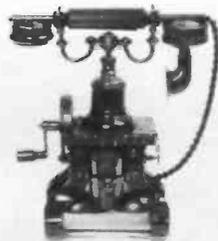
ISBN 0 85263 781 0

Have you ever wondered how the modern telephone came to look like it does? Well, wonder no more.

Although the telephone is now over 110 years old, according to the author of this interesting little book, one of Alexander Graham Bell's original instruments could be successfully connected to the modern system.

The book charts the progress of the telephone from its early days until about 1936. It also gives an interesting insight into the users of these early telephones, the switchboard operators (who could forget them) and the design of the 'phone boxes — you can't beat the old "Jubilee" kiosk of 1936.

The author also gives the reader a list of further reading and interesting places to visit. EKR



## THE SLOW SCAN COMPANION

by C. Grant Dixon G8CGK, John Wood G3YQC & Mike Wooding G6IQM

Published by BATC Publications, 14 Lilac Avenue, Leicester LE5 1FN

147 x 210mm, 100 pages. Price £3.50 inc P&P (paperback)

Anyone interested in SSTV will find this book an invaluable help. It doesn't matter whether you are a home constructor or a purchaser of "black boxes", both aspects are catered for.

There are many tried and tested circuits and designs for those who like wielding a soldering iron as well as descriptions of commercial equipment. Quite a large section of the book is devoted to computing in SSTV, as this seems to be the way many participants in the hobby are going.

The book is full of black and white photographs of not only pieces of equipment but some "off-air" SSTV pictures — so you can see what you have been missing. Altogether a very informative book.



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432-17T	17 Ele Long	2.9M	15.0 dBd	£45.08	A
<b>2M</b>					
144-5	5 Ele	1.8M	9.2 dBd	£22.48	A
144-7T	7 Ele	1.6M	10.0 dBd	£27.77	A
144-8T	8 Ele Long	2.45M	11.0 dBd	£35.95	A
144-14T	14 Ele	4.5M	13.0 dBd	£53.72	A
144-19T	19 Ele	6.57M	14.2 dBd	£64.26	A
144-6X	6 Ele Crossed	2.5M	10.2 dBd	£45.71	A
144-GP	Ground Plane		Unity	£16.57	B
<b>4M</b>					
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70/5	5 Ele	3.45M	9.2 dBd	£52.60	C
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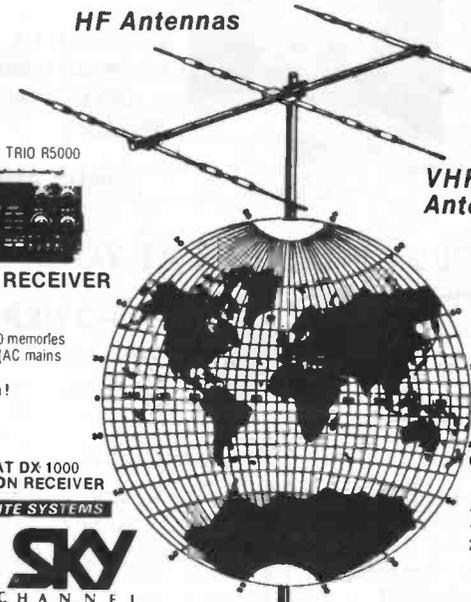
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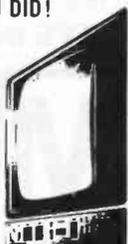
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# BANDSCAN

with Peter Laughton

## America Sign-On

By the time we go to press, WCSN from Boston USA should be reality. Late in 1985, the religious organisation which owns the *Christian Science Monitor* announced that they had plans to expand their radio activities. As well as weekly news programme over Radio Luxembourg, they planned a short wave broadcast station for Europe and North Africa. A few months later, a plot of land near Scotts Corner in the state of Maine was cleared and a 500kW short wave transmitter ordered from Switzerland. The transmitting facilities are now ready, and test transmissions should have begun by now. These were originally scheduled for late 1986, but heavy snow delayed the building work.

Programmes from Boston are fed by satellite to the transmitter site several hundred miles north. Although the Christian Science Church funds the entire project, the station manager Bob Nunez says that there will be a strict distinction between news and current affairs programmes, and the religious segments. This follows the pattern of their successful newspaper called the *Christian Science Monitor*. Best times to try will be between 0700 and 0900GMT on 7.365MHz, and again 2000-2300 on the same channel. 9.745, 9.840 and 17.640MHz are possible alternative channels for services to Africa. The contact address is WCSN, 1 Norway Street, Boston MA 02115 USA, and reception reports are appreciated.

## The Beacons

On American Samoa, plans are now going ahead for a new medium wave religious station after some time in the ice box. John Veeon of Quality Media Corporation says the "Pacific Beacon", as it's to be called, will be the third of a series.

Meanwhile the same organisation has sold its station in the Caribbean to an American religious organisation. Programming on the "Atlantic Beacon" on Turks and Caicos islands, which came on the air late last year on 1.570MHz, is assembled in Florida USA. Buddy Tucker of Christian Radio Productions says they've had quite a bit of response from medium wave listeners in Europe listening deep into the night. If you do hear them, the contact address is via Box 5321, Fort Lauderdale Florida 33310 USA.

## NDXE Global Hoax?

Only Dickson Norman, an entrepreneur in Opelike Alabama USA really knows if his plans for a global **stereo** commercial **s.w.** station are really reality. The construction permit issued by the FCC for his station is still valid, but an FCC spokesman in Washington DC has explained that NDXE is not yet a registered callsign. The play on "in Dixie" is clever, but broadcast

*Welcome to this new column in which we'll be looking at the background to international communication developments. Whilst the intention is to focus specifically on radio for the time being, it's clear that a lot of international broadcasting is becoming inter-related.*



Photo of Christian Science Monitor Headquarters in Boston Mass USA

station callsigns in the US all begin with a 'W' or a 'K'. Some US utility services use an 'N' callsign, but it will take a lot of lobbying for the rules to be changed to include a broadcast operation along the lines being planned.

Although announced back in 1985, NDXE hasn't got much further than a few publicity releases and promo tapes sent to other shortwave stations. The owner says the broadcasts will be in stereo using the Kahn system adopted by some US a.m. stereo medium wave stations. However there are no stereo-capable shortwave receivers on the market, and the results are



NDXE Global Radio Sticker (for 1986!)

likely to be disappointing bearing in mind the high congestion of the bands.

Although NDXE has no transmitter, it has a very active promotion campaign running with T-shirts, stickers and other goods. Membership of a listeners club is offered for a (mere) US\$31.00, although audible complaints have started to appear from members that they don't get much for their money. The latest releases say that NDXE will start this year — until you hear a carrier though it might be wise to refrain from joining the "listeners club".

## Time to Go?

Time signal stations on shortwave seemed to be a threatened species. Not only do they offer a useful time reference, but the frequency is spot on too. But for who? Such services are expensive to run, and it seems that many research institutions and marine traffic have other ways of getting the correct time than shortwave. Last May, New Zealand shut its standard frequency station ZLF. Others in Europe are considering doing the same thing, or at least reducing their activity to output on very low frequencies only. The latest to be threatened is VNG in Lyndhurst, Australia. Telecom Australia, which runs the service, wrote to a number of Australian scientific bodies asking if they would be interested in contributing towards the cost of maintenance. The response was disappointing. However, Australian amateur radio operators have sent in a plea to keep the service going, and the latest word is that the service will continue "for the moment".

## Micro-Flares

In the early hours of Monday February 9, engineers in Alice Springs, in the centre of Australia, let off a very large helium balloon. And so began a flight designed to last between 15 and 20 days and float at heights of some 40km above the earth's surface. The craft belonged to the American NASA organisation, and underneath the 1 million cubic metre balloon was a heavy payload with experiments from the University of California at Berkley.

International broadcasting depends on a refractive layer in the atmosphere to get signals round the globe. This layer, known as the ionosphere, isn't perfect, and its properties are heavily dependent on radiation from the sun. One of the most disruptive solar events that has a direct bearing on the ionosphere is called a solar flare. This is a sudden, unpredictable brightening of the sun's chromosphere, usually in the vicinity of a sunspot group. It mainly consists of an enormous outburst of ultraviolet radiation, together with very energetic X-rays and cosmic rays. The particles take about up to 3 days to reach the earth in the solar wind, and when they interact with the earth's ionosphere, radio

reception is often disrupted. You'll hear people talking about a Sudden Ionospheric Disturbance or "s.i.d".

One of the experiments on the high-flying balloon was designed to make a detailed examination of what are called micro-flares, discovered on a previous balloon experiment. Dr Robert Len, project scientist on the mission, says the information gained from studying these small flares will give us a better understanding of much larger solar flares. At present we know very little about the very complex physical and chemical processes taking place up there.

The balloon transmitted data every 45 seconds back to a command centre in Toulouse, France. When the data is processed in about eight months time, we may know a little more. The term "micro" in micro-flares is all relative. Such an X-ray outburst is still much larger than the size of the earth, though it is not large enough to cause communication problems on earth.

## Jamming Update

In January, Soviet jamming of the BBC's Russian service suddenly stopped, leading to newspaper reports that a partial decrease had occurred in the level of deliberate short wave interference. However, the US financed broadcaster, Radio Free Europe/Radio Liberty based in Munich West Germany has done further monitoring research. They believe the 10 or so jamming transmitters in the Soviet Union that were used against the BBC are now being used to block reception of their station even more effectively than previously. Overall then, the levels of jamming appear to be about the same... though politics could change the situation at the push of a switch.

## Goodbye MF and HF

Radio Malaysia's three national networks in Tamil, English and Mandarin have ceased to be heard on medium and short wave. Groups representing Tamil speakers have objected to the change, saying that although the v.h.f. f.m. frequencies give much better quality in city areas, reception is often poor in outlying areas, such as on the rubber plantations. High energy costs and a desire to avoid too much duplication are thought to be the reason behind the decision to move away from the use of medium and short wave.



**Radio Nederland  
Wereldomroep**

Radio Netherlands special 40th anniversary logo

The national service in Malay however remains on medium wave as usual. Short wave listeners in the area though aren't complaining, because they can now hear stations previously blocked by the local transmitters!

## Words on the Woodpecker

It was back in July of 1976 that complaints were first made about a new form of interference on short wave. Later its activity increased, and amateur radio operators christened it the "Woodpecker" because of its "rat-tat-tat" sound beating 10 times a second. The respected non-government non-profit group in America called ANARC has now come out with a report on the beast. It goes into some depth with charts and detailed text explaining how several hundred volunteers around the world tracked what's widely believed to be an over-the-horizon radar system based in the Soviet Union. Although one of the main sites near Kiev, Ukraine hasn't been heard for some time, as the sunspot cycle takes an upward trend it will probably return. In some parts of Scandinavia when it operated on or near 10.7MHz, the PTT in Norway and Sweden received complaints from the public that it was breaking through onto simple domestic v.h.f. f.m. sets. The 60 page report is offered for cost price to

listeners interested in the findings. That works out at US\$9.50 including airmail postage in Europe. T-shirts with the "No-Woodpecker" road-sign style logo are being sold for US\$10 to raise funds to cover the costs of the project. Further information from Woodpecker Project, 1634 15th Street NW, Washington DC 20009 USA.

## Holland's Diamond Jubilee

Radio Netherlands in Hilversum is celebrating a double anniversary on April 15. It's 40 years since the Radio Netherlands foundation was formed, and 60 years since short wave broadcasts began from The Netherlands, indeed Western Europe. Broadcasts from the station PCJJ began in 1927, though one of the famous announcers Eddy Startz quickly dropped the second J in the callsign.

He then referred to the letters as standing for "Peace Cheer and Joy". On the anniversary date the musical interval signal used on air will be changed. A new digital version of the current melody, "Merck toch hoe sterk" recorded at the Carillon in Breda will be used instead. Letters sent in the month of April will get a special Radio Netherlands 40th anniversary postal franking mark. These are expected to become collectors items in a few years time. □



ANARC Woodpecker project

## The Woodpecker Project

Coordinated by the  
Association of North American Radio Clubs'  
Over-the-Horizon Radar Committee  
1634 - 15th St. NW  
Washington, DC 20009  
U S A



# KIT REVIEW

## C. M. Howes ASL5 Audio Filter

C. M. Howes Communications is a company with a reputation for producing good quality kits at a reasonable price. The ASL5 audio filter is intended for external use to improve the selectivity of your communications receiver on all modes of reception — a.m., f.m. and s.s.b. as well as c.w. (Morse code). It is claimed to be suitable for use with most popular makes and models of receivers and transceivers and offers both a narrow-band c.w. filter and a sharp roll-off s.s.b. filter with tighter filtering than most crystal filters.

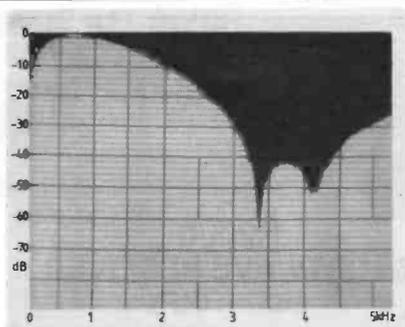
Filtering for use with narrow-band speech modes (a.m., f.m. and s.s.b.) is achieved by using two passive notch filters to give a steeper roll-off at the top edge of the speech passband. To provide the narrow bandwidth required for c.w. reception the signal is also passed through a pair of active twin-T networks before being fed to the audio output stage. For those who do not need the audio amplifier and intend to fit the filter p.c.b. inside their receiver case then the kit is available with just the filter sections under the part number CSL4.

This kit provides all the components required to complete just the printed circuit board, leaving the constructor to provide the screened case, sockets and switch. By taking this course the final appearance can be tailored to match the constructor's station as well as keeping the kit price down.

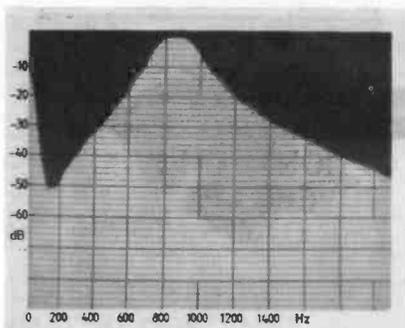
The kit comes packaged in a plastics bag with a set of well written and understandable instructions. These cover all the aspects of building the kit including notes on the tools required and how to solder if you are not too *au fait* with electronic assembly techniques. All of the components supplied in the kit were of top quality and none were missing.

The p.c.b. is screen printed on the component side with the component positioning and numbers so that there should be no difficulties in getting the leads in the correct holes. All the components are identified in the parts list with not only their values but also their

*In SWM we will be building and testing a variety of kits which will enable you to add to the versatility and enhance the performance of your receiving station. This month the Editor takes a look at the recently introduced Howes ASL5 audio filter kit.*



With the switch in the s.s.b. position.



With the switch in the c.w. position.

identifying markings or colour codings. For the constructor just starting out, this is vital information, particularly as components such as capacitors are notorious for having their values indicated in many different ways.

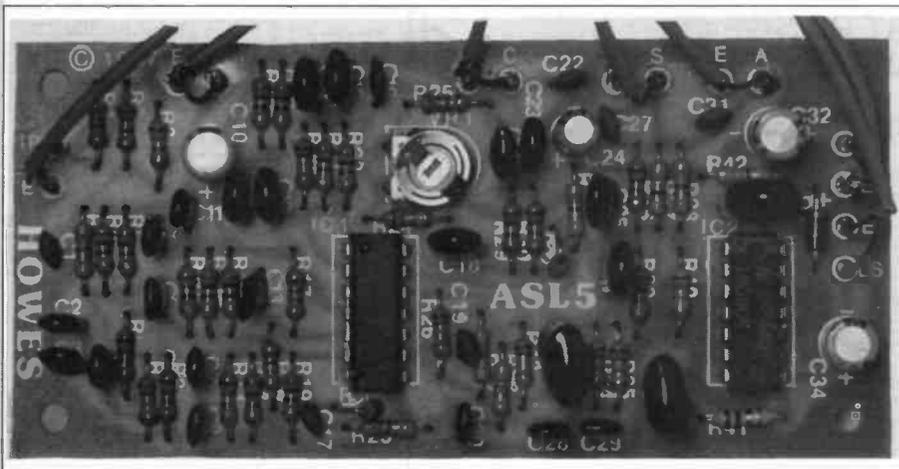
No difficulties were encountered during construction and all the components fitted into their holes in the p.c.b. with no straining or forcing being needed. All the

external connections to the p.c.b. are made to terminal pins and each connection also has an earth pin alongside for terminating the cable screens if screened leads are used. As explained earlier no case is provided and you will also require a single pole three way switch which can be a small rotary "wave-change" switch and two jack sockets to match the types used for headphones and speakers elsewhere in your station. The time taken for an experienced constructor to assemble the p.c.b. should be under an hour, and if care is taken to check the work thoroughly at each stage, a less experienced worker should have no problems in completing the project in an evening.

The instructions show how to connect the filter to a radio and explains how to use the unit to get the best clarity of audio. The c.w. filter output level is set by a preset potentiometer on the p.c.b. and this is, in fact, the only adjustment needed.

In the lab the filter's performance measured up to the specification as shown in the table, and the two spectrum analyser traces show the overall filter responses in the s.s.b. and c.w. switch positions. Used in conjunction with the office FRG-7 receiver and an external loud-speaker the difference in the audio was spectacular, the hash being reduced to a very acceptable level making listening much more pleasant. With the filter switched to the c.w. position it was possible to eliminate a strong signal close to a weak one, making it possible to copy the weak one even though it was suffering strong QSB (fading). Without a doubt this small unit is well worth fitting and would make a great difference to the performance of almost any receiving station.

The ASL5 audio filter costs £14.90 in kit form (£22.50 assembled p.c.b. module) and the CSL4 is £9.90 in kit form (£15.90 assembled p.c.b.), plus 90p post and packing direct from **C. M. Howes Communications, 139 Highview, Vigo, Meopham, Kent DA13 0UT. Tel: (0738 23129** and we would like to thank them for supplying the review kit. □



## SPECIFICATIONS

SSB	> -50dB at 3.3kHz -60dB at 3.3kHz -60dB at 4.2kHz -52dB at 4.1kHz
CW Bandwidth (-6dB)	300Hz centred on 850Hz 280Hz centred on 820Hz
Power	12 to 14V d.c.

(Measured performance in italics)

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# REALISTIC PRO-2004 PROGRAMMABLE SCANNER

*The Realistic PRO-2004 is the latest programmable scanning receiver from Tandy and covers frequencies in the two bands 25 to 520MHz and 760 to 1300MHz. Designed for monitoring stations such as public utilities, aircraft, CB and amateurs as well as broadcast radio and TV stations it has a lot of useful features claimed to be found only on this set.*

## Specifications

Frequency Coverage: 25 to 520MHz  
760 to 1300MHz

Scanning Intervals 5; 12.5; 50kHz

Modes: Wide f.m.;  
Narrow f.m.; a.m.

Sensitivity  
(w.f.m. 30dB signal to noise at 22.5kHz dev.)  
25 to 520MHz:  $3\mu\text{V}$   $1.8\mu\text{V}$   
760 to 1100MHz:  $3\mu\text{V}$   $1.8\mu\text{V}$   
1100 to 1300MHz:  $10\mu\text{V}$

(n.f.m. 20dB signal to noise at 3kHz dev.)  
25 to 520MHz:  $0.5\mu\text{V}$   $0.5\mu\text{V}$   
760 to 1100MHz:  $0.3\mu\text{V}$   $0.5\mu\text{V}$   
1100 to 1300MHz:  $3.0\mu\text{V}$

(a.m. 20dB signal to noise at 60% mod.)  
25 to 520MHz:  $2\mu\text{V}$   $1.7\mu\text{V}$   
760 to 1100MHz:  $2\mu\text{V}$   $2.1\mu\text{V}$   
1100 to 1300MHz:  $3\mu\text{V}$

IF Rejection:  
(610MHz at 70MHz): 60dB 85dB

Selectivity  
(n.f.m. and a.m.):  $\pm 9\text{kHz}$  -6dB  
 $\pm 15\text{kHz}$  -50dB

(w.f.m.):  $\pm 150\text{kHz}$  -6dB  
 $\pm 300\text{kHz}$  -50dB

## Specifications

Squelch Sensitivity  
(n.f.m. and a.m. threshold)  
25 to 520MHz:  $0.5\mu\text{V}$   
760 to 1100MHz:  $0.5\mu\text{V}$   
1100 to 1300MHz:  $3.0\mu\text{V}$   
Tight signal to noise 25dB

(w.f.m. threshold)  
25 to 520MHz:  $3\mu\text{V}$   
760 to 1100MHz:  $3\mu\text{V}$   
1100 to 1300MHz:  $10\mu\text{V}$   
Tight signal to noise 40dB

Scanning Rate: 16 channels/s (Fast)  
8 channels/s (Slow)

Search Rate: 16 steps/s (Fast)  
8 steps/s (Slow)

Search Rate: 16 steps/s (Fast)  
8 steps/s (Slow)

Priority Sampling: 2s  
Antenna Impedance:  $50\Omega$   
Audio Power: 1.8W 1.8W@ 3% t.h.d.  
Tape Out: 600mV into  $10\text{k}\Omega$

Power: 220 - 240V a.c. 20VA  
13.8V d.c. 12W

Memory Back-up: 9V

Dimensions: 75 x 275 x 230mm

Weight: 3.2kg



# REALISTIC PRO-2004 PROGRAMMABLE SCANNER

The review scanner was kindly loaned by Radio Shack, 188 Broadhurst Gardens, London NW6 3AY. Tel: 01-624 7174.

Neatly designed and built in a matt black plastics case, the sloping front panel carries the controls and display panel. The multi-purpose green liquid crystal display is clear and easily read and shows which channel and frequencies are being scanned, monitored or programmed, as well as the status of the channel and the operational mode of the receiver. The brightness of the display can be dimmed with the DIMMER switch.

## Keypad

The scanner is switched ON and OFF using the rotary VOLUME control. Alongside this is the SQUELCH control, used to eliminate noise between signals. On the right of the panel is the membrane, pressure sensitive keypad, used to control the operation of the receiver. This keypad is divided into colour coded blocks, with each key clearly marked with its functions. As each key is operated a bleep is emitted to indicate that the key has been operated. The instruction manual describes the purpose of each key in a clear and concise manner — as long as you understand the basics of how to drive a scanner. If this is to be your first scanner then it will pay you to obtain a good book on just what scanners are all about, such as *Scanners* by Peter Rouse. After all, when you buy a new car you don't expect the instruction manual to teach you how to drive!

The back panel is equally simple with a 10dB attenuator switch for use with very strong local signals, a TAPE OUT, EXTERNAL SPEAKER and 12V DC jacks. A compartment carries a 9V dry battery for memory back-up in case of power loss or if the scanner is unplugged from the mains. Battery life is quoted as about six months when the main power source is disconnected for a prolonged period. Mains

power is supplied via the built-in mains lead — fitted with a moulded-on 2-pin plug which you will have to either plug into a shaver adapter or cut-off and replace with a standard mains plug. A small hole in the panel gives access to the RESTART button to enable the receiver to be reset if it "locks up" for any reason.

## Antennas

Finally the back panel carries the ANTENNA socket. This is a standard 50Ω BNC socket and the set is supplied with a telescopic whip antenna with a mating plug. This gave quite good results for local and strong signals but for the best results the scanner should be used with a suitable wide-band antenna mounted as high as possible outside and fed by a good quality low-loss 50Ω coaxial cable. Tandy offer a base antenna for the v.h.f./u.h.f. and airbands in their current catalogue but this has not been tried with the scanner.

## Memory Banks

The memories of the PRO-2004 are divided into 10 banks each of 30 channels giving 300 discrete frequencies in all. You could store, say, all the 144MHz amateur repeaters in Bank 1, the 430MHz ones in Bank 2, v.h.f. broadcast stations in Bank 3, Airband frequencies in Band 4, and so on.

## Monitor Bank

A further MONITOR bank allows you to store up to ten other frequencies which you may have found during a search and wish to store temporarily. This facility is very useful and saves you the hassle of having to make written notes. The operation of the Monitor Bank is very simple.

Once you have found a frequency that interests you all you have to do is just press MONITOR on the keypad and that particular frequency is stored in the next vacant one of the ten Monitor memories. You can transfer any of the Monitor Bank frequencies to any of the 300 main locations as and when you want to.

Any or all of the memory banks may be scanned as desired by entering the appropriate commands from the keypad. Specific channels may be locked out if desired and this is indicated on the front panel display. Frequencies and modes are entered directly from the keypad along with all the other functions such as priority channel, 5, 12.5 or 50kHz search steps and scan speed.

## Birdies

All synthesised receivers have "birdies" — the products of internally generated signals that show up as spurious inputs. If the scanner comes across one of these "birdies" it will stop on that frequency, thinking it to be a real signal. If it is strong enough then the scanner will become locked to that frequency and will not continue scanning even if the SQUELCH control is backed right off. The instruction manual contains a table showing the frequencies of the commonest "birdies" to watch out for, and this list is most useful.

## Modes

The PRO-2004 automatically selects the mode dependent upon the frequency being received. This function is preprogrammed into the scanner but if it is desired to listen using a mode different to that preprogrammed then it is simply a push of the MODE key to select a different mode. The key operates sequentially to give a.m., narrow-band f.m. or wide-band f.m.



# STARTING OUT

BRIAN ODDY G3FEX

The advent of the modern multi-band transistor portable receiver, with its convenient built-in whip antenna, has enabled many a listener to explore the short wave bands for the first time. The thrill of hearing a direct broadcast from some far-off place in the world can quickly lead to further exploration of the bands and to the discovery that there is a whole new world of listening out there. Before you know it, you could find that you have become a short wave listener (s.w.l.).

Of course the s.w. broadcasters hope that when you hear their signal for the first time you will become sufficiently attracted by their programmes to want to become a regular listener. Consequently they usually offer a wide variety of cultural and religious items, discussion programmes, sports news, also bulletins of local and world news which are often followed by commentaries. However, depending upon your political point of view, these may seem to be purely propaganda.

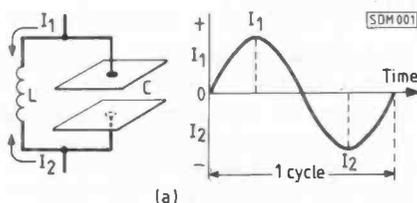
In an attempt to ensure that their signal reaches their chosen **target area**, many of the broadcasters use high power transmitting installations, capable of reaching virtually any area of the world provided the reception conditions are suitable.

It is possible to just search the bands for signals in the hope that they will prove to be interesting, without having any idea how the signals are reaching your receiver or how to get the best out of the prevailing reception conditions at the time. Like any other hobby, there are many aspects which need to be considered if you are going to make a real success of short wave listening. In order to help you to get the best out of this fascinating hobby, I will be writing about some of the interesting technical aspects of it each month in this series. So let us now start to look at things in more detail.

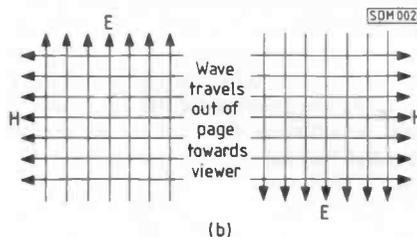
## What are Radio Waves

Perhaps the first thing that we should consider is the very nature of a radio wave so that the commonly used terms like **wavelength** and **frequency**, which are so often quoted by broadcasters and s.w.l.s. alike, can be understood and put to practical use. All radio waves have a number of things in common and the basic forces needed to produce them are generated in a transmitter.

It is the job of the first stage of the transmitter, usually called the **master oscillator**, to generate the basic radio-signal. The heart of the master oscillator consists of a coil of wire, called an **inductance** (L), attached to two metal plates which are insulated from each other, call-

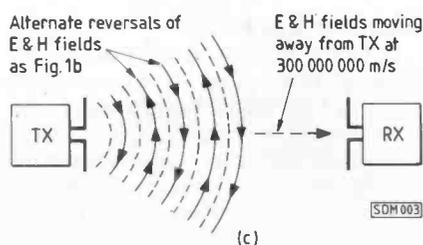


ed a **capacitor** (C), to form a **tuned circuit**. A tiny electric current passes through the coil in alternate directions at extremely high speed, perhaps thousands or millions of times a second, dependent upon the values of L and C. The current is said to be **oscillating** as it moves in this way and each time it passes back and forth it is said to have completed one **cycle** — see Fig 1a. The tiny oscillations are amplified in subsequent stages of the transmitter before being processed, or **modulated**, to include the programme information. They are then applied to a radiator, or **antenna**, where radio waves (or more correctly **electro-magnetic waves**) are set up.



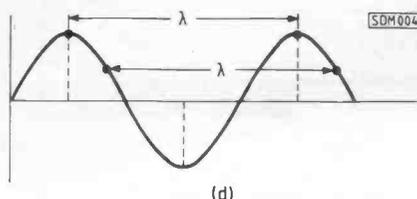
## Electric and Magnetic Forces

The waves consist of **electric** (E) and **magnetic** (H) forces which always travel at right angles to one another — see Fig. 1b. By convention the waves are said to be **polarised** in the direction of, or parallel to, the "E" lines of force. The magnitude and direction of the "E" and "H" forces change with each half-cycle of the transmitted signal as they move away from the antenna in concentric spheres called **wavefronts** — see Fig. 1c. They move away from the antenna at the incredible speed or **velocity** (V) of about 300 000 000 metres per second, or 186 000 miles per second, which is the speed of light. No wonder they can arrive at a distant location on the far side of the world almost instantly, for it only takes about one seventh of a second for them to travel around the world.



The distance travelled by the wave during one complete cycle of the transmitted signal is called the **wavelength** ( $\lambda$ ) and is measured in **metres**. It may be measured between any two points on the wave provided the field intensity is similar in magnitude and sign (Fig. 1d). The rate at which the cycles occur is called the **frequency** (f) and is measured in **hertz** (Hz).

Because radio involves high frequencies, it is necessary to introduce the terms **kilo** meaning 1 000 or  $10^3$ , and **mega** — meaning a million or  $10^6$ . Thus 1000 cycles per second = **1 kilohertz (1kHz)**; similarly, 1 000 000 cycles per second = **1 megahertz (1MHz)**. It is important to be able to convert kilohertz into megahertz and *vice versa*. Fortunately the rules are very simple. To convert kHz to MHz move the decimal point three places to the left: for example, 7500kHz becomes 7.500MHz or simply 7.5MHz. To reverse the procedure move the decimal point three places to the right. Thus 2.4MHz = 2.400MHz = 2400kHz.



# STARTING OUT

The Radio Spectrum

Division	Frequency Range
v.l.f. (Very Low Frequency)	3kHz – 30kHz
l.f. (Low Frequency)	30kHz – 300kHz
m.f. (Medium Frequency)	300kHz – 3MHz
h.f. (High Frequency)	3MHz – 30MHz
v.h.f. (Very High Frequency)	30MHz – 300MHz
u.h.f. (Ultra High Frequency)	300MHz – 3000MHz
s.h.f. (Super High Frequency)	3000MHz – 30000MHz

## Wavelength

There is a simple relationship between velocity, frequency and wavelength, namely;

$$\text{Velocity (V)} = \text{Frequency (f)} \times$$

$$\text{Wavelength } (\lambda), \text{ or } V = f\lambda \dots (a)$$

By transposing formula (a) we obtain (b) and (c):

$$\lambda = V/f \dots (b)$$

$$f = V/\lambda \dots (c)$$

To make use of the formula in (b) and (c) we need only enter the value of either f or  $\lambda$ , since we already know that  $V = 300\,000\,000$  metre/s, so let us now make some simple calculations.

*Example 1:* What is the frequency of a station operating on a wavelength of 300 metres?

Using formula (c),

$$f = V/\lambda = 300\,000\,000/300 = 1\,000\,000\text{Hz or } 1\text{MHz.}$$

*Example 2:* What wavelength corresponds to 10MHz?

Using formula (b)

$$\lambda = V/f = 300\,000\,000/10\,000\,000 = 30 \text{ metres.}$$

**Note:** The formula can be simplified to  $\lambda = 300/f$  if the frequency is in MHz, so this calculation could have read  $\lambda = 300/10 = 30$  metres.)

## Spectrum

Armed with the fundamental terms of wavelength and frequency, we can now consider the electro-magnetic spectrum

as a whole. The low frequency limit is about 10kHz and it is important not to confuse a 10kHz radio signal with a 10kHz audio sound which consists of compressions and rarefactions of the air – you cannot hear a 10kHz radio signal. The upper limit of the spectrum extends beyond 30 000MHz towards the infra-red and visible light regions. The various areas of the radio spectrum are classified into seven groups, as shown in the table.

The frequencies used by broadcast stations in the h.f. spectrum are allocated under agreements drawn up by the International Telecommunication Union (ITU) located in Geneva. This topic will be discussed in a future article. □

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Chas. E. Miller continues the saga of his efforts in getting a wartime German receiver, found in a friend's garden shed, to work again.

**MAY ISSUE  
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THURSDAY 23rd APRIL**

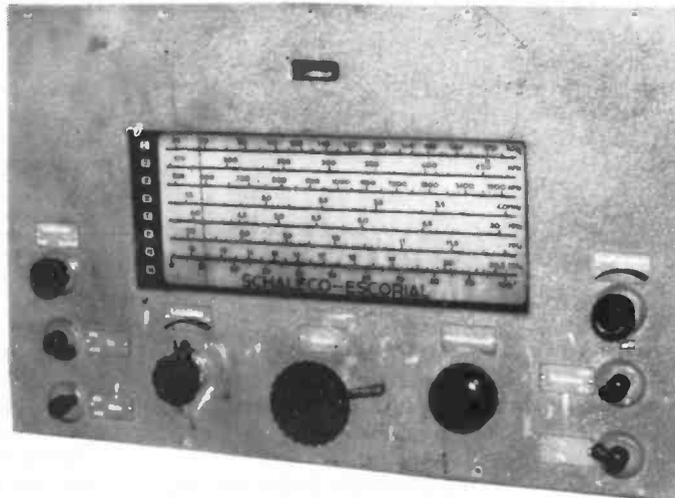
### REGULAR FEATURES

Follow what is going on in the world of listening with the regular Seen & Heard columnists. For beginners Brian Oddy continues with his Starting Out feature and Peter Laughton keeps you up to date with broadcast station news in Bandscan.

Contents subject to last minute revision.

# Restoring a Communications Receiver from Nazi Germany

Chas. E. Miller



## Part 1

The inauspicious start to one of the most interesting and unusual pieces of radio restoration to come my way was, improbably, the failure of our central heating system one cold day last February. The fault lay in a worn-out oil pump, but fortunately I am blessed with a circle of friends and acquaintances who are able to supply almost anything at the drop of a hat. A phone call to one of these benefactors resulted in a second-hand pump being delivered that same day. My friend arrived with it whilst I was working on an article dealing with the R1155 Receiver, and we naturally fell to discussing these fine sets.

It transpired that during a recent visit to a client also with heating problems, my friend had spotted an 1155 sitting on a garage shelf, apparently uncared for and unwanted. He recommended me to contact the owner with a view to acquiring the set, which I did as soon as possible. It turned out that the 1155 was definitely not for sale — it was awaiting, and had been for some time, the arrival of someone who could put it to rights. However, the owner said that he had a German communications RX with which he was willing to part, and he invited me to inspect it in its present home, a small garden shed.

## Exchange

What I saw was a field-grey cabinet of about AR88 size, housing a receiver of quite modern appearance. A large rectangular dial dominated the front panel, divided horizontally into sections for seven wave-bands, plus a logging scale. In large letters at the bottom of the dial was the legend *Schaleco Escorial*. There was a small meter mounted above the dial and three large knobs beneath it, arranged horizontally. On either side were vertical columns of three smaller knobs, four of them evidently switches. Each control was labelled, in German, but my scanty knowledge permitted me to

*When Chas. E. Miller set out on the trail of a replacement oil-pump for his central heating system he little expected to unearth a German receiver collecting dust in a friend's garden shed. This is the story of how he restored this interesting set to working condition in spite of some unusual component problems.*

translate only a few of these at the time. However, what I saw was more than enough to whet my appetite, and it was with considerable pleasure that I accepted the owner's suggestion that I should take the German set in exchange for repairing his 1155. Not surprisingly, this latter operation was carried out in record time!

When I collected the German set the ex-owner had been kind enough to clean it up by blowing out most of the dust and cobwebs, and had even gone so far as to apply mains to it to see if it might emit some kind of noise. As it happened, only mains- and grid-hums resulted, with nary a trace of a station. He was rather concerned about this, but for myself I work on the theory of the greater the challenge, the greater the eventual satisfaction when it is overcome, and I hurried the set home with pleasurable anticipation.

## Side-contact Bases

My initial inspection of the interior of the RX suggested that it was a lot older than I had at first thought, since it used the old 4V heater side-contact valves that had a brief popularity (in the UK at least) at the end of the 1930s and start of the 1940s. Side contact valves in general lasted longer on the Continent than in this country, but for most of that time had either 6.3V heaters or higher still ratings for

a.c./d.c. series operation. Thus I provisionally dated the set as circa 1939.

The side-contact base, for the benefit of readers too young to have encountered it, dispensed with the normal contact pins and had, in their stead, a series of small "feet" arranged around the periphery of the valve base, and pointing outward. Only a small amount of metal protruded beyond the base to make contact with strip springs in the holder. The latter was a of a cup-like construction and was recessed into the chassis. This, together with the smaller base on the valve, reduced significantly the "headroom" required in a receiver, which was especially welcome in compact sets. However, on the debit side was the small contact area of the "feet" which tended to plague many of the sets which used these valves with bad connections and all the resultant crackles and intermittent reception. They could be regarded, one supposes, as the Continental answer to the British B9G base fitted to the notorious EF50!

Ten valves were immediately visible in the *Escorial*, plus an empty socket that I guessed (correctly as it turned out) might have housed a b.f.o. valve. Those present indicated that there was in all probability one r.f. amplifying stage and, following the frequency-changer, two i.f. amplifiers; and on the a.f. side, one voltage amplifier followed by push-pull output. A closer examination proved this to be so, but before I went into this I had a further look at the front panel.

The wavebands covered, I found, gave virtually uninterrupted coverage from 60kHz to 21MHz, the only small gap occurring between 470kHz and 545kHz. The wavebands are arranged as follows: I, 65 to 175kHz; II, 170 to 470kHz; III, 545 to 1500kHz; IV, 1.45 to 4MHz; V, 3.8 to 7MHz; VI, 6.8 to 12MHz; and VII, 11.5 to 21MHz. On the left hand side of the dial is a vertical indicator showing the bands in

# Restoring a Communications Receiver from Nazi Germany

Roman numerals and individually illuminated by miniature festoon lamps selected by an extra wafer on the wave-change switch.

It was now possible for me to identify the controls positively by tracing them back to their spheres of activity within the set, and they turned out to be as follows: The three large knobs are, from left to right, Volume, Wave-change, and Tuning. Around the wave-change main knob is a concentric lever-type control which operated a further series of levers within the set which terminated in a large coil box on the top of the chassis; the purpose not as yet clear. The three small knobs to the left are, from the top, tone control, gramophone pick-up on/off, and mains on/off. The presence of the first two strongly suggested that the *Escorial* was a dual-purpose receiver, able to be used for communications purposes and for troop information and entertainment work. The incorporation of a push-pull output stage tended to confirm the last supposition. The right-hand set of knobs are, again from the top, r.f. Gain, a.g.c. on/off, and b.f.o. on/off.

Returning to the interior of the set I found an impressive power supply section consisting of a large mains transformer, valve rectifier (AZ1) and dual smoothing chokes arranged one above the other at one corner of the chassis. The smoothing capacitors present were of the wet-electrolytic type familiar to radio service engineers in Philips receivers as being held in place by large screw-threads cast into their cases. The one obviously missing had been roughly replaced by a wire-ended type hanging in mid-air. There were also

some exceedingly scruffy taped joints around the smoothing chokes that cried out for investigation and re-making.

## Trimmer-twiddler

The large coil-box mentioned before lies to one side of the massive tuning condenser, and has a perforated side-plate giving access to the trimmers, etc., within. With considerable heart-sinking I discovered that each access hole had once been covered by a paper seal, and that not one had remained undisturbed. The same applied to the i.f. transformers when I came to examine them. Evidently the set had at some time been in the hands of a dreaded trimmer-twiddler, one of the most pernicious beasties to be encountered in the jungle of radio repairs! These discoveries boded a long and difficult re-alignment session, especially when they were reinforced by the finding of a further batch of coils and trimmers beneath the chassis, none of which had again escaped unscathed.

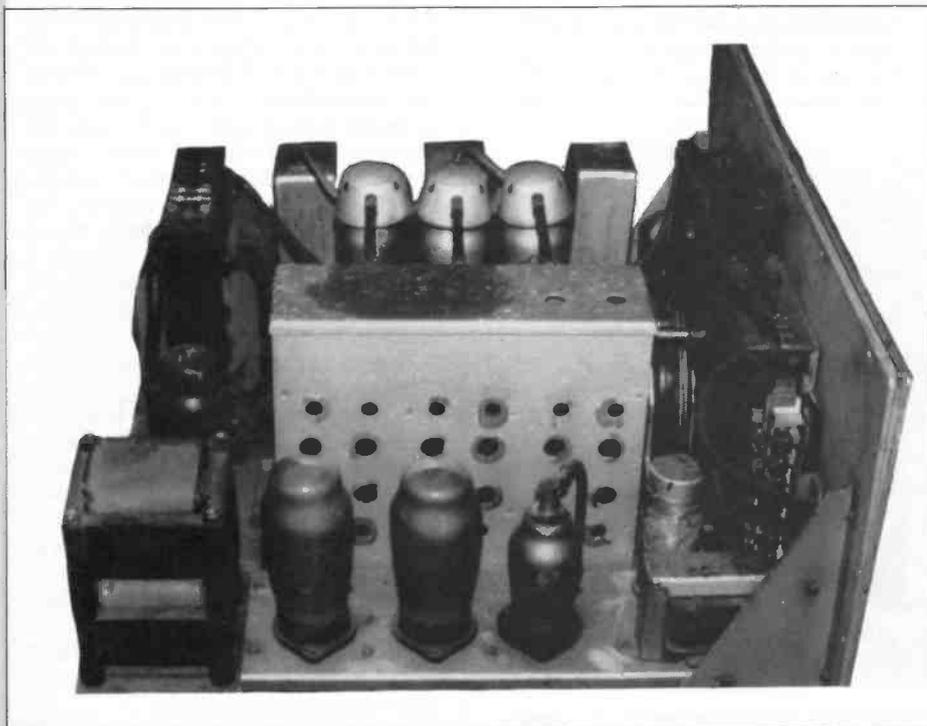
The valve line-up, as found, proved to be as follows: On a small sub-chassis to the right of the tuning capacitor, r.f. amplifier (AF3) Mixer (AF3) and local oscillator (AF7). On another sub-chassis on the extreme right side of the chassis, two i.f. amplifiers (AF7s), and the detector/a.g.c. diode (AB2). Behind this sub-chassis was the then-empty b.f.o. holder, which I guessed would have been another AF7. I was not too happy about the use of the latter type in the i.f. stages, as it is a "straight" pentode, and I would have expected to find variable- $\mu$  types, such as, indeed, the AF3. There is, of course, no guarantee that the valves have not

been swapped around over the years. On the left side of the chassis are the a.f. amplifier (AC2) and the two output valves (AL4s). The AZ1 rectifier is mounted roughly centrally at the rear of the chassis. The presence of a substantial a.f. transformer adjacent to the AC2 suggested that this type of coupling was employed between that valve and the output pair, which proved to be the case.

## Initial Tests

My initial tests were concerned with roughing out a circuit diagram for the h.t. supply and a.f./o.p. stages, followed by voltage checks with the Avometer. Following my invariable practice, I went first for those odd components that had already been replaced by some former engineer. It is in the nature of things that these are likely to be the most vulnerable in a receiver, and thus ripe for further attention. As usual, I was rewarded by the immediate discovery of two very "leaky" capacitors, both in the anode circuit of the AC2. One fed the coupling transformer, the other the tone control. Replacing both had a significant effect on the h.t. drain in this part of the set and the voltages rose accordingly. I must admit that the appearance of the two output valves was not reassuring; they both had a milky look about them which threatened a "soft" vacuum, but in the event they both gave no cause for alarm in their performance. It was whilst examining these valves that I first noticed that all in the set were over-stamped with a word indicating that they had been inspected by the German Army; and this led me on to discover numerous rubber-stamp impressions on the chassis, each depicting the Nazi double-headed eagle and swastika. Even today the sight of that symbol causes me a small frisson of unease, for, as a child of the '30s I was just old enough to comprehend what Winston Churchill meant when he spoke of "...the monstrous tyranny, never surpassed in the dark, lamentable catalogue of human crime." Consequently, when I subsequently came to disturb parts of the *Escorial* that were patently original, I was constantly aware that the last person to touch them had worked under the yoke of Adolf Hitler; and that the voice of the "Blood-thirsty guttersnipe" (Churchill's epithet) must oft have thundered forth via the finished product. Nor was it possible to ignore the fact that a 245V tapping on the mains transformer, in addition to the usual 220V one for German supplies, made the *Escorial* suitable for use in Britain...

The majority of small components in this RX are mounted on tag panels bolted to the sides of the chassis, with many of the larger-value capacitors being in the form of metal boxes, a little larger than an OXO cube which are screwed to the



# Restoring a Communications Receiver from Nazi Germany

underneath of the chassis. Most of these appear to have been of 0.5 $\mu$ F capacitance in their youth, but have by now degenerated into low-value resistors! Purists may object, but I have replaced the OXO cubes with large metal-clad tubular units which may not look original but are of a reliable disposition. Similarly, a large number of metal 0.1 $\mu$ F units have taken the place of rather unpleasant-looking black paper types which also exhibited regrettable "leakiness".

The removal of most of the "unofficial" h.t. consumption upped the h.t. to around 250V, which seemed to be acceptable. At that stage I made good the deficiencies around the smoothing chokes and tidied up the wiring in general. I also replaced the original, two-core, mains lead. This entered the set at rear centre of the chassis and was soldered to tags on the same panel as the h.t. decoupling resistors. Each side of the input was decoupled for r.f. to chassis by a small capacitor of exceedingly frail appearance and which I would not have trusted too far. From this point a heavily screened cable took a pair of cables to the mains on/off switch. Again at the risk of upsetting purists, I fitted a modern three-core cable, snipped away the crumbling rubber switch leads, and wired in a plastic twin to take their place. When I am dealing with mains voltage and a metal cabinet I prefer safety to slavishness!

## Hum

At this stage the a.f. stages exhibited great liveliness, but still marred by a heavy 50Hz hum. This turned out to be due to maladjustment of a small hum-dinger potentiometer connected across the heater lines and chassis. Suitable tweaking reduced the hum to negligible proportions. However, there wasn't any sign

at all of any signals from the r.f./i.f. stages of the set. The next check, therefore, was to inject a strong i.f. signal to see what it produced. Yes, but at what frequency? Well, it must lie in that small gap between 470kHz and 545kHz, and as it happened a good dose of 490kHz did give a response in the loud speaker. Only one of the i.f. transformers, though, showed any sign of being tunable — that between the two amplifiers. The others could have their iron-dust cores moved throughout their travels without the slightest effect on the response.

Another curious feature was that it was impossible to get a signal to pass through the mixer valve; to inject the 490kHz into the first i.f. amplifier it was necessary to remove the mixer and connect the generator to the anode tag of the valveholder via a 500V wkg. condenser.

It became all too evident that the i.f. transformers were going to have to come out and receive major attention. This was not easy. The makers of the *Escorial* had clearly not anticipated this level of servicing and the unsoldering of the i.f.t. connections, although tedious, was nothing compared with the sheer drudgery of easing off the retaining nuts a fraction of a turn at a time with long-nosed pliers!

Eventually, however, patience was rewarded and I had the offending transformers stripped down on the bench for inspection. As I had suspected, the actual bit of iron-dust that does the tuning had come adrift from the bakelite adjusting screw in both windings of the one transformer. It is always pleasant to find an obvious cause for failure, especially one which could be rectified with the aid of some quick-setting epoxy glue. Ah! but the cores in the other i.f.t. were in perfect order, so something else must be causing the lack of response. The leading can-

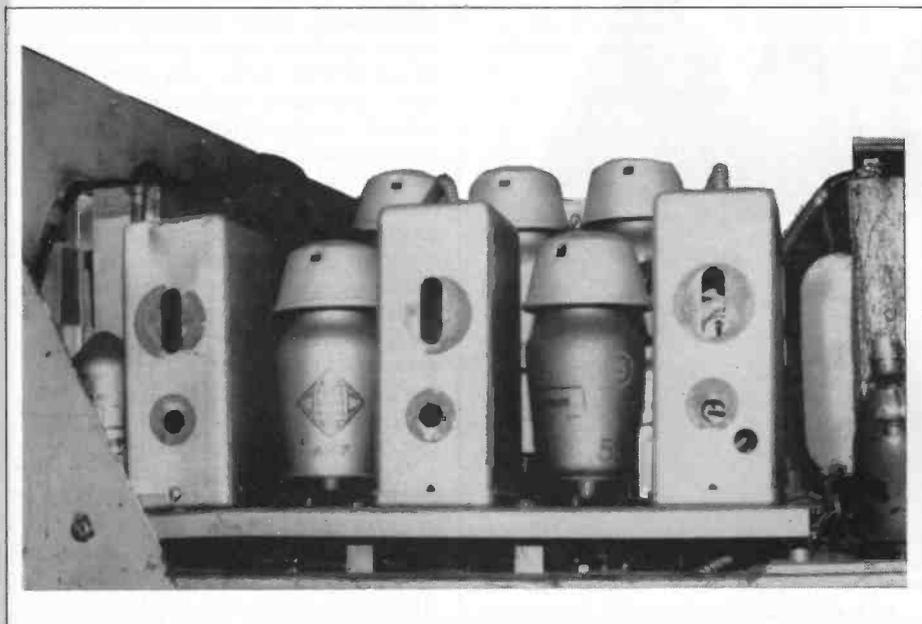
didates were the small capacitors connected across the windings. They were about as big around as old sixpences and roughly 3mm thick. The two connecting strips were rivetted to the body, which appeared to be made of a ceramic cup filled with some hard cement. According to the value printed around the circumference of each, all should have been of 300pF capacitance, but on the bridge none showed more than about 150pF. (I had by this time decided to try those in the first i.f.t. as well). Fortunately I had some 1 per cent silver-mica types to hand and I was able to effect the necessary replacements.

Re-fitting the i.f.t.s took almost as long as the removal, but when at last it had been achieved it was soon evident that the work had not been in vain. Keeping to the 490kHz, I was able to peak up all the transformers, following which a satisfying hiss was to be heard in the loudspeaker, indicative of imminent signals from the r.f. unit. The valves having top-cap grids, by the way, are well screened in the *Escorial*. The i.f. valves have flexible-metal screens attached to deep top-cap connector/covers, which gives them the look of Teutonic Michelin men. The three valves on the r.f. sub-chassis have actual copper-tube encased leads to their top-caps, with pig-tail earths at either ends. Consequently there is next to no pick-up of signals when an antenna is not connected to the set, and it was not until I had done this that I realised that the set was going to work, and work rather well, with no more ado.

## Tuning Action

All bands proved to be capable of giving results, although I must admit that it took me some time to figure out how to get Band I, as there are only six positions for the wave-change switch. (And oddly arranged at that). I eventually found that the lever behind the main wave-change knob is used for Band I or Band II, with the switch in the nominal Band II position. The tuning action is first-rate certainly one of the best that I have ever experienced. It relies on a smooth slow-motion gearing completely free from back-lash, in conjunction with a heavy fly-wheel which permits rapid changes of frequency when required. The drive to the cursor is by fine steel wire which I have no doubt is original.

Since a number of s.s.b. signals were in evidence, I was moved to do something about the missing b.f.o. valve. Knowing that I have no 4V side-contact valves, I tried an EF9, which has the same base as the likely AF7, but a 6.3V heater. Much to my surprise, after a warm-up time but little longer than normal, the EF9 got down to the business of injecting a carrier and with a little tweaking of the b.f.o. coil core, s.s.b. was resolved with ease. □



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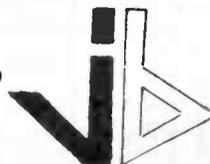


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# SHORTWAVE USA

Gerry L. Dexter

The four stations concerned were the US Government's Voice of America, of course, along with two religious broadcasters and one trying to make a commercial success of shortwave. KGEI (formerly owned by General Electric) operated as a religious-educational outlet by the Far East Broadcasting Company from near San Francisco, California, already had years of experience behind it. The commercial venture, WRUL operated by the large Metromedia communications group, had studios in New York and transmitters in Scituate, Massachusetts.

The fourth had just come on the air. WINB (World International Broadcasters) in Red Lion, Pennsylvania, was a religious station filling its broadcast schedule largely by selling time to other religious groups.

If we make a slight adjustment in the time machine's controls and skip ahead 20 years we find that not much has changed. By 1982 the Voice of America had taken over direct operation of its older US based transmitters which had formerly been operated under contract to private companies such as the NBC and CBS networks and Crowsley Broadcasting. KGEI and WINB (now of voting age) were still alive and kicking. WRUL, however, had undergone two transformations. First it was sold and became WNYW (Radio New York Worldwide). The new owners, however, couldn't make it work as a commercial venture either so it was sold again, this time to Family Stations, Inc. and the call sign changed to WYFR (Your Family Radio). Later the transmitting facility was moved to Okechobee, Florida and several new 100 kilowatt transmitters placed in operation. But, other than that, things were running along at their usual ho-hum pace.

Not for long, though! During 1982

*If time travel were possible and we could zip back in Dr. Who's Tardis to 1962 to look at the shortwave broadcasting scene in the United States, we would find only four broadcasting organisations making use of the high frequencies.*

businessman and broadcaster Joseph Costello III succeeded in getting a licence to put WRNO Worldwide on the air from New Orleans where he already owned WRNO a.m. and f.m. WRNO, the Rock of New Orleans, is a strictly commercial venture, initially carrying programmes for WRNO f.m. later selling time to religious groups and, still later, creating more and more programming especially for the short wave audience. In 1985, a second 100 kilowatt transmitter was placed in operation. As the first new US voice on short wave in twenty years, WRNO's arrival did not go unnoticed, particularly by the evangelists. In getting WRNO airborne Costello had cracked the Federal Communications Commission's long-standing reluctance to grant short wave licences and the crack grew larger and larger.

WRNO was soon followed by giant religious broadcaster Trans World Radio which got the go-ahead to put a station on the US Territory of Guam. TWR already had large installations in Monaco, the Netherlands Antilles and Swaziland. From Guam, KTWR began programming using four 100kW transmitters serving audiences in Japan, Asiatic Russia, Indonesia, Malaysia, China, Southeast Asia, India and

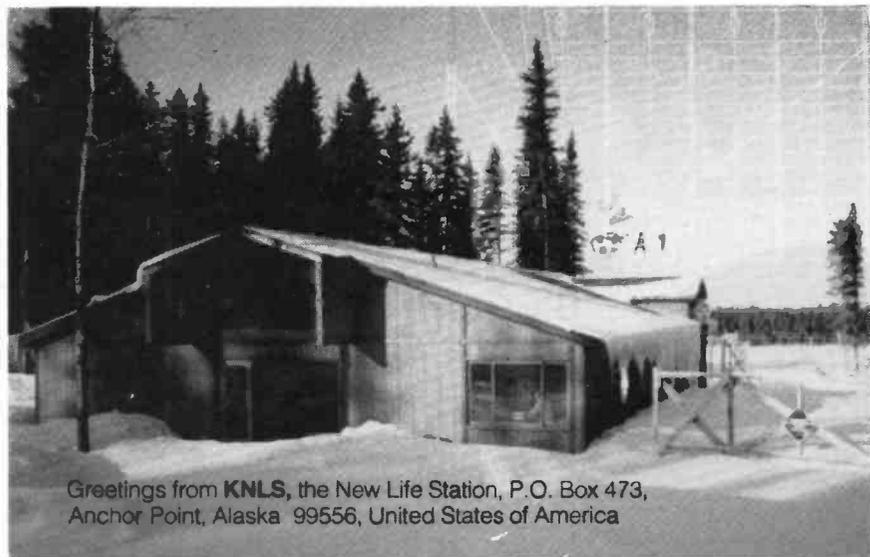
Australasia with broadcasts in a dozen languages.

Then another commercial concern got into the game. Marcom, Inc., based in Hawaii, put KYOI on the air from the US Trust Territory of the Northern Marianas (Saipan Island). The idea was to capitalise on all those short wave radios owned by youngsters in Japan. Since there was no non-stop Top 40/rock music service available to them and especially no American-style station broadcasting in Japanese, Marcom felt it couldn't miss. It might have worked except for Japanese restrictions on promoting the station within Japan which left KYOI and its "Super Rock" format unable to build an audience. By early 1986 the station was appealing for donations to help keep it on the air. By the fall of 1986 there were unconfirmed rumours that the station had been sold (about which more later).

The next blip on the screen showed up in Alaska. Texas-based World Christian Broadcasting chose a site at Anchor Point to construct its KNLS (New Life Station). Not without a good deal of difficulty, however. Some staff members were killed in an air crash and later the uncompleted transmitter building was the target of an apparent arsonist. KNLS got past the setbacks and now airs some 14 hours of programming daily, beamed to Europe, Asia, China and the Central USSR. Experiments in reaching Europe via an over-the-pole path have not met with very much success. KNLS was one of the first religious short wave stations in the US to take a "soft sell" approach and the listener is just as likely to hear a program of big band jazz music as he is a religious show.

Back on Saipan Island, KYOI was about to get a new neighbour. The Far East Broadcasting Company, which already owned KGEI in San Francisco, FEBA in the Seychelle Islands, FEBC-Philippines and several medium wave stations as well, opened KFBS with three 100kilowatt transmitters (a fourth has recently come on the air and a fifth is planned) to reach China, Indonesia, Malaysia, Vietnam, Poland and the USSR. The first transmitter of KFBS came into use in 1984 and was an old Voice of America unit. In just two years the number of US short wave outlets had doubled over what it had been during the previous 20 years.

In contrast to the large, world-based religious broadcast groups which were getting into short wave under a US-granted licence, a much smaller group was preparing to give short wave a try. The Assemblies of Yaweh, a religious sect in Bethel, Pennsylvania purchased a 50 kilowatt transmitter and installed it in an abandoned petrol station on the



Greetings from **KNLS**, the New Life Station, P.O. Box 473, Anchor Point, Alaska 99556, United States of America

The transmitter building of KNLS in Alaska

# SHORTWAVE USA

edge of Bethel. During the following months radio engineers, who were also members of the group, worked to change what was a medium wave transmitter into one which would operate on short wave frequencies. WMLK finally got on the air for tests in 1985 but most of the broadcasts are still of limited length and the full schedule has yet to be implemented. When it is, the broadcasts will consist largely of sermons and classes from the Assembly's Bible School and news related to Bible prophecy. The group believes salvation awaits only those who worship God by His Old Testament name: Yaweh. The call letters are a contraction of the word "malek" — messenger.

Unlike WMLK whose main target is Assembly members worldwide, many of those in the new crop of religious short wave stations are recognising that programming in today's environment has to be aimed at a wider segment of the potential audience, and has to be attractive, even if somewhat on the secular side. That was the track taken by the Criswell Center for Biblical Studies when they put KCBI in Dallas, Texas on the air. The Centre already had an f.m. station there which had achieved a number one ranking in listenership among the nine religious f.m. stations in the area. KCBI tosses in country/western music and seeks to take advantage of the mystique of Texas and Dallas while promoting "free people working in a free society." The station has been on the air with 50 kilowatts since early 1985.

The midwestern part of the country was the next area to sprout short wave broadcasting antennas. Reverend Lester Sumrall's LeSea Broadcasting put WHRI (World Harvest Radio) on the air from Nobelsville, Indiana on Christmas Day, 1985. WHRI is part of a growing broadcasting group operated by LeSea which includes a couple of a.m./f.m. stations, four television stations and a burgeoning satellite network. Programming comes from LeSea's radio-TV centre in South Bend (northern Indiana). If nothing else, WHRI was unique in that it was the only station which met its pre-announced on the air target date.

As the fall season began to grace the landscape in the United States, tests were being expected at any time from still another religious broadcaster. Evangelist George Otis and his High Adventure Ministries based in Van Nuys, California, were nearing the sign on of their 50kW KVOH (Voice of Hope) at Rancho Simi, California. Initially, KVOH will air programmes mostly in English but also with some Spanish. The Otis organisation already operates the King of Hope/Voice of Hope stations in



Engineers work to get the Assemblies of Yaweh's WMLK on the air



LeSea Broadcasting's WHRI signed on Christmas Day, 1985

southern Lebanon. After KVOH is launched, Otis won't be at the end of his short wave plans. He plans to put a high power religious station on board a ship and beam programs to Asia from the South China Sea and is already busy raising money to finance that project.

Early in 1987 still two more short wave stations will take to the airwaves. Adventist World Radio, which does extensive programming on existing short wave stations and also owns a few smaller short wave stations, including the new Radio Lira in Costa Rica, will go on the air with KSDA in Guam. KSDA's 100 kilowatt signal will be beamed largely to audiences in Asia, in a variety of languages.

A major US newspaper — the *Christian Science Monitor*, is well along into the construction of a station that will operate with 100 kilowatts from Maine and has plans for a second site later, in the southern part of the country. The project initially called for expanding to a

third site which would serve Asia and, as this is written, the rumours involving the sale of KYOI indicate that the purchaser is the *Christian Science Monitor* station. Although owned by the Christian Science church, the station will stick largely to a news and feature format — a sort of audio version of their well-known newspaper.

Once these two stations get into operation that may be the end of the activity for awhile. Or, it may not. A number of other individuals and groups have expressed an interest or announced plans or filed papers with the FCC. These include H. Dickson Norman's "NDXE Global Radio" in Opelika, Alabama; KRSP Worldwide Radio in Salt Lake City, Utah; Radio USA based in San Francisco (all commercially oriented), Van Heaton International, a proposed religious outlet in Holmwood, Louisiana and Susquehanna Broadcasting of Miami, Florida. None of these, however, appears to be moving very steadily towards getting on the air and plans for some, at least, may exist mostly on paper.

But even if none of them ever put a single programme on short wave, short wave broadcasting in the United States has still seen a dozen new stations on the air in just five years — a 300per cent increase over 1982.

Admittedly it is early yet. Some of the new stations are still largely untested from a viability standpoint but, so far, only one of them has failed and that facility (KYOI) perhaps rescued by another buyer. Most of the others have solid backing so it would appear that these 12, at least, are here to stay. How many more there may eventually be is anyone's guess. Our Tardis, unfortunately, only operates in a reverse mode. □



A QSL card from WRNO, New Orleans

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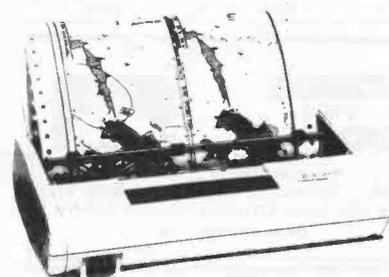
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# Seen & Heard

## AMATEUR BANDS ROUND-UP

Justin Cooper

c/o Short Wave Magazine, Enefco House,  
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For those who are new to *Short Wave Magazine* the author had better introduce himself; my name is Justin Cooper, and I used to write the s.w.l. column every other month. With the new arrangements, I will have about the same space, but every month, and the way the column appears and is put together will evolve as we go along.

Deadlines are shown elsewhere in the column, and are the dates on which readers letters intended for use in the column are to arrive at the office. They are sorted then sent on to me; as soon as they arrive, I grab 'em, wrap a wet towel round my forehead, and go into what someone described as "inspiration mode". 24 hours later I post the completed offering back to HQ for processing from typescript into what you see on the printed page. What matters to the whole exercise is the speed and so anything that arrives late doesn't get picked up, but is noted next time round.

The column will try to answer the questions that arise among you; but only in general terms. No question of saying "this model receiver by maker A is better than that model by maker B" — as much as anything because the old saying about one man's meat being another man's poison applies to amateur radio receivers as well! But we will of course try to show you how to get the best out of what you have, and where you can make improvements to the set-up you have.

In fact, of course, the receiver you use if far and away the least important part of the station, when compared with the antenna system and the skill of the operator; and in the receiving context the antenna is less important than the operator's ability.

So, what is there that separates one good operator from another? First, one suggests, the knowledge of the times at which there will be propagation from the desired DX station to the receiver; second, the willingness to be at the receiver at the desired time; and third the ability to copy a signal that is weak or surrounded by assorted stronger stuff, known as the QRM surrounding the signal. We can add to this a few lesser points, such as for example knowing what we've got once we've got it, which is really a question of being "with it" in general — something which sets you above many of the licensed types!

Now, you have your receiver set up; what else do you need? First, some sort of a log. You can buy such a thing if you like, or you can rule a few lines in an exercise book — either way, it'll be a mite dogeared by the time you fill it up and start the next one! Secondly, some sort of list of prefixes and the countries to which they refer, and here there is no doubt whatever that the Geoff Watts Prefix List is the veritable goods — it has to be the best investment in any amateur bands station that listens or operates the DX bands between 1.8 and 30MHz. If you get interested in the Russians, then Geoff also does a list of the Russian prefixes and their oblasts, which will give you a very good idea of just where your Russian is located, and whether he is in Europe or Russia.

Write to Geoff at 62 Belmore Road, Norwich NR7 OPU. The Prefix List costs just £1, and is always bang up to date — the columnar copy gets replaced regularly as it is always heavily used. As you get a little further along the way, you may well find it a help to be "on the grapevine" which implies something in the nature of a subscription to one of the weekly DX sheets, such as *The DX Bulletin* from California or RSGB's *DX News Sheet* — which incidentally was for years run by Geoff Watts. You can obtain details from RSGB HQ, Lambda House, Cranborne Rd, Potters Bar, Herts. EN6 3JN.

Now we are actually listening to one of the amateur bands. We hear a couple of amateurs in QSO (in contact with each other); one of them passes the transmission over to the other. How do you tell which station has been transmitting, and which is the one now on? The rule is pretty simple; if the operators are reasonably savvy, then at each change-over both callsigns will be given, that of the station speaking being given LAST. Thus, G3GSR is working, say, GWOESS, and is transmitting. At the beginning he will say something like "GWOESS, this is G3GSR" and at the end the format

will be more or less the same — something such as "GWOESS, G3GSR, go ahead". Now you know you have been listening to G3GSR, so if you can't hear GWOESS, on the next over, you can't claim you heard GW!

You won't have been listening long before one day you will come across a horrible throbbing rumpus usually spread over several kHz, which upon investigation proves to be spasms of umpteen stations all giving their callsigns at once, followed by spasms of relative quiet before the thing repeats; lucky you, you have found your first pile-up! Sometimes under-neath, but more often a bit to one side, you will eventually hear the cause of it all — a bit of rare (or at least rare-ish!) DX, and eventually you will be able to log him. In the absence of a "policeman" or an MC, or a "list operation" he may well be working stations at the rate of one a minute or more, if he knows his onions. The really rare country will usually be activated by a DXpedition, whose members are all pretty skilled operators, but occasionally you come across someone who has come on from the rare spot simply because he is there on other business, and who really isn't DX oriented or much of an operator. Such a one either gives up in disgust or learns — but fast!

Which brings us neatly to the question of how we define a country. Essentially, countries are defined by the rules of DXCC (DX Century Club) for the whole world. While there are about 170 countries in the UN, there are over 315 in the DXCC list, and about 366 have existed since WWII. The differences are this: many "countries" in the DXCC list are not UN countries, but places which can be shown to meet the DXCC country-status criteria. An example of this type would be Market Reef or South Georgia. Many countries have changed from being colonies to being independent countries; for example an older DXer may have the Gold Coast in his early logs, and later on hear or work it under a

different prefix and its present status of Ghana. Everyone accepts the DXCC listings for the purposes of the DXCC certificate, but for other specialist purposes other countries lists exist, all in essence based on the DXCC listings.

Geoff Watts' list gives all the essential details, and tells you also which "continent" they fall in. For the purpose of Amateur Radio the continents are Europe, Asia, North America, South America, Africa and Oceania, and all the offshore spots including Antarctica are arbitrarily lumped into a continent for the purpose of our hobby.

Finally we come to Zones; there are the original CO Zones, dating back forty years or so for the purpose of what is the toughest award in the business. Some of the forty are easy, such as Zone 14 which includes the UK, but some are very difficult to deal with, such as Zone 19 (Eastern Siberian Asia) and Zone 23 (Central Zone of Asia). The other set of Zones is the invention of the ITU; there are about ninety of these and there is an award connected with them but in real terms they don't seem to have created an enormous stir. Again Geoff Watts' list tells you what's where.

So there you have it, and your J. C. apologises to his previous readers if it all seems too too basic; but we will be collecting up lots of new chums and must remember their needs too.

### Letters

The ones we have this time were all aimed at John GOAPI, and your scribe feels a little guilty to read them; but some are in any case old friends, so we hope they won't mind.

Angie Sifton (Stevenage) has already passed the RAE, and her letter indicates that the J. C. brand of joss-sticks weren't much good on the day, as Angie came unstuck on the Morse, after a late arrival at the test centre thanks to an unco-operative car. However, no doubt a second try has been booked by now, and J. C. has changed his joss-stick supplier! Incidentally, Angie is one of the few who include c.w. listening among their activities — quite an interesting feature of the hobby, and far easier than some people think.

M. Hudson (Canterbury) sticks to s.s.b., and uses a Trio 9R59DS receiver to an end fed wire. Mick spreads his listening around the hours from 0700 to after midnight,

### Deadline Dates

Issue	Deadline
June '87	April 21
July '87	May 19
August '87	June 18

# Seen & Heard

except for work times, and thus has managed to collect up countries in all continents but South America on 3.5MHz, while 14MHz yielded a full house.

Next we hear from Robert Watters of St. Austell who has recently started to send out QSL cards to DX stations he hears. This raises a few points of interest which perhaps we should mention. Many of the DXpeditions call for QSLs to be accompanied by an s.a.e. and/or IRCs or "green stamps" otherwise known as dollar bills, to help to defray the costs of the DXpedition and the printing of the QSLs; if such is not included, some just don't respond at all, others put the return QSL into the Bureau system. Thus, even if you QSL direct, it pays to have a membership of some group, such as for instance RSGB or ISWL in UK, who have a QSL Bureau operational. Personally, since the demand for IRCs and green stamps became general, your J. C. has stopped sending QSLs out to all but the most rare DX.

We should also mention here just what should appear in a s.w.l. report for it to have a chance of getting a return QSL. That can be summed up in three words — "Useful and interesting". Useful implies that you listen to several QSOs, and compare them; that

you compare the DX signal report with others from the same area, that you indicate what you thought of band conditions at the time, and so forth. Interesting can cover all sorts of things from a note of how his signal strength went up and down as he rotated his beam, right back to the personal things outside of the hobby if you are sure they will be of interest from something he has said. The thing to bear in mind is that a DX station knows very well that he can work anywhere in the world, so a report on a single contact that was RS59 both ways isn't useful or interesting. On the other hand, if he is a couple of S-points down on his usual, and obviously failing to hear stations calling him, your detailed report may help him to a decision to lower the antenna and repair whatever's gone wrong, and he'll thank you for your help with a QSL.

Leighton Smart (Trelewis) is jubilant at hearing his first VK signal, and we notice from his log that he heard his Australians at a rather odd time — mid-afternoon — which suggests some rather weird propagation, or a very potent signal being radiated. This is the sort of thing which makes you wish for a beam, so you can swing it right round to see where the signal is best. Robert listens on

most bands where he can find activity, but finds 7MHz rather noisy. True enough, but on 7MHz and 3.5MHz, it is often the case that careful use of the attenuator or the r.f. gain control will make a spectacular improvement, indicating that the receiver is overloading due to nearby signals not in the i.f. passband. This of course is a fundamental design problem which has only been seriously addressed in amateur radio gear in the last few years. Indeed, before then, it was normal to find that the valve receiver was, in general, better than the solid-state one. Nowadays the ads make much of this question of dynamic range, but quite cleverly "expand" it by indicating a figure artificially increased by the presence and absence of the front-end attenuator or pre-amp.

## Next Time!

In our piece next month, we will be introducing new readers to the delights of the HPX game; HPX refers to hearing prefixes, rather than countries. This gives you something in excess of 3000-plus to have a go at, and can be quite good fun as readers of the old *Short Wave Magazine* demonstrated over many years. Those of you who know how it went, or who are already on the ladder will

know how to play; for the others we will be running the rules next time around.

## Club

Those of you who are new to the hobby will be well advised to join a club of some sort. There is one in most areas of the country, and members are always pleased to have new recruits; it is at the local club that you can find a solution to your starting problems by talking to those who have been at it longer, and of course it is the most likely spot to find out about the way to set about getting a licence for oneself. Clubs are never stand-offish if you go out of your way to "join in" but if you don't speak or you hide away in the corner they will respect your privacy — so don't sit in the corner silently and then say the club members are unsociable!

## Deadline

This will be found in the "box" in the piece for the next three months, to give a chance to you folk in faraway places. It is, as we have said, for arrival, addressed to your J. C. c/o Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. See you then.

## DECODE

Mike Richards G4WNC

200 Christchurch Road, Ringwood, Hants BH24 3AS

Welcome to Decode. This is a new venture for both *Short Wave Magazine* and me. Probably the best way to kick-off is to give you some background info.

I was introduced to s.w.l.ing at an early age by my father, he has been a keen radio and electronics enthusiast since the early days of radio. This initial interest has flourished and I have developed an active involvement in all aspects of electronics since that time with a special interest in data modes. From the amateur radio point of view I was first licensed as G8HHA and subsequently as G4WNC. Again, my interest centres around the non-speech modes, i.e. AMTOR, RTTY, c.w. and more recently Packet.

Next we should set out the ground rules and objectives of this column (other than blowing my own trumpet!). As with the "new look" *Short Wave Magazine* this column is aimed at the listener and will try to satisfy the following:

1: Cover the reception of AMTOR, RTTY, Packet, FAX and other data modes.

2: Detail interesting stations heard, including mode, speed and format etc.

3: Provide up-to-date info on the regulatory aspects of listening.

4: Provide information on specialist user groups and information suppliers.

5: Provide details of latest equipment and accessories.

6: Beginners intro section.

7: Introduce simple methods of trying out new modes along with technical details of mode.

Keen as I am, the success of the column depends very much on the input from readers. Please send in reports of stations heard including frequency, mode, date and time as well as any special characteristics of the transmission. I would also like to feature listeners stations

from time to time, so your details and a photo would be much appreciated. I am a member of most of the user groups but any "Hot News" will be included (if received in time).

## Hints & Tips

First tip for any newcomers is to join the specialist user group for your prime listening modes. I hope to run a feature on these groups to keep you informed. If you know of new groups then please let me know.

All you listeners who own computers running CP/M or IBM clones — that includes Amstrad PCW ones — there is a group you may not know about. There is a vast quantity of Public Domain (i.e.

nearly free) software available including radio programs from the Public Domain Software Interest Group!

## Packet News

The Packet scene seems to be growing rapidly at the moment. It seems that v.h.f. activity is concentrated on the repeaters (144.650MHz) with little activity on the simplex channels. There is a trend towards repeaters for general contacts and simplex channels for swapping large quantities of data, i.e. computer programs. On the h.f. bands packet operation is also developing rapidly with activity centred around 14.103MHz. In one evening I logged 14 stations such as EV3IOX (USSR), HA5XY (Hungary), 4Z4ZB (Israel), KA3MRX (USA), OE3OUS (Austria), YU1AQE (Yugoslavia), SK2GJ (Sweden) and C6AAA (Bahamas) amongst others — all spread over three continents.

One of the main reasons for the increased activity must surely be

Send your reports and news to Mike by April 23, May 21 and June 20 for the June to August issues

# Seen & Heard

the availability of very reasonably priced TNCs (terminal node controllers).

## RTTY & AMTOR

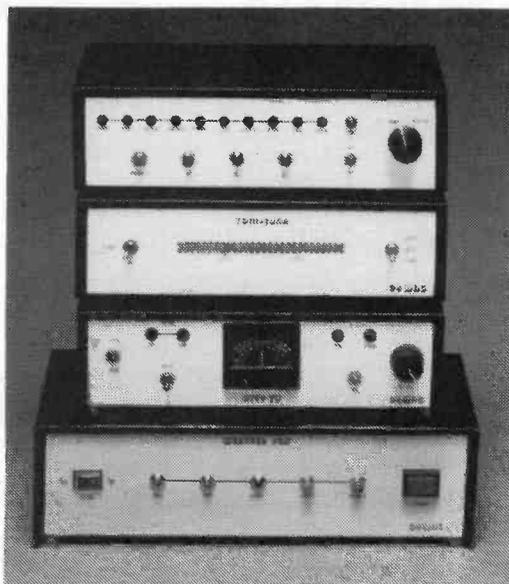
There hasn't been much time to do any logging this month (decorating seriously interferes with your hobby!). A few interesting stations I did log on 14MHz were W5LSF, NA2Q, VE8RCS, 5H3ZO (Tanzania), ZS1AK and IT9ZDA. On the amateur scene RTTY and AMTOR are still popular modes, although quite a few amateurs are concentrating their activities on Packet so things do seem to be quieting down particularly on v.h.f. The commercial TOR activity is likely to continue as it is well suited to the long haul unattended message service demanded by so many users.

## FAX

There is a wealth of FAX activity from l.f. to microwave. The main content is weather information, but news pictures are also transmitted. If you are interested in receiving weather charts the first thing you will need (other than the radio gear) is a licence. To get this you need to write to the Met Office<sup>2</sup> stating what broadcasts you want to listen to and how you intend to use the received information. The licence cost is currently £5 (not renewable annually) and is actually issued by the DTI.

## Book of the Month

This month's book is *Guide to Utility Stations 1987* distributed by Interbooks<sup>3</sup> This publication



covers non-broadcast transmissions from l.f. to 30MHz. The range of information contained in this book is really very comprehensive and must be considered to be an "s.w.l. bible". As well as the expected comprehensive list of frequencies and stations there are chapters dealing with specialist broadcasts only. To cover press broadcasts there are two sections, one listing stations in alphabetical order the other showing chronological order. Similarly there are sections dealing with meteorological FAX and RTTY. In addition to all that there are sections dealing with all manner of miscellaneous information. The book has been used in the shack for several weeks now and has proved to be extremely useful and very accurate. I would recommend this as an essential reference book for the keen s.w.l.

## Featured Station

As its my column I get first shot at this section! My station has been aquired over a period of many years and seems to be continually changing. Basic layout is an Icom IC720A h.f. transceiver (100kHz-30MHz), Yaesu FTV-107 transverter for 144MHz and 50MHz and Icom 2E and O2E (his and hers!) v.h.f. handhelds.

When it comes to specialist mode reception the accessories are brought into action. The main units are shown in the photograph. For RTTY and AMTOR operation the receiver audio output is fed to a G3LIV active filter terminal unit which converts the recovered audio into a t.t.l. compatible data signal. This signal is then passed to the AMTOR decoder which is switchable between AMTOR and RTTY. I use the old AMTOR Mk2

board which actually converts an AMTOR signal to standard RTTY so that both modes can be received by running a standard RTTY receive program on the computer.

As for the computer I use either an Amstrad PCW8512 or the trusty old VIC 20. The VIC was chosen because it's cheap, reasonably compact and produces minimal r.f. interference. As for the Amstrad, well I'm still working on software for it at the moment but hopefully some will be forthcoming from the public domain CP/M groups.

When it comes to FAX reception I have built a device that was described in a radio magazine a few years ago. It is a stand alone unit that takes a 9MHz i.f. f.s.k. signal and drives an Epson compatible printer via a Centronics parallel port. The main problem is that the i.o.c. (index of co-operation) is a bit of a bodge to suit the printer which results in the picture being rather squashed!

Finally Packet radio is received using a generously loaned TNC-220 from Siskins Electronics (thanks to Phil). Initial results are very encouraging and I shall be giving a full report in a later column.

Well that's about it for this month but don't forget I need your reports and station details to make a success of this column.

## Addresses

- (1) Public Domain Software Interest Group, 90 Braybourne Close, Uxbridge, Midd. UB8 1UJ.
- (2) Meteorological Office, Met 07, London Road, Bracknell, Berkshire RG12 2SZ.
- (3) Interbooks, Lynton Industrial Estate, Stanley, Perth PH1 4QQ.

## INFO IN ORBIT

Pat Gowen G3IOR

17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

This is the first issue of a brand-new column intended for the listeners to the many and varied signals that come to us from space. It is intended for you, the listener and reader, as a means to propagate news on what you are hearing (and seeing) on and around the many frequencies allocated to satellites in the high, very high and ultra high frequency bands.

The availability of wide coverage v.h.f., u.h.f. and now even s.h.f. scanning receivers means that the short wave listener can now receive many of the distant signals that were originally placed well outside the earlier limited capability of his (or her)

reach. New low cost ultra-low noise m.e.s.f.e.t. and GaAsf.e.t. devices, now only one hundredth of the price they were ten years ago, mean that remote signals from space, once well below the receiving capability of the average non-specialised listener, are now brought "in range" and discernable. This in turn means that the huge aperture dishes once thought to be essential for adequate satellite signal capture are no longer necessary, as quite small parabolooids, Yagis and Quagis etc., can produce enough signal for identification and tracking.

Ready access to low cost home computers means that many of these signals can now be turned

into interesting and informative output, as programs for FAX and weather satellite picture production have been written by experts in this particular field of specialisation. Other experts have written excellent user-friendly programs for popular computers that will allow observers to map, doppler shift equate and track the satellites, accurately determining their path and position in azimuth and elevation through time.

We shall be discussing all of these matters, giving frequencies and identification tags to discover satellites, tracking and level information, etc., all from input sent in by readers. Hints and tips on equipment, assistive circuits

and antennas will be included to help those who are starting in the field by publishing information sent in by experts and old hands at the hobby. In particular, we would like to produce a series of informative sections detailing the station set-up with a photograph of this and the enthusiast so that newcomers can benefit from the advice of those who are already well established in the art of satellite watching. The content should be fully descriptive, itemising the nature and performance of all of the station equipment used, with as much information as possible on the antennas, satellites observed and followed, and with diagrams and

# Seen & Heard

pictures where possible.

Your weather satellite pictures are invited for publication, again with equipment details and advice, especially as your scribe claims no expertise on this particular facet of the wider hobby. Your questions and queries, where possible, will be answered, and when not, will be published to ask for answers and help from those with experience and knowledge. Do not be demure or modest in helping us to fill the page allocated, as what may be commonplace to you may be vital information to many other followers, and what you think may be a small snippet of information, when pooled with others, may lead to some exciting discoveries.

Readers will be familiar with the world-famous Ketteringham group, whose work and study of satellites have revealed findings unknown and undiscovered by commercial sources and scientific groups whose resources are so much greater. Such an example shows the value of small groups using simple equipment, and the respect and recognition of achievement that can result. Since the launch of the world's first satellite, SPUTNIK-1, amateurs and short-wave listeners have been involved, as it was then in October 1957, that all of the initial information on the orbit, height, inclination, etc., was first performed by home listeners, long before the specialised trackers were even equipped for the brand new field of study.

In this column we shall tend to specialise in the weather satellites, and leave most of the dialogue on the communication and AMSAT satellites for readers of our *Practical Wireless* column on "Amateur Satellites". This page will, however, not be exclusive, as all general items of interest that arise will be reported, but with the concentration of input based upon the incoming information from you, the observer, listener and reader. It is YOUR column!

To get started, Table 1 is a listing of weather satellites sent to us

Frequency MHz	Orbit c = circ or g = geosat	Name/User	Remarks
136.77	C	NOAA DMSP	
136.797	C	Nimbus DMSP	
136.84	C	Nimbus DMSP	
136.95	C	Nimbus DMSP	
137.08	G	Meteosat	Non Op
137.12	C	Meteor	
137.13	C	Meteor	
137.15	C	Meteor	
137.3	C	Meteor	
137.4	C	Meteor	
137.5	C	NOAA DMSP ESSA	APT
137.62	C	NOAA DMSP	APT
137.77	C	DMSP NOAA	
137.85	C	Meteor	
401.5	C	Nimbus DMSP	
461.15	C	Meteor	
464.0	C	Meteor	Not used recently
466.0	C	Nimbus DMSP	
468.5	C	Meteor	
468.825	G	GOES	20W Time signals
468.875	G	METEOSAT	
468.925	G	METEOSAT	
1000.0	C	Meteor	
1544.5	C	SARSAT downlink	
1675.281	G	METEOSAT	
1675.929	G	METEOSAT	
1686.833	G	METEOSAT	
1691.0	G	METEOSAT Wefax	
1694.5	G	METEOSAT	
1696.0	G	GOES Wefax	
1698.0	C	NOAA HRPT	
1702.47	C	Nimbus DMSP	
1702.5	C	NOAA Nimbus DMSP	
1707.0	C	NOAA	+ or - 50kHz doppler
1707.5	C	Nimbus DMSP	
1782.5	C	Nimbus DMSP	

Any additions you have to this list will be gratefully received.

Table 1 Weather satellite frequencies

from John Branegan GM4IHJ, of Saline, Fife. John is a long time satellite follower, and is currently mainly engaged on following the Russian SALYUT-7 space station, that has a large module which transmits f.s.k. on 19.955MHz. John is collating some fascinating data on the sub-horizon propagation of this beacon, as it is telling us some of the little fully understood behaviour of the ionosphere at low incidence levels.

All of the satellites under Table 1 have been known to operate in the WEFAX Weather picture role. WEFAX, short for "WEather FAX", or "Weather Facsimile" is an "APT" (Automatic Picture Transmission) system. It is not dissimilar to amateur radio slow

scan television, inasmuch as the frames of pictures of the earth and its cloud cover that are sent to ground from the satellite include start and stop tones that are automatically received by the ground station equipment to line and frame the receiving equipment used for producing the eventual photographs. At the ground receiving station titles and land/sea outlines, lines of latitude and longitude may be added, and then returned to the satellite so that it acts as a repeater, transmitting completed pictures to the observer.

You will see that our listing contains the familiar USA NOAA and the USSR Meteor circular orbiters, as well as the Geostationary European Meteo-

sat. These Geosats can see virtually the whole hemisphere at a time, but this is not always good enough for the weathermen, because the Geosats stuck over the equator of earth cannot see the all-important weather determining areas around the poles of earth. The circular orbiters not only fill this gap, but also provide an important overhead view, which is vital to measure parameters such as water vapour content and earth heating budget.

It is some of these "special tasks" which account for the several families of weather satellites you may never have heard of. The "DMSP" satellites are a good example of this type, as they operate in circular polar orbits providing standard weather pictures for the United States Air Force and for the aircraft carrier fleet of the United States Navy.

They monitor cloud cover in step with the orbits of the US Photographic Reconnaissance Satellites. In addition, these satellites provide a wealth of data on the ionosphere. This data is used by military h.f. communicators and the many over-the-horizon radar operations that have started up in the last few years. Furthermore, they provide invaluable data on ionospheric transparency for the operators of the electronic intelligence gathering satellites.

Some of these DMSP satellites have been reported as being good visual targets, clearly visible to the human eye when the satellites are in sun and the sky clear and dark, but what is actually being seen is invariably the much larger upper stage rocket, which is often left in space with the weather satellite, because it (the third stage rocket case) carries communications equipment and aerials for the US embassies.

Other weather satellite special packages include the joint USSR/USA COSPAS/SARSAT rescue beacons, but more on these next month, hopefully with some of your input, which should be with G3IOR by April 23.

## BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

During my 10 years writing about v.h.f. for our sister magazine, *Practical Wireless*, I found that the f.m. broadcast band (88-108MHz) held a fascination for a wide variety of readers, especially when conditions were good and signals from overseas stations were being heard in most parts of the UK.

This particular frequency range, known internationally as Band II, has that extra interest, because it is on the border line for both Sporadic-E and tropospheric disturbances. Every day millions of people around the world use this band for news and entertainment by listening to their favourite national or local radio

station. The national network in the UK is provided by the BBC and the locals are organised by both the BBC and the IBA, which gives the home listener and the traveller, a wide choice of programmes. I mention the traveller because, with so many local stations now on the air, regional news, weather reports and general information

are easily obtainable by simply tuning a car radio, or a portable, to any of the stations serving a particular area.

My home equipment includes an ex-military R216 v.h.f. communications receiver which I use to check the general Band II conditions and a Plustron TVR5D, which I also use in my car to tune

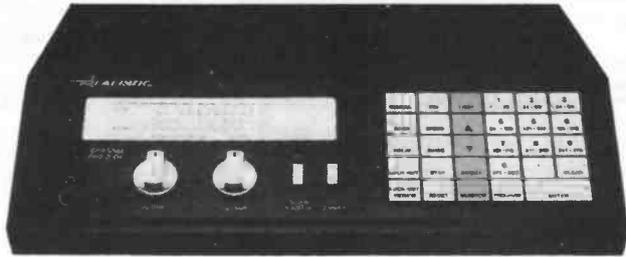
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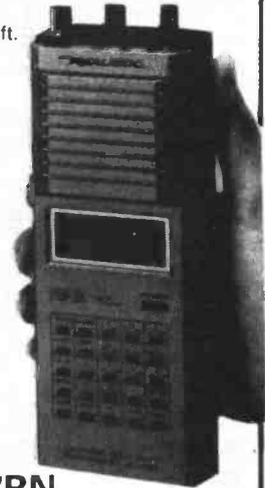
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# Seen & Heard

through the band, each time I stop on high ground. When the R216 was manufactured, some 30 years ago, there was only a few BBC stations to be heard in Band II. However although the band today is crowded and many frequencies are shared, all works well until nature takes a hand and upsets a carefully planned area of the radio frequency spectrum.

## Sporadic-E

During the mid-summer months a disturbance known as Sporadic-E can occur suddenly during the hours of daylight and cause v.h.f. signals to travel well beyond their normal range. Past experience has shown that as Band II is near the upper frequency limit for Sporadic-E, the main effect only lasts for about an hour, but in that time, strong signals from radio stations in Italy, Spain and Yugoslavia and the R4 (91.75MHz) and R5 (99.75MHz) television sound channels, are often heard. Under these conditions the Ch. R5 vision pulses, a varying low pitched buzz, are audible on 93.25MHz.

Certain spots in Band II are used by stations in the Azores, Belgium, Finland, France, E. and W. Germany, Greece, Holland, Iceland, Ireland, Luxembourg, Malta, Portugal, Scandinavia and Switzerland and are worth looking for when an intense Sporadic-E is present.

Readers with a scanner or a v.h.f. communications receiver

and a copy of the *World Radio TV Handbook* may like to select some of the frequencies, between 66 and 73MHz, that are used for f.m. broadcasting by in Bulgaria, Czechoslovakia, Hungary, Poland and Romania. Signals from these, lower frequency, stations are excellent propagation indicators because when they are heard in

the UK, with a continual "bubbling" sound, this means that an aurora has manifested. If the signals are brief but positive, like a "ping", then they have arrived via the random ionisation caused by a decaying meteor trail and if a station has exceptional strength and clarity, then Sporadic-E is present.



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## Tropospheric

The reception of line-of-sight v.h.f. signals will always depend upon the location of your QTH, its height above sea level and whether or not it is shielded in certain directions. With this in mind, most readers know what local or national stations they can receive under normal atmospheric conditions. However, when the weather is settled and the atmospheric pressure is well above 30.0in, the tropospheric path is often extended and signals from broadcasters in Belgium, France, Germany, Holland, Ireland and Luxembourg can be heard in many parts of the UK.

Finding and identifying these overseas stations is all in the fun of DXing so I look forward to receiving your reports.

At 1600 on January 16, Sean Regan, (Halifax) received a good stereo signal from Manx Radio on 97.2MHz. Sean uses a Marantz ST-64 tuner and a 7-element rotatable antenna and, in the past, has received Dutch, French, German and Swedish stations in addition to a good catch of UK locals. "The quality of the stereo sound that can be obtained from a modern tuner is quite amazing," said Sean.

I found continental stations, plus inter-station "warbles", scattered through the band on January 26, 30 and 31 and February 1, 7 and 13.

## TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

For several years I have written a monthly column for our sister magazine, *Practical Wireless*, about the reception of long distance television signals. Now this has moved to *Short Wave Magazine*, a magazine I have known for over 40 years. Readers already active in this field will know that a regular feature on TVDXing is incomplete without reports from fellow DXers. So, with this in mind, I shall look forward to receiving your letters.

## The Television Bands

Back in 1946, when I first read *SWM*, television was in its infancy and only transmitted by the BBC on 45MHz. It had a service area of about 80km from London's Alexandra Palace. Later, the IBA began a service from the London area, on 194.75MHz. Both organisations, using 405 lines, quickly installed a number of strategically sited transmitters across the UK with 5 channels in Band I for the BBC and 9 channels in Band III for the IBA.

In the 1960s a change to 625-line transmissions in the u.h.f. band began and by the mid-1980s, the 405 line systems had closed and both networks were reaching even more people by carefully sharing 18 channels in Band IV (471-608MHz) and 30 channels in Band V (615-856MHz). Throughout this period, other countries were developing their own systems, mainly using 625 lines and sharing large numbers of channels in Bands I to V.

Owing to the limited frequency space available, the channels must be allocated on an international basis. Therefore, if the planners are to avoid co-channel interference, under Normal atmospheric conditions, they must rely

on the known short range of v.h.f. and u.h.f. signals and keep the locations of similar frequency transmitters as far apart as possible. Note, I emphasised **Normal**, because when natural disturbances, such as aurora, Sporadic-E and tropospheric openings occur, within the earth's atmosphere, the accepted range of signals can increase tenfold and cause chaotic results at the receiving end.

## Band I

Many countries share the allocated portions within Band I (40-68MHz). For example, Channels E2 (48.25MHz), E3 (55.25MHz) and E4 (62.25MHz) are used by stations, in Belgium,

Denmark, Finland, Germany, Holland, Iceland, Norway, Portugal, Spain, Sweden and Switzerland. Chs. A (45.75MHz), B (53.75MHz) and C (61.75MHz) are for Ireland, Ia (53.75MHz) and Ib (62.25MHz) are used in Italy and Chs. R1 (49.75MHz) and R2 (59.25MHz) are used in Czechoslovakia, Hungary, Poland, Romania and the USSR. In Austria 49.75MHz is known as Ch. E2a.

Obviously, there are many more around the world, but it is the pictures from these countries that are usually logged in the UK when Sporadic-E is present. Although a few events do occur during the winter months, the main Sporadic-E season falls between April and September and the most vulnerable frequency, to even the mildest form of Sporadic-E, is around 50MHz. In view of this, the first place to look for DX signals is on Chs. E2 and R1. Sporadic-E openings, can occur at anytime and normally last for about 3 hours. However, during, the peak

### Deadlines

April 23

May 21

June 20

### Issue

June 87

July 87

August 87

# Seen & Heard



Fig. 1: Test card from Austria

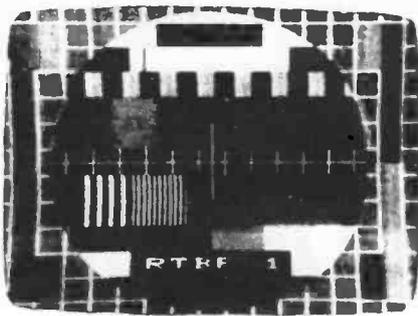


Fig. 2: Test card from the Belgian French Service

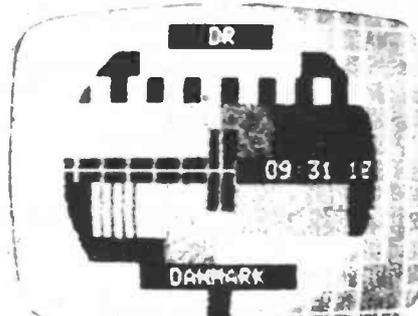


Fig. 3: Test card with clock from Denmark

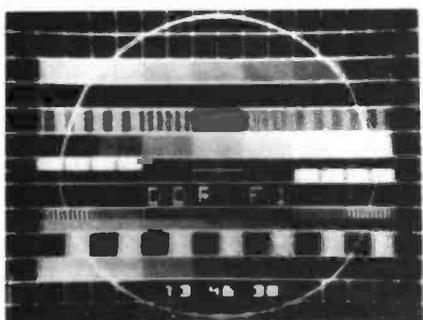


Fig. 4: Test card with clock from E. Germany

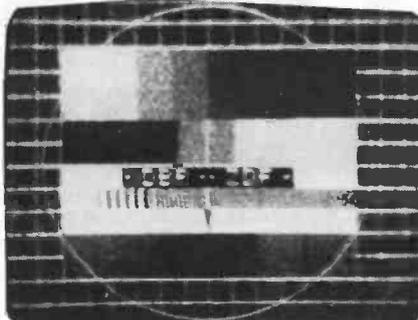


Fig. 5: West German test card

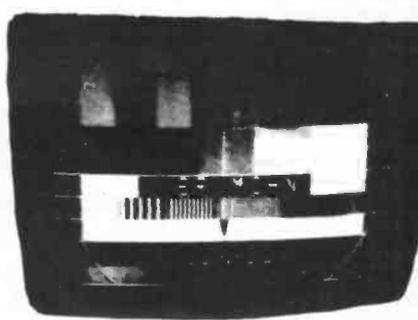


Fig. 6: West German Regional ident

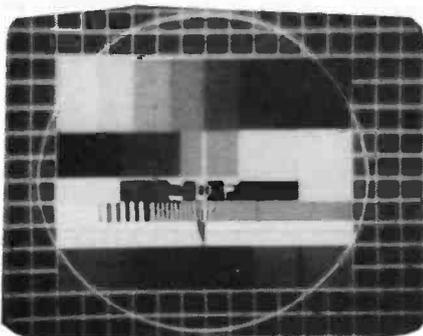


Fig. 7: West German test card

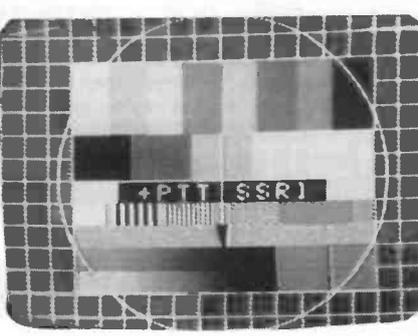


Fig. 8: Dutch test card

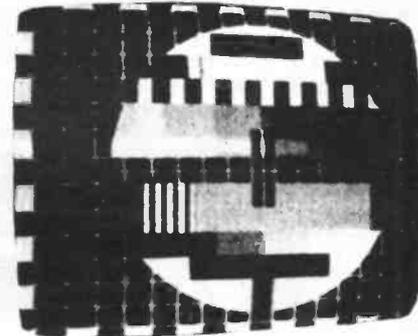


Fig. 9: Test card from Poland

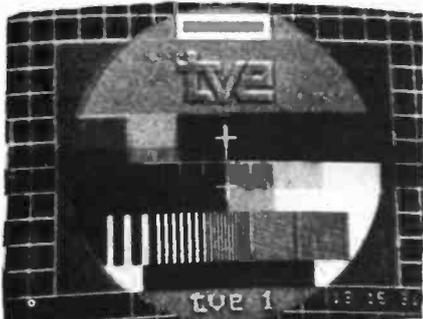


Fig. 10: Timed test card from Spain

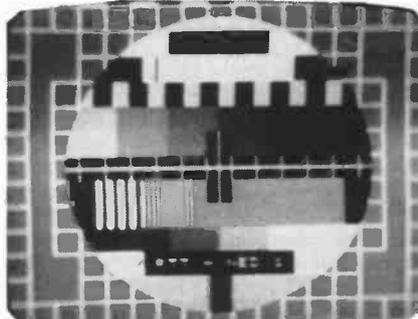


Fig. 11: Test card from Switzerland



Fig. 12: Les Hobson GOCUI

months of June and July, this phenomena can ebb and flow all day and provide some excellent DX throughout Band I.

Simon Hamer (New Radnor) received pictures from Norway (Kongsbergs), Spain (TVE) and Sweden at midday on February 6; a test card from Poland and a documentary programme from the USSR on the 8th and an ident from Iceland around midnight on the 12th.

For short periods between Jan-

uary 21 and February 15, Edwina and Tony Mancini (Belper) logged test cards from Austria (ORF-FS1), Czechoslovakia (CST and RS-KH), Denmark (DR), E. Germany (DDR-F1), Holland (PTT-NED-1), Iceland (RUV ISLAND, Ireland (RTE-1), Norway (NORGE-Bremanger, Galem, Hemnes, Kongsberg and Melhus), Poland (TVP-1), Sweden (TV1 SVERIGE), Switzerland (+PTT-SRG1) and W. Germany (ARD Grunten and SWF-BADN and RBG).

## Bands III, IV and V

The normal range of the line-of-sight signal paths, used by stations on frequencies above 100MHz, is often enhanced by complex changes within the troposphere. These events, which can last anything from a few hours to a few days, are called tropospheric openings and usually follow a spell of settled weather accompanied by high atmospheric pressure. Indications of this will be

seen on your home barometer or in greater detail on the television weather charts. Generally speaking if the pressure remains high, say around 30.4in, for a few days, watch out for an opening when it starts to fall.

Television pictures, often in colour and at varying strengths, are usually received from Austria, Belgium, France, Germany, Holland, Ireland, Luxembourg and Scandinavia in various parts of the UK while a tropo-opening is in

# Seen & Heard

progress. A typical event occurred at the end of January, when **Mike Bennett** (Slough), **Simon Hamer**, **Peter Lincoln** (Aldershot), the Mancinis and I received programmes and test cards from stations in Belgium (BRT) and RTBF), Denmark, France (TDF A2), Canal Plus, FR3 and TF1), Holland (NED 1 and 2) Luxembourg (RTL +), Switzerland and W. Germany (NDR, WDR and ZDR).

## Results

First of all be patient, because you will not receive DXTV signals on any band, every day, you must wait for those abnormal conditions to prevail. However, openings are exciting and although you can't always receive the sound and pictures together, it is fun to log and test cards from Austria Fig. 1, Belgium Fig. 2, Denmark Fig. 3, E. Germany Fig. 4, West Germany Figs. 5 to 7, Holland Fig. 8, Poland Fig. 9, Spain Fig. 10 and Switzerland Fig. 11,

with your own set. My thanks to **Len Eastman** (Bristol), **George Garden** (Edinburgh), **Keith Hamer** (Derby), The Mancinis, **Noel Smythe** (Caerphilly) and **Roger Wallis**, who photographed these signals off screen.

## Equipment

There are two ways to receive DXTV signals. First is to purchase a receiver with two tuners, one for the v.h.f. Bands I and III and the other for the u.h.f. Bands IV and V and each with their dials scribed in channel numbers; 2 to 4, 5 to 12 and 21 to 68 respectively. These are usually small screen portables and are sometimes available from the larger retail outlets or from specialist firms like **Aerial Techniques**, 11 Kent Road, Parkstone, Poole, Dorset, BH12 2EH. It is worthwhile sending 65p for their catalogue.

Second, converters are available to make your existing u.h.f. receiver operate on the two v.h.f. bands and **Keith Hamer**, at **HS**

**Publications**, 7 Epping Close, Derby, DE3 4HR, can give advice on this. Although the ideal antenna system for DXTV, is a separate beam for each of the 3 bands mounted on a rotatable mast, a simple horizontal dipole, cut for 50MHz, facing east will give reasonable results in Band I during the Sporadic-E season. However, larger and more directional antennas are required to obtain decent results in Bands III, IV and V.

## SSTV

The exchange of slow scan television pictures in the h.f. bands is a fascinating subject and now, thanks to the availability of programmes for some home computers, its popularity is growing. At 0815 on February 10, **Richard Thurlow G3WW**, (March), swapped monochrome, 8 seconds, pictures with stations in Austria and Germany on 7.041MHz, despite heavy QRM at the

continental end. Between February 1 and 14, **Les Hobson GOCUI**, (Rotherham), Fig. 12, copied signals from Germany and Sweden on 3.5MHz and, on 14MHz, he exchanged 24 seconds colour pictures with **WAOPFP** and joined in a stateside SSTV net with **K4KUG**, **W1JKF** and **WA7WOD**.

Don't forget, the World Radio TV Handbook 1987 is available from Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. Price £18.70 inc P&P.

## LONG MEDIUM & SHORT

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

May I first of all extend to you my greetings and a very warm welcome to this section of "Seen & Heard" in this great new magazine. If you are interested in listening to any of the many hundreds of official broadcast stations to be found on the long, medium or short wave bands, then this section is for you!

Each month there will be a guide to the prevailing conditions on the bands, what you can expect to hear, where and when to listen for particular stations and details of what other listeners have in fact been hearing. Some of the news, views and ideas sent in by readers will also be included in the text, along with details of m.w. and s.w. awards, DX clubs and their publications and broadcast station addresses so that you can send along your reception reports to them.

Since the information contained in the text is not intended to be in any way competitive, every report received here is important — so no matter how new or experienced you may be in this great hobby of ours, please send regular reports along to me to help make this new magazine the best ever for the listener.

## Long Wave DX

(Note: l.w. and m.w. frequencies in kHz, s.w. in MHz: Time UTC)

The first stage of a new l.w.

band plan came into effect on 1 February 1986. This moved the lower limit of the band to 153kHz and required the broadcast stations below 200kHz to change their operating frequency slightly, so that they are spaced 9kHz apart. The second stage of the plan will occur on February 1 next year and will affect the stations operating below 245kHz — this includes the BBC 200kHz Droitwich transmitter, which will move to 198kHz. The third stage is due to take place on 1 February 1990 and will affect the broadcasters using 245kHz upwards.

Some of the transmitters operating on the l.w. band use very high power and their signals cover considerable distances by day or night. A Toshiba RP F-11L portable receiver was used by **Robert Taylor** to take a look at the band in Edinburgh. He logged **Allouis**, France 162 (2000kW); **Motala**, Sweden 189 (300kW); **Roumoules**, Monaco 218 (1400kW); **Kalundborg**, Denmark 245 (300kW) and **Moscow**, USSR 263 (2000kW). **John Nash** in Brighton cannot hear the International Service of Radio Finland on 254, due to the very strong signal from **Tipaza**, Algeria on that frequency.

Some of the other interesting l.w. signals which **Philip Rambaut** noted in Macclesfield were

**Donebach**, W. Germany 153 (500kW); **Kaliningrad**, USSR 171 (1000kW); **Oranienburg**, E. Germany 177 (750kW); **Saarlouis**, W. Germany 183 (200kW); **BBC Droitwich** 200 (400kW); **DLF Munich**, W. Germany 209 (500kW); **Konstantynow**, Poland 227 (2000kW); **Junglinster**, Luxembourg 236 (2000kW); **Tipaza**, Algeria 254 (1500kW); **Burg**, E. Germany 263 (200kW); **Topolná**, Czechoslovakia 272 (1500kW) and **Minsk**, USSR 281 (500kW).

## MW Transatlantic DX

Due to the generally excellent conditions just now, the signals from a number of broadcasters in Canada, the USA and S. America have bridged the Atlantic well before midnight. No doubt it is this factor which has encouraged many new to this aspect of our hobby to try their hand at transatlantic DXing. The excitement of hearing a transatlantic signal for the first time is difficult to describe, but once experienced can quickly lead to further attempts to find out what else can be heard — and late nights too!

Broadcasts are not always what they seem, for example **David Edwardson** described how he was tuning into various m.w. stations with his **Trio R600** in Wallsend one

night at 2300 when he came across a broadcast in French on 1570kHz. To his amazement it proved to be **CKLM** in Montreal, Canada! He listened to their signal for nearly 45 minutes before being tempted to look around the band to see what else he could find and at 2359 picked up the Caribbean **Beacon**, **Anguilla** on 1610.

Needless to say **David** has been busy listening again since then. Between 0200 and 0415 logged Canadian **CJFX 580** in Antigonish, NS; **VOCM 590** St. John's Nfld and **CKCW 1220** Moncton NB and from the USA noted **WINS 1010** and **WHN 1050** both in New York and **WBAL 1090** in Baltimore.

Of course there are times when frustration may set in because positive identification of a particular station cannot be made. Perhaps the signal is very weak or under mountains of interference, it is very important in these circumstances not to let one's imagination run riot. In the heat of the moment you can get carried away and finally log the station concerned under an assumed callsign, simply by referring to a list or guide book. Certainly one way of checking again and again exactly what was being heard in such circumstances is always to make sure that a tape recorder is running when DXing. It is worth remembering that some of the DX stations may be broadcasting in

# Seen & Heard

languages other than English — French and Spanish are common.

For many years the signal from CJYQ 930 in St John's, NF has been used by DXers in the UK as a useful pointer to band conditions since it has often been the first transatlantic station to be heard here in the evening. Quite recently **George Millmore** picked them up at 2215 in Ryde, I.O.W. However, there seems to have been a change in the overall pattern during the last few months, because WINS 1010 in New York has often been heard here well before CJYQ puts in its appearance and at far greater strength!

Writing from Port Glasgow, **Rab Freeman** says "I recorded WINS on 1010 at 2158 and I have heard it earlier — it seems to give me the best indication that the band is opening". In contrast, the signals from CJYQ have been rather weak before midnight. **Alan Curry** described them in his report from Stockton-on-Tees as "poor at 2330". Their signal has been rather better in the early hours of the morning as can be ascertained from the SIO 333 which **Jim Willett** noted in his log at 0150 in Grimsby. **Alan Jarvis** says he has been hearing WINS 1010 quite regularly in Cardiff and has not been able to hear CJYQ once this winter!

A good loop antenna is one of the most important aids in separating the transatlantic signals from the European stations which are very much in evidence before midnight. The construction of loop antennas was mentioned in several reports — one of the most interesting came from **Alan Scholefield** of South Shields. He has a hexagonal loop with a mean dimension of 1.3m nearing completion. **George Morley** of Redhill has been testing out a home-made loop antenna with his Trio R2000 receiver. Between 2330 and 0150 he logged four stations in New York, namely WNBC 660, WINS 1010, WHN 1050 and WNEW 1130 also WCAU 1210 in Philadelphia and Boston's "memory station" WMRE 1510. From Canada he heard CJYQ 930; CBM 940 in Montreal; CKCW 1220 and CKLM 1570.

**Dave Mayhew** has been using his "Sooper Loop" antenna (*Practical Wireless*, July '86) to good effect in Yapton with his Grundig Satellite 1400SL receiver. He logged some interesting stations from the USA and Canada including WJR 760 Detroit; WHAS 840 Louisville, KY; CBO 920 Ottawa; KDKA 1020 Pittsburgh; CHUM 1050 Toronto; WOAI 1200 San Antonio, TX and CFVD 1370 Ville Degelis, PQ. Also noted were Radio Paradise St. Kitts on 825; ZDK Antigua on 1100 in the Caribbean and Radio Mundial in Rio, Brazil S. America on 860.



QSL card for the 21.590MHz signal from Radio RSA.  
Sent to Leslie Lyon.

In an interesting report from Loughborough, **Paul Barnett** says that he is amazed at the number of DX stations that he has been able to hear when using just the built-in antenna with his Sony ICF-2001D receiver. Many of them have been coming across early, even before 2230 on some nights: His list includes Canadian CJFX 580 Antigonish; CKYQ 610 Grand Bank, NF; CJCH 920 Halifax, NS; VOXM 590 St John's; CKVO 710 Clarendville, NF; CFBC 930 St. John NB; CJYQ 930; CFRB 1010 Toronto; CKLM 1570 and several stations in the USA — WABC 770 NY; WINS 1010; WHN 1050; WHDH 850 Boston; WCAU 1210; WTOP 1500 Washington and WMRE 1510. Also noted were the Caribbean Beacon, Anguilla on 1610 and Radio Globo in Rio, Brazil on 1220.

**George Morley** recently purchased a Sony ICF-2001D receiver and says he is impressed with its performance — he finds the e.c.s.s. mode of reception very good for DXing. **Alan Jarvis** says "I am more and more using e.c.s.s. for DXing. It has often enabled me to hear stations not readable on a.m." In fact it is possible to use "exalted carrier" reception with any s.s.b. receiver, selecting either the upper or lower sideband depending upon the interference from adjacent stations — it is certainly well worth trying this mode if you have a suitable receiver.

Using a loop antenna with his Selena B210 receiver in Glasgow, **Alexander Little** has also been hearing some interesting transatlantic signals. In addition to VOXM 590; CKYQ 610; CKVO 710; CJCH 920; CJYQ 930; WINS 1010; WHN 1050; WCAU 1210; WTOP 1500 and WMRE 1510 which he logged between 2200 and 0345, **Alexander** also picked up CBN 640 in St. Johns, NF; CJRP 1060 Quebec, PQ; WHAM 1180 Rochester, NY and WFTQ 1440

Worcester, MA.

Over in Belfast **Bill Kelly** has been using his new NRD 525 receiver to log VOXM 590; CBNA 600 St. Anthony, NF; CKYQ 610; CJYQ 930; CHER 950 Sydney, NS; Radio Vision 950 Caracas, Venezuela; KOMO 1000 Seattle, WA; CFRB 1010; WINS 1010; WBAL 1090 Baltimore; Radio Globo de Sao Paulo 1100 Brazil; WWWE 1100 Cleveland, OH; CBD 1110 St. John, NB; Radio Nacional 1130 Rio, Brazil; WCAU 1210; Radio Globo Rio 1220; WLAM 1470 Lewiston, ME; WTOP 1500; WMRE 1510; WQXR 1560 in NY; CKLM 1570 and the Caribbean Beacon 1610.

"I usually open my watch by checking marker frequencies of 930, 1010 and 1610 before getting down to serious DXing" wrote **John Sheridan** of Mapperley. John used a new loop antenna with his RCA AR88 receiver to log WHDH 850; CJYQ 930; CFBC 930; CFRB 1010; WINS 1010; WHN 1050; WBAL 1090; WCAU 1210; CKCW 1220 Moncton, NB; Radio Globo 1220; WTOP 1500; WMRE 1510; CKLM 1570; WHII 1570 Bay Springs, MS and the Caribbean Beacon 1610. **Tim Shirley** has also been using a home-made loop antenna with his Trio R600 receiver in Bristol and picked up WBBN 780 Chicago and Radio Caribes 840 St. Lucia for the first time.

The extensive report from **Rab Freeman** included stations not mentioned by others — CHYQ 670 Musgravetown, NF; CIYQ 680 Grand Falls, NF; WGY 810 Schenectady, NY; WBZ 1030 Boston; WWVA 1170 Wheeling, WV and WPOP in Hartford, CT on 1410. Using a Grundig 1400SL receiver with either a 22m wire antenna or a "Sooper loop" in New Radnor, **Simon Hamer** has added a number of new stations to his list including his first from Mexico — XEBBC in Tijuana on 1470. Others were CFCB 570 Corner Brook, NF;

CJFX 580; CHYQ 670; Radio Caribes 840; WHDH 850; CJCH 920; CFBC 930; CBV 980 Quebec, PQ; CKBW 1000 Bridgewater, NS; CHUM 1050; CJRP 1060; WBAL 1090; CHTN 1190 Charlottetown, PEI; WERE 1300 Cleveland, OH; CIGO 1410 Pt. Hawkesbury, NS; WPOP 1410; WLAM 1470; CHRD 1480 Drummondville, PQ; Atlantic Beacon 1570 and VOA 1580 Antigua.

Perhaps the report from **John Court** will encourage those listeners who live in noisy cities to try m.w. transatlantic DXing — using a Vega 206 portable receiver in Birmingham, John picked up WQXR 1560 at 2345 (SINPO 32323); WHN 1050 at 0117 (33333) and WINS 1010 at 0230 (45555)! He also heard WBAL 1090 at 0134 which rated 43333.

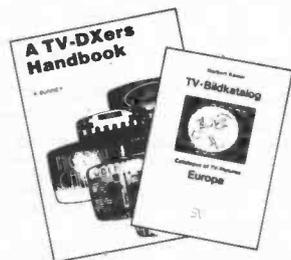
## Other DX

Vega portable receivers are popular with DXers and **Geoff Blakey** has been using his Vega 206 in two locations — in Deal where he listened to AFN Frankfurt 873, AFN Stuttgart 1143 and VOA via Munchen Ismaning 1197 and in Gosport where he picked up RTE-1 Tullamore 567 and RTE-2 Athlone 612 and Dublin 1278 from S. Ireland and the BBC Lisnagarvy, N. Ireland transmitter on 1341. **Darren Taplin** used his Vega 206 in Tunbridge Wells to log two stations in Yugoslavia — Ljubljana on 918 and Zargreb on 1134.

**Roy Spencer** of Nuneaton has been listening to TWR Monte-Carlo on 1467 at 2245 — their transmission to Europe commences at 2200. Three of the low power m.w. relay stations were logged by **Philip Rambaut** — BBC Dumfries relay (2kW) 585, BBC Wallasey relay (0.5kW) 1107 and BBC Llandrindod Wells relay (1kW) 1125. The high power BBC Radio Scotland transmissions on 810 are being heard during daylight hours in Turkey, Finland by **Kari Nieminen**. However it is not possible to say if the transmitter received is Burghead or Westerglen since they both operate on the same frequency! They are also reaching **Maurice Andries** in Dendermonde, Belgium during daylight with SINPO 23443.

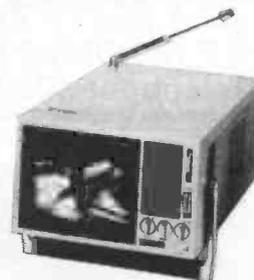
For those listeners who send along a detailed report to Manx Radio, Isle of Man (see QSL addresses), they have an attractive QSL card and some interesting literature about the history of their station. Many listeners in the UK will be unable to hear their ground wave signals on 1368 during daylight hours, however at night their skywave signal reaches many areas. **Michael Hill** has been getting good reception of their programmes in Stockton-on-Tees around 2330.

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	Kit	Assembled PCB
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TRF3 Shortwave Broadcast receiver using TRF principle. . . . .	£14.50	£19.90
CTX80 and CTX40 QRP CW Transmitters for 80M and 40M bands. . . . .	£13.40	£19.40
MTX20 20M CW Transmitter, adjustable power up to 10W RF. . . . .	£21.90	£27.70
CVF VFOs for above TXs (one version per band). . . . .	£9.90	£15.90
HC220 and HC280 2M to 20M or 80M transverters, 10W RF. . . . .	£52.50	£83.50
AP3 Automatic Speech Processor with VOGAD level control. . . . .	£15.90	£22.80
CM2 Quality microphone kit with electric mic and VOGAD. . . . .	£11.20	£15.20
CTU30 Antenna Tuner, with balun, all HF bands up to 30W. . . . .	£24.90	£29.90
ST2 Sinewave side-tone/practice oscillator 1W audio. . . . .	£8.60	£12.90
XM1 Crystal Calibrator, 80/p markers, usable LF to UHF. . . . .	£16.80	£21.90

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73 from Dave G4KQH, Technical Manager.

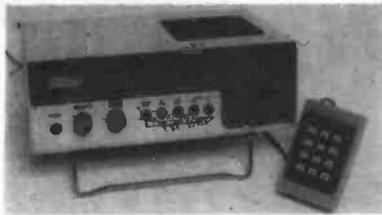


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## AR2002 RECEIVER

Frequency range of the AR2002 is from 25 to 550 and from 800 to 1300 MHz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and a search mode which checks frequencies between user designated limits. The receiver has a push button keypad for easy frequency entry and operation.

A front panel knob allows the listener to quickly step up or down in either 5, 12.5 or 25 kHz steps from the frequency initially chosen.

The AR2002 has a front panel LED bar "S" meter. There is a front panel 3.5mm jack socket for headphone use.

A socket for the optional RS232 interface (RC PACK) is provided on the rear panel. The RC PACK consists of an 8 bit CPU with its own ROM and RAM and with your own computer acting as a dumb terminal many additional operating facilities become available. Of course, if you want to write your own programs using the RC PACK as an interface then "the sky's the limit".



THE R532 AIRCRAFT BAND RECEIVER £224

Specification. Frequency range: 110 to 136MHz, i.e. all NAV/COM channels. Number of channels: 1040 (25kHz steps). Sensitivity: Better than 0.75 microvolts 10dB/SN. Memory channels: 100 (10 banks of 10). Memories can be scanned automatically or selected manually. Power required: 12V dc negative earth 300 mA typical. (Display can be switched off to reduce consumption when operating portable). Size: 160x45x130mm. Weight: approx. 1kg. (including memory backup batteries).

RS575 Hand Held Airband Receiver..... £69.50

## R-5000 COMMUNICATIONS RECEIVER

The R-5000 is a competition class communication receiver with superior dynamic range, having every conceivable feature, and is designed to receive all models (SSB, CW, AM, FM, FSK) from 100kHz to 30MHz. With the optional VC-20 "VHF Converter Unit" coverage of the 108-74 MHz frequency range is provided.

Advanced microprocessor technology controls various features, including dual digital VFOs, 100 memory channels, memory scroll, memory and programmable band scan, superb interference reduction and other features for ease of operation to enhance the excitement of listening to stations around the world.

### FEATURES

Covers 100 kHz to 30 MHz in 30 bands, Optional 108 to 174 MHz Coverage (VC-20).

The R-5000 covers 100kHz to 30 MHz in 30 bands. An innovative digital PLL synthesiser system provides outstanding frequency stability and accuracy.

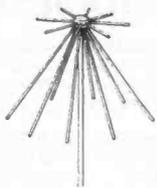
Through the use of advanced microprocessor technology, frequency, band and mode data of stations in the 108 to 174 MHz range also may be tuned, displayed, stored in memory, recalled and scanned. This is accomplished by using the R-5000 front panel controls and frequency display, which allows maximum convenience and ease of operation.

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A discone is a broadband antenna that is ideal for use with a scanner as it will usually give good reception from 50 to 500 MHz. Scanner users throughout the world use discones and one of the best is the Revcone. It has 16 elements, which screw into the head assembly, and is British made to the highest standards. The SO239 for the downlead is protected from the weather because it is inside the support tube and the entire unit is extremely robust.

Excellent value at just ..... £29.95

### RADAC

The Radac is a breakthrough in wideband antenna technology. Designed for the connoisseur and advanced scanner user, this antenna offers a more consistent performance over a much wider bandwidth. Because the Radac is a nest of dipoles, genuine performance is guaranteed from 26 to 500 MHz. As Roger Bunney said when he reviewed this antenna in the October issue of Television Magazine "On test I found that the performance was excellent, the best achieved with any general purpose monitoring aerial so far tried!"

Price inclusive of postage ..... £69.95



### PRE-AMPLIFIER

As broadband antennas usually do not have any gain, it is often desirable to use a pre-amplifier to boost weak signals. The REVCO PA-3 in-line masthead pre-amp plugs straight into the SO 239 socket on the base of the Revcone and because it is fitted at the antenna end of the feeder cable, it compensates for the losses that can occur in long cable runs. The PA-3 has been designed in co-axial fashion to connect directly to the Revcone and similar discone type antennas with an SO 239 connector and an N-type option is available for improved UHF performance.

The PA-3 covers DC to 1000 MHz with a minimum of 13dB gain, NF 5dB and an intercept point. 3rd order 15dB typical. Current consumption is just 17mA at 5V and the temperature range is -20°C to +85°C.

The PA-3 will not only improve the performance of wideband scanning and monitor receivers, it can also be used to improve the sensitivity of RF instrumentation such as spectrum analysers, etc.

The PA-3 is mains powered for economy and there is no need to run a power cable to the unit at the masthead as the co-axial cable is used to carry the supply voltage.

REVCO PA-3 PRE-AMPLIFIER (with p.s.u.) ..... £49.95  
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# Seen & Heard

Freq kHz	Station	ILR or BBC	DXer
603	Invicta Sound	I	B, I, J*, M, P
630	R. Cornwall	B	C*, I
630	R. Bedfordshire	B	B, E, G, I, M, N, P
657	R. Clwyd	B	D, F, H, I, M, N
657	R. Cornwall	B	I
666	Devonair R.	I	E, I, M
666	R. York	B	F, L, N
729	BBC Essex	B	B
756	R. Cumbria	B	F, H, L
756	R. Shropshire	B	E, I, N, P
765	BBC Essex	B	B
774	R. Kent	B	B
774	R. Leeds	B	H, J, L, N
774	Severn Sound	I	E, I, M, N, P
792	Chiltern R.	I	B, G, M, N, P
801	R. Devon	B	E, F*, I, M, N
828	2CR	I	I, M
828	R. WM	B	N, P
828	R. Aire	I	H
828	Chiltern R.	I	G, I, M, P
837	R. Leicester	B	D, E, G, I, N, P
855	R. Devon	B	I
855	R. Norfolk	B	B, M, P
855	R. Lancashire	B	F, N, R
873	R. Norfolk	B	B, N, P
936	GWR	I	E, I, M, N
954	Devonair R.	I	F, I, M
954	R. Wyvern	I	E, I*, N, P
990	R. Devon	B	F*, I, M
990	Beacon R.	I	D, N, P
999	R. Solent	B	E, I, M
999	Red Rose R.	I	F, H, N
999	R. Trent	I	J*, P
1026	Downtown R.	I	F
1026	R. Jersey	B	B, I, M
1026	R. Cambridgeshire	B	B, G, N, P
1035	R. Sheffield	B	H, N
1035	R. Kent	B	B, G, I, M
1035	Northsound R.	I	F*
1035	West Sound	I	F*, I
1107	Moray Firth R.	I	F
1107	R. Northampton	B	E, P
1116	R. Derby	B	I, N, P
1116	R. Guernsey	B	E, I, M
1152	LBC	I	B, F*, M
1152	R. Clyde	I	F*
1152	Metro R.	I	H
1152	BRMB	I	C*, E, G*, I, P
1152	Piccadilly R.	I	D, N
1152	R. Broadland	I	A, B, G, I*

1161	R. Sussex	B	A, B, M
1161	R. Tay	I	F*
1161	Viking R.	I	F*
1161	GWR	I	E, I
1161	R. Bedfordshire	B	N, P
1170	Swansea Sound	I	I
1170	R. Orwell	I	A, B*, Q*
1170	Ocean Sound	I	M
1170	Signal R.	I	N, P
1242	Invicta Sound	I	A, B*, G*, I*, P
1251	Saxon R.	I	B, G, I, M
1260	GWR	I	E, I, M
1260	Marcher Sound	I	D, F*, N
1260	Leicester Sound	I	P
1278	Pennine R.	I	J*, M, N
1305	Red Dragon R.	I	E, F*, I, M, P
1305	R. Hallam	I	C*
1323	R. Bristol	B	E, F, I, L, N, P
1323	Southern Sound	I	F*, M, P
1332	Hereward R.	I	I*, M, N, P
1359	Essex R.	I	B, G
1359	R. Solent	B	M
1359	Red Dragon R.	I	E, F*, I
1359	Mercia Sound	I	F*, N, O, P
1368	R. Sussex	B	M
1431	Essex R.	I	B, I*
1431	Radio 210	I	G, M
1449	R. Cambridgeshire	B	N, P
1458	R. London	B	A, B, F*, L, M
1458	R. WM	B	P
1458	R. Manchester	B	F*, N
1458	R. Newcastle	B	F*, H
1458	R. Devon	B	I
1476	County Sound	I	F*, I*, J, M, N, P, Q*
1485	R. Merseyside	B	D*, F*, N, P
1485	R. Humberside	B	F
1485	R. Sussex	B	M
1485	R. Oxford	B	I
1503	R. Stoke-on-Trent	B	M, N
1521	R. Mercury	I	B, F*, M
1521	R. Nottingham	B	N
1530	Pennine R.	I	F, N
1530	BBC Essex	B	B, F*
1530	R. Wyvern	I	F, I, K*, M, P
1548	Capital R.	I	A, B, F*, J*, P
1548	R. Bristol	B	E, I, M, P
1548	R. Forth	I	F*, P
1548	R. City	I	N
1557	Hereward R.	I	F*, I*, K*, M, N, P
1557	Ocean Sound	I	E, F*, I, J*, M
1584	R. Nottingham	B	F*, M, N
1584	R. Shropshire	B	P
1584	R. Tay	I	F*, J, K*, P
1602	R. Kent	B	F*, M, P

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

## MW Local Radio DX

There have been many stations logged — see chart! Don't forget to let me know all about your local radio DXing.

## Short Wave DX

Although there are indications that we may be entering the upward slope of cycle 22 in the 11-year sun spot cycle it is unlikely that the m.u.f. will rise sufficiently to enable a reliable broadcast service to be established on the 25MHz (11m) band for some time to come. Consequently, the broadcasters are forced to use lower frequencies in order to ensure that their programmes reach the listeners in a chosen target area, so let us now examine the conditions on the lower frequency bands where things are a good deal more interesting!

The conditions on the 21MHz (13m) band have been generally

unstable and daily variations in the strength of the signals received during dayling hours have been noted — the band closes very soon after dark here in the UK. The most frequently received signals stem from southerly directions — David Middlemiss of Eyemouth was one of the many DXers to log UAE Radio Dubai on 21.605, beaming programmes in Arabic and English towards Europe from 1000 until 1500.

The most southerly station to be heard on this band just now was mentioned by Bill Stewart in his report from Lossiemouth, namely Radio RSA in Johannesburg, S. Africa. Their broadcasts in Portuguese, English and French are beamed towards Europe on 21.590 from 1000 until 1556. Usually their signals are well received here and tend to peak up around mid-day. Radio RSA welcomes comments about their programmes and uses a variety of attractive and colourful QSL cards

to confirm reception reports — the one illustrated confirms reception of their signals in Scarborough by Leslie Lyon.

Phillip Rambaut has been busy logging some of the other broadcasters who use this band — Radio Cairo, Egypt on 21.465, with programmes in Thai, Indonesian and Malay which are directed towards Asia from 1115-1445; Radio Nederlands broadcasting in English to Asia on 21.480 via their relay station in Madagascar from 1130-1225; VOA beaming programmes in French to Africa on 21.550 from 1200-1330, via their relay in Monrovia, Liberia and NRK Norway on 21.700, with programmes in Norwegian intended for E. Africa from 1200-1245.

If you have a suitable receiver you might find the u.s.b. signals from the 100kW s.s.b. transmitter in Varberg, Sweden on 21.555 are of interest. Although the transmission is intended for the Middle East from 0930 until 1200 and for

**DXers:**  
 A: Maurice Andries, Dendermonde, Belgium.  
 B: Geoff Blakey, Deal.  
 C: John Court, Birmingham.  
 D: Roy Degg, Stoke-on-Trent.  
 E: Colin Diffell, Corsham.  
 F: Rab Freeman, Port Glasgow.  
 G: Francis Hearne, Ilford.  
 H: Michael Hill, Stockton-on-Tees.  
 I: Alan Jarvis, Cardiff.  
 J: Bill Kelly, Belfast.  
 K: Gerry Lovell, Weston-Super-Mare.  
 L: David Middlemiss, Eyemouth.  
 M: George Millmore, Ryde.  
 N: Philip Rambaut, Macclesfield.  
 O: Stewart Russell, Forfar.  
 P: Roy Spencer, Nuneaton.  
 Q: Robert Taylor, Edinburgh.  
 R: Chris Wood, Washington, Co. Durham.

# Practical Wireless

The Radio Magazine

MAY '87 ISSUE



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# Seen & Heard

Africa from 1200 until 1600 it can often be heard well in the UK.

The propagation conditions on the **17MHz (16m)** band have also been rather unstable, however it has been possible to receive the signals from broadcasters in several continents during the hours of daylight in the UK. The most distant signal to be heard here in the morning originates from a transmitter in Carnarvon, Western Australia on 17.715, which beams Radio Australia's programmes in English to Asia from 0100 until 0910 – John Nash has picked them up at 0800, but their signal only rated SIO 222.

A number of broadcasters direct their signals towards Europe during the day but many of their programmes are in foreign languages. Urdu is the language used by Radio Pakistan, Islamabad during their broadcast to Europe from 0715 until 1115 on 17.660, however there are two brief periods in English at 1005 and at 1100. Their signal is often quite good – the SINPO rating of 44333 noted by Sheila Hughes in Morden at 1105 is a typical value just now.

Arabic is the language used during the majority of the transmission from UAE Radio Dubai, who beam this way from 1000 until 1500 on 17.775, but there are some items in English and they are usually interesting and well produced. Using a Trio R600 receiver with an indoor trap dipole antenna in Knaresborough, Leslie Biss logged their signal as SINPO 44444 at 1155. Also using a Trio R600 receiver, Tim Shirley has been listening to RCI in Montreal, Canada on 17.820 during the afternoon. Their programmes in Russian, Ukrainian, English, French, Polish and German can be heard from 1430 until 1800.

Julian Wood of Buckie has been listening to the broadcast in English and Japanese for Europe from Radio Japan via their relay in Moyabi, Gabon on 17.785. Julian says their signal suffers from considerable interference when a VOA relay transmitter in Bethany, USA comes on the frequency at 1600, beaming to W. Africa.

It is interesting to note that the programmes in English and Dutch from Radio Suriname on 17.755 are actually broadcast to Europe by an RNB transmitter located many hundreds of kilometres to the south in Brazil – Chris Wood picked them up in Washington, Co. Durham at 1700.

The propagation conditions on the **15MHz (19m)** band during daylight have been rather more reliable than those on the higher frequencies and the band has often remained open for several hours after sunset. There are some interesting signals from unusual DX spots to look out for on this band in the morning, for example KTWR on Guam way out



Car sticker sent to Andrew Hill

in the Pacific, which Sheila Hughes heard at 0830 on 15.115, or KYOI in Siapan, N. Mariana Islands on 15.190 which Davy Hossack picked up at 0645 while testing a new Dressler-30 active antenna with his receiver in Winchburgh.

Radio Japan can also be heard broadcasting to Europe via their relay in Moyabi, Gabon on 15.230 from 0700 until 0830 – Maurice Andries logged them at SINPO 23443. Although the broadcast from Radio Australia on 15.415 at 0900 is intended for Asia, their signals can often be heard here until 1100. Tim Shirley is a regular listener to this transmission and has noticed that the strength of their signal often improves around 1000.

Using a Grundig 1400SL receiver in Trelewis, Wales, Leighton Smart has been listening to the BBC World Service via their Ascension Island relay station in the S. Atlantic – although their transmission on 15.400 is beamed towards Africa between 0615-1130 and 1430-2030 it makes a good guide to conditions from the south to the UK. Leighton has also been hearing the Madagascar relay of Radio Nederlands broadcasting their programmes in English to E. Africa on 15.570 from 1630 until 1725.

Broadcasting to Europe from Johannesburg, Radio RSA can be heard on 15.220 with programmes in English and French from 1100 until 1556 – Tim Shirley listens to their *Mail Bag* programme hosted by the popular Kathy Fitch and Shirley Veal. The broadcasts in French from Africa No. 1, Gabon commence at 1700 on 15.475 and can usually be heard quite well in the UK. David Edwardson, who uses a Trio R600 receiver and trap dipole antenna, picked up their brief news bulletin in English at 1850 as SIO 343.

Between 1545 and 1600 there is a transmission in English from RCI in Montreal, Canada on 15.325 – their evening programme in English to Europe is on 15.140 and 15.325 from 2000 until 2030. There are a number of broadcasters in the USA who use this band during the late afternoon and early evening to beam their programmes to Europe. John Sadler of Bishops Stortford has been listening to WYFR via their transmitter in Okeechobee, Florida on 15.440 from 1600 until 1845. Some of the others are WRNO in New Orleans, LA on 15.420 from 1600 until 2000; WINB Red Lion, PA on 15.295 from 1602 until 2000 and WHRI in South Bend, IN on 15.105 from 1700 until 2000.

While checking out the performance of his new Sony ICF 2001D receiver one evening in Kingston-Upon-Thames, Donald Wood discovered that the station he was hearing on 15.150 was Radio New Zealand! His reception at 1845 has now been confirmed by a QSL and letter from their manager Rudi Hill.

Two broadcasts to Europe from Brazil, S. America were logged by George Morley – RNB Brasilia on 15.390 at 1725, broadcasting in Portuguese and RNB Brasilia on 15.265 in English and German from 1800 until 1950. Leslie Biss has been listening to Radio HCJB in Quito, Ecuador on 15.270 – they broadcast to Europe on this frequency in several languages from 1800 until 2230.

The majority of the transmissions to be found on **13MHz (22m)** stem from the USSR. However, there are several other countries now using this band. Darren Taplin, who uses a Realistic DX-150A receiver plus 25m wire antenna, has been hearing Radio Nederlands on 13.770 at 1430 with a SINPO

rating of 34333. Simon Hamer picked up RUV Iceland on their new frequency of 13.759 at 1215 – this station uses u.s.b. with full carrier and the broadcasts are in Icelandic.

The conditions on **11MHz (25m)** have been especially good during the morning, sometimes permitting the bird call station announcement and the time signal for 0900 to be received from Radio New Zealand on 11.780. Their signal is not too strong, Alexander Little logged them as SINPO 22222 with his new Sony ICF-7600D receiver.

Although there are many broadcasters active on 25m during the daytime, the conditions during the evening have enabled DXers to log some interesting signals. Stations such as the Voice of Nigeria, which Alexander Little logged on 11.770 at 1728, or RHC Habana, Cuba relaying Radio Moscow to N. America on 11.840 at 1857 which Colin Diffell picked up on his Sony ICF-2001D receiver in Corsham. He also logged their broadcast to SW Europe in Arabic on 11.950 at 1918.

Some of the broadcasts directed towards Europe have been attracting the attention of Neil Dove in Lockerbie, All India Radio in New Delhi on 11.620 at 2000; WRNO in New Orleans, USA on 11.705 at 2100 and Radio HCJB in Quito, Ecuador on 11.740 at 2130. Neil also logged a number of stations in S. America – RAE Buenos Aires, Argentina on 11.710 at 2340; RNB Brasilia, Brazil 11.780 at 2130; Radio Globo Brazil on 11.805 at 2345 and Radio Bandeirantes, Brazil on 11.925 at 2215. Robert Taylor has been listening to some of the popular programmes from Radio RSA in Johannesburg on 11.900 at 2100 – their signal is often good. Using just the whip antenna with his Toshiba RP F-11 L portable Robert noted SINPO 43444 in his log.

The bird call from Radio New Zealand has also been attracting many listeners to the **9MHz (31m)** band in the morning! Their signal on 9.600 is often weak with interference present. One of the lucky ones to hear their time signal for 0900 and news bulletin was Michael Osborn, who noted SINPO 32333 in his log in Chelmsford. "I didn't expect to hear it, but got a definite ident on the hour" writes Jim Willet. Not everyone who has listened for their bird call has been lucky. Stewart Russell says he cannot hear it in Forfar, but has been getting good reception of the broadcast to Europe from Radio Australia on 9.655 from 0700 until 1030.

If you have been wanting to hear SLBC in Colombo, Sri Lanka try taking a tip from Gerry Lovell of Weston-Super-Mare and tune to 9.720 at 0145. Their transmission in English takes place from 0025

# Seen & Heard

Freq MHz	Station	Country	UTC	DXer
3.200	TWR	Swaziland	1815	U
3.230	R.RSA	S.Africa	0301	I
3.230	ELWA Monrovia	Liberia	2019	U
3.235	AIR Gauhati	India	1659	I
3.255	LBS Monrovia	Liberia	0624	F
3.270	SWABC Windhoek	Namibia	2300	I,W
3.355	AIR Kurseong	India	1600	H
3.366	GBC Radio 2	Ghana	2250	J,W
3.395	R.Zaracay	Ecuador	0230	W
3.905	AIR Delhi	India	2330	H,K
3.905	R.New Ireland	Guinea	1700	U
3.915	BBC Kranji	Singapore	0230	F,I,M,W
3.925	AIR Delhi	India	1625	H,I
3.925	NSB Tokyo	Japan	0744	F
3.940	PBS Hubei Wuhan	China	2340	F,H
3.945	NSB Tokyo	Japan	0749	F
3.955	BBC Daventry	UK	2205	M
3.958	FBS	Falklands	2015	B
3.965	RFI Paris	France	2310	H,M
3.980	R.Islamabad	Pakistan	1600	Q
3.985	SRI Berne	Switzerland	0755	B,H,M
4.003	RRI Padang	Indonesia	0300	W
4.060	R.Moscow Kharkov	USSR	1655	B,I,U
4.220	Xinjiang	China	1650	F,H,I
4.500	Xinjiang	China	2330	F,H,I
4.635	R.Dushanbe, Tadzhik	USSR	1706	I
4.725	BBS Rangoon	Burma	1457	G
4.735	Xinjiang	China	2345	F,S
4.740	R.Afghanistan	via USSR	1620	B,H,I
4.750	R.Bertoua	Cameroon	1845	H,P,R
4.760	ELWA Monrovia	Liberia	2012	B,F,I,O,P,U
4.760	Yunnan Kunming	China	1547	H,I
4.762	R.Inca, Lima	Peru	0228	U
4.770	FRCN, Kaduna	Nigeria	1920	C,E,H,I,J,M,O, P,R,U,W
4.770	R.Mundial, Bolivar	Venezuela	0320	W
4.780	RTD	Djibouti	1655	F
4.783	RTM Bamako	Mali	1850	P,R,S
4.785	R.Baku	USSR	1839	F,N,R
4.785	R.Tanzania	Tanzania	1630	B,H
4.790	R.Atlantida	Peru	0735	F,U
4.790	Azad Kashmir R.	Pakistan	1614	F,I
4.795	R.Douala	Cameroon	2232	I,J,M,R
4.795	R.Ulan Ude	USSR	0152	F
4.800	AIR Hyderabad	India	1607	F,H,I
4.800	LNBS Maseru	Lesotho	2000	B
4.810	R.RSA	S.Africa	1730	P
4.815	R.diff TV Burkina	Burkina Faso	2103	B,E,F,H,I,M,P,R
4.820	R.Botswana	Botswana	1855	B,E,F,I,J,P,R,U
4.820	La Voz Evangelica	Honduras	0240	G,I,U,W
4.830	Africa No. 1	Gabon	1930	A,B,C,D,E,F,H,I,M,P, R,T,U,V
4.830	R.Tachira	Venezuela	0110	E,F,H,U,W
4.832	R.Relaj	Costa Rica	0312	I,N
4.835	RTM Bamako	Mali	2000	A,B,D,F,H,I,J,M,P,R
4.845	R.Nacional, Manaus	Brazil	2246	H,I,M,U
4.845	ORTM Nouakchott	Mauritania	1850	H,I,J,P,R
4.850	R.Capital, Caracas	Venezuela	0145	G
4.850	R.Columbia Pt	Costa Rica	0430	W
4.850	R.Yaounde	Cameroon	1800	B,H,I,J,U,W
4.860	AIR Delhi	India	0026	I
4.860	R.Chita	USSR	2050	B
4.860	Kalinin	USSR	1832	D,R
4.865	PBS Lanzhou	China	2336	F,H,I,J,O,S

Freq MHz	Station	Country	UTC	DXer
4.870	R.Cotonou	Benin	1832	I,M,O,P,R
4.870	R.Rio Amazonas	Ecuador	0243	U
4.880	R.Bangladesh	Bangladesh	0110	F
4.880	SABC Radio 5	S. Africa	1845	B,C,E,F,G,I,L,P,Q,R, U,V
4.880	Swaziland Comm.R.	Swaziland	1800	H,I,R
4.885	R.Clube do Para	Brazil	0230	H,I
4.885	Voice of Kenya	Kenya	1824	U
4.890	ORTS, Dakar	Senegal	1831	B,F,P,R
4.895	Ashkhabad	USSR	0024	C,E,K,L
4.900	R.diff Nat. Conakry	Guinea	1935	E,P,R
4.905	R.diff Nat. Tchadienne	Chad	2200	F,H,P
4.905	R.Relogio	Brazil	0457	U
4.910	R.Zambia	Zambia	2030	I,P
4.915	GBC Accra	Ghana	2010	B,I,L,R
4.915	R.Anhanguera	Brazil	0324	O
4.920	AIR Madras	India	1536	I
4.920	VLM4 Brisbane	Australia	0847	F
4.920	R.Nat. N'djamena	Chad	2110	B,E,H,P,R
4.920	R.Afghanistan	via USSR	1900	B,E,L,R
4.925	R.Nat. Bata	Eq.Guinea	2153	B,F,M
4.930	Ashkhabad	USSR	2046	I,L,Q
4.930	RRI Surakarta	Indonesia	1600	U
4.930	R.Tbilisi	USSR	1829	L,R
4.935	SWABC Windhoek	SWAfrica	1645	B,M
4.940	Kiev	USSR	1550	B,F,I,R
4.940	R.Yakutsk	USSR	0455	H
4.945	R.Nat. Porto Velho	Brazil	2226	I
4.945	R.RSA	S. Africa	1840	E,L,P,R,U
4.955	RRI Banda Aceh	Indonesia	1559	F
4.955	R.Marajoara	Brazil	0515	U
4.958	Azerbaijan	USSR	2005	E,H,R
4.960	R.Federacion	Ecuador	0010	U
4.970	R.Rumbos	Venezuela	0300	I,W
4.970	Xinjiang	China	1623	F
4.975	Dushanbe	USSR	1650	E,H,R
4.980	Ecos del Torbes	Venezuela	2320	A,B,E,F,H,I,M,N,O,Q,W
4.990	FRCN, Lagos	Nigeria	1800	A,B,F,H,I,P,R,S,U
4.990	Radio RSA	S. Africa	2255	H,I
4.990	Yerevan	USSR	2000	B
4.995	R.Ulan Bator	Mongolia	1750	P
5.004	R.Nacioal, Bata	Eq.Guinea	1825	J,R
5.005	R.Cristal La Paz	Bolivia	0200	U
5.005	R.Nepal	Nepal	1554	L
5.010	R.Garoua	Cameroon	1824	C,H,I,M,P,R,S
5.010	R.Singapore	Singapore	1550	I,U
5.015	Arkhangelsk	USSR	0720	H,M
5.020	ORTN Niamey	Niger	1823	F,I,R
5.027	R.Uganda, Kampala	Uganda	1822	R
5.034	R.Bangui	C.Africa	1822	I,R
5.035	Alma Ata	USSR	1941	B,H,L,R,S,U
5.040	George	USSR	2015	E
5.040	R.Tbilisi	USSR	1820	B,F,R
5.045	R.Cultura do Para	Brazil	2158	O
5.045	R.Togo Lome	Togo	1855	G,I,P,R
5.052	R.Singapore	Singapore	1647	I
5.050	R.Tanzania	Tanzania	1828	R
5.057	R.Tirana	Albania	2240	E,I,M
5.060	PBS Xinjiang	China	0050	F,I
5.066	R.Candip	Zaire	0400	I
5.075	R.Beijing	China	2310	S
5.095	R.Pakistan	Pakistan	0053	I
5.095	R.Sutatenza, Bogata	Colombia	2258	E,I,J,O
5.260	R.Alma Ata	USSR	0145	F

## DXers

A: Gregory Adrian, London.  
 B: Leslie Biss, Knaresborough.  
 C: Alan Curry, Stockton-on-Tees.  
 D: Roy Degg, Stoke-on-Trent.  
 E: Neil Dove, Lockerbie.  
 F: David Edwardson, Wallsend.  
 G: Davy Hossack, Winchburgh.  
 H: Bill Kelly, Belfast.  
 I: Alexander Little, Glasgow.  
 J: Gerry Lovell, Weston-Super-Mare.

K: David Middlemiss, Eyemouth.  
 L: George Morley, Redhill.  
 M: John Nash, Brighton.  
 N: Kari Nieminen, Turku, Finland.  
 O: Michael Osborn, Chelmsford.  
 P: Fred Pallant, Storrington.  
 Q: John Parry, Northwich.  
 R: Philip Rambaut, Macclesfield.  
 S: Bill Reid, Finchampstead.  
 T: John Sadler, Bishops Cleeve.  
 U: Tim Shirley, Bristol.  
 V: Leighton Smart, Trelew.  
 W: Jim Willett, Grimsby.

until 0430. Gerry also picked up the Kavala, Greece relay of VOA on 9.740 at 0305. John Court has been listening to TWR, Bonaire, Nederlands Antilles on 9.535 at 0300.

The 7MHz (41m) band is also used by Radio Australia to beam their programmes towards Europe between 1530 and 2040. Alan Curry has been hearing them at 0900 on 7.205 and noted SINPO 43233 in his log. At 2200, Karl Nieminen logged the Voice of

Greece on 7.215, they beam programmes in Greek, German, French and English to Europe between 1900 and 0355. Using a Yaesu FR-101 receiver plus a 12m wire antenna in Finchampstead, Bill Reid picked up WRNO in New Orleans, USA on 7.355 at 0015 — their broadcast in English ends at 0400.

Writing from Johannesburg, Simon Illingworth says that due to the overcrowding and jamming on 41m, DX reception is just about

# Seen & Heard

impossible during the evening – a typical example is the chronic interference caused by the BBC World Service and Radio Moscow who both use 7.320 at 1900!

Some of the many 6MHz (49m) broadcasts to Europe during the day include RBI Berlin on 6.040 with programmes in English, German and French from 0815 until 1030 – noted by John Parry in Northwich; Radio Australia on 6.035 from 1530 until 2040 – logged as SIO 444 by John Nash at 1530; Radio Bucharest, Romania on 5.990 at 1830 – logged as SIO 434 by Daniel Masterson in Stoke-on-Trent at 2100; Radio Pyongyang, N. Korea on 6.576 at 2000 and Radio Beijing, China on 6.860 at 2100 – received by Stanley Baldwin with a JVC RC440 cassette radio in London; SRI Berne, Switzerland on 6.190 at 2230 and Radio Vilnius, USSR on 6.100 at 2230 logged by Roy Degg in Stoke-on-Trent; Radio Sofia, Bulgaria on 6.070 received by Francis Hearne in Ilford – they broadcast in Greek, Albanian and Turkish from 0400–0730 and in Turkish, German, Italian, French, English and Bulgarian from 1600–0125.

Writing from Leeds, Hugh McClure says he has been searching these bands for a



QSL card sent from Radio Korea for their 15.575MHz signal

dictation-speed broadcast of Italian to help him with his studies – if you know of one, please drop me a line.

The conditions on the 5, 4, 3 and 2MHz Tropical bands are very good just now and there is plenty to interest the dedicated listener – see chart!

## Station Addresses

Manx Radio, P.O. Box 219, Douglas, Isle of Man.

BBC Radio London, 35A Marylebone High Street, London W1A 4LG.

ILR Capital Radio, P.O. Box 95, 8 Euston Tower, London NW1 3DR.

Radio Pyongyang, Korean Central Broadcasting Station, Pyongyang, D.P.R. Korea.

Radio Sophia, 4 Dragan Tsankov Blvd., P.O. Box 5410, Sophia 1000, Bulgaria.

RAI Rome, Casella Postale 320, Centro Corrispondenza, I-00100 Roma, Italy.

Reports by April 23, May 21 and June 20 for the next three issues.

# RALLIES

**May 3:** Following another successful event in 1986, radio amateurs in the Scottish Borders will again be acting as hosts to the 4th Anglo-Scottish Rally in Kelso's Tait Hall. The doors will be open from 11am to 5pm. There will be the usual talk-in on S22, traders stands, club stands, hot and cold snacks, bar, raffles and Morse Tests.

Entrance will be £1, juniors and accompanying YLs and XYLs most welcome and admitted free. There is something to do for everyone.

**Andre Saunders GM3VLB**  
Tel: 0573 24664

**May 3:** The Swansea ARS Rally is in the Patti Pavilion, adjacent to the County Cricket Ground (on the A4067 Swansea to Mumbles coast road).

There will be the usual trade stands, bring and buy c.w. tests (pre-book with RSGB), bar, full catering, free lucky programme prizes plus lots more. The rally will be open from 10.30am to 5pm.

**Roger Williams GW4HSH**  
Tel: 0792 404422

**July 12:** The Worcester and District ARC are holding their Droitwich Rally at the High School, Droitwich. Entry to the rally is free, as is the parking.

All the usual trade stands will be there, as well as entertainment for the rest of the family. They have even laid on free transport to the local strawberry fields.

**Steve Colledge G0AOC**  
6 Tweed Close  
Worcester WR5 1SH

**May 10:** The Swindon & District ARC rally is opening at 10am at Oakfield School, Marlowe Avenue, Swindon.

Talk-in will be on S22, SU8 and GB3TD. There is free parking and there will be things like a film show and other amusements available for the children.

**Andrew Taylor G0BEQ**  
Tel: 06666 89307

**June 7:** The Spalding & District ARS Rally at Springfield Gardens, Spalding. I don't have any more details than that.

**Dennis G400**  
Tel: 0775 86382

**August 2:** The Rolls Royce ARC are holding their rally at the Rolls Royce Sports & Social Club, Barnoldswick. The doors are open at 11am. Talk-in will be available as well as trade stands, refreshments and other attractions.

**L.G. Logan**  
19 Fenton Avenue  
Barnoldswick  
Colne  
Lancs BB8 6HP

**May 17:** The Mid-Ulster ARC will be holding their annual rally at Parkanaur House near Dungannon on the Ballygawley Road. The starting time is 12 noon and the entrance fee is £1. All the usual trade stands will be there as well as bring & buy, RSGB Bookstall, QSL Bureau, etc. Talk-in is on S22.

The entire proceeds of this rally go to the Stanley Eakins Memorial Fund.

**Sam White G11BIW**  
Tel: 076 22 22855

**May 24:** The Maidstone Mobile Rally is scheduled for this date, unfortunately I have no further details at the moment.

**Alan Judge G6FZD**  
Tel: Maidstone 50709

**June 21:** The Denby Dale Radio Rally starts at 11am at Shelley High School, which is on the B6116 near Skelmanthorpe. Talk-in will be on S22, SU22 as well as 28MHz f.m.

**Gerald Edinburgh**  
Tel: Huddersfield 602905

**August 15:** The Wight Wireless Rally will be held at the Wireless Museum, Arretton Manor near Newport. The rally opens at 11am and closes at 5pm, with talk-in on S22 and GB3IW.

They hope to have the special event call GB?WM active on 3.5MHz (3.670MHz±). All the usual trade stands will be there and they hope to run some demonstrations on the day too.

**Douglas Byrne G3KPO**  
Tel: 0983 67665

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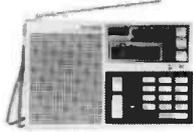
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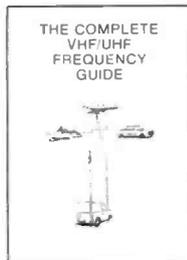
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