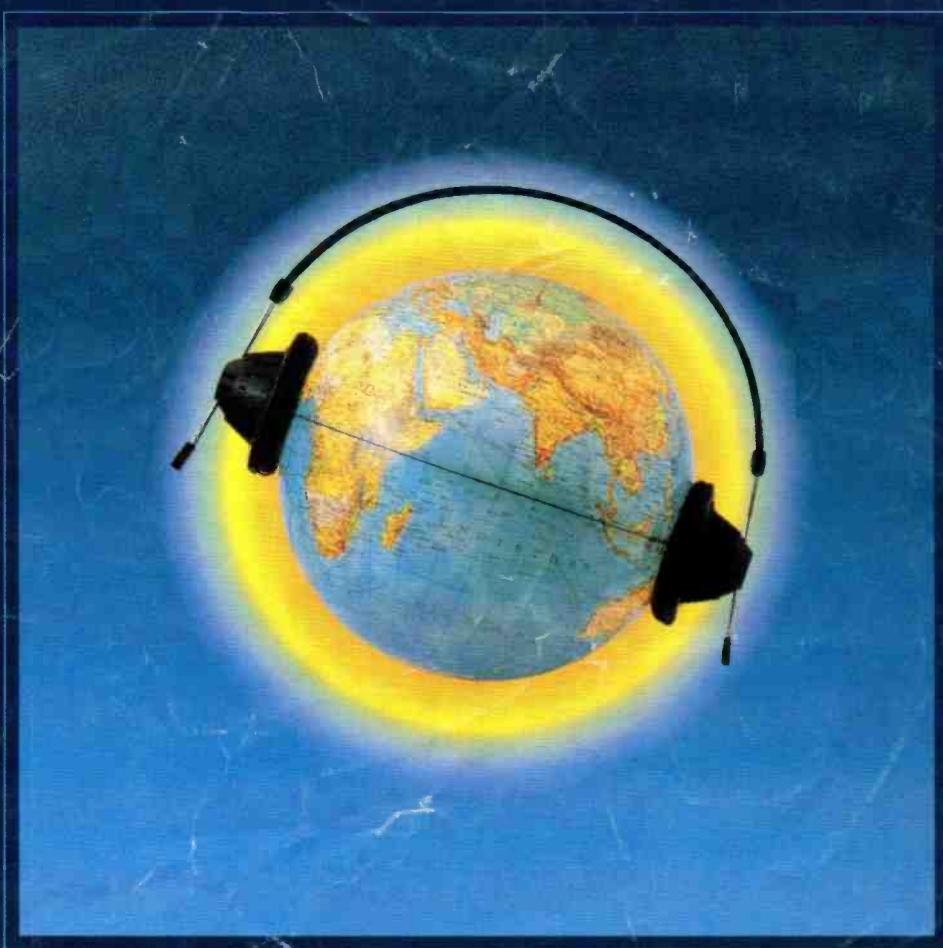


Shortwave Magazine

ISSN 0037-4261

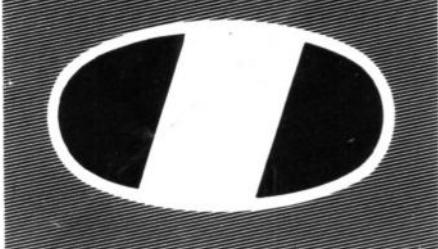
£1.45

OCTOBER 1987



**FAX SPECIAL ISSUE
In Search of Super DX
DX-TV-3**

for The Radio Listener



ICOM

Communications

IC-R7000, 25-2000MHz.

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 HP1 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 FM. Twin VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter. With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control.

Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.

Telephone us free-of-charge on:

HELPLINE 0800-521145.

Mon-Fri 09 00-13 00 and 1400-17 30

This is strictly a helpline for obtaining information about or ordering ICOM equipment. We regret this service cannot be used by dealers or for repair enquiries and parts orders. Thank you.

You can get what you want just by picking up the telephone. Our mail order department offers you free same day despatch whenever possible, instant credit, interest free H.P., Barclaycard and Access facility, 24 hour answerphone service



Datapost



ICOM

ICOM (UK) Limited

Dept SW, Sea Street, Herne Bay, Kent CT6 8LD

Tel: (0227) 363859 Telex: 965179 ICOM G

I16| Bandsan



Cover Colourful QSL cards are part of the reward for patient broadcast band DXing. Our cover this month features the "Rundfunk für 5 Kontinente" QSL card from Deutsche Welle — the Voice of Germany. Each month Bandsan, together with the Long Medium & Short section of Seen & Heard, will keep you up-to-date with all that is happening on the short wave broadcast bands around the world.

Unfortunately, Peter Shore's article on the mysterious number stations has had to be held over through lack of space.

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FIRST WORD

This issue majors in on Facsimile or FAX — a mode which is growing in popularity, probably as a result of the growing use of the home computer in radio.

You will be able to find out all about FAX, what it is and how it works as well as read the reviews of two pieces of equipment aimed at the s.w.l. who wants to get into FAX.

It is not my intention to devote large parts of each issue to "Special" topics, but it is an efficient way of introducing readers to new modes.

Those of you interested in airband, and associated radio will be pleased to know that Godfrey Manning's column is now attracting a growing input from readers. I have also started to receive articles, or ideas for



articles, on various topics associated with this popular branch of the listening hobby, and these should see the light of day in future

issues of the magazine.

Are you still having difficulties in obtaining copies of *Short Wave Magazine*? If so please write and let me know. I need to know the name and address of your newsagent as well as just what sort of problems you have, or tell stories you are told as to why the magazine is not available. As I have said in a previous issue, there should be no earthly reason stopping your newsagent from obtaining copies for you — he cannot lose out as it is on sale or return anyway.

Of course, you could always take out a subscription and really make certain of getting your copy — and earlier than you could from the shop, to boot!

DICK GANDERTON

A WORD IN EDGEWAYS

Sir

I feel I must write again, hopefully for the last time, on the subject of clandestine and pirate radio stations.

First of all I would like to comment on some of the replies in the August and September issues.

Norman Fitch G3FPK, as can be seen by his reply is a radio amateur, the majority of whom don't agree with pirate radio, so his negative response was to be anticipated. Indeed, a large number of radio amateurs aren't even interested in DXing legal broadcast stations never mind the rebels and pirates. Mr Fitch states that by mentioning such stations SWM would be getting too political. Well, Mr Fitch, you tell me the difference between Radio Moscow and The Voice of The Burmese People? Nothing! Because both stations spurt out Communist propaganda. So SWM is hardly being political by printing such a station's frequency, is it? Also it's hardly the "crime of the century" to tune in to these stations, and even if it is, then "the law is an ass", as they say!

Let's just pretend Mr Fitch is right, and it is being too political. If so then I think SWM should also stop printing details on the following stations, all of which are propaganda machines: — Moscow, VOA, Berlin, Libya, Vietnam, South Africa, Iran, Iraq, Israel, Albania, etc, etc. Now this is obviously being a little ridiculous, just like Mr Fitch's views, so hopefully, this course of action won't have

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.

to be taken.

Although clandestines are political in programme content, pirates most certainly are not. Ninety-nine per cent of pirates are non-political and programme output is mainly music. Now the majority of letters in the September issue were a bit more sympathetic to my views on the subject, viz. P. Townsend and K. Lancaster. So there is obviously a good proportion of your readers who would like the pirate and rebel subject covered. Indeed, in time, I think SWM would increase its readership as more and more people discovered that it contained "Free Radio" news. Pirates, especially, are very popular and some of the underground magazines available in the UK today have many hundreds of subscribers, some of whom may even begin to buy SWM if it started featuring these stations regularly.

You only have to look in the current WRTH under "Clubs for DXers" and you'll see the large number of clubs that cater for the clandestine and pirate enthusiasts. Hardly a "minority" is it?

I tune to the pirates mainly because they're good DX catches and one may never hear them again. They either close down, change station ID or move frequency, etc. I listen to them because they play better music than the BBC and ILR. Also I live at just the right distance from

Ireland to enable me to hear their east coast a.m. stations during the day and some of their west coast — via skywave — at night. So I have many hours of fun DXing. And FUN is really what it's all about! The same goes for the clandestine stations. It's just the fun of DXing that rare station that makes it so appealing.

For instance, at the moment, the Contra rebels have a clandestine radio station in Central America. Now, what if there was a revolution in Nicaragua and the Contras seized power? Well, I bet it would only be a matter of weeks before a brand new clandestine station took to the air, run, of course, by the left-wing Sandanistas. So, as you can see, the clandestine radio world is just as fast moving as the pirate radio world.

Anyway, now I must congratulate SWM on a couple of bits of news in the September issue.

"Bandscan" mentions clandestine radio in Northern Sri Lanka run by Tamil Separatists, and "Seen & Heard LM&S" again mentions Radio Monique 963kHz.

Anyway, let's hope SWM has even more news on the "free" stations in the coming months. Thank you.

GARY MARSHALL
MERSYSIDE

This topic has certainly set the cat amongst the pigeons. My

main concern is to keep politics out of the magazine, and although I personally cannot see any harm in listening to this type of station my blue pencil will certainly be wielded on the blatantly political bits. As I said in a previous issue, what one person would consider to be politically acceptable would be grossly offensive to another. Where clandestine or pirate stations are newsworthy, in a radio sense, then I will consider very carefully the merits of carrying such reports in SWM ED

Sir

I have read Gary Marshall's letter concerning pirate stations and the replies to it in the August issue of Short Wave Magazine. Speaking for myself, I agree with Mr. Marshall's idea of a "Seen & Heard" section for pirate and rebel stations.

For rebels, the best way for them to say that what they believe is right is through radio. A lot of rebel stations in Africa, Asia and the Middle East have a right to rebel against their governments. After all, many governments in that area are harsh and undemocratic.

Anyway, mentioning these stations in "Seen & Heard" does not mean that Short Wave Magazine agrees with and supports them.

Also, it should be remembered that not all these stations are politically biased. For instance, Radio Caroline was not politically motivated, even though this station was illegal.

Perhaps people who disagree with rebel and pirate stations should take these factors into account.
DANIEL MASTERSON

A WORD IN EDGEWAYS

Sir

I was very interested in your remarks about the old Philips radio that you had. I well remember these sets. Most would outperform, even today, many of the modern portables, and the audio quality would certainly be better.

I also agree that the youngsters are missing out a lot, not only from the practical side of geography, but from the technical knowledge that could be

gained from these old receivers.

One of the easiest ways to learn the techniques of radio was to find an old set that did not work, get a service sheet, and then take the thing to pieces, and find out why it didn't work.

Unfortunately, that is not so practical with modern printed circuit sets. Also many of the old sets were far better for DXing than some of

the modern counterparts, even though they did not have digital readout.

Anyone can push a few buttons and receive a powerful station from the other side of the world with a modern synthesised, computerised and every-other-ised "black box". You might just as well use the phone and ring up the station. True DXing is having a set that will do what you want it

to do — not what the set thinks it ought to do — finding a weak signal on the dial, and then, using your skill, coaxing the last ounce of energy from the set to get the signal audible. Maybe I am old fashioned, but I would challenge anyone to pick up a station on their "black box" that I cannot get as well, or even better, on my Racial or Eddystone valved receivers.

GEORGE MILLMORE
RYDE, IoW

WHAT'S NEW

Solomon Islands join ITU

On July 27 the Solomon Islands deposited its *Instrument of Accession to the International Telecommunication Convention* with the Secretariat of the ITU, thereby becoming the 163rd member of the Union.

The Solomon Islands gained their independence on July 7 1978. Situated in the Melanesia Archipelago, the nine main islands, Choiseul, Santa Isabel, Malaita, Vella Lavella, New Georgia, Guadalcanal, Russell, Florida and San Christobel together with the small archipelago of Santa Cruz, have a total area of 30000km² and an estimated population of 259000 who have 4550 telephones and 24000 radio receivers between them. The capital, Honiara, is the only large town with a population of 15000.

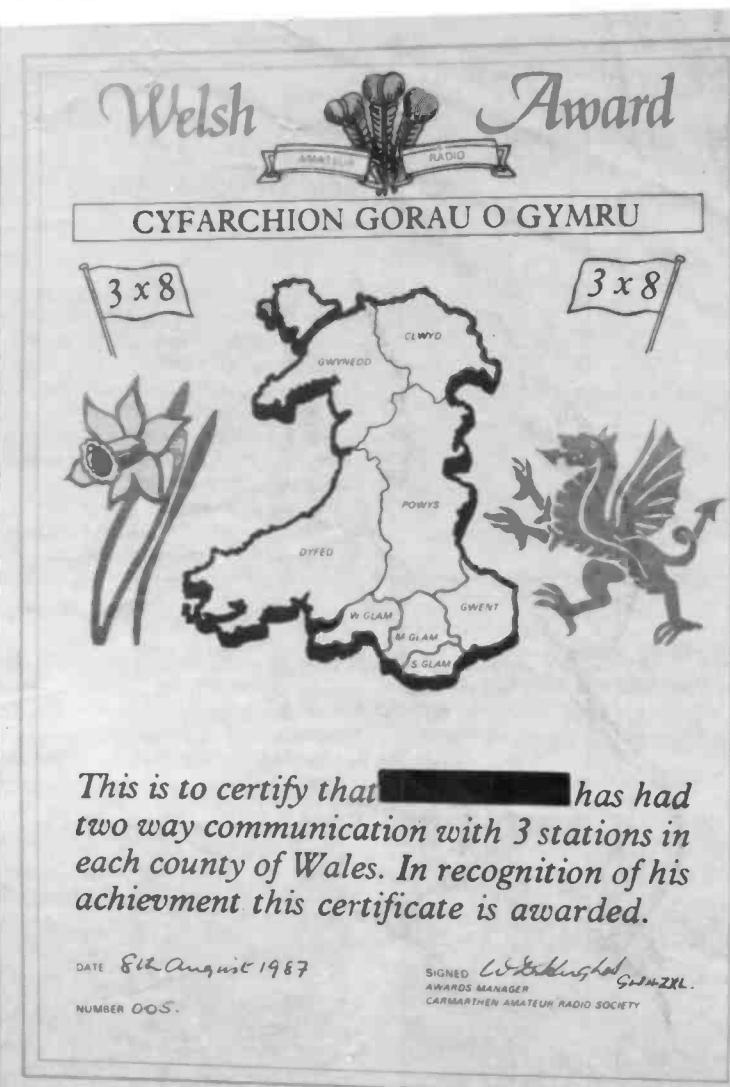
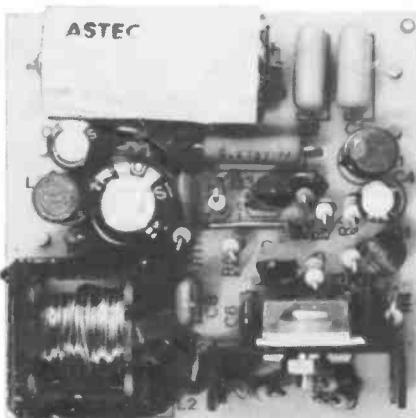
Switch-mode PSU

Do you need a stable 5V d.c. supply capable of operating at currents up to 2A? If so this small module, just 50mm square, will interest you.

The Astec AA7271 switch-mode p.s.u. has a six-transistor circuit and accepts up to 24V d.c. input. Current overload protection, thermal cut-out and excellent filtering are provided.

The AA7271 is available at the remarkably low price of £5.00 inc. postage and VAT from:

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



Welsh Award

The Carmarthen Amateur Radio Society have agreed to run a *Welsh Award* covering the eight counties making up Wales.

The Award will be available to short wave listeners on a "heard" basis and requires you to hear three confirmed contacts, using any mode, in each Welsh county, i.e. 24 in total.

Only contacts heard after March 1 1987 are valid for the Award.

The fee for the Award is £1.50 or eight

IRCs and cheques or Postal Orders should be made out to the Carmarthen ARS.

Rules and details are available from:

Awards Manager
Carmarthen ARS
PO Box 4
Carmarthen
Dyfed
SA31 1AA
Wales

WHAT'S NEW

Airband Receiver

The new International Model 877R Airband receiver from R. Withers Communications covers 54 to 176MHz as well as 27MHz CB.

The hand-held receiver is fitted with a helical antenna and is claimed to have a good performance for this type of set.

It would be ideal for monitoring airband, 144MHz amateur and p.m.r./marine bands as well as the Band II f.m. broadcasts.

Audio output is 500mW from a 75mm, 4Ω speaker. IFs are 10.7MHz and 465kHz. Power supply requirements are 6V d.c.

Two versions are available, operating from either four dry cells or NiCads.

Prices are £39.50 for the dry cell version and £49.50 for the rechargeable version complete with NiCads and charger. These prices include VAT and postage.

Further details from:

R. Withers Communications Ltd
584 Hagley Road West
Oldbury
West Midlands
B68 OBS
Tel: 021-421 8201

When George Dobbs G3RJV sent in his report on the Dayton Hamvention earlier this year there was not enough room for his photographs. Here we reproduce two of the more interesting ones.

Do you recognise this equipment? On top



Nevada out of Telecomms

Although they have been trading under the name "Telecomms" since 1969, the Portsmouth based importers, distributors and manufacturers of amateur and c.b. radio equipment have found that they are increasingly being confused with "British Telecom" by their customers. Reluctantly they have, therefore, decided to "move on to a new name".

As "Nevada" has been used for some time on the products manufactured by Telecomms in the UK, it seemed logical to adopt this name as the company's trading title.

As from November 1 you should no longer look for Telecomms but:

Nevada Communications
189 London Road
North End
Portsmouth
Hants
PO2 9AE
Tel: (0705) 698113

Toroidal Mains Transformers

Cotswold Electronics can now supply their Budget Range of toroidal transformers with an alternative double insulation which meets BS5850 at no increase in cost. With a thermal cut-out fitted these transformers would also meet all the requirements of BS415. An interwinding metal screen can also be provided.

VA ratings are still 30, 60, 100, 160, 230, 330 and 530VA and the original standard primary voltage of 120+120V is now joined by single primary voltages of 240, 110 and 220V. Windings are terminated in pvc insulated leads 150mm long.

Further details from:

Cotswold Electronics Ltd
Unit T1
Kingsville Road
Kingsditch Trading Estate
Cheltenham
GL51 9NX
Tel: (0242) 41313

British DX Club

The British DX Club's *Radio Stations in the United Kingdom* is now in its 6th edition and is reckoned by the Club to be the most comprehensive guide of its kind available.

The 24 page A5 booklet gives full details, in frequency order, of all BBC and IBA stations with cross references of parallel channels. It also includes postal addresses and background information.

The current edition (May 87) is now available for just £1.00 or 4 IRCs and an update insert with details of any changes

since the publication date is sent with orders to ensure that it is as up-to-date as possible. Information about BDXC is also available from:

British DX Club
10 Hamdean Hill
Caversham
Reading
RG4 7SB

Dayton Hamvention

is a typical Hallicrafters item. In the middle is an unknown receiver but sporting an HRO dial while the bottom RX is the BC348-Q, a fine piece of World War II US Army gear and the first RX used by George as G3RJV.

Vintage radio is also popular at Dayton and

this photograph shows a small part of one of several stalls trading in some very fine old pieces of radio gear. In spite of the expected American interest in all things old, the vintage items were probably cheaper than they would have been in the UK.



BOOKCASE

HF OCEANIC AIRBAND COMMUNICATIONS

Second Edition

by Bill Laver

Published by Waters & Stanton Electronics

Available from Short Wave Magazine Book Service

210 x 296mm, 24 pages. Price £2.95 plus 75p P&P (paperback)

Listening in to commercial airliners flying high over the oceans of the world is a popular pastime for a large number of readers of this magazine. This book is essential reference material for anyone who wants to pursue this branch of listening.

The first chapter introduces the subject in an easily understood manner, explaining how and why the h.f. bands are used to allow aircraft to keep in touch with air traffic control. Also explained is how the v.h.f. frequencies fit into the overall picture, although the book only deals with the h.f. Airband Network in the frequency range 2 to 23MHz.

The main body of the book is split into four sections consisting of a listing, by frequency and band, of aircraft channels, an alphabetical list of Main Ground Radio Stations, some European



R/T networks and the North Atlantic control frequencies.

This book is a companion to "VHF/UHF Airband Frequency Guide", also available from Short Wave Magazine Book Service.

SO YOU BOUGHT A SHORTWAVE RADIO!

by Gerry L. Dexter

Published by Tiare Publications, PO Box 493, Lake Geneva, Wisconsin 53147, USA

216 x 136mm, 76 pages. Price \$6.95 (paperback)

ISBN: 0-936653-04-3

A humorous book, written for the American market, but with much of use to the beginner anywhere. Gerry Dexter has a readable style and explains in simple and readable terms just what short wave radio is all about.

One chapter is devoted to the different features and controls of a short wave receiver. Even if you have already bought a receiver this chapter will help you to get the most out of your set and also help you to decide on what sort to get next. Chapter 3 is titled "The Shortwave Difference" and takes

the reader through the essential differences between short wave radio and domestic a.m. and f.m. broadcasting.

All types of short wave broadcasts are covered, including what the author calls "Black Sheep Broadcasting" — the clandestine and pirate stations. Aeronautical, Coast Guard, time, military and government stations are covered in brief. Amateurs get almost a complete chapter to themselves along with a short explanation of c.b. with another devoted to DXing on short waves.

DUBLIN CALLING

by Paddy Clarke

Published by RTE Broadcasting Museum, Public Affairs Division, 2nd Floor, Administration Building, Donnybrook, Dublin 4, Eire

305 x 205mm, 60 pages. Price £5.00

including postage (paperback)

ISBN: 0-86029-009-3

Subtitled "2RN and the birth of Irish Radio", Paddy Clarke's entertaining book gives a graphic account of wireless activities in the Republic from before the turn of the century. It may come as a surprise to some readers to learn that Marconi was himself part-Irish, his mother being a member of a well-known distillery-owning family.

The book takes us from Marconi's early experiments in Co. Antrim in 1898, on through the construction of his first transatlantic radio stations to the beginning of broadcasting proper in the Republic. The Marconi

Company was subsequently closely associated with the initial experimental programmes put out from 1923. The first official station, the 2RN of the title, commenced operations in late 1925, during a great Wireless Exhibition at the Dublin Mansion House.

Paddy Clark has lovingly re-created the atmosphere of the period with the aid of contemporary accounts, advertisements and photographs. The last two have provided fascinating illustrations which are enhanced by being reproduced in sepia tones. None of them is

THE SECRET OF LEARNING MORSE CODE

by Mark Francis GOGBY

Published by Spa Publishing Ltd

Available from Short Wave Magazine Book Service

147 x 210mm, 88 pages. Price £4.95 plus 75p P&P (paperback)

ISBN 0-9512729-0-X

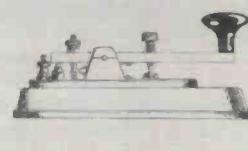
"The intention of this book is to try to help you learn Morse in the quickest possible way. An in-depth treatment of this subject is long overdue. It is hoped, therefore, that this publication will have filled the gap." This is how the author ends his Preface to this newly published book.

The reader is taken for a history lesson in the first chapter and with Chapter 2 you are told to totally immerse yourself in the code. Then, with Chapter 3, you really get started on the learning cycle.

The eight chapters cover receiving, sending, improving your speed, the test itself and a lot of other useful information as well. Seven appendices cover such topics as Morse code itself, the International Q-Code and abbreviations, sample c.w. QSOs, extra sending practice, sample

THE SECRET OF LEARNING MORSE CODE

BY
MARK FRANCIS

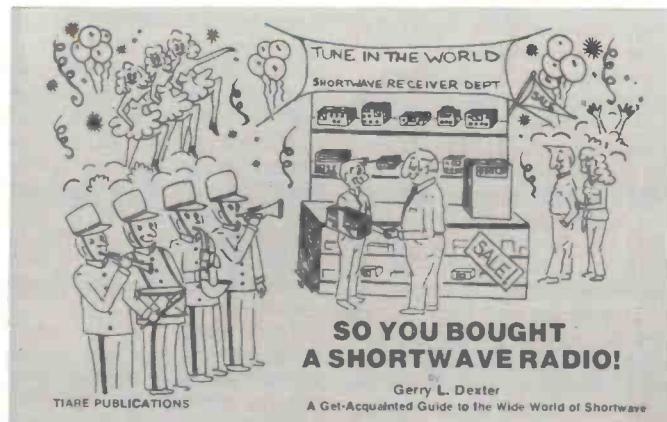


A UNIQUE GUIDE TO LEARNING MORSE CODE

—QUICKLY AND PROFICIENTLY—

tests and some useful addresses.

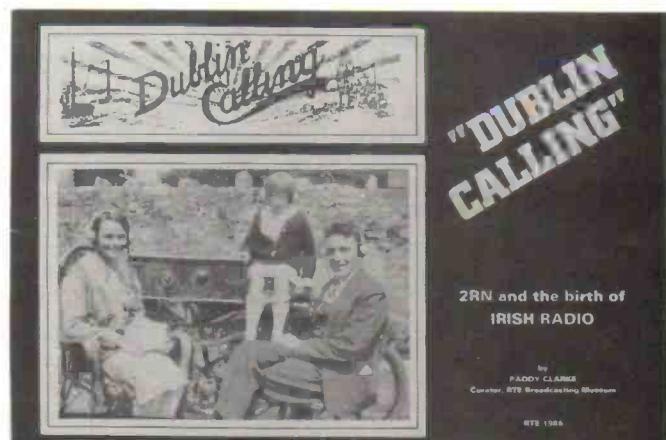
This book should prove to be a popular and useful addition to those books already available on Morse.



Gerry L. Dexter
A Get-Acquainted Guide to the Wide World of Shortwave

Cartoons add to the humourous text and there is a lot of useful information in the form of tips, books to read and s.w.l. club

addresses. For the newcomer to s.w.l.ing this is a book well worth reading.



2RN and the birth of
IRISH RADIO

by
PADDY CLARKE
Curator, RTE Broadcasting Museum

RTB 1988

familiar and it is probable that they are being seen here in this book for the first time in very many years.

This book should have a place on the shelves of all who are

interested in radio history. It achieves that all-too-rare feat of being both informative and highly readable and will be put down with regret.

CEM

GRASSROOTS

Lorna Mower

Another month, another post bag and yet again, another batch of club news to keep you occupied during the next few weeks.

To start off with this month, we have the Chelmsford ARS who have got their AGM on October 6th. For more details on the club, you'd best contact Roy G3PMX or Ella G6HKM on Chelmsford 360545.

The Verulam ARC usually meet at the RAF Association Headquarters, New Kent Road, off Marlborough Road, St Albans, on the 2nd and 4th Tuesdays of each month. They have an "Activity Evening" on 13th October, and on 27th Mr D Beattie G3OZF will be giving a talk entitled "DX Working and DX Edge". For more information contact Hilary G4JKS on St Albans 59318.

Loughton & District ARS have a formal "Homebrew G8AB 25th Anniversary Ale" talk and recipe by Jack and Olive Atkinson on October 9th and on 23rd have an informal meeting. They usually meet at Loughton Hall in Room 20 at 7.45pm. John Ray G8DZH at 9 Albion Hall, Loughton, Essex IG10 4RA or Prestel Mbx 015083434 can tell you any further details.

The South Bristol ARC meet every Wednesday at the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol, Avon BS14 0LN. On October 7th there is a lecture and on the 14th a VHF Activity Evening. Len Baker G4RZY on Whitchurch 834282 can tell you more.

Stourbridge ARS have an "on the air" night on the 5th October, along with an RSGB 21/28MHz SSB 12 hours duration contest on 11th, followed by a main meeting on 19th October. More details from the Hon Sec Derek Pearson G3ZOM on Kingswinford 288900.

The East Kent RS have their AGM and Construction Contest on October 1st and the 15th brings their Natter Night. Meetings are held on the 1st and 3rd Thursdays of each month at 7.30pm, and take place at the Cabin Youth Centre, Kings Road, Herne Bay. You can be sure to get more details from Brian Didman G4RIS, telephone Whitstable 262042.

A ladies night with Cheese & Wine is an event being held on October 29th by the Ripon and District ARS. Club meetings are held every Thursday at 7.30pm in the Old AirRaid Shelter (behind Ripon Town Hall). More details from Miss Liz Bulman, The Lodge, Lister House, Sharow, Ripon, North Yorkshire HG4 5BU.

Wakefield and District RS have got a lot planned this month. Firstly, they have a Members on the Air Contest on 6th, a Great Egg Race on 13th, a Jamboree on the Air on the 17th and 18th, on the air on 20th, followed by a Jumble

Sale on the 24th and then finally on 27th they have a Novelty Project Introduction as well as On the Air. Well, after all that, if you would like to know more then ring John Bryan G4VRY on Leeds (0532) 820198.

October 20th, which is the 3rd Tuesday, brings the Midland ARS AGM which will start at 7.30pm. The club meets on Mondays for Construction Classes, Wednesdays for Morse and Thursdays is their Night on the Air. For any further details on the club talk to Tom Brady G8GAZ on 021 357 1924.

On Monday 12 October, the Coulsdon ATS have a Sussex Repeater Group Road Show by Mike Senior G4EFO. They meet on the 2nd Mondays and last Thursdays of each month at St Swithun's Church Hall, Grove-langs Road, Purley, Surrey at 7.45pm and visitors are always welcome. Contact Alan on 01 684 0610 for more details on the club.

Lothian RS meet at the "Royal Ettrick Hotel" Ettrick Road, Edinburgh at 7.30pm. This month they have a talk on "The History of Communications" by H Mathews on the 14th and on 28th have an illustrated talk on "Malt Whiskey" by P Dryburgh. More details on the club can be obtained from P J Dick GM4DTH, 21 West Maitland Street, Edinburgh EH12 5EA. Prestel Mbx No 314471210, please note that the Mailbox Number is NOT the Secretary's telephone number.

There really is a full month ahead for those of you at the South East Kent (YMCA) ARC. October 7th is Natter Night, the 14th brings a talk on Cell-Call by Philip Smye-Rumsby G6JND, the 21st brings the second Natter Night of the month and finally on 28th, a talk on 2 metre Fox Hunting GOBPS. Meetings are held on Wednesday evenings, and Instruction Classes in Morse or Radio Amateur Examination coaching are held at the Dover YMCA, Godwyehurst, Leyburne, Leyburne Road, Dover, Kent CT16 1SN. On Monday and Tuesday evenings it is necessary to contact the club to enroll in instruction or coaching classes. For further information contact the Clubs Hon Secretary, Brian Joyner G8ZY, Brimar, Nelson Park Road, St Margarets-at-Cliffe, Dover, Kent CT15 6HL.

Todmorden and District ARS usually meet at 8pm on the 1st and 3rd Monday of each month, at the "Queen Hotel", Todmorden. On Monday 5th October they have a Surplus Equipment Sale followed by a Natter Night on Monday 19th. Contact G1GZB on Todmorden (070681) 7572.

The Atherstone ARC have "50 Years of Amateur Radio" Guest

Speaker being Tom Douglas G3BA on Monday 12th October and also have an Informal at The Bull, Witherley, commencing 8pm on 26th. All meetings are held in the Physics Laboratory, Atherstone Upper School, Long Street, Atherstone on 2nd and 4th Mondays and usually commence at 7.30pm. More details are always available from John Arrowsmith G4IWA on Atherstone (0827) 713670 (weekdays after 6.30pm and weekends).

There is a "50th Anniversary Celebration Dinner" to be held at Finchley Golf Club on 17th October for those of you belonging to the Edgware & District RS. They meet on the 2nd and 4th Thursdays of each month at 8pm in the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Further information about the club from Ian Cope G4IUZ on Hatfield 65707.

Southgate ARC meet at the Holy Trinity Church Hall (Upper) Green Lanes, Winchmore Hill, London N21 at 7.45pm. On Thursday 8th October, John Bachelor G3XMV gives a talk on Industrial Archaeology and on 22nd they have an Informal Evening. If you would like more details then the person to contact is D C Elson G4YLL on 0992 30051.

The Winchester ARC have a Q.R.P. by Arthur Parsons G2PS on 16th October. The Club meets every 3rd Friday of the month at Dungate House, Eastgate Street, Winchester. For more information contact the Club's Secretary Dick Murray on Winchester 880605.



October 9th brings a Talk on Equipment Reliability by Keith GOGFD followed by a talk on the "Early days in Radio" by Les G3ABA on the 23rd for all those of you belonging to the Itchen Valley RC. Club meetings are held on the 2nd and 4th Fridays monthly at The Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh, Hants at 19.30 hours. Maurice Cheeseman G1IPQ on Southampton (0703) 736784 will have any other details.

Colchester Radio Amateurs start the month off with their AGM on 1st October, on the 15th Steve Oakman from Marconi Instruments is holding an Equipment

Clinic, and to round off this month they have Short Waves and Beams by J Stanley Wood on 29th. All meetings in the Board Room, first floor 'B' Block, Colchester Institute, Sheepen Road, Colchester, on Thursday commencing at 7.30pm. Further details available from their Secretary G3FIJ, 29 Kingswood Road, Colchester, telephone (0206) 851189.

Sheffield ARC who meet every Monday at 8pm in the Firth Park Pavilion, Sheffield have a talk on Christian Aid on October 5th, they have their AGM on 12th and the 19th brings a Construction Contest, which will include a special category for your 50MHz transverters. Alan G8ZHG on Sheffield (0742) 395287 will be pleased to answer any questions you may have.

Fareham & District ARC have a "TM 1000 ATV" by G4JEV on October 7th, then on the 21st have a "Wartime Experience In the Radio Security Service" by G3AUV. Meetings are held every Wednesday in the Porchester Community Centre, Westlands Grove, Porchester, Hants at 7.30pm, Morse classes from 6.30pm. More details from their Secretary G3CCB on Fareham 288139.

A busy month is awaiting all those at the Bredhurst Receiving and Transmitting Society who start the month off with "An approach to Home Construction" by Chas G4VSZ on the 1st, Construction/Natter Night on the 8th, Construction Contest on the 15th, the Inter Club Quiz follows on the 22nd and then last but not least on the 29th they have "Simple Sideband" by Ian Keyser G3ROO. The Clubs Chairman, Kelvin GOAMZ, on Medway 376991 will fill you in on any other details.

A Natter Night on 14th October followed by a Junk Sale on the 28th are the activities going on at the Trowbridge and District ARC. The club meets alternate Wednesdays at 8pm in the Territorial Army Centre, by the Sea Road, Trowbridge. More details from Ian Carter GOGRI on (0380) 6656.

There's a lot on for the Mid-Sussex ARS this month, starting with an operating evening in the club shack on the 1st, a talk about Contests by Tony G3FXB on 8th, on the 11th a 21/2MHz contest, another operating evening in the club shack this month on the 15th, a Junk Sale on 22nd and finally on 29th there's a visit to the Royal Observer Corps. They meet on Thursdays at Marle Place, Leylands Road, Burgess Hill at 19.45 hrs. For more details contact Mike GOGNV on Burgess Hill 41407.

Farnborough and District RS have a film night on 14th October and a Surplus Equipment Sale on

the 28th. Both take place on a Wednesday and if you contact M C Graffius at the Paddock, Diamond Ridge, Camberley in Surrey he will I'm sure tell you of the meeting place.

Chichester & District ARC meet on the 1st and 3rd Tuesdays of each month at 7.30pm in St Pancras Hall, St Pancras, Chichester. This month, they have a Club evening on 6th, 17th-18th brings a Jamboree on the Air and the 20th a Club Meeting. More details from C Bryan G4EHG on Chichester 789587.

October 13th brings a Construction Competition by the Rev George Dobbs G3RJV for the **Bury RS**. The Society meets every Tuesday at the Mosses Centre, Cecil Street, Bury, Lancs. Main meetings are held on 2nd Tuesdays and other meetings are informal. Further information about the Society is available from C J Ashworth on 061-764 6736.

Wyre ARS meet at the Breck Sports & Social Club, Breck Road, Poulton, on the 2nd and 4th Wednesdays at 8pm. October 14th is a Pies and Peas Evening (tickets £1.25), 17th/18th JOTA GB4FS Fleetwood Scouts, see John G1TTO and the 28th is Club on the Air. More details from their Club Secretary Dave Westby on Thornton Cleveleys 854745.

Delyn RC meet every other Tuesday at 8pm in the Daniel Owen Centre, Mold, Clwyd, North Wales. Radio Amateurs, Citizens Band Operators, Short Wave Listeners and any other Radio Users always welcome. Meeting dates this month are 13th and 27th. If you would like to know more then please contact The Secretary, PO Box 150, Mold, Clwyd, North Wales CH7 1YL or telephone Deeside 819618.

The **Sutton & Cheam RS** start the month off with a Natter Night on 5th, Junk Sale on 16th, then on 23/24th the "Leicester Amateur Radio Exhibition" at Granary Halls. Meetings are held on the 3rd Fridays of each month at 7.30pm in the Downs Lawn Tennis Club,



Holland Avenue, Cheam and Natter Nights are on the 1st Monday of each month in the Downs Bar. John Puttock GOBWV at 53 Alexandra Avenue, Sutton will tell you any other details.



The Dunstable Downs RC meet every Friday at 8pm in Chew House, 77 High Street South, Dunstable. On 2nd October they have "Arran" — DPARG, 3/4th brings 70cm Contest, 16th Satellite TV Equipment and lastly, a Junk Sale on 30th. More details can be obtained from Tony GOCOQ on 0582 508259.

Wimbledon & District ARS start the month off with their AGM on 9th and on 30th they have "DX Techniques" by Nigel Cawthorne G3TXF. The club meets on the 2nd and last Fridays of each month at 7.30pm in the St Andrews Church Hall, Herbert Road, Wimbledon. If you would like to know more about the club then you can contact George Cripps G3DWW on 01-540 2180 or write to 115 Bushey Road, Raynes Park, London SW20 OJN.

The **Felixstowe and District ARS** start October off with Knot Tying for the Radio Amateur on

5th, along with a Social Evening on 19th. All lecture and Social meetings take place at 8pm in the Scout Hut, Bath Road, Felixstowe. Further details from Paul Whiting G4YQC on 0473 642595 (daytime).

Tom Douglas G3BA talks about "Antennas for Small Gardens" on October 2nd to those of you at the Mansfield ARS and Tony G4GNC talks about "Practical Frequency Measurement" on 20th. The club meets on the 1st Friday and 3rd Tuesday at the Victoria Social Club, Mansfield at 7.30pm. Keith Lawson G4AAH on Mansfield 642719 can tell you more.

Crystal Palace & District RC have a Junk Sale planned for Saturday 17th October. Meetings take place at the All Saints Parish Rooms, Beulah Hill, London SE19 at 8pm. Further information from Geoff Stone G3FZL at 11 Liphook Crescent, Forest Hill, SE23.

Tuesday 20th October brings a "Demonstration of Modern RTTY." by G4JLU for all of you at the Acton, Brentford & Chiswick ARC. Meetings are at the Chiswick Town Hall, High Road, Chiswick, London W4 at 7.30pm. More details from W G Dyer G3GEH on 01-992 3770.

A busy month ahead for everyone at the Cheshunt and District ARC. October 7th is a lecture on Batteries — their uses and abuses, 21st is a lecture on Emergency Network — County Council, and they have two Natter Evenings planned, one on the 14th and

another on the 28th. Meetings are every Wednesday at 8pm in the Church Room, Church Lane, Wormley near Cheshunt. For more details contact John Watkins on Dane End 250.

Keighley ARS meet at 8pm in the "Victoria Hotel", Cavendish Street, Keighley. Another busy month ahead for them, starting with the Wakefield Mobile Rally on 4th, Special Event Station GBO ERH East Riddlesden Hall on 10/11th, an Informal Evening on 13th, then finishing with a Junk Sale on 27th. Further details can be obtained from Kathy G1IGH on Bradford 496222.

October 1st is a talk by Don G1AJB on "Transistors for the not-so-young" at the next meeting of the Cornish RAC. The Computer Club's next meeting is on October 12th and is Molecular Electronics and Fibre Optics in Computers by Stella & Bert. They meet in the Church Hall, Treleigh on the Old Redruth Bypass at 7.30pm. More details from G4CUI on Stithians 860572.

The **Chester & District RS** meet at the Chester RUFC, Hare Lane, Vicars Cross, Chester at 8pm with Morse Classes at 7.15pm. They have a Committee Meeting on 6th October, "Esperanto in Radio Communications" by Adrian G4MOU on 13th, Constructional Project by Alan G8OJQ on 20th and on the 27th, Faroes DX Trip. Dave Hicks G6IFA on Chester 336639 will I'm sure be glad to tell you more.

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FACSIMILE

David Bird G6EJD

The system of transmitting images by facsimile is often thought by many to be a relatively new technology, but in fact it dates back to around 1842, when a Scottish inventor, Alexander Bain, actually produced a working facsimile machine. Bain had been experimenting with a system of electrically actuated pendulums, whose swinging motion was synchronised together by electromagnets. He noticed that each of the pendulums remained at the same relative position at any given instant in time. He postulated that if one of the pendulums could be made to follow the grooves of a surface engraved with an image; in much the same way as a phonograph of the time did, then the attachment of a suitable stylus to the other pendulum would allow an image to be transmitted.

Bain had succeeded then in producing one of the very first facsimile machines, but its success was to be short lived. An Englishman, Frederick Bakewell, demonstrated a facsimile machine based on a rotating cylinder. With this system, the message to be sent was printed on tinfoil using varnish, then the tinfoil wrapped around the cylinder. The picture was transmitted by an electrical stylus which was attached to a screw threaded bar. The rotation of the bar traversed the stylus along the length of the drum and this motion, coupled with that of the rotating drum, meant that the complete picture was scanned. The stylus remained in contact with the tinfoil, and as it passed over areas not covered in the insulating varnish a current could flow. This current was then transmitted to the distant station by wire, and the same configuration used at the distant end, but this time the current would burn impregnated paper. The result was an image of the original, not a perfect copy but nevertheless a copy.

This system was to be the forerunner to systems still in-use today, and with its English descent; may explain why FAX has remained a popular system for sending and receiving documents in England for many years.

General

FAX finds wide spread use in commerce,



Fig. 1a: A typical FAX picture

Facsimile — normally known as FAX — is a system designed to send graphical images over telephone or radio links, it takes its name from the Latin meaning "to make like".

weather analysis and press organisations. In fact the next time you look at a daily newspaper, take a closer look at some of the pictures — especially if they are of foreign origin — for they will almost certainly have been sent by FAX. You can see this by the fine patterning running horizontally across the picture.

FAX machines can be dedicated desktop units little larger than a modern typewriter, and have facilities for connection to standard telephone sockets. To use a FAX machine you place the document to be sent on either a drum or flat bed like a photocopier, call the distant FAX machine, listen for a reply then press the transmit button. Pictures usually take 5 to 10 minutes to send depending on the resolution of the system.

Machines in use today are generally of the digital form, but their analogue predecessors still exist and were of the electro-mechanical type, consisting of very complex pieces of engineering. They were needless to say expensive, but now on the second-hand market are available at reasonable prices the amateur can afford. Typical prices range from £5.00 to £50.00 depending upon condition. Be warned, most are of old or unusual standards, and could require extensive changes to the drum driving circuits to receive current standards.

How It Works

Images are transmitted by electronically scanning the paper document line by line from left to right, and top to bottom just as the document would normally be read. The received image produced is a hard-copy of the original, and can be of very high quality. (Fig. 1).

An electro-mechanical facsimile transceiver consists of a drum onto which the document to be transmitted or received is secured. Paper for transmission is that of the original document, but for reception can be either photo-sensitive or electrolytic in nature. Some laser FAX machines are available but still rely on special paper or toner additions along with their digital cousins.

The printed or written paper is fitted to the drum of the machine, this drum is then rotated and the document is then illuminated by a light source, the resultant reflected light is detected by a photo-cell. Voltage from this photo-cell will vary with the contrast of the document immediately under the scanning head, and since this will be very small it is then amplified by a pre-amplifier, a main amplifier, and a feedback network to give automatic picture contrast control. (Fig. 2).

Output from the feedback amplifier is applied to a voltage controlled oscillator, and this in turn produces a changing frequency varying in relation to the document's contrast. This frequency modulated audio signal can then be used to send down a telephone line, or modulate an r.f. transmitter.

For reception, an incoming signal, either from a telephone line or the output of a radio receiver is then applied to the stylus driving circuits.

Two types of paper are used — photo-sensitive and electrolytic. With photo-sensitive paper, the received image information is used to modulate the intensity of a light source applied to the paper line by line; high intensity for black and low for white. When electrolytic paper is used, a stylus is applied to the paper surface and a small current passed through the stylus and paper, the current flowing is modulated by the received signal and the resultant electrolysis of the paper produces the necessary shade.

For transmission, the document is illuminated by a small point of light, and a photo-sensitive detector adjacent to the light source measures the reflected light intensity. In both transmission and reception modes, the stylus or photo-sensor are traversed along the drum's length, each revolution of the drum

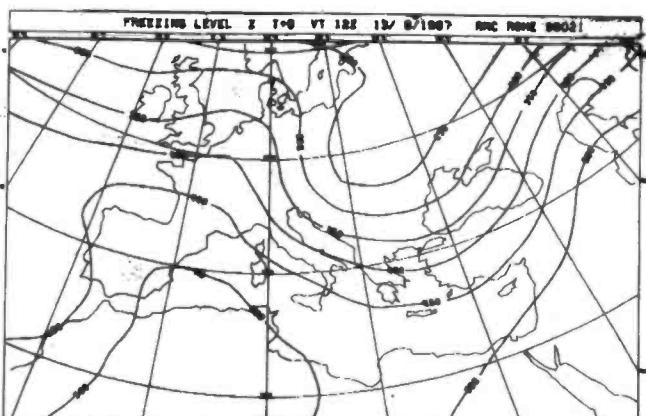


Fig. 1b: A MET chart received on modern equipment

FACSIMILE

advances the carriage by usually 0.25mm so the mechanical accuracy of the system is paramount. The amount of advancement is a function of the line scan density selected and can range from 0.10mm to 0.50mm.

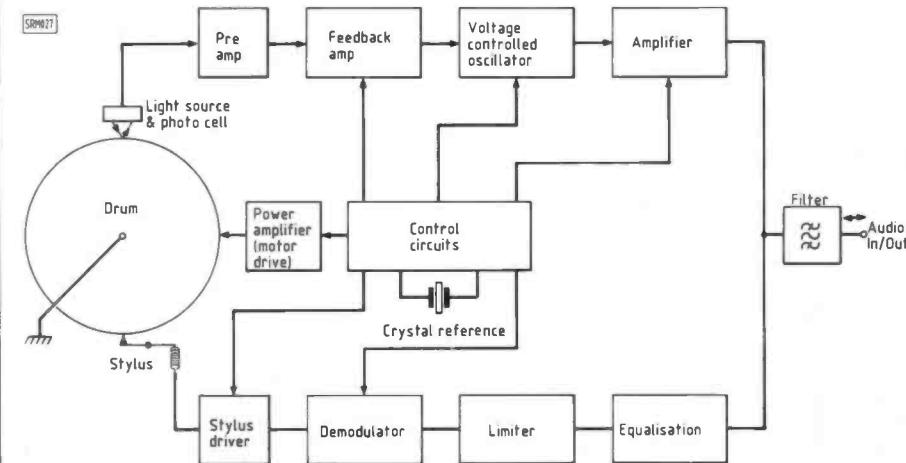
Transmission of the document in its simplest form consists of an audio tone generator which is varied in frequency by the shade intensity of the light received by the photo-sensitive scanning head. Each line is scanned and the resultant audio tone varying in frequency with the shade is then applied to either a standard telephone line or a voice quality radio link. FAX sounds like a saw working its way through a piece of timber! Some systems utilise frequency shift keying (f.s.k.) as a modulation technique, whilst others use frequency modulation of the carrier. If this is received with an s.s.b. receiver the resultant audio output is the same.

The system just described is that of frequency modulation, but other schemes are employed such as amplitude and digital modulation. In the amplitude system, the carrier level is varied in amplitude in relation to the shade being sent, white would be high level, and black low level.

Digital systems utilise the same basic technique, but the intermediate levels of grey are more defined; perhaps just black and white for meteorological charts or eight grey levels for simple computer generated transmissions. Transmission can either be via the analogue tone modulation system, or the use of binary coded data with the video information being sent as ordinary data traffic along with other services; networks in large organisations.

FAX stations are normally received on the h.f. bands using s.s.b. Upper sideband mode gives the correct sense video of black = black, switching to l.s.b. will invert the image, and in fact some Press Agencies send their pictures in a negative form to allow direct processing by printing machinery. The scanning head senses optically the shade of the picture under the

Fig. 2: Schematic diagram of a typical FAX machine



head, and this analogue signal is then applied to a voltage controlled oscillator. White areas are sent as a high audio tone of 2300Hz and black as 1500Hz, with the intermediate shades resulting in a corresponding frequency between these extremes. For example: intermediate grey would be sent with a frequency of $(2300 + 1500)/2 = 1900\text{Hz}$.

Each typical FAX line takes 0.5s to transmit at the common 120 r.p.m. or 120 lines per minute standard, other drum speeds used range from 45 to 240 lines per minute. The number of lines per second is often used as an identifier of the system such as 1, 2 or 4Hz stations for 60, 120 and 240 lines (r.p.m.) respectively. Also, the number of lines sent depends upon the so-called Index of Co-operation (IOC), and gains its name from the fact that both transmitter and receiver need to be of the same standard to "co-operate" as it were. That way they display pictures of the same height and depth and picture aspect ratio.

The example, shown in Fig. 3, demonstrates the modulation of a typical FAX line for a portion of a chequered picture. Of course, in this example, the signal comprises black and white, but had the picture been of a landscape for instance then the audio tone would have tracked the grey tones, and given the video graph the appearance of a mountain silhouette.

An example of the initial white period is shown in Fig. 4, this might be the plain border around a paper. This is followed by a gradual darkening of the image to a black section, then back to grey, black and finally to the white border again. By this stage, anyone who knows how a television operates will begin to recognise the striking resemblance, albeit at a much slower speed. The FAX line lasts for typically 0.5s whilst TV lines last for $65\mu\text{s}$, about 8000 times faster than FAX!

Facsimile pictures are transmitted and received line by line, but unlike TV without any form of synchronisation between the stations comprising transmitter and receiver. For instance, lose the synchronisation of a TV picture and it will roll round and round, since the TV transmission provides the synchronisation signals on a line by line and screen by screen basis.

With FAX this is achieved by each station having an accurate crystal controlled frequency reference, with a typical accuracy of 5 p.p.m. (parts per million) or 0.0005%. The drum is then driven by a synchronous or stepper motor which is in turn driven from the crystal oscillator, frequency divider and power amplifier stage.

For the receiving recorder to accurately reproduce the document, the two stations must be aligned. This is achieved by the sending station initially sending alternate black/white lines.

As the receiver drum rotates, the pulses from the black/white video are used to open and close the clutch mechanism, thus when the drum clutch is closed by the transmitter the two systems will be rotating in positional alignment with each other, and the transmission of the document can commence. Once synchronised/phased, the two stations are aligned, and will remain so throughout the picture transmission by virtue of their crystal reference oscillators driving the drums. Speed inaccuracies, if present, would be manifest by slanted pictures, either to the left or right depending on whether the error in speed was lower or higher.

FAX & Computers

FAX systems will remain relatively expensive, either in their analogue or digital form, since commercial users still require a high level of picture quality and accuracy. This will mean that these systems will remain very expensive and not lend themselves to amateur usage or purchase. With the growing ownership of computers, and the levels of graphics available as standard, it was only a matter of time before they were dragged into service receiving and transmitting FAX pictures.

For true compatibility with transmission designed for analogue machines, the resolution required would need to be at least 1024 pixels in the horizontal plane, and each pixel would need as many grey shades as possible. Most top of the range computers can only provide half of this re-

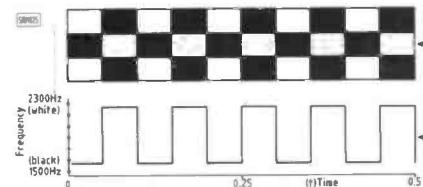


Fig. 3: How each line is sent

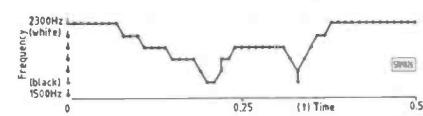


Fig. 4: How each line might look on a real picture

FACSIMILE

quirement, but for normal use, computers such as the BBC are quite acceptable, and if dot-matrix printers are used, the results can be of high quality.

To use a computer for FAX reception requires a suitable analogue/digital converter with a conversion time of less than 50µs, together with a stable (crystal) reference similar to that of the conventional machines. This allows alignment to be maintained. Computer clocks can be utilised if the digital dividers allow frequency setting down to 5 p.p.m., highly unlikely for most machines. The software needs to synchronise itself to this clock reference, and take an appropriate number of samples per line to suit the screen resolution used. Each inter-sample time will depend on the number of pixels available, and will typically be in the order of 77µs for a 640 pixel screen.

The use of computers gives the advantage of being able to store and retrieve pictures with ease, and relatively simple programs can be used to improve the picture quality, either by contrast enhancement, or the removal of noise pulses evident by single dots randomly placed. The possibilities are large, especially when linked to the digital generation of FAX images created by the

computer. The BBC computer has all the necessary attributes for reception and transmission of FAX images when coupled to suitable hardware.

FAX — Where to Find it

There are many sources of facsimile transmissions ranging from v.l.f. to v.h.f. In the v.l.f. band, circa 134kHz, reside the Press and re-transmitted satellite pictures. These are generally of low bandwidth and can produce very high quality results on amateur equipments. On h.f., circa 4.2MHz, are the almost endless streams of processed weather analysis charts giving such details as pressure areas, sea temperatures, wave heights and the location of icebergs!

On v.h.f. (136-138MHz) are the weather satellites, and although the transmissions are not FAX standards they can be copied when coupled to a suitable demodulator, satellite transmissions differ from those of FAX in that picture information is sent on an amplitude modulated 2.4kHz sub-carrier. The start of each line contains a short line synchronisation signal. Another added problem is that the transmission generally contains visible and infra-red images sent on alternate lines. If received

with a conventional FAX recorder both the visible and infra-red lines will be displayed, and the result will be unreadable. However, when just visible images are being sent then the FAX recorder will be able to cope, but will suffer from the effects of Doppler shift as the satellite goes overhead; the shift in frequency can be as high as ±16kHz.

The use of computers in receiving satellite transmissions allows considerable scope, since it can be programmed to skip alternate lines to receive just visible or infra-red images. FAX reception and transmission using computers will undoubtedly grow, and although systems are currently available for the BBC, Spectrum, Apple and TRS80 computers they have yet to gain widespread use and appreciation by many computer users, especially if they are radio amateurs.

With the wealth of information available such as general weather forecasts, images of the earth, and for the radio listeners the prediction of high pressure fronts and other communications enhancing weather anomalies, the addition of a FAX reception facility can be one of the more useful and rewarding attributes of using a computer now exhausted from playing games.

□

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

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

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



THE R532 AIRCRAFT BAND RECEIVER £224

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

R557S Hand Held Airband Receiver..... £69.50

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

FEATURES

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

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

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RX-4

MULTIMODE RECEIVE RTTY / CW / SSTV / AMTOR

This is the ultimate in software for the SWL. Just one program to receive all four modes, switching from one to the other at a single keypress. Extremely user-friendly, RX-4 has the facilities and performance you need to catch all the action on the bands as soon as you hear it.

When you see the features it's easy to see why RX-4 is today's best-selling receive software.

RTTY and AMTOR tuning scale makes tuning-in very quick and easy. Four RTTY baud rates, any shift, normal or reverse, with selectable unshift-on-space.

CW software filters and controllable autotrack for maximum performance up to 250 wpm! On-screen indicator lets you set the level and tuning with a minimum of fuss.

SSTV has selectable scan rates in both directions and two modes of picture storage for maximum use of memory.

Text and pictures can be stored, recalled to the screen and dumped to a printer as well as being saved to tape or disc.

Please note that the AMTOR section only receives ARQ mode (mode A) but this is the most common mode and covers a lot of commercial TOR stations, also.

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

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ICS ELECTRONICS FAX-1

Mike Richards G4WNC



Performance

When I first received the FAX-1 it was hurriedly connected up to my Icom IC-720A and Epson RX-80 printer. The receiver was set to I.s.b. and tuned according to the instructions on the front panel, i.e. 2.2kHz above the listed frequency. The result, perfectly aligned FAX charts! The only real test of a FAX decoder is the quality of the final pictures. Well, I can confidently report that the FAX-1 produces excellent quality charts that equal the results from conventional machines as can be seen from the pictures here. The ingenious use of quad-density graphics combined with interlacing utilises the graphics capabilities of the Epson type printer to the full.

The final picture quality of any FAX decoder is very dependant on the condition of the received signal, and the FAX-1 is no exception. One of the most troublesome conditions is multi-path propagation. In simple terms this means that the signal is received via two or more separate paths. The effect, on a FAX picture, is a widening or smearing of the image, the more paths the worse the smearing. This means that the sharp "blip" representing a dot on the chart becomes several "blips" very close together producing a wider line. Unfortunately for the short wave listener, there is no cure for multi-path other than to tune to a different frequency.

The picture quality is also affected by noise and this shows up as random dots appearing on the chart. If the signal to noise ratio is very poor then these random dots create a mist like effect over the whole chart or picture.

During the extended review period, I found the FAX-1's AUTO mode to be extremely useful and very reliable. The selection of index of co-operation, r.p.m. and picture phasing was always correct, which demonstrates the effectiveness of the tone detection logic.

The MANUAL mode was also found to be very effective and was particularly useful when tuning around to find a good signal. I found that the alignment aid, described later, enabled me to quickly centre the picture on the paper.

The bargraph tuning display worked

The FAX-1 can be summarised very easily. You need an h.f. s.s.b. receiver, a printer and lots of paper. The FAX-1 is powered up, tuned in and you can sit back and enjoy the pictures, end of story! The system is obviously more complicated than that and I hope to be able to show you the full details in this review.

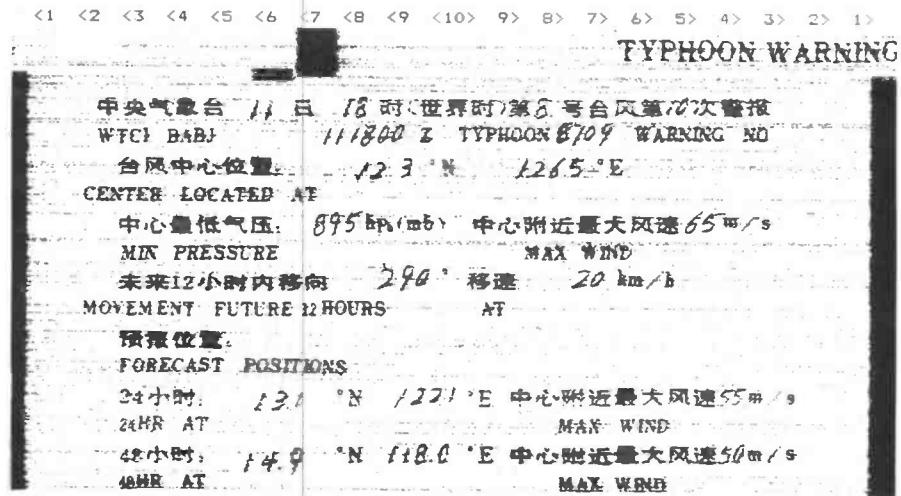
very well, with a standard h.f. FAX signal (± 400 Hz f.s.k.) giving a bar of I.e.d.s over about 50 per cent of the display. The correct tuning point is when the line of illuminated I.e.d.s straddles the centre point of the display. When receiving FAX on I.f. (where the shift is only ± 150 Hz) about 3 to 41.e.d.s were illuminated which proved adequate. With the narrow shifts on I.f. tuning obviously becomes more critical, but providing the receiver has tuning steps of 10Hz or less the FAX-1 can resolve these signals with no problems.

Another important aspect that was checked out was the unit's performance when receiving weak or noisy signals. Although the picture quality will obviously reduce with poorer quality signals, I was

pleasantly surprised with the results from the FAX-1. Recognisable charts were resolved from signals that were only just audible, which is quite impressive. To obtain the best results from poor signals, I found that the receiver tuning needed careful adjustment. My best DX during the review was a typhoon warning in Chinese with English subtitles!

Although the FAX-1 has been designed primarily to receive weather charts it can reproduce photographs and amateur FAX quite effectively. When a photograph is transmitted by a FAX station the carrier deviation is directly proportional to the contrast of the photograph and can take on any value between the two extremes of deviation. The FAX-1 cannot reproduce grey scales so it converts the incoming signal into either black or white, resulting in a loss of detail. When receiving a photograph the receiver tuning was found to be very important as it serves to adjust the contrast of the printed picture. The most popular photographs to receive are the Meteosat images re-broadcast by Offenbach (DCF-54) on 134.2kHz. One final point to note when receiving photographs is that due to the high black content, the printer has to work very hard and consequently makes a lot of noise and gets rather hot!

The China Syndrome?



Circuit Description

The audio output from the communications receiver is applied to the 3.5mm input jack on the rear panel of the FAX-1. This jack is wired in parallel with the adjacent 3.5mm output jack, allowing the connection of your shack speaker so you can still listen as normal.

The audio input signal is filtered by two cascaded active filters before being fed to an XR2211 f.s.k. demodulator. This phase locked loop i.c. produces raw data and carrier detect outputs which are subsequently fed to the microprocessor section.

In addition to the basic data signals, the f.s.k. demodulator also produces a d.c. "error signal" from the loop detector. This "error signal" is directly proportional to the audio input frequency and requires filtering before application to the compensation input of the f.s.k. demodulator. The "error signal" is first buffered by an op-amp before being fed to a two-stage, direct coupled, active low-pass filter. The output of the active filter is split in two, with one part providing a compensation input for the f.s.k. demodulator, whilst the other drives the tuning display.

The microprocessor section is fairly conventional and uses a Z-80 central processor and a Z-80A P10 for most of the input and output interfacing. The Centronics output port has additional buffering before connection to the 25-way connector. The heart of this unit is the software which is held in a socket mounted ROM.

Operational RAM storage is supplied by two 64K by 4-bit i.c.s giving a total of 64K by 8-bit random access memory. The large memory is needed for line storage during the printing process. In order to receive properly aligned FAX transmissions an accurate frequency reference is essential. In the FAX-1 all operations are controlled by a single crystal oscillator which drives the Z-80A c.p.u.

The clock and timer functions are supplied by a mass produced clock module which is powered by a separate battery. The timer control circuitry is driven by the clock module and operates a small relay with two contacts. The first contact turns the FAX-1 on and the second contact grounds the centre pin of the AUTO socket on the rear panel which can be used to operate an external relay to turn the receiver and printer on.

The power supply is fairly simple with the f.s.k. demodulator and op-amps fed with the raw 12 volts. A $\frac{1}{2}$ V_{cc} rail for the op-amps is provided by a simple potential divider followed by an emitter follower. The logic section requires a regulated 5 volts and this is supplied by a 7805 i.c. Reverse voltage protection is achieved with a relay and overvolt protection by a 15 volt Zener diode.

Operation

One of the first points to note is that most microprocessor controlled devices emit a fairly high level of QRM, the FAX-1 is no exception. Provided the main part of the antenna system is kept well away from the source of QRM, then all should be well. The audio output from the receiver can be taken either from the external speaker jack or preferably from the fixed audio output that most receivers have. In both cases the audio is fed to the 3.5mm jack on the rear panel of the FAX-1.

The s.s.b. receiver should have good short-term stability with tuning steps no larger than 100Hz. If you want to receive the I.f. FAX transmissions between 50 and 140kHz then the receiver will need tuning steps of 10Hz, the f.s.k. (frequency shift keying) modulation on I.f. is only ± 150 Hz as opposed to the ± 400 Hz normally found on h.f.

Having connected the receiver, the next stage is to find a suitable p.s.u. This is required to supply 12 to 15V d.c. at a modest 0.5A. and should be reasonably well smoothed as the op-amps are fed directly from the raw supply.

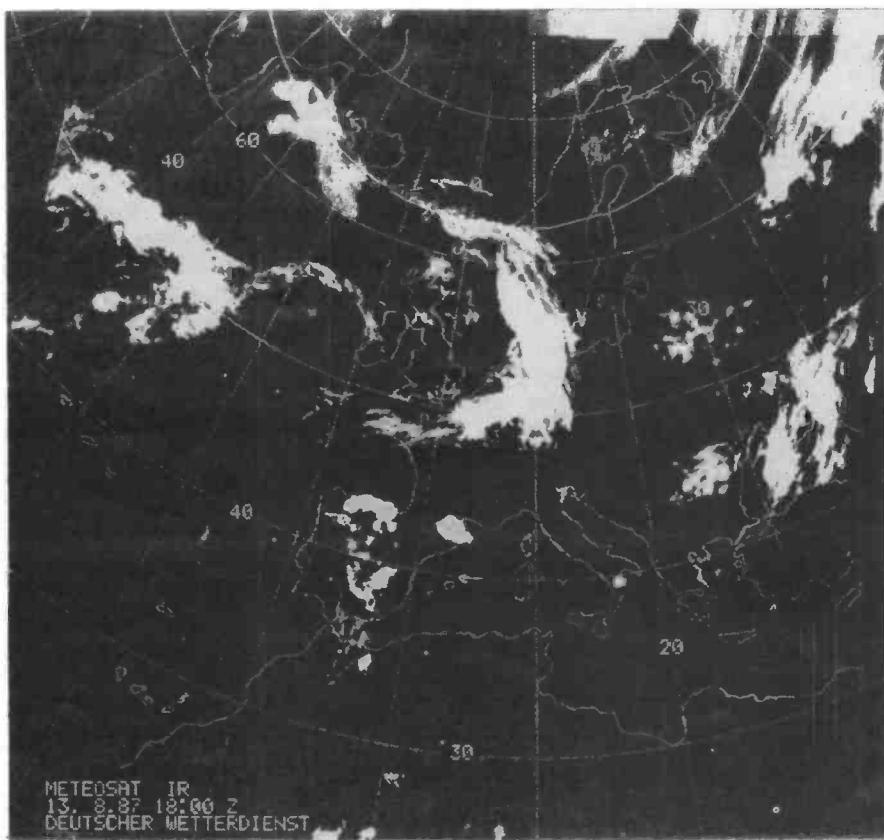
The final stage is to connect the printer to the FAX-1. The printer connection on the rear panel of the FAX-1 comprises a 25-way "D" connector wired to the same configuration as the IBM PC range of computers. This configuration has become a standard, so you will find that ready made leads to suit most printers are freely available at a reasonable price. If

you're making your own lead I would recommend using screened cable as this lead is a potential source of QRM. The printer used should be Epson compatible with quad-density graphics and a parallel interface. The Epson standard has become commonplace now so you shouldn't have any problem here. I used the review unit with an Epson RX80F/T and a Citizen 120D with no problems.

Once everything is connected up, the next thing to check is the d.i.l. mode switches on the back panel. Unfortunately, these miniature switches always seem to cause confusion and in this case the confusion has been made worse by the fact that the ON and OFF markings on the rear panel were reversed. There was an addendum slip in the manual explaining this error, but there are further confusing comments in the manual.

To try and clarify the situation I have used the following terms when discussing the d.i.l. switches in this review:
ON = Closed = Down.
OFF = Open = Up.

There are 8 of these d.i.l. switches, but only 6 are relevant, switches 4 and 6 are not used. The first 3 switches control the timer modes, with the timer enabled by putting switch 3 ON and the timer period determined by the position of switches 1 and 2. The four periods available are: 15 mins, 30 mins, 1hr and 2hrs. I found another discrepancy in the manual at this point as the switch diagrams don't agree with the switch descriptions, yet more confusion! As far as I can tell the drawings



ICS ELECTRONICS FAX-1

are all correct.

Switch 5 is used to select the type of printer in use, if it is OFF then an Epson compatible printer should be used. The ON position is only used when driving the FAX-1A ink jet printer. This printer is an optional extra for mobile use which gives a slightly lower resolution than a normal Epson type printer.

The FAX-1 is designed to reproduce charts from a receiver tuned to I.s.b. If for some reason you want to use u.s.b. then switch 7 should be set ON.

The final option on the d.i.l. mode switches enables a form feed at the end of each chart. For those of you not familiar with printers, this means that if you are using continuous perforated paper, the printer will move to the start of the next sheet after printing the chart, hence avoiding printing over the perforations. To select a form feed switch 8 is set to OFF.

If you find this all a bit confusing a simple starting point is to set all switches OFF which will give you timer off, Epson printer, I.s.b., and no form feed.

Having sorted out all the connections and switchable options we are now ready to start receiving pictures.

When the FAX-1 is first powered up, it selects its default settings of 120 r.p.m., IOC 576 and auto reception. These default settings are fine for the vast majority of weather charts so all is well. The AUTO I.e.d. means that the FAX-1 is scanning the received audio for a valid start tone and will then automatically print properly aligned charts.

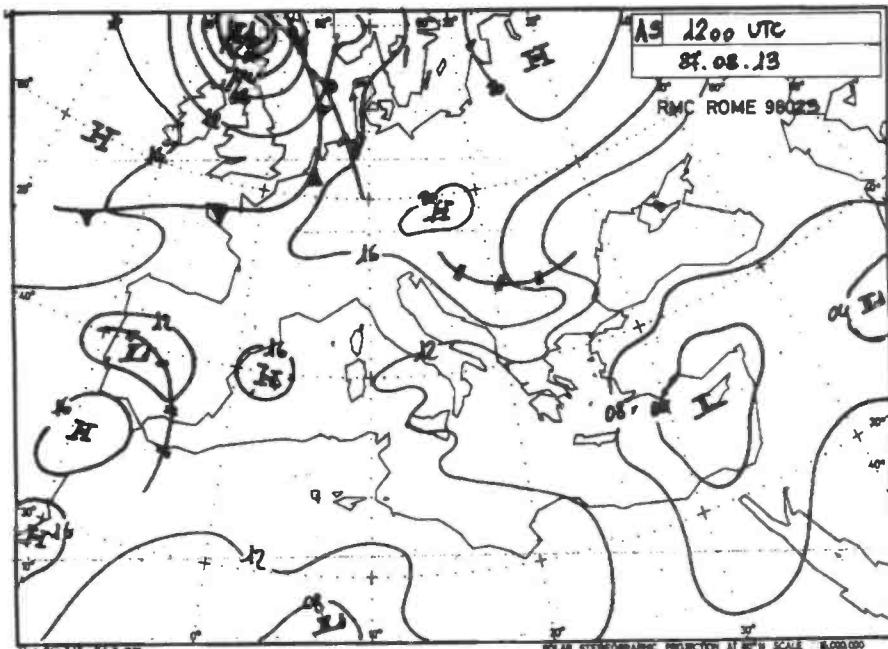
All you need now is a good FAX signal. I found that a good starting point was the Bracknell transmission on 4.782MHz. So, following the instructions on the front panel, you select I.s.b. and tune to 4.7842MHz (i.e. 2.2kHz up from published frequency) and wait for a start tone.

Whilst waiting for a start tone the tuning can be optimised as it is likely that the station will be part way through sending a chart. When a chart is being sent the bargraph tuning display shows one bright spot and a fainter tail to the left which moves in sympathy with the FAX signal. For the best picture quality, I tuned the receiver so that the signal evenly straddled the centre point of the display. On the review unit, the bright spot was over the "W" of WHITE on the panel markings.

When the start tone is received the IOC I.e.d. will move to the correct setting of 576 for a 300Hz start tone or 288 if the start tone was 675Hz.

Then, when the transmitting station sends its synchronising pulses, the FAX-1 monitors these pulses and sets the r.p.m. to match. Once this has been done the START I.e.d. will begin flashing.

When the sync pulses have finished and the chart begins, the START I.e.d. glows steadily followed shortly afterwards by the printer starting. At the end of the chart a 450Hz stop tone is transmitted which, when detected by the FAX-1 stops the printer. One nice feature is that at the end



of each chart the FAX-1 prints a line of text giving the IOC and speed used along with space for the operator to include the date, time and frequency.

If you can't be bothered to wait for a start tone, or want to just listen around, then the unit can be started manually. A single press of the AUTO button will extinguish the AUTO I.e.d. and the r.p.m. and IOC can be set manually by pressing the button immediately below each I.e.d. These buttons step the FAX-1 sequentially through its modes. Once the mode has been set, printing is started by pressing the START button. The printer bursts into life and prints a row of numbers from 1 to 10 and back to 1 across the whole width of the paper. These numbers are part of an ingenious aid for chart alignment. When starting a picture manually the chart will most probably be out of alignment, with the edge appearing anywhere but at the edge. This is where the line of numbers come into play, as all you do is note the number directly above the chart edge and press the appropriate PHASE button to realign the chart. I found that with a little practice I could align a chart very quickly, leaving only a very small part of the chart distorted.

The final section of the front panel is the clock/timer settings. The clock is set by pressing the hours or minutes button as appropriate. The start time is set in a similar fashion except that the SET START button is pressed as well. The timer is provided so that you can receive pictures of interest even when you are out. There is an EXTERNAL socket on the rear panel which is driven by the timer, this can be used to operate a relay to power up the rest of the shack, it can be manually stopped by pressing the TIMER CANCEL button.

RTTY

Whilst reviewing the FAX-1 I had the opportunity to test a future software release which enables the reception of

RTTY. One of the benefits of the software decoding used in the FAX-1 is that new features can be added quite easily. The RTTY option is fitted quite simply by changing the ROM. To access the RTTY mode the IOC button is pressed until both the 288 and 576 I.e.d.s are lit, the front panel buttons and I.e.d.s now have a secondary function. The RPM button and I.e.d. serve to select the baud rate as follows: 60 r.p.m. = 45 baud; 90 r.p.m. = 50 baud; 120 r.p.m. = 75 baud; 240 r.p.m. = 100 baud. The AUTO button toggles the unshift-on-space function, this forces a return to letter shift after receiving a space. The START button retains its normal function and starts the printing process.

The RTTY option is designed to receive commercial wide shift RTTY (425Hz or 850Hz) and its performance on this mode was very good. I did try receiving amateur narrow shift RTTY with some success but this required very careful tuning of the receiver. To reduce the amount of garbage printed the FAX-1 will only print a line if it ends with a carriage return followed by a line feed. I found that this simple technique proved to be very effective. Overall then, the RTTY option is a useful facility particularly for those who require hard copy of weather reports or news bulletins.

The FAX-1 has been on review for several months and during that time it has proved to be an extremely effective and reliable FAX reception system. I was disappointed with the quality of the 11-page A5 manual and feel that the FAX-1 deserves better. I think that overall the FAX-1 represents good value for money and just to prove the point I have parted with my own hard earned cash and bought one for the shack! □

The FAX-1 cost £..... and is available from **ICS Electronics Ltd., PO Box 2, Arundel, West Sussex, BN18 0NX.** Thanks to ICS Ltd., for the loan of the review unit.

Peter Laughton

High Seize

On Thursday July 23, a rusty 61m former Japanese fishing vessel dropped anchor. It was 7km off Long Island, near New York City on the US East Coast. By some standards this position is considered international waters. Later the same day, 27 year old Randy Steele started a series of test transmissions under the name Radio New York International.

Owner Steele said their format of rock and roll music was in response to tedious programmes on legally licensed radio stations in the area, and what he claimed were bureaucratic limitations by the Federal Communications Commission preventing some types of free speech. Flying a Honduran flag, the station appeared on 103.1MHz, at the end of the medium wave a.m. dial on 1620kHz, on 6240kHz shortwave, and curiously 190kHz long wave. That is odd because long wave is not used for broadcasting in North America. It was monitored as far away as Mid-Western North America, transmitter power being estimated by many as in the region of 10kW on each frequency. Tests were also announced, but not heard, on 530kHz, and an address for reaction and job info to an address in New York City.

FCC Visit

On Saturday July 25, the Federal Communications Commission sent out a delegation to the vessel asking the operators to stop broadcasting. This was ignored by Randy Steele on the grounds that the FCC had no jurisdiction in international waters.

On its fifth day of broadcasting, Tuesday July 28, the 29m US Coast Guard cutter *Cape Horn* pulled alongside the radio ship christened *Sarah*. Officials from the FCC and the US Coast Guard boarded the ship. They arrested two RNI operators and a journalist, then proceeded to make the broadcast equipment unusable. Richard Violette, Assistant Chief, News Media Division at the FCC said the boat was breaking rules laid down in the Radio Regulations of the ITU Convention. This clearly states that broadcasting from a ship is illegal.

The United States Voice of America station broadcast from a ship back in 1959. Short and medium wave transmitters were put on the USCGC *Courier* anchored in the Mediterranean off Rhodes, Greece. But the two channels used were registered in Geneva. Contrary to newspaper reports, this isn't the first attempt to broadcast from a ship off the US East Coast. In late August 1973, a 42m wooden ship dropped anchor 19km off the coast of Cape May in the Southern tip of New Jersey. For two days, starting September 19, religious broadcaster Carl Macintire put out his strong anti-communist programmes as "Radio Free America". Weeks before, Macintire had lost the broadcast licence for his station in

A lot has been written about a recent attempt at "international broadcasting" in the USA. We've done some thorough investigation to find out more.

Pennsylvania because the FCC thought he wasn't giving equal airtime to other viewpoints. Using a 10kW transmitter on the wooden ship though, led to heat problems. Eventually a hole burnt in the ship forcing it to cease operation and sail into port. The FCC filed a restraining order preventing Macintire going back to sea as a radio ship after repairs.

Cashing In

After the ship broadcasts ended, several people decided to cash in on the publicity the pirates had received. Station WNYG on 1440kHz invited seven members of the Radio New York International crew to do what they liked in their studios for one entire broadcast day.

Someone has obviously pumped a lot of money into Radio New York International, leading to the question as to how a group of fairly young enthusiasts can get some US\$200000 together to buy a ship, generators, transmitters, a good antenna mast, and studio equipment? Their off-shore route to broadcasting to New York is cheaper though than the roughly US\$20 million it would cost to legally purchase an existing commercial radio station in the New York area.

Legal Position

Whether the FCC had the right to board the ship and forcibly damage the equipment is now under dispute. Back in 1981 the Dutch authorities boarded a ship called *Radio Paradijs* as it started to test from international waters off the Dutch coast. A court in Amsterdam later ruled that the ship and its equipment were to be returned, though by that time enthusiasm for the project had disappeared.

Every seven years or so delegates of the 163 member states of the ITU get together to examine and update the so-called ITU Convention. In the annex of that convention is the paragraph stating the rule that broadcasting from a ship is illegal. Countries who agree to the convention are expected to incorporate the radio regulations into their own law. But countries are free to interpret the Geneva decisions in any way they like. So existing broadcasters at sea in international waters simply choose a country which hasn't yet incorporated the rule about no off-shore broadcasting into their national legislation. The RNI ship was flying a Honduran flag, though it appears the Honduran authorities gave the US State department permission to board the ship.

The converted Japanese fishing vessel

Sarah, home of Radio New York International is now in Boston harbour. A court case is due shortly, and the outcome is being closely followed well outside the US borders. The problem facing many Western governments is quite simple.

On the one hand freedom of expression is branded by most as vital to democracy. Yet allowing airtime to radical groups that could incite public violence or racial hatred may be taking the concept of "free radio" too far. To what extent do you allow the general public to decide what is right and wrong?

New Transmitters Testing

At 0400UTC on August 6, the BBC made the first test of the two new 250 kilowatt transmitters in Hong Kong. It is hoped to inaugurate the transmitter site on September 27 at the start of the new winter transmission period. Once things do get going, reception reports from the target areas of China, Japan and Korea will be encouraged.

Things are also busy at a transmitter site 24km north-east of the centre of Indianapolis, in the US state of Indiana. That's the home of religious station WHRI, and they're getting ready to start up a second 100 kilowatt transmitter. WHRI has two antennas, one for Europe, the other for South America. Part of the test schedule will involve using the same frequency beamed in two directions with the same programming.

WHRI are currently putting out special test transmissions using the new transmitter as follows: 2300-0300 on 6010kHz, 1300-1500 on 9580kHz, 1800-2300 on 17835kHz. Reports on the test transmissions sent to PO 50250, Indianapolis, IN 46250, USA will get a special verification card. Other frequencies are possible because the station has been getting interference complaints from other s.w. stations.

Belgrade Upgrades

Radio Yugoslavia seems to have started using two new 500kW transmitters for at least two English transmissions a day. The English broadcasts at 1730 and 1900UTC 5980 and 6100kHz are announced as being from the new centre. Reception reports are needed to Box 200, 11000 Belgrade, Yugoslavia.

Meanwhile in Nicaragua, the external service in Managua has started using new transmitting equipment. Programmes in English are now heard 0300-0400 and 0600-0700UTC on 6100 and 6015kHz, although some nights the domestic service appears instead. The Voice of Nicaragua is asking for reception reports to PO Box 248 in Managua.

Religious station KCBI in Dallas Texas has considerably scaled back its operation. A spokesman for the station was very vague when we called. He stated that they do "plan to do more things in a different direction in different languages"

with their existing 50kW transmitter. Operation is currently confined to a few hours each weekend, and no firm decisions as to where they go next are scheduled until next month.

Danish Longwave

A curious case of sporadic international broadcasting began on Friday lunchtime August 14, on long wave 245 kilohertz. Two days before, Danish radio announced that they would broadcast extracts in English from the book *Spycatcher* by Peter Wright. This they did, claiming that this was one way British citizens could hear the passages which have upset the British Government. An English presenter read some of the passages, after he had checked with the British embassy in Copenhagen that he wouldn't be personally prosecuted.

The reaction to the broadcast appears to have been zero. 245kHz isn't all that audible in the UK during the daylight hours. Likewise, the Danish press ignored the whole thing, as they see Danish radio as a serious competitor.

Worldnet

Some people are indeed looking critically at Worldnet, the television wing of the United States Information Agency in Washington. Whereas the Voice of America uses the radio medium to broadcast primarily news, editorial and analysis to listeners overseas, since 3 November 1983, Worldnet has produced but a few hours of TV per day. It is beamed in the direction of Europe and later also to Latin America, in the hope that the existing TV media and cable will want to use it. Radio is fast, difficult to jam effectively in hostile target areas, and relatively inexpensive. Television demands far more staff to get the pictures, and is traditionally a slower and more expensive proposition. This year Worldnet has a budget of US\$30 million. As from October 1st it has asked the US Congress for US\$44 million to continue. But the Senate Foreign Relations Committee, one of the panels set up to review the USIA's activities, voted last month to cut the 1988 funds to US\$15 million. Compared to the VOA radio, said the committee, Worldnet doesn't match up and has exaggerated claims about viewership. But this committee doesn't have the final say, and the director of Worldnet, Alvin Snyder, told SWM this view is not shared by others in Congress.

Worldnet puts on a breakfast show from 7 to 9, and in the afternoon concentrates on teleconferences. Journalists invited to the US embassy in their own country can put questions live to prominent guests in Worldnet's Washington studio. Some discussions do indeed find their way onto European TV stations, though not often with a credit to

Worldnet.

In many countries though, Worldnet is still only beaming into US embassies and cultural missions. Direct reception of Intelsat, even though unscrambled, is beyond the average viewer. At present, no-one seems to know how many of the potential viewers are watching, though Worldnet claim a healthy postbag. And if Worldnet does take off, what will be the reaction from governments during any political conflict with the United States. It is much easier to pull the plug on a TV service than blot out an overseas radio broadcast. Some of the Dutch cable systems have started showing a text caption on the channel normally carrying Worldnet.

The Dutch mechanical performing rights society, BUMA, says that before Worldnet and the radio service VOA Europe can have their signals distributed through Dutch cable systems, a contract needs to be signed with BUMA for the commercial recordings used. BUMA has put pressure on some cable systems to suspend the services until the matter is sorted out. It has been in a stalemate situation for some months. BUMA point out that organisations such as Sky Channel, the BBC and Superchannel have already made contracts with performing rights organisations in each country where they are distributed on the cable. The US embassy in the Hague say they have referred the matter to the head office in Washington who are looking for a solution in co-operation with ASCAP, the American performing rights association.

El Salvador

The non-governmental Human Rights Commission in El Salvador has reported that a new clandestine radio station in San Salvador, in its broadcasts which began on July 25, has accused the Commission of being a guerrilla front and of inventing false documentation of human rights violations. Broadcasting as the Radio La Verdad, which translates as Radio Truth, the station is currently heard on 106MHz four times a day in the capital. The station claims that Herbert Anaya, a commission member, is a commandante of the Farabundo Marti Liberation Front, and it also named Reynaldo Blanco, another member, of being linked to the left-wing guerrillas. The Spanish language Radio Truth takes a strong anti-communist line and has also accused union organisations of similar guerrilla links. In addition to the broadcasts from this clandestine radio, the Treasury Police have also recently been airing television commercials which make similar accusations aimed at the Human Rights Commission. Radio Truth may have been started by the El Salvadorean security officials to help counteract the short wave clandestine stations Farabundo Marti and Venceremos. Radio Venceremos is currently poorly heard in

the target area because of interference. Those behind it maintain that it comes from within the country.

Bond Bungles

Short wave listeners checking the new James Bond film *The Living Daylights* will no doubt spot two communication slips. While in Afghanistan, hero James explains to his companion that a certain word means "beautiful in Afghan". No doubt this has similar roots to the Austrian, Canadian and Australian languages. Also, while escaping from Bratislava, we see Bond tuning his car radio to 96.90MHz to hear Czech radio. Not much luck there in real life! Eastern Europe, with the exception of East Germany, uses a different f.m. band. Maybe SWM can act as communications consultant when Bond returns! The rest of the film isn't bad at all, hi!

Japanese Handbook

Listening to a lively local station entertaining its listeners on the American continent, especially on a pair of headphones, transports the mind to another country in seconds. It takes a bit longer to master Latin-American Spanish or Portuguese though, so you can understand more than the enthusiasm in the presenter's voice. Still, with a simple language course, plus a dictionary and tape-recorder at hand, things soon fall into place. A Japanese group have just published a 294 page paperback book called *Latin American DXing*. It is the 4th edition, and is just about essential if you want to get a lot of background on the maze of stations in Latin America. Part of the book is a directory of the more frequently heard stations in the region, who they are, and where they're transmitting. Most of the 65 pages of information is in Spanish. But all the other chapters in the book, describing a visit to the University radio stations in Mexico for instance, are written in English. It's full of logos used by the stations, photos of the transmitter site you're listening to, maps, and lists of people at the stations who usually answer the letters.

The authors point out that the station with the biggest claim in the continent has to be Radio Inca del Peru, who say that they're broadcasting "to the earth and the entire solar system". All that with about 1800 watts transmitter power.

The 4th edition of *LA-DXing* costs US\$18.00 or 23 IRCs by airmail, US\$12.00 or 16 IRCs by seamail. It is not a sort of regional *World Radio TV Handbook*, but more a collector's item for those curious as to who's behind those Latin American signals on the tropical and medium wave bands. The address for further information is **Radio Nuevo Mundo, 18-11 Fujimi-cho, Hachioji-shi Tokyo 192 Japan.** □

In Search of Super DX

by Barry Davies

To own a property in the country with a few acres of land must be the dream of most medium wave DXers who live in towns and cities. It has certainly been one of my dreams for over 20 years now — and I still live in a town! Why the dream? In a word "antennas", of course. A place in the country would allow me to put up the ideal medium wave antenna, the Beverage: a longwire antenna running for 300m or more which can be beamed right at the desired m.w. station.

However in the past couple of years, by renting a holiday cottage, I have been able to experience the qualities of a Beverage antenna, if only for a week or so. This gave me the idea of a "medium wave DXpedition" (not that there's anything new in this as our fellow m.w. enthusiasts in Scandinavia have been doing it for years).

Where to go?

The following suggestions are based on my practical experience and should not be regarded by any means as definitive guidelines.

A quiet west coast location would seem to be the ideal: successful DXpeditions have been mounted in Cornwall, North Wales and North West Scotland. At any event there should be no electricity pylons, main roads or street lights and the terrain should be as flat as possible. Use tourist or holiday brochures to help you find the best combination of location and accommodation, and having made your choice explain to the owner of the site what you want to do, assuring him that you will not be endangering life, limb or property! Remember that the best periods for medium wave DXing are outside the usual tourist season, in February, March, October and November; this means that as well as getting the property at off-peak rates you will be offering the owner the opportunity to earn some perhaps unexpected extra rental income.

What Do You Want To Do?

The idea is to erect an antenna which will run for 300/450m or so, allowing you to tune into medium wave stations not usually hearable in town and city locations. To achieve this you will need a receiver, an antenna tuning unit (a.t.u.), wire, 1.5m bamboo cane wire supports, a cassette recorder and some blank tapes, and about a week's supply of food. This lot, plus two people, should just about fit in your car!

Setting Up The Antennas

Allowing for wind, rain (and sheep), place your canes about ten paces apart in the direction of the wanted station. The canes are supported with string guy ropes and the antenna, held in place with insulating tape, is placed on top of the canes. Don't forget to bring some extra canes to replace any that may get damaged.

Most short wave listeners dream of being able to set up their station on the ideal site for pulling in the DX. Barry Davies has found one answer to the dream by taking off on an out-of-season DXpedition — to a holiday cottage miles from the trappings of modern civilisation and with enough land to enable him to erect his large antenna system.

My own interest is North America and the Far East. This means that normally two canes are put up: one directed north west and the other north east. The far ends of the antennas are terminated to a piece of copper pipe which is driven into the ground as an earth; the end of the antenna is fed to this earth via a switchable 1kΩ potentiometer. This device allows for increased sensitivity towards the desired DX signal. By switching off the earth feed the antenna becomes equally sensitive to the NW/SE and the NE/SW respectively. This latter facility is useful at night for DXing South America.

The 1kΩ pot. enables sensitivity to be increased to signals coming from one direction and at the same time reduced to those coming from the opposite direction. Thus on the north-west directed antenna, signals from North America are enhanced while those from Europe are weakened. A similar situation applies to the north-east antenna with, for instance, Taiwan stations coming in stronger and Irish stations weaker. The examples here relate to a North West Scotland location.

Changes in the weather appear to affect the setting of the 1kΩ pot. You should carry out a daily tuning-up routine around

mid-day. This is where two people come in handy: one to adjust the pot. and the other to observe the receiver's S-meter.

The idea is to tune to a strong station to the south-east, assuming you are working on the north-west antenna. Switch off the earth feed and reduce the receiver's r.f. gain, or detune the antenna via the a.t.u., to get the "S" reading showing about half way across the meter's scale. Switch on the earth feed and adjust the pot. until the "S" reading drops to zero. Turn up the r.f. gain or tune up the signal via the a.t.u. and again adjust the pot. to try and further reduce the unwanted signal. When no further reduction is possible the antenna is tuned up. You can test the system by switching off the earth feed to check that the S-meter needle shoots across the scale. Do not, however, forget to switch on the earth feed again before you start your North American DXing!

From the foregoing you can see the value of CB for communication between those making the adjustments. The alternative is a pair of DXers with strong lungs!

What To Look For

My recent article (*PW*, February 1987) on using data from WWV time signal stations indicates that what you can receive relates to the prevailing "A" index figure. In case you have not yet built up an "A" index logbook here are some general guidelines. Very quiet conditions with "A" figures between 1 and 5 favour both west coast reception from North America and signals from the Far East. Quiet conditions with "A" figures between 5 and 8 favour North America east coast reception and South East Asia. Mildly unsettled conditions with "A" figures between 8 and 14 favour the Canadian Prairie Provinces, Alaska and the Caribbean.



In Search of Super DX

Indices over 14 tend to favour South America. These bands are not, however, mutually exclusive but are a good rule-of-thumb guide.

With regard to the blank cassettes, the idea is to fill them with fabulous DX

recordings which you can turn into good, detailed reports once back home. Generally such reports sent to stations will bring forth an abundance of QSLs. If QSLs are not to your liking you will have a permanent recording to listen to — and

Some DXpedition Loggings

660 0500 CFFR Calgary AB. Country music
790 0530 CFCW Camrose AB. Country music
792 1530 PBS Guanxi, China, Chinese music
820 0615 CHAM Hamilton ON. Country music
850 1600 BEC49 Linkou, Taiwan. Chinese talk
930 0500 CJCA Edmonton AB. Talk format at this hour
940 0400 CJGX Yorktown SK. Country music
950 0515 KMTX Helena MT. Adult contemporary format
1000 1725 BED62 Luchiang, Taiwan. English pop records
1000 0420 WCFL Chicago IL. Talk format
1010 0140 CX24 R.EI Tiempo, Montevideo. Latin American songs

1090 0415 KING Seattle WA. News/talk format
1130 0615 CKWX Vancouver BC. Country gospel programme
1134 1530 VUC Calcutta, India. News in English
1160 0540 KSL Salt Lake City UT. Tabernacle choir
1175 0400 HOU84 R.Belen, Panama. Football commentary
1410 0620 CFUN Vancouver BC. Pop music
1450 0800 VSB Bermuda. Country music
1480 0700 WTDY Madison WI. Talk format
1540 0800 KXEL Waterloo IA. Country music
1566 1600 HLAZ Cheju, South Korea. Russian gospel programme
1570 0550 CKTA Taber AB. Countrymusic
1580 0600 XEDM Gran Sonore, Mexico. Mexican accordian music



you can always listen to them as an alternative to struggling with CJYQ creeping through under the noise of your town/city location.

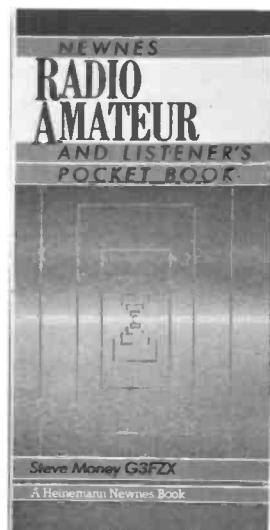
Tempted?

After your DXpedition send your results, all positively identified, to Brian Oddy for his *Long, Medium and Short* column here in *Short Wave Magazine*. □

Practical Wireless

NOVEMBER '87 ISSUE

The Radio Magazine



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FAX DECODER FOR THE BBC-B

John Waite

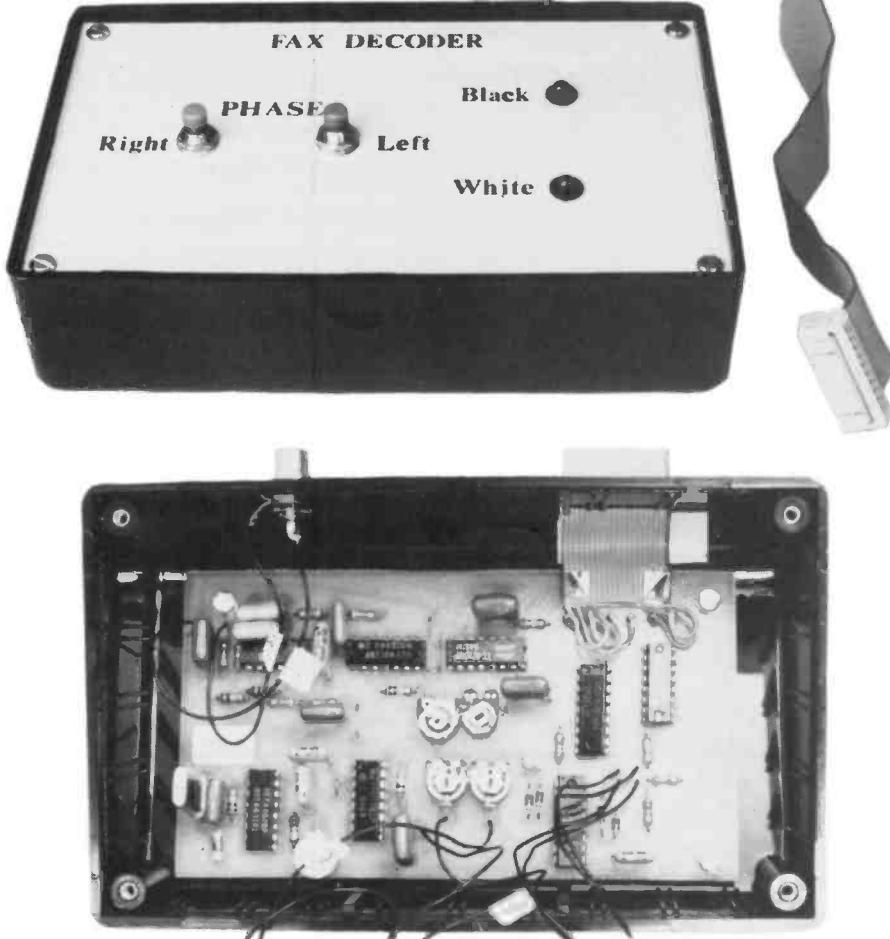
The BBC FAX decoder produced by G6EJD and G6LZB has been designed to be used with the BBC-B or Master series computers. By combining your computer, this decoder and an h.f. s.s.b. receiver you have all the components necessary for a versatile FAX reception system. If you require a print out of the received pictures then you will obviously need a printer in addition to the above. The decoder actually comprises two parts, the interface unit and the software. The interface unit contains the electronics required to decode the FAX signals and is supplied ready built and tested in a neat case. The software is available on either disk or tape so you don't have to rush out and buy expensive disk drives.

Operation

The first job is to connect the interface unit to the computer, after first switching off the power! The pre-assembled and tested interface is connected to the user port of the computer via a 20-way ribbon cable, which was supplied complete with the correct connector. The ribbon cable was just about the right length too, allowing the interface unit to sit neatly on top of my BBC-B. As the power for the interface is taken from the user port the only other connection required is the audio signal from the receiver. The interface unit can tolerate a very wide range of input levels, from about 20mV to 5V, so this feed should present no problems. The audio can be supplied either from the speaker output or preferably, as I did, by using the fixed audio output that is available from most receivers.

Having completed all the connections the computer can now be powered up and the software loaded. The software for the review unit was supplied on a 5½in 80 track disk and was auto-loaded in the usual way by pressing the shift and break keys together. The first program to load calls a second which loads the machine code routines to decode the FAX and drive the screen and printer. When the software has loaded the screen shows a menu display with seven options. The top section of the menu screen shows the current parameters and is updated whenever a change is made. For those who don't want to bother with the technicalities of working out the scan rates and height ratios, etc., 4 pre-defined settings are available from the menu. These settings are for news pictures, weather charts at 1:1 and 3:1 and finally WEFA. The fifth option on the menu is the user program mode which lets you alter the scanning rate and height ratio. This section is the key to the versatility of the system, but more of that later. The next menu option is for reviewing charts that have been saved to disk or tape. If you get confused by the various commands the final menu option is a help screen with a brief guide to the syntax of each command.

If you have a BBC computer and an interest in FAX then this could be just what you've been waiting for.



There are three screen modes available for displaying the different types of FAX pictures. These modes are selected from the main menu by typing M followed by the mode number, i.e. 0, 1 or 2. To start receiving a picture you type S for scan and the picture will start appearing. Before you can receive good quality pictures the receiver must be accurately tuned. The interface unit has two tuning l.e.d.s on the front panel marked black and white, these can be used as a rough tuning guide with the correct tuning point being when both l.e.d.s flash in sympathy with the received signal. Once you have received a FAX picture the next problem of course is what to do with it!

When the screen is full a prompt will appear at the bottom of the screen asking if you want to save it. If you answer no you are returned to the main menu if, on the other hand you answer yes you are asked for a file name and subsequently the screen is saved to disk or tape.

If you would rather display the picture on the printer this mode can be selected from the main menu by typing MP. To actually start printing you type S as per screen mode.

I mentioned earlier that the key to the versatility of the system was in the user program mode. To get the best from the system it is important to understand how a picture is processed.

I will start by describing the process used when the screen is set for maximum horizontal resolution of 640 pixels. For those of you not too familiar with computer terminology, a pixel is the smallest dot that can be displayed on the screen. If you have read the FAX article by David Bird in this issue, the rest of this explanation should make some sense!

Most FAX transmissions are sent with a drum speed of 120 r.p.m., this equates to a line rate of 120 per minute or 2 per second. Some simple arithmetic will reveal that a single line must therefore take 0.5s to transmit. I mentioned earlier that we are using a horizontal resolution of 640 pixels or 640 dots per line. So to display a single line of the FAX signal on one line of the computer screen we need to measure or sample the FAX signal 640 times during the 0.5 second that the line is being sent.

We can now do some more simple arithmetic to work out how much time is available for each pixel by dividing the 0.5s line rate

FAX DECODER FOR THE BBC-B

by the number of pixels, the result being $0.5/640 = 781\mu s$. The computer takes about $5\mu s$ to measure the signal so this has to be subtracted from the result, giving a final sample rate of $776\mu s$. When using this high resolution mode each pixel can be on or off so the decoder logic must average the result during its sample period and set the pixel as appropriate.

If you want to receive photographs via FAX you need to be able to set pixels at intermediate levels so that shaded areas can be displayed accurately. The software supplied allows the selection of two other screen modes which allow this facility. The first, mode 1, gives 4 levels of intensity with a reduced resolution of 320 pixels. The third, mode 2, provides 8 levels but with a low resolution of 160 pixels. The sample period can be calculated in the same way as when in high resolution mode, by dividing the line rate by the number of pixels. When using the lower resolution modes the computer averages the level of the FAX signal during the sampling period and sets the pixel to the appropriate level.

The supplied software can be set to drive a printer instead of the screen if required. When used with a printer the sample rate can be calculated in the same way as when using the screen, except that the number of pixels per line is fixed at 480.

That's the difficult bit over with and hopefully you should now have a fairly good grasp of how a line is resolved and displayed. In order to display a complete picture we obviously need to display many lines and this is achieved simply by repeating the line display process until the picture is complete. Unfortunately there is another little problem, the line spacing on the BBC computer is greater than the line spacing used for most FAX transmissions. The result is very long and thin pictures! The answer, fortunately, is quite simple. Instead of trying to display every line that is transmitted some are ignored. For example a standard h.f. weather chart with an IOC (index of co-operation) of 576 would produce a picture 8 times longer than the screen if every line was displayed. To produce a properly proportioned chart

on the BBC every eighth line is displayed. The ratio of the number of lines skipped to those displayed is called the height ratio.

So we now have two variables which determine the length and width of the picture, namely the height ratio and sample rate or scan rate. This is where the user program mode comes into play, as both these variables can be set to cope with virtually any FAX standard. In addition to coping with a wide range of FAX standards manipulation of the height ratio scan rate allows the user to zoom in or enlarge portions of the received picture.

Performance

The decoder was set up in the shack with my Icom-720A, BBC-B and Epson RX-80 printer. After spending some time getting to grips with scan rates and height ratios, I started looking for a good signal. I usually head straight for Offenbach on 134.2kHz but my initial efforts were not too successful. The tuning I.e.d.s on the interface unit are set-up for the normal h.f. shift of $\pm 400\text{Hz}$ so were of little use on I.f. My next choice was Bracknell on 4.782MHz, this proved to be much more successful with the tuning I.e.d.s working as expected. I did find though that the tuning needed very careful adjustment in order to display clean pictures. The technique I found most effective with weather charts, was to start with a mainly black display and then gradually tune towards white until the chart details were clear with the minimum of noise. I would strongly recommend the use of a Toni-Tuna or similar tuning aid for rapid selection of the correct tuning point. Once a recognisable chart is appearing on the screen it can be centred quite easily by pressing either the left or right phasing button on the interface unit.

When receiving standard weather charts with an IOC of 576 and 120 r.p.m. the displayed resolution was quite good, although most of the small text was unreadable. If you experiment with the height ratio and scan rates the resolution can effectively be improved by displaying only part of the image.

The reception of photographs was very interesting and quite successful with screen mode 2 providing the best results, the poor horizontal resolution was counteracted by the 8-level grey scale in this mode.

The facility to save pictures on disk was very useful though at 20K each, users with 40 track drives will soon run out of space. One minor criticism here is that you can't check the disk catalogue before saving. I found this a little inconvenient, as you need to be sure that you are allocating a unique file name to the picture or you could over-write an existing file. File retrieval from disk was again very effective but you need to set the screen to the correct mode first as this is not stored with the picture. This didn't present any particular problem as there are only three to choose from. My own solution to the filing problem was to use FAX as the first part of the file name followed by a single digit representing the screen mode and then a two digit serial number. An example would be FAX014, which means series number 14 using screen mode 0.

The results using the printer were slightly better when receiving charts, due to the increased horizontal resolution of 960 dots. If the printer is used to receive photographs be prepared for a lot of noise because the generally high dark content of a photograph will mean that the printer will be working very hard.

This FAX decoder can be recommended for any FAX enthusiast who already has a BBC computer and a suitable receiver. The ability to easily change the operating parameters is likely to appeal to the experimenter. As the unit stands there is no tone detection logic, so all pictures have to be started manually which may be a minus point to some people. The unit is very competitively priced and will hopefully encourage a few more listeners to try this interesting mode. My thanks to Peter Adams and David Bird for the loan of the review unit.

The FAX decoder is available from P. Adams, 464 Whippendell Road, Watford, Herts, WD1 7PT. Price £59.95 inclusive. □



Godfrey Manning

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Common Sense

Have you been to any aerodromes or airshows? Then let's hear about it! The airshow season tends to run down about this time of year. **Steve Parry** (Runcorn, Cheshire) went to the International Air Tattoo at RAF Fairford in Gloucestershire and quite rightly doubts the wisdom of an attempted departure by a non-participating aircraft during the Red Arrows' display. Whilst talking about safety, I was horrified to see visitors smoking whilst standing beside an aircraft parked on the apron at one display. You could see the fuel and oil floating on nearby wet puddles on the ground! And I don't apologise for repeating my reminder about keeping any radio or audio noise to yourself when visiting airports. The Civil Aviation Authority has a saying that's worth remembering: "Safety is no accident."

Runways and Compasses

The asphalt and concrete runway at Fairford is 09/27 and is 9997 feet long. These designation numbers relate to magnetic heading, worked out to the nearest 10° with the least significant digit knocked off. As any runway has two, reciprocal, directions, the designation numbers must be 18° apart. So, the Fairford runway is lined up along the 090°/270°, i.e. east/west, line.

There is usually a small difference between Magnetic North (towards which a compass points) and True North. The earth's magnetic field is constantly moving, and over the years Magnetic North oscillates either side of True North.

Once a runway has been built its position in relation to True North is fixed; but the heading reference on aircraft is most commonly a Magnetic North sensing device, hence runway designations use the magnetic bearing. At the moment, Magnetic North is about 4½° west of True North as measured in south-east England (magnetic variation).

Variation alters slightly depending on where you are and lines of equal variation (isogonals) are marked on aeronautical charts. One such chart is used when flying by visual landmarks, such as in light aircraft, and is the *International Civil Aviation Organisation (ICAO) Topographical Air Chart*. Airspace boundaries and airfields are shown on a background based on the Ordnance Survey. The latest editions also include radio navigation beacons. The UK is covered by three charts at 1:500 000 scale or eighteen charts at 1:250 000 scale. There are various suppliers; try Airtour International at Elstree Aerodrome, Hertfordshire (tel: 01-953 4870).

What's the importance of magnetic runway headings? To obtain the correct instrument landing system (i.l.s.) localiser indication, the pilot must select the magnetic heading on the horizontal situation indicator (h.s.i.) as described in part 3 of my recent series. Earlier this year

Judging by the size of my postbag, "Airband" must be popular. My thanks to everyone who has written in; please do keep in touch if you have already sent me a letter and, if you haven't written yet then I hope that you will soon! I'll try to mention everyone who writes, but please remember that a magazine is never capable of "instant data transmission."

the magnetic variation around Heathrow changed enough for it to become necessary for the two main parallel runways to be re-designated. They were 10/28 but are now 09/27 (in fact they are described as 09L, 09R, 27L, and 27R to allow for the left and right runways of each parallel pair). Runway 05/23 has not changed.

As well as charts there are plenty of other useful official documents on sale to the public. **Tom Street** (London, N4) would like to know about these. Her Majesty's Stationery Office (tel: 01-211 5656) publishes accident reports on specific aircraft from time to time. Does any reader know of any other information from this source? The Civil Aviation Authority, Printing & Publishing Services, Greville House, 37 Gratton Road, Cheltenham, Gloucestershire, GL50 2BN, will no doubt be pleased to send you their *Publications List*, although a stamped reply envelope would probably be appreciated. **C. J. Durkin** (Ormskirk, Lancashire) collects information on airport timetables and aerodrome runway details. Let me recommend *Airport Timetables UK 1987* price £5.25 by post from the Midland Counties Aviation Society Ltd., 27 Highwood Croft, Kings Norton, Birmingham, B38 8ET. For runway details try *Europe & Middle East Supplement – Vol. 2, Planning* from Aerad Customer Services (tel: 01-562 0795). Similar to this is the *En Route Supplement – British Isles and North Atlantic* on sale from 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex, HA4 6NG.

Licences

An airband transceiver may be operated by a qualified air-traffic control officer (or one in training), or by a student pilot or one whose licence includes a radio-telephony rating. **Geoffrey Powell** (Tamworth, Staffordshire) is such a one, having obtained the private pilot's licence (p.p.l.) with R/T rating. This is the basic licence obtained by all people who wish to fly light aircraft for pleasure. He used to fly out of Castle Donington and Birmingham. I hope that you will share some of your past experiences with us in this column, Geoffrey, although I understand that you

don't fly at the present.

Further up the scale comes the commercial pilot's licence (c.p.l.) and higher qualifications for airline transport. Another pilot is **Malcolm Wayland** (Huntingdon, Cambridgeshire) who is a First Officer flying a Boeing 737-200 with Britannia. Again, I hope that you will be able to tell us something about your flying experiences, Malcolm. In reply to your question, I'm just an ordinary enthusiast and not a pilot of any experience. My total time amounts to just a couple of hours trying my hand at instrument trainers and so input from someone who has flown *real* aircraft will be more than welcome in this column! Part 3 of my series described secondary surveillance radar (s.s.r.) which enables the air-traffic controller to see an aircraft's flight level and identity on the radar display screen. The identity is transmitted as a four-digit squawk code (no digit being greater than 7).

Malcolm points out that code 2000 is used wherever s.s.r. service is unavailable. Some other codes of special interest are: 7500 – hijack; 7600 – radio failure; 7700 – mayday or emergency; 4321 – conspicuity, e.g. light aircraft flying near an s.s.r. zone but not receiving instructions under radar control. The origin of "squawk" (August issue) prompted **Cliff Reynolds** (Richmansworth, Hertfordshire) to describe the codeword used during the war for identification friend or foe (i.f.f.). He remembers that "cockeral crowing" or "cockeral strangled" meant that the i.f.f. was either on or off, respectively.

Receiver Mods

From **K. Jenkins** (Bristol), another p.p.l. holder who I hope can also be persuaded to tell of his flying experiences, comes a series of receiver modifications. For the Signal 532 they are: improving sensitivity including providing power to a pre-amplifier via the antenna socket; adding a noise-blanker; adding a delay so that replies to transmissions are not missed; providing frequency display during active scanning; adding a signal-strength meter; and boosting the audio output. For the Realistic Pro-30: providing power for a pre-amplifier; improved front-end using a BFR90A transistor; automatic selection of display illumination when a mains power supply is in use, as opposed to internal NiCad batteries; and adding a signal-strength meter. If any readers would care to send me a couple of good-sized stamped envelopes I will pass on their requests for details concerning these various mods.

An interest in the North Atlantic Track System is expressed by **C. Elsey** (North Harrow, Middlesex). This airspace is densely packed with traffic, mainly going west during the day and east at night. Separation is 2000 feet vertically and 60 nautical miles laterally. To maintain this

THE MAN WHO SPANNED THE ETHER

Roger Jones

28 ▶



Fifty years ago on July 20, occurred the death of a man who revolutionised communications so significantly that it is difficult to imagine how life was possible before his momentous discoveries. Roger Jones tells the story.

Guglielmo Marconi with his mother
Annie and elder brother.

Marconi, on the left, with an engineer standing beside the microwave antenna installed at the Vatican, 1932.

Nowadays, radio transmissions span the globe and pictures are beamed from satellites which hover the earth. But, at the turn of the century, there was only one man who knew how to harness electromagnetic waves in order to send messages through the air — the youthful Guglielmo Marconi, born 1874.

During his teens, Marconi spent much of his time conducting experiments in his laboratory on the top floor of the family villa at Pontecchio near Bologna. His father, Giuseppe, protested that he was frittering away his time when he should be studying for admission to the Naval Academy or the University. His Irish mother, Annie, encouraged her son in his activities and persuaded Professor Righi to let him attend his lectures.

It was an article by Righi on Heinrich Hertz's experiments with electromagnetic waves that in 1894 put Marconi on the right track. The following year he was transmitting Morse signals over distances of a mile or more.

Marconi's father was duly impressed.

and clearly relieved that his son's youth dabblings were starting to bear fruit. After much discussion with his family and friends, Guglielmo wrote to the Ministry of Posts and Telegraphs about his invention, but the letter elicited very little interest. Presumably, the Italian postal authorities were content to send their messages by wire and could see little potential in wireless.

Yet while cable contact was possible over land, at sea it was not, and when a ship sailed out of sight it became completely incommunicado. It occurred to Annie that the British authorities might be more interested given the fact that Britain at the time was the greatest maritime nation in the world.

So mother and son made their way to England in 1896 and settled in London. Annie's optimism was justified for the British Post Office showed considerable interest in his project. His first demonstrations were conducted from the roof of the Post Office in St Martin's le Grand, and later he was to conduct

experiments on the Salisbury Plain and across the Bristol Channel to great acclaim.

He was granted a patent for his invention the following July, and in the same year, the 23-year-old inventor founded his own company. The following year found him on the Isle of Wight at the behest of Queen Victoria providing wireless communication between the Prince of Wales' yacht in the Solent and Osborne House. Marconi had become a household name.

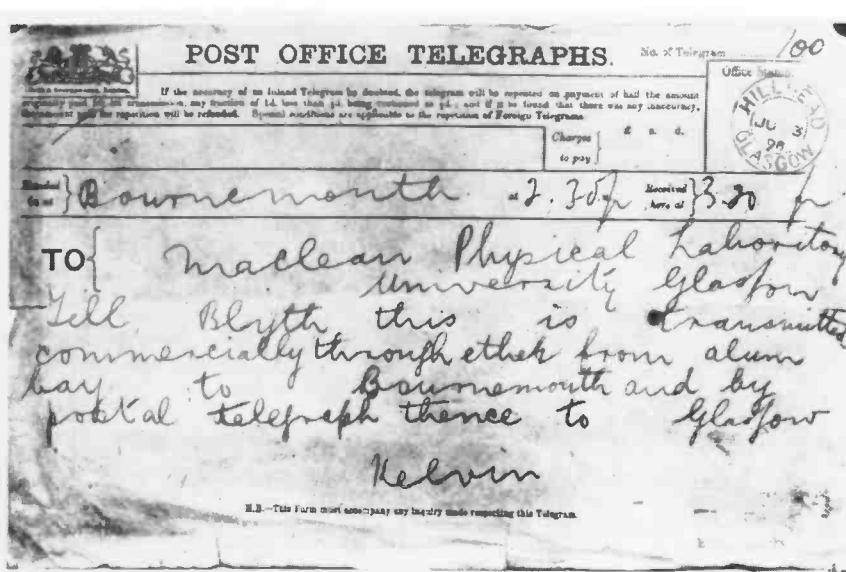
The range of his equipment increased steadily and in 1899 he transmitted messages across the English Channel. The epoch making first transmission across the Atlantic took place on 12 December 1901 – between St John's in Newfoundland and Poldhu in Cornwall. Yet many physicists of the time predicted that it couldn't be done since they were convinced wireless waves travelled in a straight line.

Business-wise things were never plain sailing, particularly in view of the threat Marconi's invention represented to cable. One cable company, for instance, sought to disparage Marconi's achievements while another threatened to bring legal action unless he quit St John's. But Newfoundland's loss proved to be Nova Scotia's gain and Marconi was able to set up a permanent station at Cape Cod.

His company signed a contract with Lloyd's to equip a number of shipping lines with wireless telegraphy, which enabled ships to send out distress calls when they got into difficulty. One notable tragedy in which wireless proved its use was the sinking of the *Titanic*.

Another contract was to provide an Imperial Wireless network designed to link all corners of the British Empire with

The first paid telegraph to be transmitted by wireless 1898 sent by Lord Kelvin.



INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

Part 3

The newcomer to the hobby has to decide which option to take when choosing a receiver system capable of covering the various DX channels. We mentioned in the first article in this series that most domestic television receivers obtainable in this country will only tune through the u.h.f. channels. This is fine, provided that your sole aim is to DX only at u.h.f. during periods of enhanced tropospheric propagation. Since the majority of the more interesting DX occurs at v.h.f. in Bands I and III, some means of covering these channels is desirable, especially if you intend to take up the hobby seriously.

Choices

When considering equipment, there are three options open to the DXer, namely, splashing out and obtaining a receiver already equipped with the v.h.f. bands, purchasing a converter to feed an existing receiver or modifying a receiver. Cost may affect your choice too. Colour receivers with multi-band or multi-system facilities aren't cheap and later you may discover that full use of these is only possible during a small percentage of DX openings.

A somewhat cheaper solution is a DX-TV converter, such as the popular D-100 system. It is tailor-made for the hobby and connects to the antenna socket of virtually any standard television receiver. It offers switchable i.f. bandwidths to enable the enthusiast to get the best out of weak or difficult DX signal situations.

Modifying an existing set may be the cheapest method of obtaining the v.h.f. bands but you must be prepared to experiment a little. It goes without saying that a fair amount of competence is required before indulging in this type of work.

Purchasing A Receiver

Before scurrying down to your local High Street store or discount warehouse, you must consider what you are actually looking for. Take a close look at your main domestic receiver or even the seldom used small-screen portable tucked away in the corner of the bedroom. It may already be suitable for DX reception, once connected to a suitable antenna.

Some receivers have multi-band tuners fitted as standard. However, in the majority of cases, the receiver will only resolve the 6.0MHz UK inter-carrier sound. These receivers are mainly of European design and may cover just the normal channels used for terrestrial broadcasting. Some receivers have additional frequency coverage to provide facilities for cable television channels. Some of the more up-market models feature frequency synthesised tuning so that Continental channels can be accessed directly. If you already own a receiver of European origin and you are not sure whether v.h.f. channels can be received, carefully examine the tuning assembly for clues. These include some form of band switching which may be marked "I", "III"

In the last article we discussed the various parameters of the different TV systems likely to be encountered during the course of DX reception. This month we explore the various types of receiving equipment available for DX-TV reception.

and "U". Sometimes the American "LO" (Low Band) and "HI" (High Band) may be encountered for Bands I and III.

If the tuning assembly is mechanical, there may be channel numbers present. The ones to look out for are 2 and 4 in Band I and 5 to 12 in Band III. These refer to the Western European channels E2 to E12. Sometimes band selection is rather discreet. Several years ago one particular button unit, manufactured in West Germany, was featured on a variety of makes of receiver. It consisted of a row of small black rotatable knobs each with an adjacent tuning scale viewed through a narrow aperture approximately 25mm long. In the u.h.f. position the channel numbers "21 and 68" were displayed. To change bands it was first necessary to deselect the button. By pulling slightly and rotating it, the tuning window would then display "5 to 12" for Band III and "2 to 4" for Band I. Not every button unit would switch to alternative band positions and not every unit had contacts fitted for band switching. If you happen to own a set with a similar button assembly and it appears to switch bands, the use of a signal generator will be useful in determining whether a v.h.f. tuner is actually fitted and working.

Similar tuning arrangements may be found on certain makes of video recorder. The Sanyo 9300, manufactured about seven years ago, had band switching in the form of a rotatable collar fitted around each tuning preset button. A few Hitachi VT11 E and Ferguson 3V35 models had a miniature plastics slider switch for this function adjacent to each thumbwheel tuning preset.

Using a video recorder with multi-band switching means that DX signals can be recorded off-air from the antenna direct, as well as operating the machine in its E-to-E mode as a form of converter.

Of course, some modification is necessary to the equipment if the sound channel is to be resolved. This will involve realigning the inter-carrier sound stage from the British 6.0 MHz spacing to either 5.5 MHz for Western Europe or 6.5 MHz for Eastern bloc countries. However, many DXers consider the reception of the sound channel as a low priority because not every mode of propagation will support it. At times it is extremely difficult to resolve sound on the lower Band I channels E2 and R1 via Sporadic-E propagation.

Full Facilities

Several manufacturers, notably Grundig, Luxor and JVC, produce receivers with full multi-standard facilities designed to resolve Continental sound and either of the two colour systems, PAL or SECAM. Some even cater for NTSC colour reception. Sometimes a basic model is available with the option of adding extra modules internally for the different systems at a later date. Many recent designs automatically switch standards once an incoming signal is detected. This is a wonderful innovation for the completely non-technical viewer. However, for the dedicated enthusiast it can actually impede chances of signal identification because it is not easy to readily discriminate between different TV standards.

One particular portable multi-standard receiver manufactured by JVC, the CX-610GB, provided manual switching of the three inter-carrier sound systems likely to be encountered during DX reception. Operating the switch would immediately give some indication as to which system was being received. PAL or SECAM colour system selection was manual too.

Fitting Tuners

Adding a v.h.f. tuner to supplement the existing u.h.f. one can be successfully undertaken by anyone with a reasonable level of technical skill. However, a word of warning is necessary at this point.

Remember that high voltages are present in a television receiver, even a small portable. Many receivers still employ live chassis techniques and consequently with modifications involving the fitting of extra controls and switches, some thought should be given to safety. This includes the use of an isolated antenna input socket and purchasing rotary controls with nylon spindles rather than metal. **If you do not feel competent enough to tackle such modifications, don't remove the back cover. Incidentally, modifications of any description will inevitably invalidate any guarantees. Never modify a hired set — the TV rental company will go crackers!**

Some manufacturers conveniently leave a space on the printed circuit panel where a tuner is normally fitted in the export version. Obtaining a service manual for the set under modification may reveal which, if any, peripheral components are

Tuner Specifications

Type	Frequency Range (MHz)		
	Band I	Band III	UHF
NSF 47807	47-68	174-225	470-840
ELC 2004	47-92	162-230	470-861
ELC 2006	47-92	104-293	470-861
UV 411/413	44-88	162-230	470-860
UV 415	47-111	111-293	470-860

INTRODUCTION TO DX-TV

already fitted. A three-position switch for band selection will be necessary, although the original export tuner preset bank, complete with band switching, may be available from advertisers in various magazines.

An alternative approach would be to remove the existing u.h.f. tuner completely and fit a multi-band one in its place. This would eliminate the problem of having to provide tuner i.f. output switching. In many cases the original tuner supplies could be used but care would have to be taken to avoid overloading the supply rails. Some experimentation may be necessary with the a.g.c. circuit because tuner requirements vary. A manually adjustable system comprising a rotary potentiometer may be more effective.

Power Supply

A stabilised power supply, suitable for powering a tuner, is shown in Fig. 1. The 30-volt tuning rail supply is tripler-derived from one of the secondary windings of the mains transformer. A transformer rated between 250 and 500mA is ideal but ensure that no more than 6 or 7mA flows through R2 otherwise the ZTK 33A voltage stabiliser begins to suffer. The value of R1 may be adjusted according to the range of tuning required. Simple rotary potentiometers are used for the main and fine tuning controls in this example, although if space permits, a presettable tuning bank could be fitted if preferred. The values of R3 and R4 are suitable for the NSF 47807 and Mullard UV 411/415/417 tuner types. These values may have to be altered in the case of the ELC 2004 and 2006 units to provide an optimum range of voltage to supply the a.g.c. pin of the tuner.

Connection data for some of the more popular types of tuner is shown in Fig. 2.

Fig 1

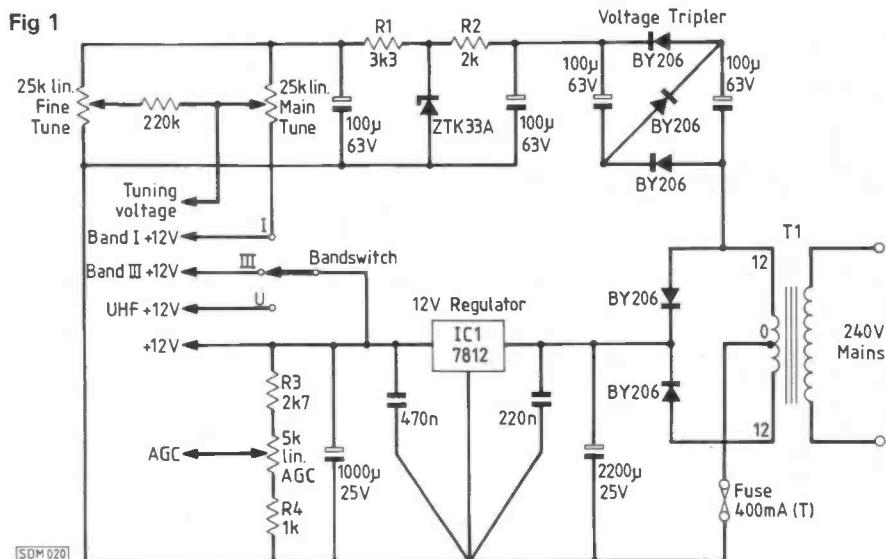
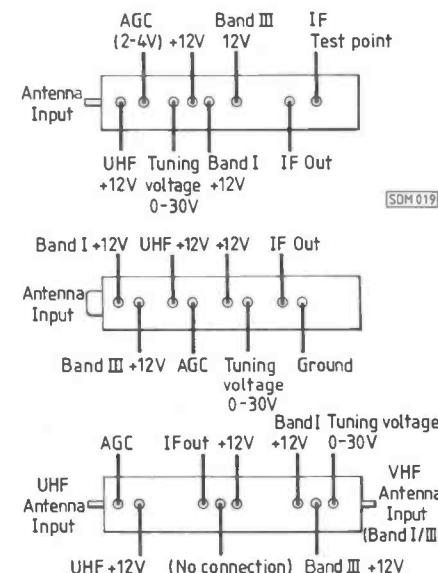


Fig 2



Top is the NSF 47807; centre, Mullard UV 411, 413 and 415; bottom, Mullard ELC 2004 and 2006. Adjustment of the tuner i.f. output coil may be necessary to provide optimum gain and performance.

This is best carried out using a weak signal. Note that if the coil is adjusted for maximum gain, the bandwidth may become too restricted to successfully resolve colour on a normal transmission. The i.f. output can be modified by adding a small value capacitor of 47 to 120pF between the i.f. output pin and the tuner body. Another capacitor may be necessary, connected in series with the i.f. feed to the i.f. strip. A miniature variable trimming capacitor with a value of 0-30pF could be tried and adjusted for optimum results.

All the tuners listed are obtainable from Sendz Components, 63 Bishopsteignton, Shoeburyness, Essex SS3 8AF. They can also supply a range of tuning preset banks, some of which are intended for multi-band applications.

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WIRELESS AT THE CHALK PITS

Joan Ham



Fig. 1: World War I display

The Chalk Pits, abandoned for 25 years, had naturalised a collection of chalk-loving plants, trees and shrubs and its industrial remains included lime kilns, barns, flint and brick buildings and the routes of an old industrial railway.

The railway has been relaid, together with a narrow-gauge passenger line. Visitors can ride from one end of the site to the other pulled by *Polar Bear*, a little green and brass steam engine from the Isle of Man or a newly-restored *Decauville* steam loco, pulling a restored RAF coach, the *Groundle Glen* "observation coach" with seats which reverse for the trip back, or a "cattle wagon" with seats. There are also various diesel/electric engines. Alternatively, a restored open-topped 1920 Leyland bus will do the round trip, or for those who prefer the oldest transport of all there is a stroll along the Nature Trail which crosses the railway via the Ranger Bridge, a magnificent 70-Brownie-proof wooden structure built by local Ranger Guides.

The Museum is an umbrella organisation, housing exhibitions and working craftsmen epitomising British Industry of the past. Access is via Amberley Station

The Chalk Pits Museum, started 9 years ago in a disused lime works at Amberley in Sussex, is one of the most accessible and beautifully sited museums imaginable. Joan Ham tells it's story.

car park (still retaining its Victorian station/ticket office/signal box) and through a converted shipping container and an ex-Goodwood racecourse turnstile. There is an introductory exhibition and audio-visual show explaining the history of the site and lime making in the first building. The oldest kilns on site, currently being restored by the Ranger Guides, first meet the eye; nearby is a working blacksmith, cobbler's shop and vintage domestic display. There are displays of stationary engines, often working, a printers shop, machine shop, working shipwright and furniture maker, water pumping display and road exhibit, a tannery building housing the Museum's collection of beautifully restored and working steam traction engines, pottery, brick exhibit and the history of concrete.

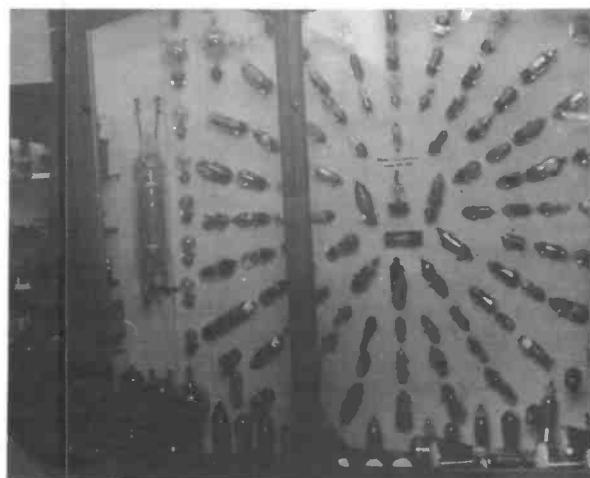


Fig. 2: Valve display with Audioncentre

Occupying 158 square metres of exhibition space and conveniently close to the Museum's tea shop, is the **Wireless and Communications Exhibition**, originally owned by **Ron Ham** and **David Rudram**, and the first collection to be donated to the Museum.

Back In Time

The visitor is immediately taken back in time to the 1890s with a coherer detector, the first method of detecting wireless waves, made by Marconi whose youthful, poster-sized, portrait gazes at the visitor from the entrance wall. Another rarity is a German ship's key, with a leaf return spring, made by Telefunken in 1905. Among a display of telegraph keys, sounders and repeaters is a fine Siemens telegraph station with its circuitry indicated with marquetry on its polished teak base. In a glass case next to this, an internal telephone exchange built of vintage components keeps the outposts of the 36 acre site in touch without miles of walking for the staff. Visitors can use a demonstration telephone to see the impressive clattering and mechanical actions

Fig. 3: Clandestine radio



Fig. 4: Vintage shack



WIRELESS AT THE CHALK PITS

of the uniselectors, finding the number dialled. A sequence of illuminated bays, each covering a particular period and accompanied by graphics at comfortable reading height, begins with the WWI section, Fig. 1, proudly featuring a Marconi 50W Trench Set, an aircraft spark transmitter and a Johnson and Philips short wave tuner. Veterans who actually operated them have been fascinated to see again, the sets that they used under fire.

Next, the era of the crystal set, and amongst the 15 or so is a Marconi RB2 with a flat pack plug-in coil, the famous Gecophones 1 and 2, a fine BTH Radiola 1 valve/crystal receiver and a selection of "Oh! My father/brother built one like that!" Time and the exhibition march on to the blue-print backed home construction sets of the 1920s, with kits like the Cossor Melody Makers and a variety of 1 and 2 valve receivers. Sitting among the plug-in coils, accumulator and accessories is a gaudy china parrot perched on a rock, made in 1929. His rock conceals a horn speaker driver unit. (The reproduction sounds like a parrot's squawk too, but he was once someone's pride and joy and did away with the headphones for family listening.)

Valve History

A glass case displays 60-years of valve history from the Audion and bright emitters to modern transmitting valves, Fig. 2. Adjoining cases house vintage components, some still in their original packets as well as military and civilian test gear. A tribute to the unsung heroes and heroines of WWII — the agents and the resistance fighters in enemy territory, is a display of clandestine equipment; the B2 suitcase set with grenade ready for emergency destruction in a special compartment, silk code handkerchief and wartime cigarette lighter for another quick obliteration, the MCR1 communications receiver, a personal receiver hidden in water flasks, a crystal set concealed in a telephone junction box, silk maps and button compass, Fig. 3.

The all-important communications side of WWII features the WS19 tank set with Russian/English markings and the famous WS18, 38, 46 and 58s used by the infantry and commandos bring back memories to many an ex-service-man ("I carried that ----- through a hedge!" and "I jumped off an invasion barge with *that* on my back!" are just two overheard comments). A rarer exhibit is the WS11 tank set.

Next-door, and representing the opposing forces is a rarely-seen display of German equipment including the Wehrmacht Torn EB communications receiver, a Kriegsmarine receiver from a U-boat, receivers and transmitter from a Heinkel, the guidance system from a flying bomb and from the civilians at war, two official Volksempfängers which replaced



Fig. 5: Ron Ham trying the R1155 receiver in the reconstructed Lancaster's wireless cabin

for the German people, their confiscated domestic radios. Two war-time civilian receivers, battery and mains, which kept the British population informed and entertained during those dark days, lead to the post-war luxury of individual sets and the return of manufacturer's labels — the Bush DAC90, the Ever-Ready Sky Queen and other such classics, only ousted by the coming of the transistor and miniaturisation.

Amateur Radio

Amateur radio is widely represented, from the popular Vintage Shack, Fig. 4, built like the traditional spare room station with wooden bench and the walls lined with QSL cards. This includes a pre-1939 HRO and an ex-WWI Morse key which belonged to the late G2YL, transmitter and 2-valve receiver used by G6YL in 1930, a traditional floor-board mounted transmitter, G6CJ's first home-brew short wave receiver, early transmitting valves used by the late G2DX and 5LK for their first VK contacts and the now silent keys of G2AZ, G2UV, G2AKM, G2DDD, G3GQE and G3NDF. This shack, arranged as a conversation-piece with life-size silhouettes of Nell Corry and Gerald Marcus G2NM discussing G6YL's

Fig. 6: HMV901 on left



receiver, is a tribute to the work of the pioneers of amateur radio. Opposite is GB2CPM, the Museum's own amateur station, run by the licence custodian, G3WMU, and his wife, G4LCU. Contrasting with the historic, this is equipped with a Yaesu 757X transceiver and its associated a.t.u. and a rotatable TET 3-element Tri-bander antenna mounted on a 15m tower. GB3CPM has exchanged contacts with stations from Australia to Alert in Alaska and other museum stations around the world. G4LCV, their son, has programmed a Sinclair Spectrum to show the lay visitors what amateur radio and GB2CPM is all about. The fascinating story of amateur radio achievements is told through another display containing Hallicrafters communications receivers, a Labgear LG300 transmitter, TW converter and transmitter, the original electro-mechanical keyer from GB3VHF and an experimental 144MHz transmitter built in the 1950s by the late Eric Cosh G2DDD.

Radio amateurs were the ready-trained backbone of forces' communications at the beginning of WWII and the exhibition moves naturally to the wireless cabin of a Lancaster bomber. This has been recreated down to the last detail with the T1154 transmitter and R1155 receiver, Morse key and all accessories, Fig. 5. The navigator's section has some authentic radar and the pilot's instruments are mounted in their proper positions. A display of USAF equipment contains transmitters, receivers and test gear.

Domestic Radio & TV

The wireless exhibition ends in an open room full of majestic polished cabinets, speakers ranging from fretwork box type to Amplion, BTH and S.G. Brown horns, massive Mid-West console and radio-gram receivers from the USA with handsome mother-of-pearl dials, TVs beginning with a 1936 HMV 901 televistor, Fig. 6, viewed via the mirror in the lid, through the post-war 9in sets made by Bush, GEC, Philips and Pye, to an HMV Colourmaster with doors and a Philips M1500 video recorder, already part of history. Special items in the room include the famous Marconi V2, a Leak amplifier using a pair of KT66 valves and a splendid Magnavox amplifier, built in 1922, with three independently switched stages each using a bright emitter valve and a large metal horn speaker embellished with their roaring tiger trade-mark.

Visitors emerge blinking into sunlight, as often as not to the throb of the veteran bus waiting to take them, via the newly constructed country bus garage to other parts of the museum. Entrance to the garage is through a 1920s Southdown Parcels office leading to a photographic and component display and into the garage itself, where visitors can see the restored and under restoration bus

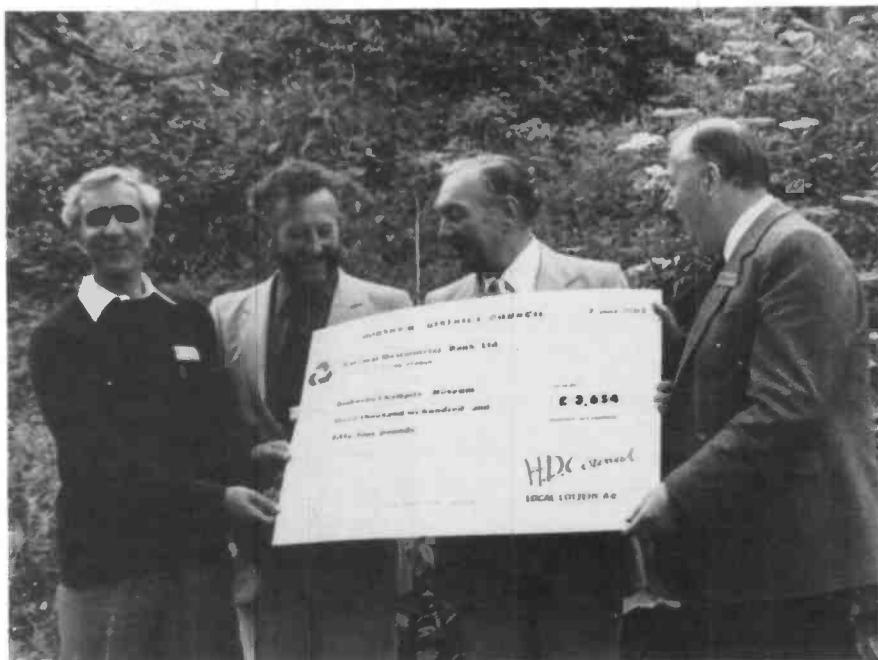
WIRELESS AT THE CHALK PITS

collection. The mood of nostalgia lingers.

For the older visitors the whole history of radio and television has developed from crackly beginnings to high definition pictures and stereo sound within their own lifetime. It is not unusual to see them re-enter the radio building for a second look or for the family to return to find father or grandfather who has unaccountably got "lost" and is found again having got no further than half-way round the radio building.

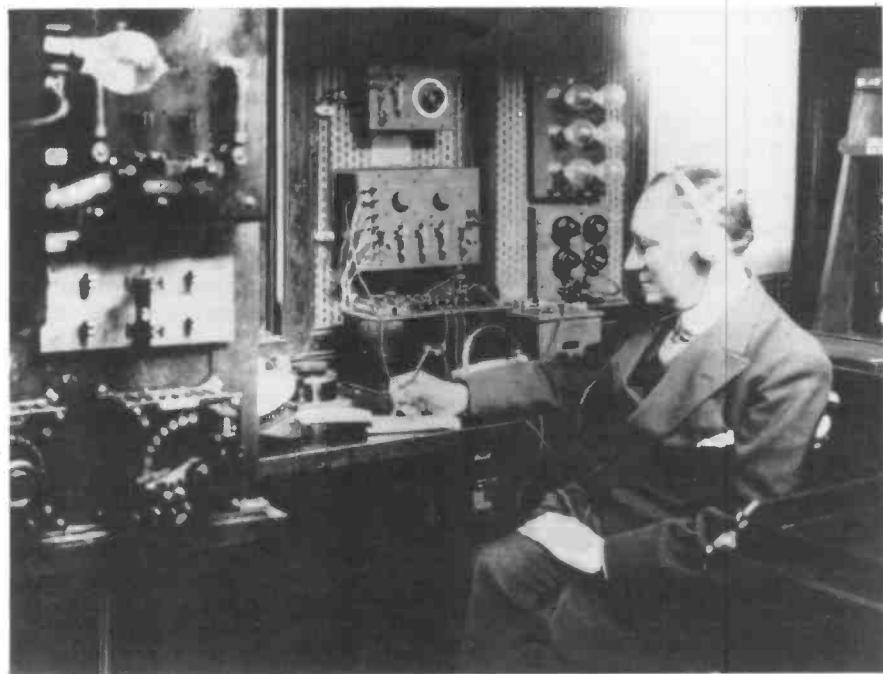
The current radio exhibition was opened on 6 June 1982, by Geoff Arnold, the Editor of *Practical Wireless*. The collection was housed at a cost of some £10 000 from museum funds and a welcome donation of £3654 from the Horsham District Council's lottery fund, Fig. 7.

Fig. 7: Horsham District Council's Chairman presenting a welcome donation to the new radio building. (l-r) David Rudram, John Warren (museum chairman) Councillor Arthur Sheppard and Ron Ham □



THE MAN WHO SPANNED THE ETHER

◀23



Marconi on his yacht *Elettra* about 1920.

wireless stations. Although a scandal erupted over the dealing in Marconi shares in 1912, Marconi was exonerated and was made an Honorary Knight Grand Cross of the Royal Victorian Order by King George. This was but one of many honours bestowed on the inventor during his lifetime.

Marconi's early transmitting stations were powerful affairs which transmitted on long wave, but later on he started to operate on shorter wavelengths and in his last years conducted experiments into microwaves. His research also extended to an early form of radar, the development of which — by British scientists — was to prove such a boon during the Second World War.

Marconi's health had never been good and as he turned the age of sixty he was prone to heart attacks. His funeral in Rome on 21 July 1937 was attended by thousands of mourners, while thousands more lined the streets... Many radio stations around the world observed a two minutes silence for the man who made global (perhaps even interplanetary) communication possible. □

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UR70 70ohm coax	per metre	0.35	(0.10)
UR95 50ohm coax dia. 2.3mm	per metre	0.40	(0.10)
4mm Polyester Guy Rope (400kg)	per metre	0.20	(0.10)
50 metres 16 swg hard drawn copper wire		6.95	(1.50)

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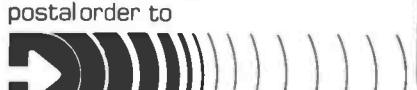


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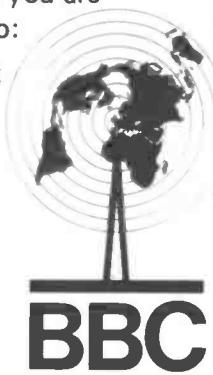
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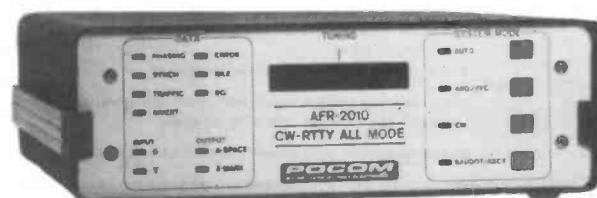
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STARTING OUT

Brian Oddy G3FEX

Although a listener could devise a system of his own for recording such information, it is advisable to make use of one of the standard formats which are internationally understood by other listeners and broadcasters. This is especially important if reception reports are going to be sent to broadcasters, as they need the information in a concise and accurate form for assessment with the minimum of effort.

In the most widely used system a letter signifies a particular aspect of reception followed by a rating figure. The letters used in the full system spell SINPFEMO and the meaning of each letter is (S) Signal Strength; (I) Interference; (N) Noise; (P) Propagation disturbance; (F) Frequency of Fading; (E) Modulation quality; (M) Modulation depth; (O) Overall merit. The rating figures extend from 1 to 5 and their significance is indicated in Fig. 1.

The full SINPFEMO code is usually shortened by most listeners to SINPO, dispensing with the frequency of fading and modulation depth ratings. A signal which is very loud and clear and free from interference, static, noise, fading and distortion would be indicated as SINPO 55555 — it is important to note that the code is written in this format and not as S5 I5 N5 P5 O5. Apart from broadcasts via local transmitting stations, very few would actually qualify for S5 and O5 ratings, although all other ratings are possible. In order to ascertain the SINPO ratings for a particular broadcast, each aspect of the signal must be carefully analysed and enthusiasm must not be allowed to influence the value chosen!

Signal Strength

Signal Strength (S) is perhaps one of the easiest ratings to determine, since the signal can be compared with others. Many receivers are fitted with an "S" meter, or employ a string of i.e.d.s to indicate signal strength. Although some of them are calibrated from 1 to 5 in accordance with the SINPO code "S" values, many read 1 to 9 plus dB-over-S9 in accordance with the RST code used by amateur and commercial operators. Some meters are calibrated in "dB above one microvolt", indicating the signal level at the antenna terminals, but these are often inaccurate and should not be taken too seriously! Regardless of the type of calibration, such meters enable the strength of all signals to be easily compared.

Interference

The rating for interference (I) refers to the subjective effect of an unwanted signal on or close to the frequency of the desired one. Generally speaking a weak background from another broadcaster sharing the same frequency will be less objectionable than a whistle caused by a nearby carrier beating with the desired signal — this is especially true if the resulting beat note is around 1 or 2kHz

In addition to noting in a log book the date, time and frequency of a broadcast station received while DXing, it is also customary to detail some of the other facts about the signal and reception at the time, so that a more complete record may be obtained.

since the human ear is more sensitive to low frequencies.

Noise

The noise rating (N) is largely determined by the prevailing atmospheric noise and bears no relation to the noise introduced by a receiver, which can be ignored. Except during periods of ionospheric disturbances, summer static and electrified rain the rating is seldom worse than N3 and even during good conditions when the higher frequencies may be employed, it is unlikely to be better than N4.

Propagation

Propagation disturbance (P) is related to the intensity of atmospheric noise and the degree of fading present. A high noise level and rapid fading mutilating the programme would rate as P1, but similar conditions with the programme acceptable might rate P3. Shallow fades with little or no noise would rate as P4 or P5.

Overall Merit

To obtain the figure for overall merit (O), simply add together all of the individual ratings and then divide the total by the number of ratings to arrive at the average figure, to the nearest whole number.

Propagation

Some listeners find it difficult to tell the difference between man-made interference (I) and the atmospheric noises (N) or to appreciate what is meant by propagation disturbances (P) and so decide to drop them from the SINPO code and use the much simpler SIO code. Since very few signals qualify for a rating of S5 or

Fig. 1.

O5 and the ratings at the other end of the scale indicate an unusable signal the SIO code ignores ratings 1 and 5. The choice of which code to use is best left to the listener, but the full SINPO code is far more meaningful.

Log Book Headings

The typical headings for each page of a log book are depicted in Fig. 2. Note that a remarks section has been included so that programme details and other points in connection with a broadcast may be noted for future use. All entries in the log book should be made at the time of reception, but before noting down the SINPO/SIO ratings it is advisable to listen carefully to the signal for about 15 minutes to make quite sure that they are accurate, as they may be used to form the basis of a reception report.

QSL Cards

Listeners have been sending reception reports to broadcasters since the earliest days of radio, and as a mark of their appreciation they either confirm the report by letter, or more often send a colourful verification card, known as a QSL card — the term QSL is part of the International Q code used by commercial and amateur c.w. operators, and means "I give you confirmation of receipt". Collecting these colourful QSL cards is an enjoyable offshoot of DXing and many listeners have hundreds of cards in their collection!

A considerable amount of engineering expertise will have gone into choosing the most suitable operating frequency and time to ensure that a broadcast will reach listeners in a chosen target area, consequently the listener reports emanating from the area are of primary interest to them. Although reports from other areas are only of academic interest, every report infers a listener to their programmes — an important aspect when it comes to producing audience research figures and obtaining budgets for future programmes! In general, anyone who cares to send along a meaningful reception report to a broadcaster can expect to receive their QSL by return, however some take many months to reply and a few do not QSL at all, so do not expect a one hundred percent return rate.

Symbol & Meaning	Rating				
	1	2	3	4	5
S Signal Strength	Just Audible	Poor	Fair	Good	Excellent
I Interference	Extreme	Severe	Moderate	Slight	None
N Noise	Extreme	Severe	Moderate	Slight	None
P Propagation Disturbance	Extreme	Severe	Moderate	Slight	None
F Type of Fading	Very Rapid	Fast	Moderate	Slow	None
E Modulation Quality	Very Poor	Poor	Fair	Good	Excellent
M Modulation Depth	Over Modulated	Low Level	Fair	Good	Maximum
O Overall Merit	Unusable	Poor	Fair	Good	Excellent

STARTING OUT

Honesty

It is important to be honest about all aspects of a broadcast in a reception report and to bear in mind that poor SINPO ratings and adverse comments about a programme will not affect the QSL response. It is also worth remembering that a detailed reception report compiled during several days will be of far more use than one covering a single broadcast.

Reports

The report could be sent in the form of a letter, but since it would be unlikely to stand out in a pile of mail a much better idea would be to design an eye-catching personalised form and then get it photocopied — having one specially printed could prove expensive. Some broadcasters and certain DX Clubs can provide suitable printed forms — see appendix.

Before filling in the details on the form it is advisable to ascertain the intended target area, the frequency of transmission and the duration of the broadcast by referring to either a current broadcast schedule for the station concerned, or to an up to date station guide, such as *The International Listening Guide* from Germany.

The report should contain the following information:

- (1) Your **name** and **address** on each sheet, printed in block capital letters — be sure to include your country!
- (2) The **date** written in full — not as 12/10/87, since this can mean 10th December '87 in some countries!
- (3) Quote **time** in UTC (= GMT).
- (4) The **frequency** in MHz — if unknown quote the wave-band involved in metres.
- (5) The **SINPO** or **SIO** ratings.
- (6) Detail **stations adjacent** to the frequency.

(7) Give at least 5 minutes of **detailed programme information**.

(8) Detail your **receiver** — quote manufacturer and model number, also describe it, e.g. a "domestic portable" or a "communications receiver".

(9) Give details of the **antenna** in use.

If possible, send your report by airmail as soon as it is completed. Out of date reports are of little use from the technical viewpoint, although your comments about the programmes may still be valid.

Appendix

The British DX Club can supply suitable report forms to members — 25 forms cost £1.00 incl. post (UK), £1.20 or 4 IRCs overseas. For details of membership write to Colin Wright, 54 Birkhall Road, Catford, London, SE6 1TE. □

DATE	TIME (UTC)	FREQUENCY (MW kHz) (SW MHz)	STATION	LOCATION	SINPO	REMARKS
3/10/87	1500	21.590	RADIO RSA	JOHANNESBURG	44444	'MAILBAG' PROGRAMME
6/10/87	1900	17.790	HCJB	QUITO	33333	SENT QSL 6/10/87
5/10/87	2248	15.145	WINB	RED LION, USA	32233	

AIRBAND

△ 22

separation without risk of collision, accurate inertial navigation (i.n.s.) is used and at least two independent units must be carried. Inertial navigation does not rely on ground radio aids at all, but senses acceleration and hence keeps track of the aircraft's position since leaving a known starting point. A further requirement is the ability to maintain a fixed Mach number, so that aircraft can be spaced 15 minutes apart longitudinally on each track. Slow aircraft would therefore not be allowed to use the tracks. On high frequency, upper sideband, suppressed carrier is used. On the UK side of 30°W aircraft are controlled by Shanwick Oceanic (the controller being at Prestwick with the radio antennas at Shannon), and on the USA/Canada side of 30°W control is assumed by Gander Radio.

VHF Airband

"What is the use of the frequency band 108-117.95MHz?" asks **Paul Whiteley** (Poulton-Le-Fylde, Lancashire). This part of the v.h.f. band is assigned to navigational aids to 50kHz intervals; specifically, v.h.f. omni-directional radio-range (v.o.r.) beacons and i.l.s. localisers. Each facility transmits its call sign as Morse letters, and some v.o.r. beacons also broadcast aero-

(a.t.i.s.). I don't know the locations of the various relay stations, Paul.

GATWICK AIRPORT Pier 2.



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Enefco House, The Quay,
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drome weather reports in the form of an automatic terminal information service

The controllers at, say, the London Air Traffic Control Centre (LATCC) at Porters Way, West Drayton, Middlesex, can communicate with aircraft all over the southern half of Britain by using these remote radio stations which are linked back to LATCC ("Latsie" to its friends) via land-lines. A note to the public relations officer at LATCC might produce some information — if so, please share this with us. Paul lives below Airway Upper Amber One (UA1) and **John Slevin** (Limerick, S. Ireland) will find himself under Green One (GI) as it heads away from the Shannon v.o.r. (113.3MHz, ident SNN, di-di-dit, dah-dit, dah-dit) on the 114° radial.

Dave Lawrence G6HXR (Snodland, Kent) suggests that when visiting any BAA airport a copy of the *Airport Timetable* can be collected from the information desk free of charge. Dave also draws attention to the Lashenden Air Warfare Museum at Headcorn Aerodrome, Kent; this is 9 statute miles south of Maidstone on the A274 (the road, not the Amber 274 airway!) How about a report of what's there, Dave? And to all of you: keep your letters coming! Until next month, "watch your airspeed." □

SEEN & HEARD

AMATEUR BANDS ROUND-UP

Justin Cooper
c/o Short Wave Magazine, Enefco House,
The Quay, Poole, Dorset BH15 1PP

There can be virtually no doubt now that the new sunspot cycle started around September 1986, and so for several years to come the bands will be on an improving trend. In practice, the rise from bottom to top is usually quicker than the fall back; thus about four years from now should see us at the peak. As to how good that peak will be is anyone's guess; I recall last time round how the pessimists predicted a very low maximum, while on the bands we not only got a decent one, but also a long plateau on the downward side as well!

However, for those who are new to the game, what I can see ahead is the situation where 28MHz is often open to real DX, and on occasion Twenty will be useful round the clock. It is said that the low bands tend to be less handy around sunspot peaks, but the last cycle rather disproved that idea — though to be fair many more countries became active on Top Band, and 5BDXCC increased 3.5MHz DX-activity.

Of course, more sunspots tend towards the increase of maximum usable frequencies, but there is also the negative side, in that chromospheric eruptions of the sun can produce sudden ionospheric disturbances or s.i.d.s, knocking out the bands for up to an hour or two, and affecting 30MHz down to 2MHz; the effect is less above 30MHz, and in the region 10-100kHz one may actually see improved propagation by way of the D-layer.

The other "knock-out drop" is the ionospheric storm. This originates at the same time as the event which creates the s.i.d., but the slower-moving particles take a couple of days to reach us. Magnetic storms and aurora effects are noted, and the storm takes several hours to peak up, the fade-outs lasting a couple of days or more.

Interestingly enough there is some evidence that on trans-equatorial paths propagation may in fact be improved at such a time. And, of course, if you note any effect of the sun, like a very good day, or a very poor one, it is worthwhile to make a note to look again in 27 days time, to see if the cause of the disturbance is still active.

Who knows, it may even get you looking at sunspots for yourself — but if you do, don't look at the sun either directly or through a telescope or binoculars, or you will blind yourself. Look at the sun's picture focussed and projected on a card, and even then

course all was unpacked and put back on the band; the antenna at first was a Datong Active Antenna, but that seems to have suffered in the move, so a long piece of wire now goes out of the window, over the kitchen roof and about 30 metres down the garden to an old apple tree — as this is giving 59+ signals it will serve for the moment.

Tony makes an interesting point when he compares the callsigns around today with those he remembers from his earlier spell on the bands — he had to get a current list before he was prepared to believe some of them!

Now we turn to **B. Patchett (Sheffield)** who made sure we didn't overlook his list by sending it on red paper! It is very interesting to notice how Brian, with a score of over 1000, managed to find 18 of his 28 new prefixes in Europe — as we have remarked before, it is often the case that we start by disregarding every European we hear in favour of the more distant stations, only to realise later on that a European prefix is as good as any other if it's a New One!

Turning to **C. Eve (Jersey)** we note that Chris went to Spectrum Communications for converters for 144, 70 and 50MHz bands, though at the time of his letter he hadn't actually heard a signal on 70MHz; 50MHz had produced a CT1, and of course there was lots on 144MHz. On a different subject entirely, Chris has been working at the problem of interference from TV sets in the vicinity, and he finds that if one uses a dipole, fed through a balun at the feedpoint, and then firmly grounds the outer of the coaxial feeder and uses an a.t.u., then the noise is at least reduced to the point where it is at definable points up the band rather than plastering everything with noise.

D. Hughes (Adderley Edge) has some hard words to say about some of the behaviour on the bands; deliberate tuning-up QRM on DX stations and others on Eighty in particular is his particular hate. On Eighty there is a long history, going back several decades, of anti-DX activity by a few souls of somewhat limited intellect and ability. It springs, I feel, from the pre-WW2 status of the band on the one hand, and on the other from envy of people who can work DX that others can't even hear.

But of course, while all this is true, it is also the case that the post-war policies of almost all the national societies and P. & T. administrations has been to

All-Time Post War HPX Ladder

Name	Last Mth	Prefixes This Mth
Phone Only		
B. Hughes (Harvington)	3269	3269
E. M. Gauci (Malta)	3188	3199
E. W. Robinson (Felixstowe)	2592	2592
H. M. Graham (Chesham)	1932	1932
M. Ribton (Gillingham)	1867	1867
M. Rogers (Bolton)	1809	1802
P. Oliver (Paisley)	1730	1730
F. Dunn (Chester)	1566	1566
N. Henbrey (Northiam)	1561	1561
P. Davies (Market Drayton)	1427	1427
B. Patchett (Sheffield)	1129	1157
Mrs. A. Sitton (Stevenage)	929	929
A. P. Lincoln (Aldershot)	888	888
J. J. Sales (Lancaster)	874	874
R. G. Williams (Borehamwood)	857	857
G. Casetton (Orpington)	775	775
S. Field (Barningham)	735	735
C. R. Eve (Jersey)	New	687
L. Marquardt (Hereford)	609	609
A. Vest (Durham)	605	605
N. Fox (Wakefield)	595	595
A. Woodcock (Denmark)	603	603
D. R. J. Hughes (Alderley Edge)	545	545
CW Only		
F. Dunn (Chester)	2035	2035
H. Scott (Rievaulx)	1396	1396
N. Melville (Edmonton)	1147	1147
C. R. Eve (Jersey, C.I.)	247	302
M. Rodgers (Bolton)	202	202
RTTY Only		
A. P. Lincoln (Aldershot)	547	547
W. J. Prior (Lochcarron)	501	501
C. R. Eve (Jersey, C.I.)	430	448
N. Henbrey (Northiam)	334	334

Starting score, 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules.

Annual HPX Ladder
Starting date January 1, 1987

Name	Last Mth	Prefixes This Mth
J. J. Sales (Lancaster)	450	450
R. G. Williams (Borehamwood)	449	449
Mrs. A. Sitton (Stevenage)	378	378
L. Griffiths (Sheffield 6)	315	315
A. Hall (Lockington)	New	281
M. Probert (Basingstoke)	260	260

200 Prefixes to have been heard 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 1987

E. M. Gauci (Malta)	681	726
---------------------	-----	-----

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.

you'll probably need a neutral-density filter.

So, now is the time to think about equipment improvements; and above all to consider the skywires and their vital part in the search for DX!

Letters

Various comments on the weather this time, and the QRM from other activities; but we felt that we just had to note how **E. M. Gauci (Malta)** was feeling about the local temperatures of around 40°C — Eddie could hardly summon up the strength to type out his letter and

list! And, of course, that sort of weather usually brings with it the static crashes and bangs that are such a nuisance, especially on the lower bands.

A wanderer returns! **A. Hall (Lockington)** used to write from Alvaston, Derby, back around 1982, but eventually he moved to the present rather large house, and after a long spell of redecorating he now "has a large room left over" to give him plenty of room for his radio, books, maps and so forth. Then of course, the hunt was on for the receiver, cables, books and the rest, but in due

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After many months of research and development RWC LTD are pleased to announce their latest HF modification for the Yaesu FRG9600 which now includes LF/HF/VHF/UHF coverage from 100kHz to 950MHz and improved 'S' Meter and a typical receiver *sensitivity now >2μV pD HF, >1.5μV 60-950MHz all @ 12dB SINAD. (Please contact us for detailed specifications).

We have fitted a High performance HF Front-End made for us by AKD. The new HF section is fitted internally with switching circuits and a small toggle Switch on the rear apron to enable band change whereby the display changes to read actual frequency (100kHz-60MHz). The standard SO239 antenna connector has now been changed for an 'N' connector for coverage from 60-950MHz and an SO239 connector fitted for HF coverage 100kHz-60MHz. (UHF extended coverage is now standard as per our original MK2 modification up to 950MHz).

As an 'N' connector is now fitted to all RWC FRG9600s for VHF-UHF coverage it is possible to use a wide-band discone antenna such as the ICOM AH7000 which is supplied with low-loss coaxial cable and 'N' connectors. A dipole or long-wire antenna can be used for HF coverage with very good results. This facilitates use of two antennas for all bands.

All modifications are Fully Guaranteed for twelve months from date of purchase/modification providing our modifications seals are unbroken. See the reviews or s.a.e. for a copy!

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* We reserve the right to change specifications due to continuous development and modification of this product.



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AM-FM (WIDE & NARROW) LSB, USB. 100kHz-950MHz
BROADCAST MONITOR AND SCANNING RECEIVER



No other radio is available with these features and facilities at this price! Check it out!

FRG9600 MK2 Model 60-950MHz 'N' connector @ £499.00 + 5.00 carriage. (Modified unit only).

FRG9600 MK3 Model 100kHz-950MHz 'N' connector and SO239 for HF @ £599.00 + £5.00 carriage. (Modified unit only).

RWC Exclusive Base Station Complete HF-UHF Package FRG9600 MK3 Model, Icom AH7000 ant, G5RV HF multiband, PA4C ac-13V dc adaptor, inclusive carriage UK £699.00.

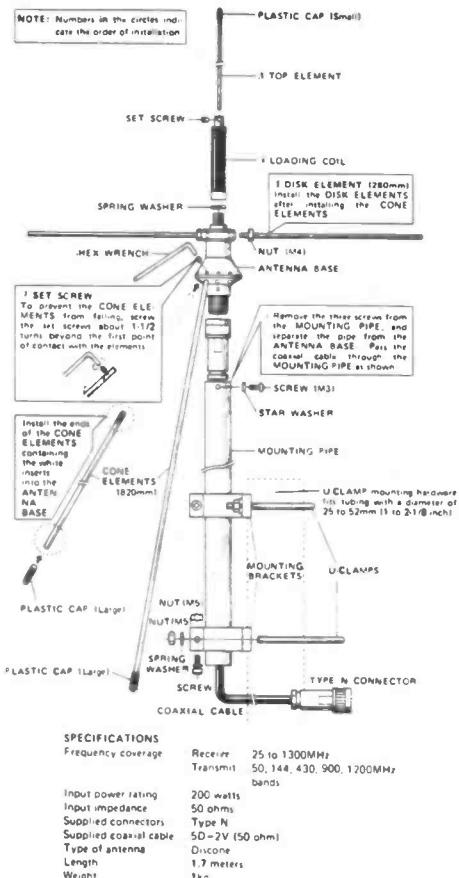
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AH-7000

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OMNIDIRECTIONAL ANTENNA



SPECIFICATIONS	
Frequency coverage	Receive 25 to 1300MHz Transmit 50, 144, 430, 900, 1200MHz bands
Input power rating	200 watts
Input impedance	50 ohms
Supplied connectors	Type N
Supplied coaxial cable	50-2V (50 ohm)
Type of antenna	Discone
Length	1.7 meters
Weight	1kg

Icom AH7000 @ £82.50 (inc free carriage UK mainland).

YAESU/RWC FRG9600 Options

PA4C ac adaptor £16.50 inc post.

FIF232C RS232 computer interface @ £75.00 inc post.

Raycom GP900 900-950MHz 3dB, base station ant @ £22.00 inc post.

AM-FM wide & narrow IF filters POA.

RWC 9600 MK2 owners HF mod @ £99.00 inc carriage (send unit).

FRG9600 existing owners HF & UHF mod - 100kHz-950MHz. Send unit carriage paid @ £129.00. (UK owners only.)

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

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

RWC Modified Video Unit. 6.00MHz IF video (modified from NTSC) @ £27.50 inc post.

Please call or telephone for other available options.

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SEEN & HEARD

reduce entry standards in terms of technical and Morse requirements, which has led to gross overcrowding of our bands — and it is unlikely that we shall see any significant expansion of our h.f. bands within the next, say, thirty years. By that time the amateur population will have also tripled at least, and c.w. will have disappeared in all probability, and standards will have almost disappeared ... the mind boggles!

Our next offering comes from F. K. Clarke (Rainworth) who points out that D. Hughes' FRdx400 receiver has a WWV position on 10MHz. This position actually covers 9.9-10.5MHz, giving coverage of the amateur 10MHz band and also of some music broadcasts. Ken in fact owns the FRdx400 SDX version which includes extra filters and f.m., plus extra bands to cover the rest of Ten, the Yank CB band, plus 70 and 144 MHz. Finally, Ken says that all the needed data is in fact in the receiver "book of words", but if D. Hughes is still in problems, Ken will answer a letter addressed to him at 95 Kirklington Road, Rainworth, near Mansfield, Notts. NG21 0JZ.

N. Fox (Wakefield) has been tied down by work commitments of late weeks, hence the absence of reports; however, Neil did find time on August 15 to put up a 40m length of wire fed through an a.t.u. and orientated on north and south America. The fact that it worked was demonstrated by an immediate collection of seven new prefixes, by way of NS7, KEO, KD7, WB7, KR9, ND8, and LU9.

R. W. Robinson (Felixstowe) comments acidly on the summer short-skip conditions as a result of which he enriched himself with just two new prefixes; and about the best DX was KP4GY in Port Real, a small fishing port in northeast Puerto Rico. 7X25LS and TK/P/HB9TL were both calling for QSLs to their home calls — respectively 7X2LS and HB9TL.

Turning to M. Ribton (Gillingham), Mike confined himself this time to a list; of these, we note W8TPAX the Pan-American Games station, QSLs going via W9SU; 6Y25DA for

their 25th anniversary of independence for which the cards go to VE4JK; and 5L6D, who accepts cards via PO Box 398 Monrovia.

B. F. Hughes (Worcester) adds a few to his collection, just to keep things rolling along, but of course he is still fully preoccupied in "setting up shop" at the new QTH; nonetheless some 22 more go into the Ladder.

It was s.s.b. all the way for N. Henbrey (Northiam) with seven more new ones; but the RTTY entry is a place-holding "nil".

Just too late, the letter from M. Rodgers (Bolton) arrived here, but we were in fact able to get his scores in by bellowing over a telephone — not something we normally do, but we felt that an RTTY starting score to add to existing phone and c.w. entries justified it!

Not much of a return this time, says W. J. Prior (Lochcarron) as the lure of the salmon and the sea-trout is greater ... and we can understand that! Of the three new ones on RTTY, Bill wonders about TV7GLC, heard very clearly and read several times on June 21. We don't know off-hand but would guess it was of French origin — has anyone else any firm knowledge of this station?

Checking

H. Scott (Rievaulx) has a three-part list this time: one from the current month's listening, one of queries, and one culled from old log-books after a re-reading of the Rules! Of the odd ones, three are quite definitely the result of someone's bad Morse sending but Heaven only knows what they might have been. The other one is also bad sending, but intrigued your old JC — it came out as GZ1AV, but to spare the blushes of the operator, we won't say more than that the GM concerned now has a red face and is trying to get out of some slipshod sending

habits! However, all four are unacceptable, in that in no case is the mis-reading down to anything obvious.

Vale

Just as we were wrapping this offering up, a late letter arrived to tell us of the sad passing of H. M. Graham (Chesham). Maurice was in fact a contributor to the column before I took it over two decades ago, first from Harefield, then from East Anglia and latterly from Chesham, where we met at a meeting of the local club. He was stricken by cancer, and had been in for some time. In his regular letters, Maurice was very analytical; in addition to his HPX entry, he always included a band-by-band summary and dates of any items of interest, plus any other snippets he thought would be useful. Maurice will be sadly missed, by his family, his friends, and in the wider sphere.

VHF Propagation

Under the conditions of truly flat or dead bands, v.h.f./u.h.f. propagation is normally out to a distance of roughly "line-of-sight plus one third". Reference to a Nautical Almanac such as Reeds will give us a couple of tables, one showing horizon distance for given height of eye, and another close by giving "dipping distance" — this one takes into account both height of eye and height of light. Both are much used by coastal navigators for position-fixing. From the dipping distance table we see that for height of eye and height of light both 12m (about 40 feet) the dipping distance is about 22.5km x 2 or 45km. Adding our extra third, we get a range between two stations having antennas at 12m of around 48-64km in clear, flat country. We all know that for much of the time propagation to greater distances will occur: Why?

What we call "anomalous propagation" occurs from two

basic causes: ionisation and weather conditions. To take ionisation, at the lower v.h.f. bands we may find normal h.f. type propagation giving inter-continental openings on 50MHz, when there are enough active sunspots about.

Another ionisation effect, this time lower down, is called Sporadic-E and consists of a patch or patches of intense ionisation at E-layer height, intense enough to refract v.h.f. signals. If two stations are beaming at each other, and the patch lies at the point where the two beams intersect, then we may well find an opening along that path.

Yet another ionisation effect is that of the Aurora (Northern Lights), more often than not manifest on our bands when no visible aurora can be seen. Anyone who has seen Aurora Borealis will know how it seems to move about, and it would seem to be the result of this movement that causes a marked Doppler shift on the signal reflected off an aurora. Thus a c.w. carrier that left you at T9, sounds like a rusty buzz-saw in my headphones, s.s.b. is copied with difficulty, and a.m. is unreadable. For two stations lying say, east and west of each other to communicate by Aurora, they will both aim northwards, and waggle the beam for a peak, which will usually lie a bit off north. If they are fairly close by, it is instructive to turn their beams towards each other, when the T5 Auroral signal will turn into the T9 radiated signal.

So much for ionisation effects. Now to weather. A ridge of high pressure running across the country may well support propagation along the ridge if it is well marked; I recall one connecting Cornwall and the London area some years ago, mainly because I noted it in Cornwall first, drove to East Anglia, and listened to it from the other end! Ducting is interesting too, where weather conditions result in the formation of an "atmospheric waveguide" — communication is possible between stations whose antenna system is sitting within the duct, so either raising or lowering the beam might remove the DX!

To ensure your reports get mentioned, make a note in your diaries of the next three month's deadlines: October 20, November 17 and December 11.

DECODE

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

when you only use half of it. If you think differently then please write and let me know. Perhaps someone knows of some receive-only packet equipment that they will tell me about.

From my own monitoring it seems that packet activity is still growing, particularly on h.f. One

worrying point is that the sector of 14MHz used by packet operators seems to be expanding in an uncontrolled fashion. I have heard stations working between 14.095MHz and 14.108MHz which means they are now encroaching on the RTTY section. I don't have any objections to

packet, but I think it is a shame that the amateur FAX allocation has now been completely obliterated.

This month my logs show XX9MO (Portugal) and WB9TYT (USA) as the more interesting stations, with the usual dozens of Is, DLs etc., EAs and Gs. The

SEEN & HEARD

Portuguese station is the first I have logged so perhaps this is a new country.

RTTY & AMTOR

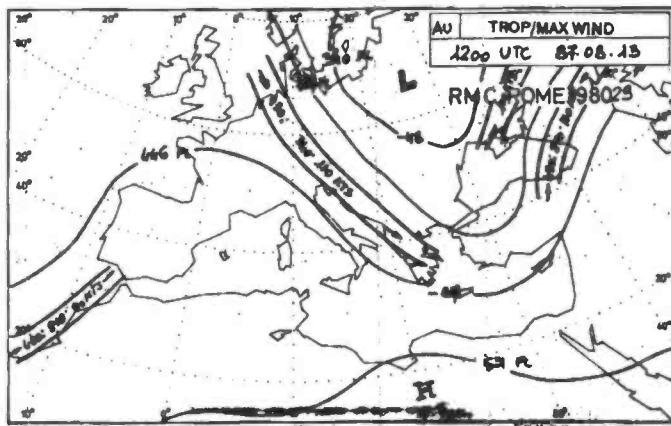
There appears to be lots of interesting activity on this mode. I expect you have all noticed the general improvement in band conditions, particularly between 10 and 15MHz. I logged the following amateur stations on 14MHz: HK1MHR (Columbia), PS7KM (Brazil), CE2CQZ (Chile), SV5TS (Rhodes) and TR8DX (Gabon).

Those of you who regularly monitor the 14MHz amateur band will have noticed the increasing use of higher baud rates. There is one mailbox in particular that after log-on asks the user to change to 75 baud if possible. This seems a good idea and with the majority of operators using computers it's also a good way of speeding-up the data transfer. The only problem arises with the poor s.w.l., who now has to establish the baud rate as well as deciding if the signal is upside down or not! I suppose for those of you fortunate enough to own automatic decoders this presents no difficulty. For those working with simple decoding systems the best technique is to develop a "tuned ear", i.e. learn the sound of normal 45 baud RTTY so that you can easily recognise a higher rate. The commonly used baud rates are: 45, 45, 50, 75 and 110 baud. With luck the software houses will read this and produce some automatic decoding software aimed at the s.w.l.!

On the commercial front there are quite a few strong Far East signals to be heard on the 12 and 13MHz bands. There are also many weather RTTY stations including some in the USSR, one example is RBV75 (Moscow Meteo) on 7.685MHz. This station uses 50 baud Baudot (ITA No 2) and you may find you have to invert the signal to resolve it. These signals can of course, only be monitored if you have authority to do so.

ASCII

Ever since I first mentioned the use of this mode I have been discovering more and more stations running ASCII. What appears to be happening is that amateurs who are keen to have access to packet and RTTY are buying multi-mode interfaces like the AEA PK-232 and the Kantronics KAM. Most of these multi-mode units also support ASCII, so of course the amateur desire to experiment means more ASCII on the bands. I recently logged HB9KU working OH2LU on 14.085MHz using 110baud ASCII. The QSO seemed to work very well with no problems. ASCII transmission does not have a specific frequency allocation so it will generally be found in the RTTY



Rome Meteo IMB56 13.600MHz 1200UTC 13-8-87.

section of the band. The only snag with ASCII from the s.w.l. point of view is it's yet another type of signal to resolve so the permutations of baud rate, data type, shift and polarity become even more complex. See my comments in the RTTY section for advice.

FAX

As this is a special FAX issue of SWM I thought it only right to spend a little extra time this month monitoring FAX. I have had quite a lot of success with a host of interesting charts received. For high quality charts the Rome Meteo stations on 13.600MHz and 13.365MHz (IMB56) have been very good especially during the late afternoon and early evening. The charts are sent at 120 r.p.m. with an IOC of 576. The signal strengths have been between S7 and 9 but with no multi-path propagation which means nice crisp pictures. If the pictures you have been receiving show a general smudging or smearing the chances are that multi-path propagation is the culprit. The signal strength is no guide as I have often found that the Bracknell transmission on 4.782MHz although being extremely strong often suffers quite severe multi-path distortion. There is, unfortunately no solution other than to tune to another frequency.

From the DX point of view there have been a few interesting reports from the Far East. One station of particular note is Beijing Meteo in China (BAF4) on 10.117MHz using 120 r.p.m. and an IOC of 576. The signals have not been very strong but the received quality has been quite

readable. One particularly interesting chart is a typhoon warning which is sent using Chinese characters and English text. This warning is sent at 0200, 0800, 1300 and 2005UTC, the best results so far have been in mid-evening. This Chinese station also re-broadcasts satellite pictures between 0800 and 0900UTC though these have not yet been received. If you want to see some charts from the USSR then Minsk Meteo (RSR79) on 7.575MHz seems to be coming in quite well. Most of the USSR stations use 90 r.p.m. and IOC of 576 so don't forget to change your decoder settings.

Contests

I have received a very interesting letter from Ted Double G8CDW who is the chairman of BARTG. Ted is a keen s.w.l. on the h.f. bands and likes to enter contests whenever he can. His efforts have recently been rewarded by coming second in the short wave listener section of the BARTG Spring h.f. RTTY contest. This particular contest attracts a World-Wide entry so this is quite an achievement, congratulations Ted.

You are now all probably thinking that Ted has a massive antenna farm and all the latest hi-tech receiving equipment. You're wrong! Ted's station is actually very simple, with a Yaesu FRG-7700 receiver fed by a 20 metre dipole strung across the loft and an a.t.u. to ensure a good match. On the computing front Ted uses a Commodore 64 with a ten year old home-brew ST-5 terminal unit. Now I'm sure that many of you have a similar standard of receiving equipment

so why not have a go at a contest? I propose that we give Ted a run for his money next year in the BARTG contest. So first of all some practice is in order, the best way to start is to listen to a few contests and try logging as many calls as possible for about an hour. After a few sessions you will soon get in the swing and learn how to dig those DX stations out of the noise.

If you've received this issue on time you should be able to catch the CQ Magazine World Wide RTTY Contest on September 26 and 27. Briefly the rules are:

- (1) Contest Period
48 hours
0000UTC September 26 to 2400UTC September 27
- (2) Bands
1.8, 3.5, 7.0, 14.0, 21.0 and 28.0MHz
- (3) Classes
a: Single operator
b: Multi-operator
- (4) Modes
Baudot (ITA2)
AMTOR
ASCII
- (5) Message
RST and CQ zone number for all stations outside USA and Canada.

(6) Logs
All logs and entries to be received by December 1 1987 at this address:
CQ RTTY Contest,
76 N. Broadway,
Hicksville,
NY. 11801. USA.

With luck this contest should increase the activity on all the modes because as well as normal RTTY there are sections for AMTOR, ASCII and Packet.

Amstrad PCW Computer

I know that several readers have this particular computer and would like to use it in the shack. At last an RTTY program has been released and is distributed by BARTG. The program was actually written by G4EVS to enable him to send data to a colleague and it was only comparatively recently that Dave realised that there was a market for the program and managed to set up the marketing operation through BARTG.

Before you can start receiving any RTTY or ASCII you will need a serial interface for the Amstrad and a terminal unit. The serial interface must be either the Amstrad version or one that is exactly compatible with the Amstrad. The terminal unit can be from any source provided it can handle RS-232 data levels. The program is supplied on a standard Amstrad disk and requires CP/M to be loaded first. To load the program the disk is inserted in drive 1 and you type COM12. You will then be

All reports are welcome, and to make sure you don't send them in too late, make a note of the deadlines: October 23, November 20 and December 14.

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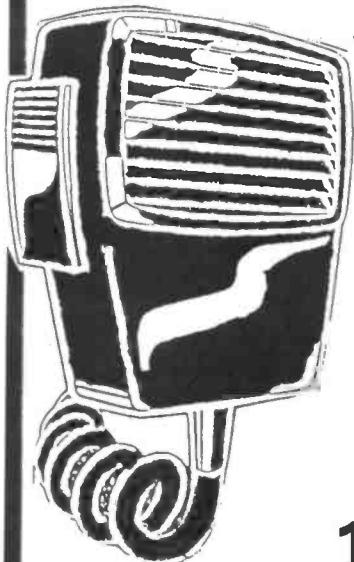


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presented with a menu screen which allows you to choose either ASCII or RTTY and to set the various parameters as required. A real time clock is displayed whilst the program is running and the time can be set from the main menu. One very useful feature for

the s.w.l. is the facility to create a spool file, which means that all the received data can be stored in a file for retrieval later. Another essential feature is a wide range of baud rates from 45.45 to 9600 baud which should be adequate. If you are licensed and want to

transmit then this is supported along with up to eight pre-selected messages. One disadvantage for the amateur is that there is no type-ahead buffer when in transmit. I did speak to G4EVS regarding this point and he commented that if there is

sufficient demand he may well write a mark 2 version with a type-ahead buffer included. The program is available from BARTG, c/o John Beedie GW6MOK, Ffynnonlas, Salem, Llandeilo, Wales SA19 7NP and the cost for members is £15.00 inclusive.

INFO IN ORBIT

Pat Gowen G3IOR
17 Heath Crescent, Hellesdon, Norwich NR6 6XD

Last month we dealt with decoding the Morse code telemetry of the new RS-10/11, and indicated how the values found might be used by observers for some interesting and practical scientific research. The "RS" series of satellites are fundamentally transponder satellites, and their main purpose is the provision of amateur communications, the telemetry being mainly for the purpose of checking the function of the equipment aboard.

Two of the amateur-radio satellites in orbit, OSCAR-9 and OSCAR-11, also known as UoSAT-1 and 2, are not transponder bearing spacecraft, but were built with the main intention of educational and research use in mind. A host of additional information is available from the telemetry supplied from these two sources that will enable those following the values sent down to perform some very interesting and valuable work. Already many thousands of radio amateurs, schools, universities and colleges around the world are regularly following the UoSAT pair.

UoSAT-OSCAR-9

UoSAT-OSCAR-9, Fig. 1, was launched for AMSAT by NASA

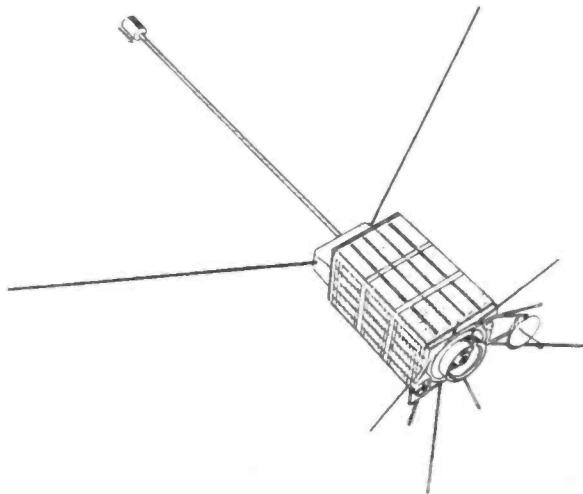


Fig. 1.

from Vandenberg, California at 1127UTC on 6 October 1981, into a 554km, 95 minute, sun-synchronous, circular, polar orbit, shown in Fig. 2. It is still performing well, although it is dropping back toward earth and will undoubtedly burn-up within two years or so. Built mainly at the University of Surrey, it took some 30 months and £250000 to complete — probably a time and cost effective record in the realms of satellite production.

It carries a charged-coupled

device camera, magnetometers, two on-board commandable computers, particle counters, phase-referenced multiple h.f. beacons, s.h.f. beacons, the main v.h.f. and u.h.f. amateur band f.m. downlink beacons, and a speaking "Digitaler", and was intended to use a novel gravity-gradient system of stabilisation. Sadly, on attempting deployment, internal wiring snared the long boom intended both to stabilise the spacecraft and to provide an antenna for the h.f. beacons, which meant that camera pointing and the provision of an efficient radiator on 7, 14 and 28MHz became impossible. Even so, adequate functioning of the other parameters is possible.

The telemetry can come down in the form of Morse code, and this is normally so on the 21.001MHz h.f. beacon which is a very useful propagational indicator. It can also be sent as a spoken voice, using a speech synthesiser called the "Digitaler", often switched on by the earth-signal-controlled onboard computers according to the schedule required, or it can be sent down as RTTY at 45.5 bauds.

The main format is ASCII, at either 1200, 600, 300, 110 or 75 bps, which cannot be read by ear, but can be decoded by a simple demodulator designed by G3RUH. The p.c.b. and circuit for this is available for only £11.00, and the 1200 baud demodulator

p.c.b. and circuit for just £3.00 from AMSAT-UK, and will give the interlink between your f.m. receiver on 145.825MHz and a TV RX to display all data. For details, send a.s.a.e. to AMSAT-UK, London, E12 5EQ. Alternatively, computer programs are available that will display all the content from a pre-recorded tape or direct from your receiver onto the TV screen.

One program tape for the versatile Spectrum computer called "UO-1EAR" and "SHORT1" (for UoSAT-1, "UO2-EAR" and "SHORT2" is available for UoSAT-2) is put out by G4IDE Micro Systems, who also have a program called "WOD" for showing the stored round-the-world Whole Orbit Data. Details are available from Roger Barker, G4IDE, 79 South Parade, Boston, Lincs, PE21 7PN, Telephone Boston 63454.

Another program, called "SUDD" (Spectrum UoSAT Data Demodulator) works for both UoSAT-1 and 2 and is available from G4HLX, Neill P. Taylor, 87 Hunters Field, Stanford in the Vale, Faringdon, Oxon, SN7 8ND. Using this program I produced the examples shown with my IC201, Spectrum computer and Epson RX80 printer.

The basic ASCII telemetry frame produced by the program (Fig. 3) is presented as one line of status information, repeated twice, displaying the state of the

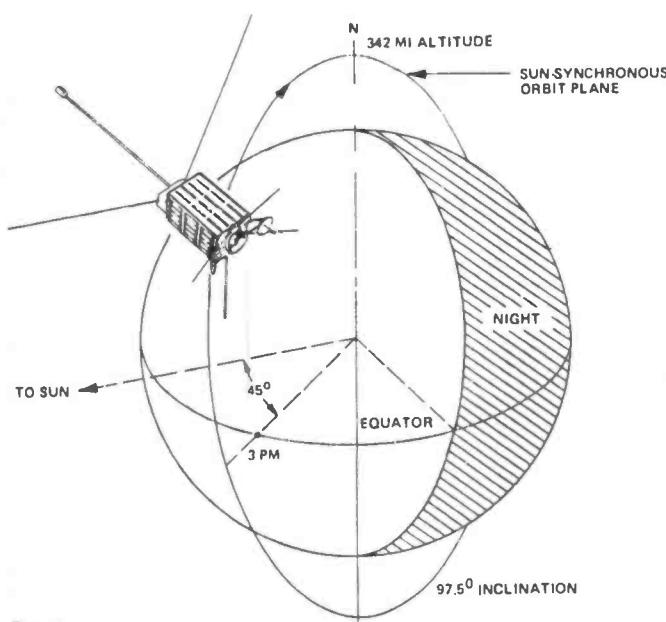
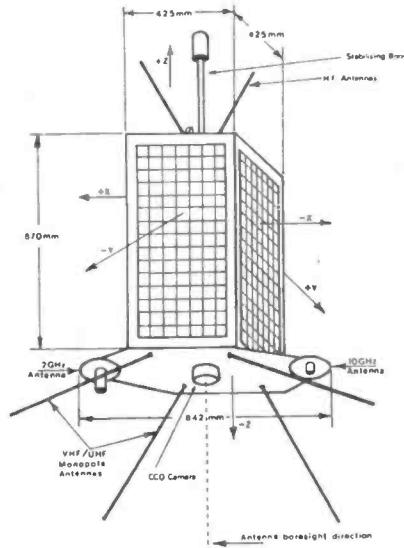


Fig. 2.

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45 digital channels, followed by the 60 analogue channels, numbered 00 to 59. The status points give the on/off conditions of the various on-board experiments and systems, as shown in Fig. 4. The computer program will interpret these for you, and print them, as shown in Fig. 5, to give the meaning of each of the 45 status points shown. As you can see, a considerable amount of information is supplied.

The analogue channels show the channel number first, followed by a three-digit decimal number which indicates a particular voltage, power, temperature, etc. Fig. 6 shows the meaning and mathematical formulae to allow you to calculate each of the 60 analogue telemetry channels, giving us even more data which we can use for experiments. Again, the program and the home computer can do all this for you as demonstrated by Fig. 7.

In addition to these is a "diary", regularly updated, giving the satellite schedule, the time and date, which systems are in operation and when, and details of the "WOD" program and channels selected, more about

Fig. 3

A	MSTP	101012	101010	00110	10000	01
110	00011	00011	10001	00100		
AMT	101010	101010	00110	10000	01	
110	00011	00011	10001	00100		
000040	01000	02724	03002	04002	05	
529	06539	07200	08446	09597		
10076	11360	12500	13640	14780	15	
20150	21100	22150	23100	24150	25	
410	42411	43593	44892	46191		
354	36368	37255	38418	39142		
40139	41100	42257	43400	44134	45	
56014	57100	58276	59441	60599		
56014	58100	59276	60441	61540	55	
56474	57255	58334	59428			

UoSAT-1 Digital Status Points

			'01' '1'
	*****		*****
01	145 MHz general data beacon	of/on	
02	435 MHz engineering data beacon	off/on	
03	Primary Spacecraft computer	off/on	
04	CCD camera module	off/on	
05	Radiation detector - A	off/on	
06	Magnetometer expt.	off/on	
07	7 MHz beacon expt.	off/on	
08	14 MHz beacon expt.	off/on	
09	28 MHz beacon expt.	off/on	
10	21 MHz beacon expt.	off/on	
11	2.4 GHz beacon expt.	off/on	
12	10.47 GHz beacon expt.	off/on	
13	145 MHz command RX	Squelch 0: signal present	
14	435 MHz command RX	Squelch 0: signal present	
15	Status calibrate		
16	BCR status	A/B	
17	H.F. beacons expt. synthesisers	off/on	
18	Telecommand decoder status	ground/primary computer	
19	Magnetorquer	off/on	
20	Primary S/C computer block load port	disable/enable	
21	Secondary S/C computer data O/P	active/inactive	
22	Secondary S/C computer clock	interrupt failure/clock 0	
23	Secondary S/C computer processor	running/halted	
24	Secondary S/C computer power-down	high/low power	
25	14MHz H.F. beacon synthesiser lock	out/in	
26	28MHz H.F. beacon synthesiser lock	OUT/IN	
27	21MHz H.F. beacon synthesiser lock	OUT/IN	
28	Radiation detector - B	off/on	
29	Tip mass uncaging Confirmation	no/yes	
30	Speech synthesiser power	off/on	
31	Visual data display memory	off/on	
32	Gravity gradient boom motor power	off/on	
33	Secondary S/C computer power	off/on	
34	HF beacons expt. power	off/on	
35	Navigation magnetometer power	off/on	
36	S/C computer memory error bit -1		
37	S/C computer memory error bit -2		
38	S/C computer memory error bit -3		
39	Status calibrate		
40	primary S/C computer data UART O/P	inactive/active	
41	Gravity gradient boom motor	forward/reverse	
42	Magnetorquer power	forward/reverse	
43	Magnetometer expt.	measure/calibrate	
44	Navigation magnetorquer	safe/arm	
45	Gravity gradient boom motor	safe/arm	

Fig. 4.

UoSAT-1 Analogue Channel Equations

Channel	Parameter	Cal. Equation
00	Secondary S/C computer (F100L)	$1.2N \text{ mA}$ ($0.125A < I < 1A$)
01	Solar array current +X	$200 + 1.12N \text{ mA}$
02	Battery half voltage	$N/100 * (1.01) \text{ V}$
03	Radiation detector A O/P	$40N * (1.04) \text{ Counts/S}$
04	Radiation detector B O/P	$40N * (0.04) \text{ Counts/S}$
05	Magnetometer expt. HY-coarse	$\text{INT}(Nyc/63.5+0.689)*8054-Fy \text{ nT}$
06	Magnetometer expt. HX-coarse	$\text{INT}(Nxc/63.5+0.689)*8103-Fx \text{ nT}$
07	Magnetometer expt. HZ-coarse	$-\text{INT}(Nzc/63.5+0.689)*8009+Fz \text{ nT}$
08	Battery pack-A temperature	$(474-N)/5 * (1.01) \text{ Degrees C}$
09	Spacecraft facet temperature +X	$(474-N)/5 * (1.01) \text{ Degrees C}$
10	Visual display expt. CCD current	$1.2^*(N-30) \text{ mA}$ ($0.15A < I < 1A$)
11	Solar array current -Y	$200 + 1.12N \text{ mA}$
12	2.4 GHz beacon expt. power O/P	$(N-145)*0.45 \text{ mW}$
13	Radiation expt. EHT volts	$N \text{ Volts}$
14	Radiation detectors expt. current	$(N+20)/8 * (0.983) \text{ mA}$
15	Magnetometer expt. HY-fine	$Fy=18.55^*(Nfy-495.7) \text{ nT See Ch 05}$
16	Magnetometer expt. HX-fine	$Fx=18.53^*(Nfx-496.45) \text{ nT See Ch 06}$
17	Magnetometer expt. HZ-fine	$Fz=18.34^*(Nfz-493.55) \text{ nT See Ch 07}$
18	Battery pack-B temperature	$(474-N)/5 * (1.01) \text{ Degrees C}$
19	Spacecraft facet temperature -X	$(474-N)/5 * (1.01) \text{ Degrees C}$
20	Spacecraft computer current	$1.2^*(N-25) \text{ mA}$ ($0.125A < I < 1A$)
21	Solar array current -X	$200 + 1.12N \text{ mA}$
22	Battery / BCR +14V bus	$N/50 * (1.056) \text{ V}$
23	Sun sensor +Z axis	$N/200 * (1.01)$
24	10.4 GHz beacon expt. current	$(N-40)/4 * 0.97 \text{ mA}$
25	Magnetometer expt. temperature	$(467-N)/6.85 \text{ Degrees C}$
26	Magnetometer expt. current	$(N/8)*0.9945 \text{ mA}$
27	Telecommand receiver current	$(N-16)/8 * (0.952) \text{ mA}$
28	Radiation expt. temperatuoro +X1	$(474-N)/5 * (1.01) \text{ Degrees C}$
29	Spacecraft facet temperature -Y	$(474-N)/5 * (1.01) \text{ Degrees C}$
30	Battery charge current	$2.9N \text{ mA}$
31	Solar array current +Y	$200 + 1.12N \text{ mA}$
32	Power conditioning module +10V	$N/60 * (0.93) \text{ V}$
33	Telemetry system current	$(N-16)/30 * (1.084) \text{ mA}$
34	2.4 GHz beacon expt. current	$0.4^*(N-11) * (1.072) \text{ mA}$
35	445 MHz data beacon power O/P	$(N-82)*1.67 \text{ mW}$
36	445 MHz data beacon current	$(N-7)*4 * 0.014 \text{ mA}$
37	445 MHz data beacon temperature	$(474-N)/5 * (1.01) \text{ Degrees C}$
38	Pr1.S/C computer temperature -X1	$(474-N)/5 * (1.01) \text{ Degrees C}$
39	Spacecraft facet temperature +Y	$(474-N)/5 * (1.01) \text{ Degrees C}$
40	+14V line current	2.86 mA
41	+5V line current	$1.28(N-50) \text{ mA}$ ($0.075A < I < 1A$)
42	Power conditioning module +5V	$2N/300 * (1.12) \text{ V}$
43	Sun sensor -Z axis	$N/200 * (1.01)$
44	HF beacon expt. current	$(N-36)/3 * 1.038 \text{ mA}$
45	435 MHz data beacon power O/P	$(N-102)*1.792 \text{ mW}$
46	435 MHz data beacon current	$(N-34)/3 * 1.053 \text{ mA}$
47	435 MHz beacon temperature	$(474-N)/5 * (1.01) \text{ Degrees C}$
48	Sec.S/C computer temperature -Y1	$(474-N)/5 * (1.01) \text{ Degrees C}$
49	Spacecraft facet temperature +Z	$(474-N)/5 * (1.01) \text{ Degrees C}$
50	+10V line current	$3N \text{ mA}$
51	-10V line current	$1.3^*(N-60) \text{ mA}$
52	Power conditioning module -10V	$0.0158N - 0.0224^*N' \text{ V } ('N'=Ch 32)$
53	Navigation magnetometer Y-axis	$(N-663.4)*183.486 \text{ nT}$
54	Navigation magnetometer Z-axis	$-(N-336.55)*189.54 \text{ nT}$
55	Navigation magnetometer X-axis	$-(N-496.5)*194.55 \text{ nT}$
56	Speech synthesiser current	$(N-16)/10 * 1.009 \text{ mA}$
57	CCD imager temperature	$(474-N)/5 * (1.01) \text{ Degrees C}$
58	Telemetry system temperature +Y1	$(474-N)/5 * (1.01) \text{ Degrees C}$
59	Spacecraft facet temperature -Z	$(474-N)/5 * (1.01) \text{ Degrees C}$

NOTE: The axis labelling employed is right-handed for all sub-systems.

Fig. 7

Second.	S/C	computer	48
01	Solar array	crrnt	200
02	Radiation	high / voltage	3.12V
03	Radiation	det B	15.0%
04	Magnetom.	ext B	15.0%
05	Magnetom.	ext H	15.0%
06	Battery	temp A	65.0%
07	9Facet	temp +X	65.0%
08	11Solar array	mag current	65.0%
09	11Solar array	temp -Y	65.0%
10	12.4GHz	beacon pur	OP
11	13Radiation	det E	375
12	14Radiation	det crrnt	41.9
13	16see	06	41.9
14	17see	07	41.9
15	18Battery	pack_B temp	31.915%
16	19Computer	temp	11.715%
17	20Solar array	crrnt	15.0%
18	21Solar array	crrnt -X	13.918V
19	22Battery/BCR	11V bus	0.35%
20	23SSIM sensor	+Z axis	0.35%
21	24.4GHz	beacon crrnt	0.319V
22	25Magnetom.	ext temp	54.199m
23	27Telecom	command RX crrnt	37.009m
24	28Facet	temp +X1	56.985%
25	29Battery	charge crrnt	580
26	31Solar array	crrnt +Y	502.4
27	32Telemetry	sync crrnt	16.320V
28	34.4GHz	beacon crrnt	0.429mA
29	35145MHz	beacon pur	OP
30	37145MHz	beacon crrnt	50.67 mW
31	37145MHz	beacon temp	44.533m
32	38Ppri. S/C	comp temp -X1	11.3120
33	39Facet	temp +Y	67.064%
34	40+14	line current	371.8
35	41U1	line current	64
36	42PWR cond	module +5V	5.615V
37	43SSIM	sensor -Z axis	0.35%
38	44HF	beacon ext crrnt	34.255V
39	4545MHz	beacon pur	OP
40	4645MHz	beacon temp	18.00992m
41	4745MHz	beacon temp	32.1109m
42	48SSIM	temp -Y1	6.06
43	49Facet	temp +Z	18.584%
44	50Facet	line current	40.000A
45	51-100V	line current	39
46	52Pwr	cond module -10V	-10.715V
47	53Nav	mag Y axis	-100.631V
48	54Nav	mag Z axis	-34.000V
49	55Nav	mag X axis	-34.000V
50	56Speech	synth crrnt	0.0545V
51	57CCD	imager temp	45.313m
52	58Telemetry	sys. temp	13.392%
53	59Facet	temp -Z	28.28
54			9.2932%

Fig. 8

We receive many letters asking for details / descriptions / results of experiments carried out on / with the UO-9 & 11 and whilst we shall do our best at UoS to write more articles / papers for you, it is also true that there are many experimenters around the world carrying out interesting activities - we and other experimenters would like to share your experiences and results. Please take some time this year to write up your activities from the simplest station to the most complex and send them to the UoS or to UoS sections of the International Society and radio magazines). Suitable articles / papers / descriptions will be included in the Bulletins and announced (if desired) to ANSAT-UK for possible inclusion in OSCAR NEWS.

Whilst we get many letters to USOS commenting favorably on the Society, there are still many who are unaware or unconvinced as to its relevance to Amateur Radio - mainly due to lack of published information and particularly results. PLEASE devote a little time this year to making your national society, radio magazines and AMS clubs aware of what is going on with USOSAT and the chance of success in raising support for further USOSAT spacecraft dependent on this SUPPORT!

SEEN & HEARD

A new, revised, 61-page spiral-bound booklet is now available from the University of Surrey that describes in full detail both the UoSAT-1 and 2 spacecraft, including photographs. Send £3.50 as cash or sterling cheque to the UoSAT Mission Control Centre, University of Surrey, Guildford, Surrey, GU2 5XH to receive your copy. The price includes post and packing. Future Info In Orbit columns will tell you where and when to listen for the

signals from these spacecraft plus some more information, especially on the more advanced UoSAT-OSCAR-11 satellite.

Weather Satellites

Following the information on the WSR524 weather satellite receiving system in our August column, Feedback advise that they are now producing a colour version in the same unit, plus a factory re-fit service if existing

monochrome users wish to update their systems. An IBM PC interface and software pack is also available for archiving, and a Meteosat version of the 524 will be available by the end of the year.

(It is not possible to update existing 524s to Meteosat). For full details and prices write to Feedback Instruments Ltd, Park Road, Crowborough, East Sussex, TN6 2QR.

Your deadlines for the next three issues are: October 23, November 20 and December 14.

BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE



Fig. 1.

pounding in early on August 17, at midday on the 1st and 15th and around 1900 on the 7th and 15th. In Belfast, Bill Kelly heard some of these stations around 1800 on the 7th. Channel R3 sound on 83.75MHz was also heard at 1452 on the 1st.

Brian Clifton (Orpington) reported "severe fading" when he identified Arabic, Dutch, French,

Italian and Spanish stations, in Band II, between 1000 and 1045 on July 11. Brian is a member of the *Voice of the World DX Club* and uses a Sony ICF-7600D, with its own rod antenna. "A very nice portable set and handy for travelling," said Brian.

Tropospheric

During the early afternoon of July

31, I received French stations on several spots between 98 and 101MHz while using the radio section of my Plustron TVR5D, with its telescopic antenna, near the famous show ground at Ardingly in W. Sussex. The Plustron's v.h.f. dial, seen on the left of Fig. 1, selected more French stations when I was parked at Burwash (E. Sussex) at 1600 on August 4 and at Handcross (W. Sussex) on the 5th. These were strong enough to combat the static generated by a thunder storm at Burwash and to get through a thick covering of trees above my car at Handcross. Trees are usually hostile to v.h.f. signals. Bill Kelly received BBC Radio Lancashire and Radio Telefis Eireann (RTE-2) at 0705 and 0715 respectively on August 3 and Treble T Radio, from Dublin, early on the 5th. I counted nine foreign stations, mainly French, plus many adjacent and co-channel "warbles" in Band II from the home station at 1732 on the 16th.

TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Receivers

Briefly, there are two ways of adding v.h.f. television to the home station, firstly with a small-screen portable which includes a tuner for Bands I and III and secondly to use a converter in front of a u.h.f. television receiver or video recorder. I use both systems. The portable is ideal for band checking when my car is parked at a good location and the converter, a D100 (Fig. 1), adds the DXing facility to the home station video recorder.

This version of the D100 includes Band II on its v.h.f. tuner which offers the chance of seeing pictures on Chs. R3 (77.25MHz), R4 (85.25MHz) and R5 (93.25MHz), during the more intense Sporadic-E disturbances.

At 1755 on July 20, Garry Smith (Derby) watched the opening sequence from Romania (TVR) on Ch. R3. I found the individual gain controls, bandwidth selector switches and the fine tuning arrangements an asset when trying to identify individual stations from the

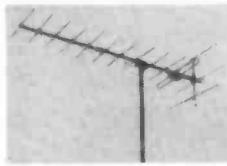
mixture of signals which often appear on certain spots in Band I. A typical example is the mere 1.5MHz which separates the well populated channels, E2 (48.25MHz) and R1 (49.75MHz).

Band I

Early riser Michael Banbrook (London) watched Spanish Breakfast-Television (TVE-1) around 0745 on July 20, 22 and 23 and pictures from Italy (RAI-1) on days 18, 19 and 20 and August 4 and 5. "Both TVE-1 and

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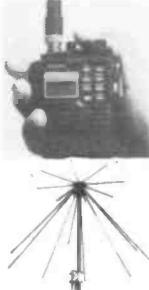
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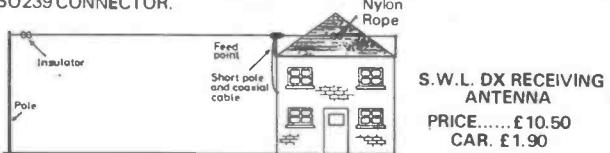
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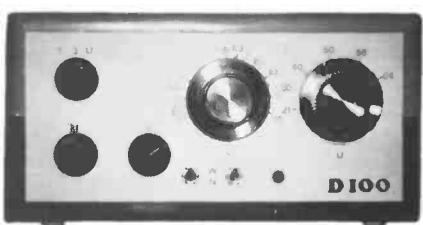


Fig. 1: TV converter



Fig. 2: Hungary

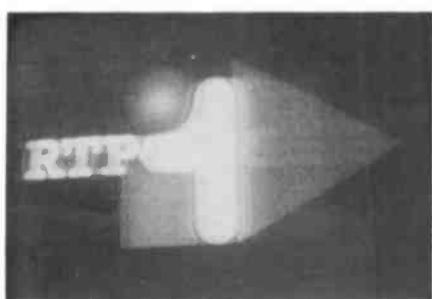


Fig. 3: Portugal



Fig. 4: Russia



Fig. 5: Norway



Fig. 6: Norway



Fig. 7: Jullundur



Fig. 8: Pakistan



Fig. 9: Rawalpindi



Fig. 10: Rawalpindi



Fig. 11: Hungary SSTV



Fig. 12: Portugal SSTV

RAI-1 were received around 0730 on the 30th and, apart from occasional fading at lunchtime, lasted throughout the day," said Michael, who logged Spain again for an hour at 1000 on the 31st, around 1700 on August 4 and 0900 on the 8th. Michael found pictures from Spain and Italy were exceptionally clear on August 4 and 5 respectively. In addition he logged W. Germany (ARD-1) at 1830 on the 30th and briefly at 1800 on the 31st and Portugal (RTP-1) on August 4.

I logged Portuguese (RTP LISB-1) and Spanish (TVE) test cards, from home, at 0955 on the

2nd and while using my Plustron TVR5D, with its own rod antenna, at Burwash, I received a news programme on Ch. E3 at 1807 on the 4th. Whilst parked under trees in the National Trust car park at Handcross, I watched, at amazing strength, a detective film with Spanish sound at 1445 on the 5th. On arrival home, at 1830, I found a mixture of fading pics around Chs. E2/R1 and Iceland's test card, with QSB on Ch. E4.

On the 21st Neil Purling (Hull) received the Icelandic test card and weather reports from Norway and Noel Smythe (Caerphilly) received test-cards and/or

programmes from Austria (ORF-FS1), Czechoslovakia (DDK-3, RS-KH and CST-Bratislava), Denmark (DR), E. Germany (DDR-F1), W. Germany (ARD/ZDF and Grunten), Hungary (MTV-Budapest and Magyar Televízio, Fig. 2), Iceland (RUV-Island), Italy (RAI-1), Norway (Bremanger, Gamlem, Greipstad, Gulen and Melhus), Poland ('d't'), Portugal (RTP-Porto and RTP-1), Fig. 3, Spain (TVE and the regionals Aitainia, Valencia and Valentino), Sweden (TV1 Sverige), Switzerland (+ PTT-SRG-1), USSR (HOBOCTN), Fig. 4 and Yugoslavia (JRT BGRD, Ljubljana,

Televíza-Zagreb and ZGRB-1), during various Sporadic-E events between July 21 and August 9.

A similar list of countries for the period July 18 to August 14 were logged by Simon Hamer (New Radnor) with the addition of Finland (YLE TV1), Norway (Dagsrevyen and Hemnes), Romania, plus the news captions BPEMR, (USSR), HIREK (Yugoslavia), TELEGIOMALE (Italy), TELEDARIO (Spain) and the sign-off flag and national anthem from Poland (TVP). Edwina and Tony Mancini (Belper) added the Norwegian regionals Bagn and Kongsberg and the

SEEN & HEARD

captions BAYERN STUDIO and SWF-BADN (W. Germany), CST-INTERVISION, (Czechoslovakia), GEORGIA (USSR), INFORMIE (Spain), +PTT SSR-1 (French from Switzerland) to this month's score from their 20-country log, which, as usual, ranges from Scandinavia to the USSR and from Belgium to the Mediterranean.

Around 1630 on August 4, Bert Mills GW3LJP (Rhayader) received a news programme from an Arabic station and among the variety of pictures received from Scandinavia by Len Eastman (Bristol) was a clock-caption (Fig. 5) and a programme (Fig. 6) from Norway.

In Bedford, John Raleigh has two Panasonic receivers, fed by multi-element beams. These are operated by a single mains switch and are ready tuned to Chs. E2/R1 in Band I and Ch. E8 in Band III. During the 31 days prior to August 18, John logged signals from Austria, Denmark, Finland, Hungary and Iceland once only, Czechoslovakia, Poland, Sweden, Switzerland and Yugoslavia, twice, Norway 3 times, Portugal and the USSR on 5 days and Italy and Spain on 9 and 12 days respectively. "At the peak of the event on July 26, pictures on Chs. E2/3 were changing every few seconds," said John. This was supported by Owen Jones (Blurton) who emphasised the point that signals from Italy, Portugal and Spain had been predominant on his screen. One of Owen's specific interests this season has been clocks and he

logged such captions from Denmark, Italy, Norway, Portugal, Spain, W. Germany and the USSR.

Between 0712 and 0735 on July 20, Garry Smith logged test cards from Austria, Czechoslovakia, Hungary, Italy, E/W Germany, Switzerland and the USSR. However, much later, around midnight, he received an unidentified programme, from the west, on Chs. A2 and A3, which in Canada and the USA are 55.25 and 61.25MHz, respectively. "This was a lucky catch, the signals were weak but on my recording, a programme can be made out". Many congrats Garry, we must keep a closer watch on those frequencies. He also logged an Arabic film on Ch. E4 at 1404 on August 1. Garry is one of the Editors of *Teleradio News* which is published bi-monthly by HS Publications, 7 Epping Close, Derby, DE3 4HR and contains readers' reports, photos and much useful gen for the TV-DXer. Sample copies are available at £1.50 inc pp.

Tropospheric

Noel Smith received pictures from France (*Canal Plus*), on Chs. 5 and 7, from 0630 and throughout the morning on July 24, and I logged stations showing adverts,

cartoons and show jumping, in Band III, early in the evening of August 16 and noted co-channel interference on the u.h.f. band during the evenings of the 12th and 16th.

John Raleigh received pictures from Belgium on Ch. E10 (BRT TV1) daily from August 11 to 14 inclusive and Ch. E8 (RTBF-1) from the 11th to 15th and from France on Chs. L5/9 from the 8th to 16th. The Mancinis logged pictures, at varying strengths, from *Canal Plus* and Ireland's Radio Telefis Eireann (RTE-1) on Ch. H (207.25MHz) almost daily between July 16 and August 15.

From his QTH in India, Major Rana Roy received strong pictures from Jullundur TV on Ch. 9 (Fig. 7), Pakistan TV on Ch. 10 (Fig. 8), and Rawalpindi TV on Ch. 8 during the tropospheric openings on January 19, February 11 and March 29, respectively. Cricket lovers will note the familiar faces of England's Chris Broad and Australia's Richard Benaud in Figs. 9 and 10.

SSTV

It is with deep regret that I have to report the death of Richard Thurlow G3WW who was a regular contributor to this column. Richard was an international

leader in the world of SSTV and his work in this field will be greatly missed, I wish to extend our deepest sympathy to his family and multitude of friends at this sad time.

In Cumbria, Raymond Gilchrist, using a Sony ICF2001D receiver with a Skipmaster CLR2 vertical antenna, received slow scan television pictures on 14MHz, from Austria, Canary Islands, Finland, Germany, Italy and Poland, between July 24 and 26 and added Czechoslovakia, France, Greece, Holland, Hungary (Fig. 11) Jersey, Portugal (Fig. 12), Sardinia, Spain, Switzerland and Wales during the first 13 days of August. Although the majority of his pictures were received around 14.230MHz, he did see an oval, partly-hatched, logo with the caption "ham radio" from an unidentified station on 21.340MHz on July 30. Any ideas readers? The audio picture pulses from Raymond's receiver are fed to a Sinclair Spectrum computer, with Technical Software's RX4 program, and selected stored pictures are reproduced on a Timex printer.

During the month prior to August 5, Les Hobson GOCUI (Rotherham) exchanged pictures on 14MHz with stations in Canada, Finland, Germany, Labrador and Newfoundland and Poland. He also exchanged 8 and 32s black and white and 24s colour pictures with CT1AKD, "CT1AKD uses a BBC-B computer and his 24s colour definition was very good," said Les.

Your Band II DX and Television deadlines for the next three issues are: October 23, November 20 and December 14.

LONG MEDIUM & SHORT

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

The m.w. local radio and tropical band charts in "Seen & Heard" are popular with many readers since they detail all of the stations noted in the reports from contributors and form a quick station/frequency guide when DXing. A l.w. chart was introduced into the series from the August issue and already this is proving popular!

For some time the idea of introducing a m.w. transatlantic DX chart has been under consideration, supplemented by a few paragraphs of text so as to give a more detailed idea of band conditions, the equipment in use and the stations involved than a simple chart could provide. The first of these new charts appears in this issue and no doubt it will soon increase in size since the darker evenings now herald the start of the m.w. transatlantic DX season.

In view of the number of

stations logged on the s.w. bands there is no intention to introduce a chart covering them since it would occupy the whole of SWM!

DX Report

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

Long Wave DX

In a most interesting report from Johannesburg, S. Africa Simon Illingworth described how he checked the band one morning before dawn and positively identified the BBC Droitwich transmission on 200kHz amongst the noise! Simon also picked up weak and erratic signals from the other stations detailed in the chart and was able to make a positive identification of all of them except one on 180kHz, which was most likely Ankara, Turkey. Apparently all of these DX signals faded out at dawn and only the local naviga-

tional beacons which occupy the band during the day could then be heard.

No doubt Simon's report will be of special interest to Paul O'Connor because he intends to take his car radio with him on a visit to Johannesburg in October — no doubt l.w. DXing will prove to be an interesting challenge! Paul compiled his latest list for the chart while using the car radio after dark in Birmingham.

Writing from Glasgow, Alexander Little says, "The long wave band on my receiver is ruined by very strong images from Radio Clyde, Radio Scotland, Radio 1, Radio 2, and Radio 3. I tried to modify my loop antenna to cover the long wave band, but I decided not to as I would have to prise it apart". Image problems of this type are normally associated with single conversion receivers using an i.f. around 455kHz —

since the local oscillator operates 455kHz above the incoming l.w. signal it can also mix with a m.w. signal and an image results. Jim Willett also noted this problem in Grimsby and tackled it by making a l.w. version of the "Trombone ATU" — SWM August '87. By winding 300 turns of fine wire salvaged from an old transformer around a ferrite rod 180mm long, the a.t.u. covers the l.w. band. It seems to work well with domestic receivers, cutting out the image signals from local BBC and IBA stations — Jim has also noted a marked reduction in TV line time base interference since using the a.t.u.

The report from Philip Rambaut in Macclesfield compared the strength of the signals received at 0800 with those heard at 2200. It is interesting to note that the signals from Donebach, W. Germany 153 reduced from S4 to

SEEN & HEARD

Freq kHz	Station	Country	Power (kW)	DXer
153	Brasov	Romania	1200	G*
153	DLF Donebach	W. Germany	500	A*, D*, E, G*
162	Allouis	France	2000	A,B*, D*, E, G*
171	Kaliningrad	USSR	1000	E,G*
171	Medi 1 Nador	Morocco	1200	B*, G*
177	Oranienburg	E. Germany	750	D*, E, G*
180	Ankara	Turkey	1200	B*
182	Polati	Turkey	1200	G*
183	Saarlouis	W. Germany	2000	A,D*,E,F,G*
189	Motala	Sweden	300	A,E,G*
189	Tbilisi	USSR	500	G*
200	BBC Droitwich	UK	400	A,B*,D*,E
209	DLF Munich	W. Germany	500	A,E,G*
209	Azilal	Morocco	800	A*,E*,G*
209	Kiev	Ukraine	500	A*,C*,G*
218	Roumoules	Monaco	1400	A,D*,E*,G*
218	Baku	USSR	?	G*
227	Konstantinow	Poland	2000	G*
236	Junglinster	Luxembourg	2000	A,B*,D*,E,G*
236	Kishinev	USSR	1000	A*
245	Kalundborg	Denmark	300	D*,E
245	Erzurum	Turkey	200	G*
254	Tipaza	Algeria	1500	A*,D*,E*,G*
263	Plovdiv	Bulgaria	500	G*
263	Burg	E. Germany	200	E
263	Moscow	USSR	2000	D*,G*
272	Topolna	Czechoslovakia	1500	A*,E*
281	Minsk	USSR	500	F*,G*

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

DXers:

- A: David Edwardson, Wallsend.
- B: Simon Illingworth, Jo'burg, S.A.
- C: George Morley, Redhill.
- D: Paul O'Connor, Birmingham.
- E: Philip Rambaut, Macclesfield.
- F: Tim Shirley, Bristol.
- G: Jim Willett, Grimsby.

S3 after dark, whereas those from Motala, Sweden 189; Roumoules, Monaco 218; Tipiza, Algeria 254 and Topolna, Czechoslovakia 272 all increased in strength after dark.

George Morley has been testing out his new Trio R5000 receiver in Redhill and says "Kiev on 209 was quite a good signal at 0006UTC with a 'Peters & Lee' record, the same programme as on 4.940MHz at the same time — one of the advantages of the 5000's memory and its two v.f.o.s!" The lack of a SINPO type

"S" scale on the signal strength meter of the R5000 is proving to be a distinct disadvantage, since all broadcast stations read 20/40dB over S9 on the RST type metal scale! His Trio R2000 had both scales fitted.

A l.w. converter is used ahead of a Trio R600 in Wallsend by David Edwardson — he compiled his impressive list for the chart during daylight and after dark. He has been experimenting with inductive loading on his 0.25 by 0.25m m.w. loop antenna, but so far results are disappointing. Using a Trio R600 receiver in Bristol, Tim Shirley logged Saarlouis, W. Germany (Europe No. 1) on 183 at 0800 and sent them a report — he was surprised to receive their QSL in only four days.

MW Transatlantic DX
The m.w. transatlantic DX season is once again on the horizon and judging by the report from "old timer" Bill Kelly in Belfast there is already plenty to interest the DXer! Some of the signals to peak S3 on the meter of Bill's JRC NRD525 receiver were Canadian VOCM 590, CBNA 600, CKVO 710, CBD 1110 and CKLM 1570; also WWWE 1100 and WCAU 1210 in the USA and Radio Globo in Rio, Brazil on 1220.

Tim Shirley added several new ones in the New York area and Boston to his growing list of DX — since they have not been reported before in this series they are subject to confirmation by QSL.

Sending along his first report for the chart from Coventry, A. Taylor says "My receiver is a Realistic DX302 fed by a Sooper Loop — this loop is the best I have used . . ." Jim Willett used his trusty RCA AR77 receiver to

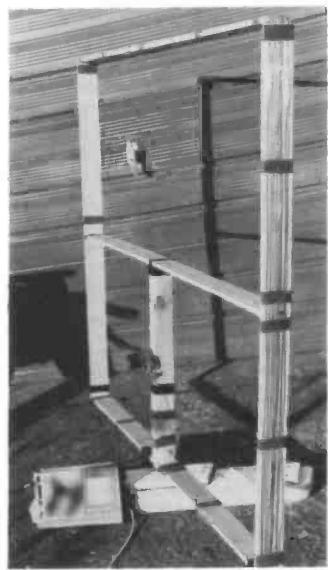


Fig. 1: David Edwardson's 1m square loop.

compile his list and obtained a positive identification from all of the stations except one on 1470, which gave its call as XE?? and mentioned Mexico — I have shown it as XEBBC in the chart.

Other MW DX

An interesting report from Simon Illingworth detailed some of the DX he has been hearing in Johannesburg recently — VOA via Selebi-Phikwe, Botswana 621 at 1800; General Service, Zambia 621 at 2000; EAJ.5 Sevilla, Spain 792 at 0356; Radio Moscow via Kuybyshev, USSR 1143 at 2235; BBC WS via Orfordness 1296 at 2236; BBC via Zyyi, Cyprus 1323 at 1819; Radio-1 Rome, Italy 1332 at 0455; RFI Nancy, France 1350 at 0350; BBC WS via Masirah Island, Oman 1413 at 1745; SRFI Saarbrucken, W. Germany 1422 at 2200; TWR Monte-Carlo, Monaco 1467 at 2239; Radio Moscow via Leningrad, USSR 1494 at 0336; Vatican Radio via Rome, Italy 1530 at 0353; ILR Capital Radio, London 1548 at 2149 and Radio Mediterranean Cyclops, Malta 1557 at 2230.

The impressive list of DX compiled by Tim Shirley includes

Freq kHz	Station	Location	Time (UTC)	DXer
880	WCBS	USA New York, NY.	?	H
990	WZZD	Philadelphia, PA.	0200	B
1010	WINS	New York, NY.	0120	D
1050	WHN	New York, NY.	0315	A,B
1090	WBAL	Baltimore, MD.	0145	B
1100	WWWE	Cleveland, OH.	2355	B
1140	WRVA	Richmond, VA.	0330	A
1190	WLIB	New York, NY.	0030	F
1200	WOAI	San Antonio, TX.	0430	A
1210	WCAU	Philadelphia, PA.	0305	B
1220	WGAR	Cleveland, OH.	?	H
1260	WEZE	Boston, MA.	0330	F
1280	WADO	New York, NY.	0230	F
1330	WNYM	New York, NY.	2316	F
1390	WEGP	Presque Isle, ME.	?	H
1500	WTOP	Washington, DC.	0235	B,H
1540	WPTR	Albany, NY.	0420	A
1560	WQXR	New York, NY.	0215	B,F,H
1600	WWRL	New York, NY.	0515	A
590	VOCM	CANADA St. John's, NF.	0320	B
600	CBNA	St. Anthony, NF.	0300	B
620	CKCM	Grand Falls, NF.	0330	B
630	CHEP	Edmonton, AB.	0335	B
710	CKVO	Clarenceville, NF.	0235	B
750	CBGY	Bonavista Bay, NF.	?	H
930	CJYQ	St. John's, NF.	0120	D,G,H
1110	CBD	St. John, NB.	2348	B
1570	CKLM	Lavel, PQ.	0330	B
*		C. AMERICA & CARIBBEAN		
1100	XEBV	Moroleon, Mexico.	0420	B
1110	XERED	Mexico City, Mexico.	0240	B
1470	XEBBC	Tijuana, Mexico.	?	H
1570	Atlantic Beacon	Turks & Caicos Is.	0230	A,B
1610	Caribbean Beacon	Anguilla.	0045	A,B,C,E,G,H
750	R. Vision	SOUTH AMERICA Caracas, Venezuela.	0320	B
1100	R. Globo	Sao Paulo, Brazil.	0120	D
1220	R. Globo	Rio de Janeiro, Brazil.	0200	B,G

DXers:

- (A) Simon Illingworth, Jo'burg, S. Africa.
- (B) Bill Kelly, Belfast.
- (C) Alexander Little, Glasgow.
- (D) George Morley, Redhill.
- (E) Paul O'Connor, Birmingham.
- (F) Tim Shirley, Bristol.
- (G) A. Taylor, Coventry.
- (H) Jim Willett, Grimsby.

SEEN & HEARD

1350 — their signal seems to reach many areas of the UK during daylight. Michael Banbrook was very surprised to hear both RTE-1 567 and RTE-2 via Athlone 612 at 1000 during a visit to Maidenhead!

Up in Forfar, Stewart Russell has also been hearing some of the more distant stations during daylight — Radio Luxembourg via Marnach 1440 at 1800; RSI via Solvesborg, Sweden on 1179 at 1930 and BRT International via Wolvertem, Belgium on 1512 at 1930. After dark, the programmes from Manx Radio, Isle of Man on 1368 can be received in many areas of the UK — Daniel Masterson logged their signal in Stoke-on-Trent as SIO 333 and Alan Curry noted it as 423 in Stockton-on-Tees. It is worth sending them a report and requesting their QSL plus a copy of their fact sheet detailing the history of the station — it certainly makes interesting reading!

Reports on the BBC 648 multi-lingual broadcasts on 648kHz continue to arrive here. Listening in Thessaloniki, Greece George Efstratiades found their signal to be audible but poor at night. Writing from Belfast, R. Quigg says "I cannot recall when I last heard it — must be several years now — thanks to their new directional antenna array no doubt!" Using a JRC NRD 515 receiver with a Mizuho KX-3 a.t.u. and 20m wire antenna, Glen Glen-Davidson has been monitoring their signal throughout the day in Newcastle and has established that reception is generally good there during daylight, but some co-channel interference exists at night. Paul O'Connor found similar conditions in Birmingham.

The construction of a 1 metre square loop antenna designed by David Edwardson was detailed in this series last month — it is now depicted in Fig. 1. David used this giant loop to receive BBC 648 and logged their signal as SINPO 35553 at 0652 and 44454 at 2203. Using a Vega B212 receiver, Sheila Hughes has been monitoring their signal in Morden and rates it as SINPO 55455 at 0800. Sheila has been finding their programmes very interesting and some of their regular features are now among her favourites! The programmes from BRT Brussels on 1512 also attract her attention — items on cookery, sports and topical events are often included in their 25 minute programme. Listening at 2100, Sheila logged their signal as SINPO 44444.

Bill Kelly has been listening at all hours of the night to compile his impressive list of DX — Ain Beida, Algeria 531 at 0230; Volgograd, USSR 567 at 0325; Bechar, Algeria 576; Braga, Portugal 576 at 0310; Valenca do Minho, Portugal 567 at 0320; Wavre-

Overijse, Belgium 621 at 0335; RFI France 711 at 0440; Sadiyat, UAE 729 at 2335; Alger, Algeria 891 at 0250; Izmir, Turkey 927 at 0230; Trapani, Italy 936 at 0315; Alger, Algeria 981 at 2300; Las Palmas, Canary Is 1008 at 0250; Azurara, Portugal 1062 at 0515; Kalundborg, Denmark 1062 at 0155; Lille, France 1071 at 0440; Riga, USSR 1071 at 0215; Krasnodar, USSR 1089 at 0110; Santa Cruz de La Palma, Canary Is 1098 at 0300; Kaliningrad, USSR 1143 at 0230; Strasbourg, France 1161 at 0215; Minsk, USSR 1197 at 0215; Tripoli, Libya 1402 at 0300; Stargard, Poland 1503 at 2255; Jeddah, Saudi Arabia 1512 at 0115; Sfax, Tunisia 1566 at 0220 and Vatican Radio, Rome 1611 at 0435.

MW Local Radio DX

A giant loop just over 2m square is used ahead of a Trio 9R59DS receiver by Nick Rank when DXing in Buxton — so no wonder he can hear so many stations during daylight! He says "When all TVs, Hoovers, etc., are turned off, both Essex Radio and Radio 210 come in on 1431 at about strength 3 on the SIO scale. The more distant ones like Moray Forth and Ocean Sound are inaudible until nightfall".

While travelling by train to London, Stewart Russell enjoyed himself tuning into many local radio stations as he passed through each county! He compiled his list for the chart while in Hounslow, Heathrow and Staines. The construction of his Sooper Loop antenna is now complete, so his next contribution from Forfar is likely to be a bumper DX list! The full details of the construction of the popular Sooper Loop by Dave Mayhew appeared in the July '86 *Practical Wireless* — back issues are still available from PW Publishing in Poole. A. Taylor has been putting his to good effect in conjunction with a Realistic DX302 receiver, logging all of the stations in his list between 1230 & 1450.

Michael Banbrook recently visited Maidenhead and used the car radio to check the band — he was astonished to hear BBC Radio Devon 801 and BBC Radio Leicester 837 coming in at excellent strength at 1100UTC! Some DXers use the different jingles broadcast by many m.w. local radio stations as a means of identifying them. Paul O'Connor points out that BRMB have changed their "news music" to a drums and saxophone jingle.

Although we are now on the upward slope of the next solar sunspot cycle, the 25MHz (11m) band is likely to remain silent for some time to come — see graph on page 35, August '87 SWM. Some occasional openings to distant places have occurred on

the 28MHz (10m) amateur band via Sporadic-E recently, but broadcasters cannot make use of this mode of propagation to provide a reliable service on 11m since it is unpredictable.

According to the forecast, October should be the best month for DXing this year and already the conditions on the higher frequency bands are starting to improve! There have been a number of days recently when reception on the 21MHz (13m) band has been better than in recent months, however this band still tends to be generally unstable. By making regular checks on some of the signals beamed towards Europe a very good idea of band conditions can quickly be established.

Radio RSA make direct broadcasts daily to listeners in Europe and W. Africa from Johannesburg, S. Africa on 21.590 from 1300 until 1556. Since their signals have travelled over 9000km to reach us, they make a good pointer to reception conditions from that area. In fact the reception of RSA has been generally good recently — John Nash has been monitoring their signals during most afternoons in Brighton and usually logs them as SINPO 55545.

When assessing the reception conditions in this way, it is important to bear in mind that some of the broadcasts are beamed towards Europe via relay stations and therefore only provide a guide to the reception conditions prevailing between the relay station and the listener and not from the country originating the programmes!

Of course the relay stations often provide a better service to Europe than would otherwise be possible by direct transmissions from a distant country, but from the DXer's point of view they tend

to take away the thrill of hearing distant places direct! Radio Japan uses a relay station in Moyabi, Gabon on 21.700 in an attempt to ensure that their programmes in English and Japanese reach listeners in Europe from 1500 until 1700. Using a Lowe SRX30 receiver plus a Cedar RQ80 a.t.u. in London, Phil Townsend picked them up for the first time recently and found reception good.

There are also a number of interesting broadcasts to be found on this band which are not directed towards the UK, but can nevertheless be received here — these include direct transmissions to a particular target area and also transmissions via relay stations. Relatively simple receiving equipment is all that is needed when suitable conditions exist.

Examples of direct transmissions to other Continents were noted in the reports from several listeners — Leslie Lyon used a Philips portable receiver with an indoor wire antenna in Scarborough to log Radio Prague, Czechoslovakia on 21.705, beaming programmes in English and Czech to S.E. Asia at 0830. A Philips D.2935 receiver plus 20m wire antenna and a.t.u. enabled Leslie Hollis of Grantham to hear a broadcast in French, English and Portuguese to Africa from Vatican Radio, Rome on 21.485 between 1100 and 1230 and later to receive a broadcast in Swahili and French for listeners in E. Africa from Radio DW Cologne via Wertachtal, W. Germany on 21.600 at 1500 Bill Griffith used a Sony 2001 receiver with a 6m wire antenna in London to log the broadcasts from UAE Radio Dubai on 21.605 at 1100 — their programmes may be heard from 0615 until 1500 and are mainly in Arabic, however there are some interesting items in English.



Fig. 2: Ron Pearce's 955S one-valve RX.

SEEN & HEARD

Freq kHz	Station	ILR or BBC	DXer
603	Invicta Sound	I	A,C*,E,F,G,H
630	R. Bedfordshire	B	E,F,H
657	R. Clwyd	B	C,E
666	Devonair R.	I	C,H
666	R. York	B	C,F,H
729	BBC Essex	B	F,H
756	R. Cumbria	B	F
756	R. Shropshire	B	D,H
765	BBC Essex	B	C,F,H
774	R. Kent	B	A,H
774	R. Leeds	B	F
774	Severn Sound	I	C*,E,H
792	Chiltern R.	I	A,F,H
801	R. Devon	B	A,F,H
828	R. WM	B	E,F,H
828	R. Aire	I	F
828	Chiltern R.	I	A
837	R. Leicester	B	A,F,H
855	R. Norfolk	B	H
855	R. Lancashire	B	F,H
873	R. Norfolk	B	F,H
936	GWR	I	A,C*,E,H
945	R. Trent	I	C*,E,F
954	R. Wyvern	I	E,H
990	Beacon R.	I	E,F,H
990	Hallam R.	I	F
999	Red Rose R.	I	B,F*
999	R. Trent	I	A,F,H
1026	R. Cambridgeshire	B	F,H
1035	R. Sheffield	B	F,H
1035	R. Kent	B	A,G,H
1035	NorthSound R.	I	B,F*
1107	Moray Firth R.	I	C*,F*
1107	R. Northampton	B	F,H
1116	R. Derby	B	C*,F,H
1152	LBC	I	G
1152	R. Clyde	I	C*,I
1152	Metro R.	I	F*
1152	BRMB	I	E,H
1152	Piccadilly R.	I	F*
1152	R. Broadland	I	C*,F*
1161	R. Sussex	B	C*
1161	R. Tay	I	C*,F*
1161	Viking R.	I	F

The 955S one valve receiver depicted in Fig. 2 was built by Ron Pearce in Bungay — it has certainly been pulling in some interesting signals on this band, including Radio DW Cologne 21.680 beaming to Australia from Wertachtal, W. Germany at 0941; UAE Radio Dubai 21.605, broadcasting to N. Africa at 1032; RSI Stockholm, Sweden 21.690, with programmes for the Middle East at 1111 and Radio Nederland beaming to W. Africa via their Bonaire, Netherlands Antilles relay on 21.685 at 1840.

A good deal of discussion on the future of s.w. broadcasting and the possible introduction of single sideband (s.s.b.) transmissions took place at a recent World Administrative Radio Conference. An example of s.s.b. broadcasting may be found on 13m by tuning to the RSI station in Varbergh, Sweden which radiates the Swedish home service on 21.555MHz between 0900 & 1600 and runs a peak power of 100kW.

The reception conditions on the 17MHz (16m) band have shown a marked improvement recently, especially from Australia and the Far East. George Hewlett officially monitors most of the transmissions from Radio Australia on a

daily basis in Torquay and he says he has always believed that the autumn is the best time of the year for listening to their broadcasts.

Although their 16m transmissions are directed to S.E. Asia from 0100 until 0850 via Carnarvon, Western Australia on 17.715 and to E. Asia from 0000 until 0900 via Darwin, N. Australia on 17.750 they can often be heard here in the early morning via the long path over the Pacific. David Edwardson logged both of them around 0200 recently, noting the 17.715 signal as SINPO 35542 and 17.750 as 24532.

George Hewlett monitors both transmissions from 0400 and often logs them as SIO 322 at 0430, but the signals usually improve to 433 later. By 0500 the 17.750 is lost through co-channel interference and jamming and occasionally the 17.715 signal fades out around 0530, but it usually returns around 0615. By the end of October George thinks there may be signs of deterioration, as reception gets later and the mornings are much darker.

The daily news bulletin and sports round-up from Radio Australia on 17.715 have been attracting the attention of Robert Taylor at 0830 — he uses just the

Freq kHz	Station	ILR or BBC	DXer
1161	R. Bedfordshire	B	H
1170	R. Tees	I	C*
1170	Signal R.	I	C*,F,H
1242	Invicta Sound	I	C*,H
1251	Saxon R.	I	F,H
1260	Marcher Sound	I	D,F
1260	Leicester Sound	I	E,H
1278	Pennine R.	I	F
1305	Red Dragon R.	I	C*,E
1305	R. Hallam	I	F,H
1323	Southern Sound	I	C*,H
1332	Hereward R.	I	E,F,H
1359	Essex R.	I	F,G
1359	Red Dragon R.	I	F*
1359	Mercia Sound	I	E,F,H
1368	R. Lincolnshire	B	F
1431	Essex R.	I	F,H
1431	Radio 210	I	F,G
1449	R. Cambridgeshire	B	F,H
1458	R. London	B	G
1458	R. WM	B	C*,E,H
1458	R. Manchester	B	F
1476	County Sound	I	F,H
1485	R. Merseyside	B	F,H
1485	R. Humberside	B	F,H
1485	R. Oxford	B	G
1503	R. Stoke-on-Trent	B	C*,F,H
1521	R. Mercury	I	C*,G,H
1521	R. Nottingham	B	F,H
1530	Pennine R.	I	F
1530	R. Wyvern	I	E,H
1548	Capital R.	I	C*,G,H
1548	R. Forth	I	F*
1548	R. City	I	C*,F
1548	R. Hallam	I	F
1557	Hereward R.	I	H
1557	R. Lancashire	B	F
1557	Northants 96	I	C*,F
1557	Ocean Sound	I	C*,F*
1584	R. Nottingham	B	F,H
1584	R. Shropshire	B	H
1584	R. Tay	I	C*
1602	R. Kent	B	C*,H

Note:
Entries marked * were logged during darkness.

All other entries were logged during daylight.

DXers

- A: Michael Banbrook, Maidenhead.
- B: Alan Curry, Stockton-on-Tees.
- C: Bill Kelly, Belfast.
- D: Daniel Masterson, Stoke-on-Trent.
- E: Paul O'Connor, Birmingham.
- F: Nick Rank, Buxton.
- G: Stewart Russell (while in London).
- H: A. Taylor, Coventry.
- I: Robert Taylor, Edinburgh.

France 17.850 (French and English to Africa 0800-1600) — heard by Robert Taylor; Radio RSA Johannesburg, S. Africa 17.780 (French and English to W. Africa and Europe 1200-1556) — John Nash enjoys their *Mail Bag* programme on Sunday afternoons; RFI Allouis, France 17.620 (French and English to W. Africa 1000-1800) — noted by Leslie Lyon.

During the evening, Neil Dove of Lockerbie logged Radio Nederland via their Bonaire, Netherlands Antilles relay 17.605 (English and French to C. Africa 1830-2025); Radio HCJB Quito, Ecuador 17.790 (Czech, German, English, Norwegian and Spanish to Europe 1800-2230); RCI Montreal, Canada 17.820 (English and French to W. Africa and Europe 1800-2100); REE via Noblejas,

SEEN & HEARD

Freq MHz	Station	Country	UTC	DXer
2.310	Yunnan	China	0035 P	
2.340	Fuzhou	China	0015 P	
2.380	FBS	Falklands	0145 P	
2.445	Nanchang	China	0120 P	
2.470	R.Cacique	Brazil	0205 P	
2.495	R.Madagascar	Madagascar	2300 P	
3.205	AIR Delhi	India	0100 P	
3.210	R.Federacion	Ecuador	0310 G	
3.210	R.Mozambique	Mozambique	2200 D,F,G,M	
3.215	R.Orange	S.Africa	0315 G	
3.215	R.Orion	S.Africa	0305 F,G	
3.220	R.HCJB Quito	Ecuador	0400 G	
3.220	R.Togo, Lome	Togo	0530 P	
3.230	R.RSA	S.Africa	0323 D,G	
3.255	LBS Monrovia	Liberia	2350 P	
3.270	SWABC 1	Namibia	2200 F,P	
3.280	R.Beira	Mozambique	0410 G	
3.285	R.Bandeirantes	Brazil	0420 G	
3.320	R.Suid Afrika	S.Africa	0010 F,G,P	
3.325	R.Liberal	Brazil	0400 P	
3.330	R.Comoro	Comoro Is.	0300 D	
3.330	R.Rwanda	Kigali	0300 G,P	
3.355	R.Nac.Luanda	Angola	0315 G,N	
3.355	AIR Kurseong	India	0320 G	
3.355	R.Botswana	Gaborone	0400 F,G,P	
3.365	GBC Radio 2	Ghana	2210 A,F,I	
3.370	R.Beira	Mozambique	1912 F	
3.375	R.Dourados	Brazil	0355 G	
3.380	R.Malawi	Malawi	0253 F,N	
3.395	R.Zaracay	Ecuador	0235 G	
3.395	ZBC Gweru	Zimbabwe	1921 F	
3.905	AIR Delhi	India	0010 C,G	
3.915	BBC Kranji	Singapore	2305 A,F,P	
3.930	Capital R.	Transkei	1900 F,N	
3.930	R.Nac.de Cabo	Cape Verde	2330 P	
3.940	PBS Hubei Wuhan	China	2300 P	
3.950	Xinjiang	China	2200 C	
3.955	R.Orion	S.Africa	2330 F,P	
3.965	RFI Paris	France	1922 B	
3.985	SRI Berne	Switzerland	1926 B	
4.000	Bofoussam	Cameroon	0220 P	
4.460	R.Capt.V.Ustariz	Bolivia	0130 P	
4.500	Xinjiang	China	2213 D	
4.545	Alma Ata	USSR	0013 I	
4.635	R.Dushanbe, Tadzhik	USSR	0025 I	
4.720	RRI	Indonesia	2200 P	
4.725	BBS Rangoon	Burma	0210 P	
4.735	Xinjiang	China	2200 C,D,Q	
4.740	R.Afghanistan	via USSR	1909 K	
4.755	R.Maranhao	Brazil	0035 I	
4.755	Sani Radio	Honduras	0020 M	
4.760	ELWA Monrovia	Liberia	2100 I,K,Q	
4.760	TWR	Swaziland	0329 D	
4.760	R.Frontera	Venezuela	0130 N	
4.765	CRE Guayaquil	Ecuador	0300 P	
4.765	R.Moscow	Via Cuba	0207 D,I	
4.770	FRCN, Kaduna	Nigeria	1855 F,I,K,P	
4.775	R.Los Andes	Bolivia	2310 P	
4.775	RRI Jakarta	Indonesia	0500 P	
4.780	V.Carabobo	Venezuela	0100 P	
4.785	RTM Bamako	Mali	2100 F,P,Q	
4.790	Azad Kashmir R.	Pakistan	1830 P	
4.795	R.Douala	Cameroon	2030 C,G,I,K,M,P,Q	
4.800	LNBS Maseru	Lesotho	2150 D,F,P	
4.800	R.Popular Cuenca	Ecuador	0320 G	
4.805	R.Nac. Amazonas	Brazil	2154 J,M	
4.805	Voice of Kenya	Kenya	2310 P	
4.805	R.Nacional	Sao Tome	2200 N	
4.815	R.diff TV Ouagadougou	Burkina Faso	1945 C,G,I,K,Q	
4.815	R.Pakistan Karachi	Pakistan	0500 P	
4.815	R.Nac.Tabatinga	Brazil	0456 I	
4.820	Botswana	Botswana	2055 F,K	
4.820	La Voz Evangelica	Honduras	0448 I,P	
4.825	R.Ashkhabad	USSR	2256 F	

Freq MHz	Station	Country	UTC	DXer
4.825	V de Selva	Peru	0230 P	
4.830	Africa No.1	Gabon	1925 A,C,I,J,K,M,O,Q	
4.830	R.Bangkok	Thailand	0420 P	
4.830	R.Reloj	Costa Rica	0020 G,P	
4.830	R.Tachira	Venezuela	0230 C,D,G,P	
4.835	RTM Bamako	Mali	2204 C,D,I,K,M,Q	
4.840	R.Bukavu	Zaire	2250 P	
4.845	R.Nacional, Manaus	Brazil	0300 D,G,P	
4.845	ORTM Nouakchott	Mauritania	2000 K,M,Q	
4.850	R.Columbia Pt	Costa Rica	0355 G	
4.850	R.Luz & Vida	Ecuador	0235 P	
4.850	R.Tashkent	USSR	2310 M	
4.850	R.Yaounde	Cameroon	2035 A,C,E,I,K,Q	
4.850	R.Capital, Caracas	Venezuela	0345 G	
4.855	RRI Palembang	Indonesia	0125 P	
4.865	V de Cinaruco	Columbia	0245 P	
4.865	PBS Lanzhou	China	2115 C,D,I	
4.865	R.Mozambique	Mozambique	0320 G	
4.870	R.Cotonou	Benin	1855 C,D,K,Q	
4.875	R.Cruz/Sur, La Paz	Bolivia	0300 P	
4.875	R.Nac.Boa Vista	Brazil	0310 C,D	
4.880	R.Acreana	Brazil	0255 G,H	
4.880	SABC Radio 5	S.Africa	1930 C,D,F,G,K,M,Q	
4.885	R.Sararenda	Bolivia	0320 P	
4.885	T.Than Hoa	Vietnam	0105 P	
4.890	R.Centinela Loga	Ecuador	0240 G,P	
4.890	ORTS, Dakar	Senegal	0400 D	
4.895	RTM Kuching	Sarawak	0130 P	
4.900	R.diff Nat. Conakry	Guinea	2032 K	
4.900	R.Juventud	Venezuela	0320 P	
4.905	N'djamena	Chad	2035 F,K,M	
4.910	R.Zambia	Zambia	1914 F	
4.915	R.Ghana, Accra	Ghana	2032 E,F,I,K,M,P	
4.915	R.Nac.Macapa	Brazil	0225 G	
4.920	R.Nat.N'djamena	Chad	0305 G	
4.920	R.Quito	Ecuador	0345 G,L	
4.925	R.Nacional, Bata	Eq.Guinea	1940 C,M	
4.930	Ashkabad	USSR	1805 M	
4.930	4VEH	Haiti	0100 P	
4.930	RRI Surakarta	Indonesia	0020 P	
4.935	SWABC Windhoek	S.W.Africa	1800 N,P	
4.940	R.Abidjan	Ivory Coast	2100 Q	
4.940	Kiev	USSR	2045 C,I	
4.940	R.Yakutsk	USSR	0245 G	
4.945	Caracol, Neiva	Colombia	0140 P	
4.950	R.Pakistan	Pakistan	0010 P	
4.955	R.Cult.Huanta	Peru	0150 P	
4.958	Azerbaijan	USSR	2040 C	
4.960	R.Federacion	Ecuador	0200 P	
4.970	Cabinda	Angola	2320 P	
4.975	R.Uganda	Uganda	2035 K	
4.980	PBS Xinjiang	China	2100 P	
4.980	Ecos del Torbes	Venezuela	0205 D,G	
4.985	R.Brazil Central	Brazil	0200 G	
4.990	AIR New Delhi	India	0005 C,M	
4.990	FRCN, Lagos	Nigeria	2040 C,F,I,K,Q	
4.995	R.Andina	Peru	0345 G	
5.005	R.Nacional, Bata	Eq.Guinea	2010 C,K,P	
5.010	R.Garoua	Cameroon	1955 C,F,K	
5.010	R.Pakistan	Pakistan	0530 P	
5.015	R.Vladivostok	USSR	0235 P	
5.025	R.Bororema	Brazil	0355 C	
5.025	R.Uganda, Kampala	Uganda	2040 K	
5.035	Alma Ata	USSR	2100 Q	
5.035	R.Aparecida	Brazil	0205 P	
5.035	R.Bangui	C.Africa	1950 D,F,K	
5.045	R.Cultura do Para	Brazil	0120 P	
5.045	R.Togo Lome	Togo	1950 E,K,N,Q	
5.050	R.Singapore	Singapore	0620 P	
5.050	R.Tanzania	Tanzania	2250 P	
5.055	TWR	Swaziland	0553 I	
5.057	Gjurokaster	Albania	2040 K	
5.095	R.Sutatenza, Bogata	Colombia	0150 D,P	
5.190	R.Nav.Cont.Caja	Peru	0350 P	

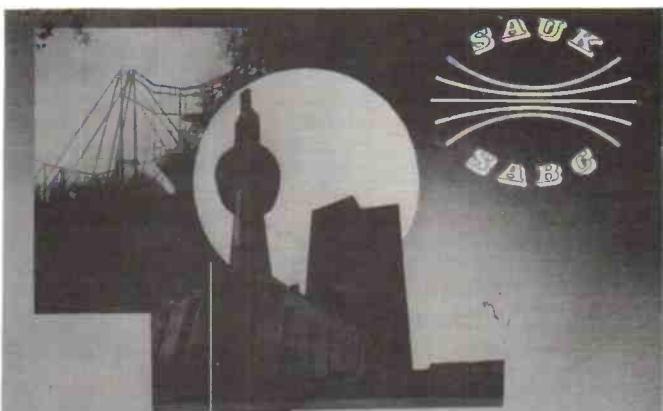
DXers

- (A) Alan Curry, Stockton-on-Tees.
 (B) Colin Diffell, Corsham.
 (C) Neil Dove, Lockerbie.
 (D) David Edwardson, Wallsend.
 (E) Bill Griffith, London.

- (F) Simon Illingworth, Johannesburg, S. Africa.
 (G) Bill Kelly, Belfast.
 (H) Alexander Little, Glasgow.
 (I) George Morley, Redhill.
 (J) John Nash, Brighton.
 (K) Fred Pallant, Storrington.

- (L) John Parry, Northwich.
 (M) Leslie Sargent, Runcorn.
 (N) Tim Shirley, Bristol.
 (O) Philip Townsend, London.
 (P) Jim Willett (at Whernside, N. Yorks).
 (Q) R. Wilson, Nottingham.

SEEN & HEARD



South African Broadcasting Corporation QSL card, received by T. Shirley.

Spain 17.845 (Spanish to S. America 1930-2245); Radio DW Cologne via Kigali, Rwanda 17.860 (German to W. Africa 1800-2150) and RCI Montreal, Canada 17.875 (Polish, French, English and Russian to Europe 1800-2100). Alan Curry and Ian Fordyce have been listening to WYFR via Okeechobee, Florida USA 17.750 (English and Spanish to Europe 2000-2300).

Long distance signals can be heard on the **15MHz (19m)** band in the early morning. Radio Japan broadcasts direct to Europe on 15.195 from 0500-0900 and also via Moyabi, Gabon on 15.230 from 0700-0830 — Philip Rambaut logged both signals around 0755, noting 15.195 as SIO 222 and 15.230 as 322. The 19m broadcasts from Radio Australia are not intended for listeners in Europe, but may often be heard here on 15.240 — noted as SIO 433 by George Hewlett at 0400; on 15.395 — noted as SINPO 23432 by David Edwardson at 0740; also on 15.415 from 0900 — noted as 43433 by Alexander Little at 1045.

By listening carefully on this band, many interesting stations may be found during the day — VOIRI Tehran, Iran 15.084 (SIO 343 at 0830; BBC via Ascension Island 15.105 (333 at 0748) and 15.400 (333 at 0907); Radio Kuwait 15.505 (433 at 0915); Radio Pakistan, Islamabad 15.605 (222 at 0923); FEBA Radio, Seychelles 15.405 (212 at 1130); VOA via Tinang, Philippines 15.410 (111 at 1315) were just a few of the stations logged by Philip Rambaut. WYFR via Taipei, Taiwan 15.055 (333 at 1345) and RBI via Nauen, GDR 15.240 (544 at 1415) were noted by Robert Taylor. VOIRI Tehran, Iran 15.084, broadcasting in Farsi and Arabic to the Middle East was received by Bill Stewart in Lossiemouth at 1720.

Some of the stations in N. and S. America which may be received here during the evening include RNB Brasilia, Brazil 15.265 at 1800 — noted by Edward

Broadsmith in Worcester; WYFR via Okeechobee, Florida 15.566 — logged by Leslie Hollis at 1945 as 44433. WHRI South Bend, Indiana USA 15.105 — received by Peter Vlietinck in London at 2000; RAE Argentina 15.345 — noted by Ian Fordyce at 2130; AWR Costa Rica 15.460 — logged as 35542 with rough audio by Neil Dove at 2140. George Efstratiades heard VOFC Taiwan via Okeechobee Florida on 15.440 at 2200 and WCSN Boston, Mass on 15.300 at 2245.

The reception conditions on the **11MHz (25m)** band have been fairly reliable both during the day and at night. Generally good reception of Radio Australia's broadcast to the S. Pacific on 11.910 has been noted by George Hewlett around 0400 — this transmission is via their Shepparton transmitter from 0400 until 0630.

An early morning broadcast from Radio Finland, Helsinki on 11.755 was noted by John Parry as SIO 444 at 0640 (English and German to Europe 0600-1000). During the day George Morley logged several interesting stations while using his new Trio R5000 receiver, including Radio HCJB Quito, Ecuador 11.835 (English to Europe 0700-0830) — noted as SIO 434 at 0817; Radio Beijing, China 11.600 (English to S. Asia 1400-1555) — 323 at 1353; BBC WS via Kranji, Singapore 11.750 — 434 at 1505; SLBS Colombo, Sri Lanka 11.800 (Tamil and Hindi to S. Asia 0830-1630) — 211 at 1520. The programmes in English broadcast on 11.675 by Radio Kuwait between 1800 and 2100 have been attracting the attention of Bill Griffith and Daniel Masterson during the evening.

Using a Yaesu FRG-7700 receiver in Stockton-on-Tees, Ian Curry listened to Radio Bucharest, Romania 11.940 (German,

French and English to Europe 1800-2125), noting SINPO 43344 in his log. Bill Stewart used his National Panasonic RF 2800LB receiver with its built-in whip antenna to log Radio Moscow, USSR 12.070 as SINPO 45544 at 1905 (English, Russian and Spanish to Europe 0400-2130); The Voice of Israel, Jerusalem 12.075 as 33333 at 1910 (English and French to Europe 1900-1955); Radio Damascus, Syria 12.085 as 32333 at 1915 (German, French and English to Europe 1835-2105) and Radio Moscow, USSR 11.980 as 43333 at 1920 (German, English and Russian to Europe 1500-2330).

Listening in Buckie, Julian Wood heard Radio Pakistan, Islamabad 11.615 (Turkish to the Middle East 1645-1745); The Voice of Israel, Jerusalem 11.585 (English, French and Hebrew to Europe 1000-2215); AIR New Delhi, India 11.620 (English to Europe 1845-2230). At 2200, Ian Fordyce picked up a station that is seldom mentioned — Radio Clarin, Dominica 11.700 (Spanish to C. America 1130-0400).

There are many broadcasters active throughout the day and night on the **9MHz (31m)** band and due to the resulting congestion, some co-channel and adjacent channel interference exists. Despite these problems, reception from many areas is good.

The programmes from Radio Australia are beamed to listeners in Europe on 9.655 by their Shepparton transmitting station in S.E. Australia from 0700 until 1030 and their signal often peaks SIO 444 just now! Another good signal to look out for in the morning stems from Radio HCJB in Quito, high in the Andes mountains of Ecuador — their broadcast to Europe on 9.860 is in English from 0700 until 0830. Leslie Lyon is a regular listener to their *Happiness Is* programme, which usually ends with a true story with a moral.

A broadcast in Chinese from VOA via their Tinang, Philippines relay on 9.555 was logged by George Morley as SIO 322 at 1447. He also picked up Radio Pakistan, Islamabad beaming programmes in Urdu and English to the Middle East on 9.465, noting 423 in his log at 1620. A talk on smoking attracted his attention at 1940, which proved to be from Radio Beijing, China on 9.850.

The broadcasts from Iceland are seldom mentioned by DXers, their weather forecast followed by the news in Icelandic on 9.985 at 1850 and David Edwardson picked them up at 2013, noting

SINPO 45544 in his log. Bill also heard VOIRI Tehran, Iran on 9.020 with the news in English at 2030 and more news in English from Radio Tirana, Albania on 9.430 at 2230.

Most of the **7MHz (41m)** stations reported last month are still being heard. Many broadcasters make extensive use of this band and consequently the level of co-channel and adjacent channel interference is very high indeed. At least two stations still operate in the exclusive section of the 40m amateur band (7.000 to 7.100MHz), namely, Radio Tirana, Albania on 7.065 and Radio Beijing, China on 7.050, 7.055, 7.065, 7.080 or 7.095.

Two seldom mentioned stations were noted in the report from Leslie Hollis, namely ICRC, Geneva 7.210 — their Red Cross report may be heard on the last Sunday of the month at 1100; The Voice of Nigeria, Lagos 7.255, noted as SINPO 33432 at 1130. Listening in Corsham, Colin Diffell logged RFI via Allouis, France 7.135 at 1855 (French, Polish and Russian to E. Europe 1600 to 2045); Vatican Radio, Rome 7.250 at 1922 (Polish, German, Italian, English, Esperanto and French to W. Europe 1800-2010); RBI Berlin via Nauen, GDR 7.260 at 1928 (Swedish, Italian, English, Danish to Europe 1515-2115).

Radio Australia broadcasts to Europe on 7.205 from 1530 to 2040 — George Morley logged their signal as SIO 444 at 1631. George Hewlett has noted a very weak co-channel background around 1815 but it is drowned by Radio Australia's signal which comes roaring in!

Radio Australia has also been coming in well on the **6MHz (49m)** band. — John Parry logged their transmission to Europe on 6.035 at 1745 as SIO 444 and noted "a remarkable signal on this frequency in broad daylight". Their 49m broadcast extends from 1530 to 2040 — Neil Dove enjoyed their *International Report* at 2000 and noted SINPO 44544 in his log.

Station Addresses

BBC Radio Clwyd, Old School House, Glanafon Road, Mold, Clwyd, CH7 1PA.

IRL Northsound Radio, 45 King's Street, Aberdeen, AB2 6BL.

Radio Denmark, Kortbolgetjenesten, Radiohouse, DK-1999 Copenhagen V, Denmark

KFBS Saipan, FEBC, P.O. Box 209; Saipan, CM.96950, North Mariana Islands.

ELWA Monrovia, Sudan Interior Mission, P.O. Box 192, Monrovia, Liberia.

Radio Mozambique, External Service, C.P.2000, Maputo, People's Rep. Mozambique.

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LISTEN OUT FOR

GB4XXX: On the air over the period October 8 to 11 this station will be QRV on all h.f. and 144 and 70MHz amateur bands and QRP on 3.5MHz. Location information is given as I072TV (Int. Loc.) and WAB (Worked All Britain) SH43.

G4AUX, G4CAX or G4LPX
QTHR or Prestel Mbx. 011110374

GB2CCP: This station is being operated by the Mid-Lanark ARS to commemorate the restoration and re-opening of the Duke of Hamilton's Hunting Lodge, designed by William Adam and built in 1732, in Chatelherault Country Park. The special QSL card will depict workmen building the original lodge from stone obtained from nearby quarries. There will be three stations on the air during October 10 and 11 on 3.5 to 28MHz and 144MHz.

GM3MTH
QTHR

GB8EAR: This station will be on the air on October 24 from Hove and is part of the El Alamein Reunion being held at the Great Hove Town Hall, Hove. The station will be using 144MHz.

G2DHV
QTHR

**Have you Got a
Special Event Station
we should know about?
If so, write and tell us**

GB8AER: This Special Event Station will be operational from the Winter Gardens, Blackpool to commemorate the British 8th Army at El Alamein. The dates to look out for this station are October 24 to 26 and October 30 to November 1. Apologies for the confusion last month with GB8EAR which also commemorates El Alamein, but from Hove on October 24. GB8AER is organised on behalf of the Royal Signals Amateur Radio Society who would like to work other RSARS/RAFARS and RNARS members.

G2DHV
QTHR

ON4CLM: This station will be on the air from October 26 to November 3 from the "Radioschack Eastcoast" in Knokke, Belgium and is part of the celebration of the Canadian Liberation Movement which

resulted in Knokke being liberated, at great cost of Canadian life, on 1 November 1944. Each year the Canadians are remembered with ceremonies, festivities and a "Canadian Liberation March" over a distance of 37km. The station will be using 144.475MHz f.m.; 3.515, 7.012, 14.020, 21.020, 28.020 and 144.020MHz c.w. and 3.685, 7.045, 14.145, 21.245, 28.545 and 144.250 s.s.b.

As well as the Special Event Station, a magnificent six-colour award is available for all contacts with ON4CLM, and this year's award features the "Queen's Own Rifles of Canada". Each successive year honours one of the nine Canadian regiments that participated in the liberation of Knokke. The award costs £2.00, \$5.00, 10 IRCs or equivalent, with all proceeds going towards a welfare fund which maintains memorials, displays, etc.

Limited quantities of the '83, '84, '85 and '86 awards are still available for those wanting to collect the entire series. For QSLs, awards or additional information write to:

Radio ON4CLM
PO Box 140
8300 Knokke
Belgium

RALLIES

★ SWM will be in attendance.

★ September 27: The Harlow & District ARS are holding their rally at Harlow Sports Centre. Doors open at 10am.
0279 27788

October 4: North Wakefield Radio Club are holding their Amateur Radio Rally at Outwood Grange Secondary School, Potovens Lane, Outwood, Wakefield. Attractions include over sixty dealers, tombola, bring & buy, licensed bar and refreshments, Raynet, clubstands, repeater groups and demonstrations. There will be plenty of attractions to keep the kids out of your hair.

S. Thompson G4RCH
0532 536633

★ October 4: The 1987 Welsh Amateur Radio Convention, hosted by the Blackwood & District Amateur Radio Society, will be held at the usual venue, Oakdale Community Centre, Blackwood, Gwent. Doors will open at 10.00 a.m. and the official opening will be performed by Joan Heathershaw G4CHH, President of the RSGB at 11.00 a.m.

The programme will include v.h.f. and h.f. features and Morse tests will be available — prior booking needed with RSGB HQ. The usual trade stands will be there plus PW/SWM, bring & buy and RSGB stands. Admission is £1.50 at the door including the raffle with £300 in cash prizes.

Talk-in on S22 and for those coming via the M4 it is suggested that you leave via Exit 28.

Brian Davies GW3KYA
0495 225825

★ October 4: The Great Lumley ARES are holding their rally at The Community Centre, Great Lumley, Co. Durham. Doors open 11am. Talk-in on S22, RBO and GB3NT.

Keith Watt
7 Turfside
Leam Lane Est, Gateshead
Tyne & Wear

October 10: The Midlands VHF Convention will be held at Madeley Court Centre, Telford, Shropshire. The main part of the convention will start at 1100. There is a programme of lectures from 1200 to 1900. That will be followed by an evening buffet with bar until 2200. There will be lunch-time catering (snacks and bar), as well as a small trade show, bring and buy stall and book stall. Admission is £1.20, evening buffet tickets, priced £5.50 are available by advance booking.

J. P. H. Burden G3UBX
18 Langley Road
Merry Hill
Wolverhampton
WV3 7LH

October 11: The Armagh & Dungannon District ARC (G1OADD) are holding their mobile rally at Drumsill House Hotel, just outside Armagh on the Moy Road. Admission is £1.00 and the doors open at 12.00 noon. Trade stands, bring and buy sale, bar with meals and snacks and Morse tests. Ample parking facilities with talk-in on S22.

John A. Murphy
Armagh 522153

★ October 23/24: The Leicester Amateur Radio Show is being held in the Granby Halls, Leicester.

Frank Elliott G4PDZ
Leicester 553293

★ November 7/8: The North Wales Radio Rally will be held at the Aberconwy Conference Centre, Llandudno, Gwynedd. **Derrick Watts**
Colwyn Bay 530041

November 7: The Seventh North Devon Radio rally is to be held in Bradworthy Memorial Hall, near Holsworthy, Devon. Doors will be open from 10.30 a.m. to 5.00 p.m. All the usual attractions including a bring & buy stand. Talk-in will be provided on S22.

K. J. Nichols G8MXI
QTHR

November 15: The Bridgend & District RC are holding their rally at the Bridgend Recreation Centre, Angel Street, Bridgend. Doors open at 11am (10.30am for the disabled). Free parking, a bring and buy, Morse tests (pre-booked with RSGB), bar facilities and talk-in on S22.

Dave George GW1OUP
0656 723508

★ December 6: The Verulam Christmas Rally will be held at St Albans City Hall. Doors open 11am.

S. C. B. Dunning
0923 52959

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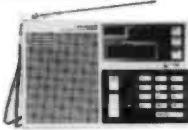
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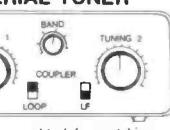
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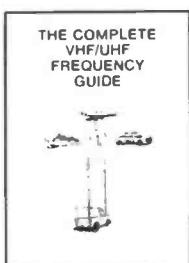
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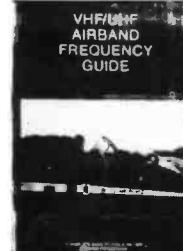
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