

ICOM

Count on us!

IC-R7000, 25-2000 MHz, Commercial quality scanning receiver



ICOM introduces the IC-R7000, advanced technology, continuous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the

main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz. The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

IC-R71E, General coverage receiver.

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 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.



Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

Datapost: Despatch on same day whenever possible.

Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.

Icom (UK) Ltd.

Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.



[26] Sony ICF-7600DA Reviewed



Cover The Sony ICF-7600DA receiver is the subject of one of our two reviews featured in this issue.

Part 11 of the popular "Introduction to DX-TV" series has been held over and should appear in the August issue.

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Short Wave Magazine

Weather Satellite Reception Part 4	9	Peter Rouse GU1DKD
Radio City	10	Sharon George
Historic QSO	12	Ron Ham
Three-Band SSB Receiver Part 1	14	C. M. Lindars
Forty Five Years Listening Part 2	17	Goff Curtis
SWM Review	23	John Waite
Panasonic RF-1680L Receiver	23	John Waite
Restoring an Eddystone 940 Receiver Part 1	24	T. J. Wright G1BCR/G9BZW
SWM Review	26	John Waite
Sony ICF-7600DA Receiver	26	John Waite

REGULARS

First Word	2	Editorial
A Word in Edgeways	2	Your Letters
What's New	3	Latest News & Products
Grassroots	6	Club News
Listen Out For	7	Special Event Stations
Rallies	7	Where to Go
Further Thoughts	15	Late News Items
Airband	20	Aeronautical Radio News
Bandscan	29	Broadcast Station News
Scanning	29	For the Scanning Enthusiast
Starting Out	32	For the Beginner
Services	33	Important Information
What Receiver?	48	Technical Specifications
Book Service	50	Order Your Technical Books
Trading Post	52	Readers' Adverts

SEEN & HEARD

Amateur Bands Round-Up	34	Justin Cooper
Decode	35	Mike Richards G4WNC
Info in Orbit	36	Pat Gowen G3IOR
Band II DX	37	Ron Ham
Television	37	Ron Ham
Long Medium & Short	41	Brian Oddy G3FEX

FIRST WORD

I am sure that you are all waiting with baited breath for the results of the competition to win a Lowe HF125 receiver. The total number of valid questionnaires received at this office by the 25th March was 1488 and the nearest estimate to this figure was 1484 made by David J. Berg of Palmers Green, London. Five runners up will receive a year's subscription to *SWM*. Two of these were easy to select, K. Pryce of Dunstable guessed 1480 and B. Thomas of Castleford, W. Yorks estimated 1478. For the remaining three prizes there were 13 who guessed 1500 returns! I have decided, therefore, to put all thirteen names into a hat and the first three drawn out will get the subscriptions,

The remaining ten will get a £5 voucher to spend on any *SWM* service. I felt that this was a much better solution to the problem than setting a tie-breaker.

If you are one of the many, many readers who have written to me over the past few months and have not yet received a reply, my apologies. I am desperately trying to reduce the backlog of unanswered mail but producing the magazine must take first priority.

This issue sees the start of a short series detailing the construction of a simple side band receiver for listening to three of the most popular h.f. amateur bands. Why not try your hand at some home construction in

the old-fashioned sense — you will find that it has a satisfaction all of its own.

"Starting Out" had to be left out in the June issue for several reasons. However, it returns this month to its regular spot in the magazine.

In case you have been wondering what happened to our DXPedition to Ecuador the short answer is that it didn't! Various things conspired against the planned trip and HCJB decided to cancel it at the last minute. However, enough interest was shown that it will probably be attempted some time next year. I hope that we will be able to give you much more notice.

DICK GANDERTON

A WORD IN EDGEWAYS

Sir

As one of your regular short wave readers, I was very interested to read the article "Of Scanning Discs & Steam" on page 9 of the May issue. I have been intending to write to you for some while and the article has encouraged me to do so today.

I enclose two pictures, received over air in about 1929 by my father-in-law. I believe they were some of the first pictures received over the air by radio and although I do not know much of the process used, I am told that a revolving disc perforated with a series of holes was used and that this was a fore runner to television.

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines.

I have some thirty other similar photo's, mostly portraits of film stars and one is of a weather forecast and map. I believe that my father-in-law, used to have his apparatus to receive the pictures at the back of his Derbyshire, and when they shop in Shirebrook, were coming through, quite a crowd would gather to see what was being transmitted — the same picture I am told would be visible for some

15-20 mins — and it was never known what would be shown.

I do not have any further details, but would like to know more. Mr Wylde would have been 97 years of age if he were alive, his widow is alive, age 92, but is rather vague as to the details of the process used and the equipment.

Perhaps your readers could put me in touch with some person or organisation who

may be interested to know of the existence of the pictures that I have.

I very much enjoy my interest in radio generally and short wave listening in particular and wish to congratulate you on the excellent magazine produced each month.

ALWYN SAUL
LEAMINGTON SPA
WARWICKSHIRE

Unfortunately, the pictures sent by Alwyn are too faded to reproduce here. If any reader can throw more light on these pictures from this description, please reply through me. ED

Sir

*I am a bit puzzled by the letter from Mr D. Gommo in April *SWM*. In fact, after reading his letter, I felt compelled to have a quick tune across 3.5MHz to see if maybe I was missing something. Nope, everything still in the usual places and all the amateur stations within the bandplan. While I agree with Mr Gommo regarding "intrusion" with unnecessary wattage, continental or otherwise, I think he'll find that they are in fact commercial stations and are there quite legally (unfortunately).*

As for c.w. "swamping" everything, all the amateur c.w. stations that I heard were within the bandplan and there are actually very few commercial c.w. stations operating within the 3.5MHz band. Dare I suggest that

what Mr Gommo is hearing are actually (commercial) RTTY or TOR stations, which do sometimes cause a bit of a problem on 3.5MHz.

Yes, there are some interesting QSOs between the "more mature in years" and most of them are above reproach as operators. Unfortunately, there are also far too many of these "mature" operators who are boorish and inconsiderate to anyone outside their own "clique" and woe betide the shiny new GO who, for whatever reason, happens to stumble onto "their" frequency.

Like Mr Gommo, I have been a listener for many years to short wave transmissions of every type. While I agree that we do have our problems, one of which could be a falling of operators

standards, I don't quite see what point he was trying to make. Is he implying that standards have gone down simply because there are not so many operators in his age group? (Actually, many newer licensees are in the "middle aged" group). On the other hand, he could be saying that c.w. operators are not "genuine" considerate amateurs. (Many of our newer licensees are heard regularly on c.w.)

There are many possible reasons for older amateurs leaving the hobby. Yes, there has been a great influx of new operators over the past few years, mostly as a result of the CB boom in the early 80s. The result is undoubtedly that the average level of experience among amateurs is a lot lower than before and, in this sense,

there has been a lowering of operator standards. However, I find that many of these newer operators make up in enthusiasm for what they lack in experience and I certainly don't believe that they are responsible for any mass exodus of G2, 3, 4 etc. In fact, I feel that Britain is more fortunate than some other countries in having had its CB boom just at a time when the numbers of new amateurs are starting to taper off in most countries.

Perhaps if Mr Gommo wants to improve what he sees as "falling operator standards", he should celebrate the start of his fifth decade in the hobby by becoming licensed.

DAVE WORD
G4YYW/N4DYR
SCARBOROUGH
NORTH YORKSHIRE

A WORD IN EDGEWAYS

Sir

I would like to express my annoyance to Gerald Casey's letter in the April issue.

It is fine to have paid monitors in foreign countries listening in to powerful stations like Radio Canada International or Radio Netherlands, but what he obviously forgets is that reception can vary tremendously over relatively short distances, and anyway

reception of any station is hardly likely to be the same, given the tremendous variety of radios around (compare reception of Deutsche Welle with a Yaesu FRG-8800 and a typical "kitchen" 4-band radio). I am sure that a monitor's report is uncharacteristic of many radio listeners, so I think that reception reports from ordinary listeners are

necessary and should always be encouraged.

I support Mr Smith when he says that HCJB is more interested in whip-arounds for evangelisation than DX-reports (compare the amount of DX-programmes on HCJB with its evangelical programmes and you'll see what I mean!) I also agree that Mr Steele's letter is very discouraging to the

newcomer who would like to send a reception report to any radio station.

I could find it incredulous that Mr Casey manages to criticise Mr Smith's letter as being "self righteous" when a quick scan over his letter will reveal it to be particularly derisive and inflated.
DARREL REES
AMMANFORD
DYFED

Sir

After reading your excellent feature on the Holiday Listening Guide in the May edition of SWM may I add the following observation:

You give the impression that the BBC is only available in foreign parts of the Short Wave and that English on the medium and f.m. bands are only to be found spasmodically.

Whilst this may be true in some parts of the world, there are numerous English language stations

broadcasting on both m.w. and f.m. to holiday makers, English ex-patriots and English speaking troops around the globe. The radio guide for Cyprus, taken from their local paper, indicates that the majority of broadcasting wavelengths are given to BBC World service and BFBS (British Forces

Broadcasting Service) both of which are available on m.w. and f.m. all over the island, as well as CBC which you mention in your article. I could also mention Riviera Radio (now 60% owned by London's Capital Radio) which broadcasts in English on f.m. to the French Riviera.

May I also mention a point

for Peter Laughton in his Bandscan regarding the "Satellite News Desk". The new commercial station Radio Nova International commenced broadcasting earlier this month using the Intelsat VA F11 satellite — will you be doing a feature on it or, indeed, telling us of a cheap and nasty way to receive it?

Thanks again for an excellent magazine.
PHIL SHANNON
HODDESDON
HERTS

**BBC MW 1323 KHz 227m; 639 KHz, 469m; 720 KHz, 417m.
BFBS MW 1044 KHz, 285m; 1503 KHz, 200 m
VHF/FM 99.6 MHz (ESBA); 92.1 MHz (WSBA); 89.9 MHz;
CBC MW 693 KHz 433m; 603 KHz, 498m VHF/FM 94.8 MHz
97.2 MHz**

WHAT'S NEW

Rally & Convention

The Hilderstone Radio Society are holding a rally and convention at Hilderstone College on July 30.

The lecture timetable is:

2.00pm Derek Bradford G3LCK on "Youth into Amateur Radio, What Can We Do";
2.30pm Dr. Ken Smith G3JIX on "Simple Test Equipment in the Shack";
3.00pm A symposium by a number of young members of the Thanet Electronics Club for Youth on topics including: "The History of

Morse", "Where Your Wave Came From", "The Advent of Telephony", "Can Kids Foxhunt & Build Oscilloscopes?";
3.45pm Ian Keyser G3ROO on "Simple Receivers, DC and Others".

In addition to the lecture programme there are all the usual events to be found at the rally.

For more details, contact:
Alan on 0843 593072 or
Ron 0304 812723

SILVAR

The Stevenage & District ARS are putting on a display of radio and electronics for the nine secondary schools in Stevenage. The combined school rolls amount to more than 7500 students. The display will take place at the John Henry Newman school on July 20-22.

The Stevenage Information Technology Centre is joining them in this project. The purpose of which is to interest students in a career in radio/electronics via a knowledge of, and an interest in, amateur radio.

They will be putting on a 75 minute talk/display and demo on amateur radio, using the RSGB New Student Publicity packs. This will be followed by a 30 minutes talk/display by SITEC on vocational training and career entry, with handout fact sheets on the new Student Licence, r.f. propagation, club membership, etc.

The event is scheduled to run from 9.30am to 3.30pm for students and from 6.30pm until 9pm for teachers and members of the public, by invitation.

If this year's venture is a success they hope to repeat it in subsequent years from different school sites each year.

The title of the event SILVAR stands for Student Link via Amateur Radio. They will be using the callsign GB75JHN, so if you hear them on the band and can answer them, remember it's in a good cause.

Offers of help, material, equipment, manpower or suggestions to:

Peter GOGTE
Tel: 0438 724991

Microflame Super Cub

The Microflame Super Cub burns with the same clean, blue flame as a full-size Butane blowtorch. Despite its small size, it still can deliver 1300°C. That should be hot enough to soft-solder 12.5mm copper plumbing, but sufficiently precise to silver-solder small items.

There should be no trouble fitting the Super Cub into any tool kit, complete with a refill. The 25g high capacity, low pressure disposable cylinder should burn for two hours.

The Super Cub and one 25g Butane canister costs £9.95 including VAT, replacements Butane canisters cost £1.65.

Microflame Ltd

Vinces Road

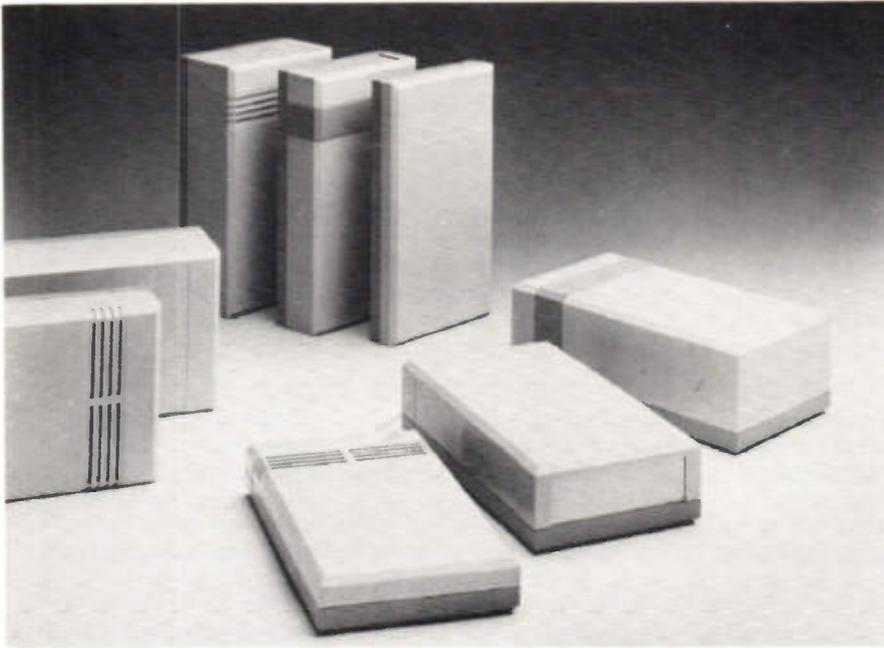
Diss

Norfolk IP22 3HQ

Tel: 0379 644813



WHAT'S NEW



25 Years in Boxes

West Hyde Developments has been supplying the electronics industry with enclosures and accessories for 25 years now.

They are introducing a new range of plastics cases called Elegant. These are manufactured in West Germany by Bopla. The enclosures are moulded from high impact polystyrene with a two-tone light grey finish. There are seven different sizes available and the cases can be used either free-standing, wall mounted or for hand-held equipment.

There are various options available for each size of case, including ventilation slots; flat, aluminium or plastics ends, panels or clip-in trim pieces.

For more details on these enclosures, contact:

West Hyde Developments Ltd
9-10 Park Street Ind Est
Aylesbury
Buck HP20 1ET
Tel: 0296 20441

Receiver Shopping List

The 10th edition of the Receiver Shopping List published by Radio Nederland has arrived in the SWM offices. It contains no photographs of short wave receivers, nor does it contain more than a brief summary of each receiver. They have condensed as much

un-biased consumer advice and price information into the space allowed. Seeing as this booklet is free, they have done very well too.

The details given in the booklet are: Manufacturer, Model Number, Power Requirements, Weight, Year of Introduction, Star Rating, Coverage, Size, Price (as best

they can), Availability and Comments.

To receive a copy of the Receiver Shopping List, send to:

Radio Nederland
PO Box 222
1200 JG Hilversum
The Netherlands

The LBO1020 Oscilloscope

Thandar Electronics have announced the introduction of the Leader LBO-1020 20MHz dual-trace oscilloscope.

It is a 5mV/div, 20MHz (500µV/div), 4MHz portable dual-trace oscilloscope with a maximum sweep speed of 50ns/div (mag x10) and 150mm c.r.t. with internal graticule.

The major features include an illuminated graticule and a special triggers pick-off circuit which ensures synchronisation with composite video signals. Alternate trigger mode allows the stable display of two

asynchronous signals plus display modes for CH-1, CH-2, ALT, ADD and Polarity CH-2 INVERT Plus X-Y operations.

The LBO-1020 is supplied complete with probes, priced £315 plus VAT. For more details, contact:

Thandar Electronics Ltd
London Road
St Ives
Huntingdon
Cambs PE17 4HJ

The Mary Rose Award

The Marconi Radio & Electronics Society sponsor The Mary Rose Award and they have recently had to revise the rules:

There are no start or termination dates for this award and all bands and modes can be used. No QSLs are required but a certified check list, as per the log sheet, must be signed by two amateurs or an amateur club official.

UK and European stations must work twenty-five stations within the Hampshire and Isle of Wight boundaries. Stations outside Europe must work ten stations in the same area.

The Marconi Club HQ station is not mandatory, but extra points are available for working it. The appropriate calls are: GB2MAR and G4JMR, these count as five points if appearing once in a check list. Special event stations run by the club also count.

Should a station be fortunate enough to contact HQ under more than one call, the second HQ call will count as one point only, and a maximum of seven points can be obtained this way.

Silver Endorsement stickers are available for 50 points and Gold stickers for 100 points.

The basic award costs £3.75 for European and UK stations, £5 for outside Europe. The Silver and Gold endorsements cost £1 each.

V. Scambell G3FWE

Marconi Radio & Electronics Club
Solent View
78 Slade Road
Ryde
Isle of Wight

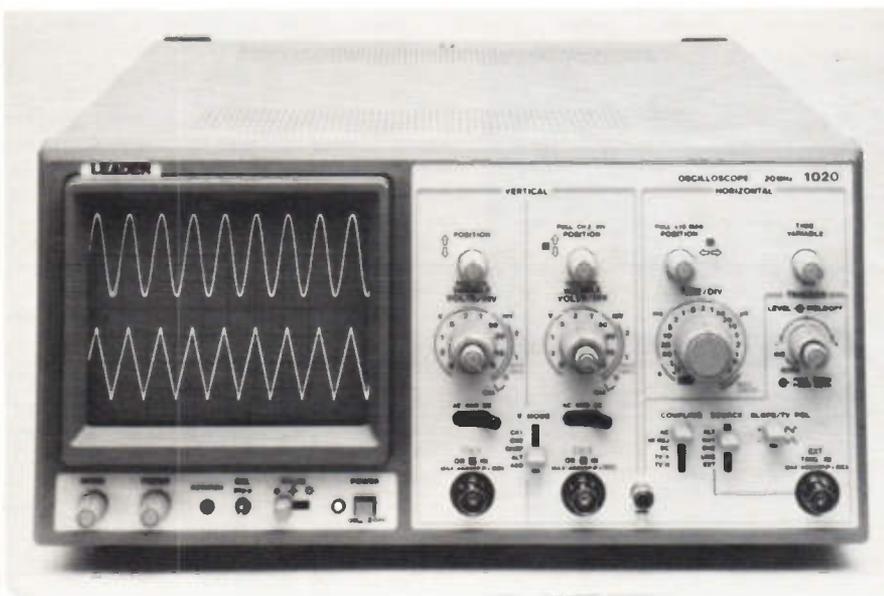


Chart Recorders

Electronic Temperature Instruments Ltd have now included Rustrak chart recorders to their range of temperature measurement instrumentation.

Rustrak strip chart recorders are available to measure both temperature and humidity. The size of the recorders make them suitable for both portable applications and control panels.

The humidity chart recorder is designed to monitor both temperature and relative humidity or air/gases. Relative humidity being defined as a percentage of water vapour present in the air/gas in relation to the saturation level that could be achieved at temperature.

The recorder samples the humidity sensor every eight seconds and prints a dot on the chart. Four seconds later, the recorder switches to the temperature channel and its sensor. The series of dots make continuous lines, the right-hand channel has a short break in its trace every 12mm of chart travelled, this provides channel identification should the traces overlap each other.

The prices for these instruments start at £199 for the basic temperature recorder. If you would like more details on the range of equipment, contact:

Electronic Temperature Instruments Ltd
PO Box 81
Worthing
West Sussex BN13 3PW
Tel: 0903 202151

Royal Opening

The RSGB is delighted to be able to announce that its patron His Royal Highness Prince Philip, Duke of Edinburgh, has accepted the Society's invitation to open the 1988 Convention at the NEC, Birmingham, on Friday July 15. Afterwards he will attend a special anniversary luncheon.

Corrosion Resistant Soldering Iron

The Viking thermally-balanced soldering iron has a stainless steel shaft and tip-retaining collet to make it resistant to corrosion.

An extensive range of long-life tips is available. These include chisel and double-flat types as well as extended point and an i.c. desoldering tip for devices with 14 or 16 pins.

The iron is balanced for comfortable use and has a large, smoothly contoured, safety ring to guard the operator against possible contact with the hot shaft. The Viking has a power rating of 27W, which gives a tip temperature of approximately 390°C.

In addition to mains operation, the iron can also be supplied for use with 12, 12 and 50V supplies. The weight is 100g and the length 215mm.

For more details on this soldering iron, contact:

Electronics & Computer Workshop
Unit 1
Cromwell Centre
Stepfield
Witham
Essex CM8 3TH



Marconi Spectrum Award

This award can be obtained for both h.f. and v.h.f. working.

UK & EU h.f. section

Each applicant requires 10 stations on each of five different bands, but at least 10 of the total number of QSOs must have been c.w. All modes can be used. Endorsements are available for all c.w. claims.

DX h.f. section

Each applicant must work five stations in five bands, all modes count but at least five of the total QSO must be Morse. Endorsements are available for all c.w.

No QSL cards are required in either section, logs must be signed by two local amateurs or club official.

The callsigns IP1TTM and II4FGM count for five points each.

UK & EU v.h.f. section

A minimum of three bands must be used with

a maximum of five stations in any one country. The award can be given for a singular record breaking contact that has international recognition.

All modes may be used, but five QSOs using c.w. are mandatory within each claim. No QSLs required, just the usual signatures. Special event stations on the Isle of Wight and Flatholm Island count as five points.

The award costs £5.50, but for more details of the rules or any explanations, contact the Awards Manager.

V. Scambell G3FWE
Marconi Radio & Electronics Club
Solent View
78 Slade Road
Ryde
Isle of Wight

Liniplex from Phase Track

Short wave broadcast listeners will soon enjoy the quality of reception which has hitherto been enjoyed only by serious BBC World Service listeners overseas using the Liniplex crystal controlled h.f. receivers.

The Liniplex receiver system is based on receivers supplied for "off air" broadcast relays to, amongst others, BFBS in the Falklands, Belize, Gibraltar, Cyprus, Hong Kong and Nepal.

The principal feature of these receivers is the linear phase locked synchronous demodulator which is unique and patented in the UK. In addition, an active tracking filter

allows sideband modulation to be selected at will with no deterioration in audio quality from the double sideband case. No fine tuning is required during the reception of normal a.m. broadcasts.

The Liniplex OSC-1 synthesiser will be available at the end of July.

Phase Track Ltd
16 Britten Road
The Robert Cort Industrial Estate
Elgar Road
Reading RG2 0AU



GRASSROOTS

Lorna Mower

East Kent RS meet 1st & 3rd Thursdays, 7.30pm at Parkside Lodge, Kings Road, Herne Bay. July 7 is a Car Rally and the 21st an Operating Evening at Bishopstone. Brian Didmon G4RIS on Whitstable 262042.



Verulam ARC have Practical Power Supplies by G4KGP on June 28, an Activity Evening on July 12 and DX Eyeballs by G4PAY on the 26th. 2nd & 4th Tuesdays, 7.30pm in the RAF Association HQ, New Kent Road, St. Albans. Hilary G4JKS on St. Albans 59318.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford. July 8 is a 144MHz d.f. Contest. All other meetings are Nights on Air with Morse. Jonathan Ward G4HHT on Coventry 610408.

South Bristol ARC meet Wednesdays, 8pm in the Whitchurch Folk House, East Dundry Road, Whitchurch. June 29 is a Briefing for v.h.f. NFD by G4XCB. Len Baker G4RZY on Whitchurch 834282.

On June 28 Wakefield & District RS are On the Air, July 16 is a Barbecue at G4VRY and the 19th is an Annual Open Pitch & Putt at Holmfield Park. Tuesdays, 7.45pm in the Community Centre, Prospect Road, Ossett. John Bryan G4VRY on Leeds 820198.

Yeovil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. July 7 is a Club Visit to Hinkley Point, the 14th a Barbecue at Ham Hill and the 21st Oscillators by G3MYM. David Bailey G1MNM at 46 Goldcroft, Yeovil.

Atherstone ARC have the DF Hunt 2 on July 11 and the 25th an Informal at The Bull, Witherley, 8pm. 2nd & 4th Mondays, 7.30pm in the Physics Lab, Atherstone Upper School, Long Street, John Arrowsmith G4IWA on Atherstone 713670.

Exeter ARS have a Construction Contest on July 11. 2nd Mondays, 7.30pm in the Community Centre, St. Davids Hill. Ray Donno G3YBK on Exeter 78710.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Wormley. July 27 is Portable on Baas Hill. Peter Davies G1KQA on Lea Valley 764930.

Mid-Warwickshire ARS have Some Simple Antenna Experiments by G0GLU on July 12. 2nd & 4th Tuesdays, 8pm in St. Johns Ambulance HQ, 61 Emscote Road. P. A. Brown G0HIH on Marton 632370.

Wimbledon & District ARS meet 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Road. June 24 is the Summer Bazaar and July 8 is RAYNET by G4SYT/G1ADW. David Love G4RBQ on 07373 51559.

Farnham & District ARC meet Wednesdays, 7.30pm at the Porchester Community Centre, Westlands Grove. When the Winds Blow by South East Hants RAYNET Group is on July 6 and the 20th is Home-brew by G4XZL. Bob Reeves G8VOI on Portsmouth 250830.

South East Kent (YMCA) ARC meet Wednesdays with Morse or RAE Coaching on Mondays & Tuesdays. July 13 is a Fox Hunt. John Dobson on Dover 211638.

In July, Binstead ARS have Fault Finding by G6XGH. They meet Mondays, 7.30pm at "Brickfields", Newnham Road, Binstead, IOW. Bob Griffiths G0ISB at 29 Dubbers, Godshill, IOW.

Edgware & District RS meet 2nd & 4th Thursdays, 8pm in Watling Community Centre, 145 Orange Hill Road, Burnt Oak. July 14 is a Test Equipment talk & demo, the 28th an Informal—Station on the Air. Ian Cope G4IUZ on Hatfield 65707.

Barry College of Further Education RS meet Thursdays, 7.30pm in the annex of the Barry College of FE, Barry to Bonvilston Road (A4226), near the Welsh Hawking Centre. July 14 is DXpedition to VP8 land and the 16th a coach trip, NEC. Dr Kevin Johnston GW4BCB at 68 Heol Isaf, Radyr, Cardiff.

Felixstowe & District ARS have DXpeditions by G4FRE on June 27, a Social on July 11, a trip to the NEC on the 16th and a talk by G8SXZ on the 25th. Meet alternate Mondays at 8pm in the Scout Hut, Bath Road, all Socials in the Grosvenor Hotel. Paul Whiting G4YQC on Ipswich 642595 (daytime).

Keighley ARS meet 2nd & 4th Tuesdays, 8pm in the Club Room, rear of Victoria Hotel, Cavendish Street. June 28 is Electronic Gas



Detection by G0BZH, July 12 an Informal Evening and the 26th a Visit to Police Operations Room & Museum, Bradford. Kathy G1IGH on Bradford 496222.



Sutton & Cheam RS have First Aid for the Radio Amateur by G8HKP on July 15. 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Avenue, Cheam and Natter Nights are 1st Mondays in the Downs Bar. John Puttock at 53 Alexandra Avenue, Sutton.

On June 29, Wirral & District ARC have the Eileen Medley d.f. Cup. Alternate Wednesdays, 8pm at the Irby Cricket Club, Irby Mill Road, Irby. Alan Griffiths G1XYP on Moreton 7517.

Crystal Palace & District RC meet 3rd Saturdays, 8pm in the All Saints Parish Rooms, Beulah Hill. July 23 is an Informal at Lambeth Country Show, 6pm, special event callsign GB75LCS. Geoff Stone G3FZL on Forest Hill 6940.

South Powys ARC have a Demo of HRO receiver on July 5. 1st floor, RAFA Club, The Struet, Brecon, 1st & 3rd Tuesdays. B. Carter GW8AAG on Bwlch 730158.

Horndean & District ARC have Amateur Radio Awards by G3JFF on July 7. 1st Thursdays, 7.30pm at Merchistoun Hall. Dan Bernard G4RLE on Portsmouth 755274.

July 19 is Photography by G0GPZ for Midland ARS. Tuesdays, 7.30pm with classes from 7pm in Unit 16, 60 Regent Place, B'ham. Wednesdays is Morse, Thursdays a Night on the Air. Tom Brady G8GAZ on 021-357 1924.

Todmorden & District ARS meet 1st & 3rd Mondays, 8pm at the Queen Hotel. July 4 is a Treasure Hunt for G4HYY Trophy. Val Mitchell G1GZB on Todmorden 7572.

Wyre ARS meet 2nd & 4th Wednesdays, 8pm in the Breck Sports & Social Club. July 2/3 is VHF NFD (camp), the 6th is a Barbecue and the 13th and 27th are Morse Classes. Dave Westby G4UHI on Lancashire 854745.

Stourbridge & District ARS have a Carnival Briefing on July 4 and Test Equipment Use & Abuse G8JTL/G8MCK on the 18th. 1st & 3rd Mondays, 7.45pm in Robin Woods Centre, Beauty Bank. C. Brunn G1WAI on Hagley 885602.

Rugby ATS meet Tuesdays, 7.30pm at Cricket Pavilion, outside Rugby Radio Station. June 28 is the annual mid-summer barbecue, July 5 and 26 are 144MHz d.f. Hunts, the 12th is Stereo TV by Mr Robinson of the BBC and the 19th an Activity Night. Kevin Marriott G8TWH on Rugby 77986.

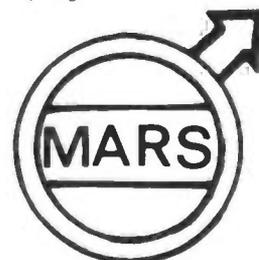
Stevenage & District ARS have Committee Meetings on June 24 and July 26, VHF Field Day on July 2/3, a Fox Hunt on the 5th and Satellite Comms by G3HEA on the 19th. They meet 1st & 3rd Tuesdays, 8pm at SITEC Ltd, Ridgmond Park, Telford Avenue. Peter GOGYE on Stevenage 724991.



Blackwood & District ARS meet Fridays, 7pm at Oakdale Community College (in school term). July 1 is a Video, the 8th a Quiz with Newport ARC and the 15th a Natter Night. Brian Matthews GW6YYR on Newbridge 243858.

Pontefract & District ARS have Amateur Radio Awards by G4OSY on July 7. Thursdays, 8pm in the Carleton Community Centre, Carleton Road. Eddie Grayson G6OJX on Knottingley 83792.

On July 7, Horsham ARC have PO Box 88 by G3FXB. 1st Thursdays, 8pm in the Guide Hall, Denne Road. Phil Godbold G4UDU on Steyning 814516.



Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane, Derby. June 29 is Radio Control, Dolphins and all that by G8TSQ, July 6 is a Junk Sale, the 20th Ambulance Communications by G8SSL and Weather FAX Reception Techniques by G8UQP on the 27th. Kevin Jones G4FPY on Derby 609157.

Chelmsford ARS have Auroral Propagation by G2FKZ on July 5. 1st Tuesdays, 7.30pm in Marconi College, Arbour Lane. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815. □

LISTEN OUT FOR



GB2RNL: On July 28–31, a special event station will be run for the benefit of the Royal National Lifeboat Institution. They will be on the air from the headquarters in Poole (in the depot complex) to coincide with the RNLI open days which are the 29th and 30th. On those two days the HQ will be open from 10am to 6pm to the public. A QSL card will be produced for this event, but can only be supplied on receipt of an s.a.e. or for overseas amateurs the requisite number of IRCs. Don't forget the RNLI is dependant upon donations so costs must be kept to a minimum.

The frequencies they will be using are: 3.750, 7.050, 14.250, 21.250 & 28.500MHz ('phone). 3.550, 7.025, 14.075, 21.075 & 28.075MHz (c.w.).
Of course, that's \pm QRM.

As the RNLI is funded by donations only, if you would like to send them something to help out, they will be more than happy to accept all donations! The donations only address is:

GB2RNL
Peter Holness
RNLI HQ
West Quay Road
Poole
Dorset
The address to send your envelopes for QSL cards is:
GB2RNL
Malcolm A Williamson
GOEGA
21 King Alfred Avenue
Bellingham
London SE6 3HT

GB75YMD: This station will be on the air from Dover Castle on July 2. It's for a youth rally being held then. They will be operating on h.f. and 144MHz s.s.b. The callsign stands for "Young Men of Dover" as the station is being run by the South East Kent (YMCA) ARC.

GBONKG: This station will be on the air from 10am on July 17 from Littleton Road Playing Fields, Salford, Lancs.

The Salford Recreation Department are having a family funday and the Northern Kite Group will be taking part. They have CAA clearance to fly up to 1000ft. They will be running a 1000ft wire antenna for the h.f. station as well as 144MHz using a 200ft antenna. All QSOs will be acknowledged with a special QSL card.

GB75IBH: Between July 23 and 31, the Wigan-Douglas Valley ARS will be operating a special event station to celebrate a week-long international Scout Camp at Bispham Hall Scout Estate, Billinge, near Wigan. Approximately 1500 Scouts from around the world will be participating and they hope to make many contacts on most bands including 50MHz.

Colin G6AHF
Tel: 0942 715851

GB75TV: The Rugby TV Repeater Group is planning a special event station over the August Bank Holiday weekend (August 27/28). The station will be operating ATV on at least 430 and 1296MHz from Sheenington, near Banbury in Oxfordshire.

The hours will be from 12 noon to 8pm on the Saturday, and from 7am to 12 noon on the Sunday.

G6IQM
QTHR

RALLIES

***June 26:** The 31st Longleat Mobile Rally will be held, as always, at Longleat Park, Longleat, near Warminster, Wilts. The rally starts at 10am. More details from:

Brian Goddard G4FRG
Tel: 0272 848140

***July 10:** The Sussex Mobile Rally will take place at the Brighton Raceground. More details from:

Bob Henaire G1IOS
Tel: 0798 43841

***July 15-17:** The RSGB 75th Anniversary National Convention will take place at the National Exhibition Centre, Birmingham. HRH Prince Philip, Duke of Edinburgh, will perform the official opening.

***July 24:** The Cornish Radio Amateur Club are holding their rally at the new venue of the Village Hall, Perranwell. This is about 8km south-west of Truro.

July 24: The Burnham Beeches, Maidenhead and Chiltern ARC will be holding the 6th McMichael Rally at Haymill centre, Burnham, near Slough. Doors open at 10.30am, 10.15am for the disabled. All the usual attractions will be there and the car boot sale will again be held. More details from:

Bob Hearn GOBTY
70 Herbert Road
High Wycombe
Bucks

*SWM in attendance

July 28-31: The AMSAT-UK Colloquium will again be held in the University of Surrey, Guildford. More from:

G3AAJ
Tel: 01-989 6741

July 30: The Hilderstone Radio Society are holding their mobile rally and convention at Hilderstone College, St Peters Road, Broadstairs, Kent. There will be trade stands, a bring and buy, talk-in station, a special event station, raffle, refreshments and a lecture programme.

Alan
Tel: 0843 593072

***July 31:** the Scarborough ARS Rally will be held at The Spa, Scarborough. Doors open at 11am. Talk-in will be on S22 and SU8 as well as GB3NY. More details from:

Ian Hunter G4UQP
Tel: 0723 376847

***August 14:** The Flight Refuelling ARS and the Bournemouth RAIBC Rally will be held at the FRARS Sports & Social Club, Merley, Nr Wimborne, Dorset. All the usual attractions will be there for all the family. Entrance is 50p (children free). Gates open from 10am to 5pm. More details from:

John Fell GOAPI
Tel: 0202 691649

August 14: The 1988 Derby Mobile Rally will take place at the usual venue of Lower Bemrose School, St Albans Road, Derby. Doors open at 11am. More details from:

G3KQT
QTHR

August 21: The Newbury & District ARS will be holding a radio car boot sale at The Acland Hall and Recreation Ground, Cold Ash, Newbury. It open at 10am. Pitches are £5 or £4 if pre-booked and there is a limited supply of inside tables at £10. Please contact:

Mike Fereday G3VOW
Tel: 0635 43048

August 28: The Annual Rally of the British Amateur Radio Teleprinter Group (BARTG) will again take place at Sandown Park Racecourse, Portsmouth Road, Esher. More details from:

Peter Nicol G8VXY
Tel: 021 453 2676

August 28: The Galashiels & District ARS are holding their Open Day at the Focus Centre, Livingstone Place, Galashiels. There will be trade stands, a bring and buy as well as catering facilities. More from:

John Campbell GMOAMB
Tel: 0835 22686

SHORT WAVE RECEIVERS are our speciality (and all that goes with them)



The R-5000 from Kenwood

The R-5000 has established itself as one of the world's outstanding receivers, and a glance at the photograph will tell you what a range of facilities are on offer. The photograph of course only tells you what is on the front panel, but behind it is the engineering skill of Kenwood. The Kenwood engineers, widely acknowledged to be the best in the business, have made the R-5000 into one of the finest receivers you could wish to own. Not only in sheer performance but in the ease of use which is the hallmark of their careful approach to total design.

The R-5000 will satisfy the most demanding applications, whether in winking out the weakest rare amateur DX, or listening to Radio Hanoi under conditions in a heavily congested Broadcast band. The combination of operating facilities means that the operator can match the performance of the receiver to the prevailing conditions on the air. The result — total satisfaction.

Am I alone in being so enthusiastic? I don't think so. Read what Angus McKenzie said in his review (Amateur Radio magazine). "I was most impressed with the front end, as it is far superior to much of the competition. The selectivities of the various filters on CW, SSB, and AM were excellent. . . ." In "Short Wave Magazine", Ken Michaelson remarked "I used the R-5000 for some weeks and was impressed with its performance. . . . I was able to resolve signals which when I first tuned them in seemed too weak to decipher." These comments give you some idea of the listening satisfaction which can come from a truly top class receiver.

The R-5000 scores on quality of construction as well as performance. Rainer Lichte says in his review:—"The entire electronics are housed in a sturdy metal cabinet. This outer barrier and elaborate shielding of critical inside parts combine to form an RF-tight enclosure. Excellent workmanship is evident everywhere, the finish is outstanding." Ken Michaelson said much the same thing:—"In passing, I must comment on the finish of the interior. The whole assembly, when the top cover was lifted off, was a picture. Gleaming plated screening and circuit boards and components all having the appearance of being carefully put together. Quite different to some I have seen."

I think that there is little doubt that the R-5000 is one of the really classic receivers of the future, but having bought it, you will then find that you can extend its usefulness by adding the internally fitted VHF converter, giving you 108 — 174 MHz coverage in addition to the normal 30kHz — 30MHz range, with the VHF frequencies read out on the main receiver display. All the HF modes are available on VHF as well — AM, USB, LSB, CW, FM, FSK. There is also a selection of high specification optional filters for special needs, and even a voice synthesiser option which will announce the frequency in English (and Japanese if you prefer. . .)

As Rainer Lichte concludes:—"The multitude of functions puts the R-5000 almost in a class by itself. Undoubtedly this is the best receiver ever offered by Kenwood." Well, he likes it, Ken Michaelson likes it, and Angus McKenzie likes it. I just think it's terrific and I'm sure you will agree when you try an R-5000 for yourself at one of our branches or your nearest Kenwood approved dealer. By the way, just to keep the record straight, the ONLY Kenwood approved dealer in London (apart from our own branch at Eastcote) is Radio Shack Ltd. Anyone else trying to sell you an R-5000 has no connection whatsoever with the UK sales and service organisation, and should be treated with due caution, even if you may be getting "Forty quid off, John."

In the words of Dr Samuel Johnson when he referred to London:—

"Prepare for death if here at night you roam."
"And sign your will before you sup from home."

Caveat Emptor.

John Wilson.
G3PCY/5N2AAC

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WEATHER SATELLITE RECEPTION

Peter Rouse GU1DKD Part 4

Audio Monitor and Meter

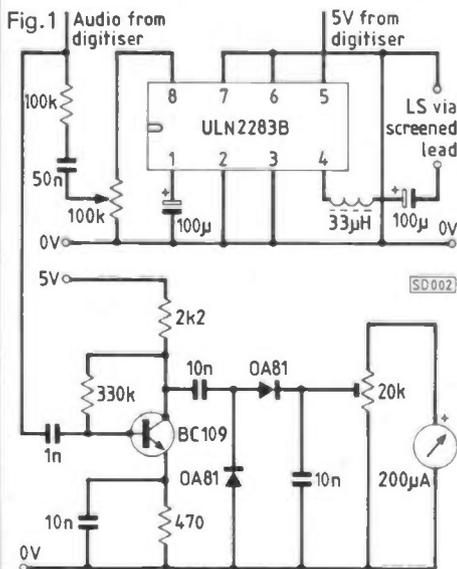
Most "budget priced" weather satellite digitisers rely on the correct level of audio input to determine such things as correct picture contrast. At least one system on the market needs the audio level set differently for either infra red or visible image. It is therefore useful not only to be able to hear the audio coming out of the cassette recorder (the loudspeaker on most machines is muted when you plug into the ear socket), but also have some kind of meter to show exactly what that level is. The audio monitor is also useful for hearing when a pass has come to its end and also the presence of any fading or interference which may affect the picture.

Many budget systems are also supplied purely as a circuit board with no casing and so it makes sense to not only case-up the board, but also include the monitor and meter at the same time. The circuit that follows uses inexpensive components and layouts are not critical so there is no need to use a p.c.b., as stripboard is more than adequate.

The Monitor

The amplifier consists of nothing more than a small 1 watt audio i.c., type ULN2283B (available from Cirkit). This i.c. is supplied in a 8-pin d.i.l. configuration and costs very little. The complete circuit diagram for both the monitor and meter circuit is shown in Fig. 1. The i.c. will operate happily at any supply between 3 and 9 volts and, as long as the 33µH choke is included and the loudspeaker fed via coaxial cable, it is far more stable than some similar i.c.s which need careful layouts to avoid oscillation. The input for both the audio monitor circuit and the meter amplifier are taken from the point where audio from the recorder is fed to the digitiser.

Note that the volume control is connected to give near constant input impedance. Both the de-coupling capacitor on pin 1 and output coupling



In the final part, we look at a useful audio monitor and signal level meter as well as two methods of automatically switching-on a tape recorder.

capacitor on pin 4 can be increased in value if larger components are to hand; the values shown are minimum only. The 5 volt supply is taken from the digitiser which, in some cases, will draw its power from the computer. The voltage is not critical and if the digitiser uses self-contained power supply this will do as long as it is not more than 12 volts.

Meter Circuit

The meter circuit consists of nothing more than a single transistor audio amplifier followed by two diodes to rectify the signal. The 10nF capacitor following the diodes merely grounds any remaining a.f. and the rectified d.c. is fed via a 20kΩ pre-set resistor to the meter movement. Virtually any type of capacitors can be used in this part of the circuit and, although the transistor shown is a BC109, any high gain npn type can be used here including surplus types.

The pre-set resistor is used to set a sensible reading on the meter scale. My own is set to read about 75 per cent needle deflection on maximum useable input to the digitiser. A note is kept of optimum deflection for infra-red or visible image and for some of the Russian satellites which, on my own equipment, produce optimum pictures at levels slightly below those of the American NOAA's.

Tape Switching

Few of us are able to be around each and every pass of the weather satellites and so a method of switching a tape recorder on and off is a must. Many modern receivers designed for satellite reception include such a feature as

standard, but if you are working with home-brew equipment or modified receivers that do not have this facility then Figs. 2 and 3 show switches that can be added to some receivers.

The first circuit is designed to work with f.m. intermediate frequency i.c.s, such as the MC3357, where some form of scan stop output is included which switches from high to low when the squelch opens. On the MC3357 this is pin 13 and it is possible that other i.c.s may use a similar arrangement. A look at Fig. 2 will show a fairly simple circuit consisting of two npn transistors and a relay.

Depending on the circuit arrangement, for some receivers it may be that the 100kΩ input resistor will need to be changed to a higher or lower value to give correct operation. Under no signal conditions, the BC109 is switched on which in turn grounds the base of the BC107 switching it off. Once the squelch opens and the scan stop goes low, the BC109 switches off and so the 22kΩ and 2.2kΩ resistor provide a d.c. path from the supply rail to switch the BC107 on, which in turn switches on the relay. The diode merely protects the BC107 from back-e.m.f. generated by the relay coil.

The second arrangement in Fig. 3 shows the alternative method of switching for those i.c.s which have a scan stop that holds low when the squelch is closed and goes high when it is open. Typical of this type of i.c. is the MC3359 where the scan stop is provided on pin 15. Here the circuit is even simpler as no inversion is required and the relay driver transistor can be turned on and off directly from the scan stop.

In each case, the relay contacts are wired to switch the recorder on and off via the remote switch socket found on most cassette machines. Both circuits operate at 12 volts and the best way of installing them is to build the circuits on a small piece of stripboard and fit them inside the receiver's case, feeding the switching lead via a small jack socket on the back of the receiver.

Obviously these switching circuits can be used for purposes other than weather satellite reception and in particular the circuit shown in Fig. 2 will work with the many scanners that employ the MC3359.

Fig. 2

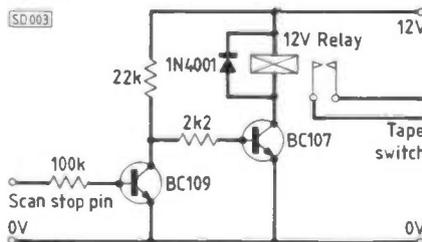
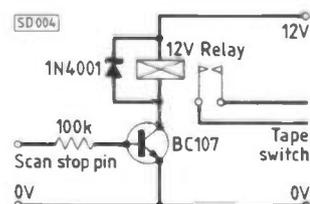


Fig. 3



An inexpensive case housing not only the digitiser board but also the audio amplifier, speaker and meter circuit (the push-button and toggle switch are for the digitiser).

RADIO CITY

Sharon George

Where it all Started

Radio City is the Independent Radio Station for Greater Merseyside and part of North Wales, appointed by The Independent Broadcasting Authority. They were awarded the contract in 1973, and commenced broadcasting at 6am on 21 October 1974. They were the first provisional station to operate on a 24-hour basis and the ninth independent radio station to go on the air.

Under the terms of the Broadcasting Act, the IBA is required to re-advertise franchise contracts at stated intervals. Radio City's present contract with the IBA was awarded in 1985 and operates until 1993.

Radio City commenced broadcasting with a single on-air studio and production suite. Since then, the facilities have been modernised and increased. Radio City now uses seven studios and a sophisticated outside broadcast unit.

Currently employed are a staff of fifty, covering Sales, Programming, Engineering, Marketing, Accounts and Management.

Who Listens

Radio City's broadcasting area takes in Merseyside, North Wales and North Cheshire and covers a potential audience of 2.1 million. The last research (Feb-Dec 1986) showed that over four weeks, 53% of that potential audience tune into Radio City, that is 1113000. The audience generally tends to be under 55 years of age with almost 45% under 35 (415 000) and is evenly split between male and female.

The research also showed that listeners tune into Radio City for an average of 43.9 hours (almost two hours per day). Peak listening is between 8-8.30 Monday to Friday (190 000 tune in), at 9.30 - 10am

This month we start an occasional series looking at different local radio stations all around the UK. Keep an eye open for your favourite in the coming months.

rock and disco. There are weekly magazines on the arts and religion as well as seasonal features on holidays, health and business. Even within the regular programmes, there's a constantly changing pattern of special themes, features and listener participation activities.

The Radio City Area

Radio City maintains a high profile around the area in a variety of different ways. This commitment and involvement with the community takes many forms, from sponsorship to concerts, participation in major events to the opening of garden fetes and roadshows to major outside broadcasts.

The flagship of Radio City's promotional efforts is the "Showmobile" - a 12m mobile unit which attends local events throughout the area during the summer months.

Radio City's other main area of community involvement is sponsorship. They are keen to sponsor many different events in the community, gardening competitions, orchestral concerts, football matches and marathons.

Like many radio stations, Radio City has always been committed to raising funds for charity. Initially this was done via the Radio City Charity Trust which raised thousands of pounds for local charities through events such as The Miss Radio City Gala Evening, The Radio City Jamboree plus charity football matches and other events.

In 1983, however, Radio City launched a brand new charity fund raising appeal called Give a Child a Chance, to raise money to fund projects which help local children in need. Since the appeal began, some £250 000 has been raised and distributed to worthy organisations.

Dave Lincoln



Saturdays (148 000 tune in) in between 10.30 - 11.30am Sundays (weekly peak average of 214 000).

This takes no account of all the local radio DX enthusiasts who spend many hours listening to identify stations like Radio City.

What You Hear

For twenty four hours a day it's a mix of music, news, sport and chat.

Dave Lincoln starts off the day with his Breakfast Show with music, news, sport, weather, traffic and travel. At 10am, there's John Kennedy with his show that delves into life on Merseyside.

Phil Easton takes to the airwaves after the one o'clock news with an afternoon magazine packed full of features, quizzes and star guests.

Then, last but not least, Mark Jones rounds off with two hours of action packed music and information presented in his imitable quick-fire style.

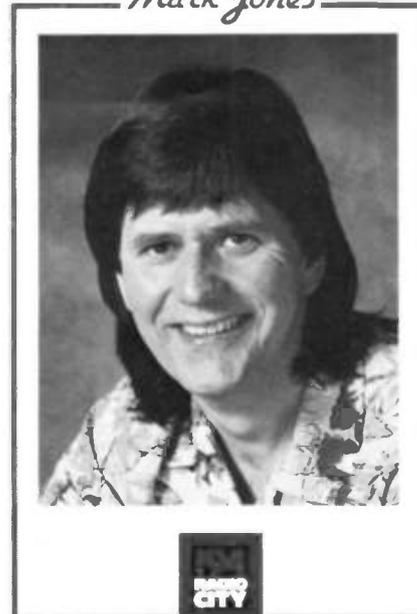
City's nightly *Downtown* programme has become very popular on Merseyside with two hours of up-to-date music for younger listeners, rounded off by the softly melodious *Peaceful Hour*.

During the evening and at weekends, Radio City broadcasts a broad range of weekly specialist programmes to cater for individual tastes. Musically, there are shows for lovers of country, classical, CD,

Phil Easton



Mark Jones



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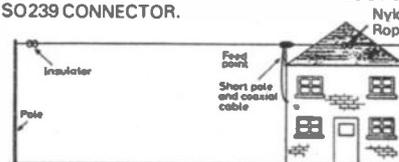


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The Programmes

News: The Radio City Newsroom operates day and night, updating bulletins on the hour, 24 hours a day. Its team of journalists cover the major news stories wherever and whenever they happen.

As well as hourly updated bulletins, the Newsroom provides news round-ups at breakfast time, lunchtime and in the evening. Like other IBA stations, its source of national and international stories is Independent Radio News, based in London. Information is fed by landline to the newsroom and can be gathered by direct link newscars and again the news can be on the air as it's happening.

Business News: They have always included items relating to local commerce and industry within their hourly bulletins. Merseyside's much-reported and well-documented financial climate and economic problems virtually guarantees however that much of the coverage relates to factory closures, redundancies and bankruptcies and the like.

Not all the news is bad, they had quite a degree of success helping people interested in starting up small businesses.

Arts: The main thrust of City's arts coverage is contained within the weekly

3-hour Thursday evening programme *Scene and Heard*.

Authors often appear on the programme as do reviews of their newly-published books. Books on the theatre, cinema and world music feature prominently.

In the second hour the emphasis is on classical music. Music expert Brendon Carroll looks at new releases and plays at least one major work from the classical repertoire.

In the final hour, the spotlight falls on music available on compact disc, with technical expert Ian Kendrick on hand to steer listeners through the maze of technical jargon.

It is not just from the world of professional theatre that they take their material. Merseyside has a thriving and very active amateur theatre.

Sport: Their award-winning sports team have travelled the world to relay live coverage of Everton and Liverpool's many football matches. A Radio City reporter is present at every major game played by either Club and approximately fifty live commentaries go out each season.

The Sports Department are responsible for three programmes on City each week. *Saturday Sport* begins at 2pm with the

first news from the afternoon's outside-broadcasts and closes four hours later. It is the station's busiest programme featuring inputs from a dozen or more different sources and hundreds of items of information. The programme services all sports lovers from the loyal football supporter who lives every second of the blow-by-blow commentary on his favourites; to the occasional participant who can hear about a new facility, a new book or new equipment in their chosen sport.

Every Tuesday and Wednesday evening during the nine months of the football season, *The Midweek Special* takes a more reflective look at the local sporting scene with a studio guest.

Although football is the area's number one sport with Tranmere Rovers, Chester City, Wrexham and Wigan Athletic also figuring prominently in City's coverage, the station has also relayed live coverage of top rugby league, boxing, rallying and horse racing events to its listeners.

Hopefully, this gives you an idea of what Radio City is like and what you can expect to hear, etc. If you do hear a signal for them and you're outside their "normal coverage" area, don't forget to let Brian Oddy know all about it for his "Long, Medium & Short" column in this magazine. □

HISTORIC QSO

Ron Ham

The Avro Lancaster, used extensively by the RAF during WWII, was one of the most technically advanced aircraft of its day. Although over 40 years have passed since these famous bombers were used in anger, they are still remembered by men who served in and around them and in books and museums.

Around 1430 on April 3, **Gerry Brownlow G3WMU** from Storrington, right, worked the special event station **GB50RAF** at Cranwell on the 3.5MHz band and exchanged reports of 57 and 59. This was an unusual QSO, because at Cranwell the operators were celebrating the 50th anniversary of the RAF Amateur Radio Society and Gerry was in the radio exhibition building at the Chalk Pits Museum (Amberley), seated in the reconstructed wireless operator's cabin of a Lancaster bomber.



The museum's callsign GB2CPM was emitted by the TT154 transmitter at the top of the picture and the signal from GB50RAF was heard by Gerry on the R1155 receiver below it. Both units are over 40 years old

and were put in working order by Gerry who was delighted when the RAF operator commented on the good r.t. quality coming from this vintage transmitter. □

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THREE-BAND SSB RECEIVER

C. M. Lindars

This simple receiver was designed to be easily built from readily obtainable components and to offer a reasonable performance on the 14, 7 and 3.5MHz (20, 40 and 80m) amateur bands. It follows the principles normally adopted for direct conversion receivers and makes no pretensions at being a luxury model. Rather, it is of very basic design, leading to ease of construction and low cost. The constructional techniques used may appear to be archaic, but they have been chosen to keep costs down. The wiring follows a logical sequence and the various functional panels can be built one at a time and then assembled with comparative ease.

The r.f. pre-selector, mixer, v.f.o. and a.f. amplifier are all attributable to designs by Mr. J. Young published in *Radio Communications*, October '73 and February '75 and the a.f. filter is taken from a design in *Radio Communications* January '78. We are indebted to Mr. J. Young and Mr. A. W. Hutchinson, Editor of *Radio Communications* for permission to use the designs in this project.

The receiver is not, of course, suitable for the reception of a.m. signals, but it will perform well on c.w. (Morse) transmissions. However, it is possible to zero-beat an a.m. station, albeit with a rather poor audio result.

This simple, low-cost, single side band receiver has been designed to appeal to the beginner to short wave listening as well as try their hand at some simple home construction. This month we will look at the circuit diagram and discuss the methods of construction chosen.

before being passed on to the double-diode mixer via the 3-turn link wound on T1. The pre-set resistor R3 is used to balance the mixer and compensate for slight differences in the two diodes D1 and D2.

The variable frequency oscillator (v.f.o.) is of the Vackar type and is switched to cover the three amateur bands specified. The frequency of the v.f.o. is varied by the combination of the selected fixed

capacitors C25, 26 or 27 in series with variable capacitors C28 tuning L4, 5 or 6. The fixed capacitor in series with C28 is used to spread each band over as much of the 180 degrees movement of the tuning control as possible. If a different value of v.f.o. tuning capacitor (C28) is used it will be necessary to juggle with the values of the series capacitors to achieve the desired coverage. This will be dealt with more fully in the setting-up notes.

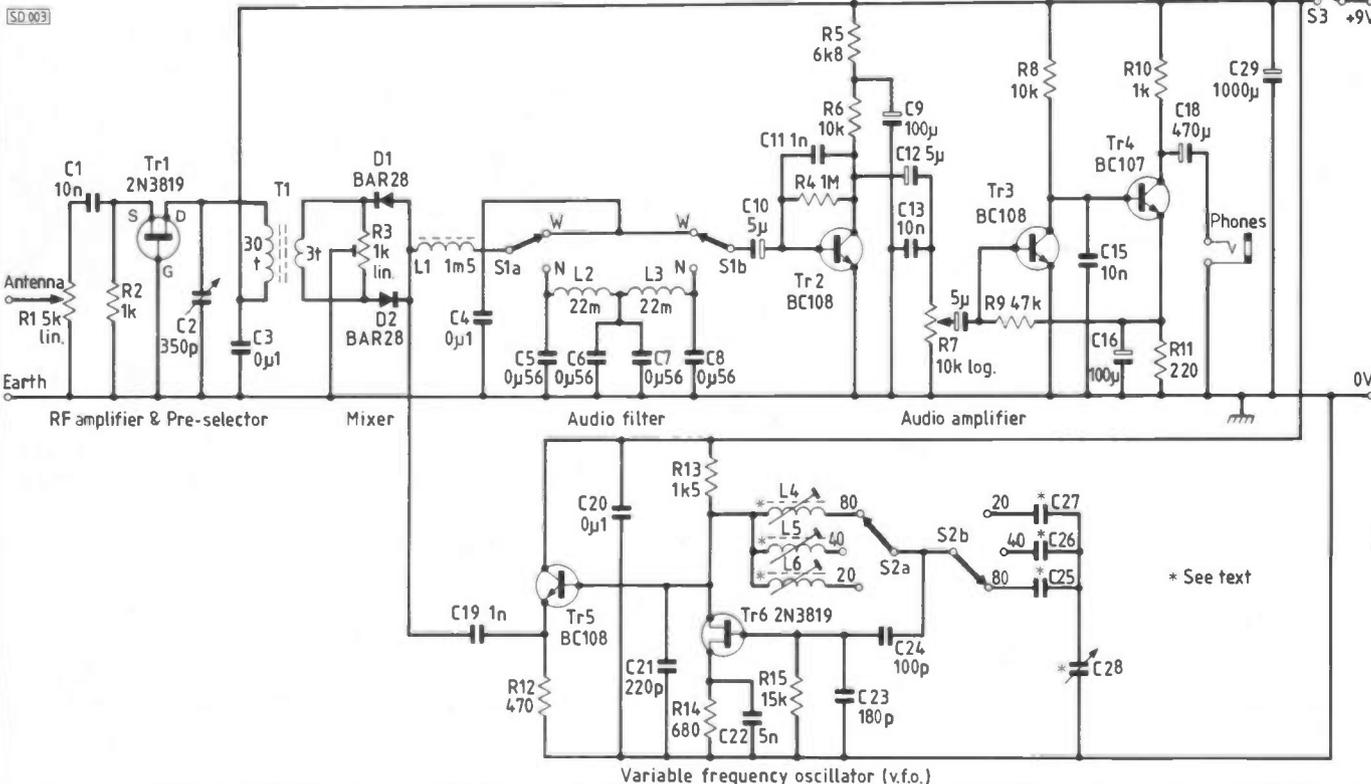
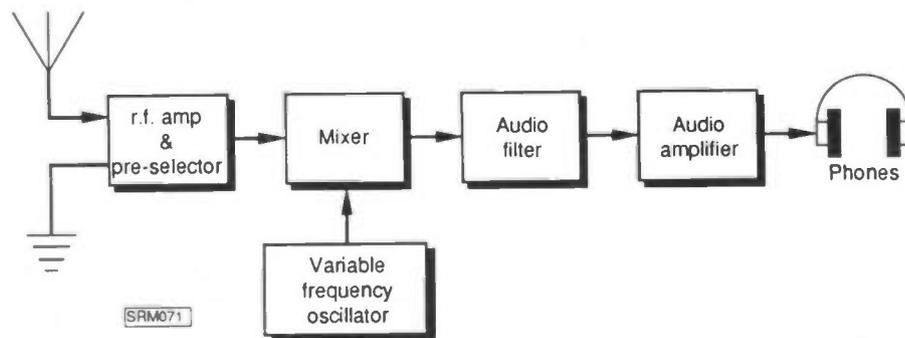
The output from the v.f.o. is fed to the mixer through C19 and the resulting audio frequency (a.f.) signal taken to the audio amplifier either directly or through the audio filter.

The a.f. signal level is controlled by R7 before being amplified by Tr3 and Tr4 and used to drive a pair of headphones. The ex-army, medium impedance type, which are usually about 100ohms d.c. resistance, are ideal here and are readily available on the surplus market.

It is very important that the supply leads to the v.f.o. go directly back to the battery and not via any of the a.f. wiring. If this is not done then the results will be r.f. in the a.f. circuits, giving rise to violent "howl-

Circuit Details

The radio signal is fed via the antenna input control R1 to the source of f.e.t. Tr1 which is connected in the "grounded gate" configuration. The amplified signal from the drain of Tr1 appears across the 20-turn winding of T1, which is tuned by the pre-selector variable capacitor C2,



THREE-BAND SSB RECEIVER

Part I

ing" when the volume is turned up. With the correct wiring it should be possible to turn the AF GAIN (volume) control to maximum with no sign of oscillation, only a loud hiss.

There is some degree of "pulling" of the v.f.o. when the pre-selector is operated close to resonance. However, experience will soon enable this slight problem to be overcome.

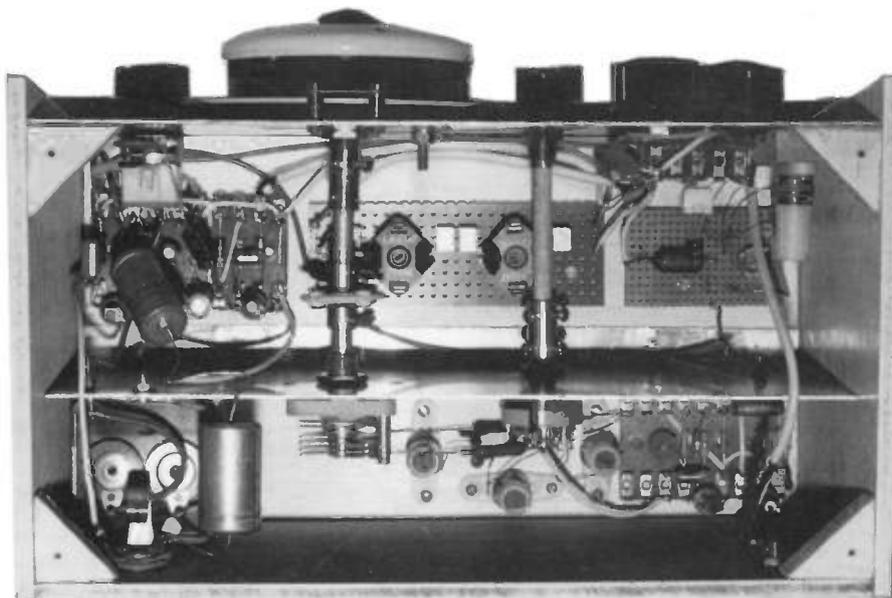
Components

Tuning Capacitor. The prototype receiver used an Eddystone E586 variable capacitor with a maximum value of 140pF. This unit has specially shaped vanes and for use in this receiver the number of vanes was reduced to three fixed and four moving. This reduces the capacitance range to 5-28pF. The values of C25, 26 and 27 listed offer a little more than full coverage of the three bands designed for and the scale shape, although not linear, is quite good.

However, the Jackson Type 804 25pF capacitor is more likely to be readily available and this is recommended. It will probably be necessary to experiment slightly with the fixed series capacitors to obtain the optimum coverage of each band and the scale will be a little more cramped, but not seriously so, at the h.f. end.

Band Switch. It is essential that only a good quality switch is used here. If you are tempted to press into service a switch from the junk box then the contacts must be cleaned with a volatile switch cleaning fluid. Enclosed types will benefit from a full strip down and overhaul, increasing the spring pressure while you are at it.

Slow Motion Drive. A good quality, slow-motion drive is essential for the v.f.o. tuning control. The one chosen for the prototype was an old Muirhead 50:1 geared drive but these have not been available for many years now. You might be lucky enough to find one on an old piece of equipment or at a radio rally.



Jackson make a couple of Dial Drives — the 120mm diameter 4489/C has only a 6:1 reduction drive and will be found to be quite tricky to use. The 4103/A, which has a rectangular dial, also has a 6:1 reduction but is provided with a 36:1 fine tuning reduction as well. It also has two scales, one calibrated 0-100 over 180 degrees, the other blank for your own markings.

into a home-made case constructed simply from plywood and aluminium sheet. An alternative would be to use one of the low-cost cases available from Minffords, fitting an additional aluminium screen down the centre.

Next month we will get on with the practical aspect and start building when the circuit description should start to make more sense. □

Construction

The radio is split into small, self-contained modules which are fitted into the case and connected together. Tag-boards are used for the audio amplifier and v.f.o. modules and tag-strip for the pre-selector as these provide a cheap and easily understood construction system. The mixer and a.f. filter are built using matrix-board, but it would be possible to use the "Easiwire" system described in the June '88 issue if you wanted to.

The author's original receiver was fitted

Abbreviations

a.f.	audio frequency
a.m.	amplitude modulation
c.w.	continuous wave (Morse)
d.c.	direct current
f.e.t.	field effect transistor
h.f.	high frequency
pF	pica farads
r.f.	radio frequency
s.s.b.	single sideband
v.f.o.	variable frequency oscillator

FURTHER THOUGHTS

News for DXers

Sweden Calling DXers, the programme for radio enthusiasts transmitted by Radio Sweden, produce a bulletin each week with lots of news about the world of radio. Some interesting snippets from the bulletin number 1988 (dated 26.04.88) are:

Radio Argentina al Exterior was heard on 5.650MHz at 0030 in Spanish. This frequency is not listed in the WRTH 88.

The Voice of Kenya's English service is now on the air on 4.934MHz, signing off at 2100 (2110 on Saturdays).

Radio Damascus has added the new frequency of 11.765MHz to its English programme to North America and Australia at 2105 — 2205.

The BBC World Service now uses the tropical band frequency of 3.244 (via the Lesotho relay) at 0400 — 0545 and 1515 — 2030. A new BBC local radio service began operation on April 11 serving the county of Somerset. It is called Somerset Sound and transmits at 0630 — 0900 on weekdays and at 0600 — 0800 on the weekends on 1.323MHz.

Radio Kiev was heard in English on a new frequency of 7.400MHz to North America at 2330.

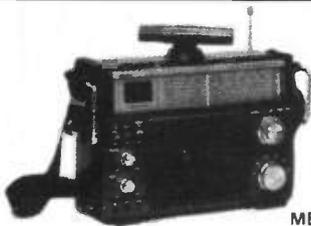
All these reports are from listeners around the world, if you hear the same, why not write and tell the appropriate columnist in Seen and Heard?

Raycomm Open Day

In conjunction with the Sandwell ARC, Raycomm Communications Ltd, are holding an Open Day on July 3. It's at International House, Oldbury (Raycomm's HQ).

A number of traders have been invited and there will also be a flea market and bring & buy organised by the Sandwell Club.

Adequate parking arrangements have been made and there will be a talk-in station, G1SAN, on S22 and SU8 as well as on the local repeater GB3BM. Doors are open between 11am and 4.30pm.



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FORTY FIVE YEARS LISTENING

Goff Curtis

It is far easier, and satisfying, to wink out a weak Morse signal from the Pacific area, for example, than to try and understand even a fair s.s.b. transmission from (say) the same area in the middle of the QRM, and sidebands splatters. The recent Mount Athos operation was the worst example of an ill disciplined crowd calling on SY2UA/SYs frequency, calling when he was either operating, or apparently listening, plus the QRM and QSB. It took all of twenty minutes to absolutely identify Georges full callsign. A DU8, correctly just h.f. of the frequency, came up with "they don't deserve an expedition, do they". On the following Friday SY2UF/SY came up on c.w. about RST 349, and although he was only fairly readable, with the same absurd calling smack on his frequency, and worst of all, calling him whilst he was working, his callsign was identified in about two minutes. That's c.w.

Why don't these people, mostly Europeans, use their receivers and listen. What is the point of calling a station when it is transmitting!

*There was an old owl who sat in an oak.
The more he heard the less he spoke.
The more he spoke the less he heard.
Why not copy that wise old bird.*

Anon

A DX station was recently heard to send to the "mob", "call up 2 up or I will have to blacklist you". Another said "what's wrong, haven't you got a receiver"? A third, after instructing them to "call 5 up", which most ignored, then said "my God", and closed down. The receiver is just as important as the transmitter, which most UK stations appreciate, as I can remember hearing much "ham" (horrible word!) operating from G Land, in fact, at this QTH, one can "feel", and almost see them listening, ready to pounce on a catch. Many well known DXers: G6Z0 and G3AAE to name only two, have never been heard to send "CQ", unless they have when I was out of the room, but when they are heard in operation it is definitely worth clinging on to them because they will almost certainly be calling, or working, somebody to whom it is worth listening. G6Z0 "led" me to KS6AG by calling her, although he didn't manage to raise her. The intelligent TXers lead us to the DX. Clamping onto these fellows, and some YLs, watching the DX nets, on the air news, and the DX broadcasts is bound to help the "countries heard" score creep up, and it is not necessary, although better!, to have super gear.

For the newcomer the best receiver possible that one can afford, a good antenna, two at right angles would be useful, some know-how on the bands to use, and which time of day and year, to get on them, and he or she can log more or less anything — provided it's coming through! As an after thought, some skill, patience,

Goff reckons that this will probably ruffle a few feathers and provoke a few letters from readers. Most c.w. operators agree that real amateur radio is c.w. and it seems a pity that most listeners are not interested, can't be bothered or think that it is impossible to read Morse — regrettable, as they are missing the most stimulating part of amateur radio.

and sometimes persistence helps, plus luck.

Other pleasures for a DXer are contacts with fellow listeners by letter, telephone, eye to eye or, best of all, tape recordings, and one cassette "round Robin" includes a G5, and an ex-G8 which keeps us all in touch, and on the ball.

Another useful spin off was a "set listening period", which was encouraged by several magazines some years ago in the 1950/60s. Those wanting to take part, and many did, switched on their RXs at (say) 0800hrs, and listened s.s.b. or c.w. until 0900, logging all they possibly could during the hour. It was surprising how some of the logs differed on the same band, which had been set by the magazine. It would be a good thing if certain periodicals brought these back, as they were good fun, and very useful indeed in checking if the receiver needed aligning, or for rusty antenna connections!

Pete G3KOE, a pal of mine, often used to take part in these "s.l.p.s", and I would often visit his QTH, not only to pick up his

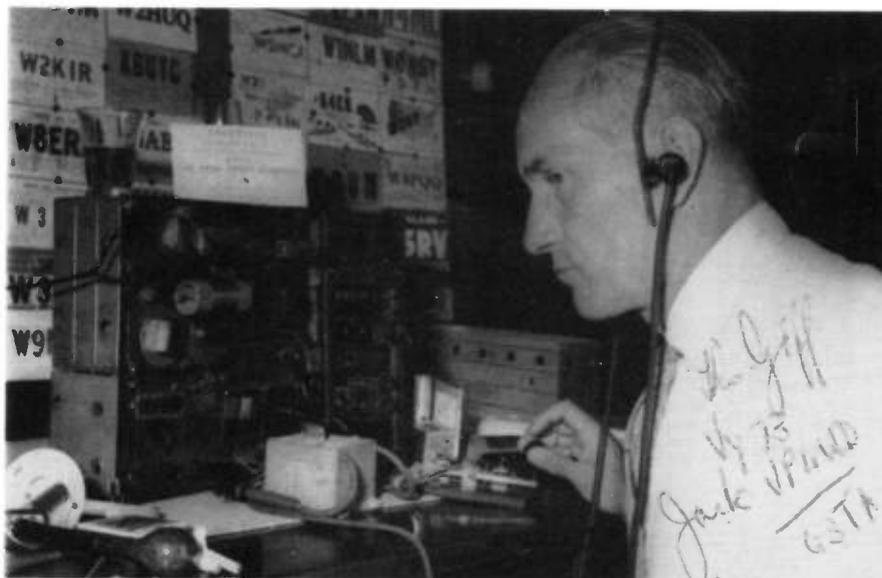
logs, but to operate! This was legally allowed in those days if a licensee was "in charge", and luckily for me Pete, although perfectly at home with c.w., wasn't all that keen on it, liking speech, so when he had finished two or three contacts, handed the key over to me. As many c.w. QSOs were made as possible until his YL tactfully dropped hints that surely it must be about my YL's bedtime, so I wondered off well pleased with another evening key bashing. Almost the last QSO before Pete became a silent key was with VP8GO, ex G3LET, on Signy Is, S. Orkneys, who used two CR100 RXs, and a microphone presented by his former E.K. Cole Ltd, colleagues before he left for the Antarctic. Not a lot of notice was taken during the QSO, but later I was surprised to remember he had given me an RST of 299 (due atmospheric?) but this was forgotten when arriving back home to find I had never heard the S. Orkneys.

G3KOE also, with G6XL, Geoff Watts of *DX News Sheet* fame, Bill Wilkinson, now G4MSK, and I, had a good thing going in those days in which we all had lists of the Amateur Countries not heard by the other four. If one of us heard something needed by one, or all of the others, we immediately contacted those concerned by phone or telegram with the info.

I believe it was with these small beginnings that Geoff built up thousands of subscribers to his weekly *DX News Sheet*, which is a wonderful help to the listener, and particularly the DXer. The RSGB now handles this sheet due, I understand, to family health reasons. A very complete, and comprehensive list of amateur callsigns, etc, can still be obtained from him in Norwich for a nominal sum.

Within two years of leaving the RAF, radio "Bods" could have a callsign without having to pass the radio amateurs exam, and being fortunate enough to "get it out of the system" once a week, at least,

Jack VP4WD, the first amateur on Tobago



Part 2

on 3KOE's key I kept putting it off until it was too late, which was regretted for a time, although not for long, as listening, DXing, country chasing, the broadcast, aircraft, and shipping bands were so absorbing, and pleasantly time consuming, there seemed time for little else.

Going into the attic again, the last tea chest revealed a load of radio magazines of which three monthlies of the 1950s were devoted almost entirely to the short wave listeners. One was called the *Short Wave Listener*, the other two being the *Radio Amateur* and the *Short Wave News*, and the *Short Wave Magazine* gave us quite a lot of space. We could never understand why the first three stopped publishing, as there were bags of listener enthusiasts in those days, as there is today, and I, for one, really appreciate the up to date *Short Wave Magazine* and wish it a long life.

These were the magazines that ran those "set listening periods" which were so popular. One hour of useful pleasure. Talking of hours prompts an off the cuff thought that if a listener sat at her or his receiver for about two or three hours a day for forty years, the total listening time would be approx 4000 hours, and not an hour too long. One of the finest "pursuits" in the many ways that one can be entertained today.

In my opinion a recent incident on 145MHz s.s.b. was the height of entertainment, if not of amateur radio. An LA9 station on Hitra Is, picked out the last two letters from one caller in the "pile up" calling him, The LA then went back to this caller, asking for his full callsign which he

made number one, to be contacted later. he repeated this ten times with different stations, and then called his list of ten in rotation, adding "no breakers". Nobody did break in, and there was wonderful peace on the frequency as he worked the stations he called one by one. A far quicker, and quieter method, than those used by some go between "make your call" controllers.

Finally, the basis of radio operating is interceptive listening, and it seems that some of today's licensed operators, were not short wave listeners before they got through the amateur test, or they have forgotten what they should have learned. They don't use their receivers as they should. They don't listen to find out when to call, or if its likely they will be heard; when not to do so because the other fellow is "working", and not listening, so

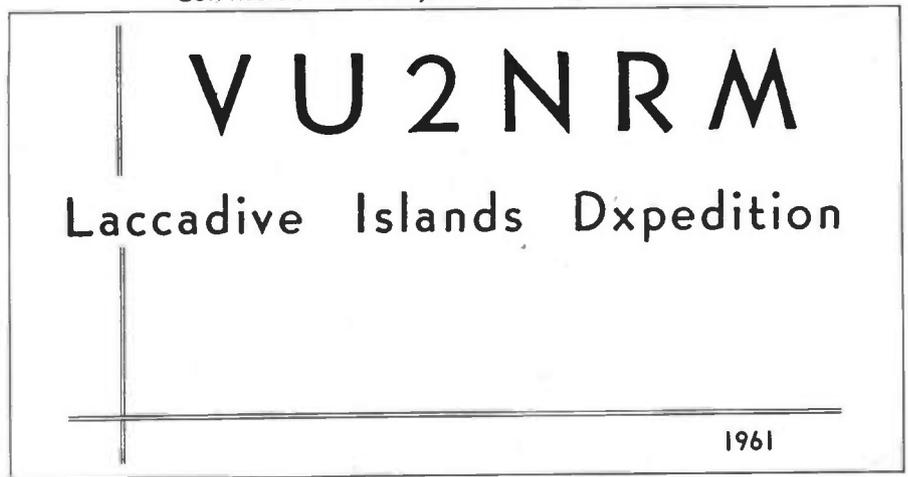
there is little chance of being answered. A waste of watts!

The short wave listener who is aiming at becoming a TXer can become a good, or outstanding operator eventually, if a year, or so, has been spent on the bands listening, when by then he, or she, will have the experience and training some apparently have not.

To hear good calls we must know the propagation characteristics of the separate bands. The location and ident of the countries, the times they are likely to "come in", bearing in mind their local time, and the influences of the time of year, and much more!

A newcomer to the bands could be "put off" by the bare essentials to do anything worthwhile. Well, don't be. They make listening an absorbing, and wonderful experience.

Goff heard this station just before they closed down



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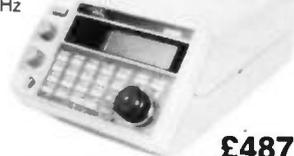
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Godfrey Manning G4GLM

First, some help. **Barry Walker** (Coventry, Tel: 0203 597110) is looking for an altimeter that could be used for propagation monitoring as well as for interest when touring by car. The idea came from Ron Ham's photograph of his own instrument ("Seen and Heard," April *SWM*, page 40). Any aneroid altimeter can be used as long as no electrical supply is required and provided that it is equipped with the usual barometric pressure setting subscale (in millibars or, sometimes, inches of mercury). For a fuller description of what to look for, read my comments in the February "Airband." Meanwhile, if you know of a source of altimeters please contact Barry direct; but if the supply is prolific enough then also let me know so, that I can mention it in this column.

"Can you give me any information on flight numbers?" asks **Chris Durkin** (Ormskirk, Lancs). Each flight number tends to be allocated to a particular scheduled route; but some charter operators which fly mainly "one-offs" could re-use flight numbers many times (such as Air Atlantique). Each season, the flight numbers seem to be completely re-hashed especially in the case of inclusive tour operators. One interesting case that I came across recently is Speedbird 1000; this appears to belong to a Beech King-Air 300, presumably used by British Airways on liaison/communication duties, but more information would be gratefully received by an inquisitive yours truly. The best information source that I can recommend, Chris, is *Airport Timetables UK 1988* published by the Midland Counties Aviation Society. It will be available by the time you read this; request the price (with an s.a.e.) from 27 Highwood Croft, Kings Norton, Birmingham B38 8ET. Or, better still, join the Society (the monthly *Airstrip* newsletter is worth the subscription on its own) and buy the *Timetables* at the members' inclusive price of £5.20.

Samples of the logbook (as supplied by **The Airband Shop** (Stockport) are still available from me if you send a reply envelope with a 13p stamp or IRCs. Offer open while stocks last, as they say. **Anne Reed** (Cheltenham) was first off the mark in claiming hers; she is interested in scanners in general.

The meaning of some more Volmet terms puzzles **Phil Radford G3YDZ** (Lowestoft). A trend forecast may be added to the actual weather given by Volmet and is valid for two hours ahead. TEND means tendency; GRADU constant change; RAPID is a change expected within half an hour; TEMPO changes occur temporarily before reverting to the more general weather pattern; INTER means intermittent, fluctuating changes; PROB gives the percentage probability of a forecast change occurring; but, NOSIG may instead be used when no significant change is expected. The time of commencement of change (UTC) may

Welcome aboard this month's bumper edition of "Airband." If you'll just strap in, then away we go. . .



also be given. "Short Wave Weather" (May *SWM*) explains more about Volmets.

Follow-ups

The International 877R receiver has attracted comment. **Graham Whiting** (Leamington Spa) confirms that the tuning dial is very imprecise. Selectivity is not adequate to separate adjacent channels, and the squelch seems a little sluggish to open at the beginning of transmissions. According to **Leslie Griffiths** (Sheffield) the squelch is carrier activated. The other drawback is the set's lack of an external antenna socket, limiting reception to a built-in "rubber duck" helical. This receiver is obviously far cheaper than a multi-channel scanner but the performance is severely traded-off by compromising on the price. When choosing a receiver, compare with similar cheaper sets but, having decided not to pay the price of a scanner remember not to expect scanner-type performance.

Graham is holidaying in Italy this year and I look forward to his report about the

flight and the foreign airport. As you say, Graham, I can't normally answer letters directly but I do try to include everybody in this column. I've managed it so far!

In the May "Airband" reference was made to navigation aids putting out the unexpected Morse identity TST (dah, di-di-dit, dah). This indicates a beacon under test; but any other incorrect ident should be treated in the same way: do not use this facility for navigation, as it may be unreliable. The Civil Aviation Authority (CAA) document on *The London Air Traffic Control Centre* is actually document number 260. Don't forget to include the postage costs even when ordering free documents from the CAA.

Frequency Information

The CAA *General Aviation Safety Information Leaflet 4/88* reports two changes to v.o.r./d.m.e. beacons since the last issue. The two facilities in question are Dean Cross, Cumbria (DCS: dah-di-dit, dah-di-dah-dit, di-di-dit, 115.20MHz) and Barkway, Hertfordshire (BKY: dah-di-di-dit, dah-di-dah, dah-di-dah-dah, 116.25MHz); they have both been re-introduced.

Another function of the CAA is the monitoring of the performance of navigation aids. A new computerised monitoring system is about to be introduced for v.o.r., d.m.e. and n.d.b. facilities; 64 reception sites keep tabs on the beacons. Part of the system involves receiving the Morse ident and digitising it.

The June "Airband" gave details about the Trimmingham relay station from **Tim Christian** (North Walsham, Norfolk); he supplies more details as follows. The emergency frequencies 121.5MHz (+5kHz offset) and 243MHz are relayed from here as is 127.95MHz which is a secondary to 134.25MHz. Apparently the forthcoming (so we hope) sunspot maximum may be the last on which h.f. aeronautical traffic will depend. By the time the sunspot cycle after the present one comes round, long-distance flights will communicate via satellites. A trial involving transoceanic flights using Inmarsat (ground uplink 6GHz, aircraft downlink 1.6GHz) is being planned and the system might be in more general use within half a decade (sunspot cycles take around 11 years). Multiplexing techniques will enable 32 separate communications to use a single frequency. This leads me to ask how reluctant existing operators will be to scrap their h.f. gear and replace it with something more elaborate. Another option is that the h.f. transceivers will be kept as a standby, so any new equipment will increase the aircraft's non-revenue-earning weight. Time will tell.

"From where is RAF Volmet (4.722MHz) transmitted?" Asks **Tom Smith** (Swindon). **Alan Jarvis** (Cardiff, Wales) has the answer: Upavon, 9 miles SE of Devizes, Wilts. This should also

Abbreviations

CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
e.g.	"for example"
h.f.	high frequency
i.f.	intermediate frequency
i.l.s.	instrument landing system
IRC	International Reply Coupon
n.d.b.	non-directional beacons
RAF	Royal Air Force
r.m.i.	radio magnetic indicator
s.a.e.	stamped addressed envelope
SE	south-east
UTC	Co-ordinated Universal Time (= GMT)
v.o.r.	very high frequency omni-directional radio range

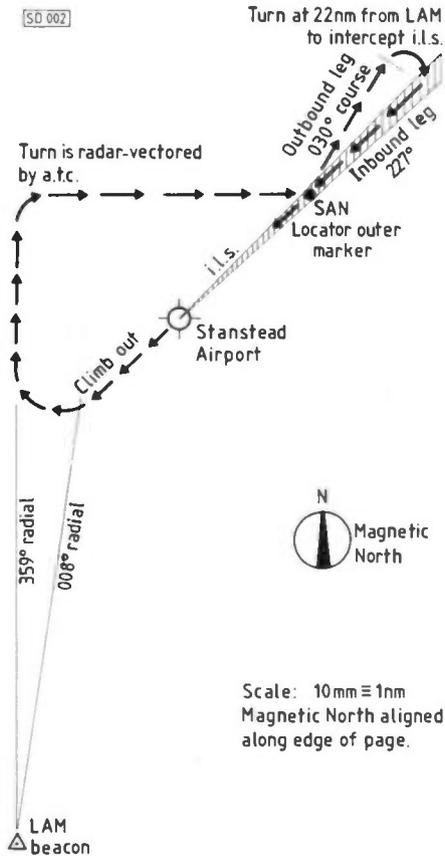
satisfy **Paul Whiteley** (Poulton-le-Fylde, Lancs., April "Airband"). But there is a secondary frequency of 11.2MHz; is the transmitter at the same location? Does anyone know how RAF Volmet chooses which airfields to cover on any particular day? As far as New York Volmet goes, it's my fault that the April issue gave the wrong frequency which Alan points out ought to be 13.270MHz; 6.604 and 10.051MHz are also used.

Beacons Again

Alan adds to the helpful ideas concerning a list which gives beacon identities in alphabetical order. On tuning a beacon, its location can thus be found once the Morse has been decoded. *Handbuch der Funknavigationshilfen (Radio Beacon Handbook)* by Dr. Jürgen Trochimczyk (Wilhelm Herbst Verlag, Cologne) has such a listing for worldwide n.d.b.s. but tends to be a bit out of date. Interbooks of Perth supply this (see adverts in *SWM*).

How about trying to find the best DX for n.d.b.s? Well, Alan, this would be unfair except under controlled conditions! The most important thing is to remember that altitude might confer an advantage, so pilots contributing to some sort of record for most distant beacons heard should state their altitude (QNH) or flight level at the time of reception. Any offers? One word of warning: for actual navigation it is vital to use any beacon only when within its accepted operating range. A weak distant beacon may be an interesting find, but the signal may not be accurate enough for navigation over that distance.

Who needs radar? Not **Arthur Tingley** (1km south of Detling beacon, Kent), so it seems. Arthur has sent me a clear photograph showing the con-trail track of an overflying aircraft; headings and a precise turn are all annotated. Although you find my coverage of beacons "a little eclectic," Arthur, I'm sure that you are beginning to see their importance. Unless you know where the beacons are, you can't tell the position of the aircraft either! Detling 2 and Dover 1 departures pass straight over Arthur's house, and he also sees arrivals for Southend from the south and Gatwick from the North and east. The overflying aircraft are usually easy to follow, e.g. arriving from Abbeville or Boulogne, perhaps heading 320° along UA2 before crossing Detling (DET: dah-dit, dit, dah, 117.3MHz) for Brookmans Park and maybe eventually Birmingham. The photo, however, shows a track that turns right off the 320° course when overhead Detling: this is hard to explain by reference to a high altitude radio navigation chart alone. Aerad chart H108A covers the south of England's high altitude routes (telephone Aerad Customer Services on 01-562 0795 for prices). The first time you order from Aerad, don't forget to ask for the free *Legend Booklet*. To answer your last



point, Arthur, h.f. transmissions do use upper sideband now. This signal contains all the necessary audio information but is only intelligible if the missing carrier is put back at the receiving end. A simple technique uses a beat frequency oscillator in the receiver; it is possible to add one without making any actual connections to the set, by placing an oscillator (tuned to the set's i.f.) in close proximity to the receiver thus enabling electromagnetic coupling to occur.

Problems

Tom Smith is afflicted with a "consistent signal of some strength between 443 and 463kHz" on his Matsui MR4099 receiver. Also present are two high-pitched noises at 444 and 457kHz. This signal is so wide, Tom, that a spurious seems likely; or possibly overloading by something very local? See if removing the antenna clears the problem (difficult if an internal ferrite rod is involved, but in this case, try to use its directional properties to null out the offending signal). Also try turning likely electrical appliances, etc., in your house on and off to see if one of these is the culprit. Has anyone else experienced this problem?

Dave Taskis (Ilford, Essex) finds that his AR2001 scanner interferes with his Sony Air-7! The interference is not mains-borne. The same principles as used when reducing the interference caused by computers might help here, and I suggest a look at the April *Radio Communication* ("Technical Topics: Minimising r.f.i. from digital equipment," page 266). Any further

suggestions would be welcome.

Dave also has problems from the AR2001's bleep (which gives positive indication of making each keystroke). Since the bleep is not reduced by the volume control, it practically deafens the listener when headphones are worn! Is there any way to quieten it?

Landing on the ILS

Recently I had a try at landing at Stansted in a light twin using the instrument landing system (i.l.s.) — simulated, unfortunately (see diagram). Starting with a climb-out from runway 23, the Lambourne v.o.r. is already tuned in and identified (LAM: di-dah-di-dit, di-dah, dah-dah, 115.6MHz) and the 008° radial selected on the indicator. As the needle crosses centre (the aircraft is flying through the radial) the 359° radial is now selected and a right turn begun to establish on it. This brings the course to nearly due north and radar vectoring instructions are now issued by air traffic control.

"Shortwave 123, remain 2500 feet on the QNH 1010, call Approach 125.55, good-day." I acknowledge, and then call Stansted Approach. Whereas Approach could radar vector me all the way to the i.l.s., in this case the published procedure will be followed: I am to navigate my way there by using the locator outer marker beacon (SAN: di-di-dit, di-dah, dah-dit, 339kHz). A right turn onto an easterly heading is given and I then follow the course to SAN by reference to the radio-magnetic indicator (r.m.i). Arrival here is signified by overflying the outer marker; a blue light flashes on the instrument panel and a series of dashes is heard in the headphones at this moment. Having arrived at the fixed starting point for the procedure, the outbound section begins.

The little twin-prop aeroplane has to follow the procedure for aircraft with true-air-speed of less than 150 knots; the track of 030° is flown away from the SAN locator n.d.b.; the r.m.i. needle now points backwards to 210°, the reciprocal bearing. Once the LAM d.m.e. is indicating at least 22 nautical miles away, the inbound tear-drop turn is commenced to the right. On rolling out on the 23 runway heading (227° to be precise) the localiser appears on my left. The outer marker is once more passed, this time directly inbound for a descent with the glide slope followed by landing or a go-around. A technical description of the limitations of using i.l.s. facilities appeared in *CAA Aeronautical Information Circular 11/1988*. CAA publications are obtained through their Printing & Publication Services, Greville House, 37 Gratton Road, Cheltenham, Glos. GL50 2BN.

Until next time, thanks to new and regular correspondents alike for your letters; it is indeed these, and not kerosene, on which this column flies! □

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PANASONIC RF-1680L REVIEW

John Waite

First Impressions

The Panasonic RF-1680L is a medium sized mains/battery radio measuring some 287 x 163 x 58mm. The styling is very modern with extensive use made of push-button controls and l.e.d.s. where possible. Despite its size it is actually quite light and easy to handle. When I first opened the box, my first reaction was that it was a very "plastics" radio, but its looks very much belies its performance.

There are no standard extras supplied with the radio, except for the mains lead. Although there is a full-width, plastics carrying handle on the top of the set. In fact in many ways this set looks just like many radios you find in kitchens all over the country, again this belies its performance. The multi-language operating manual comes in eight different languages! They are English, French, German, Dutch, Swedish, Danish, Italian and Spanish. So just about everyone should be able to find one they understand! The radio is very easy to operate and it only takes five pages of the manual to explain everything. They even manage to include some diagrams to illustrate some of the points.

Controls

As mentioned earlier, extensive use is made of touch controls and none of these requires very much pressure to operate any function. The only rotary control is the main tuning knob, located on the right hand side of the set.

The band selection is achieved with a five-position slider switch on the top panel. This covers the five bands catered for: f.m. (87.5-108MHz), l.w. (150-285kHz), m.w. (520-1610kHz), s.w.1. (5.9-18MHz) and s.w.2 (5.9-6.2MHz).

Other controls are for f.m. mute (on/off), loudness (on/off), tone (high/low), radio on/off and a volume control. The volume control is a little unusual, the best way I can describe it is that it is a type of touch sensitive rocker switch. You press one end for more volume, the other end to decrease the volume. Whilst talking about volume, this set has more than its share, 1.2 watts to be exact!

There is, on the left-hand side, both the ear phone and mains socket. The ear phone socket is the usual 3.5mm mono jack, but do be careful of your ears as there is 0.75W available on this socket.

The antenna, at least the visible one is a telescopic whip, but there is a ferrite rod inside for l.w. and m.w. operation.

Operation

Operating this radio proved to be extremely simple and the instruction booklet doesn't need to be consulted very much at all. I think it would make it suitable for either a beginner or for someone who gets on better with a simple radio.

The main tuning control had a very nice feel to it making it easy to accurately tune

If you're looking at the budget end of the portable radio market, this model from Panasonic could be just right for you.



into stations. The s.w.2 band is best for this as it is effectively a band spread scale for the 49m band. This means that the whole width of the scale is dedicated to the usual 49m band. There always seems to be plenty of interesting stations around on this band.

The three controls below the analogue tuning dial on the front panel each has an l.e.d. indicator to show the state of that function. The red l.e.d. is illuminated when the function is active. There is a tuning l.e.d., which illuminates in proportion with the signal strength. The last l.e.d., again a red one, is on the radio on/off switch.

As the front panel on/off switch is a touch sensitive one, there is an additional slider on/off switch on the right hand side. This prevents the set being accidentally turned on in transit, thus saving the batteries.

Performance

When I got into the SWM test lab with the Panasonic RF-1680L, there were a few surprises in store for me. The first surprise was the short wave sensitivity. On the s.w.1. band, it was 1.1µV for 10dB signal to noise, which is really quite respectable. When I checked the s.w.2 band, I found that the sensitivity was an impressive 0.75µV for 10dB signal to noise ratio. This is really very good for a radio in this price bracket and I must admit results that I wasn't expecting. It's always nice when you get unexpected results as it restores your faith in the electronics industry!

Sensitivities on the other bands, though not as notable as the short wave performance, were better than expected. I have included the results in the table so you can see what I mean.

The audio section of the RF-1680L was very good, producing a very pleasant sound quality, especially on v.h.f. f.m. This is achieved by using two speakers, a 120mm main speaker with a 15mm tweeter for the high frequencies. There

was also plenty of volume as I mentioned before.

The tuning system on the set used a conventional analogue dial and pointer. I expected this to have the usual accuracy of plus or minus "quite a lot"! I was amazed to discover that the dial accuracy was in the order of one per cent, I kept checking this all over the bands to make sure I wasn't seeing things. The technique I used, was to set the pointer to the centre of the frequency printed on the display (e.g. for 800kHz the pointer was set to the centre of the middle zero). Once the dial had been set, I tuned the signal generator for optimum signal to noise ratio and read the final frequency on the digital display on the signal generator. It was then a matter of a simple calculation to work out the percentage error between the signal generator frequency and the radio's dial. The only band that wasn't better than one per cent was s.w.1 and this was better than 2 per cent.

All in all I found this set quite surprising and if you are looking for a simple and reasonably priced set, then this could well be worth your consideration. The Panasonic RF-1680L costs £44.50 and should be available from your local Panasonic dealer. Many thanks to Panasonic UK Ltd. for the loan of the set. □

SPECIFICATION

Frequency Range:	f.m. 87.5-108MHz l.w. 150-285kHz m.w. 520-1610kHz s.w.1 5.9-18MHz s.w.2 5.9-6.2MHz
Sensitivity:	<i>(f.m. 2.82µV) (12dB SINAD) (m.w. 81.5µV/m) (l.w. 280.5µV/m) (s.w.1 1.1µV) (s.w.2 0.74µV) (10dB S:N ratio)</i>
Power Output Speakers:	1.2W (0.7W) 120mm Woofer 15mm Tweeter
Dimensions:	287mm Wide 163mm High 58mm Deep
Weight:	1.2kg.

measured results in italics

Abbreviations

dB	decibel
f.m.	frequency modulation
kHz	kilohertz
l.e.d.	light emitting diode
l.w.	long wave
MHz	megahertz
mm	millimetre
m.w.	medium wave
s.w.	short wave
v.h.f.	very high frequency
W	watts

T. J. Wright G1BCR/G9BZW

Short wave listening has for many years been an interest of mine. However, owing to pressure of work and a professional involvement with communications equipment my active leisure interest in the pursuit waned considerably. In fact all I did was keep a good quality s.w. portable with me for news and not much else.

As I become more settled in life I yearned to indulge in the hobby again and began to consider the best way to get started. Over the years I have had access to many different receivers, coming to the following conclusions, which some readers may choose to dispute, regarding available equipment:

1. Commercial/professional and top-grade amateur receivers: almost all are very good, but also very expensive.
2. Semi-professional and some amateur receivers: many are not all they're cracked up to be, and some are over-priced!
3. Basic amateur equipment: reasonable performance in relation to price — you get what you pay for. Good value for money.
4. "Far-eastern delights" as advertised in the Sunday papers: lousy performance at grossly inflated prices. The "offer of a lifetime" — also available at your local market!
5. Second-hand from category 1 (also ex-military): many good sets at sensible prices if you look around, but exercise caution.
6. Second-hand from categories 2 & 3: good value providing the equipment has been well looked after and properly serviced.

When buying from category 5 or 6 go to a specialist dealer, many of whom

This is a step-by-step account of Tim Wright's successful attempts at revitalising a weary, and damp, receiver to first-class working order.

advertise in this and other "radio" magazines. You will pay a little more but you will almost certainly get a good deal as he has his reputation to consider. Also you have the added advantage of being able to trade-in your existing equipment now (if in good condition) and possibly part-exchanging the set you are buying for something better at a later date, if you choose.

The Ailing Eddystone

Having made the decision to get a reasonable receiver I opted for category 5 as I was prepared to do some work on the set if required. Little did I know what I was letting myself in for!

As luck would have it, a receiver was offered to me at a very reasonable price — an Eddystone 940. I looked for the good points first. It was a reasonable size and would fit into a domestic environment, used sound engineering practice in the construction (cast aluminium chassis for good mechanical and electrical stability and a superb, split-gear, tuning mechanism free of backlash). The 1st r.f. stage used cascaded triodes for low noise and good linearity, with three tuned stages at signal frequency to increase image rejection and reduce mixer blocking, separate mixer and oscillator stages for

better stability and there was room to carry out improvements or modifications.

Now for the bad points. It was physically sound, filthy dirty but undamaged from storage in the damp. There was evidence of botched attempts to repair it and it was not working very well. It was deaf, noisy, the b.f.o. was faulty and "band 1" was unstable. But it was worth gambling on!

Examination of the receiver to find the cause of the poor operation revealed a leaking screen de-coupling capacitor in the first i.f. stage. This had caused the bias resistor to overheat and drift high in value; also it was necessary to replace an open-circuit electrolytic in the cathode of the b.f.o. The instability was cleared by replacing the mixer valve.

Correcting these faults and attention to the previous repairs showed up other deficiencies which needed to be put right. These were noisy carbon resistors (inherent in the design and also due to ageing), unreliable capacitors (ageing components again), poor i.f. selectivity (design), intermittent variations in gain on bands 1 and 2 (this was eventually traced to a faulty wave-change switch) and inability to set accurately to a frequency without the use of a calibrator (could do with digital frequency readout).

The Restoration

The sequence of step taken to restore and improve this mediocre receiver into a condition suitable for DXing was as follows:

First the outer cover, coil pack cover, all valves, knobs, the dial glass, pointer and inner scale were removed, and the chassis cleaned with an air-line and brush — any grease and staining being removed with methylated spirit and a brush. Next the cabinet and front panel were cleaned with "T-Cut" paint restorer, the knobs soaked in bleach, and the dial glass and scale washed in lukewarm water with a mild detergent using a soft brush to avoid damage to lettering. Valve bases were cleaned with a solvent, and an old valve worked around in the socket to clean the pin contacts; the use of a darning needle enabled the contacts to be tightened in the valve bases.

At reassembly the valves etc. were fitted, the gear train greased, the ball-races lubricated and the switch contacts cleaned with a non-oily cleaner intended for low-current contacts. The tuning capacitor plate spacing was checked with feeler gauges and centred as necessary, and the mechanical tracking of the tuning system checked.

Readers who may be considering a similar restoration job should note that, for reasons of safety, connecting-up must be via an isolating transformer or an earth leakage circuit breaker; do **not** use headphones and keep one hand in a



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RESTORING AN EDDYSTONE 940 RECEIVER

Part 1

pocket while working on the equipment.

It is useful to have a complete set of new valves ready as the next step is to check all test voltages as shown in the manual. If there are any discrepancies try replacing the valve in question as it may be faulty. If this does not correct the voltage error refit the original valve and carry out checks to establish the cause: this will probably be short-circuit or leaking capacitors, or resistors that have changed value or gone open circuit. Only when all d.c. conditions are *correct and stable* proceed further.

Check the local oscillator output to the mixer grid with an oscilloscope or r.f. millivolt meter, and establish that there is a reasonably constant output level at all frequencies on all bands. Next re-align all the i.f. stages and the b.f.o. (see manual); check sensitivity at the mixer stage is within tolerances. Using a frequency counter attached to the mixer grid, track the l.o. at 450kHz above signal frequency on all bands (this is easier than using a signal generator as suggested in the manual). It may involve some juggling of



STORAGE IN THE DAMP...

the ends against the middle, due to interaction between the two adjustments, but keep repeating both adjustments until the tracking is correct throughout the length. If any band does not track correctly examine only the coils and capacitors associated with that band — and don't overlook the possibility of switch contact problems. I did, and went after a red herring looking for dud capacitors. Finally

align the r.f. mixer and antenna stages and re-check the tracking and sensitivity.

If you wish, try replacing different valves in the r.f. and i.f. sections to get an improvement in the sensitivity and reduce background noise.

You should now have a reasonable receiver on which to carry out some modifications to improve the selectivity and thus enable effective use on today's crowded bands. Remember that this set was designed when 10kHz channel spacing was the standard. Other improvements are for ease of operation, better dial accuracy with frequency readout, and some other minor modifications. These will be described in detail in Part 2.

Abbreviations

b.f.o.	beat frequency oscillator
d.c.	direct current
i.f.	intermediate frequency
i.o.	local oscillator
r.f.	radio frequency

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SONY ICF-7600DA REVIEW

John Waite

The Sony ICF-7600DA represents an interesting compromise between a conventional receiver with an analogue tuning display and the more modern digital display. The ICF-7600DA covers v.h.f. f.m., long and medium waves and twelve short wave bands, which should satisfy the needs of most broadcast listeners. It's handy size of 192mm x 117mm x 32mm, makes it ideal for both travelling and home use.

The ICF-7600DA is supplied with a good range of accessories which some manufacturers would class as optional extras. These include a compact antenna, soft case, earphone and a frequency guide. The operating manual was the usual multi-lingual production with 23-pages of English instructions. The other languages covered are French and Spanish. As with all Sony manuals I've come across, extensive use is made of diagrams to illustrate different operations. I found the manual very easy to use, it enabled me to get the best out of the radio in a very short space of time. At the end of the English language section there is a trouble shooting guide, which can help avoid red faces when you take the set back to a dealer as, "it doesn't work" when you're at fault really.

Tuning

The tuning options on the ICF-7600DA are well thought out, appealing both to those who like a digital readout for accuracy and those who prefer analogue scales. The tuning steps on medium wave (m.w.) can be set to cater for either 9kHz or 10kHz channel spacing depending on where in the world you want to be listening for. Although the change over between the two tuning step is very easy, it does mean removing the batteries as the switch is concealed in the battery compartment. Although this does mean that accidental change-over is very difficult, if you don't replace the batteries inside of one minute the memories and clock settings are erased. The tuning steps on long wave (l.w.) are 3kHz and for v.h.f. f.m. it's 50kHz. The tuning steps on all the twelve short wave bands is 5kHz.

Each of the bands has the well-recognised tuning steps of most modern receivers so few stations should be missed. Unfortunately, again in common with many receivers of this type, there is no fine tune control for catching those stations operating outside the bandplan.

Although the radio has a digital display, frequency selection is by rotary tuning control only. There are no up and down button or direct entry keyboard. The tuning control comprises a slim 25mm diameter knob on the right-hand side of the receiver. Movement of this control is smooth running and not notched to match the tuning steps of the band in use. Despite its small size, I found the control very accurate and easy to use. I do think,

Are you looking for portable radio but unsure where to start? Perhaps the ICF-7600DA from Sony could be ideal for you. John Waite puts this receiver through its paces.

however, that a small depression on the control would help when turning the control quickly, as it's easy for your fingers to slip off the control.

Band selection is achieved by a row of four push-buttons below the large display. The short wave bands have two methods of stepping between them, either using the up and down control or when the end of the band in use is reached if you keep tuning the set steps to the next short wave band available.

A very small red l.e.d. tuning indicator is located above the display, which illuminates when a certain level of signal is received.

Display

The display is a mixture of permanent and liquid crystal markings. The conventional analogue frequency scales are permanently marked, but not the pointer — that's part of the liquid crystal display (l.c.d.). The band indicator, analogue pointer and all the digital information (including the clock time setting) are formed by the l.c.d. Most disappear when the set is switched off, the clock actually only appears when the set is switched off (unless there are no batteries).

For the size of radio, the display is actually quite large, measuring some 80 x 70mm. The digital frequency readout numerals are 6mm high, so should prove very easy for most people to read. Unfortunately, you should keep a torch handy if you are in the habit of listening to the radio in the dark, as there is no back light provided on the set.

The analogue scales are all marked in either kHz or MHz, but the meter band names are printed at the bottom of each scale. The band in use is indicated by a short, solid, horizontal liquid crystal bar, immediately above the appropriate scale.

The digital display gives a readout in kilohertz (kHz) on the s.w., m.w. and l.w. bands, on the f.m. bands it's in megahertz (MHz).

Controls

There are a total of twenty different control buttons or switches on the radio, most of which are on the front panel. Despite the apparently large number of controls, the layout has been well-designed and most are self-explanatory.

I shall only mention those controls that are either unusual or worthwhile enough to warrant explanation. Obviously there are such things as volume, tone and on/off controls, these hardly need explanation.

I shall work my way round the controls but in no particular order. One of the more useful controls is the key protect button. This performs the usual task of disabling all the front panel keys (except the main power switch). This is particularly useful in avoiding accidental frequency changes when listening to your favourite station. A little "key" symbol appears in the top left-hand corner of the display to tell you when that function is in operation.

Although the radio has fifteen memories, these are distributed between the bands, i.e. there are five available between the twelve s.w. bands, five available on f.m. and the rest between the l.w. and m.w. bands. Storing a frequency in one of the memories is simplicity itself. You simply tune to the required frequency, hold down the ENTER button and press one of the five memory buttons. To recall any of the previously stored frequencies, the operator selects the required band and press the appropriate memory button. Easy isn't it!

For those who like to be woken up by



Fig. 1.

SONY ICF-7600DA REVIEW

your radio, the Sony is well equipped with an alarm which will either turn the radio on at a pre-determined time or set a buzzer going. It also has a "sleep" function to soothe you to sleep which lasts for about 65 minutes.

The only other control that deserves some further explanation is the power switch or should I say switches. The ICF-7600DA is fitted with two power switches, one is a push button on the front panel and the other a slide switch on the top panel! The top panel switch is labelled MAIN whilst the other is marked simply power on/off. Fortunately all is explained in the manual as the slide switch on the top panel is provided to prevent the radio accidentally being switched on during transit.

Operation

The radio proved very easy to use and produced a very pleasant sound — in common with many other Sony radios I have tried. The digital display was particularly useful for finding DX stations quickly when I knew which frequency I wanted. It also helps when trying to identify stations as I could look for exact frequencies in the various listings and not "anything between x and y".

I was not so pleased with the response of the analogue tuning scale. The pointer

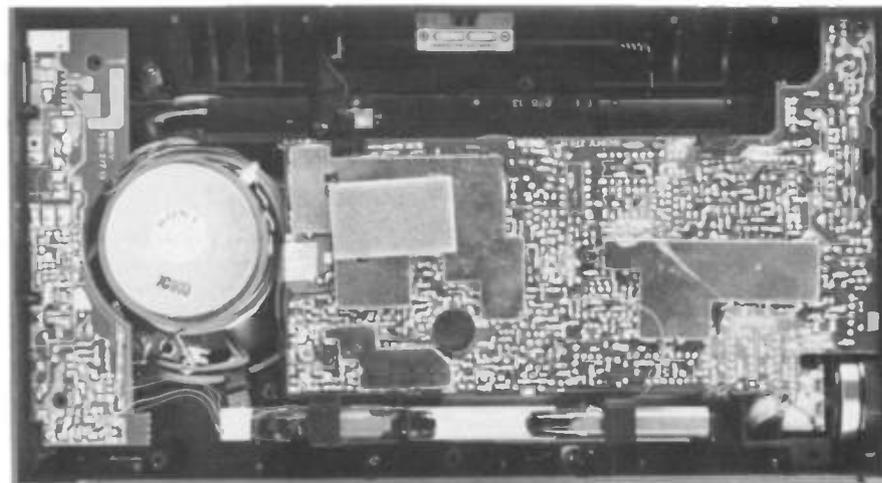


Fig. 2.

bar moved in steps up and down the scales, but each step required approximately a third of a turn of the tuning knob. This gave a rather disjointed feel and looked very disconcerting when trying to use the analogue scale effectively. The ability to rapidly move between the various short wave bands proved useful for DX chasing.

The ICF-7600DA also has the facility to attach tape recorder via a 3.5mm mono jack and can also be run from an external power source. This needs to be a 6V d.c. supply, such as the Sony AC240.

I had the opportunity to use the *SWM* test lab briefly when I had the ICF-7600DA and found that the short wave bands sensitivity was quite good. It ranged between a best of 1.3µV at 10MHz to a worst of 2.8µV at 21MHz which, if you look through series like "What Receiver?", you will see it fares quite well. (This was for a 10dB signal to noise ratio.) The sensitivity on the other bands was equally as good for a radio of this type, giving a good all-round performance.

Whilst "talking technical", the power consumption was quite moderate at a maximum of 120mA at full output, so you should get quite a good life out of your batteries.

I'm not sure I would opt for this radio as my main station, but would certainly look seriously at it as one to use when travelling. For prolonged base station use it can be a little small and light, just the things you are looking for in a travel portable.

The "Extras" You Get

As with a lot of modern Sony radios, you seem to get a package rather than just a radio. To start with, the back panel of the ICF-7600DA has a retractable plastics stand. This enables you to set the radio at about a 30° angle, making it just right for table-top use. A wrist strap is also provided that is permanently fixed to the left-hand side and swivels in all directions.

In the base of the box, I found a very neat plastics travel pouch with Velcro fixings. It just about covers the radio and all its controls so obviously isn't meant to hold the radio whilst in operation, but it will save it being badly scratched when you are travelling around though.

A standard (and nowadays old fashioned) type ear piece is included. Although there is no reason why you can't plug in light-weight head phones as an 8Ω 3.5mm mono jack is provided in the side of the radio.

The last "extra" is the "Sony AN-6 compact antenna for short wave". This comes in a small plastics box and comprises about 9m of wire that you can clip to the telescopic antenna. There is a carrying strap and clip on the housing to the compact antenna too, this is useful for hanging it on curtain rails and the like as you can see from the illustration taken from the manual.

Fortunately if you get into a mess winding this 9m of wire back into the case, it can easily be opened and the tangle sorted out, which shows how much thought went into its design.

How Much?

The Sony ICF-7600DA costs about £160 and should be available from your local Sony dealer. Many thanks to Sony UK for the loan of the radio. □

Abbreviations

dB	decibel
d.c.	direct current
f.m.	frequency modulation
kHz	kilohertz
l.c.d.	liquid crystal display
l.e.d.	light emitting diode
l.w.	long wave
mA	milliampere
MHz	megahertz
m.w.	medium wave
s.w.	short wave
v.h.f.	very high frequency

SPECIFICATIONS

Frequency Range:	f.m. 87.5-108MHz l.w. 150-285kHz m.w. 531-1602kHz s.w.1 3050-3565kHz s.w.2 3700-4215kHz s.w.3 4650-5165kHz s.w.4 5800-6315kHz s.w.5 6950-7465kHz s.w.6 9375-10010kHz s.w.7 11525-12160kHz s.w.8 13375-14010kHz s.w.9 14975-15610kHz s.w.10 17475-18110kHz s.w.11 21325-21960kHz s.w.12 25475-26100kHz
Frequency Steps:	f.m. 50kHz l.w. & m.w. 3 or 5kHz s.w. 5kHz
Antennas:	f.m. & s.w. telescopic l.w. & m.w. Built-in ferrite bar
Speaker:	77mm diameter
Power Output:	400mW at 10% distortion
Outputs:	Tape record 0.775mV 1kΩ 8Ω earphone
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Dimensions:	191.5mm wide 117mm high 31.5mm deep
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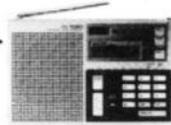
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SCANNING

Alan Gardener

Doug Middleton of Broadstone started the ball rolling with a letter to me in which he described his experiences with the *Practical Wireless* design of "Taw" v.l.f. converter. He has been using this very successfully with his Kenwood TS-430 amateur band transceiver and wonders if it is possible to do something similar with the Icom R-7000. Doug also mentions the fact that he has extended the range of his PV "Taw" converter to go up to 2MHz but that he now finds problems with interference due to strong signals overloading the converter.

The idea behind converters is not new. As the name suggests they are used to convert from one group of frequencies outside the coverage of a receiver to those which lie within. One of the earliest uses in domestic equipment was when 405-line television started transmitting on Band III. Many manufacturers produced converters which permitted existing TV receivers, which normally could only tune across Band I, to receive the new channels. A more modern example is the low-noise block converter used to translate s.h.f. satellite TV signals down to the lower frequencies used in the set top tuner/demodulator.

Let's take a quick look at the principles behind converters. The incoming signal has, in some way, got to be changed in frequency without altering its overall characteristics. This is achieved by combining it with a locally generated signal (the local oscillator) in a device known as a mixer, this takes the signals and literally *mixes* them together, producing many new combinations of the two original frequencies. By careful choice of local oscillator frequency and filtering of unwanted signals it is possible to select a signal which is within the tuning range of the receiver (see Fig. 1).

For example if we wished to tune the short wave bands from 0-30MHz on a scanning receiver it would first be necessary to determine what frequency range to use in order to be able to tune the converted signals. A common choice in commercial units is 100-130MHz, mainly because it makes the mental arithmetic involved in converting the frequency displayed on the receiver front panel to the actual signal frequency much easier to do — all you have to do is subtract 100. Choosing this sets the local oscillator frequency to 100MHz — so let's see what else is involved.

It is a good idea to put a filter in the signal path before the mixer, allowing only signals in the range 0-30MHz to reach it. This is to prevent strong signals, at the frequency the scanning receiver is tuned to, from being picked up on the short wave antenna and *leaking* through the mixer causing interference to the converted signals. Most designs use a 40 or 50MHz low-pass filter to do this giving a fair degree of rejection to signals at 100MHz and higher. Some converters also have a

In this month's column, Alan Gardner takes a look at ways of adding short wave reception to your scanner by means of external converters.

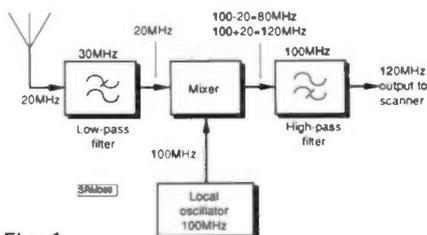


Fig. 1.

high-pass filter after the mixer to prevent any very strong signals in the range 0-30MHz from leaking through the mixer and causing problems by overloading the scanner, although this refinement is a bit of a luxury.

This type of converter can give very good results but is prone to problems with overloading, mainly due to the wide range of signals reaching the mixer at any one time. As I described earlier, the mixing process produces a range of new frequencies at the output, some of which may interfere with the wanted signal. To reduce this problem it is common to use a device termed a high level doubled-balanced mixer in the circuit. This is especially designed to minimise the effect of signals at the input mixing with each other and producing interference, as opposed to the desired combination of input signal and local oscillator. Even so it is still possible to overload the converter and in many cases connecting a resonant full size antenna to the input will result in spurious signals being produced.

There are a few ways around this problem, the easiest is to only use a short antenna, just a metre or two of wire is usually sufficient, as most modern scanning receivers are generally much more sensitive than dedicated short wave receivers. This is because they do not have to cope with the strong signal levels experienced on the short wave bands. If you want to improve the performance of this type of converter then try adding

some form of antenna tuning unit (a.t.u.) or tuneable band pass filter to the input, this will help to reduce the range of signals reaching the mixer at any one time and so help to reduce overloading. Another useful item is a variable attenuator placed in the antenna lead before the converter, it is often surprising by just how much a signal can be reduced in strength before it starts to sound weaker — however what does become noticeable is the reduction in background noise making listening much less fatiguing. One unit which has switched band pass filters built into it is the Datong PC1 general coverage converter. This converts 50kHz-30MHz up to 144MHz in 30 switched 1MHz wide bands and gives very good performance. However it does have the drawback that only signals within the selected 1MHz band can be received at any one time. This may be frustrating if you want to make use of the scanning facilities on your receiver to tune over many widely differing frequencies. If this is the case it may be better to use one of the simpler converters, a design for which appeared in the March '87 issue of *Practical Wireless* (photocopies are available at 75p).

Scanning TV

All of this leads us nicely into the idea of using a scanning receiver as a form of converter, in this case to receive v.h.f. long distance television signals. Reader **Dave Hicks** of Bewdley has come up with what must be one of the simplest and most interesting modifications yet for the Icom R-7000. This receiver, in common with quite a few of the more modern designs of scanner, uses a 1st i.f. in the u.h.f. region. In the R-7000, this is 778.7MHz which happens to correspond to u.h.f. TV Channel 60. If we extract a signal from the receiver it is possible to feed it directly into a standard TV receiver and display any TV signal we may be receiving on the scanner. Note that in the case of the R-7000 the i.f. frequency changes above 512MHz, so this will only work over the range 25-512MHz and 1025-1512MHz, good enough for the TV Bands I and III as well as the amateur 430 and 1296MHz allocations.

Interested? — switch off the power and take the lid off! **As usual please don't attempt this or any other modification**



unless you know what you are doing, and remember it may affect any warranty in force on the equipment. First take a quick look at the circuit diagram in the owner's handbook, what we are going to do is take a signal from the collector circuit of Q8 on the r.f. unit circuit board. If this is done directly it tends to load the output of the circuit too much, and reduces the receiver sensitivity. What I suggest is to take a "sniff" of signal from the earthy end of the collector load resistor R153 as this is physically very easy to achieve.

Look inside the receiver at the main circuit boards on the top side. Viewing from the front look towards the rear right hand side, you will see several small metal boxes with spring "fingering" around the lids. In-between two of them is an even smaller metal box without a lid, this contains Q8 and associated circuitry. Look carefully inside the box towards the right hand side you should see a resistor slightly larger than the surrounding ones standing on end with one of the leads bent over back into the circuit board, this is R153. Take a miniature 1nF capacitor and connect it at the point which the bent over lead enters the resistor body. Keeping all lead lengths as short as possible connect the other end of the capacitor to the inner of some sub-miniature 50ohm coaxial cable (RG178 if you can get some) solder the outer to the metal screening box. Take the other end of the coaxial cable to the "spare" phono socket on the back of the receiver, this now becomes the i.f. output, replace the lid and plug in. You now need to make up a screened connecting lead to go between the receiver and TV set, use some good quality cable to prevent local TV signals from being picked up on the lead.

Next tune the TV to the R-7000's i.f. signal, if your local TV stations are on Channels 21-26 you are lucky as the R-7000 can receive them, all you need to do is tune to the vision carrier of one and then fine tune the TV until you can see a picture. If you do not have TV signals on these channels try this method. Unplug the R-7000's antenna lead and tune to 445.6MHz this is one of the few self-generated spurious signals present in the receiver. Tune the TV around Channel 59 until the noise disappears, this is the R-7000's local oscillator signal on 768MHz. Continue tuning a little higher in frequency and you should see a change in the noise displayed on the screen. Select another frequency on the R-7000 well away from the previous one — say 25MHz. The noise should now reappear. If it stays the same try repeating the process until you find the correct frequency. Once this is done note the TV tuner setting so that you can find it again. You are now free to try receiving other TV stations with the scanner. The vision carrier generally has to be at least 59 on the meter before any picture is detectable on the screen. One interesting

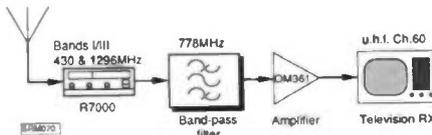


Fig. 2.

fact is that if the signal is really strong the R-7000's a.g.c. begins to act and reduces the gain, so the picture starts to become noisy again. One way around this is to tune away from the vision signal by 300kHz or so, this reduces the a.g.c. action and so prevents the problem.

Another tip from Dave is to tune to the sound signal instead. This helps as the sound is generally transmitted at a much lower signal level and also has the advantage of permitting you to listen to, as well as watch, stations which use 5/5.5MHz sound/vision spacing as opposed to the UK standard of 6MHz. You will have to retune the TV slightly to get the best picture though.

I have performed this modification with good results. Even as I write I am watching a *Yogi Bear* cartoon in Italian as it drifts up and down in signal strength. The only problem I have found is that the i.f. signal is slightly too low in level to use on very weak stations, but it can be improved by the addition of an external TV booster amplifier in the lead feeding the TV. One with about 25dB gain seemed the best, and also stopped the R-7000's a.g.c. from making the picture look noisy on strong signals. What I now intend to do is build an amplifier and 778.7MHz band pass filter into the R7000 using a small helical filter (Circuit/Bonex) and OM361 wide band amplifier module (RS/Electromail) — see Fig. 2. I hope that I will then be able to report on some of the more exotic TV signals that Dave has already been using this combination, especially with Sporadic-E propagation becoming more frequent during the summer months.

The great thing about using this method is that you can put all the foreign TV channels into memories and let the scanner do all the hard work for you, set the squelch for the level at which you can pick out picture detail, sit back and wait. In the meantime dig out your back issues of *SWM* (August '87 onwards) and take a look at the series "Introduction to DX TV" by Keith Hamer & Gary Smith. This gives details of TV channels, along with some very useful hints and tips. (Back issues of the magazine are available direct from the Poole offices at £1.45 each inc. post.)

As I said earlier it should be possible to do this modification with other types of scanning receiver, in fact I seem to remember trying something similar with an AOR receiver a few years ago with limited success. If you own an AOR (1st i.f. 750MHz u.h.f. TV Channel 56), or a Realistic PRO-2004 (1st i.f. 610MHz u.h.f. TV Channel 38) then why not have a go, let me know your results.

Log-Periodic Update

Reader **Martin Ehrenfried** was mentioned in the February column with his comments relating to a log-periodic antenna distributed by Waters & Stanton. At the end of the item I mentioned that he was keen to get hold of another version of the antenna which had a bandwidth of 50-1300MHz. At the time Waters & Stanton said that they would consider importing it if there were enough enquiries. Well it looks as if this did the trick as Martin has just taken delivery of one of the new antennas. He comments that it is just as well made as the smaller version and should be fairly unobtrusive as he can now remove all the other antennas on his mast. The boom length is 2 metres with the longest element just under 3 metres from tip to tip, it is supplied with a stand-off mounting bracket which permits either horizontal or vertical mounting.

Martin has also tested the previous version for transmit performance on both 144 and 430MHz with good results, the v.s.w.r. being 2:1 at 144MHz and 1.5:1 at 430MHz. He feels that the v.s.w.r. on 2 metres could be improved by replacing the present metal mounting pole which runs through the centre of the antenna with a glass fibre (g.r.p.) tube. This should help to prevent some of the interaction which is presently taking place. The other improvement he intends to make is to replace the UR67 coaxial cable which presently connects the antenna with some low-loss Pope H100. This should make a big difference at 934 and 1300MHz and may be the most worthwhile improvement since the installation of an external antenna. Martin promises to keep me informed of his findings.

Have you any interesting uses for your scanning receiver, or have you performed any modifications or improvements? If so why not share them with other readers? As usual all mail to PO Box 1000, Eastleigh, Hants, SO5 5HB. Please enclose an s.a.e. if you require items returning. Until next month — good listening (and watching!).

Abbreviations

a.g.c.	automatic gain control
a.t.u.	antenna tuning unit
Band I	45-70MHz
Band III	175-230MHz
dB	decibel
g.r.p.	glass reinforced plastics
i.f.	intermediate frequency
r.f.	radio frequency
s.a.e.	stamped addressed envelope
s.h.f.	super high frequency
TV	television
u.h.f.	ultra high frequency
UK	United Kingdom
v.h.f.	very high frequency
v.l.f.	very low frequency
v.s.w.r.	voltage standing wave ratio

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Detection

The additional process is known as **detection** and the type of detector required will depend upon the modulation system employed at the transmitter. When an amplitude modulation (a.m.) system is used, the carrier (fc) and the modulating signal (fm) are combined in such a way that the **modulation envelope** contains the carrier (fc) and the "mirror image" upper and lower sideband frequencies (fc + fm and fc - fm) — see "Starting Out" *SWM* December '87.

The modulation envelope resulting from the 100 per cent modulation of an h.f. carrier by a single sinusoidal audio frequency tone will resemble Fig. 1a. If a superhet receiver is tuned into this signal it will produce an i.f. which will have identical modulation characteristics. To recover the original audio tone it will be necessary to employ an a.m. detector. Various circuits have evolved over the years, but the one most frequently used in modern receivers is appropriately known as an **envelope detector** — the basic circuit is shown in Fig. 2.

A device with a one way action is used to **rectify** or effectively remove the lower half of the i.f. waveform so that a series of d.c. pulses results. Each pulse consists of a half cycle of the i.f. signal — see Fig. 1b. The stream of d.c. pulses from the rectifier (D) flows into a load resistor (R), across which is placed a capacitor (C1). The values of R and C1 are chosen with care, so that during each pulse C1 can charge up to the peak value of the rectified voltage and retain enough charge between pulses to effectively smooth out the voltage across R — see Fig. 1c. C1 thus acts as a filter and effectively removes the i.f. component from the output of the rectifier. Only the d.c. component which varies in the same way as the original modulation then remains. When it is applied to an audio frequency amplifier via a coupling capacitor (C2) only the variations in voltage are transmitted to its input as an a.c. signal — see Fig. 1d.

Any device which has a one way action can be used as the rectifier to remove the lower half of the waveform. In an ideal rectifier there should be no resistance in one direction (forward) and an infinite resistance in the opposite direction (reverse), however some devices are only partial rectifiers, which implies that they have less resistance one way than the other.

Some minerals possess the property of being partial rectifiers, consequently the early crystal receivers used minerals such as Galena, Bornite, Carborundum, Silicon, Tellurium and Zincite. A metal contact or "Catswhisker" was often used in conjunction with a single mineral in some of the early receivers, but others used two minerals in contact with each other. Diode valves formed the basis of the detectors in most of the later valve receivers because they had a very low

The initial process by which a superhet receiver selects and subsequently converts a desired signal to an intermediate frequency (i.f.) has already been described in some detail in this series. Although the i.f. signal contains an exact replica of the information conveyed by the original transmitted signal, it cannot be retrieved without further processing within the receiver.

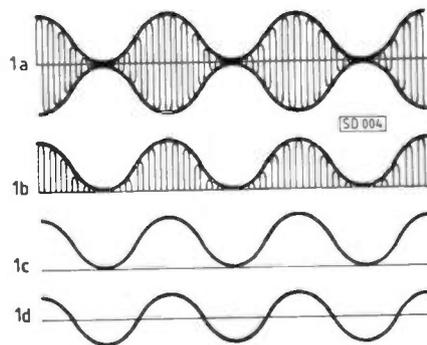


Fig. 1.

forward resistance and a very high reverse resistance and needed no adjustment. Modern solid-state receivers have reverted to the use of crystal diodes and often employ Germanium or Silicon crystal diodes as a.m. detectors.

Although an envelope detector will demodulate an a.m. broadcast signal or a Morse code transmission which uses a **modulated continuous wave (m.c.w.)**, in its basic form it cannot be used to detect a simple keyed carrier, or c.w. signal. The reason for this is that the output from the rectifier would be simply a series of steady d.c. pulses during "carrier on" conditions, whereas no d.c. output would exist during periods of "carrier off" conditions, consequently these changes would only cause a variation in the level of the receiver background noise heard via the loudspeaker.

CW Reception

In order to detect a c.w. transmission it is necessary to pre-mix the signal with the output from an oscillator operating very

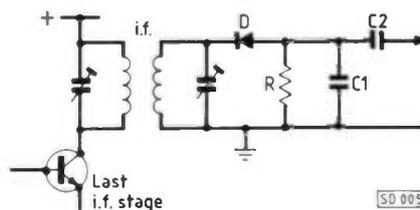


Fig. 2.

close to the desired signal, so that a **heterodyne** or **beat note** arises. A highly stable variable frequency oscillator (v.f.o.) would be needed if that operation had to be carried out at the incoming signal frequency, since its frequency would have to be adjusted to beat with every chosen c.w. signal. Fortunately that method can be avoided with a superhet receiver, because the output from the **beat frequency oscillator (b.f.o.)** can be conveniently coupled into, or just ahead of, the detector stage. The b.f.o. will only be required to operate over a limited range centred on the last i.f. frequency in order to produce a beat note with an incoming i.f. signal.

It is important to note that the b.f.o. can be operated above or below the i.f. frequency and still produce the same beat note — for example if the last i.f. frequency is 455kHz, then the b.f.o. could operate at 456kHz or 454kHz to produce a 1kHz beat note. This infers that if an unwanted c.w. signal lies on the high side of a wanted signal, it could be avoided by simply moving the b.f.o. to the low side of the i.f. — this is especially true if the tuning of the b.f.o. and/or the main receiver tuning is adjusted slightly so as to zero beat the unwanted signal.

A slightly different technique has to be adopted for the reception of a transmission using **frequency shift keying (f.s.k.)**. In this system a steady carrier is radiated throughout the transmission, but its nominal frequency is shifted by perhaps 1kHz during **mark** (key down) periods. To decode the signal, the receiver main tuning should be set so that the carrier frequency representing a **space** (key up) is roughly centred within the i.f. passband. Depending on the type of shift involved the b.f.o. will then need to be set either above or below the i.f. signal — the correct setting will soon become apparent when the Morse code is clearly heard!

It is normal practice to turn off the **automatic gain control (a.g.c.)** during c.w. reception — instead, the gain is controlled manually via the r.f. gain control, leaving the audio gain well advanced. There are two main reasons for doing so — first, the b.f.o. output may result in an a.g.c. potential which would reduce the overall gain of the receiver since it is effectively a carrier within the i.f. passband. Secondly, a potent unwanted c.w. signal close to a wanted one may cause the a.g.c. to reduce the gain in bursts, thereby impairing the desired signal.

It may be quite a simple matter to add a b.f.o. to an existing a.m. receiver so that c.w. signals can be received. Two points are worth noting here — first, be sure to screen the b.f.o. well so as to avoid the harmonics from the oscillator being picked up by the front end of the receiver. Secondly, the level of the signal from the b.f.o. should only be sufficient to provide a good beat note with an average c.w. signal, otherwise an excessive amount of

STARTING OUT

hiss will be evident — this would mask the weaker signals.

Filters

Because a c.w. signal is simply a keyed carrier and there are no sidebands present, it is possible to employ a high degree of selectivity in a c.w. receiver. This is usually achieved by installing a very narrow filter in the i.f. chain. Modern filters often consist of a number of quartz crystals connected in a lattice network so as to produce a response which has a narrow peak and very steep sides — filters with a bandwidth of 500Hz at -6dB and 1.5kHz at -60dB are frequently used, but even sharper filters with a bandwidth of only 250Hz at -6dB and 480Hz at -60dB may be employed. Some of the more expensive communications receivers offer a choice of filter, each being selected by means of diode switches which are controlled electrically from the receiver front panel.

Many of the other valved communications receivers are still in use and they often employ a single quartz crystal to provide a very sharp response for c.w. reception. The crystal is placed in one arm of a simple bridge circuit which is usually installed between the mixer and the first i.f. stage — Fig. 3. A variable capacitor (C) in the opposite arm of the bridge enables the effective shunt capacitance of the crystal and its holder to be balanced out, thus allowing only signals at the crystal series resonant frequency to pass on to the following i.f. amplifier stage(s).

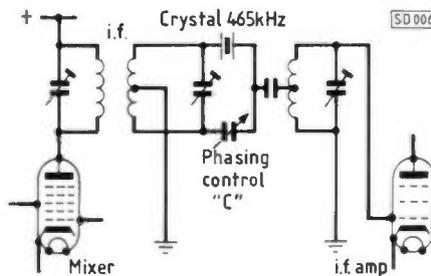


Fig. 3.

When the capacitor C is adjusted so as to exactly balance the bridge the response will resemble Fig. 4a, but a slight variation from the balanced setting will result in the asymmetrical response shown in Fig. 4b. The sharp **rejection notch** is due to parallel resonance within the crystal and its position on the response may be varied slightly by adjusting C. A front panel control marked **crystal phasing** enables the setting of C to be varied so that an unwanted heterodyne close to a wanted signal may be notched out. In practice this type of c.w. filter is very effective and is still a favourite with many dedicated c.w. operators!

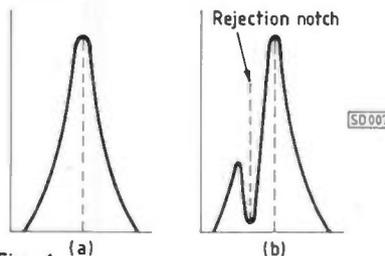


Fig. 4.

Another approach to improving selectivity is to employ an **audio filter** between the receiver headphone jack and the headphones. A number of filters are available on the market — some of them include a **notch filter** for removing an unwanted beat note and a **peak filter** to enhance a desired signal. It is perhaps worth noting here that some types of inductively tuned filters tend to cause an unpleasant ringing effect which may reduce the readability of a c.w. signal.

All of the transmission systems detailed so far involve sending an r.f. carrier to a distant receiver, but is possible to transmit information by radio without sending a carrier — how this can be achieved will be revealed next month. □

Abbreviations

a.c.	alternating current
a.g.c.	automatic gain control
a.m.	amplitude modulation
amp	amplifier
b.f.o.	beat frequency oscillator
c.w.	continuous wave (Morse)
dB	decibel
d.c.	direct current
f.s.k.	frequency shift keying
h.f.	high frequency
Hz	hertz
i.f.	intermediate frequency
kHz	kilohertz
m.c.w.	modulated continuous wave
r.f.	radio frequency
v.f.o.	variable frequency oscillator

SERVICES

Subscriptions

Subscriptions are available at £17 per annum to UK addresses and £19.00 overseas by Accelerated Surface Post outside Europe. For further details see the announcement on page 15 of this issue. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £27.00 (UK) and £30.00 (overseas). Three year subscriptions are also available for *SWM* at £45.00 (UK), £50.00 (overseas).

Queries

We will always try to help readers having difficulties with a *Short Wave Magazine* project, but please observe the following simple rules:

1. We cannot give advice on commercial radio, TV or electronic equipment, nor on modifications to our designs.
2. We cannot deal with technical queries over the telephone.
3. All letters asking for advice must be accompanied by a stamped, self-addressed envelope (or envelope plus international Reply Coupons for overseas readers).

4. Write to the Editor, "Short Wave Magazine", Enefco House, The Quay, Poole, Dorset BH15 1PP, giving a clear description of your problem.
5. Only one query per letter, please.

Back Numbers and Binders

Limited stocks of most issues of *SWM* for the past 10 years are available at £1.45 each, including post and packing to addresses at home and overseas (by surface mail).

Binders, each taking one volume of the new style *SWM*, are available price £3.95 to UK addresses, or overseas, including post and packing. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Please note that Volume 45 finished with the December 1987 issue, making nine issues in the volume. In future each volume will run from January to December.

Ordering

Orders for p.c.b.s., back numbers and binders, *PW* computer program cassettes and items from our Book Service, should be

sent to *PW Publishing Ltd.*, FREE-POST, Post Sales Department, Enefco House, The Quay, Poole, Dorset BH15 1PP, with details of your credit card or a cheque or postal order payable to *PW Publishing Ltd.* Cheques with overseas orders must be drawn on a London Clearing Bank and in sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 678558. An answering machine will accept your order out of office hours.

Components for *SWM* Projects

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

The printed circuit board for the *SWM* Audio Filter, July '87 issue, is available price £2.75. The printed circuit board for the *SWM* Active Weather Satellite Antenna, June '88 issue, is available price £4.20. Orders to *Short Wave Magazine*, Enefco House, The Quay, Poole, Dorset BH15 1PP. Prices of p.c.b.s include VAT and P&P.

AMATEUR BANDS ROUND-UP

Justin Cooper

PO Box 4, Newtown SY16 1ZZ

Last month, I tried to show that however good the receiver, it's the skill of the operator that counts. This time we need to discuss what makes an antenna work poorly. Some of it is easily dismissed as "site", more, by far, is down to the use of an unsuitable antenna. For example, the trap vertical at ground level used with a single one metre ground-stake over old rocks; or the dipole, cut to formula, installed in the loft and used without further checking. I've heard on the editorial grapevine that you'll be hearing a lot more on the subject of antennas and what's best for what situation in the forthcoming series. So, my best advice is to keep reading, but until then think very carefully when planning where your antenna will go and don't condemn the latest purchase until you've given it a fair trial.

Letters

Let's start with **D. Peat** (Mansfield). David says he doesn't understand the rules, but he seems to have collected most of whatever was about. His queries include EW44AA (Volgograd), which was a celebration special prefix for the end of WWII; J73LC is fairly well known from the Caribbean, but to hear ZD7HG/P/CU2 in the Azores must be regarded as a bit off-putting — how much more worthwhile he would have been had he been on from Ascension! Top-notch in the frustration stakes though was Y88POL the Antarctic Russian base; heard through 21 contacts but no callsign copied from him and so not claimed.

N. Yule (Hertford) wonders whether L4D heard on 21MHz on April 26 owns the shortest possible callsign. I don't ever

remember a legitimate amateur callsign of less than three letters since WWII. There is, of course, King Hussein of Jordan who holds the callsign JY1.

The author of my next letter comes from near Gainsborough, Lincs and took the RAE in May (best of luck). The R210 receiver driven from a dipole has been used to listen on 3.5, 7 and 14MHz. The list of stations heard contains all continents bar South America.

Next we have the 101st list from **E. W. Robinson** (Felixstowe) who uses, if memory serves aright an Eddystone EA12 — perhaps the best that ever came from that famous stable. Y110BGD was to celebrate ten years since Y11BGD came back on the air after years of silence from that country; SX1RAAG was to celebrate 30 years since the radio amateurs in Greece formed their national society, while 4KODX was a Russian station close to the N. Pole, at 89 degrees N and 172 East and finally 4X4OID was to mark 40 years of Israeli independence.

It's surprising what a difference practice can make, **W. J. Prior** (Lochcarron) used to complain that he couldn't hear anything but local stuff from his site, thanks to the mountains around. Now things are noticeably different; his five RTTY loggings include Europe, N. America and 9M2CO. Just goes to show, "practice makes perfect".

N. Melville (London N18) notes V188NSW near Sydney, Australia (a 1988 special) and EO3AZB. The latter is another of the calls put on to celebrate the end of WWII by the Russians, which seem to be becoming somewhat of an annual event.

On to **B. Woodcock** (Leeds 17) who comments on hearing JY1 on

28MHz, nice to hear that His Majesty is back on the bands again. Other DX heard included the Kingman Reef expedition, ZK1DD, TYOLC, the Russian-Canadian ski-trek and twelve new ones for the IOTA (Islands on the Air) Award. As he says, 21MHz has been quite perky, but we need a bit more time before 28MHz really does its thing.

S. Burgess (Stockport) comes up with the question of v.h.f. and u.h.f. prefixes. As far as the HPX score is concerned, we will accept any valid prefix. However, we do NOT accept a signal logged on a repeater, unless that signal was heard clearly on the input. On a different tack, Simon has put a star alongside his 3XOA, I don't know if that means he queries it or not. It certainly seems to have pleased a lot of people.

S. Hill (Port Talbot) now has an FR-50B and a dipole strung between chimneys, by kind permission of neighbours. Perhaps the only snag is that the dipoles run E-W and so fire N-S, but at least that way there is a clear take-off. On a different tack, I mentioned in February's column someone asking for s.w.l. Hill's address, would they please contact him at the new place: 57 Penlyn, Cwmavon, Port Talbot SA12 9NL.

Remember me saying a little while back that I didn't like that "GG9" prefix, well, **N. Henbrey** (Northiam) says it was HG9. The chap concerned was repeating the second letter of his prefix. So, all queries answered.

J. Mowat (Luton) is surprised how well his indoor 21MHz dipole works, for example Indonesia and the Philippines being very notable around 1700Z.

D. McGlone heard SORASD on April 16 and it rather puzzled him.

Well Dave, it's the Saharan Republic. On the other hand, Dave still has difficulty hooking the ZLs. Perhaps the best time is the early morning long-path opening; direction between west and almost south, see a Great Circle Map.

Welcome to **L. Sargent** (Runcorn) who runs an FRG-7700 plus an FRA-7700 a.t.u. fed from an inverted-vee wire. Having started by listening to the commercial bands, Leslie has now discovered the amateur bands and on April 29 found TA4KB, KL7CSP, 4Z4ZB, 4X6JS, HK3CAH, HK6ISX, CE3DWO, WA4JVL/TF and W5WDN.

D. Hedges (Prestwick) isn't quite a first-timer, but his letter raises a couple of points relevant to this area. First, the definition of DX, well it's up to the individual. Initially it is sheer distance, which comes to a stop when you find ZLs, after that, you are into places which are rarely heard, such as, in Europe for example, Market Reef OJO, or to a lesser extent Aaland OH0 on the way to Market Reef. Other DX in Europe could include, for example, the SMOM or in the Very Rare category what about a genuine Albanian. Just about everyone has heard a pirate ZA, but the last accepted operation from there was ZA2RPS, about two decades ago. ZA is DX from anywhere in the world. Changing tack, what about R4L? Russian, needless to say, and a special.

K. Fletcher (Hayes) is into the c.w. stuff and is finding his FRG-7 and CWR600 Codemaster do their thing quite well on 14 and 21MHz. Keith uses a wound pole, vertical, three metres above ground, fed into a groundplane and tuned to peak with a KW Ezeematch. The best DX was certainly VP9NLR. Incidentally,

All-Time Post War HPX Ladder

Name	Phone Only	Prefixes	Name	Prefixes
E. M. Gauci (Malta)		3396	CW Only	
B. Hughes (Harvington)		3379	H. Scott (Rievaulx)	1396
E. W. Robinson (Felixstowe)		2753	N. Melville (Edmonton)	1290
M. Ribton (Gillingham)		2218	P. J. Barnes (Blackpool)	589
M. Rodgers (Bolton)		1828	M. Rodgers (Bolton)	380
R. Shilvock (Halesowen)		1768	C. R. Eve (Jersey, C.I.)	342
N. Henbrey (Northiam)		1726		
B. Patchett (Sheffield)		1366	Name	
B. E. Woodcock (Leeds 17)		1326		Prefixes
C. R. Eve (Jersey)		1165	RTTY Only	
A. Woodcock (Denmark)		1027	W. J. Prior (Lochcarron)	577
R. G. Williams (Borehamwood)		908	A. P. Lincoln (Aldershot)	551
A. P. Lincoln (Aldershot)		898	C. R. Eve (Jersey, C.I.)	500
S. Burgess (Stockport)		840	D. R. Tanswell (Iver)	360
D. McGlone (Limerick)		656	N. Henbrey (Northiam)	345
N. K. Yule (Bengeo)		650	M. Rodgers (Harwood)	270
L. Marcquardt (Hereford)		645		
D. R. Tanswell (Iver)		628	Starting score, 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules.	
R. Gawan (Preston)		569		
S. Hill (Port Talbot)		562		
D. Hedges (Prestwick)		560		
P. McAllen (Southampton)		528		

Annual HPX Ladder
Starting date January 1, 1988

Name	Prefixes
R. E. Webb (Ashford Kent)	498
J. Mowat (Luton)	440
C. R. Eve (Jersey)	361
D. Peat (Mansfield)	360
D. B. Glover (Newton-le-Willows)	276
S. Myers (Liverpool 9)	275
D. Gilbert (Farnham)	223

200 Prefixes to have been heard since January 1, 1988 for an entry to be made in accordance with HPX Rules. At score 500, transfer to the All-Time list is automatic. Note, the Annual Table is a Phone only listing.

Most in 1988

E. M. Gauci (Malta) 713

Rules as for the Annual Listing. An entry for this listing must be in addition to any claim for the All Time Post War listing.

receiver, decoder and TV used as display unit are all fed from a 12 volt supply.

Modes and Progress

Obviously there are many more modes in amateur radio than just s.s.b. telephony. The broadcasters use a.m., as did amateurs until the advent of s.s.b. around 1953. Of course there was always RTTY, packet, AMTOR and FAX to give us a paper copy. AMTOR is really an

improvement to conventional RTTY in essence. SSTV is to be heard, both B/W and Colour. Then, of course, there is always c.w.

In these days of squeezed bands and shortages of spectrum space, there's a lot to be said for a good c.w. signal. There's nothing quite like it for getting through all the crashes, crackles and bands that

appear on crowded bands. Learning c.w., whether you are sending or just receiving it, isn't quite as bad as is often made out. So why not have a go and let me know how you get on.

Actually, next month's column will be the last I write for *Short Wave Magazine*. I started this column in 1960, for the original

SWM team, and the time is fast approaching to hang up the pencil and typewriter. I'm not sure who will be taking over the column, hopefully I shall be able to give you all the details next month (if I can twist his arm hard enough!). I would like to say now, thanks for all the letters and reports everyone has sent me over the years, if my friend has as much help he won't have any trouble putting the column together. As I say, more details next month — keep writing.

The next three deadlines are
July 19, August 16 & September 20

DECODE

Mike Richards G4WNC

200 Christchurch Road, Ringwood, Hants BH24 3AS

I must start by apologising to all readers who have taken the trouble to write and have not yet received a reply. I'm afraid the excellent response from yourselves has overwhelmed me and I have a large backlog of letters. I promise I will reply to you all as soon as possible.

Readers' Problems

This column is obviously gathering a very wide readership as I have received a letter from an amateur climatologist. Mr C. G. Roberts runs the Halesowen Climatological Station in the West Midlands and has been involved in this fascinating hobby for the past 40 years.

Mr Roberts uses his radio equipment in order to receive the wide range of weather charts that are transmitted using FAX. To receive these charts he uses a Lowe Electronics HF-125 receiver and an ICS Electronics FAX-1 FAX decoder which feeds an Epson FX-85 printer. The antenna system consists of a 20m wire with a "matched" 50Ω coaxial feeder and an a.t.u.

Unfortunately despite this excellent equipment, Mr Roberts is having some difficulty resolving signals from Offenbach (DCF-45) on 134.2kHz. One of the problems with receiving signals from Offenbach is the narrow frequency shift (150Hz) which is common to all low frequency FAX transmissions. This type of signal requires very careful tuning and will only illuminate two or three i.e.d.s each side of the centre point on the FAX-1 bargraph display.

Another common problem comes from using an a.t.u. (antenna tuning unit) which is not designed to cover these low frequencies. These units often incur significant losses when operated outside their designed frequency range. Also if a balun (balanced to unbalanced transformer) is fitted in the antenna this can also lead to high

losses, unless it has been designed for use at l.f. If you are using a centre fed antenna, a simple way to convert it into a reasonable l.f. antenna is to short out the feeder at the shack end and connect it to the receiver antenna terminal.

Mr Roberts has also had some problems with interference from his printer on the 3.289MHz Bracknell transmission. This one is not so easy to cure, but the first steps are to ensure that the printer and receiver are well earthed and that a screened lead is being used between the FAX-1 and the printer. Most of my own problems with printer noise in the past have been associated with poor earths.

John Harris of Stratford-on-Avon is trying to get started in this fascinating hobby and like many others is not sure where to start. He owns an Atari 520ST computer and is primarily interested in receiving news broadcasts.

I'm not aware of any RTTY software for the Atari 520ST but as it is generally well supported I would try contacting one of the user groups. I'm sure that if any readers know of a source they will drop me a line with the details. In the event of there being no software available, then the only other option, provided the Atari has a serial port, is to consider one of the many Intelligent Terminal Units that are available from about £250 upwards. These are usually capable of receiving many different modes with some of the more expensive models providing automatic signal identification.

The basic receiver requirements for utility station monitoring are:
Frequency Coverage:

100kHz to 30MHz

Tuning Steps: 20Hz or less

Modes: u.s.b. and l.s.b.

One of the main points to watch is the tuning steps, as anything greater than about 20Hz will make accurate tuning impossible. On the bright side though a receiver with say 100Hz steps is still usable, provided it is equipped with a r.i.t. (receiver incremental tuning) control to fill in the gaps. A

good example of a modern value-for-money receiver is the HF-125 from Lowe Electronics.

Ivar Markussen LA5XX (Norway) has written asking for help. Ivar lives in the extreme North of Norway, only 6km from the Russian border and would like to use his Sharp MZ-700 computer for RTTY, presumably to brighten the long northern winter. Yet again I don't know of any radio software for this computer, but if any readers can help please drop me a line and I will pass the info on to Ivar.

Regulatory Update

Leslie Sargent of Runcorn recently had occasion to write to the DTI seeking clarification of the regulatory position with regard to short wave listening. The reply by the DTI was quite interesting and Leslie has given me permission to quote a section here:

"... I would also point out that further legislation is to be considered for introduction later this year that will exempt all receive only apparatus from the licensing requirements under the Wireless Telegraphy Act. The final details of this are yet to be resolved and until such time as any regulations are introduced the current regulations will apply..."

At first sight this appears to suggest that all receive licensing requirements are to be abolished, which must be good news for the

short wave listener. If this really is the case then the short wave listener should be free to listen to any transmissions, which represents a welcome step forward.

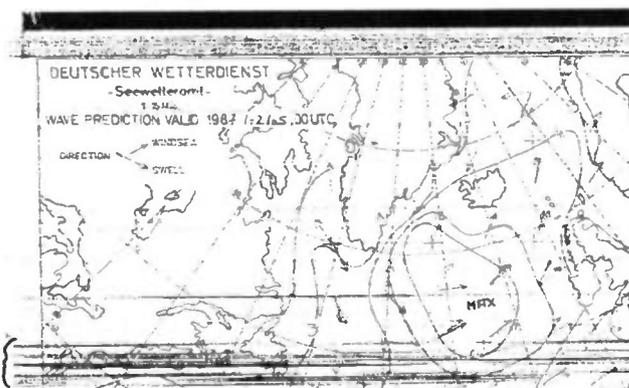
The new legislation is bound to include a clause which prevents the listener from making use of, or passing to a third party, any information that has been intercepted. An example would be a news report from a Press Agency which although it could easily be received the content of the report could not be published without the permission of the Press Agency.

I will obviously keep you up to date with developments on this front, but if you have any contact with the DTI please write and let me know and I will pass on the news via this column.

Schedules

Dave Worthy of Sunderland has recently spent some time in the Far East and being a keen s.w.l. kept up his monitoring. Dave's report includes several station schedules which with the improving propagation, should be receivable in the UK.

Kuna News Service (Kuwait)
English transmissions to Europe:
14.831MHz (9KT33) 0700 – 1600UTC
7.697MHz (9KT264) 1300UTC
17.623MHz (9KT344) 0700 – 1600UTC



9.227MHz (9KT27) 1300UTC
 Arabic transmissions to Europe:
 14.835MHz (9KT33) 0700-1600UTC
 7.701MHz (9KT264) 1300UTC
 17.627MHz (9KT344) 0700-1600UTC
 9.231MHz (9KT27) 1300UTC

Note that the English and Arabic transmissions are sent at the same time with only a 4kHz difference in frequency. The transmission mode used by Kuna is RTTY 50 baud with 350Hz shift.

If you are looking for some good DX then try Karachi Meteo which currently uses the following schedule:

5.29MHz (ARA) 1500-0140UTC
 9.11MHz (ARA) 1500-0140UTC
 11.51MHz (ARA) 0140-1500UTC
 19.683MHz (ARA) 0140-1500UTC

The mode used is 50 baud RTTY but I don't know what shift is in use.

English news broadcasts from AFP Paris are beamed to Africa according to the following

schedule:
 13.7297MHz (FPN 72/H3) 0700-0800UTC and 1710-1900UTC.
 15.977MHz (FPP 97/G) 0700-0800UTC and 1710-1900UTC.
 18.6707MHz (FTS 67/H3) 0810-1700UTC 20.3118MHz (FTU 31B/G) 0810-1700UTC
 Mode is 50 baud RTTY with 350Hz shift.

All these schedules are from the 'horses mouth', i.e. they have been received off air from stations concerned.

BARTG Rally

This popular rally which is being held on Sunday August 28 (bank holiday weekend) is a must for all utility enthusiasts. The venue is the Sandown Park race-course which is situated on the A-307 Portsmouth Road, Esher, just South of Kingston-on-Thames. For those travelling from afar access is quite easy via the M-25

and you will also be pleased to hear that there is ample free car parking available.

In addition to the usual attractions of trade and user group stands there will be a car boot sale where you should be able to pick up all manner of useful bits and pieces. One word of warning about some of those bargains. You will find all manner of miscellaneous computers for sale which, if you know what you are doing, can be quite useful. If you are aiming to use them for RTTY make sure there is adequate software available before you buy. Remember, a computer is only as good as the software it runs!

I am hoping to make it to the rally, but with our first baby due some two weeks later I might be unavoidably detained!!

Frequency List

This month's frequency list has been compiled from readers' reports and uses the normal

format of frequency, mode, speed, shift, call sign. The highlighted frequencies have not been positively identified and any additional information that you can add would be appreciated.

3.318MHz RTTY 50/R (Grenzel Meteo)
 3.79MHz SITOR A (UAT Moscow)
 5.656MHz SITOR A (Khargia) Cario
 7.460MHz RTTY 50/ LZB BTA news Bulgaria
 7.658MHz RTTY 50/R YZD Tanjug news
 7.724MHz SITOR A (SPW Warsaw)
 7.727MHz RTTY 50/R FDY French Air Force
 10.815MHz RTTY 50/ IRH58 ANSA news Rome
 11.133MHz RTTY 50/R
 17.525MHz RTTY 50/425 OLV3 CTK News Prague.

That's all for this month but please keep those reports flowing in either to the address at the head of the column or to my Prestel mailbox 425470071.

INFO IN ORBIT

Pat Gowen G3IOR

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

Weathersats

Lawrence Harris writes in from Plymouth to tell us some more news of the satellites he is following. He keeps a very careful log of his findings, a habit continued from his days as a professional satellite-controller, and is thus able to give us some fine detail of events.

Regarding the Russian Meteor weathersats, Lawrence writes, "MET 2/14, which is normally to be found on 137.85MHz suffering from aperture problems, was switched off in mid-March. Following my last observation, a very good one degree elevation pass near Greenland at 1957UTC on March 14, it has not been detected since".

The new MET 2/17, launched on January 30 this year, normally to be found on 137.3MHz, was not transmitting when Lawrence Fig. 1

looked for it at 1526UTC on March 19. This was despite the fact that it was in sunlight and well above his horizon. It was not heard to be active again until April 17, when it entered a twilight pass for the UK. In mid-May, it is still silent for much of the time, despite being in full sun for the UK passes. MET-30, however, remains a regular picture transmitter, but its frequency has now dropped down to 136.970MHz. It can normally be observed on passes between 1030 and 1258UTC sending its regular "bleep" for up to a 12 minute period.

Lawrence has found that the polar orbiting COSMOS-1602 on 137.33MHz has been treating us to some very good pictures lately, and is to be heard for three consecutive passes each period. "In mid-May," says Lawrence, "I received an excellent picture of

the Leningrad area just as the satellite was at the evening terminator. Usually the METEOR satellites turn off before venturing that far into darkness, but COSMOS-1602 has different sensors, producing visible light pictures more like the NOAA series."

He further tells me that he has been seeing some spectacular views out to the far west, using the aforesaid intermittently operational Meteors, plus the continuously active NOAA-9 and NOAA-10 (137.62MHz and 137.50MHz), also, when they are only one degree above his ideal westerly horizon. "I recently saw as far west as the St. Lawrence River in Canada, and followed it down to Boston," he writes. "There were clear skies, and I was able to identify the islands and other recognisable landmarks.

Lawrence has recently extended his satellite receiving station and in addition to monitoring all the weather satellites, the UoSAT pair on 145.625MHz, and Meteosat on 1.69GHz, he is also following the activity from the Soviet MIR manned space station and a number of other communications on other spacecraft..

Finally, our correspondent throws some light upon the question posed by Leslie Sargent in our May column, who needed to identify the source of the satellite signals heard between 149.994 and 150.042MHz. "He has stumbled across the Russian Cosmos navigational satellite system," answers Lawrence. "There are some four satellites involved, all transmitting near 150MHz, so if one listens regularly, sequences of similar signals will be heard. There is also



a military system close by on 149.91MHz, and these can be heard regularly if one scans this area."

A further reply to Leslie was kindly sent by Dr. T. F. Bernascombe of the Teesside Polytechnic School of Information Engineering, who wrote, "It is highly likely that the frequencies you listed are a 'spread' of the Channels 1-5 of the USSR Cosmos Navsat, as:

Channel 1 ... 149.91MHz Military Navsat Channel

Channel 2 ... 149.94MHz Military Navsat Channel

Channel 3 ... 149.97MHz Military Navsat Channel

Channel 4 ... 150.00MHz Civilian Navsat Channel

Channel 5 ... 150.03MHz Military Navsat Channel

"It is very easy to suppose that there are a number of frequencies across the bands mentioned, as the data transmission on each channel is quite broad. Fine tuning across a channel does sound as if there are a number of 'frequencies' in use, but this is not so as each of the 'frequencies' contains a portion of the channel's complete data information. All five channels emanate from the one satellite."

Picture Printing

Readers will recall our February column when Gordon Train related his exploits into weather satellite picture reception and printing using his 48K LYNX computer. John Doerr, of Ostwestry has followed this up by writing in and sending us some excellent pictures he has printed as a result of the latest modifications he has since made to his original programme, giving eight shades of grey to his Epson FX-80 printer.

The routine allows the printer to copy every dot off screen, or every other dot. If every dot is used, the result is a picture somewhat wider than the screen. If every other dot is printed, then this preserves the aspect ratio to that as seen on the screen, but at the expense of detail, as every other pixel is discarded.

A full size picture of the printed

Fig. 3

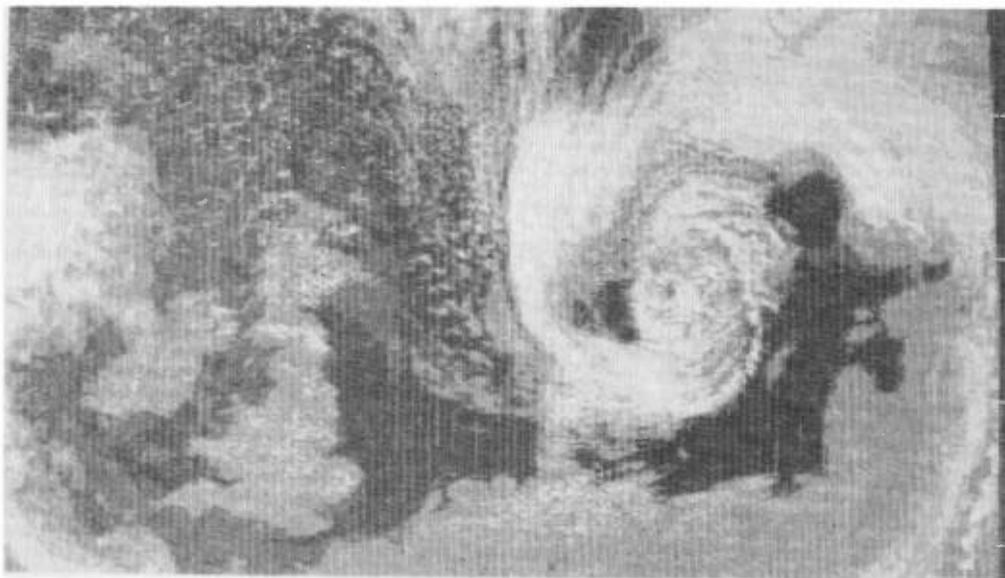


Fig. 2

720 x 210mm picture taken from NOAA-9 back in September 1984 is shown in Fig. 1, the original of which looks really great when pinned to the wall and is viewed from some two metres away, the dot patterns then merging to the eye to form very realistic grey scaling.

The picture labelled Fig. 2 is also from NOAA-9, taken at 1430 on 16 May 1986. Notice the large cloud swirl which has developed over Scandinavia. This picture was printed at half screen width.

Meteosat pictures are shown by the next half-width picture Fig. 3 portraying the Nile, Red Sea and the eastern Mediterranean Sea.

John has recently made a further modification which consists of a compression routine to compress a screen dump before saving it. He explains, "On the 128K Lynx computer, to achieve 512 wide by 252 pixels deep, in all eight colours, each basic colour (red, blue and green) has 16K of memory devoted to it, making in all 48K of data for each screen dump". The routine he has written can now analyse and compress 16K of data into a mere 128 bytes, enabling getting some five or six pictures on a 200K disc. "This is on the proviso", John points out, "that large blocks of one colour are contained in the

pictures, and most satellite pictures are not like this."

John is now preparing to set up his gear again, and promises us some more pictures when his system is all functioning once more.

Phase III-c Launch

If all has gone to plan, you should be hearing signals from the new "OSCAR-13" satellite beacons now, although it will be a little longer yet before the spacecraft is serially fired into its final orbit and the transponders commanded on for amateur radio utilisation.

Polar Bridge

The joint Canadian-Russian amateur radio based expedition are now pressing on southbound to Resolute Bay, having reached the North Pole at 0720UTC on April 26 for a big celebration attended by many who had assisted the operation. Michael Meerhan G0/PA3BHF was one of the visitors, having travelled by air to Moscow, thence to Sredney Island, then to the floating ice island North Pole 28 and from there to the pole by helicopter. Michael took with him a large number of written questions for the team that had been posed by the students of the many schools around the world who are following the expedition by satellite.

Wally Unsworth G1LKY, of Lincoln continues in phase with his keen local group to follow the progress daily, listening to the voice communications on 14.121 and 14.282MHz, UoSAT-11's Digitaler, as well as the packet radio mailbox system that temporarily used 14.301MHz to maintain essential communications monitored by G6JIK. He has

calculated that despite the difficult climatic conditions and the melting ice problem, the progress has averaged 18.69 kilometres per day. Their early estimate of April 25 for the moving groups North Pole arrival was spot on, as the trekkers "hove to" the day before arrival in order to phase in with the welcoming delegation the following day.

This expedition is being followed by thousands all round our planet, thanks to amateur radio satellite communications, which is playing a vital part in the endeavour.

MIR Frequencies

Readers may wish to observe the following frequencies for imminent Soviet space activity. All of the following are used in their programme, mainly for MIR and missions associated with it.

143.626MHz (MIR v.h.f. groundlink) 166.00MHz 247.50MHz

922.755MHz 922.250MHz 9.25.260MHz (Progress 36-T associated)

19.954MHz (COSMOS-1686 attached to SALYUT-7)

New tracking ships are now readied in Leningrad, and *Energia* is now sitting on its launch pad at Baikonur, reputed to be about to launch the new Soviet space shuttle, called *Buran* ("Snowstorm"), a larger and different design to the NASA STS series. June 7 is set for a ten day MIR mission with a visiting Russian and Bulgarian cosmonaut, the latter having the same name as the Soviet cosmonaut Alexander Alexandrov. August 29 will see an Afghanistani and Soviet joint MIR mission, and in November a French astronaut will visit with a Soviet cosmonaut and perform a "space walk". It should be all worth following!



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A socket for the optional RS232 interface (RC PACK) is provided on the rear panel.

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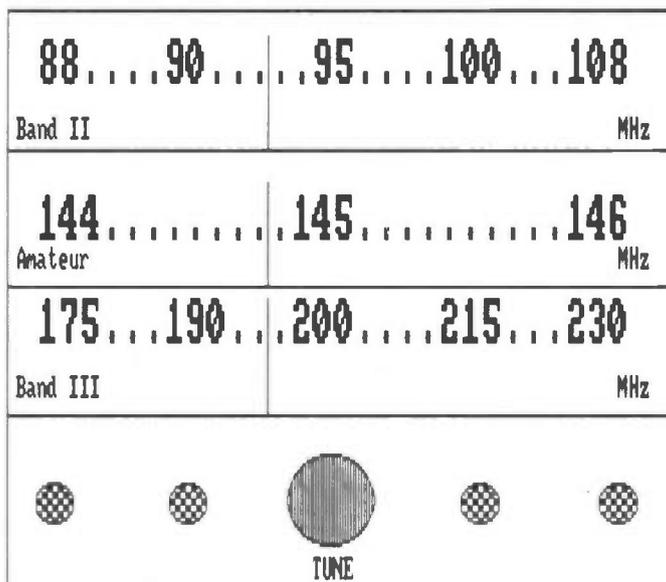
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"I have noticed that when the barometer is actually falling between approximately 1035mb (30.55in) and 1015mb (30.0in) here, I seem to receive the best DX, but not as it is rising," wrote Ken Lancaster from Rotherham.

My Short and Mason barograph has worked continuously since 1962 and I have seen dozens of openings that have followed the same pattern. This does not work for me every time, for instance, I have known barometric readings to be right for an opening and then found nothing unusual on the bands. However, later on, that all-important reader's letter has arrived and confirmed that there was a limited event at that particular time.

Many v.h.f. enthusiasts look for DX in the amateur and broadcast bands and if they used a "super" receiver like the one I dreamed up for Fig. 1, they would see just how directional and limited in frequency range that some of the minor openings can be. During the lifetime of an extensive tropo, radio and television signals reach most parts of the UK from stations ranging from Ireland to Italy and from Scandinavia to France on each side of the bands shown.

The network of amateur radio beacons which transmit continuously from strategic sites throughout Europe and Scandinavia (144.8-145MHz) and the large number of European television transmitters using Band III are first class indicators as to the



DXer's "super" receiver

prevailing v.h.f. conditions.

Scanners can be programmed with one or more UK beacons furthest away from your QTH: such as Cornwall (GB3CTC 144.915MHz) and Wrotham (GB3VHF 144.925MHz), Belfast (GB3EGI 144.945MHz), Dundee (GB3ANG 144.975MHz) and Lerwick (GB3LER 144.965MHz) in The Shetland Is. The frequency of a broadcast station in Band II or III which is geographically near to the selected beacon could also be useful.

"To celebrate Dublin's millennium

(1000yrs), RTE has opened a station in Dublin, called "Millennium 88" on 88MHz," wrote Simon Hamer (New Radnor). He heard this and Radio Telefis Eireann's FM1, 2 and 3 during the tropospheric opening on April 24. In addition, Simon's haul on the 24th included stations from Belgium, France and Holland, BBC Radio 1 on 104.8MHz and local BBC Radios Cleveland, Cornwall, Cumbria, Devon, Essex, Leicester, Lincolnshire, London, Newcastle, Norfolk, Nottingham, Scotland, Solent, Sussex, Ulster

and York.

Around 1945 on the 24th, and again at 2130 on May 17, I tuned through Band II with my ex-military R216 v.h.f. communications receiver, fed by a discone antenna. I heard many interstation "warbles" plus a variety of programmes from France, Germany and Holland.

Ken Lancaster received "superb stereo" from BBC Radio 1 on 104.8MHz early on April 25 and again, in mono, on May 5 and 10. Between 2000 and 2030 on May 6, Ken heard BBC Radio 1 in stereo and French and German stations between 98 and 103MHz.

I spent the afternoon of May 5 in Arundel, and I tuned through Band II with my Plustron TVR5D and, with its own rod antenna. I logged several strong French stations between 97 and 103MHz. This car-park is at sea level, the pressure was on the change and the weather was sunny, warm and clear. Similar conditions prevailed during the afternoon of the 13th when I heard these French stations again, but this time I was about 180m a.s.l.

During the Sporadic-E opening on May 11, Simon Hamer heard stations from Denmark and identified Radios Bornholm, Copenhagen and South Sealand and at 1900 on the 15th, I heard four very strong eastern European f.m. broadcast stations between 66 and 69MHz and possibly the Ch. R4 television sound on 91.75MHz.

TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

"Both RTBF and PTT-NED can be found working on Chs. E3 and 4 on most days," reports John Raleigh from his QTH in Bedford. He told me that both stations appear in a tropo-flutter and that he had received full pictures, lasting only a few seconds, when the pressure was low at 999mb (29.55in). When the barometer is high, around 1025mb (30.3in), he received them for hours at a time. This is typical tropo John and a good first-hand observation to assist our new recruits.

Band I

In New Radnor on April 20, Simon Hamer identified test patterns from Czechoslovakia (RS-KH) on Ch. R2 (59.25MHz) and Iceland (RUV Island) on Ch. E4 (62.25MHz), via meteor scatter.

Simon also received pictures, via Sporadic-E, from East and West Germany (DFF-1 and ARD-1) on Chs. E4 and E2 (48.25MHz); Hungary (MTV-1) on Ch. R1 (49.75MHz); Italy (RAI) on Chs. 1a and b (53.75MHz and 62.25MHz); Portugal (RTP-1) on Ch. E3 (55.25MHz); Spain (TVE-1) on Chs. E2, 3 and 4 and Yugoslavia (JRT) on Ch. E3 — all on May 6. Then there was Scandinavia (Norge Televerket) and (Kanal-1 Sverige), on Ch. E2 on the 10th and Denmark (DR Danmark) on Chs. E3 and 4, Poland (TVP) and USSR (Cyrillic captions) on Ch. R1 and West Germany (NDR-1) on Ch. E4 on the 11th. Simon's prize came at 1950 on the 6th, when he saw an Arabic caption on Ch. E4 which he suspects came from Tunisia (RTT).

It seems that Sporadic-E covered a lot of the world around

that time because, from his QTH in Meerut, India, Lt Col Rana Roy saw an Arabic play from Dubai, on Ch. E2, at 1930 on May 5 and Russian TV, on Chs. R2 and 3, between 1030 and 1140 on the 7th.

The Norwegian test card, Fig. 1 and the Swedish programme caption, Fig. 2, were received by Noel Smythe (Caerphilly) and Edwina and Tony Mancini (Belper), respectively. Noel's archives also produced photographs of the test signals which he received from Czechoslovakia Fig. 3 and Iceland Fig. 4, during the 1987 Sporadic-E season. In June last year, the late Len Eastman (Bristol) frequently watched programmes from Spain, Figs 5 and 6. During a similar event, Bob Brooks (Great Sutton) watched an English programme on Spanish TV, Fig. 7 and in July 1983

he logged a TVE regional ident for Andalucia, Fig. 8.

Pictures from Scandinavia were prominent in the Mancinis log this time. They received Denmark on April 16, 27, 30, May 1, 6, 7, 9 and 11; Norway (NRK) and at times the regional test cards, with clocks, enscribed Bremanger, Gamlem and Kongsberg on April 15, 18, 23, 25, May 2, 5, 6, 8, 9 and 11 as well as Sweden (SVT Kanal-1) on April 15, 16, 18, 23, 25, 26, 28, 29, May 2, 4, 5, 6, 8 and 9. The signals which they received from Austria (ORF-FS1), Czechoslovakia (CST-1, RS-KH and DDK-2), Iceland, Italy, Poland, Switzerland (+ PTT SRG-1) on Ch. E3 and the USSR appeared much less frequently on the days already mentioned. Among the variety of idents seen by Edwina and Tony during the period were Intervision from Czechoslovakia, ARD SWF/BADN

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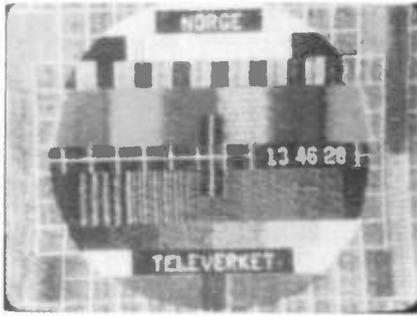


Fig. 1: Norway

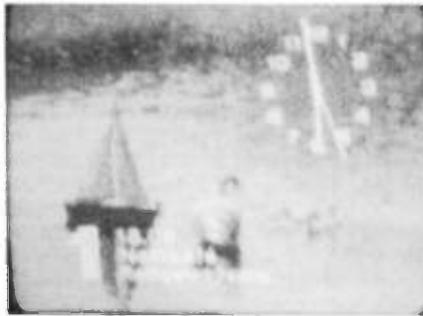


Fig. 2: Sweden

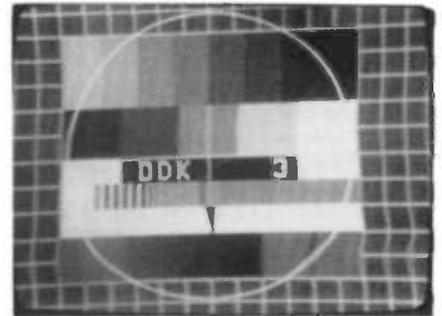


Fig. 3: Czechoslovakia

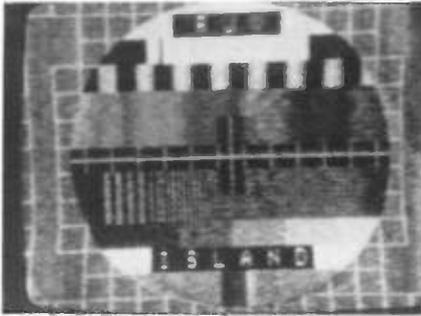


Fig. 4: Iceland



Fig. 5: Spain



Fig. 6: Spain



Fig. 7: Spain



Fig. 8: Andalusia

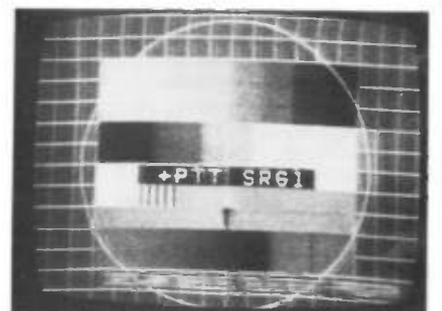


Fig. 9: Switzerland



Fig. 10: Pakistan



Fig. 11: Czechoslovakia SSTV



Fig. 12: Czechoslovakia SSTV

and Ochsenkopf from West Germany, Alphabet from Italy, a new logo Telediaro from Spain and of course the Hoboctn news caption from the USSR.

Bob Brooks reports receiving test cards from Poland on April 27, May 4 and 11; programmes from Austria and Spain (Discussion Group) on the 6th; Italy (News) and USSR on the 7th; Denmark, Poland (Dancing), USSR (News) and West Germany (ZDF programme details) on the 11th; Hungary (Caption), Italy (Sport), Spain (variety and film review) and the USSR (film) on the 15th. On the same day, Bob saw a film on Ch. E2 at 1340 and motor cycling and cycle racing on Ch. R2 between 1528 and 1615 from unidentified sources.

John Raleigh noted short bursts of good pictures from Italy at midday on May 7. He also watched a programme, for about 30 minutes, from an unidentified station in the north-east at 1200 on May 11. John thinks that the latter may have been Sweden's TV1.

The test card from Switzerland, Fig. 9, sent in by Garry Smith (Derby) has a moving line of text along the bottom.

Tropospheric

The atmospheric pressure was changing, the weather was sunny and warm at 1643 on May 5 and I was parked, at sea level, in Arundel on the sea-side of the South Downs. I check the band

with my Plustron TVR5D and using its own rod antenna and found strong negative pictures from France in Bands III and IV. At midday on the 6th, while parked on Telegraph Hill, some 200m a.s.l., the only signal left was a French station in Band III.

Bob Brooks logged the RTE clock on Ch. H (207.25MHz) at 1016 on the 7th. On May 4, 5, and 6, the Mancinis received pictures in Band III from Belgium (RTBF-1 Wavre) in colour, on Ch. E8 and France (Canal +) on Ch. L5. In fact, they logged spasmodic signals from Canal + on most days between April 14 and May 11, including part of a chat show on the 22nd and wrestling on the 24th. In addition they logged a possible test card from Germany

(ARD-1) on April 19 and test cards from Ireland (RTE-1) on days 14, 15, 18, 19, 21, 22, 25 and 30 as well as the programme schedule from RTE-2 on the 15th, 18th, 19th and 25th.

Simon Hamer noted a slight tropo-lift on the 24th and reports seeing pictures from Belgium (BRT-1 and RTBF-1) and Luxembourg (RTL +) in Band III and France (TDF), Holland (PTT NED 1 and 2) and Ireland (RTE-1 and 2) on several spots in the u.h.f. band.

Although varying degrees of co-channel interference were seen on some u.h.f. channels during the evening and into the small hours of May 16/17, I could not find any effect of these conditions in Band III.

News from India

In March, Rana Roy observed tropospheric disturbances to Band III early on the 5th and 7th and during the evenings of the 6th and 15th. "Pakistan TV seems to have started Breakfast TV with similar programmes as the Indian TV, but the duration is 90 minutes," said Rana. He logged test cards and programmes from stations in India and Pakistan while these events were in progress. He also received pictures from Bhatinda, Jullundur, Kasauli, Lahore, Mussoorie with heavy interference from Bhawalpur, and Rawalpindi

between 0700 and 0748 on the 5th; Faisalabad showing an American detective film, Lahore and Rawalpindi on the 6th; the low power transmitter at Delhi, Kasauli and Lahore on the 7th and very strong signals from Amritsar, Bhatinda, Jullundur showing a Hindi feature film, Kasauli, Lahore and Mussoorie on the 15th.

"Pakistan TV could be seen clearly (like a local station) till 2330 when the programmes finished," said Rana. At 2345 on April 2, he saw commercials from Pakistan, Fig. 10, TV followed by an American serial called *Adventurer* on Ch. 10.

SSTV

In Runcorn, Les Sargent received slow scan pictures, on 14MHz, from 11CEL working TA4A at 1602 on April 24; OK3CKW, with photograph, Figs. 11 and 12 in OSO with EA9NP at 1959 on the 27th and a caption, on 14.179MHz, showing "RTTY CW SSTV" at 2059 on the 28th. "There was no identification at all on this, from time to time it was idling as the print out shows," said Les and would like to know its source. Can anyone help?

Although studying for exams in April Les Hobson GOCUI managed a bit of time to exchange 8

seconds SSTV pictures, on 14MHz, with DF2 RJ, ISOATZ and VE1AMA.

On May 18, Les Hobson had the pleasure of demonstrating SSTV, including colour techniques with camera and recording on tape, at his QTH in Rotherham to Elaine Waters and Richard Griffin from the amateur radio side of the DTI and Ian Abel G3ZHI and Fred Pickersgill G3XXN from the RSGB. "It was a very interesting day indeed," said Les who wishes to thank Ian and Fred for asking him to give Elaine and Richard an insight into this mode of amateur radio communication.

LONG MEDIUM & SHORT

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

In our enthusiasm for this great hobby of DXing, we should not overlook the fact that our families and neighbours may not experience the same delight in the reception of broadcast stations at all hours of the day and night!

If you enjoy DXing late at night it is important to remember that, in the "dead of night", sounds travel clearly. Sudden bursts of noise from a loudspeaker may well disturb members of the household when they are trying to get some sleep! In an attempt to identify a station it is all too easy to turn up the volume, which may even annoy the occupants of adjacent flats. There is a simple solution to the problem — use headphones, but do ensure they match the receiver output impedance.

Long Wave DX

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

While on holiday in Siusi, a small village 1000m up in the Italian Dolomites, Alex Mackow used a Nordurende portable with internal ferrite rod antenna to compile an interesting log for the chart. During the evening he noted the transmission from BBC Droitwich, UK on 198 (at 33333) at 2025. The most potent signal stemmed from Roumoules 216, rated at 54444. In contrast, the signal from Kalundborg, Denmark 245 was 23333.

Writing from Stoke-on-Trent, Daniel Masterson says his recent holiday in Torremolinos enabled him to try DXing in a new location. Listening late at night, he was surprised to hear BBC Droitwich 198 and Azilal in Morocco 209. It is certainly worth remembering to take a portable with you on holiday!

The broadcasts from Monaco via Roumoules are being well received on their new frequency of

216 in many areas of the UK. Using a Panasonic RF-1680L portable, Phil Townsend (London) found that he can hear them clearly during the afternoon, despite the high levels of electrical noise always present there during working hours. Bill Eyre (Stockport) says that their potent signal masks the broadcasts from Oslo, Norway who share this frequency. After midnight, when Roumoules closes down, their transmission can be heard very clearly. This is a point worth remembering if you wish to add Norway to your list of countries heard on the l.w. band! The signal from Roumoules has also been reaching S. Ireland well as Ciaran Fitzsimons (Co. Laois) rated it as SINPO 45545 at 1038.

Reporting from Macclesfield, Philip Rambaut says that the 2kHz heterodyne whistle which he mentioned last month may still be heard between 207 and 209kHz. Despite the implementation of the second stage of the new band plan last February, the broadcasts from Morocco via Azilal continue on 209. The whistle arises when their carrier beats with the one radiated by DLF from Munich, W. Germany on 207.

Apparently the signal from Azilal is so weak in Newcastle-upon-Tyne that Glen Glen-Davison has been unable to obtain any form of positive identification despite monitoring it both day and night. In contrast, the broadcasts from Donebach 153 reach him at SINPO 54444 around noon and those from Munich 207 rate as 33443.

Poor l.w. reception has been noted in Edinburgh by Robert Taylor. During daylight he rated the signal from Allouis 162 as SIO 333, while those from Donebach 153 and Saarlouis 183 were 322. Despite the long sea path, the signal from Kalundborg is only 222.

Freq kHz	Station	Country	Power (kW)	DXer
153	Brasov	Romania	1200	D,E,J*,O*
153	DLF Donebach	W. Germany	500	A,B*,D,E,F,J,K,L,M
153	Ufa	USSR	100	C,O*
162	Allouis	France	2000	A,D,E,G,J,K,L,M,N*
171	Kaliningrad	USSR	1000	A,D,E*,J,M,N*,O*
171	Medi 1-Nador	Morocco	1200	J*,O*
177	Oranienburg	E. Germany	750	A,D,E,G,J,M,N*,O
180	Ankara	Turkey	1200	O*
183	Saarlouis	W. Germany	2000	A,C,D,G,K,M,O
189	Motala	Sweden	300	A,D
198	BBC Droitwich	UK	400	B*,C,D,E,F,G,H*,K,M,N*
200	Leningrad	USSR	150	O*
207	DLF Munich	W. Germany	500	A,D,F
207	Kiev	Ukraine	500	N*,O*
209	Azilal	Morocco	800	H*,I,O*
216	Roumoules	Monaco	1400	C,D,E,G,K,M
216	Oslo	Norway	200	C,D*,N*
225	Konstantinow	Poland	2000	A,D,G,K,M,N*
234	Junglinster	Luxembourg	2000	A,B*,C,D,E,G,K,M,N*
234	Kishinev	USSR	1000	N*,O*
245	Kalundborg	Denmark	300	A,B*,C,E,G,K,L,M
254	Tipaza	Algeria	1500	B*,D,E,G,M,O*
254	Lahti	Finland	200	A,C
263	Burg	E. Germany	200	C,E
263	Moscow	USSR	2000	A,D,M
272	Topolna	Czechoslovakia	1500	A,C,D,G,M,N*,O
281	Minsk	USSR	500	O*

Note:

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

DXers:

- A: Leo Barr, Sunderland
- B: John Berridge, Cardiff
- C: Colin Diffell, Corsham
- D: Bill Eyre, Stockport
- E: Ciaran Fitzsimons, Co. Laois, S. Ireland
- F: Glen Glen-Davison, Newcastle-on-Tyne
- G: Alex Mackow, while in Belzano, Italy
- H: Daniel Masterson, while in Torremolinos, Spain
- I: Philip Rambaut, Macclesfield.
- J: Tim Shirley, Bristol.
- K: Darran Taplin, Tunbridge Wells
- L: Robert Taylor, Edinburgh
- M: Phil Townsend, London.
- N: Neil Wheatley, Newcastle-on-Tyne.
- O: Jim Willett, Grimsby

MW Transatlantic DX

It seems that the long hours of daylight just now have not encouraged many listeners to try this aspect of our hobby, but those who decided to stay up late were no doubt surprised by the number of signals which bridged the Atlantic. The reports indicate that the most consistent signal to reach our shores well before midnight stems from WINS in New York 1010. Tim Shirley logged

them in Bristol at 2130.

The signals from CJYQ in St. John's, Newfoundland 930 have always been a good pointer to band conditions, but recently they have not been reaching the UK until later. Jim Willett logged them in Grimsby at 2345.

Listening in New Radnor, Simon Hamer was surprised to hear a number of stations which he had not logged before: CFTR Toronto, ON 680; CKVM Ville Marie, PQ 710; CKAC Montreal, PQ 730; CJRC Ottawa, ON 1150; CHOO Ajax, ON 1390; CBJ Chicoutimi, PQ 1580; WCBK New York, NY 880; WWKB Buffalo, NY 1520; WPTR Albany, NY 1540; Kingston, St. Vincent 705; XEKOK Las Cruces, Mexico 750; R. Jamaica, Spur Tree 770; R. Paradise, St. Kitts 825; ZBM-1 Hamilton, Bermuda 1230; XEBBC Tijuana, Mexico 1470 and R. Vision, Caracas, Venezuela 750. Three of these stations (CFTR, CKVM, CJRC) have not been

SEEN & HEARD

mentioned before in this series and are subject to confirmation by QSL.

During the last few months Tim Shirley has logged several stations which have not been mentioned before in this series and therefore subject to confirmation by QSL. Tim has just sent along photocopies of two letters which confirm his reception on 19/2/88 of KSGO in Portland, Oregon on 1520 and WZAP in Bristol, VA on 690.

Unfortunately, the letters are too large for publication, but both make interesting reading. The one from KSGO states that their power output is 50kW by day and 10kW at night. A three tower antenna system is used to direct the major radiation towards the north-west! The letter from WZAP mentions that they were a "daytime only" station until 1986, but they now radiate 10kW by day and just 25 watts after dark — their antenna is a non-directional guyed vertical tower about 83m high. Congratulations Tim on your achievement.

Other MW DX

Although the truly long distance m.w. signals only reach the UK at night via sky wave paths, some of the broadcasts from stations on the Continent may be received in certain areas of the UK during daylight via ground wave paths. BRT-2 via Wavre, Belgium 540 (150/50kW); RTBF-1 via Wavre 621 (300kW); BRT-1 via Wolvertem 927 (300kW); Hilversum-5 via Flevoland, Holland 1008 (500kW); also DLF via Bayreuth, W. Germany 549 (200kW) were all clearly received in London by Phil Townsend using a Panasonic RF-1680L.

An Eddystone 680X receiver with a 25m wire antenna enabled Darran Taplin (Tunbridge Wells) to log the broadcasts from France Culture via Paris 864 (300kW) as 54444; Norwegian Prog-1 via Kvitsoy, Norway 1314 (1200kW) as 44444 and Radio Polonia via Stargard, Poland 1503 (300kW) as 23433 during the afternoon.

Having purchased a Sangean ATS-803, David Wright of Telford says he has regained an interest in this hobby. During daylight, he logged Hilversum 1 via Lopic 675 (120kW) and Hilversum 2 via Flevoland 747 (400kW). He also picked up two of the official broadcasts from S. Ireland, namely RTE-1 via Tullamore 567 (500kW) and RTE-2 via Athlone 612 (100kW).

Some of the low power relay stations were logged by DXers during daylight. Glen Glen-Davison rated the signal from BBC Dumfries 585 (2kW) as SINPO 54554; BBC Redmoss 1449 (2kW) as 43554 and BBC Carlisle 1485 (1kW) as 44444. He also picked up the Dublin relay of

RTE-2 on 1278 (10kW), noting their signal as 43333 at 1200.

Two low-power BBC Bournemouth relays were noted by George Millmore (Wootton, IOW): Radio 1 (2kW) 1485 and Radio 3 (0.5kW) 1197. He also logged the 0.5kW BBC Radio 4 relay in Lots Road, London on 702.

The 10kW relay of BBC Radio 4 via Lisnagarvey, N. Ireland 720 was logged by David Wright. There are three more 10kW transmitters at Lisnagarvey, they relay BBC Radio 1 (1089), 2 (909) and 3 (1215). However, their signals cannot be easily separated from those radiated by several high power BBC transmitters in other areas of the UK since they share the same frequencies.

A high power transmitter at Lisnagarvey on 1341 (100kW) radiates BBC Radio Ulster to N. Ireland, but their signal reaches many other areas too. Using a Sooper Loop ahead of a Sony ICF-7600D portable, Robert Taylor (Edinburgh) rated their signal as SIO 434 at 1230. During the early evening he logged Pori, Finland 963 as SIO 444; DDR1 via Burg, E. Germany 783 (1000kW) as 444 and Kalundborg, Denmark 1062 (250kW) as 434. At dusk, he heard RTBF1 via Wavre, Belgium 621 (300kW) and Radio Bremen, W. Germany 936 (100kW), both at 444.

Listening during the evening, John Evans (Shawford) heard RNE1 via Madrid, Spain 585 (200kW) SIO 434 at 1920. He also heard RNE1 via La Coruna 639 (100kW) at 1955 (444). At 2000, he picked up SER R. Sevilla 792, their 20kW signal peaked 444. The broadcasts from RNE1 via la Coruna 639 were also mentioned in the report compiled by Daniel Masterson while in Torremolinos. He rated their signal as SIO 434 at 0100. He also logged RNE1 via Barcelona 738 (250kW), noting their signal as 333 at 0130. He rated the 20kW transmission from SER via Valencia 1260 as 333.

John Evans has just received a *Magic Disc* from Deutschlandfunk, W. Germany, it was offered as a prize in a recent competition. The disc is about the same size as an LP record, but the "track" has only 15 spiral turns. They are etched onto its surface and form a spiral loop antenna which is pre-set tuned to their Neuminster transmitter on 1269 (600kW) by a 12nF capacitor. How well does it perform? As its name implies, it's magic! Using it with his Vega 206 portable, John logged their signal SIO 555 at 1815 — yes, a perfect rating! Without the disc, the strength of their signal is a mere S2. He made a comparison test by using a "Sooper Loop" ahead of his Lowe SRX30 receiver, but their signal then rated as only 344.

Freq MHz	Station	Location	Time (UTC)	DXer
USA				
650	WSM	Nashville, TN	0430	C
660	WNBC	New York, NY	0430	B
770	WABC	New York, NY	0155	A
850	WHDH	Boston, MA	2300	B
860	WOAY	Oak Hill, W. VA	2100	B
880	WCBS	New York, NY	0305	A
1010	WINS	New York, NY	2130	A,B,C
1030	WBZ	Boston, MA	0330	A
1050	WFAN	New York, NY	0100	A,B,C
1090	WBAL	Baltimore, MD	0330	A
1130	WNEW	New York, NY	0230	A
1190	WOWO	Ft. Wayne, IN	0300	C
1210	WCAU	Philadelphia, PA	0100	A,C
1220	WGAR	Cleveland, OH	0100	C
1470	WLAM	Lewiston, MA	0225	A
1500	WTOP	Washington DC	0400	A
1510	WSSH	Boston, MA	0130	A,C
1520	WWKB	Buffalo, NY	0205	A
1540	WPTR	Albany, NY	0400	A
Canada				
540	CBT	Grandfalls, ON	0320	A
580	CFRA	Ottawa, NF	0255	A
590	VOCM	St. John's, NF	0030	A,B,C
600	CBNA	St. Anthony, NF	0250	A
610	CKYQ	Grand Bank, NF	0300	A
620	CKCM	Grand Falls, NF	0500	B
680	CFTR	Toronto, ON	0225	A
710	CKVM	Ville Marie, PQ	0345	A
710	CKVO	Clarenceville, NF	0345	A
730	CKAC	Montreal, PQ	0200	A
750	CBGY	Bonavista Bay, NF	0310	A
920	CJCH	Halifax, NS	0250	A,C
930	CFBC	St. John, NB	0250	A
930	CJYQ	St. John's, NF	2345	A,C
940	CBM	Montreal, PQ	0250	A
950	CHER	Sydney, NS	2300	B
1010	CFRB	Toronto, ON	0340	A
1050	CHUM	Toronto, ON	0315	A
1110	CBD	St. John, NB	0330	A
1150	CJRC	Ottawa, ON	0015	A,C
1150	CKOC	Hamilton, ON	0350	A
1200	CFGO	Ottawa, ON	0315	A
1220	CKCW	Moncton, NB	0120	C
1390	CHOD	Ajax, ON	0320	A
1410	CIGO	Pt. Hawkesbury, NS	0145	A,C
1570	CKLM	Lavel, PQ	0030	A,C
1580	CBJ	Chicoutimi, PQ	0220	A
C. America & Caribbean				
705	Kingston	St. Vincent	0315	A
750	XEKOK	Las Cruces, Mexico	0330	A,B
770	R. Jamaica	Spur Tree, Jamaica	0310	A
825	R. Paradise	St. Kitts	0310	A
1100	ZDK	Antigua	0300	A
1230	ZBM-1	Hamilton, Bermuda	0350	A
1570	Atlantic Beacon	Turks & Caicos IIs	0340	A
1580	VOA	Antigua	0245	A
1610	Caribbean Beacon	Anguilla	0100	A,C
South America				
0750	R. Vision	Caracas, Venezuela	0330	A,C
980	R. Nacional	Brazil	0250	C
1100	R. Globo	Sao Paulo, Brazil	0300	A
1220	R. Globo	Rio, Brazil	0130	A,C
1350	R. Buenos Aires	Argentina	0310	C

DXers:

- A Simon Hamer, New Radnor.
- B Tim Shirley, Bristol.
- C Jim Willet, Grimsby.

While in Siusi, N. Italy Alex Mackow monitored the BBC 648 broadcasts on 648kHz, their signal rated as 33333 at 2011. The BBC Polish Service on 1296. had a similar rating. The broadcasts from SABC Radio Lotus on 648 have been attracting the attention of P.R. Guruprasad (Molepolole, Botswana). He uses a Philips D-1835 portable and rates their signal as 35444 at 1920.

Writing from Sunderland Leo Barr says that, in terms of m.w. performance, his Steepletone MBR-7 is quite the best radio he has ever owned. During daylight he heard Alger, Algeria 981 (600/300kW) at 1937 and after dark he compiled an extensive log which included Cheboksary, USSR 531 (30kW); Katowice, Poland 1080 (1500kW); Bari, Italy 1116 (150kW); Tovarnik,

Yugoslavia 1124 (300kW); Zardar, Yugoslavia 1134 (300kW); Kaliningrad, USSR 1143 (150kW); Solvesborg, Sweden 1179 (600kW); Minsk, USSR 1197 (50kW); Tartu, USSR 1215 (50kW); Prague, Czechoslovakia 1233 (400kW); Kaunas, USSR 1386 (1000kW); Leningrad, USSR 1494 (1000kW); also Stargard, Poland 1503 (300kW).

Simon Hamer has now received a QSL to confirm reception of the broadcasts from the Faroe Islands on 531 (5kW). At night he picked up the broadcasts from another seldom mentioned station: BBC Zakaki, Cyprus 720 (100kW).

After a delay of 95 days, a QSL and some attractive stickers have been received from R. Sevilla,

Spain by John Nash (Brighton). They confirm his reception of their broadcasts on 792.

Looking up the exact locations of stations in Europe, N. Africa and the USSR can make DXing much more interesting, but it is often difficult to pin-point them by referring to an ordinary map. The two-coloured maps in *Dial Search* show only the locations of broadcast stations and so make this a simple task — the booklets provide a good deal of other information too! *Dial Search* is available from the SWM Book Service, see page 50.

Reporting from Southport in Queensland, Australia, John Ratcliffe says that the static is still troublesome. He has been hearing the broadcasts from 2YA in Wellington, New Zealand regularly on 567. Their 60kW transmitter is located on the beach at Tithati Bay, which is some miles away from the studio centre. No doubt the clear sea path helps their signal to reach Australia. John has been experimenting with a hexagon shaped spiral loop antenna.

MW Local Radio DX

Writing from Denbigh Martyn Doig

says he recently purchased a Sony ICF-7600DS portable and rebuilt his m.w. loop antenna. He compiled his first impressive list for the chart between 0930 and 1130.

During daylight, Darran Taplin added several stations to his growing list of local radio DX: BBC Radio Devon via Barnstaple 801 and via Exeter 990; ILR GWR via Chippenham 936 and via Bristol 1260; ILR Red Dragon Radio via Newport 1305. He says "It amazes me how many I can receive here!"

Reporting from Morden, Sheila Hughes says that when she is attempting to receive a local radio station for the first time she now uses the special map of UK station locations and other information detailed in *Dial Search*. This helps her set up her Vega 206 receiver on the correct frequency and her loop antenna in a suitable direction. She logged several stations for the first time during the month: BBC Radio Clwyd via Wrexham 657; ILR DevonAir via Torbay 954; BBC Radio Guernsey 1116 and ILR Hereward Radio via Peterborough 1332.

"Interesting and encouraging",

is how Leslie Hollis described his first serious attempt at local radio DXing. Using a home built "Long Arm" loop ahead of his Trio QR-66 receiver he found its performance to be quite remarkable.

Short Wave DX

More and more sunspots are now appearing upon the surface of the sun and they imply greatly improved conditions on the higher frequency bands. Despite this, the 25MHz (11m) is still not attracting the broadcasters.

In order to assess the conditions prevailing on the 28MHz (10m) amateur band, low power beacon transmitters were built and installed in many countries by radio amateurs. The signals from these beacons now indicate that signal paths all round the world are open at various times.

In view of this, there can be no doubt that broadcasters using high power transmitters and large beam antennas would have little difficulty in reaching listeners in selected target areas by opting to use the 11m band. Perhaps their reluctance is really due to the fact that many s.w. receiver

manufacturers have omitted the 11m band in their designs.

The conditions prevailing on the 21MHz (13m) band have tended to be rather unstable during the last few weeks and from time to time sudden ionospheric disturbances (s.i.d.) have occurred. Despite these effects, the broadcasts which reach the UK from southerly directions have been well received here during most days. The early morning transmissions to Europe from Radio Japan via Moyabi, Gabon 21.695 were noted in several logs. Using a Sangean ATS-803A portable with just the built-in telescopic whip antenna, Ian Baxter (Blackburn) rated their signal as SINPO 44444 at 0740.

The daily broadcasts to Europe from Radio RSA in Johannesburg, S. Africa (21.590) are popular with many listeners and the clarity of their signal leaves little room for improvement. The 55544 rating noted by John Nash at 1400 being pretty typical of the kind of signal to expect. The broadcasts to Europe from UAE Radio Dubai (21.605) have also been reaching their target well. Their programmes are mainly in Arabic, but some items in English make interesting listening. Michael Anthony (Gillingham) rated their signal as 54445 at 1200.

Using a Tatung TMR-7602 receiver in Coventry, John Chown has been listening to the programmes in English and Japanese from Radio Japan. They are relayed to Europe via Moyabi, Gabon on 21.700 at 1500. John has also been listening to the Christian Science Monitor station in Boston, USA; WCSN 21.640 at 1600. Another religious broadcaster in the USA, WYFR 21.615 beam their programmes in Eng. Port, Du and Fr to Europe via Okeechobee, FL. Kenneth Buck rated their signal in Edinburgh as 343 at 1600.

There are a number of broadcasts to other areas during the day and some of them can be received here. In Northwich, John Parry picked up Radio Nederlands via Talata Volon, Madagascar 21.480 (Du to Middle East). He rated their signal as 44554 at

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

DXers:

- A: Leo Barr, Sunderland
- B: Matthew Clarke, Birmingham
- C: Alan Curry, Stockton-on-Tees
- D: Colin Diffell, Crockham
- E: Martyn Doig, Denbigh
- F: Glen Glen-Davison, Newcastle-on-Tyne
- G: Francis Hearne, Ilford
- H: Leslie Hollis, Grantham
- I: Sheila Hughes, Morden
- J: G. Millmore, Wootton, IOW
- K: Stewart Russell, Forfar
- L: Tim Shirley, Bristol
- M: Darran Taplin, Tunbridge Wells
- N: Robert Taylor, Edinburgh
- O: Phil Townsend, London
- P: Ted Walden-Vincent, Gt Yarmouth
- Q: N. Wheatley, Newton-le-Willows
- R: Jim Willett, Grimsby
- S: David Wright, Telford

Freq kHz	Station	ILR BBC	Power in kW	DXer
585	R. Solway	B	2.00	E,J,K*,L,N,Q
603	Invicta Sound	I	0.10	B,E,H,I, M,O,P,R,S
630	R. Bedfordshire	B	0.30	E,I,M,O,P,R,S
630	R. Cornwall	B	2.00	E,L
657	R. Clwyd	B	2.00	B,E,H,I,M,R,S
666	DevonAir R.	I	0.34	M,S
666	R. York	B	0.50	C,E,H,K,N,P,Q,R
729	BBC Essex	B	0.10	E,H,I,L,M,O,R
756	R. Cumbria	B	1.00	E,F,K,N,Q,R
756	R. Shropshire	B	1.00	B,E,H,L,S
765	BBC Essex	B	0.50	E,H,L,M,O
774	R. Kent	B	0.70	H,M,O,P
774	R. Leeds	B	1.00	E,F,Q,R
774	Severn Sound	I	0.14	B,E,H,S
792	Chiltern R.	I	0.27	C,E,I*,M,O,P,R
792	R. Foyle	B	1.00	E
801	R. Devon	B	2.00	E,H,M,S
828	R. WM	B	0.20	B,E,S
828	R. Aire	I	0.12	E,R
828	Chiltern R.	I	0.20	I*,M,O,P
837	R. Cumbria	B	1.00	E,F,K*,Q
837	R. Furness	B	1.00	R
837	R. Leicestershire	B	0.70	E,I,M,O,P,R,S
855	R. Norfolk	B	1.00	I,K,M,O,P,R
855	R. Lancashire	B	1.00	E,F,H,L
873	R. Norfolk	B	0.25	E,I,M,O,P,R
936	GWR	I	0.18	D*,E,H,I M,N,R,S
945	R. Trent	I	?	E,K*,M,R,S
954	DevonAir R.	I	0.32	I
954	R. Wyvern	I	0.16	E,H,K*,M,R
990	R. Aberdeen	B	1.00	Q
990	R. Devon	B	1.00	I,M
990	Beacon R.	I	0.09	B,E,S
990	Hallam R.	I	0.25	R
999	Red Rose R.	I	0.80	F,K*,N,R
999	R. Solent	B	1.00	I,M
999	R. Trent	I	0.25	R
1026	R. Cambridgeshire	B	0.50	I,M,O,P,R,S
1026	Downtown R.	I	1.70	E,K,I*
1035	R. Kent	B	1.00	H,M,O,P
1035	Northsound R.	I	1.78	K*,N,P,Q,R
1035	R. Sheffield	B	1.00	R
1035	West Sound	I	0.32	E
1107	Moray Firth R.	I	1.50	K*
1107	R. Northampton	B	0.50	I,M,P,R,S
1116	R. Derby	B	0.50	C,E,R,S
1116	R. Guernsey	B	0.50	I,M
1152	BRMB	I	3.00	B,S
1152	R. Broadland	I	0.83	G*,R
1152	R. Clyde	I	3.60	K*
1152	LBC	I	23.50	I,M,O,P

Freq kHz	Station	ILR BBC	Power in kW	DXer
1152	Metro R.	I	1.80	Q
1152	Picadilly R.	I	1.50	E,R
1161	R. Bedfordshire	B	0.08	P
1161	R. Sussex	B	1.00	M
1161	R. Tay	I	0.70	K*,N
1161	Viking R.	I	0.35	E,P
1170	R. Orwell	I	0.28	G,M,P,R
1170	Signal R.	I	0.20	E,S
1170	R. Tees	I	0.32	Q*,R
1242	Invicta Sound	I	0.32	I,M,O,P
1251	Saxon R.	I	0.76	H,I,M,O,P,R
1260	GWR	I	1.60	D*,M
1260	Marcher Sound	I	0.64	E,S
1260	Leicester Sound	I	0.29	B,I,M,P
1260	R. York	B	0.50	A*,F,K,P
1278	Pennine R.	I	0.43	E,R
1305	Red Dragon R.	I	0.20	I,M
1323	R. Bristol	B	1.00	D,E,H
1323	Southern Sound	I	0.50	I,M,O
1332	Hereward R.	I	0.60	E,I,M,P,R
1359	Essex R.	I	0.28	M,O,R
1359	Mercia Sound	I	0.27	E,S
1368	R. Lincolnshire	B	2.00	P
1368	R. Sussex	B	0.50	I,M,O
1431	Essex R.	I	0.35	H,I,M,O
1431	Radio 210	I	0.14	I,R
1449	R. Cambridgeshire	B	0.15	E,M,P
1458	R. Cumbria	B	1.00	R
1458	R. London	B	50.00	M,O,P
1458	R. Newcastle	B	2.00	F,K*,Q,R
1458	R. Manchester	B	5.00	E
1458	Radio WM	B	5.00	S
1476	County Sound	I	0.50	I,M,R
1485	R. Humberside	B	1.00	P
1485	R. Merseyside	B	2.00	B,E
1485	R. Sussex	B	1.00	I,M
1503	R. Stoke-on-Trent	B	0.50	E,I,K*,M,S
1521	R. Mercury	I	0.64	I*,M,O
1521	R. Nottingham	B	0.50	E,R
1530	R. Essex	B	0.10	I,M,O,P
1530	Pennine R.	I	0.74	A,E,H,K*
1530	R. Wyvern	I	0.52	E,H,S
1548	Capital R.	I	97.50	M,O
1548	R. Cleveland	B	1.00	D*,Q
1548	R. Forth	I	2.20	K*,R
1557	Hereward R	I	?	M,P
1557	R. Lancashire	B	0.25	E,K
1557	Northants 96	I	0.76	R
1557	Ocean Sound	I	0.50	I
1584	R. Nottingham	B	1.00	E
1584	R. Shropshire	B	0.30	E,S
1584	R. Tay	I	0.21	K*,R
1602	R. Kent	B	0.25	E,H,M,O,P,R

SEEN & HEARD

0720. Around 1330, Darran Taplin logged Radio Moscow, USSR 21.725 (Eng to W. Africa) at 33333; Vatican Radio, Rome 21.725 (Port, Sp to S. America) at 22322; SRI Schwarzenburg, Switzerland 21.695 (Eng, Fr, Ger to S. Asia) at 34433; RBI via Nauen, GDR 21.540 (Hindi, Eng to SE. Asia) at 34433. Listening in Lockerbie, Neil Dove logged Radio DW via Wertachtal, W. Germany 21.680 (Eng to Asia) as 34443 at 1615. Around 1730, Philip Rambaut logged VOA via Monrovia, Liberia 21.485 (Swa to E. Africa) SIO 333; WYFR via Okeechobee, FL 21.525 (Eng to W. Africa) at 222; Radio Nederlands via Bonaire, Ned. Antilles 21.680 (Eng, Fr to C. Africa) at 211; BRT Brussels, Belgium 21.810 (Eng & Fr to Africa) at 322.

It seems that the broadcasts from Radio Nederlands via Talata, Volon, Madagascar (21.485) are being well received in Botswana. Using an Aiwa CS-W200 H portable with just the built-in telescopic whip antenna, P.R. Guruprasad logged them as 45454 at 0850. In contrast, he rated their broadcast to SE Asia via Madagascar on 21.480 as 51243 at 1150. Although the programmes in English from Radio DW in Cologne, W. Germany are beamed to S. Asia via Julich 21.650 and to SE Asia via Wertachtal 21.680, both transmissions are being clearly heard in Botswana (21.650) rated as 55454 at 0915 and 21.680 as 45454 at 0905.

The conditions prevailing on the 17MHz (16m) band have also been rather unstable, but many interesting broadcasts have been heard by DXers. One of the early morning long distance transmissions to reach our shores stems from Radio Japan. Their programmes in Eng and Jap are broadcast direct from Tokyo on 17.835 and may be heard from 0325. Tim Shirley has been receiving their signal clearly at 0500.

The broadcasts from Radio Australia via Shepparton and Carnarvon (17.715) to south and central Asia have been monitored on a daily basis in Torquay by George Hewlett from 0400. He found reception generally poor due to adjacent channel interference. He has also been monitoring their transmission from Shepparton to the Central Pacific area on 17.795 and has found reception to be a good deal better on that frequency, often noting SIO 434 in his log around 0600.

Listening in Wallsend at 0600, David Edwardson picked up a broadcast from FEBA Radio in Mahe, Seychelles on 17.855 (Eng to Middle East) and logged their signal as 24442. The broadcasts from KYOI in Saipan, N. Mariana Islands 17.780 (Eng to E. Asia)



Robert Taylor's "Listening Post in Edinburgh".

have been attracting the attention of Ron Proudfoot in Newcastle-upon-Tyne. He rated their signal as 35433 at 0645.

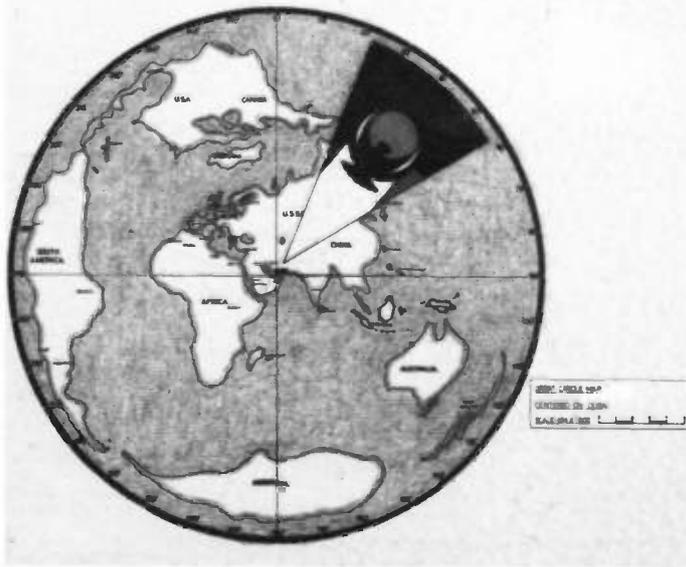
Some of the many broadcasts noted by DXers during the daytime were Radio Prague, Czechoslovakia 17.840 (Eng, Cz to S. Asia), heard at 0753 by Leo Barr; Radio Pakistan, Islamabad 17.660 (Urdu, Eng to Europe), logged by John Chown at 0900; Voice of Israel, Jerusalem 17.630, rated as 55444 at 1000 by David Wratten in Cambridge; Radio Cairo, Egypt 17.675 (Eng, Beng to S. Asia) rated as 34443 at 1257 by Darran Taplin; RCI via Sackville, E. Canada 17.820 (Eng to Central America) logged by Michael Anthony at 13.15; Radio Nederlands via Talata Volon, Madagascar 17.575 (Eng to Asia) rated as 44334 at 1500 by Christian Pritchard, using a Kenwood R2000 receiver in Cambridge.

During the late afternoon David Wratten logged RFI via Issoudun, France 17.20 (Fr, Eng to W. Africa) as 44444 at 1630 and UAE Radio Dubai 17.865 (Ar, Eng

to Europe) as 55444 at 1630. Noted in the report from Philip Rambaut were Radio Nederlands via Bonaire, Ned. Antilles 17.605 (Ar, Eng, Fr, Du to W. Africa) SIO 444 at 1750; Radio RSA Johannesburg, S. Africa 17.775 (Du to Europe) 322 at 1752; RT Morocco 17.815 (Eng) 433 at 1755; also REE via Noblejas, Spain 17.815 (Sp to S. America) 433 at 1745.

Many more broadcasts were heard during the evening. Neil Dove logged Radio DW Cologne, W. Germany 17.715 (Eng to Africa) as 44544 at 1800; VOA via Greenville, USA 17.785 (Eng to W. Africa) as 43533 at 1805; Radio RSA Johannesburg, S. Africa 17.880 (Eng to Europe) as 45544 at 1820; WYFR via Okeechobee, FL 17.845 (Eng to W. Africa) as 44544 at 2020; RCI via Sackville, E. Canada 17.875 (Eng, Fr, Russ to Europe) 55545 at 2040; WHRI South Bend, Indiana 17.830 (Eng to S. America) as 45444 at 2105.

The programmes from the Voice of Free China (VOFC) (17.750) often make interesting listening.



QSL received from UAE Radio & Television Dubai by D. B. Glover.

John Parry rated their transmission to Europe via Okeechobee, FL (Chin; Fr & Ger) as 34553 at 2055. The report from John Chown mentioned the popular broadcasts from Radio HCJV in Quito, Ecuador, he heard their transmission in English to Europe on 17.790 at 21.30.

The 15MHz (19m) band is the centre of DXing activity for many listeners and many broadcasts from several continents have been logged during the month. The reception of signals over long distance paths has been generally good, but very disturbed (s.i.d.) conditions were evident during some days, which resulted in fade-outs.

The broadcasts from Radio Australia via Shepparton 15.240 (Eng to S. Pacific 2100-0730) have been reaching the UK well around dawn. Using a JRC NRD525 receiver, Kenneth Reece monitored their transmissions in Prenton during several mornings and rated them as SINPO 54444 around 0630, falling to 45544 by 0700. George Hewlett says that reception from Australia is coming up to its summer peak. He rated their transmissions via Shepparton on 15.160 as SIO 434 at 0630; on 15.240 as 444 at 0600 and on 15.315 as 322 at 0600. Due to co-channel interference and sideband splatter he logged their transmissions via Carnarvon on 15.395 and 15.415 as unusable.

To allow for seasonal variations in propagation many broadcasters change their operating frequency in March, May, September and November. The latest changes have resulted in the broadcasts from Radio New Zealand being inaudible on 15.150 around 1830 as Radio Moscow, USSR has opted to use that frequency.

There are many direct broadcasts to Europe in a variety of languages throughout the day. Some of those received during daylight were Radio Pakistan, Islamabad 15.605 (Urdu & Eng) rated as 34554 at 0755 by John Parry; Radio Bangladesh, Dhaka 15.525 (Eng) noted as SIO 333 by Robert Taylor at 1235; WCSN in Boston, USA 15.280 (Eng, Fr & Ger) logged by Peter Hall in Chichester as SIO 433 at 1700; RHC Habana, Cuba 15.270 rated as 44434 at 1736 by Ian Baxter; UAE Radio Dubai 15.320 (Ar & Eng) logged by Ted Walden-Vincent in Gt. Yarmouth at 1730; Voice of Vietnam, Hanoi 15.010 logged by Alan Curry in Stockton-on-Tees at 1800; RNB Brasilia, Brazil 15.265 (Eng & Ger), heard by Edward Broadsmith in Worcester at 1800.

After dark many more were received, including RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Ger, Fr & It) rated as 34323 at 2030 by Jean-Yves Camus in Creteil, France; Radio Korea

Seoul, S. Korea 15.575 (Port, Eng, Ger & Sp) logged by Julian Wood in Buckie at 2030; RCI via Sackville, E. Canada 15.325 (Fr, Eng & Russ) noted as 45544 at 2100 by Christian Pritchard; Radio HCJB Quito, Ecuador 15.270 (Cz, Ger, Eng, Nor, Fr & Sp) logged by Bob Isaacs in Peterborough at 2130; VOFC Taiwan via Okeechobee, FL 15.440 (Ger & Eng) received by John Chown at 2145.

Many of the broadcasts to other areas were also logged by DXers, including Africa No.1, Gabon 15.475 (Fr & Eng to W. Africa) rated as SIO 54 at 1740 by Philip Rambaut; Radio Jamahiriya Tripoli, Libya 15.450 (Eng to Africa) noted as 44434 at 1850 by John Nash; VOA via Greenville, N. Carolina 15.205 (Eng to N. Africa) rated at 1915 by Kenneth Buck as SIO 454; AFRTS via Bethany, Ohio 15.430 logged by Cyril Kellam in Sheffield as 333 at 2030; Radio Australia via Shepparton, heard at 2200 by David Edwardson on 15.240 at 24432 and on 15.395 at 35533; KYOI Saipan, N. Mariana Islands 15.405 (Eng to E. Asia) logged by David Wratten as 32332 at 2300; VOA via Pora, Philippines 15.290 (Eng to E. Asia) rated as 35443 by Neil Dove.

Ron Proudfoot has received a QSL letter from Radio For Peace International (RFPI), which not only confirms his reception of their broadcasts on 41m (7.375 at 0305) but requests reports on their transmission via San Jose, Costa Rica on 15.495 between 2100 and 2359.

A high level of jamming is now being employed by the USSR in the 13MHz (22m) band in an attempt to prevent the broadcasts in Russian from Radio Liberty on 13.690 from reaching their target, they take place between 0700 and 1400.

The broadcasts from Radio Moscow, USSR occupy many frequencies in this band throughout the day, but some of the remaining frequencies have been adopted by other broadcasters. They include Radio Baghdad; RFI Berlin; Radio Korea, S. Korea; Radio Liberty; Radio Netherlands; Radio Pakistan; Radio Prague; Radio Pyongyang, N. Korea; Voice of Israel and WCSN, WHRI, WRNO and WYFR in the USA. Although many of their transmissions are intended for listeners in areas outside Europe, they can often be received here well. For example, the broadcasts in Czech and Eng to S. Asia from Radio Prague, Czechoslovakia (13.715) were logged by John Nash as SINPO 55444 at 1530.

The 11MHz (25m) band has a great deal to offer listeners and DXers during the day and at night. The broadcasts from Radio Australia via Shepparton 11.910 (Eng to S. Asia 0400 - 0630)

have been reaching the UK very well. The SIO 444 noted by John Berridge in Cardiff at 0600 being a typical rating.

Some of the broadcasts from several DX spots were noted in the report from John Evans: RFO Papeete, Tahiti 11.825 (Fr) rated as SIO 333 at 0800; TWR Agena, Guam 11.805 (Eng to E. Asia) 333 at 0923; KYOI Saipan, N. Mariana Islands 11.900 (Eng to E. Asia) 433 at 1030; KFBS Saipan, N. Mariana Islands 12.025 (Cant to C. Asia) 232 at 1300; AWR Agat, Guam 11.980 (Eng to S. Asia) 422 at 1500.

During the evening many broadcasters move down to this band when the higher frequencies become unreliable, consequently there is some congestion but a wide choice of station exists! The reports mentioned many of them, including Radio Pakistan, Islamabad 11.570 (Urdu & Eng to Europe) logged at 1725 by Leo Barr; Radio Kuwait, State of Kuwait 11.665 (Eng to Europe)

rated as SIO 444 by Robert Taylor; ELWA Monrovia Liberia (Ar to NW Africa) noted as 44544 at 2030 by Jean-Yves Camus; AIR via Aligarh, N. India 11.620 (Eng to Europe) logged as 43333 at 2200 by Alan Curry; RAE Buenos Aires, Argentina 11,710 (Sp, Port & Eng to N. America) heard at 2200 by Cyril Kellam; also Radio Sophia, Bulgaria 11.720 (Bul & Eng to N. America) received by Francis Heame in Ilford at 2245.

The 9MHz (31m) band was selected by Radio Australia as being the most suitable for direct transmissions to Europe and their choice has certainly proved to be a wise one. Although their broadcasts may be received on a number of frequencies in this band, listeners in Europe should tune to 9.655. Reception is generally good, the 45544 noted by Kenneth Reece at 0700 being a typical rating.

George Hewlett monitored two of their other frequencies noting 9.580 (Eng to C. Pacific) as 433

at 0800 due to adjacent channel interference; also 9.770 (Eng to SE Asia) as 433 at 1000. John Evans logged their broadcast in English and Japanese to E. Asia on 9.7810 as 343 at 1100. Ian Baxter picked up ABC Brisbane 9.660 (24 hour s.w. domestic service) at 0755, rating their signal as 12222 at 0755.

Some of the broadcasts from TWR on the remote Island of Guam, C. Pacific were received by

DXers

- A: Leo Barr, Sunderland
- B: Ian Baxter, Blackburn
- C: Alan Curry, Stockton-on-Tees
- D: Colin Diffell, Corsham
- E: Neil Dove, Lockerbie
- F: David Edwardson, Wallsend
- G: Bill Griffith, London
- H: Davy Hossack, Fremantle, W. Australia
- I: Cyril Kellam, Sheffield
- J: John Nash, Brighton
- K: Fred Pallant, Storrington
- L: Christal Pritchard, Cambridge
- M: Kenneth Reece, Prenton
- N: Tim Shirley, Bristol
- O: Darran Taplin, Tunbridge Wells
- P: Robert Taylor, Edinburgh
- Q: Ted Walden-Vincent, Gt. Yarmouth
- R: Neil Wheatley, Newcastle-upon-Tyne
- S: Jim Willett, Grimsby

Freq MHz	Station	Country	UTC	DXer
2.380	R. Ecuador, Limeira	Brazil	0230	N.S
2.560	Xinjiang	China	2250	F.N
3.205	R.Ribeirao Preto	Brazil	0230	N
3.210	R.Federacion	Ecuador	0355	M
3.210	R.Mozambique	Mozambique	0322	M,S
3.215	R.Oranje	S.Africa	0417	M,N
3.220	R.HCJB Quito	Ecuador	0437	M
3.225	R.Clube Lins	Brazil	0300	N
3.230	ELWA Monrovia	Liberia	2110	N
3.270	SWABC 1, Namibia	SW.Africa	1900	M
3.300	R.Cultural	Guatemala	0430	M,S
3.320	R.Orion	S.Africa	0230	S
3.325	FRCN Lagos	Nigeria	2200	L
3.330	R.Progreso, Piura	Peru	0451	M
3.365	R.Cultura, Araquara	Brazil	0411	M
3.365	GBC Radio 2	Ghana	2200	B,C,G,S
3.375	R.Dourados	Brazil	0430	M
3.380	R.Malawi	Malawi	2100	S
3.395	R.Zaracay	Ecuador	0335	M
3.915	BBC Kranji	Singapore	2030	H,L
3.927	Capital R.	Transkei	2100	S
3.955	BBC, Daventry	England	0536	M
3.955	R.Orion	S.Africa	2130	S
3.965	RFI Paris	France	1930	L,M
3.970	RFE Munich	W.Germany	1843	J
3.975	BBC, Skelton	England	2130	H
3.980	VOA Munich	W.Germany	0430	M
3.985	R.Beijing, China	via SRI Berne	2137	A,C,I,S
3.985	SRI Berne	Switzerland	1835	L,R
3.995	DW Cologne	W.Germany	2144	A,M,R
4.005	R.Difusora Grau	Peru	0200	N
4.035	PBS Xizang, Lhasa	Tibet	0030	S
4.080	R.Ulan Bator	Mongolia	2200	S
4.194	R.Uchiza	Peru	0308	N
4.460	R.Nor Andina	Peru	0330	N
4.680	R.Nac. Espejo	Ecuador	0502	M
4.735	Xinjiang	China	2300	F,M,R
4.740	R.Afghanistan	via USSR	1848	K,M,S
4.755	Sani Radio	Honduras	2350	S
4.760	Yunnan, Kuming	China	2200	E
4.760	ELWA Monrovia	Liberia	2130	E,S
4.760	R.Frontera	Venezuela	2359	S
4.765	R.Moscow	via Cuba	0535	M
4.770	FRCN Kaduna	Nigeria	2120	E,J,O,S
4.775	R.Gabon, Libreville	Gabon	2000	S
4.780	V.Carabobo	Venezuela	0210	S
4.785	RTM Bamako	Mali	2215	S
4.785	R.Baku	USSR	0224	M,S
4.790	R.Atlantida	Peru	0538	M,S
4.795	R.Douala	Cameroon	2020	K,M,S
4.800	R.Popular, Cuenca	Ecuador	0320	M
4.800	LNBS Lesotho	Maseru	2000	S
4.805	R.Nac. Amazonas	Brazil	2320	S
4.810	R.Yerevan	USSR	2020	D,E,M
4.815	R.diff TV Burkina	Ouagadougou	2050	J,K,M,S
4.815	R.Nac.Tabatinga	Brazil	0416	M,S
4.820	R.Botswana	Botswana	2030	E,H,M,S
4.820	R.Paz y Bien, Ambato	Ecuador	0334	M
4.820	La Voz Evangelica	Honduras	0237	J,M

Freq MHz	Station	Country	UTC	DXer
4.825	V of Selva	Peru	0030	S
4.825	R.Ashkhabad	USSR	2030	E
4.830	Africa No.1	Gabon	2000	A,B,D,E,F,K,L
4.830	R.Reijo	Costa Rica	0544	L,M,S
4.830	R.Tachira	Venezuela	0215	L,M,S
4.835	RTM Bamako	Mali	2005	K,M,R
4.840	R.Andahuaylas	Peru	0045	S
4.845	R.Nacional, Manaus	Brazil	0430	G,M
4.845	ORTM Nouakchott	Mauritania	2040	E,J,K,M,S
4.850	R.Yaounde	Cameroon	2012	B,D,E,G,J,K
4.850	R.Capital, Caracas	Venezuela	0200	M,S
4.865	PBS Lanzhou	China	2145	S
4.870	R.Cotonou	Benin	2050	B,E,K,M,S
4.875	R.Nac., Boa Vista	Brazil	0319	M,S
4.880	SABC Radio 5	S.Africa	1850	E,K,L,M,S
4.885	Voice of Kenya	Kenya	1930	K,S
4.890	RFI Paris	via Gabon	0417	M
4.890	ORTS Dhaka	Senegal	1940	K,M
4.895	R.Moscow, Kalinin	USSR	0200	L,M
4.895	R.Baré, Manaus	Brazil	0305	M
4.905	R.Nat.N'djamena	Chad	2115	B,E,K,M,S
4.905	R.Regioia, Rio	Brazil	0215	L
4.915	R.Ghana, Accra	Ghana	1950	E,F,K,S
4.915	Voice of Kenya	Kenya	1938	B,M,O
4.920	R.QUITO	Ecuador	0330	M,N,S
4.922	Ondas del Titicaca	Peru	0130	N
4.925	R.Comos,Cochabamba	Bolivia	2330	N
4.930	R.Moscow, Ashkhabad	USSR	2050	E
4.940	R.Abidjan	Ivory Coast	1945	B
4.940	R.Kiev	USSR	2200	B,L,M,R
4.940	R.Yaracuy, S.Felipe	Venezuela	0320	S
4.945	Caracol, Neiva	Columbia	0530	M,S
4.945	R.Nac.Porto Velho	Brazil	0030	S
4.955	R.Marajora, Belem	Brazil	0315	F
4.970	R.Rumbos, Caracas	Venezuela	2320	L,M
4.975	R.Timbira, Sao Luiz	Brazil	0130	S
4.975	R.Uganda, Kampala	Uganda	2015	B,K,M,O,S
4.980	Ecos del Torbes	Venezuela	0255	F,M,S
4.990	VOIRI Tehran	Iran	1946	B,R
4.990	FRCN Lagos	Nigeria	2300	C,M,O,Q,S
4.990	R.Yerevan	USSR	2117	M,O,M,S
5.005	R.Nacional, Bata	Eq.Guinea	2015	B,E,G,H,J,K
5.010	R.Garoua	Cameroon	1950	B,K,M,S
5.015	R.Moscow Arkhangelsk	USSR	1950	E,K
5.020	ORTN Niamey	Niger	2000	H,S
5.025	R.Rebelde, Habana	Cuba	0357	M
5.025	R.Uganda, Kampala	Uganda	1940	K
5.030	R.Impacto	Costa Rica	0500	F,M
5.035	R.Alma Ata	USSR	0604	M
5.035	R.Bangui	C.Africa	2040	E,K,S
5.040	Vos del Upano, Macas	Ecuador	2350	S
5.045	R. Cultura do Para	Brazil	0250	F,M
5.045	R.Togo, Lome	Togo	2120	E,K
5.050	Voz de Yopal, Yopal	Columbia	0100	S
5.057	R.Tirana Gjrokaster	Albania	2145	M,R
5.065	R.Candip, Bunia	Zaire	2020	K,M
5.095	R.Sutatenza, Bogota	Columbia	0235	E,F,J,S
5.125	R.Beijing	China	2035	J
5.290	R.Moscow Krasnoyarsk	USSR	2324	M

SEEN & HEARD

John Evans during the afternoon. He logged their transmission on 9.785 (Jap to E. Asia) as SIO 333 at 1200; 9.820 (Jap & Cant to E. Asia) as 333 at 1205; also 9.870 (Eng to S. Asia) as 444 at 1510. Listening in Freemantle, W. Australia Davy Hossack has also been hearing their broadcasts, he noted their transmission on 9.820 as 434 at 1600.

A number of other broadcasts intended for listeners in areas outside Europe were mentioned in reports: Bamako, Mali 9.635 (Fr to Africa) logged by David Edwardson as 34553 at 0715; IBRA Radio Stockholm via Malta 9.765 (Sunday only) rated as SIO 444 at 0700 by Cyril Kellam; BBC via Kranji, Singapore 9.605 (Tamil & Beng to S. Asia) logged by P.R. Guruprasad as 43443 at 1620; WYFR via Taipei, Taiwan 9.955 noted as 444 at 1702 by Philip Rambaut; Radio Sana, N. Yemen 9.780 (Ar) rated as 44444 at 1950 by Jean-Yves Camus; Radio Austria Int., Vienna 9.585 (Eng & Ger to E. Asia) logged at 2130 by Francis Heame; Voice of Turkey, Ankara 9.445 noted as 44444 at 2200 by Alan Curry; Radio Oman 9.735 (Ar to N. Africa) noted by Jean-Yves Camus as 34433 at 2200.

Many broadcasters beam their

programmes to Europe during the evening. Reports included the Voice of Greece, Athens 9.425 (Ger & Eng) rated as 333 at 1915 by Robert Taylor; VOIRI Tehran, Iran 9.022 (Tur & Eng) logged at 1930 as SIO 444 by Neil Wheatley in Newcastle-upon-Tyne; Radio Beijing via Kunming, S. China 9.290 (Russ) noted by Neil Dove as 42542 at 2000; Voice of Israel, Jerusalem 9.815 (Heb, Eng, Fr & Russ) logged by Ted Walden-Vincent at 2045; REE via Arganda, Spain 9.765 (Fr & Eng) heard by Phil Townsend at 2100.

Many of the European broadcasters use the 7MHz (41 m) band throughout the day, but a number of transmissions from more distant areas may be received too. Noted in the reports during the evening were Radio Australia via Carnarvon 7.205 (Eng to S. Asia) heard at 1800 by Peter Vlietinck in London; Radio Kiev, USSR 7.240 logged at 1900 by Julian Wood; AIR New Delhi, India 7.412 (Eng to Europe) received by Edward Broadsmith at 1945.

Later, several more were heard including Beijing, China 7.935 (Prog.1. in Mand) logged by Michael Anthony at 2045; Radio Korea, Seoul 7.550 (Ar, Ger & Eng

to Europe) rated as 44433 by Neil Dove at 2050; WHRI South Bend, USA 7.400 (Eng to Europe) noted as 43333 at 0200 by Christian Pritchard; FRCN Nigeria 7.255 (Hausa, Eng & Fr to W. Africa) logged at 0500 by Kenneth Reece.

Many of the broadcasts in the 6MHz (49m) band are intended for listeners in Europe. Listening during the early evening, Colin Diffell logged several of them in Corsham: Radio Nederlands via Flevoland 6.020 (Eng); RFI via Issoudun, France 6.045 (Russ, Fr & Pol); Radio DW via Wertachtal, W. Germany 6.075 (Ger); RBI via Nauen, GDR 6.080 (Dan & Eng); Radio TV Luxembourg 6.090 (Ger); RBI via Konigswusterhausen, GDR 6.115 (Eng & Ger); Radio Finland, Helsinki 6.120 (Fr, Eng & Sw) Later, Radio Pyongyang, N.Korea 6.576 (Eng & Fr to Europe) was heard by Alan Curry, he noted their signal as 33233 at 2030.

Radio Australia uses this band to reach listeners in S. Asia, but their transmission via Carnarvon on 6.035 often reaches the UK around 1600. Stewart Russell, who often monitors their broadcasts in Forfar until close down at 2100, has found reception to be generally poor recently and

the severe adjacent channel interference from broadcasters located in Europe makes matters a good deal worse.

Much later, some of the broadcasts from other distant places may be heard: AIR via Aligarh, N. India 6.110 (Nep & Tib) was logged at 0130 by Michael Anthony. Tim Shirley heard Radio Reloj, Costa Rica 6.005 (Sp) at 0330 and Radio Inconfidencia, Brazil 6.010 (Port) at 0430.

Abbrv.	Language
Ar	Arabic
Beng	Bengali
Bul	Bulgarian
Cant	Cantonese
Chin	Chinese
Cz	Czechoslovakian
Dan	Danish
Du	Dutch
Eng	English
Fr	French
Ger	German
Heb	Hebrew
Hind	Hindustani
Hung	Hungarian
It	Italian
Jap	Japanese
Mand	Mandarin
Nep	Nepali
Norw	Norwegian
Pol	Polish
Port	Portuguese
Russ	Russian
Sp	Spanish
Swa	Swahili
Sw	Swedish
Tib	Tibetan
Tur	Turkish

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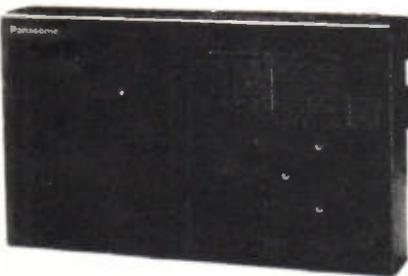
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**Grundig Yacht Boy 215
Portable Receiver**



- **COVERAGE:** 150 – 260kHz, 510 – 1620kHz, 5.9 – 21.9MHz, 87.7 – 108MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:**
- **RESOLUTION:**
- **SELECTIVITY:**
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 0.4 watts
- **IF STAGE:**
- **FEATURES:** Carrying strap; 3.5mm headphone socket; l.c.d. clock and snooze and sleep facilities
- **REVIEWED:**
- **PRICE:**

**Panasonic RF1680L
Portable Receiver**



- **COVERAGE:** l.w.: 150 – 285kHz; m.w.: 520 – 1610kHz; s.w.: 5.9 – 18MHz; f.m.: 87.5 – 108MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:** l.w.: 56.3µV/m/50mW output; m.w.: 56.3µV/m/50mW output; s.w.: 11.2µV/50mW output; f.m.: 0.4µV/50mW output (– 3dB limit sens)
- **RESOLUTION:**
- **SELECTIVITY:**
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 1.2W r.m.s.
- **IF STAGE:** l.w., m.w., s.w.: 455kHz; f.m.: 455kHz
- **FEATURES:**
- **REVIEWED:** Short Wave Magazine July 1988
- **PRICE:** £39.95

**Sony ICF-5100
Portable Receiver**



- **COVERAGE:** m.w.: 530 – 1605kHz; s.w.1: 5.85 – 6.35MHz; s.w.2: 6.95 – 7.45MHz; s.w.3: 9.4 – 9.9MHz; s.w.4: 11.6 – 12.1MHz; s.w.5: 15 – 15.5MHz; s.w.6: 17.55 – 18.05MHz; s.w.7: 21.4 – 21.9MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:** m.w.: 36dBµV, s.w.: 1dBµV (9.6MHz), f.m.: 13dBµV
- **RESOLUTION:**
- **SELECTIVITY:** ± 7.2kHz (– 50dB)
- **IMAGE REJECTION:** m.w.: 32dB (1605kHz), s.w.: 49dB, f.m.: 30dB
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 100mW at 10% t.h.d.
- **IF STAGE:** m.w.: 455kHz, s.w.: 10.7MHz & 455kHz, f.m.: 10.7MHz
- **FEATURES:**
- **REVIEWED:**
- **PRICE:** £80

WHAT RECEIVER

**Uniden CR-2021
Portable Receiver**

- **COVERAGE:** 150 – 29,999MHz, 76 – 108MHz
- **MODES:** a.m., s.s.b., f.m.
- **SENSITIVITY:** Input for 10dB (S + N)/N, a.m. 5µV s.s.b./c.w. 5µV, f.m. 2µV for 6dB (S + N)/N
- **RESOLUTION:** 1, 3, 50 or 100kHz
- **SELECTIVITY:** narrow 5kHz at – 6dB, 10kHz at – 50dB wide 6kHz at – 6dB, 12 kHz at – 50dB
- **IMAGE REJECTION:** 70dB at 7.1MHz, 26dB at 106MHz.
- **IF REJECTION:** 80dB (1st i.f.), 60dB (2nd/3rd i.f.) at 7.1MHz, 70dB at 78MHz
- **SPURIOUS REJECTION:** 60dB
- **FREQUENCY STABILITY:** within ± 1kHz after one hour
- **AUDIO OUTPUT:** 1.2W in 4Ω for 10% distortion
- **IF STAGE:** 1st 65.15MHz, 2nd 10.7MHz, 3rd 455kHz f.m. 10.7MHz
- **FEATURES:** Available on second-hand market
- **REVIEWED:** Practical Wireless June 1984
- **PRICE:** Available on second hand market

**Grundig Satellit 650 International
Multi-band Portable Receiver**



- **COVERAGE:** 148 – 420kHz, 510 – 1620kHz, 1.6 – 30MHz, 87.5 – 108MHz
- **MODES:** a.m., f.m., s.s.b. (u.s.b. & l.s.b.)
- **SENSITIVITY:**
- **RESOLUTION:** 1, 5, 10, 100kHz
- **SELECTIVITY:**
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 15 watts
- **IF STAGE:**
- **FEATURES:** Sockets for external antenna, line in, line out, cassette recorder, external loudspeakers and headphones; clock; mains or battery operated; peak tuning meter and separate bass and treble controls.
- **REVIEWED:**
- **PRICE:**

**Sony ICF-7600DS
Portable Receiver**



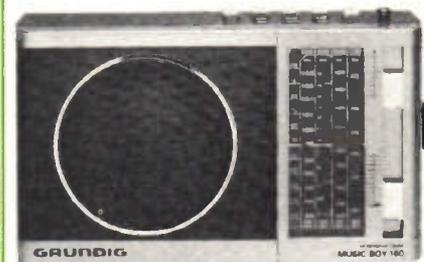
- **COVERAGE:** l.w.: 153 – 519kHz, m.w.: 522 – 1611kHz, s.w.1: 3.9 – 3.995MHz, s.w.2: 4.7 – 5.195MHz, s.w.3: 5.9 – 6.195MHz, s.w.4: 7.1 – 7.395MHz, s.w.5: 9.5 – 9.995MHz, s.w.6: 11.6 – 12.195MHz, s.w.7: 13.5 – 13.795MHz, s.w.8: 15.1 – 15.595MHz, s.w.9: 17.5 – 17.995MHz, s.w.10: 21.4 – 21.9MHz
- **MODES:** a.m., c.w., s.s.b., f.m.
- **SENSITIVITY:** l.w., m.w.: 37dBµV (999kHz); s.w.: 3dBµV, f.m.: 9dB
- **RESOLUTION:** l.w.: 3kHz, m.w.: 10kHz, s.w.: 5kHz, f.m.: 100kHz
- **SELECTIVITY:** l.w., m.w., s.w.: ± 5.6kHz (– 50dB); f.m.: 53dB (± 400kHz)
- **IMAGE REJECTION:** 50dB
- **IF REJECTION:** l.w., m.w., s.w.: 68dB; f.m.: 40dB
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 450mW at 10% t.h.d.
- **IF STAGE:** l.w., m.w., s.w.: 55.845MHz & 455kHz; f.m.: 10.7MHz
- **FEATURES:**
- **REVIEWED:**
- **PRICE:** £180

**Panasonic RXC34L
Portable Stereo System**



- **COVERAGE:** l.w.: 148.5 – 285kHz; m.w.: 520 – 1610kHz; s.w.: 5.9 – 18MHz; f.m.: 87.5 – 108MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:** l.w.: 141µV/m/50mW output; m.w.: 79µV/m/50mW output; s.w.: 4µV/50mW output; f.m.: 1.8µV/50mW output (– 3dB limit sens)
- **RESOLUTION:**
- **SELECTIVITY:**
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 8W r.m.s. max
- **IF STAGE:** 470kHz, 10.7MHz
- **FEATURES:**
- **REVIEWED:**
- **PRICE:** £59.95

**Grundig Music Boy 160
Portable Receiver**



- **COVERAGE:** 150 – 260kHz, 510 – 1620kHz, 87.5 – 108MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:**
- **RESOLUTION:**
- **SELECTIVITY:**
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 1.5 watts
- **IF STAGE:**
- **FEATURES:** 3.5mm headphone socket
- **REVIEWED:**
- **PRICE:**

**Matsui MR4099
Portable Receiver**



- **COVERAGE:** 150 – 29,999MHz, 87.5 – 108MHz
- **MODES:** a.m., f.m., s.s.b., c.w.
- **SENSITIVITY:** for 12dB SINAD with 90% a.m. 2.4MHz – 114dBm, 3.3MHz – 113dBm, 4.9MHz – 112dBm, 6.0MHz – 111dBm, 11.8MHz – 109dBm, 25.8MHz – 109dBm, 800kHz – 112dBm, 200kHz – 98dBm, f.m. with 45kHz deviation 96MHz – 94dBm
- **RESOLUTION:** 1, 9, 10 or 50kHz
- **SELECTIVITY:** narrow ± 2.3kHz at 6dB, ± 10kHz at 60dB, wide ± 4.7kHz at 6dB, ± 10kHz at 60dB
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 1.2W for 10% distortion
- **IF STAGE:** AM1 55.845MHz, AM2 450kHz, FM 10.7MHz
- **FEATURES:** External antenna socket, sleep timer; b.f.o. control; l.e.d. signal strength indicator and 9 memories
- **REVIEWED:** Short Wave Magazine September 1987
- **PRICE:** £99.99

**Panasonic RF-B40DL
Multi-band Portable Receiver**



- **COVERAGE** l.w. 146 – 288kHz, m.w. 520 – 1611kHz, s.w. 1.615 – 29.995MHz, f.m. 87.5 – 108MHz
- **MODES** a.m., f.m.
- **SENSITIVITY** f.m. 2.5µV, l.w. 563µV at 281kHz S/N 20dB, m.w. 45µV, s.w. 11µV at 6MHz S/N 20dB
- **RESOLUTION** 5 and 9kHz
- **SELECTIVITY**
- **IMAGE REJECTION**
- **IF REJECTION**
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 550mW (r.m.s. max)
- **IF STAGE** 459kHz (a.m.)
- **FEATURES** Mains adaptor included; operation key lock switch; a.m. sensitivity switch; 27-station pre-set tuning and I.c. display
- **REVIEWED** Short Wave Magazine September 1987
- **PRICE** £139.95

**Sony ICF-7600DA
Portable Receiver**



- **COVERAGE** f.m.: 87.5 – 108MHz, l.w.: 150 – 285kHz, m.w.: 531 – 1602kHz, s.w.l.: 3.050 – 3.565MHz, s.w.2: 3.7 – 4.215MHz, s.w.3: 4.65 – 5.165MHz, s.w.4: 5.8 – 6.315MHz, s.w.5: 6.95 – 7.465MHz, s.w.6: 9.375 – 10.010MHz, s.w.7: 11.525 – 12.16MHz, s.w.8: 13.375 – 14.010MHz, s.w.9: 14.975 – 15.61MHz, s.w.10: 17.475 – 18.11MHz, s.w.11: 21.325 – 21.96MHz, s.w.12: 25.475 – 26.1MHz
- **MODES** a.m., f.m.
- **SENSITIVITY** l.w. & m.w.: 31dBµV at 999kHz, s.w.: 3dBµV, f.m.: 10dBµV
- **RESOLUTION** 5kHz on s.w., 3kHz on l.w., 3/10kHz on m.w., 50kHz on f.m.
- **SELECTIVITY** l.w., m.w. & s.w.: ±6.5kHz – 50dB, f.m.: 53dB (±400kHz)
- **IMAGE REJECTION** 63.5dB on s.w. and m.w. 44.5dB on l.w.
- **IF REJECTION** 50dB
- **SPURIOUS REJECTION** 50dB
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 450mW at 10% t.h.d.
- **IF STAGE** 10.7MHz 455kHz
- **FEATURES** digital and analogue display, clock and alarm, 15 memories, telescopic antenna
- **REVIEWED** Short Wave Magazine August 1987
- **PRICE** £159.95

**Realistic DX-360
Portable Receiver**



- **COVERAGE** l.w.: 150 – 265kHz, m.w.: 520kHz – 1620kHz, s.w.1: 4.5 – 5.5MHz, s.w.2: 5.8 – 7.5MHz, s.w.3: 8.2 – 10MHz, s.w.4: 11.4 – 14MHz, s.w.5: 14.6 – 18.2MHz, s.w.6: 21 – 26.1MHz
- **MODES** a.m., f.m.

WHAT RECEIVER

**Grundig Satellit 400 International
Multi-band Portable Receiver**



- **COVERAGE** 148 – 353kHz, 513 – 1611kHz, 1.6 – 30MHz, 87.5 – 108MHz
- **MODES** a.m., f.m., s.s.b.
- **SENSITIVITY**
- **RESOLUTION**
- **SELECTIVITY**
- **IMAGE REJECTION**
- **IF REJECTION**
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 3 watts
- **IF STAGE**
- **FEATURES** Automatic waveband scan; i.c.d. clock; sockets for headphones, external antenna, line in, line out and external d.c. supply and peak tuning meter.
- **REVIEWED**
- **PRICE**

**Panasonic RF-B10
Compact Portable Receiver**



- **COVERAGE** m.w. 520 – 1610kHz, s.w.1 5.95 – 6.20MHz, s.w.2 7.10 – 7.30MHz, s.w.3 9.50 – 9.90MHz, s.w.4 11.65 – 12.05MHz, s.w.5 15.10 – 15.60MHz, s.w.6 17.55 – 17.90MHz, f.m. 87.5 – 108MHz
- **MODES** a.m., f.m.
- **SENSITIVITY** f.m. 3µV, m.w. 100µV, s.w. 4µV
- **RESOLUTION**
- **SELECTIVITY**
- **IMAGE REJECTION**
- **IF REJECTION**
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 200mW
- **IF STAGE**
- **FEATURES** Operation hold switch; a.m. sensitivity switch; i.e.d. tuning indicator, carrying case and earphone included.
- **REVIEWED**
- **PRICE** £59.95

- **SENSITIVITY** At –6dB; 600kHz, 250µV; 1000kHz, 250µV; 1400kHz, 250µV
- **RESOLUTION**
- **SELECTIVITY** At 600kHz; 28dB normal 20dB limit; at 1MHz; 30dB normal 24dB limit; at 1.4MHz; 38dB normal 30dB limit
- **IMAGE REJECTION** l.w.: 260kHz 36dB; a.m.: 1400kHz 38dB; f.m.: 106MHz 34dB; s.w.1.: 5.5MHz 22dB; s.w.2: 7.4MHz 20dB; s.w.3: 10MHz 18dB; s.w.4: 14MHz 16dB; s.w.5: 18MHz 14dB; s.w.6: 26MHz 10dB
- **IF REJECTION** l.w.: 260kHz 28dB; a.m.: 600kHz 28dB; f.m.: 90MHz 85dB; s.w.1: 4.5MHz 70dB; s.w.2: 6MHz 75dB; s.w.3: 8.4MHz 78dB; s.w.4: 11.5MHz 80dB; s.w.5: 15MHz 80dB; s.w.6: 21MHz 80dB
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 660mW
- **IF STAGE** 10.7MHz
- **FEATURES** telescopic antenna, low battery indicator, wrist strap
- **REVIEWED** Short Wave Magazine July 1987
- **PRICE** £59.95

**Sony ICF-PRO80*
Portable Receiver**



- **COVERAGE** 150kHz – 108MHz; 115.15MHz – 223MHz (using supplied frequency converter)
- **MODES** a.m., f.m., n.b.f.m.
- **SENSITIVITY** l.w., m.w.: 42dBµV (999kHz), s.w.: 2dBµV (ext a.m.), –4dBµV (ext n.b.f.m.), f.m.: 9dBµV
- **RESOLUTION** l.w.: 3kHz, m.w.: 10kHz, s.w.: 5.50kHz, f.m.: 50kHz
- **SELECTIVITY** ±3.8kHz/±6kHz (50dB)
- **IMAGE REJECTION** 77dB
- **IF REJECTION** 63dB
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 500mW at 10% t.h.d.
- **IF STAGE** l.w., m.w. & s.w.: 55.85MHz, 455kHz; f.m.: 50kHz
- **FEATURES**
- **REVIEWED** Short Wave Magazine March 1988
- **PRICE** £350

**Panasonic RF-B60
Portable Receiver**



- **COVERAGE** l.w.: 155 – 519kHz, m.w.: 522 – 1611kHz, s.w.: 1.615 – 29.999MHz, f.m.: 87.5 – 108MHz
- **MODES** a.m. and f.m.
- **SENSITIVITY** +21dBµV at 3MHz
- **RESOLUTION** 5kHz steps on s.w., 9kHz on m.w. and l.w., 100kHz steps on v.h.f. f.m., 1kHz fine tune on l.w., m.w. and s.w.
- **SELECTIVITY** 6dB at ±3.1kHz, 60dB at ±6.35kHz
- **IMAGE REJECTION** 60dB
- **IF REJECTION**
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 550mW
- **IF STAGE** 450kHz, 10.7MHz, 55.845MHz
- **FEATURES** S-meter, telescopic antenna, 36 memory channels, digital display, scanning, dual-time clock and alarm, timer, external antenna socket, headphones socket
- **REVIEWED** Short Wave Magazine May 1987
- **PRICE** £170

**Panasonic RF-B20L
Compact Portable Receiver**



- **COVERAGE** l.w. 150 – 285kHz, m.w. 520 – 1610kHz, s.w.1 5.95 – 6.20MHz, s.w.2 7.10 – 7.30MHz, s.w.3 9.50 – 9.90MHz, s.w.4 11.65 – 12.05MHz, s.w.5 15.10 – 15.60MHz, s.w.6 17.55 – 17.90MHz, s.w.7 87.5 – 108MHz
- **MODES** a.m., f.m.
- **SENSITIVITY** l.w. 126µV, m.w. 100µV, s.w. 1.4µV (average), f.m. 2µV
- **RESOLUTION**
- **SELECTIVITY**
- **IMAGE REJECTION**
- **IF REJECTION**
- **SPURIOUS REJECTION**
- **FREQUENCY STABILITY**
- **AUDIO OUTPUT** 400mW
- **IF STAGE**
- **FEATURES** Operation hold switch; i.e.d. tuning indicator and external speaker/earphone socket
- **REVIEWED**
- **PRICE** £74.95

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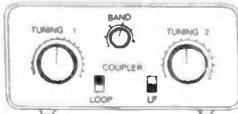
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