

AMATEUR RADIO AND ELECTRONICS

HOBBY FAIR



To be held at **Wembley** Conference Centre

Saturday 5th & Sunday 6th, July, 1986.

EXCELLENT CATERING & BAR FACILITIES AVAILABLE ALL DAY.

**The first two day fair to be held in the
SOUTH OF ENGLAND.**

**A Major new event in the amateur radio
calendar**

**There will be a host of special interest
groups • Star Prize Raffles • Tombolas
Bring & Buy and lots lots more.**

**Over 200 retail & manufacturers stands
from all over BRITAIN.**

ADMISSIONS: ADULTS £2.00

O.A.P'S & CHILDREN £1.00

UNDER 5's FREE

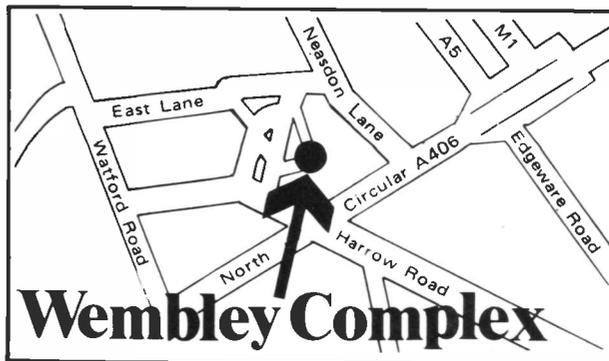
FAMILY TICKET £4.50

OPENING TIMES:

SATURDAY 10.30 - 6p.m.

SUNDAY 10a.m. - 4.30p.m.

Minutes from the M1 and M4 and
well sign posted.



ORGANISERS: AMATEUR RADIO PROMOTIONS LTD., WOODTHORPE HOUSE, CLAPGATE LANE,
BIRMINGHAM B32 3BU. Telephone: 021 - 421 5516.

SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

VOL. 44

JUNE, 1986

No. 512

CONTENTS

Page

Editorial — <i>Equipment</i>	125
Communication and DX News, by <i>E. P. Essery, G3KFE</i>	126
Propagation Study on 50 MHz during Sunspot Maximum, Cycle 21 (Part 2), by <i>Ken Ellis, G5KW</i>	129
KW Ten-Tec 'Corsair II' Transceiver, a Description and Use, by <i>E. H. Trowell, G2HKU</i>	134
G3RJV's Workshop Notebook	137
Amateur Radio Computing, by <i>Paul Newman, G4INP</i>	139
"Practically Yours", with <i>Glen Ross, G8MWR</i>	140
Practical, Simple Sideband — Part 1, by <i>Rev. G. C. Dobbs, G3RJV and Ian Keyser, G3ROO</i>	142
Oblast Corner, by <i>Nigel Cawthorne, G3TXF</i>	147
VHF Bands, by <i>N. A. S. Fitch, G3FPK</i>	149
Thanet Electronics Ltd., by <i>Ken Michaelson, G3RDG</i>	154
Clubs Roundup, by "Club Secretary"	156

ADVERTISERS' INDEX

	Page
Amateur Radio Promotions. <i>inside front cover</i>	
ARE Communications Ltd.	164
B. Bamber Electronics	161
J. Birkett	164
Colomor Electronics Ltd.	162
Datong Electronics Ltd.	124
Dewsbury Electronics	123
Fantex Radio	164
D. P. Hobbs Ltd.	162
KW Ten-Tec Ltd.	122
R. A. Kent (Engineers)	164
P.M. Electronic Services	160
Norman Field G4LQF	162
Quartslab Marketing Ltd.	164
F. G. Rylands	164
S.E.M.	123
Small Advertisements	160, 161, 162, 163
Stephens-James Ltd.	122
S.W.M. Publications	<i>inside back cover</i> <i>back cover 160, 162, 163</i>
Uppington Tele/Radio (Bristol) Ltd.	160
Reg. Ward & Co., Ltd.	164
Waters & Stanton Electronics	124
Geoff Watts	164
Western Communications (Galway) Ltd	122

Editor: PAUL ESSERY, G3KFE/G3SWM
Advertising: Charles Forsyth

Published at 34 High Street, Welwyn, Herts. AL6 9EQ, on the last Friday of the month, dated the month following.
Telephone: 04-3871 5206 & 5207

Annual Subscription: Home: £16.00, 12 issues, post free
Overseas: £16.00 (\$21.00 U.S.), post free surface mail

Editorial Address: Short Wave Magazine,
34 High Street, Welwyn, Herts. AL6 9EQ, England.

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

AUTHOR'S MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of A4 sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made at a competitive rate for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

© Short Wave Magazine Ltd.

COVER DESIGN:
Allan & Co. Ltd., Welwyn

E. & O. E. VAT Reg. No. 239 4864 25

STEPHENS-JAMES LTD.

47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA

Telephone (0942) 676790

Turn at the Greyhound Motel on the A580 (East Lancs. Road).



LANCASHIRE & THE NORTH WEST'S LEADING RETAILER IN AMATEUR RADIO. 20 YEARS SERVING THE AMATEUR'S BY AMATEURS SPECIALISING ONLY IN AMATEUR RADIO EQUIPMENT. 24 HOUR MAIL ORDER SERVICE

TRIO RANGE (Sole authorised TRIO dealer in North West)

TS940S HF Transceiver.....	£1795.00
TS930S HF Transceiver.....	£1395.00
TS440S HF Transceiver.....	£950
TS430S HF Transceiver.....	£750.00
TS830S HF Transceiver.....	£898.00
TS530SP HF Transceiver.....	£779.00
AT1230 Antenna tuning unit.....	£170.65
AT940 Auto Antenna tuning unit.....	£210.20
AT930 Auto Antenna tuning unit.....	£176.87
TL922 HF Linear Amplifier.....	£1265.00
TH21E 2m Hand held FM.....	£189.30
TS780 2m/70cm All mode Transcvr.....	£1061.00
TR9130 2m All mode Transceiver.....	£544.73
TR751E 2m Multimode.....	£525.00
TR2500 2m FM Portable.....	£245.00
TR2600E 2m FM Portable.....	£299.00
TM201A Mobile 2m Transceiver.....	£296.00
TS711 2m All mode base station.....	£770.74

Full range of accessories available.

Full size G5RV antenna.....	£16.85
Half size G5RV antenna.....	£14.25
80-10 Dipole Kit.....	£24.95
Pair 7-1 MHz Traps.....	£9.75
HS50B 1-1 balun.....	£18.74
Large dipole centre piece.....	£3.50

We are also stockists for: G-Whips — Welz — Kenpro — Diawa Rotators and SWR meters, power supplies. Microwave Modules, Global, Tonna antennas, ARRL and RSGB Publications. Pocom Auto RTTY readers. Full range of clamps, aluminium tubes, vertical antennas, dipoles. Send large SAE for full details. Our secondhand equipment is one of the largest in the country, send S.A.E. for our up dated list. Quotations for HP on request. Shop hours 9.30 till 5.15 Mon — Friday, 4 pm Sat.

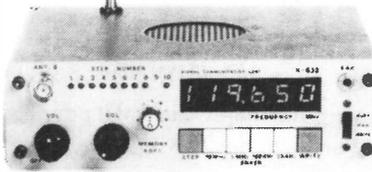
TRIO TS940S TRANSCEIVER

Top of the range for all serious DX and competition users. Designed for SSB-CW-AM-FM-and FSK operation. All Amateur bands from 160 to 10 metres. The Transceiver also incorporates a 150kHz to 30MHz general coverage receiver having an excellent dynamic range. 40 memory channels. The latest feature is a green back-lit matrix LCD which shows graphical VBT and OF slope tuning positions, can also be used to review the frequencies stored in the memory and the other VFO. Variable power output control. Break in keying on CW. Split frequency working.

NEW MODEL

AOR2002 Scanning receiver. Replacing the AR2001 receiver which has proved to be the best scanning receiver available. Now with frequency coverage 25 to 550MHz plus 800 to 1300MHz. Improved keyboard. Front panel knob for frequency stepping in addition to the up/down buttons. Front panel LED strip "S" meter. Front panel headphone jack. Socket for RS232 interface board on rear panel.

ALL THIS FOR £435.00



THE R532 AIRCRAFT BAND RECEIVER £209.00 inc. VAT

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

STATION ACCESSORIES

DL600 600 watt Dummy Load.....	£43.70
DL150 150 Watt Dummy Load.....	£20.00
DL60 60 Watt Dummy Load.....	8.73
LF30A Low Pass Filter.....	£27.70
SWR50 SWR/Power Meter.....	£20.75

WELZ SWR/POWER METERS

SP122 1.8-60MHz.....	£85.00
SP220 1.8-200MHz.....	£59.00
SP420 144-525MHz.....	£71.00

TONNA

4 Element 2m Yagi.....	£14.95
9 Element 2m Yagi.....	£17.71
17 Element 2m Yagi.....	£37.66
19 Element 432MHz Yagi.....	£20.70
21 Element 432MHz Yagi.....	£29.67
G-Whip New all band Base Station Antenna	£85.50
Welz Diamond DCP5 10-80 trapped vertical with radial kit.....	£149.00

JAYBEAM

LW5 5 El 2m Yagi.....	£16.68
LW8 8 El 2m Yagi.....	£21.05
LW10 10 El 2m Yagi.....	£27.20
PBM 1010 El Parabeam.....	£65.49
C5/2m 2m Co-Linear.....	£86.25
D5/2m Double 5 Element Slot Yagi.....	£29.67
Q4/2m 4 Element 2m Quad.....	£33.98
Q6/2m 6 Element 2m Quad.....	£44.51
Q8/2m 8 Element 2m Quad.....	£55.60
D8/70cm Double 8 Slot Yagi.....	£28.18
PBM 18/70cm 18 El Parabeam.....	£37.06
MBM28 28 El multibeam.....	£24.72
MBM48 48 El multibeam.....	£40.82
MBM88 88 El multibeam.....	£55.77
8X/70 Crossed 8 Yagi.....	£48.24
12X/70 12 El Crossed Yagi.....	£59.28
5X/2m Crossed 8 El Yagi.....	£32.14
8X/2m Crossed 8 El Yagi.....	£41.40
10X/2m Crossed 10 El Yagi.....	£51.92
TB1 Rotary Dipole.....	£83.37
TB2 2 Element Tribander.....	£155.25
TB3 3 Element Tribander.....	£230.00

KW TEN — TEC CORSAIR II

NO FRILLS, "GIMMICKS", OR UNUSED FACILITIES — FOR THE SERIOUS PHONE/CW OPERATOR WHO WANTS THE LOWEST NOISE, CLEANEST AND MOST SELECTIVE AMATEUR hf TRANSCEIVER ON THE WORLD MARKET.



Other KW-TEN TEC winners

The ARGOSY II phone/cw transceiver. The CENTURY 22 cw only transceiver. The original KW TRAP DIPOLE and TRAPS, 8 ATU's, KW BALUN, and ANTENNAS WRITE OR PHONE FOR DETAILS

KW TEN — TEC LIMITED

Vanguard Works, Jenkins Dale, Chatham, Kent, ME4 5RT Telephone. 0634 — 815173.

WESTERN COMMUNICATIONS (GALWAY) LTD.

KILCOLGAN · GALWAY · IRELAND

Tel: (091) 96206 (091) 96091

U.K. Callers: 0009-96206 0009-96091

Telex: 29833 WCOM EI

CLEARANCE SALE

Up to 50% reduction on remaining YAESU Accessories for all HF and VHF rigs while stocks last.

X-TALS — TRANSVERTORS — X-TAL FILTERS
FANS — AM/FM UNITS — ANT. COUPLERS
VFO'S — HEADPHONES — SPEAKERS

FT270/2700/203	S/H DRAKE TR7/R7/L7
FT790/730/FT726 SAT. UNIT	NEW DRAKE TR7 ACCS.
FT980/757/FRG9600	MICROWAVE MODULES
FL2010/2050/FRT7700/FRV7700	DATONG

Hansen equipment to clear
Host of spares for all above.

MOBILE 5/8 WHIPS — IRE 7.65

STD. FIXED BASE — IRE 6.60
(Incl. Cable + Fittings)

MAG. MOUNT — IRE 16.50

REMEMBER WE GIVE YOU FULL EXCHANGE RATES FOR YOUR STERLING.

Send S.A.E. for List.

DEWSBURY**ELECTRONICS****NEW**

**THE NEW
STAR MASTERKEY
ELECTRONIC CMOS
MEMORY KEYS**

**NEW**

Following the outstanding success story of the Dewsbury Electronics' STAR-MASTER key with over 500 units in use world wide, by amateurs, and at sea by professional operators, many users requested memory facilities at a reasonable price.

So here it is.
The STAR-MASTERKEY CMOS Memory Keyer.

- * Features full iambic keying.
- * Eight 50-character memories
- * Automatic Repeat on one memory (CQ calls etc.).
- * Memory retention for battery life.
- Ultra low current drain.
- * Uses four AA size cells.
- * Switchable Auto-Character Spacing.
- * Dash & dot memories
- * Compact 3" high, 6" wide, 7" deep.
- * Direct & grid block keying sockets for both solid state & valved PAs.
- * Switchable Sidetone Oscillator with loudspeaker & headphone socket.
- * Loads memory from paddle "OFF AIR".
- * Speed & weight controls.
- * Adjustable sidetone pitch & volume.
- * Comes complete with batteries.
- * BRITISH BUILT & FULLY GUARANTEED.

Price £95.00. Post, packing and insurance £3.00.
VIBROPLEX, HI-MOUND & BENCHER KEYS AVAILABLE.

Dewsbury Electronics offer a full range of Trio Equipment always in stock.
We are also stockists of DAIWA, WELTZ, TELEREADERS, ICS AMTOR-AEA PRODUCTS-BNOS, MET ANTENNAS, BENCHER, VIBROPLEX.



Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands.
Telephone: Stourbridge (0384) 390063/371228. Open Monday thru Saturday.
Instant H.P. subject to status, Access Visa and real money.

**S.E.M.**

UNION MILLS, ISLE OF MAN

Tel: MAROWN (0624) 851277

**YOU CAN NOW HAVE LF, MF, HF, VHF, UHF
WITH ONE RECEIVER**



S.E.M. H.F. CONVERTER. This already very popular unit converts 100KHz to 60MHz, UP to 100.1MHz to 160MHz to extend the range of your scanner receiver. It has 3 50239 sockets. One to your receiver aerial socket, one for an H.F. aerial, one to your existing VHF/UHF aerial. Switch our converter ON and you have LF, MF, HF. Switch OFF and you are on VHF/UHF. 12v 5mA. £45. Ex-Stock.

NEW S.E.M. WIDEBAND PRE-AMPS. Following a lot of development work and evaluation of the devices available, we have produced 2 new WIDE BAND PRE-AMPS with unbeatable performance. Covering 3-40MHz or 20-400MHz. Measurements: GAIN 9dB, N.F. 1.5dB, 3rd ORDER IP (INPUT) + 30dBm. Each pre-amp in 3 types. Basic pre-amp £30, straight thru. when off £35, R.F. switched £40. All Ex-Stock.

S.E.M. TRANZMATCH. The most VERSATILE Aerial Matching (Tuning) Unit available. Matches 15-5,000 ohms BALANCED or UNBALANCED feeders up to 1 KW. Air coupled BALUN (no toroids) means no connection to equipment, which can cure TVI both ways. An SO2339 and screw terminals for CO-AX, END-FEED or TWIN FEEDERS. Size 8 1/4" x 4" x 7 1/4". 3.5-30MHz £95. 1.8-30MHz £105. The highly acclaimed EZITUNE built in (see below) £35 extra. 90% we sell have the EZITUNE option. All Ex-Stock.

S.E.M. EZITUNE. Because no similar unit is made, its usefulness is not appreciated until you have used one. Eliminates need for S.W.R. bridge. Clean up the bands, increase your P.A. life by many times, by tuning up without transmitting, the easy way. Connects in aerial lead, produces S9+ noise in receiver. Adjust A.T.U. or aerial for minimum noise. You have now put an exact 50 Ohms into your transceiver. Fully protected, you can transmit through it, save your P.A. and stop QRM. SO239s. 3" x 1 1/2" x 2". £39.50 Ex-Stock. P.c.b. + fixing + instructions to fit in TRANZMATCH or any ATU £35 Ex-Stock.

S.E.M. WAVEMETER. Have you read your licence? Have you got a wavemeter? Produced following so many requests. 1.5-30MHz in 3 switched bands with a meter. Only £34.50 Ex-Stock.

S.E.M. IMBIC KEYS. No better fully auto keyer. Uses Curtis chip. R.F. proof. Sidetone, etc. £45. A first class twin paddle key £17.50 Ex-Stock.

BRAID BREAKER/HI PASS FILTER. Stop TVI at TV. £6.95 Ex-Stock.

RF NOISE BRIDGE. Adjustable 0-infinity ohms, 3" x 1 1/2" x 2" only. SO239s, 1-170MHz. Neat, accurate & economical. £39.50 Ex-Stock.

3WAY ANT. SWITCH + 4th position to EARTH. 1kW. SO239s. Good to 2 metres. £19.80. Ex-Stock.

S.E.M. 2 METRE TRANZMATCH. 5 1/2" x 2", 3". SO239s. £29.50.

SENTINEL 2M LINEAR POWER/PRE-AMPLIFIERS

Feature either POWER AMP alone or PRE-AMP alone or both POWER AND PRE-AMP or STRAIGHT THROU when OFF. Plus a gain control on the PRE-AMP from 0 to 20dB. N.F. around 1dB with a neutralised strip line BF981. Top performance on transmit and receive.

Ultra LINEAR for all modes and R.F. or P.T.T. switched. 13.8V. SO239s. Three Models: Ex-Stock.

3/36. 12 times power gain, e.g. 3W in, 36W out. £70.

10/50. 10W in, 50W out. £86.

10/100. 10 to 100W. £135.

SENTINEL AUTO 2 METRE PRE-AMPLIFIER (R.F. Switched)

1dB N.F. and 20dB gain, (gain control adjusts down to unity) 400W P.E.P. power rating. Use on any mode. 12V 25mA. Sizes: 1 1/2" x 2 1/4" x 4". £34 Ex-Stock.

PA5 Same specification as the Auto including 240V P.S.U. £39 Ex-Stock.

SENTINEL 2 METRE PRE-AMPLIFIER. No R.F. switch. £21.90 Ex-Stock.

S.E.M. AUDIO MULTIFILTER (Users say it's the best filter you can buy). The most versatile filter available. Gives "passband" tuning, "variable selectivity" and one or two notches. Switched Hi-pass, Lo-pass, peak or notch. Selectivity from 2.5KHz to 20Hz. Tunable from 2.5KHz to 250Hz. PLUS another notch available in any of the four switch positions which covers 10KHz to 100Hz. 12V supply. £69.50 Ex-Stock.

12 MONTHS COMPLETE GUARANTEE INCLUDING ALL TRANSISTORS.

Prices include VAT and delivery. C.W.O. or phone your credit card number for same day service. Ring or write for more information. Place orders or request information on our Ansaphone at cheap rate times.

Goods normally by return.

Multi-Mode Audio Filters

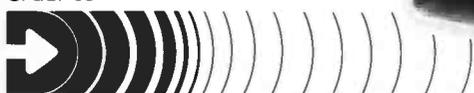
FL2 or FL3 improve even the best of communication receivers by allowing optimum removal of noise from the signal you want to copy, whether SSB, CW, or RTTY. Extremely versatile yet easy to use and install.

Price: FL2 £89.70 FL3 £129.37
Inc. VAT (as FL2 plus auto notch).

To order simply dial

0532 552461

or write with cheque or postal order to



Dept SW Datong Electronics Ltd., Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England



Access/Barclaycard welcome – Fast delivery service

Catalogue and data sheets on any product available free on request. **Dial 0532 552461**

NEW

SPECIAL DISCOUNT PRICE!

**AZDEN
PCS 5000**
2M FM 25 WATTS
140 – 150 MHz
(Tx 144 – 146 MHz)



£279

At last an FM transceiver with an up to the minute specification with an old fashioned price! Highly compact measuring 50 x 140 x 182mm its 25 watts and high performance front end give superb coverage under mobile or fixed operation. The back lighted LCD readout and key-pad makes for easy operation and the computer controlled frequency selection is a joy to use. Two banks of 10 memories are scanned, consecutively or separately with channel lockout on any or all memories. Priority channel can be used to check your favourite frequency whilst monitoring any other channel and the priority channel can be instantly recalled via a side button on the mic.



£249

FABULOUS SONY AIR – 7
108-136 MHz; 144-174 MHz; 76-108 MHz
(plus 150 kHz – 2194 kHz)

The new Sony Air-7 is a superb new monitor with a performance and presentation that outperforms the competition. The PLL circuitry, LCD readout and 40 memories (10 on each band) make a most versatile package. Such features as priority channel, channel lockout, and delay are all included and the sensitivity puts most of the competition to shame! It also includes the broadcast bands both VHF and LW/MW and covers such things as NDB beacons as well as part of the marine band to 2194kHz. Primarily designed as an air-hand monitor it is without doubt the most sensitive model available. Its coverage between 144 and 174MHz is equally impressive. We are amazed at its performance and so will you be when you try it!

NEW

SOME NEW BOOKS!

UK LISTENERS CONFIDENTIAL FREQUENCY LIST NEW THIRD EDITION

Now completely updated with over 50% more information and a smart new presentation. No self respecting listener should be without a copy. If you enjoy exploring the short wave bands then this new third edition is just the job! It covers the HF spectrum from 2 to 30 MHz and gives comprehensive details of transmissions outside the amateur bands. Specially compiled for the UK and European listener it sets out in a very easy way a complete list of hundreds of interesting transmissions that will keep you occupied for days on end! A fraction of the cost of other similar publications, it contains details of Marine, Air, Military, Embassy, Press and News agencies. Many listings have time schedules included with comprehensive RTTY details. It lists the HF frequencies used by civil and military aircraft, when and where to pick up the press bulletins, long distance marine traffic, plus broadcast etc and much more. Send today for your copy of this invaluable publication.

£5.95 + 75p p&p

HF OCEANIC AIRBAND COMMUNICATIONS NEW SECOND EDITION

This guide sets out to explain to the beginner how the HF band air traffic works. It contains full details of the world aircraft frequency bands in the range 2 to 23 MHz together with control frequencies and those commonly used for Oceanic control. Also included are many VOLMET frequencies, the Search and Rescue frequencies used by RAF helicopters and Nimrods, the HF RT network, London Company frequencies, European control centres, Military segments, etc. An ideal companion for the HF airband listener. Send today for your copy.

£3.95 + 50p p&p

VHF/UHF AIRBAND FREQUENCY LIST

This frequency manual is without doubt the most comprehensive list of VHF/UHF aircraft listings available in the UK. Of vital importance to the airband enthusiast or indeed any keen VHF/UHF listener it sets out in a very easy to follow manner full details of a whole host of stations. Every known UK airfield that has radio facilities is listed including Civil, RAF, USAF, MOD, Navy, Radar, Rescue, etc. Both VHF and UHF frequencies are listed and you will probably be surprised to learn just how much activity there is between 200 and 400MHz! Also included are air to air frequencies. Red Arrows contact frequency and much much more. Send today for your copy and find out just how much you have been missing.

£3.95 + 50p p&p

WORLD RADIO TELETYPE HF FREQUENCY LIST

A new publication produced by popular request. If you are interested in RTTY or thinking of taking it up, this book will be a very handy frequency guide. It lists full details of the World's RTTY services including meteorological, press and marine. They are all entered in country order plus a separate listing under transmission times (GMT). Simplex and duplex frequencies are listed with details of languages and also a handy reference section on band plans and prefixes, etc. Altogether a handy guide to have around the shack or just for interesting reading.

£3.95 + 50p p&p



WATERS & STANTON ELECTRONICS

MAIL ORDER & MAIN SHOWROOM: BRANCH:

18-20 MAIN ROAD, HOCKLEY, ESSEX, Tel: Southend (0702) 206835 & 204965
12 NORTH STREET, HORNCHURCH, ESSEX. Tel: Hornchurch (04024) 44765
HOURS: MON – SAT 9.00 am – 5.30 pm. E.C. WED 1.00 pm



COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

ONE has to admit that there are times when one wonders at the inner workings of the minds of some civil servants — all this, of course, simply because I am still answering questions about my tower proposal, even though it was 'agreed' before I moved in. . . . Perhaps we should have a law to compel civil and local government servants to wear the paper hats they laboriously fashion "to cover themselves"!

However, in the meantime I have my dipole in the loft, and with big hills to east and west I have been quite surprised at how well it has performed. I'm now having serious thoughts about turning it into a beam, fixed in direction, and aiming somewhat north of west. It'll be interesting, and it *might* just reduce the risk of TVI from the piped TV system.

However, we digress from our brief. What about the bands and their antics?

Conditions

A sizeable body of informed opinion sees the bottom of the current sunspot cycle as being late this year, though another proportion of those qualified-to-know plump for next year, maybe as late as the summer of 1987. If one looks at the observed cycles since 1700, as shown graphically in such a work as Ratcliffe's book "Sun, Earth and Radio," one is hard put to discern much of a pattern beyond the major fluctuations; but there does seem to be a hint that the *smoothed* numbers 'bottom out' at a higher level when the peak of the cycle has been very high, and reach almost zero when the peak has been poor. We talk about the smoothed numbers of course because of the wide day-to-day variation which occurs. But — what will happen tomorrow is, as it has always been, unpredictable, thank heaven. Were it otherwise, there wouldn't be that thrill of anticipation when you open the shack door and hope to find the bands all madly alive!

The New Bands

Of course there are still the twits who use SSB on these bands — but if someone wishes to proclaim to the world that he is an idiot, who are we to stop him making a fool of himself? Obviously, what is needed is a few licence withdrawals to encourage the others to mind their manners. However to turn to happier things we have a first report from G3EKP (Belthorn) who likes the 0715-0915 UTC time-slot, and worked up his breakfast appetite on VK2PA, VK2DUY, VK2CSB, VK2VA, VK3CAT,

VK3DQ, VK3CAL, VK3BXN, VK6ZE who is an expatriate from the local area of G3EKP, and VK7GK who called G3EKP one evening at 2100z and gave him a surprise. KC3TT, VE1ATJ, CT3DS and 9H1BB were also worked. The next move was to work 18 MHz, by tuning the 10 MHz dipole with an ATU, which yielded PY2BZD and numerous G stations. On April 24, OZ1LGF was heard and worked on an otherwise dead band.

G4VDX (Leyland) notes how G6ZO manages to snaffle all there is to be had on the band and wonders whether he could be persuaded to report . . . but Joe isn't doing too badly himself at that: W1CUIY, KP4L, G4DMR/VE8, LA3YV/MM, ZS6CEV, W4HIR, OY1R, W3QBK, OK3CUZ, K2OZ, YU4YA, KE8AY, FM5WD, KY9L (Dick is a regular on the band) WA2SPL/1, K8TVG, KD2KL, 9H1BB, VP2VA, and YL K2AGJ who has 114 countries worked on the band, VK2PA, VK2CSB, VK2YK, and VK3JI. The gotaway list is quite impressive too, with TA1C, SV1AAH, 5B4OG, a brace of YVs who hunt together (YV1BVJ and YV1AQE), LU9CV, VK3DND, VK2BQD, VO1BD, 4Z4DX, FG5XC, FG5AM, FM5AHK, and SV0AH.

Harold at G2HLU (Earley) noted that QRP netted I1UST and OK1DAV, plus W4LRD on the main rig.

The report from G4FLK (Corfe Mullen) covers from 0700 to 1100 on April 6. In the first hour some 16 stations were logged, with VK and ZL among the Europeans, and VK3CAT actually worked. At 0800 there was a QSY to 18 MHz, where DJ1EI was worked, and GW3AHN noted with heavy fading on him, but nothing else; and finally, at 1020, a shift up to 24 MHz resulted in ZS6BMS, GW3AHN and SV0AH. At the same time, as a cross-check, a listen was had on 21 MHz, where PYs and ZS6J were to be heard amid all the Europeans, and the heavy local 'mush' and QSB.

Only 10 MHz of the new bands gets a mention from G2HKU (Sheppey) but it seems the main rig accounted for W1AQI, VP2VA, K5MA, W4IF, W2FC, W2GW and VK2DUY, while the QRP box at four watts was enough to make a contact with VP2VA.

Next we have a letter from G4WWA (Cleobury Mortimer) who noted a good weekend for 10 MHz, when he worked VK2CSB, VK5LU, VK3AWX, VK6WT twice, and VK2BDQ. Tony has a sloping dipole for 10 MHz, with the lower end just

four feet up, but this shows several S-points improvement over the alternative G5RV aerial at 30 feet. One supposes that this is due either to the orientation of the G5RV, or just for some reason the RF isn't 'going up the spout' properly, despite on the face of it having got things shipshape. This sort of thing happens all too often, mostly to G3KFE since he came to the present QTH!

Ten Metres

Our first letter is from G4ZZG (Warrington) who says he has little to report from his lunch-time CQ calls: CW contacts with G4JZM, G3EKP, and G0CWM, SSB with EAs on April 6 — the EAs were also reaching PA, ON and DL. On April 24 there was a four-way SSB contact between Charles and G4POQ/M, G4UCV/M and G4XDB/M, but the real surprise came on 28th when switch-on immediately resulted in IY4M in the beacon sector at good strength, followed by HA, EA7 and I contacts. A couple of hours later and 5B4CY was up to good strength, and 5B4DN heard working a string of Gs but *not* G4ZZG. On 29th, the beacon heard was DF0AAB, plus QSOs on SSB with EA4CSP and G4ACB — the latter over a difficult ground-wave path. May 4 was the day when both the IY4M and 5B4CY beacons were audible along with plenty of EAs and PY2MER — but the latter got away!

"CDXN" deadlines for the next three months:

July issue—June 4th
August issue—July 2nd
September issue—August 6th

please be sure to note these dates

Our next letter is the one from G3NOF (Yeovil) who found very little on the band in April apart from IS0MBU, at 1424 on May 1. However on May 2, between 1700-2033z, the band perked up and EA8AJS, 4X4VL, EA8AGQ, TU2LM, CE3DDO, LU and PY were all heard; Don says he understands that some North Americans were heard in the afternoon.

G4HZW (Knutsford) says that it was a poor month, with widespread E-type openings coinciding with the QRT of the Russian reactor . . . to try and improve band conditions by the near melting-down

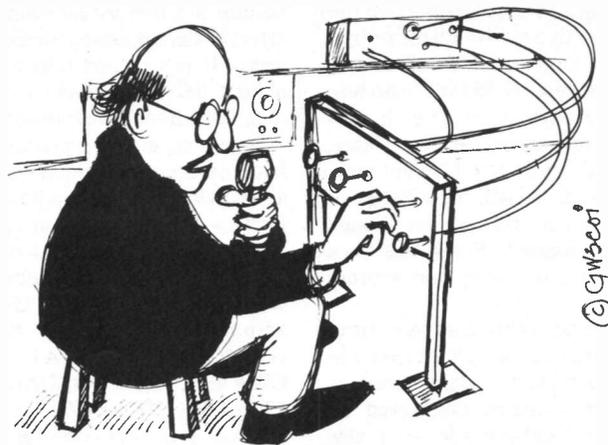
of a nuclear power station, we agree, does seem to be taking things a little too far! April 28 saw the ZS6PW beacon, plus the two DL ones both just audible, and then on the next day FE6IDE and DJ3IJ both worked. May 2's opening yielded Tony 5B4DN and 4X4VL, but he missed the South American opening already mentioned, although he heard about it and also that a VE1 was worked. For the rest the period with the birds in Scotland seems to have been enjoyed, and lots of Europeans were worked on 7 MHz.

Finally, we must mention the *Southern Ten-Metre FM Group*; for the princely sum of one pound to Jim Hicks, G4XRU, you can receive six issues of the newsletter over a year. The object of the exercise, apart from the obvious one of cracking-up some activity is to study, at a time when ionospheric propagation is largely absent, the VHF-fashion modes of propagation the band offers. The first issue is a brave effort and well put together, and we wish it well. G4XRU can be contacted at 33 Hayling Rise, Worthing, W. Sussex BN13 3AL.

Twenty

With the extension of the hours of daylight (didn't it seem to come suddenly this year after the hard winter!) the band is more open at hours when reasonable mortals can be active. So far my loft dipole has shown with all continents, and has given pay-dirt at various times; in the mornings for VKs and ZL, at around noon when JA was heard, and then in the evenings when East Coast Ws were on at good strength, and — this I find surprising — little unwanted noises-off from the loft location. Now, of course, attention has had to be turned to the small matter of the plant world, where there has been a positive explosion of growth, and that on top of an enormous back-log from a definitely non-gardening predecessor!

G3NOF (Yeovil) didn't notice much on the VK/ZL long-path in the mornings, but found the short path open to the Pacific from 0800-1000z; 1300-1800z seemed to be good to JA, VU, YC, VK and KG6; North America from 1130-2300z or even later, with the West Coast chaps appearing at around 1600. South America was noted till after midnight, and it all added up to contacts with AH6GQ, AL7HB, AP2P, BY1QH, DK6NN/C6A, DP0GVN in Antarctica, DU7PI, DU9RG, EL2FM, FP4CJ, HH7PV, HL4HE, HL9TX, HL0Y, IM0JOO (San Macario Is.) J28EL, J37AH, JAs, JT1BG, JW6WDA, JY8KV, KG6RN, KH6IJ, KP2AH, OX3LX, PY0FI (Fernando de Noronha), RA0FA (Sakhalin Is. in Zone 19), SU1ER, T30AT, TA1E, TA2G, TR8RAL, TUIBQ, TH4BR, TZ6FIC, UA0FF (Sakhalin again), VE6HP, VE7QI/4X, VE8RCS (Ellesmere Is.), V85AK, V85HG, a scattering of VKs, VS6UA, UF6, UM8, UW9YV, UZ9SWR,



“... Incidentally, I've solved the hand-capacity thing...”

UZ0QWA for another Zone 19 entry, W2NQ/7 (Oregon), XE1ND, YB5QZ, YC5NOF, ZC4AK, ZF1LE, ZF1MM, ZP5HF, 3A2LF, 4X4JU, 4X5J, 5H3ZR, 5Z4MR, 8R1RPN, 9M2BB, 9M2DF, 9M8GH (Sarawak), and 9V1VY. On a more general note, Don says that to the time of his letter (May 6) he had not heard anything of the Clipperton, FO0XX, DX-pedition, although he had heard that they reached the island on May 5.

Joe at G4ZZG says that what he works on this band is of interest only to him, but he did notice on the afternoon of April 8 JA8SW, JA8GMZ and JA8EOF were all working into U.K. Hokkaido, where the JAs are, is certainly the rarest part of JA in terms of licences.

G2HLU says the best results on QRP have been on 14 MHz, though WAC hasn't been reached — yet! However, the first Asian appeared on April 1, in the shape of UA9WLE, who in turn was closely followed by JA7FWR; since then UA9WFG, UA9JH and UA9CES on this side of the Urals, and UA9HBM in Tomsk have settled the matter beyond argument! Also found on April 1 was 'IOF5' — no doubt a joker, but if so, whyever not 'IOF4'? Turning to the Big Rig, Harold managed J37A for a new one, KR7Q, W6ALQ in Montana, W7KSA, and 9M2FZ, plus quite a lot of good contest QSOs in BERU. On a different tack, Harold wonders whether we could dispense with the 'T' on the end of a report, as he reckons not to hear dirty signals these days. . . .!

Twenty CW for G3BDQ (Hastings) included such as ZF1MM, W7LVI, VQ9QM (Chagos), VQ9RB twice (also in Chagos), VU2MKS, UM8MIZ, KE7V, K5VT/7, VP9HW, A4XJZ (Muscat), YB4FN, 7X2AX, plus the usual crop of small frv.

A rare treat indeed to have a letter from G3ROO (Dover) especially as Ian has been greatly in the wars lately — and uses so much of his spare time to write such superb

articles for us. G3ROO has full power from a *Tonne* linear which goes into a modified TET beam. The month's interest began on March 31, in fact, when a CQ call one morning netted three VKs, namely VK2NN, VK2ATT, and VK3BYE; and on April 1 the same happened with just VK3BYE. Since then, G3ROO and VK3BYE have been maintaining a sked, with success on eleven out of twenty mornings, some of the missing days being when either G3ROO or Len, VK3BYE, could not be 'on parade.' On the morning of April 18, the band seemed awfully flat at 0700, sked time, but a call brought VK3BYE back at RST 519 and giving the 'ROO signal at RS53; but within five minutes they were both using SSB and both up by three S-points. To continue the story, this sked has been used to get VK contacts for some of the locals; John, G4SMX, and son Barry (Barry has passed RAE and Morse and awaits his 14th birthday to get his own call) worked VK3BYE several times with a dipole in the middle of Dover; and G0AXD/M has also made it to the VK using 100 watts to a G-Whip while on the way to work. These were 'real' QSOs with a bit of chat, and there were others who got a report but didn't complete a full QSO. As for 21 MHz, we'll discuss that in due course. Meantime, get well soon Ian.

Now we head for G2HKU who appears to have been having fun up in Rochdale with G3RJV, and to have been introduced to 'hot black peas' by the latter. It seems to have been successful as we now hear there is a hot black pea tanker coming down south (and visiting Welwyn, unless we can divert it!) in aid of G-QRP Club funds! As a result of all this, Ted has only worked 9Y4BA, UD6DKW, and UQIGWE on Twenty CW.

Odd Bits

In the contest line of country, June 7-8 is our own NFD, while the ARRL FD is June 28-29. The All-Asian CW contest is over

the weekend June 14-15, and note that this one is at least partly a clash with the shorter (24-hr) South American CW affair. All this from the invaluable W1WY who has, he says, had a slight stroke but is now almost back to normal — take care, Frank, we need you! On a different tack, W1WY notes that W1BB, Stew Perry, of Top Band fame, is still with us though ailing and hospitalised. Frank has been trying to get in touch with him without much luck.

Readers will be aware that American amateurs reckon you can get *anything* in the flea-market at Dayton Hamvention — well, this year someone discovered an apparently *live* hand-grenade — a new weapon to break the DX pile-ups? Other events there were a fire due to an overloaded power plug (familiar?) and then a power transformer failure which put almost everything into darkness on the Sunday, just to make it interesting. However, VK9NS/P29JS was inducted into the CQ DX Hall of Fame, and WM4T discussed progress in his landmark tower case — so far the battle has cost over 15,000 dollars, but thanks to the changes brought about by the rules amendment PRB-1 he won his last appeal and the City of Lakeside Park have to decide what constitutes a 'reasonable' aerial.

On a different note *TDXB* comments somewhat sourly about the Clipperton expedition's choice of frequencies, wondering why, if they are out to work Europeans, they didn't pick spots in the European parts of the band? A Good Thought and we must wait and see! Incidentally they *didn't* get an XF4 ticket for a stop at Revilla Gigedo.

Still with the conventions, at Visalia Prof. R. Helliwell went public with predictions for the next *two* sunspot cycles from which we gather he sees the steep upswing appearing from mid-1986.

We also hear that XW may yet come back on; a JA is picking up the threads there, rather along the lines that proved so successful with YI and BY, and so if you hear an XW he might be for real. Like we might find a true-blue ZA, or a nine-bob note?

Top Band

Firstly, G3BDQ. John misunderstood my comments last time round as being in the main about *power*; while this is true, I was also angry at the way many new countries to have come on Top Band have been given different bits of the whole (very few countries have the lot as we do) and that as a result any effective band-planning has become impossible. Thus the DX-Window concept which has been so helpful to *everyone* has gone overboard in

favour of a free-for-all which has had the effect of depopulating the band of normal users. It has turned into a band that is almost 100% populated by DX chasers, many of whom have bum signals anyway.

However, my own private battle to get back on the band ended with getting the aerial to load up, on Top Band, Eighty and Forty — but whether anyone wants to come on and work me is a moot point!

To revert to G3BDQ, John worked CW with RF6QAI, UI8OAA, UB0YW who is actually at Chern in the Ukraine, UA9FKR, UA9QAL, UA9NN, UA9UCO, UA9CBO, UA0AG, SV1TY, TF3SZ, 4X4NJ, and ZL3GQ on April 7 at 1855z — just shows how things are down, when you recall G3BDQ raising him three times last year.

G2HKU offers his SSB contacts with PA0PN, plus CW to OK2PAZ, Y34WL/A, RB5WAG, UA1OHL, UQ2ONL, UCIAWC and SM5IZ.

Now Eighty

For G2HKU the big rig's CW went out to TI4BGA, and the QRP rig managed CW with GW4HDB, plus two-way QRP contacts with G3PDL, G4ENW, G4GLC, G2HLU and G4HZV.

G2NJ (Peterborough) stuck to his eight-metre last, and mentions his contact with GW3SSJ, Badger, who has his new QTH at Brecon; his aerials are of necessity beneath a large power line, so that his 132 feet is at just 14 feet in the centre and six feet at the ends. However, this and 1.5 watts was enough to enable an hour-long natter on the band. An interesting contact G2NJ mentioned was the one with G3TLF of Hull (whom the writer recalls from two decades or so ago as living then in Harlow); Fred was using a 1918 vintage key which he is hanging on to despite the blandishments of Stateside collectors. G3KPO on the Isle of Wight was also using a 1918 key when worked on the same day; Douglas remarked on the interest shown by school parties to the Museum to which he sometimes lectures. On a different note, G2NJ notes that the TOPS CW nets were lacking GW8WJ for the first time since they started in 1983, due to a six-hour power cut. Finally, on a sadder note, Nick notes the death of Hal Cadman, G3LBQ, a member of the TOPS CW nets, who has become a Silent Key. He will be missed by the group, and doubtless by others too.

G2HLU mentions that he used Eighty mainly for the CW QSOs around the British Isles with his QRP rig, and a little play in BERU during which the only contact of note was with VE3BVD.

As for G3ZPF (Kingswinford), David says the weather has been too bitter to do anything about the aerials so he still has the

eighty-metre wire up; thus David has mainly been working the locals at weekends, plus one spell of insomnia when he found VE1WN and HH2CF at 0230z, followed by VE2BNM and WA1KMR at around 0430 the same night, just in nice time to get up at 0550 to go to work. Is that what you call an *early* night? On a different line, David has sent off his 500 QSLs for the 5BDXCC to ARRL, for which the postal charge was some £27 pounds!

21 MHz

G4VDX has a monoband 'Dipole of Delight' for 10 MHz, and reckons GM3HAT would be pleased to know he loaded it up on 21 MHz and worked VQ9GM!

G3ROO's routine seems to have been to start on Twenty and then creep on to 21 MHz later in the day. This play led to contacts with YB5QZ, V85AC, YU5ACE, PY2ZJ, LU1BFK, YC0EFC, YC3DSJ (who dished out a 59+ report!) and 9M2FS.

Turning to G3NOF, Don says he has not heard anything from the Pacific, but there were a few short-path openings to JA between 1000-1200z, extending to 1500z for Indonesia. Little was heard from Africa and nothing was worked. The Africans came in 1400-1800, starting with ZS's and working north, while 1800z onwards saw the South Americans.

In terms of SSB contacts, it added up to A4XJQ, A92EM, AZ1ARU, CE3HFA, GW3KYN/5N6 (who incidentally is now 5N6MGN), J28EL, JA5IOQ, JA5RH, JE3WTH, JH5MQH, JY9VQ, OD5BP, OE5JTL/YK, PP1AE, PS8QF, PT7RV/PS7, PT8ZCB/OA4, TR8LD, TU1BS, TU2F1, TZ6FS, YB0ZEE, YC1PM, YC2AFP, YC4FAV, YC4GAP, YC6LD, YC7WH, YC0BAQ, YC0BW, YC0EJG, YC0GVT, ZC4EE, ZD7CW, ZS1SL, ZS4SF, ZS6AGP, ZS6AN, ZS6AZI, ZS6JCF, ZS6OF, 5B4OA, 5N8KBM, 5X5MB and 5Z4DE.

Finito

That, once again, is the bottom of the clip; now we have a nice crop of reports on the new bands we look also for reports on the other bands, and in particular Top Band, Eighty and Forty — what about it, readers? The majority seem to want to read about your doings, as it keeps them up to scratch when for any reason they can't get on the bands themselves — so they rely on you.

The deadline for next time is in the 'box' as usual, and is the date for your letters to arrive, addressed to "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. *Adios!*

Propagation Study on 50 MHz during Sunspot Maximum, Cycle 21

Part 2

*F2 propagation over the North Atlantic path
from the Isles of Scilly, 1979 – 1981*

KEN ELLIS, G5KW (ex-SU1KE/HZ1KE/MD5KW, etc.)

THE events which prompted the writer to embark on a propagation study of 50 MHz at the Garrison Fort, St. Mary's, Isles of Scilly during the peak of Sunspot Cycle 21 started 40 years ago during the peak of Sunspot Cycle 18.

On November 24, 1946, G5BY and G6DH, received signals from Ed Tilton, W1HDQ, and on 5 November, 1947, G6DH and W1HDQ made the all-time first two-way on 50 MHz. Two days later the writer, operating as MD5KW in the Suez Canal Zone of Egypt, made the first two-way 50 MHz QSO from that area with G6DH and others and heard W1HDQ and W2AMJ several times, but despite repeated attempts was unable to complete a QSO. The MD5 prefix was the problem.

During this period the small band of dedicated operators which had permission to operate on the 50 MHz band provided much valuable information on F2 propagation over the North Atlantic and transequatorial paths. However the withdrawal of permission to operate due to Band I TV interrupted the studies and many theories were left unconfirmed and some controversial matters left unresolved.

Now that two-way operation is again possible in a few countries in Europe the next few years, leading up to the peak of Cycle 22, present a challenge and an interesting opportunity for newcomers to join the many dedicated operators on the crossover area of the HF/VHF part of the spectrum and make a useful contribution towards resolving some of the propagation uncertainties.

A brief resumé is therefore being presented, but it should be appreciated that some of the theories advanced are those held by those operating at the time, and are subject to modification by more recent events and more up-to-date information.

From the NBS and other prediction charts the highest MUF is stated to occur north and south of the magnetic equator in the 20 degrees latitudes, with a gradual and progressive drop as the latitude becomes higher north or south. A distance of about 2500 miles is generally accepted as the maximum skip distance for single hop F2 layer propagation on the east-west path. This is based on the "Control Point Theory" which assumes a point about 1200 miles from either end along the Great Circle path between the two stations under consideration. A difference of opinion exists as to whether multi-hop or a type of "wave guide" effect is responsible for the much greater distances covered during sunspot peaks and other abnormal long distance contacts. The fact that signals are heard at any point beyond the 2500 mile distance tends to support the "wave guide" type of propagation theory; but we still have a lot to learn and the similarity of HF propagation with skip distance widening as the MUF gets higher and the sun gets higher must be considered. Your comments or observations would be appreciated to help in completing the story. A few average times have been inserted on Fig. 2 along the route from VE1AVX to the far west of U.S.A. with no evidence of a major skip in between: but this is not conclusive.

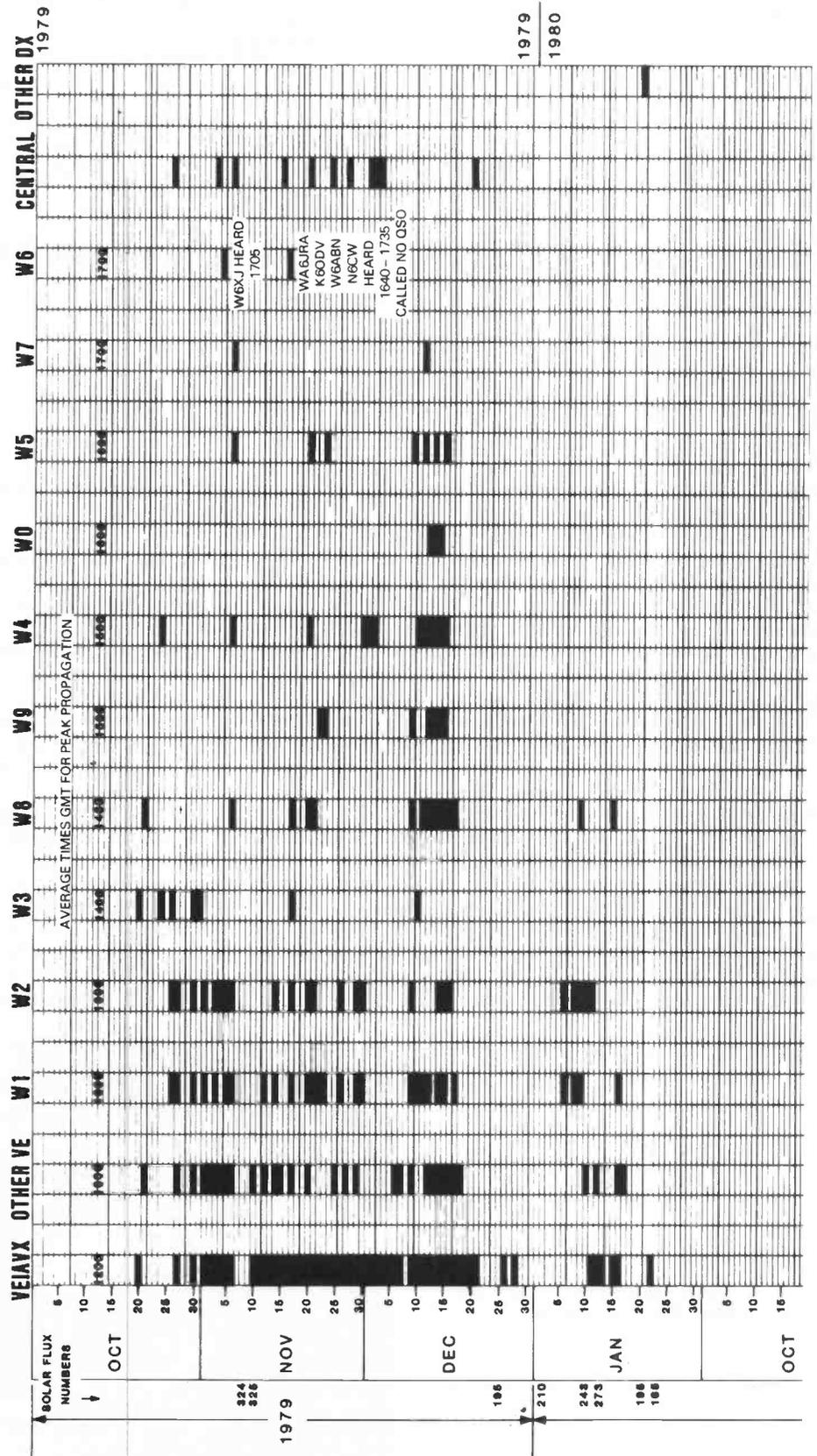
Hilton O'Heffernan, G5BY, at his South Devon QTH in 1947.



**PROPAGATION STUDY CROSSBAND TEN-SIX METRES
ISLES OF SCILLY - NORTH AMERICA OCT 1979 - DEC 1981
BY KEN ELLIS G5KW. WJ09E.**

DURING PEAK YEARS OF SUNSPOT CYCLE NR.21
CROSSBAND QSO'S TEN - SIX METRES BY G5KW

Fig. 2



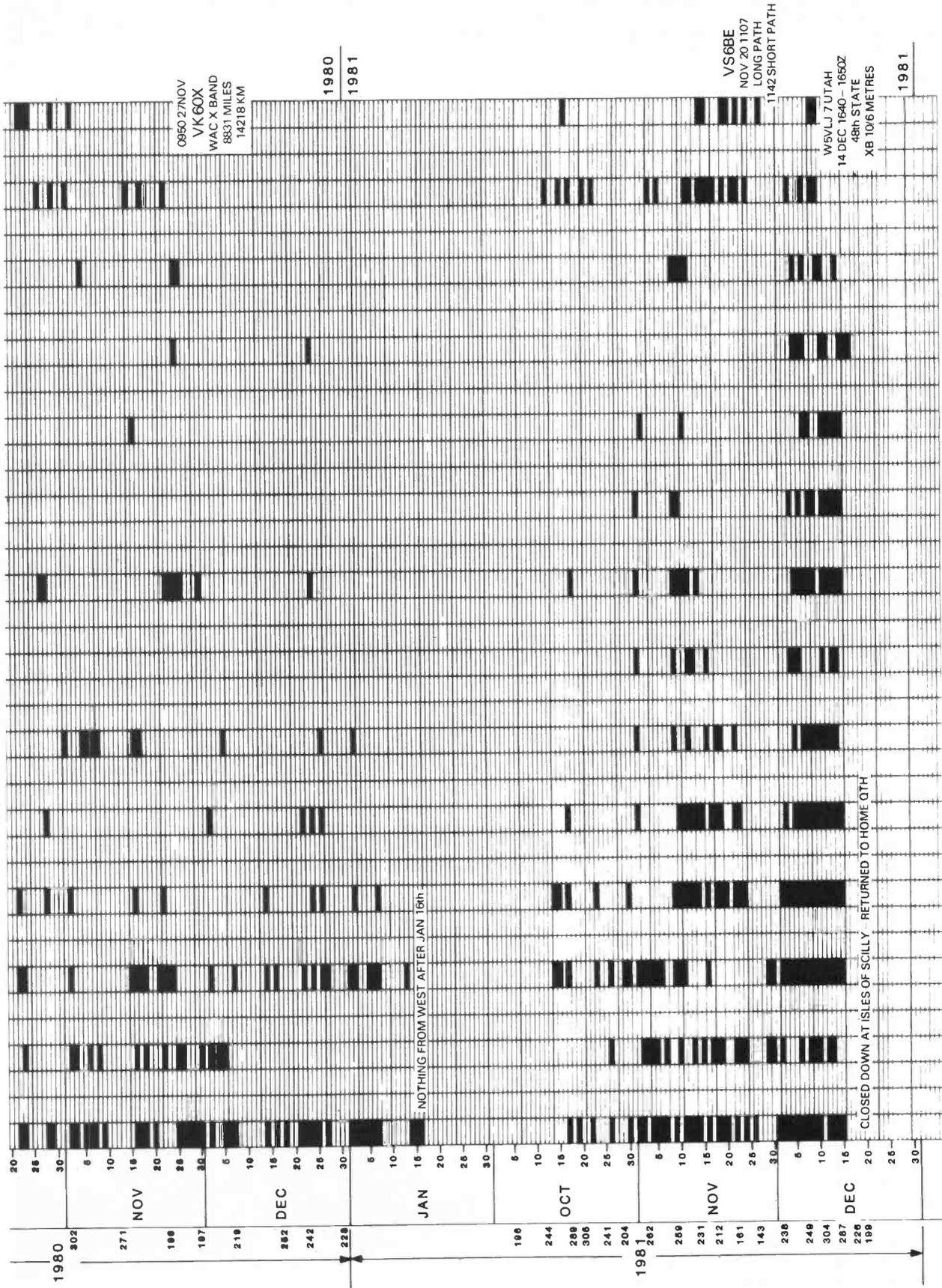


Fig. 3

DATE DURING WHICH X BAND 10/6 QSO's WERE MADE VE - W STNS

	VEIAVX	OTHER VE	W1	W2	W3	W8	W9	W4	W0	W5	W7	W6	CENTRAL AMERICA	OTHER DX
1979														
OCT	3	3	3	3	3	1	-	1	-	-	-	-	1	
NOV	27	14	14	12	2	4	2	3	-	3	1	-	4	
DEC	22	10	7	4	1	8	5	8	3	4	1	-	6	
	52	27	24	19	6	13	7	12	3	7	2	-	11	
1980														
JAN	6	4	3	5	-	1	-	-	-	-	-	-	1	
OCT	4	1	2	2	1	-	-	2	-	-	-	-	4	
NOV	16	10	9	3	-	6	-	5	-	1	1	3	-	
DEC	13	3	8	3	4	2	-	1	-	-	1	-	-	
	39	18	22	13	5	9	-	8	-	1	2	3	5	
1981														
JAN	10	-	6	2	-	1	-	-	-	-	-	-	-	
OCT	5	1	6	5	1	-	-	1	-	-	-	-	3	
NOV	18	16	12	13	12	7	5	6	6	2	-	4	14	
DEC	14	7	14	14	12	9	6	10	9	7	8	5	4	
	47	24	38	34	25	17	11	17	15	9	8	9	21	
TOTAL	138	69	84	66	36	39	18	37	18	17	12	12	37	

The Effect of Latitude

According to the prediction charts at latitudes between 50 and 60 degrees north there is an average downward gradient in the MUF of 0.8 MHz per degree; e.g. G5BY's MUF to the U.S.A. should be approximately 1.6 MHz higher than that of G6DH. Working with the MUF limit a bare 50 MHz, this fact was amply borne out in practice: when at G6DH W1HDQ was only weakly received it was generally found that G5BY had had a good

opening for an hour or so. The fact that G5BY was nearer to W1HDQ by over 200 miles was important as the nearest U.S.A. station to G6DH was over 3000 miles away. VE1QZ in Halifax, approximately 2500 miles from the nearest U.K. station, was usually heard first and loudest during 50 MHz F2 openings. In the other direction G5BY also scored: during the course of many tests with MD5KW on a number of occasions G5BY would report MD5KW S9 when the signal was inaudible at G6DH even though the MUF was above 50 MHz in that direction; in these instances G6DH was too close to MD5KW — distance 2100 miles. PAOUN had on a number of occasions not been able to receive MD5KW who was 1950 miles from him, when G5BY was receiving him okay; G5BY was 2300 miles from MD5KW. Up to November 9, 1947, MD5KW had only been received twice at G6DH for short periods at fairly weak signal strength. On November 10th when MD5KW made his first two-way QSO with G6DH the signals were S9 at both stations.

Date	Time GMT	Call	Remarks
1979 Nov. 2	1320	HC1JX	
„ 4	1240	VO2AG	
„ 6	1400	KP4Q	
„ 15	1245	KV4FZ	
„ 30	1255	ZB2BL	
„ 30	1335	J4NOJ	
„ 30	1425	FY7EZ	
1980 Oct. 24	1110	EL2AV	
„ 25	1055	5B4AZ	
„ 26	1400	VP2VGR	
Nov. 4	1430	VP5D	
„ 15	1350	DL3ZM/YV5	
„ 26	0955-1010	VK6RTT	Beacon heard.
„ 27	0950	VK6OX	This QSO completed crossband WAC 50 MHz for G5KW and G4BPY
1981 Oct. 14	1440	HI8DAF	
„ 21	1340	K2Q1E/8P6	
Nov. 8	1355	TI2NA	
„ 12	1235	9Y4LL	
„ 13	1255	PJ9EE	
„ 13	1435	HC8VHF	
„ 20	1107	VS6BE	long path
„ 20	1142	VS6BE	short path
„ 25	1553	HK0BKX	

Table 1



General view of the VHF beam installation at G5BY, Bolt Jail, South Devon, in December 1947. On the left, two wide-spaced 4-ele 58 MHz beams; a close-spaced 51 MHz 4-ele is at the centre with, on the right, an all-metal wide-spaced 50 MHz beam.

In this and other later occasions when the writer had QSO's with many U.K. stations it is probable that Sporadic-E was assisting and affecting the skip distance — November 10th being a case in point. Between 0900z and 0930z eight QSO's took place with G stations S9 each way in South England then the band suddenly folded up and nothing was heard afterwards.

G5KW and Cycle 21

During the early autumn of 1979 the writer, operating from a chalet at Culverstone in Kent about 600-ft. a.s.l., experienced a similar frustrating problem that stations in the eastern area had experienced during Cycle 18. Although it was an excellent QTH



Ken Ellis, G5KW, pictured at the VHF stand at the recent RSGB National Convention.

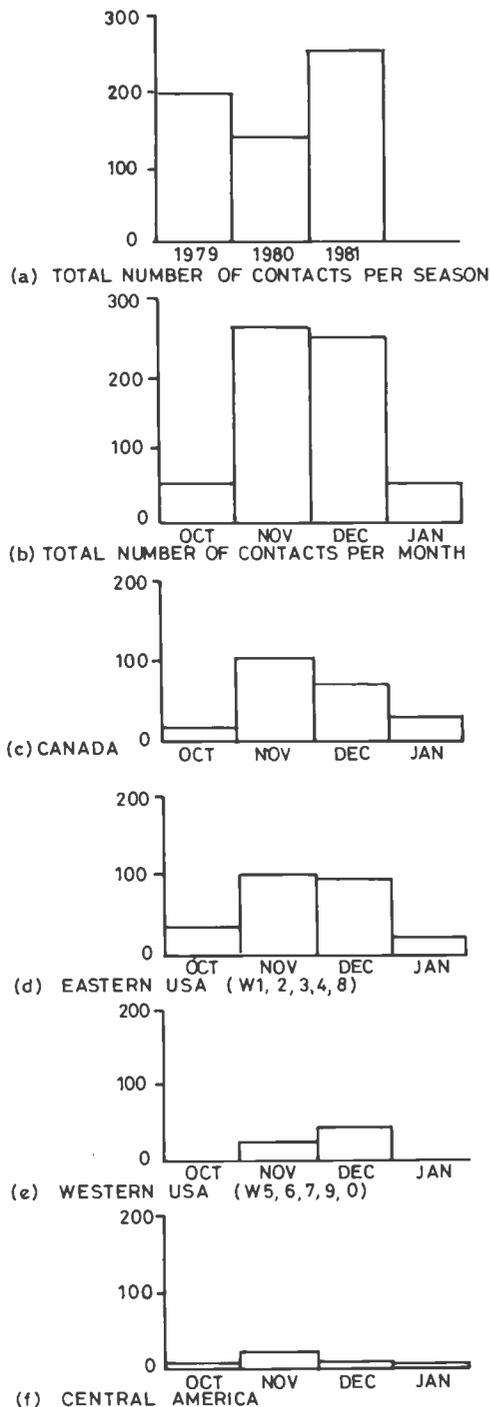


Fig. 4

E 737

The G5KW Ten-Six metres crossband contacts from the Scilly Isles to America during the winters of the sunspot maximum of Solar Cycle 21. drawn by G2AHU

using modern equipment and high gain aerials, other stations to the south and west of Culverstone were heard in crossband QSO with W and VE stations but nothing was heard by G5KW. The nearest successful stations to G5KW was G3FXB who was having QSO's with East and West Coast stations.

So a decision was made to go as far west as possible! With the co-operation of Mike Goody, G3RPC, QTH Telegraph Hill, St. Mary's, Isles of Scilly, I managed to get permission to operate from the Garrison Fort at the south-west tip of St. Mary's. This is an excellent site, noise free and a clear take off in all directions. It was soon clear that a wise decision had been made and that some interesting results were likely as an almost daily QSO was made with VE1AVX at St. John's, New Foundland, approximately 2500 miles to the west — the optimum distance for F2 propagation.

See Fig. 2. Before drawing any conclusions from the information listed here, several factors should be taken into consideration:—

(a) The fact that ten/six metre crossband operation was used and not six/six 2-way with possible propagation differentials.

(b) Fewer American stations operate in the Midwest and western areas.

(c) The statistics here recorded only refer to G5KW single operator activity with unrecorded breaks in operating time.

(d) Another factor to be considered when dealing with F2 operation at sunspot maximum is the effect of Es and other sporadic unaccountable types of propagation mode.

Hopefully during the run up to the peak of Cycle 22 with the possibility of 24-hour operation, and some or all of the other restrictions removed, a much more detained analysis may be made, and current theories either confirmed or revised. A very interesting and useful field of study for the dedicated 50 MHz operator of the future.

Fig. 2 is a daily log by G5KW with call areas arranged by distance along the Great Circle path going west from Isles of Scilly to give an idea of daily/monthly penetration of propagation.

Fig. 4, drawn by Ray Cracknell, G2AHU, and analysed during the three excellent lectures he gave at RSGB VHF and NEC Conventions shows:—

(a) Total number of contacts per season, 1979, 1980 and 1981.

(b) Total number of contacts per month, Oct., Nov., Dec. and Jan.

(c) Total number of contacts per month, Canada.

(d) Total number of contacts per month, Eastern U.S.A. (W1, 2, 3, 4, 8).

(e) Total number of contacts per month, Western U.S.A. (W5, 6, 7, 9, 0).

(f) Total number of contacts per month, Central America.

Fig. 3 gives a detailed breakdown of the individual call sign areas shown in Fig. 2 and summarised in Fig. 4.

In addition to the North American QSO's a number of interesting crossband contacts were made with Central American, and other DX stations: some of the more interesting ones are shown in Table 1.

to be continued

KW Ten-Tec 'Corsair II' Transceiver, a Description and Use

E. H. TROWELL, G2HKU

IN a *Short Wave Magazine* article last year (September issue) the writer described the then current production model of the KW Ten-Tec Corsair II Model 560. This was a broad band, all solid-state design covering all nine HF bands and offering true CW break-in as a major design feature in addition to SSB.

Following the programme of continual research and development the Corsair II Model 561 is available from KW Ten-Tec of Chatham, Kent, and contains a number of useful improvements. This in itself must have been a difficult task as the original Corsair is such an excellent transceiver that it would be hard to suggest something worthwhile and at the same time keep away from the "all singing, all dancing concept" available from the Land of the Rising Sun.

At first glance there does not appear to be any change in panel layout. The overall size and weight are the same, the most noticeable difference being the colour which is a change from the normal Ten-Tec two-tone black with black knobs and off-white lettering to a two-tone grey with grey knobs and black panel lettering with white lettering on the sub-panels. Altogether a rather pleasing clear cut effect.

However there is much more change than that first glance reveals. Internally there are 5 extra IC's and 2 diodes fitted and in the receive mode the original Corsair had a 12-pole crystal ladder SSB filter with the optional extra of an 8-pole filter giving a 16-pole performance. In the Corsair II there is no longer an option as the higher grade 16-pole filter is standard fitting, resulting in an improved shape factor.

On the front panel above the phone jack, a new rotary control has appeared marked BP FILTER. This 8-pole active audio band pass filter is centred at 750 Hz with a filter width of 200 Hz. Rotation of the control clockwise fades the receiver audio response from normal to various amounts of bandpass effect with the maximum of 750 Hz. This filter is most useful on a noisy or crowded band. On 1.8 MHz for instance the annoying 'frying' noise which is sometimes present could be made more tenable and the control was put to good use during the writer's participation in a contest. It is possible to find a position to suit the individual operator on CW or SSB which will result in a more readable signal with less general noise. The filter is not an added item as it is built

into the IF board and its action takes place prior to the AGC take off point. It follows therefore that when the filter is in use the AGC will only respond to signals actually passing through the filter and not to those adjacent and unwanted. This system overcomes the problems encountered with 'add on' units where strong adjacent signals can cause blocking or distortion.

The control marked AF-RF AMP to the lower left of the main tuning knob now becomes the AF/POWER control, the power switch being 'on' when the knob is pushed in. This change in bringing the audio and on-off switch together conforms with the normal control functions we are accustomed to in this country. When using the KW Ten-Tec Model 260 power supply this control will also switch off the supply itself provided that the switch on the 260 is already in the 'on' position.

Conversely the control to the lower right of the main tuning knob is now the RFGAIN/ATTN. The attenuator pad is brought into operation when the knob is pulled out, this action also switches out the low noise pre-amp as in the earlier model. A point to note here is the LED on the sub-panel now functions in reverse, *i.e.* in the Corsair II it lights when the attenuator is in circuit.

The other changes on the main front panel are five toggle switches which, although still performing the same functions, now have shorter operating spindles. The SPOT button between the OFFSET control and the main tuning has a different function, and does not produce a 750 Hertz audio tone. Instead when pressed, it shifts the BFO frequency 750 Hertz thus removing the offset and enabling the operator to accurately zero beat the incoming signal. The PBT control does not now have a centre indent position.

The top sub-panel carrying the meter, digital readout and five small controls has a number of changes. The meter and its functions remain the same but the first five figures of the digital readout are now yellow instead of red, the sixth staying green. The remaining five controls have all been changed and are now KEYSPEED, N.B. LEVEL, N.B. WIDTH, ALC and PROCESS, respectively. The two VOX controls have been moved to the rear panel and the two new controls appearing are KEYSPEED and N.B. WIDTH.

The rear panel has also undergone some change. Looking at the



Front view of the Corsair II.

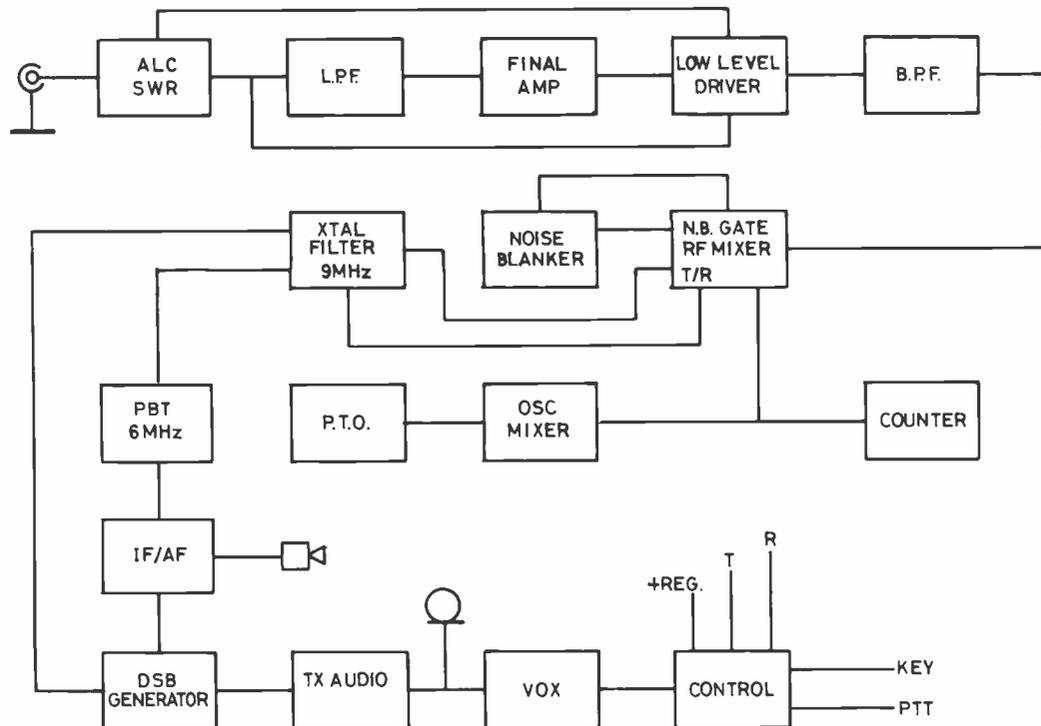


Fig. 1 Simplified Block Diagram of KW TEN-TEC CORSAIR II

E
736

panel the Rx/Tx switch is in the same position to the left of the output stage heatsink. Below the switch are two aerial sockets, one for an external receiver, the other for the transceiver itself, also in their normal positions. The changes occur to the right of the heatsink and at the panel top are three VOX adjustment controls being DELAY, GAIN, and ANTI, respectively. Below these are the EXT SPKR and KEYS PADDLE sockets and at the bottom those for POWER and ACCESSORIES. At the right of these is a bank of twelve phono sockets, four in each row and they are QSK, EXT T/R, SPARE, AUX 12v, the row below being KEYS MEM, KEY, AUX 12v PTT and the last row VFO IN/OUT, AUDIO IN/OUT. There is a bridge fitted to the VFO IN/OUT sockets unless the external VFO Model 263G is in use.

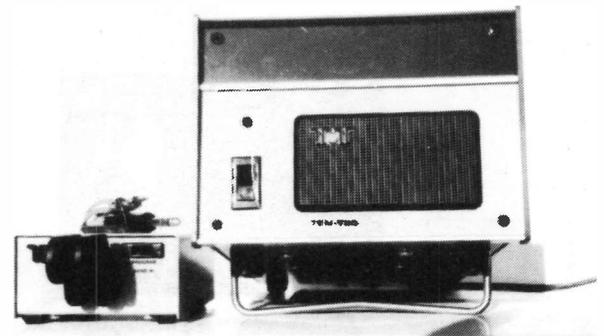
The KEY socket will accept electronic keyers with an open collector (positive) output or bugs and straight keys. The Corsair II is also suitable for AMTOR use if operated in the FAST QSK position as in this mode the recovery time is only 30mS. The KEYS PADDLE socket is standard 1/4" stereo type and operates the new built-in Iambic keyer, the speed range of 8 to 50 w.p.m. being controlled by the knob on the front sub-panel.

Available as an accessory is the new KW Ten-Tec Model KR1B Iambic Paddle Keyer which has been designed specifically for the Corsair II. This has some rather interesting features. It is, of course, a dual paddle key, however the paddle tension is not controlled by springs but by magnets. On the rear panel of the keyer is a control marked TOUCH, the rotation of which adjusts the degree of magnetic tension. Individual adjustment of each paddle travel is provided through two holes in the top of the case. On the front panel is a slide switch marked PROGRAMME-SEND. In order to enter the Corsair II keyer memory the switch is placed in the PROGRAMME position and up to 40 characters (including pauses) may be stored, the speed being set by the Corsair II KEYS SPEED control. The stored message may be sent at any time by moving the slide switch to the SEND position, then as soon as the push button on top of the keyer is pressed, the recording will be sent at any required speed adjusted by the Corsair II KEYS SPEED control. The keyer was used both for normal operating and for contest participation and performed extremely well. No problems were encountered either in the initial setting up or the actual operating even though the writer had never

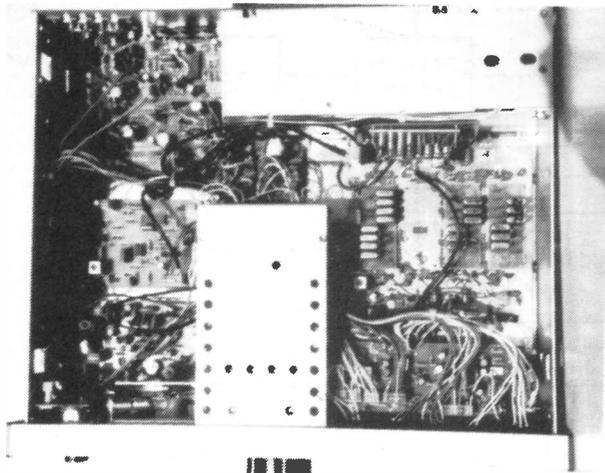
used a keyer of this type before. Two separate twin cables connect the keyer to the Corsair. One leaves a position marked DIT/DAH (!) on the rear panel of the keyer and is terminated in a 1/4" stereo jack plug, the other twin lead has a phono plug on each lead, the red one connecting to an AUX 12v socket on the Corsair and the plain plug to the KEYS MEM socket. The keyer is weighted and does not move around during keying as it weighs nearly two pounds and is fitted with non-slip rubber feet. Overall size is 2 1/16" high, 3 3/8" wide and 7 1/16" deep, finished in grey to match the Corsair II.

Returning to the receiver facilities of the new model, there has been considerable change in the IF/AF section. Apart from the already mentioned audio filter, there is a new noise blanker which is certainly more effective than the earlier model. It has both variable level and width controls which were easy to adjust and surprisingly, actually did have some effect on the Russian "Woodpecker".

During the course of a QSO on CW with a weak W6 station the Woodpecker started its awful racket and the W6 vanished. Without much hope the noise blanker was switched in and a reduction in the level of the "Poltava Pestilence" (so named some years ago by S. W. M.) was noticed. It was by no means removed,

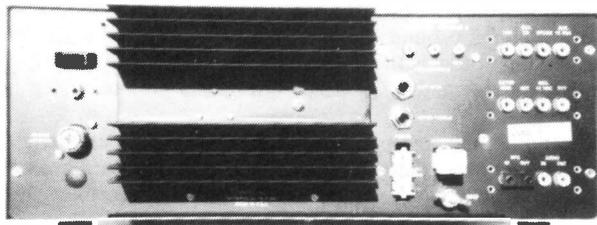


Model 260 PSU for the Corsair II and Model KR1B keyer paddle.



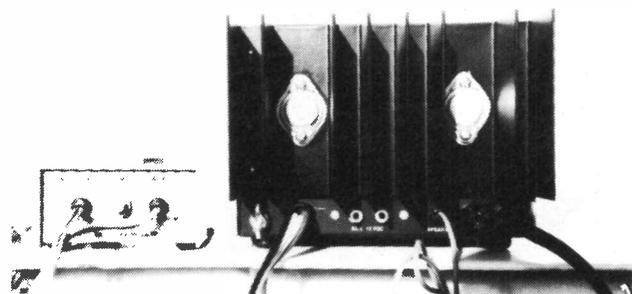
Top view of the Corsair II, showing new layout.

but it was just possible to copy the W6 by very careful adjustment of both the LEVEL and WIDTH controls. It was no accident that KW Ten-Tec have "designed in" a degree of blanking pulse width (set by the N.B. WIDTH control) and a repetition rate that coincides with the Russian OTH radar system. As a noise blanker in more normal use it proved effective on ignition noise, the setting of the LEVEL control being easily reached although care is needed to prevent the blanker becoming too sensitive and thus overloading. One thing puzzles the writer regarding the IF/AF board; it is not compatible either electrically or physically with that fitted in the original Corsair, yet it bears the same part number.



Corsair II rear panel.

There is a new amplifier and mixer board with a claimed dynamic range of 95dB typical, this being 5dB more than the original model. Any increase in dynamic range, however small, can only be an improvement as the figure expressed in dBs is a ratio between the strongest acceptable input signal and the weakest discernable signal. This means an increase in strong signal handling without sacrificing any sensitivity.



Rear View of Models 260 and KR1B.

In the transmit section the original 4-pole 9 MHz crystal ladder filter has been changed to an 8-pole version and is mounted on a new board not fitted in the earlier model and known as the 'Xtal Filter Board, Part No 81252'. It is mounted on the front facing side of the output stage screening box. Surprisingly for Ten-Tec there appears to be an error in the Owner's Manual as in the contents list it appears as 81253. On page 3 - 11 it is again listed and its action referred to under this part number, but lower down the page, on the circuit diagram, it is correctly numbered 81252. The earlier 4-pole filter was part of the noise blanker board mounted on top of the chassis to the centre left. The board now in this position is the new noise blanker and does not contain any crystal filter.

The VOX system has been removed from its inside front panel location and mounted on a new board on the inside of the back panel. It no longer associates with the processor which remains on its inside front panel location and in place of the VOX now has the CMOS oscillator for setting the built-in keyer speed as its fellow resident.

With the exception of the crystal ladder filter now fitted as standard and mentioned earlier, the other filters are available and strongly recommended. All crystal ladder types, they are: Model 288, 1.8 kHz 8-pole SSB filter; Model 285, 500 Hz 6-pole CW filter; and Model 282 250 Hz 6-pole CW filter.

As with the original Corsair a matching remote VFO is available, now known as the Model 263G. Similar facilities are provided including full QSK and the remarkable ability to listen on two different frequencies at the same time and to be able to vary the strength of either in relation to the other.

The power supply available for the transceiver is the same Model 260 but now finished in colours to match the Corsair II and is supplied with its own manual. On the rear panel are two phono type sockets marked AUX 12vDC which are capable of supplying up to 5 amps.

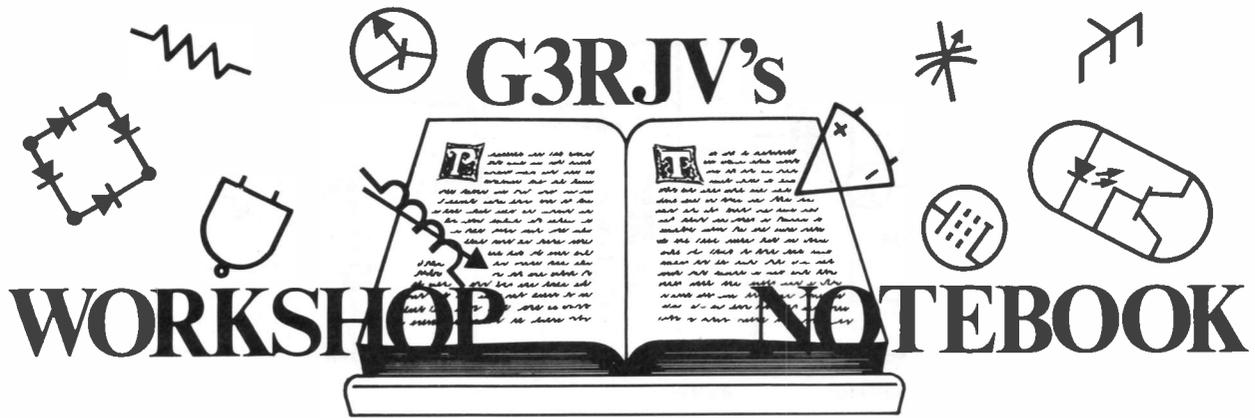
The usual TVI checks were carried out using both SSB and CW at full input on all bands (except those restricted!) with the colour TV receiver alongside the Corsair. No problems were encountered.

A comprehensive Owner's Manual is provided which describes in detail all adjustments, functions and voltage readings together with a parts list and circuit diagram of each stage. An outstanding feature of all KW Ten-Tec transceivers is their ease of access for both adjustments and servicing. All printed circuits assembly boards are identified, interconnected with cables, identified plugs and sockets, and all easily removed. How nice it would be if other manufactureres did likewise.

To summarise, again, an excellent transceiver with the changes being both real and welcome improvements. KW Ten-Tec claim that the Corsair II is "the lowest noise, cleanest and most selective amateur HF transceiver on the world market". This could well be true.

Subscription rate to
Short Wave Magazine
is £16.00
for a year of twelve
issues, post free.

SHORT WAVE MAGAZINE LTD.,
34 HIGH STREET,
WELWYN, HERTS. AL6 9EQ



A SIMPLE VARIABLE SIGNAL SOURCE

A COMMON question from the newcomer to amateur radio is, "How much test equipment do I need?" The question is often prompted by visions of those upmarket amateur radio shacks which resemble a minor controlroom at NASA or, if they are equipped from second-hand sources, the panel of Flash Gordon's space ship. Worry not young man or maiden. I suspect that a lot of such equipment is for cosmetic purposes only. It looks good: test equipment is usually well endowed with controls, meters and readouts . . . very "scientific"! One only has to look at the number of oscilloscopes that amateurs buy or fight over at rally bring-and-buy sales. Most of them are audio scopes incapable of seeing a half-decent RF signal. What do they use them for? It is possible to be quite an advanced constructor of radio equipment with very little expensive or specialist equipment.

The basic workhorse of the amateur's test equipment will be a multimeter (analogue is best) with perhaps a homemade diode RF probe. This enables the chasing of voltages, currents and signals around a circuit. If coils are to be wound, a dip meter is useful and simple to make; it can also double as a signal source. Many amateurs seem to have digital frequency meters these days and if this is the case, the dip meter does not need a scale for showing frequency — just feed a bit of signal into the frequency counter. Signal generators are quite useful to have in their own right but the simpler and even medium priced examples often have very simple circuits; these are easy to build. There are other alternatives: I will remember as a "slip of a lad" taking a bit of signal out of the local oscillator of a general coverage receiver to give a variable frequency source. If the IF offset is known, it is simple to work out the frequency from the reading on the receiver dial.

For sometime now I have had a synthesised RF driver, a fine piece of surplus equipment, originally designed to drive marine transmitters; I can just dial up a frequency and out it comes. All very nice but sometimes I want to be able to "swish" a signal about so that I can find it on an uncalibrated receiver, so I decided to build up a simple RF signal generator to cover the amateur HF bands. Nothing very elaborate: this 'page from my Notebook' describes it.

The Circuit

The circuit of the signal generator is shown in Fig. 1. One of the problems of making one's own variable signal generators has been finding suitable coils. It is possible to wind coils for the job and I have done this in the past but the results seem rarely reproducible. I decided to look at the useful range of 10K Toko Coils sold by Circuit Holdings. Although they do include a range of local oscillator coils for the short wave bands, the range of RF input coils for those bands have a tapped tuned winding. That tapping is conveniently placed towards the low end of the tuned winding suggesting that a Hartley oscillator might be possible. A few tests with a one transistor (FET) oscillator circuit showed that a

Hartley circuit could be built that would oscillate over the whole HF band spectrum.

The final circuit uses that single FET Hartley oscillator (TR1) feeding a source follower (TR2) with a variable output controlled by RV1. In practice the three RF input coils in the Toko 10K range gave a frequency sweep from about 1.25 to 45 MHz; a very useful range, but naturally the actual ranges depend upon the settings of the cores in the coils. The recommended variable capacitor for the tuned circuits is around 300pF, and I used an old two-gang airspaced tuning capacitor from a scrap radio. It looks as if it is around 500pF per section. I used one section and the resultant range on each coil does seem to confirm my guess of the value. Any similar capacitor would do the job. One of the little Polycorn types would also be suitable although these have associated problems of control knob and drive mountings.

Making the unit self-contained is helpful. I found a small transformer which I believe came from the same scrap radio as the variable capacitor: it was one of those mains/battery radios. This, with a little rectifier bridge and a smoothing capacitor (C6), made up a suitable mains power supply for the generator. Four silicon diodes could be used in place of the bridge and small mains transformers capable of providing a nominal 9 volts or so at around 100mA are quite cheap even if they have to be bought. An LED, with suitable series resistor (R6), was added to give on/off indication.

Now signal generators are fine for checking frequencies on receivers. One problem is that there may be existing signals, or even (heaven forbid) birdies, which could be confused with the generator signal. A simple way around this is to modulate the signal so it has a distinctive sound — so a very simple modulator is included in this circuit. It is simple, being the basic oscillator circuit around a single 555 timer integrated circuit. It gives a suitably unpleasant note which can be added to the signal to aid identification. Applying the modulating signal to the base of TR2 seems to give enough modulation of the generator signal . . . Isn't it crude!

Construction

The two parts of the circuit, RF signal generator and modulator, were built onto two small printed circuit boards; the layout is shown in Fig. 2. (It would be easy to build up the circuit on pieces of Perfboard or even Veroboard). The rest of the circuitry was point-to-point wired. The three coils required to give the full coverage of the HF spectrum were hard wired around the switch (SW3). This switch is a three-way switch. Two poles are required but usually wafer switches offering 3 ways are 4-pole, so only half the switch is used. I thought of using one spare set of contacts to switch on three LEDs which would indicate on the front panel which range is in circuit. Then I thought again! But you could do it.

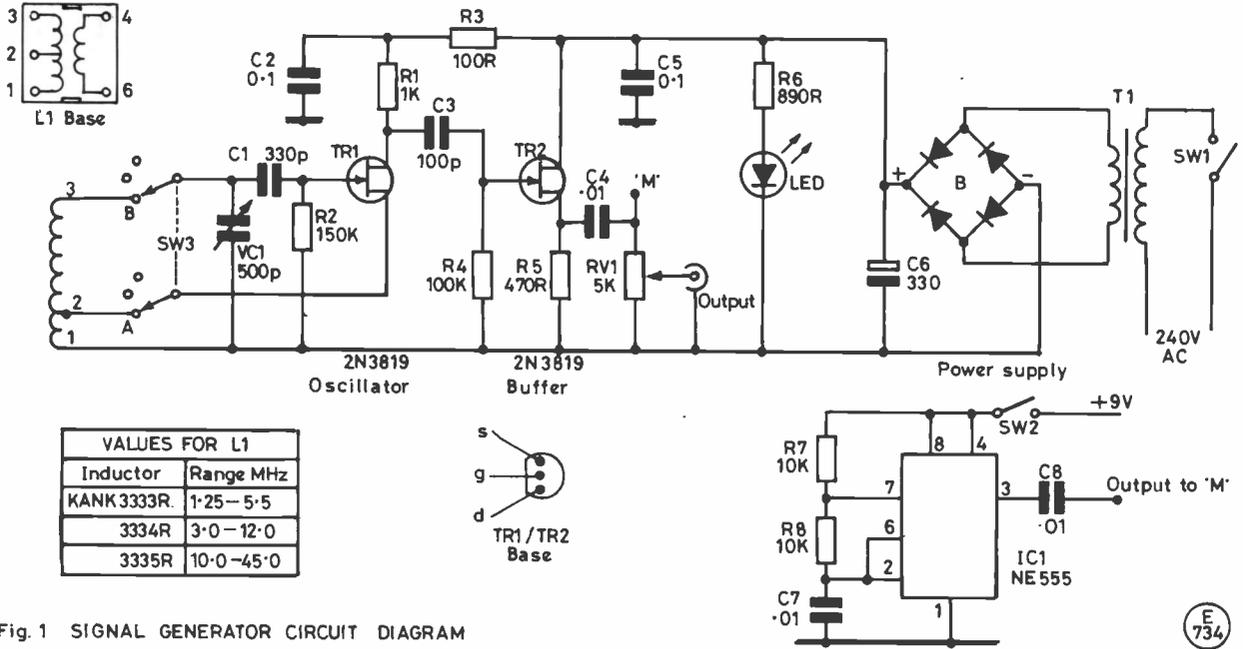


Fig. 1 SIGNAL GENERATOR CIRCUIT DIAGRAM

Table of Values

Fig. 1

- R1 = 1K
- R2 = 150K
- R3 = 100R
- R4 = 100K
- R5 = 470K
- R6 = 890R
- R7, R8 = 10K
- RV1 = 5K linear
- C1 = 330pF
- C2, C5 = 0.1µF
- C3 = 100pF
- C4, C7, C8 = 0.01µF
- C6 = 330µF, elect. 25V
- VC1 = 500pf variable, see text
- TR1, TR2 = 2N3819
- IC1 = NE555
- B = bridge rectifier suitable for voltage
- LED = general purpose LED
- SW1, SW2 = single-pole on/off
- SW3 = two section of a 4-pole, 3-way wafer switch
- T1 = mains transformer capable of an output of 9 volts at 100mA
- L1 = see values for L1 in inset
- Coils = Toko 10K from Cirkit Holdings
- Hardware = as suggested in text

Note: all capacitors, except C6, may be ceramic types.

enough. Now — here comes an important option. Have you got a frequency counter? If so there is little point in adding a fancy scale to show frequency: it's not going to be very accurate anyway. Take off another output point, say via a small value capacitor from the top of RV1, and feed it into the counter. This not only does away with the need for a scale but provides a more accurate reading of frequency. No counter? Then a scale will have to be added to VC1.

Boxing Up

This depends upon the counter/no-counter option. If a scale is not required the whole unit will fit into quite a small box, the size being controlled by the bits and pieces that have to go inside. If a scale is being added this ought to be large enough to show three readable scales of frequency. Thus the enclosure size will be governed by how large the scale is made; the bigger the better for ease of reading.

Remember that there is mains inside the box, so leave a little space to get it in and to the transformer. SW1 must be capable of switching 240 volts although little current is required. One alternative is to run the whole thing from a 9 volt battery, it draws little current so battery life is not really a problem. The front panel layout and the situation of the boards and control components

The frequency coverage of each coil, especially the highest frequency range, is wide so some form of slow-motion drive is required for VC1; one of the little epicyclic 6:1 drives would be

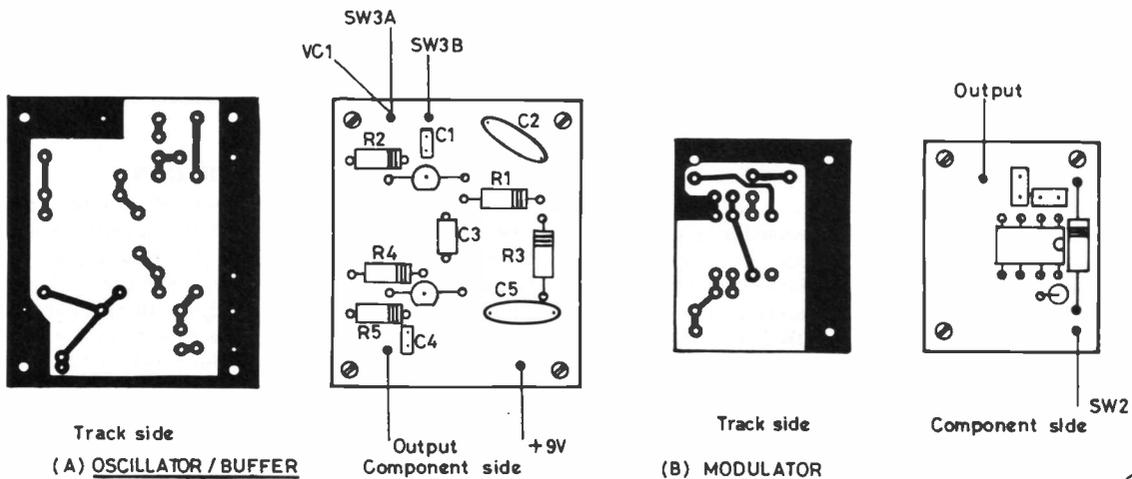


Fig. 2 SIGNAL GENERATOR BOARD LAYOUTS

depend upon the choice of housing. The project is so simple that individual constructors can tailor it to suit their needs or what they have at hand.

Calibration

Calibration is simple if the constructor has a frequency counter. Poke a signal into the counter and off you go, but if the counter is around the shack the whole time then dial calibration is not required. Calibrating a scale depends upon the availability of a frequency counter. If the constructor can borrow one from a friendly local radio amateur then the task is simple. If not, the scale will have to be calibrated by finding the output on a general coverage receiver and relying upon the accuracy of the receiver calibration. This may not be very accurate in some cases, but in

practice this is not the end of the world: usually such a simple signal source is only required to ensure a receiver is in the band or close to a particular frequency. Accurate RF frequency points are usually checked using a crystal calibration source. We'll have one of those don't we? Well, we ought to have one.

The complete signal generator, although not the last word in sophistication or the ultimate in accuracy, is a useful item to add to the constructor's work bench. It would be possible to extend the ranges higher and lower but I leave that ball in your court.

Toko 10K coils available from Cirkit Holdings, Park Lane, Broxbourne, Herts. EN10 7NQ (0992-444111).

Amateur Radio Computing

A Bi-monthly Feature for All Those with a Radio Station and a Computer

PAUL NEWMAN, G4INP

PIRACY — a particularly ugly word in the amateur-radio context reared its ugly head in a slightly different form a few weeks ago when I learned that GIFTU Spectrum RTTY is being illegally advertised and sold in Holland. It appears that a certain PE1B—station advertises in a Dutch radio magazine along with similarly unauthorised copies of other peoples programs!

All the pirated copies have the same embedded callsign since no attempt has been made to "hack" the program. I regret that the callsign is a G4 — call. Investigations have shown that this station loaned his GIFTU copy to a "friend", a Dutchman as a favour. Whether this was done innocently or not, it is clear that he could have made it a little harder for the pirate by not loaning the tape.

I realise that anyone determined to pirate software will do so. But we can *all* make it a little more difficult by *never* lending tapes — even to a friend. We can all ensure that we buy our software from its original source — never through an agent unless it is positively known they are legitimately dealing in the items concerned.

Make no mistake — if you support these thieves you will, in the end, help *kill* software in our very specialised field of activity.

The appearance of my last article coincided with the completion of the G4IDE Spectrum Weather-Facsimile system which has already given some quite spectacular METEOSAT cloud-cover pictures from the Offenbach VLF transmitter of the Duetscher Wettfadienst. Several experimental NOAA pictures have also been taken. Also what appears to be news-agency FAX pictures have been seen but the originating station is unknown. Pictures have been taken on VLF (134.2kHz) as well as on HF.

Although the system stretches the Spectrum's abilities, Roger has made a marvellous job of implementing FAX on a computer

(not an easy task for any micro!). With practice, I found the system easy to get results from and I am sure it will provide interesting results for those interested in the weather. The only drawback I could find was that annotations on the pressure and agrometeorological charts could not be read since these are below the resolution of the system. The only way these could be read is on a proper mechanical FAX unit. This is no great disadvantage since their meaning would be lost on most of us anyway!

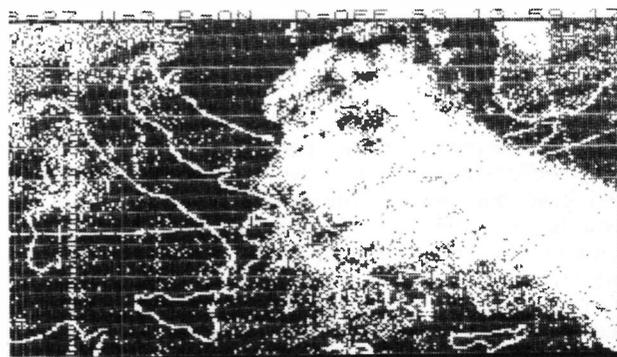
The resolution does, however, permit latitude/longitude and major pressure annotations to be read which assists in reading some of the pressure charts and cloud-cover pictures.

Picture 1 shows an infra-red cloud-cover picture taken at 1200z on 5 April 1986 by METEOSAT. The outline of Italy, Sicily and Sardinia can be seen clearly. Picture 2 was taken about 3 hours later — you can see how the cloud mass has moved. A similar picture of West Europe taken that day showed almost total cloud over U.K. with the surrounding sea areas clear!

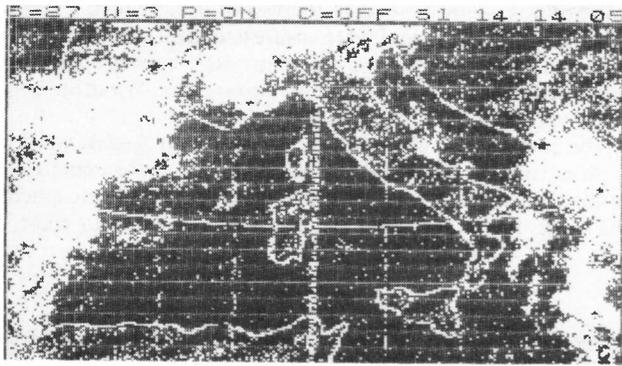
G4IDE WEFAX costs £16.00 complete with ready-built hardware clock (a vital part of the system) and cassette software complete with several SCREEN picture-saves, an audio recording to aid identification of stations and comprehensive instructions. Signal input is *via* the EAR socket on the Spectrum and the system also works on the new Spectrum 128k in 48k mode (1).

Recent correspondence concerning the accuracy of some of the GM4IHJ satellite tracking software leads me to suspect that some users may not be aware that most of these programs do require careful upkeep of the Keplerian element, to maintain their usefulness.

In particular, the PROP9 UOSAT-1 predictor should have the elements updated at least every month since at present the satellite is in low-orbit and subject to some atmospheric drag. If elements are more than 4 weeks old then the predicted times may be several minutes out, which probably means you'll catch the satellite on its way down!



Picture 1



Picture 2

You will find Keplerian elements on the news broadcasts carried on UOSAT-1 and from published sources such as AMSAT-UK literature. I also hope to cover updating the satellite programs in detail in a forthcoming SARUG newsletter. Those wanting further data on updating PROP9 can, of course, write to me with an s.a.e. and I will try to resolve any problems you might have.

The recent handover of Sinclair Computers to the Amstrad company puts the future of the Sinclair QL in question although rumour has it that a privately funded consortium will ensure its survival.

It seems from the few letters from QL users that I do get that the radio-user base for this micro is very small indeed. I am sure, however, that they will be interested to learn (along with Spectrum users) that the possibility of using an "intelligent terminal unit" for RTTY/CW/AMTOR is being explored. Thanks to the cooperation of a leading supplier of these units one has been obtained on loan for possible program development.

Whilst it is far too early to say exactly what the results will be, I am hopeful that even if a full-scale program doesn't result enough experience will have been gained to encourage others to write software for these units.

I shall be very pleased to hear from any of you who are already

using one of these intelligent terminal units with any micro, particularly if you have written your own software.

A lot of excellent software for the Spectrum has become available recently through the activities of SARUG and this includes an excellent log-book style program which I hope will be available on cassette through the software service.

Neill, G4HLX, has just released another new program for the Spectrum user in the form of SQUIF — Squares INdex File. This creates and maintains files of data concerned with recording VHF/UHF locator squares worked/QL'ed etc. This includes a nicely presented map of Western Europe showing a summary of squares recorded. Square input may be in Universal or QRA notations and the program has full sorting, printing and save/loading features.

Full instructions are provided together with details of adding program lines to drive your own printer, and Microdrive conversion. SQUIF provides an excellent means of recording your achievements on VHF/UHF. The only deficiency I could find was the absence of a "best DX" feature which I thought would have rounded-off this useful program nicely. (2)

Users of the G4IDE/G4INP UOEAR satellite decoder for UOSAT-1 who purchased copies prior to the change in the telemetry format now sent, can obtain an updated version for £2.00 by sending to G4IDE Microsystems. The original program should be kept since it is not known at present whether the old telemetry format will be used again. New version of the program will handle the new TLM format.

A Whole Orbit Dump graph-plotting program written by G4IDE will be available through the software service of SARUG with the next newsletter issue and this makes observation of the data sent as WOD very much easier. (3)

That rounds things off for this time. Next issue I hope to have something a little different for you, but until then 73.

References:

1. G4IDE Microsystem, 79 South Parade, Boston, Lincs. PE21 7PN. All enquiries with s.a.e. please. Non-UK payments in sterling only and add £1.00 extra postage.
2. N. P. Taylor G4HLX, 87 Hunters Field, Stanford-in-the-Vale, Faringdon, Oxon SN7 8ND. S.a.e. with all enquiries please.
3. SARUG, c/o P. Newman G4INP, Red House Lane, Leiston, Suffolk IP16 4JZ. S.a.e. with all enquiries.

• • • "Practically Yours" • • •

with GLEN ROSS, G8MWR

ONE of the more common aspects of amateur radio activity is mobile operating. Most activity seems to take place on the VHF bands but there is a growing interest in the use of the HF bands to give worldwide coverage as the sunspot cycle starts its upward curve. The range of equipment and aerials available is very wide but the would-be operator is still left with the problem of where to mount the equipment in a modern car, and that can cause a real headache; and perhaps even more seriously the difficulties of reducing electrical interference to manageable proportions. I use the word 'manageable' deliberately because the amount of electrical equipment in the modern vehicle is very

extensive and the probability of tracking down and eliminating all the interference is daunting.

Installation

Many problems can be avoided by using some thought in the original installation of the equipment. First ensure that the metal casing of the gear is soundly earthed to the metalwork of the car, do not rely on the earth at the aerial end of the coaxial cable. Even more important is to take the supply feed to the rig directly from the car battery. Do not pick it up from the auxillary supply which

will be carrying all sorts of pulses, crashes and bangs from various parts of the car's electrical anatomy. Always route the coaxial cable as far away from other electrical wiring as possible and never let it get entangled with all the wiring which lives behind the dash.

Ignition Noise

This is the most obvious source of interference and is heard as a machine-gun effect which increases in speed with engine revs. Most modern cars are fitted with resistive leads to the plugs but these are not always very effective at VHF. The simple answer could be to use right-angled plug suppressors and if these are of the shrouded motor cycle type then the plug insulators will be kept dry and this will reduce tracking noises on the HF bands. Remember that there is also some radiation through the ceramic body of the plug and this can be overcome by using a metal shrouded type of suppressor which earths to the metal base of the plug and so shields it completely. If all else fails there is a form of plug suppressor available which contains an inductive element and is very effective at around 100 to 200 MHz.

High Voltage

The high voltage for the plugs, typically around 20,000 volts, is generated by the ignition coil which is in effect a spark transmitter. It is virtually impossible to keep the switching transient out of the car's cable loom but do ensure that the capacitor which is fitted to the low voltage supply side of the coil is in good condition and well earthed. Special inductive suppressors are also available for use at this point. The high voltage circuit is completed through the battery, not by earth at the coil, and because of this many cars are now fitted with a plastic-cased coil. This allows direct radiation from the coil windings and should be replaced with a metal-cased variety. Even some of these have heavily painted cases and on this type remove the paint from the area under the fixing clip so as to ensure a good earth to the can.

Distributor

There is little that can be done here except to ensure that the points and capacitor are in good condition. In exceptional cases of radiation from this component it may be found that an old tin can cut to fit over it and with suitable insulated holes for the leads to exit from can be an advantage, provided the can is securely earthed. In even more exceptional conditions it may even be helpful to run the plug leads in screened cable with the screening earthed to the can.

Rev. Counter

More cars are now featuring this device in an attempt to create an "image" and there is virtually nothing that can be done to eliminate radiation from the wiring. They may be wired in series or across the ignition system and rely for operation on very fast rising pulses. It is therefore not possible to fit capacitors, etc., to this circuit and is one of the reasons for keeping the wiring to the rig away from the dashboard loom.

Alternator

The noise from this is easily heard by the receiving station as a whine which changes pitch in sympathy with the engine speed. Check that the suppressor fitted to the alternator is still connected at the spade terminal (they have a nasty habit of falling off) and that the earth clip is clean and tight; inductive suppressors are also available for use at this point. If all else fails try connecting an electrolytic capacitor of 2000 μ F or more as close as possible to the point where the supply enters the rig. A further improvement can be obtained by connecting a choke capable of carrying the current demanded by the rig on the supply side of the capacitor.

Instrumentation

Most of the instruments on the modern vehicle are run from a "stabilised" supply which is obtained from a unit which acts in

much the same way as a vibrator, chopping the supply on and off. Make sure that the case is well earthed and fit suppressors to the input and output leads. In very stubborn cases it is usually easy to replace the unit with a home-made electronic stabiliser. Other items which respond well to the capacitor suppressor treatment are the windshield wiper motor, heater blower, the electric fuel pump if one is fitted — and do not forget the electric window motors.

Mechanical Items

Because most of the earth returns in a modern car are made through the bodywork and nearly all the parts are only carrying some of the current it is important to see that the electrical bonding of these parts is secure. There should be a heavy bonding strap between the engine and car body and this frequently gets in a terrible state; as well as causing interference it can be the reason for difficult starting.

The exhaust system is usually mounted on rubber blocks and on most cars forms an excellent quarter-wave aerial on fifteen metres; make sure that it is well bonded to earth in at least two places along its length.

It has also been found that the average car bonnet allows a lot of radiation to get past it due to poor earthing at the hinges. The answer is to bridge the hinges using the outer braiding from a piece of UR67 cable or something similar.

The Battery

All the current taken by the car runs through the battery and its earth strap. If this looks at all suspect replace it with the heaviest piece of strap you can get your hands on. Make sure that all the battery connections and especially the connection between the earth lead and the bodywork are beyond reproach. Keep the battery clean and correctly filled: a partly empty battery will, due to its higher internal resistance, produce higher voltage pulses from the current flowing through it than a correctly filled one will. A poor cell in a battery will cause untold trouble and can also be very difficult to spot. If you are in real difficulty getting rid of interference it is always worth trying a different battery on the car.

Steering

An often unsuspected way of interference getting in is through the steering column. This frequently passes close to the ignition system and usually looks like a quarter-wave at ten metres. Try bonding this to the chassis where it comes through the bulkhead. Build up of static on the tyres can cause a screaming noise particularly at fairly high speeds but can be cured by injecting some anti-static powder through the valve stem into the tyre.

The Aerial

This can itself cause interference due to corona discharge of high voltages built up on the bodywork of the car. If the aerial does not have a spherical tip try soldering a small nut on the extreme end of the rod. It should also be obvious that the aerial should be mounted as far away as possible from all interference-creating equipment consistent with it being mounted somewhere where it will radiate well. The feeder used to connect it to the rig should be heavily screened and routed well away from the car's wiring. If you have mounted your HF aerial on the bumper do not rely on a rusty bolt to give you your earth connection, make sure the bumper is well bonded to the car's metalwork.

Capacitors

The usual way to suppress things is by using a capacitor from the local DIY store. These may work satisfactorily at HF but due to the lead lengths and the internal inductance of the spiral wound plates they may have little effect at VHF. It is well worth while fitting .01 μ F disc capacitors using the shortest possible leads if the ultimate suppression at VHF is required. *Happy motoring!*

Practical, Simple Sideband Part 1

in this special new series, these two very well-known designers and constructors get together to unravel its mysteries

REV. G. C. DOBBS, G3RJV and IAN KEYSER, G3ROO

What is Single Sideband? — by G3ROO

CONSIDERING the number of shacks with general coverage receivers such as the FRG-7700, FRG-7, R-1000, to name but a few, it is very surprising that the age of 'separates' has passed. The ease of use of the transceiver has no doubt played a part in this change, but there are considerable advantages in using separates. These include easier construction and the ability to replace either the transmitter or receiver alone — often with a considerable saving in cost. Consider my second station which consists of a Racal RA-17 receiver and a KW-204 transmitter: total cost on the second-hand market between £150 and £200, depending on condition, and for that you get a station which I would pit against any modern transceiver.

The big problem with this station is its size — it is far from compact! But take a modern receiver, the FRG-7700 or R-1000 for example; these sets are compact and perform tolerably well and will fit in the average living room without looking out of place. If we could add another unit of similar dimensions this would no doubt be accepted by the wife (or husband) and we have our amateur HF station. Unfortunately there is no suitable transmitter on the market and so we are forced into constructing it. I can almost hear the squeals and shudders from here, but hold fire, is it so bad? We are used to seeing these fancy boxes that, if left to their own devices, could almost have QSO's by themselves! But what are we looking for? A simple unit that will generate SSB on one or more bands, will not cost the earth, and will be relatively simple to build.

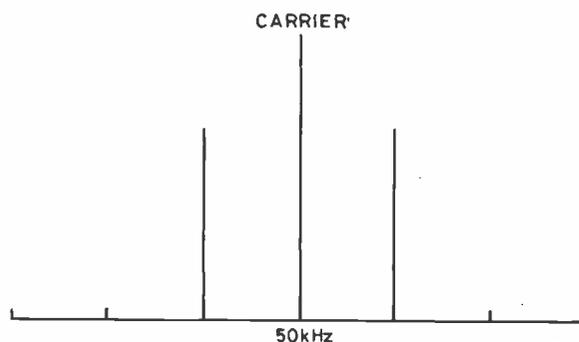


Fig.2 DSBTX Modulated by 1kHz Tone

E 717

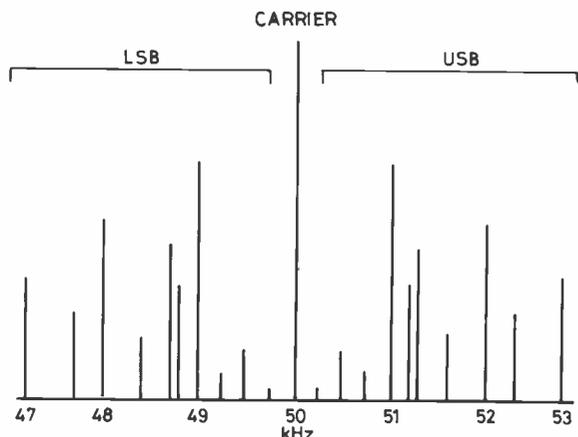


Fig.1 Double Sideband Amplitude Modulated Transmitter Typical Speech Spectrum

E 716

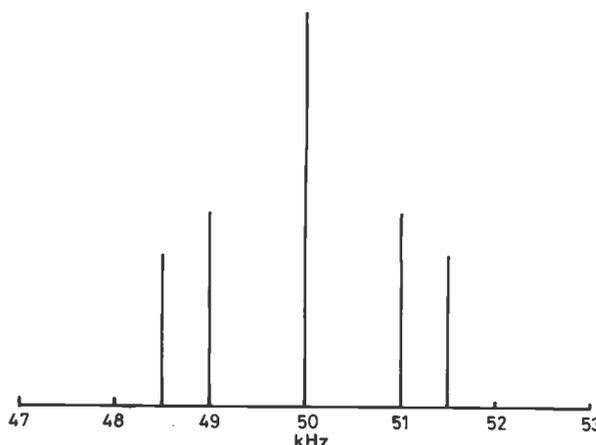


Fig.3 Modulation frequency of 1 & 1.5 kHz
1.5kHz amplitude less than 1kHz modulation

E 718

Before we dive into a suitable design let's have a look at what single sideband is. I have been surprised recently at the large number of club members that really do not know what it is and how it is generated. To get some idea look at Fig. 1. This is a sketch of what would be seen on a spectrum analyser of an amplitude modulated transmitter being modulated by speech at one instant in time; frequency is represented on the horizontal scale, rising to the right, and amplitude on the vertical scale. In the centre we see the carrier signal, to the right we see a bunch of signals which we call the upper sideband, and to the left of the carrier on the low frequency side the lower sideband. Careful comparison of the two sidebands will reveal that they are identical but inverted. If we

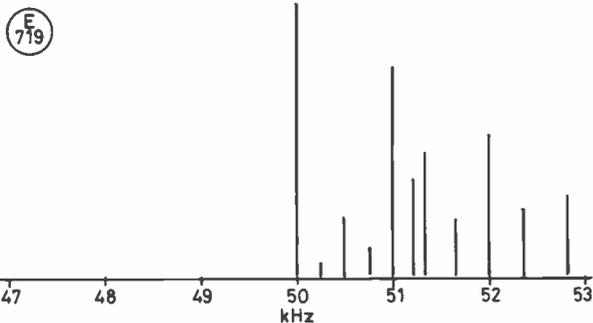


Fig.4 Output spectra of Single Sideband Full Carrier.

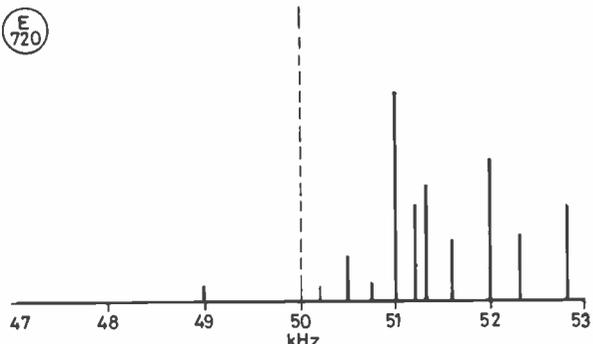


Fig.5 Output spectra of SSB reduced carrier Tx.

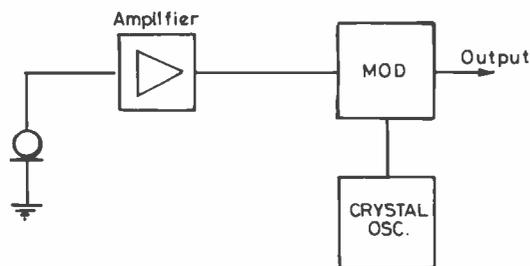


Fig.6 Block diagram of AM DSB Tx

now look at Fig. 2 we see the carrier with two signals of less amplitude and spaced 1 kHz either side: this is the spectrum of an AM transmitter being modulated by a single 1 kHz tone. Fig. 3 shows the same transmitter being modulated by two signals, one of 1 kHz and the second of 1.5 kHz (the 1.5 kHz modulating signal is of lower amplitude than the 1 kHz signal). If we now return to Fig. 1 we can deduce the frequencies and amplitudes of

the individual signals that made up the sound that was modulating the transmitter at that instant in time.

From Fig. 1 we saw that the two sidebands were identical but inverted; if this is the case why bother with both? — they carry the same information but use up valuable power. Remove one and put the spare power into the other sideband and we increase our signal strength; this signal can be seen in Fig. 4. Here we have an amplitude modulated upper sideband signal; notice that we have reduced the bandwidth taken up by the transmitter by almost half and in so doing leave room for another station to operate in the spectrum vacated. But what about that strong carrier signal, do we need that? Not really, it's only function is to supply a signal for the sidebands to beat against and so reproduce the original modulating signal. If we do not transmit this we can always re-insert it at the receiving end and the power saved in transmitting it can be put into the remaining sideband. The resulting signal we transmit is shown in Fig. 5 and when compared with Fig. 1 you will see it is identical to the upper sideband we started with.

Fig. 6 shows a simple block diagram of amplitude modulated double-sideband transmitter that will generate the signal shown in Fig. 1. Fig. 7 shows the spectrum of the output signal. You will notice on the far left-hand side there is the modulating AF signal, in the centre of the AM-DSB signal there is the carrier signal generated by the oscillator and either side the two sidebands generated by mixing the two input signals. The modulator used in this circuit is said to be unbalanced as these two input signals are allowed to arrive at the output. If we now use a single balanced modulator and feed the AF signal into the balanced input the resulting AM-DSB will remain unaltered but the AF signal at the far left of Fig. 7 will disappear. If we now change the modulator to a double balanced device neither of the input signals will be allowed to pass to the output and the resulting output signal will be as in Fig. 8. This we call a double-sideband, suppressed carrier signal.

We are half way there and only used three building blocks! We will continue using our 50 kHz model although in practice it would be a most unsuitable choice of frequency, but more of that later. The important thing to realise is that an SSB signal can be generated anywhere in the RF spectrum providing suitable components are available.

Our double-sideband suppressed carrier signal (DSB for short) now has to be reduced to single sideband (SSB). To do this we pass the signal through a filter that will allow only signals in the range 50.0 to 53.0 kHz to pass, the remainder will be rejected; this can be seen in Fig. 9. Notice, however, that not all the lower sideband has been removed; it is not possible for any electrical circuit to be perfect and there is bound to be some leakage. The important thing is that the unwanted signal must be rejected to a sufficiently low level to be unimportant. In the vast majority of circumstances providing the unwanted signals are reduced by at least 45dB there should be little problem.

We now shift the carrier frequency to 53 kHz with the result as

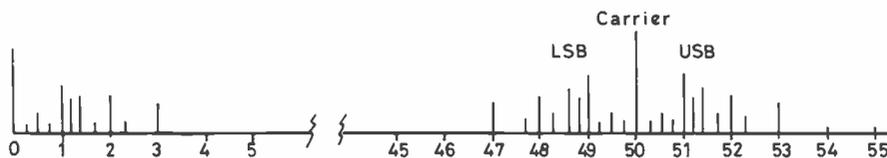


Fig.7 Spectra 0-55kHz of DSB (AM) Transmitter

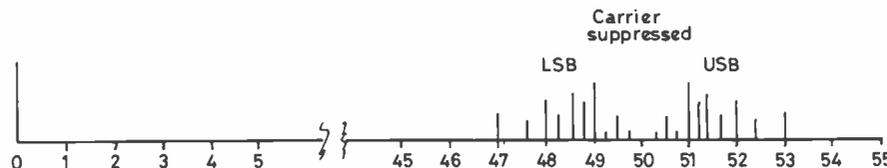
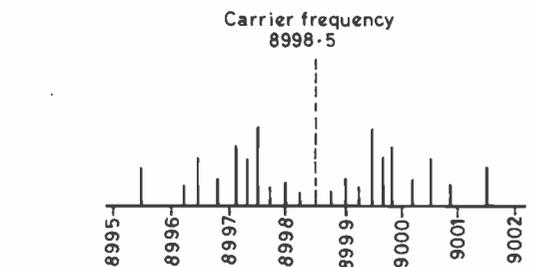


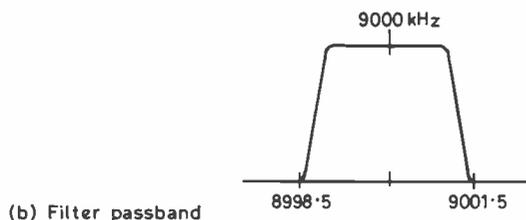
Fig.8 Spectra 0-55kHz of DSB Suppressed Carrier Transmitter using Double Balanced Modulator

E 722

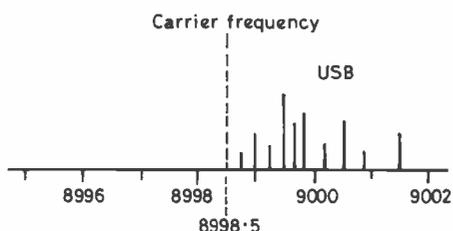
E 723



(a) DSB suppressed carrier from double balanced mod.

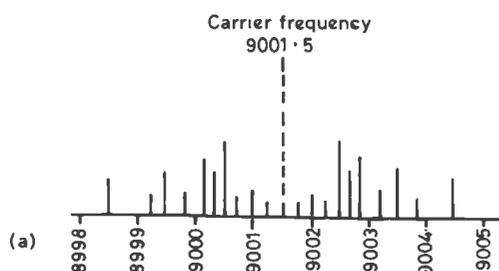


(b) Filter passband

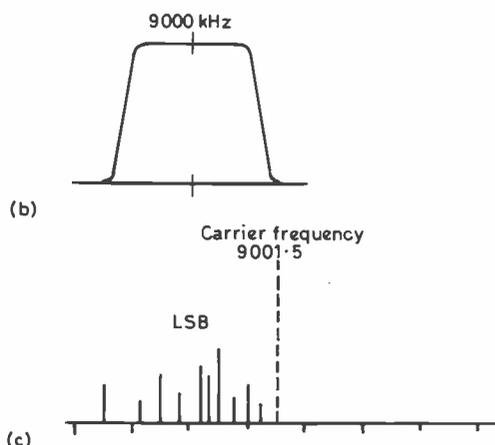


(c) Fig.9 Spectra after passing DSB signal through crystal filter to produce Upper Sideband Signal with Carrier frequency of 8998.5 kHz

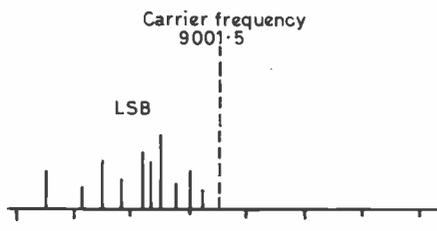
E 724



(a)



(b)



(c)

Fig.10 Spectra after passing DSB signal through crystal filter to produce Lower Sideband Signal with Carrier frequency of 9001.5kHz.

E 725

seen in Fig. 10. If the signal is now passed through the filter the upper sideband is rejected and the lower sideband allowed to pass; this is one method of changing the sideband transmitted. There is another method that can be used and this will become evident later when we cover the mixing process of SSB signals onto the band we require.

Our model has been on 50 kHz, however suitable filters for this frequency are not readily available. At 455 kHz they tend to be expensive, but when we get into the HF spectrum costs reduce considerably and a suitable unit for a simple sideband transmitter can be purchased from IQD Ltd. (North Street, Crewkerne, Somerset TA18 7AR), The PCB will accept three of their units without modification to the board: the 90H2.4B, the 90F2.5B, or a cheaper unit, the 90F2.4L, designed for LSB operation. This filter is in fact centred on 8998.5 kHz and so the carrier crystals will have to be correct for this unit or the component values 'fiddled' to pull the standard carrier crystals onto frequency.

The following design uses the 90H2.4B filter and demonstrates how a single-band unit for any of the HF bands can be constructed with very few complications. The unit could easily be modified so that switching could be included and the transmitter made to work on all bands; however for the novice constructor it would be better to start on a single-band unit and then use the module to upgrade to other bands.

The overall circuit diagram is given in Fig. 11. We will cover this up to the filter and then start on the problem of mixing SSB signals on to the bands we wish to use.

TR1 and TR2 make up a very simple circuit to produce the carrier signals required for upper and lower sideband generation. The filter we are using is centred on 9.0 MHz and the carrier frequencies are therefore 8998.5 and 9001.5 kHz. This signal is fed to the carrier input port of an SL640 double-balanced modulator via TR3, an emitter follower; VR1 is used to set the drive level to the double-balanced modulator for optimum results.

The signal from the microphone is amplified in an SL630 microphone amplifier and then passed to the signal input on the SL640. You will notice that VR2 is also connected to this input via the resistor R6. This is used to slightly modify the bias on this input and in so doing improve the balance of the carrier input port of the device; this ensures that the least possible carrier signal leaks through the device. Balance of the signal input port could be improved by modifying the bias on the carrier input port, however any leakage of the audio signal is not important as it is so far removed from the filter frequency.

The DSB signal from the balanced modulator is then amplified by an SL610. This is not really necessary for the filter specified as the insertion loss of the filter is fairly low — however other filters might be used in the circuit which are not so good and an amplifier

**Table of Values
Figs. 11a & 11b**

R1, R2, R6 = 100K	C17 = 5n2 ceramic
R3 = 220R	C18, C19 = 30pF
R4 = 39K	C20 = 1nF ceramic
R5 = 10K	C34 to C39 = see Table 1
R7 = 4K7	C41 = 100pF ceramic
R8 = about 15K, adjust on test	C42, C43 = 33pF ceramic
R9 = 100R	Reg 1, Reg 2 = 78L08
R10 = 18K	TR1, TR2, TR3 = BC183
VR1 = 220R horizontal preset	IC1 = SL1630 or SL630
VR2, VR3 = 47K horizontal preset	IC2 = SL1640 or SL640
C1 to C12, C21 to C33, C40, C44, C45 = 0.01µF ceramic plate	IC3, IC5 = SL1610 or SL610
C13 to C16 = 2.2µF tant. bead	IC4, IC6 = SL1641 or SL641
	Filter = 90F2.4L, 90F2.5B or 90H2.4B (see text)
	X1, X2 = carrier crystals to suit filter

Note: all resistors ¼-watt rating; filters are available from IQD Ltd., North Street, Crewkerne, Somerset TA18 7AR.

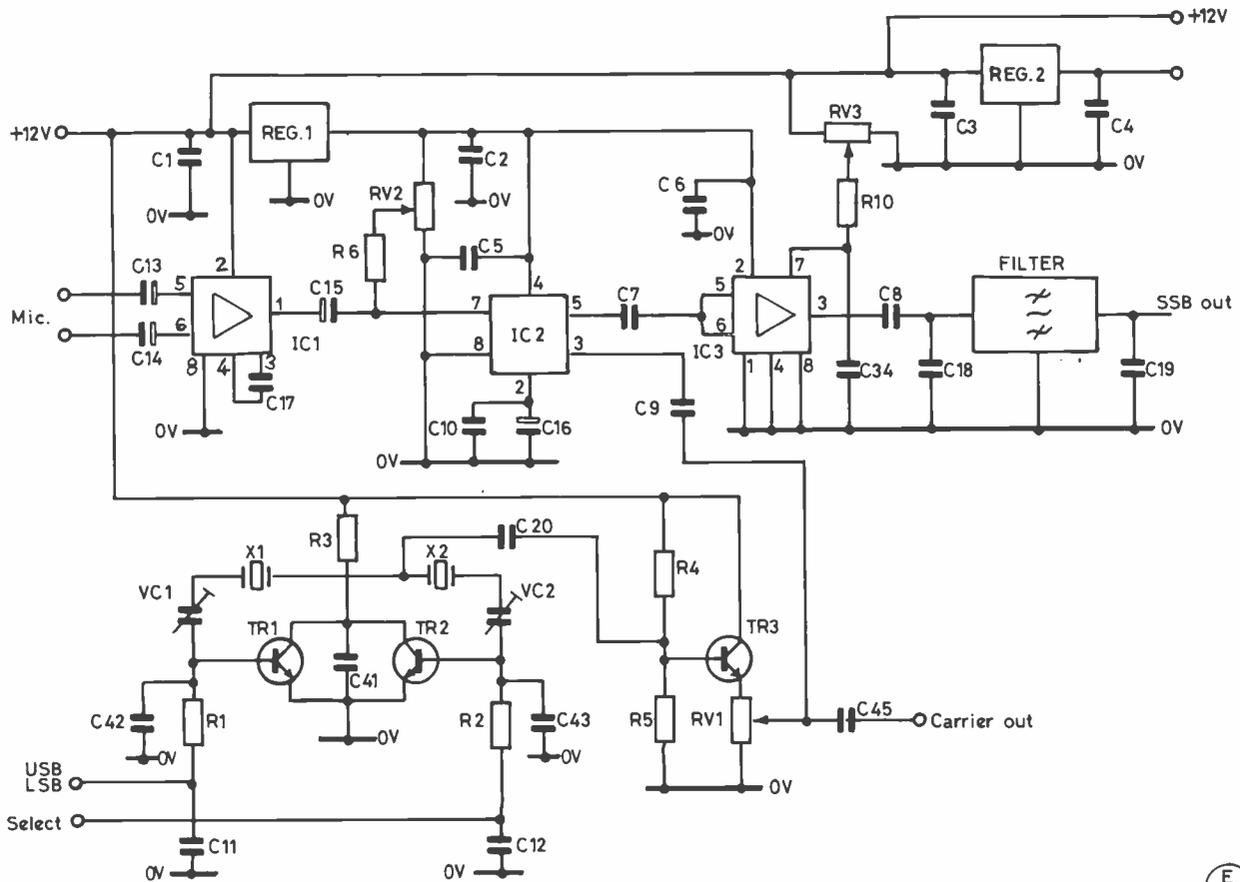


Fig. 11(a) Simple Sideband Exciter Circuit Diagram.

E 726

might be necessary. Preset VR3 is used to set the gain of this stage and should be adjusted 'on air' to the point just below the setting where reports of distortion of the signal are received. Including this provision improved the versatility of the PCB.

Depending on the carrier crystal selected the output from the filter will either be upper sideband with a suppressed carrier frequency of 8998.5 kHz, or a lower sideband signal with a suppressed carrier frequency of 9001.5 kHz.

Mixing the SSB Signals

Having a signal on 9 MHz is of little use to us and we have to mix it with another signal to make it tuneable across the band we require. For this we need a VFO, many designs of which have appeared in magazines over the years. The unit I used is one of my own, which was published in the May 1986 issue of *Short Wave Magazine* and for which a PCB and essential components are available.

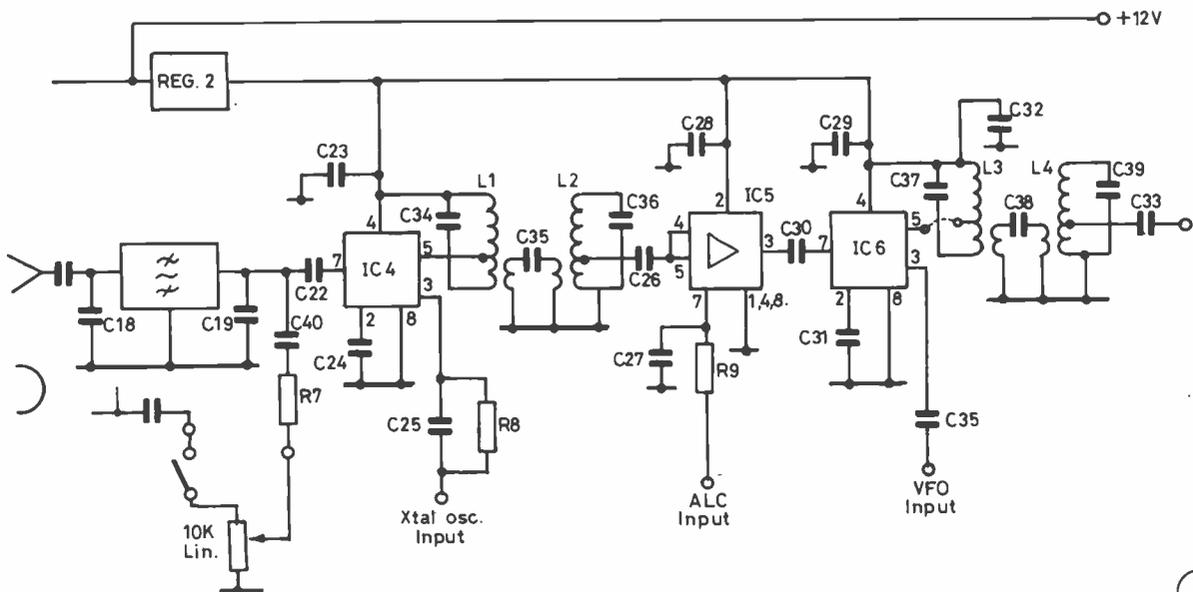


Fig. 11(b) Simple Sideband Mixer Circuit Diagram

E 727

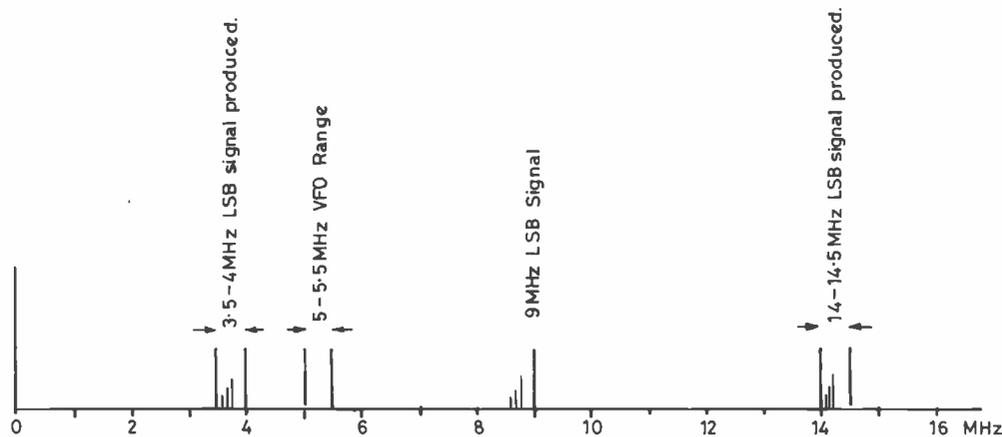


Fig. 12. Spectra produced by mixing 5 - 5.5MHz VFO with 9MHz LSB signal

E 729

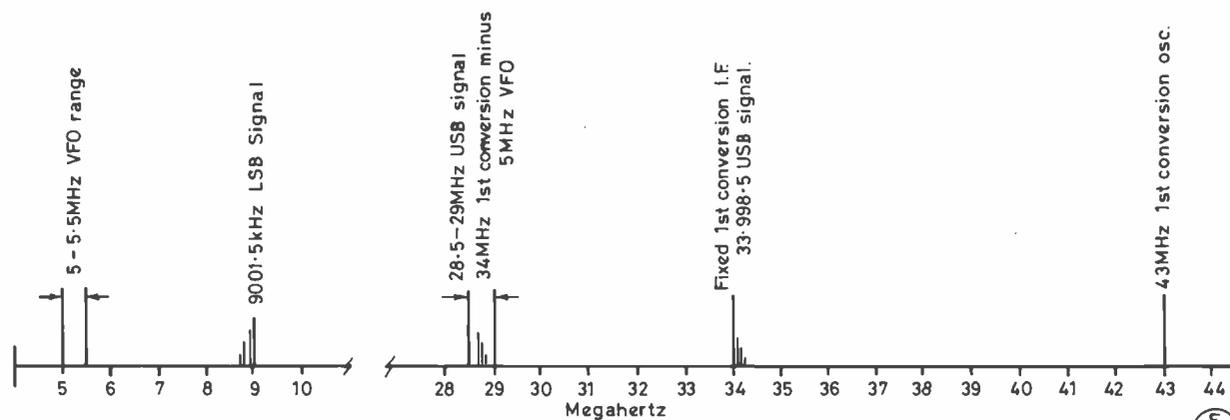


Fig. 13 Spectra of Dual Conversion to HF bands showing sideband inversion.

E 729

If we mix the 9 MHz signal with a 5.5 MHz signal from the VFO we will get the SSB signal reproduced on 3.5 MHz ($9.0 - 5.5 = 3.5$ MHz). If we then change the VFO frequency to 5.3 the SSB signal will appear on 3.7 MHz and this can be seen in Fig. 12. A lower sideband signal on 9 MHz mixed with a 5.3 MHz signal produces a lower sideband signal on 3.7 MHz. If now, instead of subtracting the VFO frequency from the LSB signal, we add the two together we end up by generating a LSB signal on 14 MHz ($9.0 + 5.0 = 14$ MHz and $9.0 + 5.5 = 14.5$ MHz).

It is now obvious that if we mix the 9 MHz signal with the VFO and place an 80-metre filter in the output of the mixer we will have a QRP transmitter on 80 metres, and if we then replace the 80-metre filter with a 20-metre filter we will have a QRP transmitter on 20 metres. A dual band transmitter just by changing a few coils! To obtain USB on 20 metres we switch to the USB crystal in the carrier oscillator.

This is a very simple method of making a two-band transmitter. To cover other bands it is either necessary to change the VFO frequency or to change the SSB frequency of 9 MHz to one that can be mixed with the VFO to give an output on the required band. Fig. 13 shows a typical conversion to get onto the 28.5 to 29.0 MHz band. We first mix the 9 MHz LSB signal with a 43

MHz crystal oscillator. This will generate a 34 MHz USB signal on 34 MHz. . . yes USB signal, we started with LSB on 9 MHz and have ended up with an upper sideband on 34 MHz. Let's prove that before going on. Firstly we convert the carrier oscillator frequency of 9.001.5 and this, subtracted from 43 MHz, produces 33.9985 MHz. Now consider the lower sideband transmitter being modulated with a 1 kHz tone, this will produce an output on 9000.5 kHz (carrier frequency minus 1 kHz). This subtracted from the 43 MHz crystal oscillator produces 33.9995 MHz, 1 kHz HF of the new carrier frequency and therefore upper sideband.

Having selected this signal in an LC filter centred on 34 MHz we pass it to another mixer to mix it with the VFO frequency. The 34.0 MHz upper sideband signal minus the VFO set on 5 MHz will generate a signal on 29 MHz and this will be upper sideband. If in doubt of this, subtract 5 MHz from the carrier frequency of 33.9985 ($43.0 - 9.0015$ MHz) and you will get the new carrier frequency on 28.9985. Now assume that the transmitter is modulated with 1 kHz: that sideband signal will be on 33.9995 MHz. Next subtract the 5 MHz VFO frequency and the new sideband frequency will be 28.9995, 1 kHz above the carrier frequency and so upper sideband. A little bit of a mind bender, but when grasped never to be forgotten!





OBLAST CORNER



NIGEL CAWTHORNE, G3TXF

First Steps in DX-ing

WITH band conditions still being generally poor, oblast chasing provides an interesting challenge for low powered stations and those using restricted HF antennas.

Charles, G4ZZG, makes his first entry with 10 watts of CW to a quarter-wave vertical. Rupert G4XRV uses 20 watts to a 20m. dipole at about 20ft.

CQ-M Contest

Again there is confusion on what the exchange will be in this year's CQ-M Contest (May 10 – 11). In some publications it says the USSR stations will be sending their oblast number, as they used to, and in others that it will again be a serial number as it was last year.

Whatever it is, let us know how you got on in the CQ-M Contest this year.

Oblast Notes

Alan, G3PMR, has been working on a computer data-base for storing his oblast records. Alan queries R2FAA. It's okay — oblast 125 and QSLs have been received.

Paul, G4PWA, has recently received QSLs from the following rare ones: EV7DN (002), UI8ZAA (056), UI8ZAC (056) and UL8JWR (019). A QSO with UL7DA (029) brings Paul's all-time worked total to 172.

Ted, G0BZV, reports the following on 40m. CW: RA9FF, RA9SVL, RL7QA, RU4CG, UA9JCU, UA9XCR, UH8AAW, UI8CAM, UM8MO. Ted is using a TS-830S, a G5RV antenna and a long-wire at 30ft.

Ed, KA2MXO, is working on an oblast beam heading program that will give an accurate bearing for every oblast from your own QTH. More details later.

UI8GAJ (054) was an all-time new one for Mike, G4AYO. Mike also reports working EK0AA (QSL via UA3AOF), UL7KAC (024), UL7YAV (176) and UZ0FWA (153) on 20m. CW. Mike's gotaways include UI9CWA (049), UI8DAA (173), UI9GWA (054) and UA0HAE (106).

Brad, BRS-1066, confirms that the RT5UL/UI operation was from oblast 173 (UI-D) and that the /UJ and /UM operations by the same Kiev City Radio Club DX-pedition to Central Asia were from oblasts 041 and 034 respectively. Brad reports having a field-day on CW recently with many new "In-Year" oblasts being heard on all bands from 160m. to 20m.

John, G4WSX, sent a photocopy of a mystery QSL from UA0BDU. UA0B would normally be oblast 105, but the QSL shows the QTH as Dickson Island which is just off the coast of the mainland. The operator at UA0BDU has filled in the oblast box with "N171". Oblast 171 is the now deleted Arctic region oblast.

Tom, KIKI, (editor of USSR *Tidbits*) reports that plans are underway for DX-peditions to rare oblasts UD6N (002), UM8P (177), UI8T (052) and UI8C (049) by UA9OJ and friends in May. A group from UZ9OWI plans to activate UF6O (015) in June. UJ8R (042) activity is expected by UJ8JCQ in the summer.

Alex, G4UNH, reports QSOs with UL7BY (016) and UL7DA (029) for all-time new ones. Alex missed EK9AD in 114 (QSL via UZ9CWW).

New BRS Numbers

Two oblast chasers report receiving BRS numbers. Frank Dunn has received BRS 88557 and Angela Sitton BRS 88639.

Notes from "Radio"

The December '85 issue of *Radio* includes an up-date on the top 160m. DX scores in the USSR. According to the list four stations (UT5AB, UG6GAW, UB5ZAL and RB7GG) each have over 100 countries confirmed on 160m. UT5AB leads with 133 confirmed and 142 worked. Eight USSR stations are listed as having worked over 100 countries on 160m.

In the 160m. oblast stakes, UA3QGO comes out on top with 165 confirmed 160m. oblasts.

The same issue reports that, in letters to the editor, complaints over the quality of QSL cards are not rare. RA3QRX complains that "cards that we receive do not always have a pleasant appearance. Often they are scraps of paper." He goes on to complain that "acquiring printed cards is very difficult and ordering them from a print-shop is even more complicated."

The same article then goes on to explain how QSLs should be ordered. It says that three copies of a sample QSL card "signed by the radio amateur and confirmed and verified by the seal of the local oblast committee" have to be submitted. According to the same item, QSLs cost 1.7 kopecks each. As of 1



"1980 Olympic Games" cards are still being used by U.S.S.R. stations — six years later!

OBLASTS 'WORKED' TABLE

Station	All-Time	
	1986 (max 184)	Time (max 184)
G4AYO	141	173
G4WSX	99	129
G4OII	97	148
G3PMR	87	112
G0BZV	87	87
G4ZFE	85	103
G4OBK	76	152
G3YRW	60	124
G4ZZG	48	66
G4UNH	43	128
G3TXF	40	172
G4VFG	34	72
G4XRV	26	26
G4YIR	18	43
G4PWA	8	172
G4LZZ	6	76
G4TWX	5	112

OBLASTS 'HEARD' TABLE

Station	All-Time	
	1986 (max 184)	Time (max 184)
Brad BRS-1066	151	175
Frank BRS-88557	132	174
Eddie 9H1-15357	100	136
Tony BRS-87156	97	127
SWL Philip Davies	90	115
Ken BRS-88465	62	62
Maurice BRS-32601	50	148
Norman BRS-28198	42	91
Angela BRS-88639	28	29
Luciano BRS-86766	22	80
SWL Neil Melville	—	153

Table 1. Send your entries for the '1986 in-year' and 'All-time' tables to reach G3TXF by June 30th for the August issue. The 'All-time' table is based on current oblasts only (max 184). An oblast check-list will be found on p. 503 of the February 1986 issue of *S.W.M.* Complete lists of call-signs are not required with the table entries, just oblast totals.

January 1986, the minimum order quantity is 2,000 QSLs. Finally the report notes that orders will be delivered in "not less than four months after receipt". Hardly an 'instant printing' service!

The January issue notes that "hard times" have set in for radio amateurs with there being practically no DX propagation on 21 MHz or 28 MHz. The same article notes that it has even become hard to work DX on 14 MHz. According to *Radio*, the sun-spot minimum is expected around the beginning of 1987. UA3AOW, writer of the "Propagation Predictions for March" column in *Radio*, says that the next sun-spot maximum is expected to occur in 1990, but "that it will not be a high one".

The same issue shows a picture of special activity station UQ0GZZ which was on the air from Latvia last August.

According to an item in the Russian weekly newspaper *Soviet Patriot*, about 10,000 USSR and foreign stations applied for the "Victory-40" award. If that is so, U.K. claimants appear to be getting low serial numbers on their Victory-40 awards. Jim, G3DKO, reports getting number 405.

Polar Activities

An article called "On the air — The Arctic" in the 5 February issue of *Soviet Patriot* gives some details of a recent winter polar trekking expedition. The expedition carried an SSB rig weighing 1kg, running 10 watts. The polar trekking group used the callsigns EK0KP and EK0AJH. Camp base stations used the callsigns



One of the many types of 'standard' QSL formats used by U.S.S.R. stations: this one depicts the "Radio" series of amateur satellites.

4K0COC (located on drifting ice), EK0DR, EK0GZ, UZ0QWF and UA0QCG. The report notes that daily skeds were maintained with the Moscow station UK3KP (club station of a newspaper) between 12 – 14z on 14182 kHz or 14280 kHz.

K1KI notes that the polar operation finished in early March and that they have probably returned to the mainland by now.

John, G3YRW, reports a QSO with UW0AJ in the Arctic seaport of Dudinka in mid-March, where the outside temperature was minus 36°C!

Franz Josef Land

Further mention of Franz Josef Land operations is made in the 19 February issue of *Soviet Patriot*. UA1OT is reported as operating on Fridays beginning at 1900 GMT on 1,835 kHz. Both UA1OT and RW1OWA are active on both 80m. CW and SSB. QSLs for UA1OT go via UB5KW.

Satellite News

The February 1986 issue of *Radio* says that of the six "Radio"-series satellites placed in orbit at the end of 1981, only two ("Radio-5" and "Radio-7") are still in operation. Plans are already in hand for a new series of USSR amateur satellites. New modes including up-link reception on 21 MHz and down-link transmission on 144 MHz and 432 MHz are planned for the next generation of amateur satellites.

Table Entries

Send entries for the "All Time" and the "1986 In-Year" oblast heard/worked tables and CQ-M reports to reach G3TXF at Holt Cottage, Kingston Hill, Kingston-upon-Thames, Surrey KT2 7JH, by June 30th to appear in the August issue.

Many thanks to Tom K1KI (USSR *Tidbits*), RSGB *DX Newsheet*, IARU/ARRL, and Dex, W4KM, for items extracted. Good hunting and DSW!

VHF BANDS

NORMAN FITCH, G3FPK

ONCE again conditions have been rather uninspiring but *Sporadic E* propagation has been observed on the lower VHF's with some Portuguese stations appearing on 50 MHz in early May. There was a reasonable *Aurora* on May 2 but tropospheric conditions have been very mediocre.

Class B Morse

In a press release received on May 2 from the *D.T.I.* Class B licensees were granted permission to use CW on the bands they are presently permitted to transmit on; *i.e.* 144 MHz and up. Thus, CW becomes a permanent feature of the licence, it no longer being necessary to apply for a variation on an individual basis. The press release included the following:- "In order to minimise inconvenience to other band users, it is recommended that Morse operation should be in accordance with the *RSGB* guidelines. These guidelines are available from the *RSGB* on request."

The *RSGB*, in its GB2RS News Broadcast on May 11, included the following passage:- "... the guidelines that were drawn up as part of the Morse experiment still apply, the most important of which are to identify the station in Phone and *not* to operate within the CW sections of the bands. Operation should be restricted to the *all modes* sections of the bands." As far as 2m. is concerned, the all modes section is 144.500 to 144.845 MHz and it is perhaps worth mentioning that this is a non-channelised part of the band. One "teach-in" uses 144.510 MHz using SSB mode and this is a very sensible choice in the compliance with the *RSGB* guidelines. It is hoped that those daytime nets which have been using the SSB part of the band will now follow suit.

Packet Radio

The *RSGB*'s VHF Committee has agreed two 2m. frequencies for an experimental packet data repeater network. These are 144.650 and 145.275 MHz but are not the usual input and output frequencies. Data relays will receive and send on the same frequency. Any group interested in establishing an experimental packet radio repeater should contact Mike Dennison, G3XDV, the Chairman of the

Repeater Management Group; he is *QTHR*.

Your scribe would appreciate reports from readers on VHF packet radio operation. As observed at G3FPK, there is a fair amount of activity on 144.675 MHz and it would be interesting to learn who is doing what and with which systems. Locally, G4APL and G8DTQ in Caterham are using PR.

Awards News

Congratulations to Bernd Westphal, DH4AAE, from Peine in West Germany, who is member no. 64 of the 144 MHz QTH Squares Century Club. His certificate was issued on May 12 and he has exactly 100 squares confirmed. All QSOs were on SSB, one *via Es*, the rest by tropo. His QTH in FM52j is between Hannover and Braunschweig. Unfortunately no personal, QTH or station details were included in Bernd's application.

Bob Ainge, G4XEK, from Cheadle (SFD) is member no. 59 of the QTHCC and was awarded his "125" sticker on April 22. The 25 new squares were worked by six on CW and 19 on SSB, 18 being on tropo., five *via Es* and two *via Ar* propagation.

Although it should not be too difficult to work 100 stations on 70cm. these days, it is surprising how few VHFCC certificates have been issued. The latest member of the Club is Roger Betts, G1EHJ, from Tamworth (SFD) who is member no. 40 and whose certificate was dated May 10. His personal, QTH and station details were published on page 454 in the January issue. The QSLs were from all the U.K. prefixes except GM, plus D, F, ON and PA. Since your scribe took over VHF B in 1975, only 22 70cm. VHFCCs have been issued.

Another 2m. VHFCC certificate has been issued and no. 382 went to James Cooke, G6TYB, from Winstanley, near Wigan. The date was April 12. He knew about the hobby for many years but it was an Open Day at the Wigan College of Technology that set him on the road to becoming a licensed radio amateur. He took the *R.A.E.* in December 1982 and got his licence in the following February. The QTH is three miles southwest of Wigan at 250ft. *a.s.l.* and he shares the shack with his wife, Glenys, who is G4WDC. The 2m. gear comprises a *Yaesu* FT-290R transceiver, *Microwave Modules* MML144/30 amplifier and a *Welz* Diamond GH22 colinear antenna and 8-ele. horizontal *Yagi*.

For details of the QTHCC and VHFCC awards, send an *s.a.e.* to the Welwyn address. If you are nearing 100 squares confirmed, or already have enough, there is an application form which goes with the rules. About other awards, one of the more worthwhile series is the German national society's "UKW-Europa-Diplom" which comes in four classes. It is

based on a countries worked and points system, and Class 3 requires 10 countries and 60 QRB points; Class 2, 15C and 95pts; Class 1, 20C and 130 pts. and the Trophy class, 30C and 300 pts. The rules are too lengthy and complicated to list here but an english version is available. Any reader interested should send an *s.a.e.* with IRC to:- D.A.R.C., UKW-Referat, Diplom Manger, Georg Grahle (DL4OL), Erlengweg 7, D-3201 Holle 4, W. Germany.

Beacon Matters

The 2m. beacon band plan was mentioned last month following the *D.A.R.C.*'s idea that it be drastically cut. Brian Bower, G3COJ, who coordinates the VHF/UHF *IARU* Region 1 beacons, has written to say that the *RSGB*'s VHF Committee met on April 19 and discussed this topic and agreed that the band will, "... have to be smaller and the *RSGB* will be submitting a paper to this effect to the *IARU* Region 1 conference next year."

Brian recalls that the present 150 kHz 2m. beacon band was the brain child of the Scandinavians and he was surprised it was agreed to. Also, the plan was for beacons over 50W *e.r.p.*, the lower power ones being regarded as uncontrolled and as signal sources. He suggests that these uncontrolled beacons could, in future, be 5W *e.r.p.* and less.

"VHF Bands" deadlines for the next three months:—

July issue—June 4th
August issue—July 2nd
September issue—August 6th

Please be sure to note these dates.

Space News

The following information has been abstracted from various *University of Surrey* and *AMSAT-UK* publications. First, the Soviet scene. The old *RS-1* orbiter is in full sunlight again and is being heard continuously on 29.401 MHz sending "55" on CW. All the letters have been replaced with the digit 5, so the telemetry is quite meaningless. *RS-9* has been having a few problems under test but *RS-10* is ready for launch, which could be in late May. The transponders in *RS-5* and *RS-7* have been on full time recently but the next eclipse periods started on May 23 for *RS-7* and May 27 for *RS-5*, so transponder availability will now be curtailed. This eclipse period will last till early August and it is suggested that, with careful management by control stations *RS3A*, and sensible use by amateurs, there is every possibility that these satellites will be useful for some time yet.

The *AMSAT Phase 3C* spacecraft building and testing is progressing and

thermal vacuum testing was scheduled for May 10. *AMSAT-DL* members are heavily involved in the project but communication between them and the *AMSAT-NA* team in Colorado is suffering from the language problem and the fact that there is no electronic mail service in Germany. An article by Werner Haas, DJ5KQ, describing 3C in detail was published in *Oscar News* No. 59 from *AMSAT-UK*. This confirms the various transponder and beacon frequencies given in VHF-B, April issue, and quotes ground station requirements for reliable operation.

Now to *Oscar-10* and news of the latest transponder schedule till Aug. 15 advised by Ian Ashley, ZL1AOX, who is the Ground Control Station in New Zealand. As usual, the figures are the *Mean Anomalies* and are:- 050-119 Mode B; 120-136 Mode L; 137-199 Mode B; 200-219 Off; 220-244 Mode B; 245-049 Off. As the sun angles and eclipse times change, there could be minor amendments to this schedule and any will be broadcast over the appropriate beacon on 145-810 MHz.

The *D.T.I.* has granted permission for the broadcasting of GB2RS/AMSAT news bulletins on 0-10 any day of the week. Prior to this, only Sundays were authorised, which was often inconvenient.

In *UoSAT Bulletin* no. 174A there was an item concerning ACSSB, which is a rather efficient compressed system of voice transmission. Ed Nowak, W1FAJ, from Farmington, CT. has completed a "Level 2 ACSSB 0-10 Mode B Station" and is anxious to conduct experiments with anyone similarly equipped. Level 1 uses compression at the Tx and expansion at the Rx, but Level 2 ACSSB, to quote from the piece, "... uses the compression/expansion and a companion subcarrier. The subcarrier provides a constant signal for receiver frequency lock, and it also carries information about the level of compression being applied at the transmitter. This information can be used by the receiver to apply the correct amount of expansion. The equipment is based on surplus *Sideband Technology Inc.* ACSSB equipment Ed obtained last year from the *ARRL* as part of Project Companion." This sounds all very hi-tech and a quick look through the five year cumulative index in *Ham Radio* revealed no clues although your scribe does recollect something being read in one of the numerous magazines that accumulate in the office.

John Acton, G1DOX, (CBA) is the only reader who admits to operating through 0-10. On Apr. 14, he worked DG4AW (JO52CC), LX2GB in Luxembourg City, DD5GP in Rottwil and 4X4IX in Tel Aviv, the latter a new satellite country. No doubt the lack of reports is due to the very limited availability of the satellite in the evening hours. However, insomniacs and those able to operate in the daytime could have

long access to 0-10 from May 18 for a week or so.

Contests

The 1,296 MHz Trophy Contest is on May 31, 1600-2400, for fixed and all-other stations. On June 1, the 432 MHz Trophy and SWL event takes place, 0900 to 1700, for fixed, all-other and SWL stations. The third legs of the Microwave and 10 GHz *Cumulatives* are on June 15, 0900-2000, the microwave band this time being 3.4 GHz.

Further afield, the 9H VHF/UHF/SHF Group is promoting its annual contest from 0001 on June 1 to 2400 on June 15 to coincide with the usual peak of the *Es* season. British Isles stations need to contact one Maltese station on 2m. in this period to qualify for an entry. All other QSOs with other stations count for points at one *per* kilometre, but any 9Hs worked are worth double points. No serial numbers are necessary but obviously QTH locators must be exchanged to enable points to be calculated. The same 9H station can be worked more than once provided it is on a different day. Entries should go to P.O. Box 31, Valletta, Malta by July 15.

The Italian national society, the *A.R.I.*, has several VHF/UHF contests in June. The 2nd International DX affair going through the whole month for *Es*, MS and FAI QSOs. The 10th Alitalia Field Day is on June 7, 1300-2200 and June 8, 0500-1100. The 10th Citta di Messina event is on June 28/29, 1400-1400, all of which are good news in case of *Es* openings on 2m.

Erik Gedvilas, G8XVJ, wonders if more news of overseas contests could be published in VHF-B. Your scribe would be delighted so to do, but without information from any organisers, this cannot be done. So, if any readers should acquire details of such contests or activity periods, please send them along. In the May 3/4 contest, Erik was out portable with the Warrington group in IO93AD only to find that another group, G4CQR/P, were just a kilometre away and had journeyed 200 miles for the event. Naturally, with the Warrington station G4RNL/P on 70cm. running 400W to eight 21-ele. *Yagis* and the others using 200W to four 21-ele. *Yagis*, both suffered from overload problems. Therefore Erik wonders if a register of portable sites could be established, presumably by the *RSGB*, so that this problem could be avoided. After all, not everyone knows that a particular group usually operates from a certain site.

Sporadic E

Although the *Es* season usually starts at the beginning of June on 2m., it begins rather earlier on the lower VHF. Jim Rabbitts, G8LFB, is a keen Band 1 TV watcher for such propagation and saw his

first pictures on Apr. 29 from Spain on Channel E2, between 1100 and 1130, and again at 1145. Also, there was reception from the German transmitter at Grunten (FH32j) on E2. On the 30th, Italian TV was received from 1145 to 1215. On May 7, Russian TV was found for 45 minutes in the morning. On the 9th, more Spanish TV with a 6m. opening to Portugal from 1800-1815. Between 1500 and 1700 on the 10th, there were two 15 min. periods of Italian TV. On the 11th, there was a 6m. opening to Iberia.

Six Metres

Bo Christensen, OZ1DJJ, is now in Greenland for a year or so and has the call OX3LX. He is QRV on 6m. with 150W and a 5-ele. *Yagi*. He has rejuvenated the beacon OX3VHF (GP60QQ) on 50.045 MHz. Bo's QTH is on the southern tip of Greenland at about 46.6°W, 60.7°N, about the same latitude as Bergen in Norway and Yell in the Shetland Is.

Paul Turner, G4IJE, (ESX) has been active on MS and completed QSOs with the following stations in April:- 6th, LA6QBA 26 26 15 mins; 12th, GM4YPZ 26 27 10 mins; 17th, GM4FDT 27 27 35 mins; 19th, GM4YPZ 26 26 8 mins; 22nd (*Lyrids*) GM4FDT 26 27 8 mins; 26th, LA6QBA 26 26 6 mins; and again on the 27th, 29th, 30th and May 1 in 6, 10, 5 and 4 mins. respectively. On May 1, Paul worked LA2AB in Oslo, 26 26 in 10 mins. All these QSOs were on SSB using one minute periods and illustrate how easy MS contacts are on 6m. even with low *e.r.p.*

Rod Burman, G4RSN, (BRK) was encouraged to try MS by G4IJE and his first success was LA6QBA on Apr. 30. QBA was worked again at 0536 on May 5 and there was a two minutes burst which permitted a brief, tropo-type QSO. The conventional MS contact was completed in less than ten minutes. Rod has heard that CT1WW is building a big amplifier for 6m. John Jennings, G4VOZ, (LEC) is one of several operators complaining about the lack of activity on the band.

Mike Johnson, G6AJE, (LEC) has been working 6m. stations crossband to 70cm. and comments on the high standard of operating compared to that on 2m. He reports QSOs with G4VOZ, G5UM, G4XEN, G4GVC and G4JAI, all locals.

Jonathan Eastment, GW4LXO, (GNS) has built the *Practical Wireless* "Meon" transverter but found that several tuned circuits would not tune to 50 MHz. He fitted 10pF miniature ceramic capacitors across C5, C8, C12, C35 and C38 on the print side of the board. Next he discovered that the amplifying stage TR5 was not amplifying due to insufficient drain/source voltage. This was cured by changing R32 from 470R to 150R. After these mods, it worked fine, but he added a regulated supply because the original design has no on-board regulated supply for the crystal oscillator and buffer stages.

ANNUAL VHF/UHF TABLE

January to December 1986

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G1KDF	—	—	87	14	55	8	18	3	185
G1DOX	—	—	66	7	38	4	19	3	137
G4NBS	—	—	49	14	45	7	8	2	125
G6HKM	—	—	58	10	27	7	—	—	102
G4YCD	—	—	63	10	21	2	—	—	96
G1EHJ	—	—	49	6	36	4	—	—	95
G4MUT	24	2	31	8	23	5	8	1	93
G4WXX	—	—	79	14	—	—	—	—	93
G0CUZ	—	—	49	20	16	2	—	—	87
G3FPK	—	—	72	15	—	—	—	—	87
G4SEU	31	3	14	3	23	2	—	—	76
G1SWH	—	—	64	6	—	—	—	—	70
G4VOZ	36	3	—	—	28	2	—	—	69
G6XRK	—	—	58	9	—	—	—	—	67
G4TGK	—	—	50	8	—	—	—	—	58
G6OKU	—	—	31	5	18	1	—	—	55
G6AJE	—	—	7	5	31	4	3	1	51
G8XTJ	—	—	42	8	—	—	—	—	50
G1PDW	—	—	43	7	—	—	—	—	50
G4YIR	—	—	40	6	—	—	—	—	46
GW6VZW	—	—	40	6	—	—	—	—	46
G4DEZ	—	—	24	8	—	—	4	1	37
GW4HBK	30	3	—	—	—	—	—	—	33
G1HGD	—	—	10	2	11	2	—	—	25
G4TIF	10	2	6	3	1	1	—	—	23
G2DHV	2	1	9	1	—	—	—	—	13

Three bands only count for points. Non-scoring figures in italics.

Jonathan's first QSO, using a dipole in the shack, was with G3PTO in Chipping Sodbury. Stations heard are G3FYX, G4DGU, G4OXY, G4PHZ, G4RQI, G4UPS, GW2DPD, GW3CBY, GW4BCD, GW4HXO and GW4VVX. An amplifier is under construction and an outdoor beam will follow later.

On May 9, there was a brief *Es* opening to Portugal from 1800 to 1815. CT1LN, CT1AWO and CT4PO were reported active by G5KW and G4IGO. On May 11, Ken Ellis, G5KW, (KNT) heard EA1CDR calling "CQ" on 10m. for crossband QSOs, listening on 50.102 MHz. The EA was working duplex so the stations who were calling him on 6m. and who were getting through could be heard. Ken called for a long time but never made it. However, several westerly G and GW stations did. CT1LN was heard calling "CQ" at 1830 and did come back to G5KW who got an RST 559 report.

"Lefty" Clement, KITOL, (Maine) monitors Russian TV Channel R1 on 49.75 MHz to see if the band is open to Europe. During June, he finds it is almost every day but comments that we must come on the band to 'make noise' otherwise we could be missing out. Your scribe would expect there to be frequent *Es* openings to the south, particularly in the late afternoon periods, and that from late evening beaming northwest to North America is bound to produce results occasionally. KITOL will be looking for GD, GI, GM and GU this year and would also welcome a QSL card from Chris Bartram, G4DGU, whom he worked last July.

Four Metres

Only two readers submitted 4m. news this month. John Jennings, G4VOZ, (LEC) reports that activity held up well in April, although not much 'real DX.' G4HRY appeared on Mar. 26 and once or twice since, Dave being the only 4m. station currently active from Coventry. John reckons that if it was not for the steadfast activity by G3CUN in Birmingham, the West Midlands would be quite a rarity. Best DX was G4WND/P (NLD) in IO95AF on SSB on Mar. 30.

John used the G8LM call from his home QTH for the Apr. 20 contest working 33 stations in 2½ hours of operating. Nothing was heard from GD, GI, GJ or GU. After the contest, he worked G4SEU/P (YSW) and also managed an FM QSO using horizontal polarisation. G4ENB (BFD) was using the GB4MTR call up to Apr. 22 and had a lot of people looking for him. David Butler, G4ASR, was scheduled to use GB4MTR till June 17. From June 18 to July 15, G13ZTL (LDR) is due to operate the call, after which it will be the turn of GM4ZUK (GRN).

After nearly a decade, Pat Billingham, G4AGQ, (SRY) is back on 4m. but finds computer QRM rife, plus illegal cordless

telephones at certain frequencies. His CW Ladder entry includes eight stations worked in April.

Two Metres

Alex della Casa, G4YNO, (FE25e) wrote on Apr. 22, very kindly enclosing a QSL for G3FPK from I2KSX/8. He says that the big Feb. *Ar* penetrated to the I3 district but, as such events are very rare, few operators understood the "bad modulation" effect. He reports March/April conditions, as 'nothing spectacular' the only interesting QSO being an MS one with G0CUZ (YM) on Apr. 21 using one minute periods in SSB. The sked was completed in 40 mins. with 4b, 6p, the longest burst being about three seconds at S6. Skeds with GW4SWM and G6WYZ only produced a few pings. G4YNO uses a *Trio* TS-830S, *SSB Electronics* transverter and a 4CX250B amplifier. A BF981 Rx preamp. is used, the antenna now being a 20-ele. long *Yagi*, boomlength 9.15m. He says that I4BXN uses eight of these for *E-M-E* and that I2ODI has designed a 17-ele. *Yagi* on a 10m. boom. Alex did not mention any claimed gain for the latter, but it ought to be around 14.5 dBd.

Mike Honeywell, G0ABB, (HPH) now has his 17-ele. *Yagi* at just over 45ft, thanks to assistance from G4YBO, G0DXY and G0ESE. He is still running his *Mirage* amplifier off car batteries and has added 39 more CW stations to his ladder total in April. In an *Ar* on May 2, he worked SM4KYN (JO79) at 2342 but heard little else. Colin Morris, G0CUZ (WMD) has devoted most of his operating to CW MS mode, all skeds. He completed with in April;- 5th, OK2PZW (IJ) and HG8VF (JG), 6th, OK1DAC (HK), 20th, SP6FUN (IL) and YU3MQ (HF), 24th, EA5EMM (ZZ) and IK0FEC (GD), 30th,

F6DRO (AD). And in May;- 3rd, IW2BNA (EF), 4th YU3TS (HF) and on the 5th, TK/DK6AS (EB) in Corsica and from whom a 70s. burst was received. Colin did not complete with DK0TU (GM) at 1,600 *l.p.m.* or with UP1BWR (MO) a long haul sked which did, however, produce several pings and burst from the Russian's 200W and 13-ele. *Yagi*. Colin has some interesting comments on MS which will be aired later on.

G1DOX (CBA) can work Irish stations with apparent ease. On Mar. 31, he added G14SXV (TYR), E19FE (Tipperary), E14GA/P (Cavan), E13CWB/P (Wicklow), E16AS (Dublin), E15KK (Cork) and E18FV/P (Leix). Other new ones for the table were G6URX (TWR) on Apr. 6 and G11BIW (ARM) on the 10th. Bob Nixon, G1KDF, (LNH) found G14OWA (LDR) on Apr. 19, G0AEA (IOS) on the 28th and, in a lift to Guernsey on the 30th, GU4WRP with others heard between 2200 and 0030. In the May 2 *Ar*, from 1630 to 1845, about eight GMs were heard, and worked were GM3JIJ (WIL), GM1KHU (GRN) and GM4SUF (HLD). In the contest on May 3/4, numerous F, ON and PAs were worked. Bob says that G11RGN is a good signal from Co. Tyrone now, and that EI stations have an activity period every Monday evening on 2m. and 70cm. from 8 to 10 local time. Also, G14KIS comes on from rare counties and WAB squares on Saturday mornings.

Ian Rose, G1PDW, (ESX) added EI and PA to his 1986 countries tally. Distant new counties included GW4RRA/P (PWS), GW4PCS/P (DFD), G1DOX (CBA), G0AEA (IOS) and E13GE (Wicklow). Welcome to Gerry Schoop, G1SWH, from Wigan (MCH) who has been licensed for three months. He uses a *Yaesu* FT-290R with *muTek* front end, an *MM* 100W amplifier and 19-ele. *MET*

Yagi at 30ft., the QTH being 330ft. *a.s.l.* He enters the Annual Table with 70 points and, in the Irish contest on Mar. 30, he worked nine EIs including EI6EF (Longford), EI5FK/P (Cork) and EI9ED/P (Meath).

J. Challenger, G4EIB, (WMD) runs 30W of CW to a 14-ele. *MET Yagi* at 45ft. his QTH being 750ft. *a.s.l.* On Apr. 25 he had a 30 mins. QSO with EI4GA near Dublin and on the 26th, a 35 mins. chat with G0ABB. Terry Hackwill, G4MUT, (BRK) discovered the *Ar* on May 2 at 1705 but only weak GMs were about. He worked GM3WYL in Glasgow at 1740 and GM3UFD (ZR) at 1823, QTE 30°, the event disappearing at about 1845. Ian Cornes, G4OUT, (SFD) sent in his usual neat computerised list of CW stations worked of which there were 11 new ones in April.

Ray Baker, G4SFY, (NOR) found conditions "pretty dismal" in the IARU Contest on May 3/4, best DX being to EL square, DLORBW, and from DJ, DF0AP. John Wimble, G4TGK, (KNT) lists the only DX of note as G0AEA, G6YVB (HBS), GU1PMY (GUR) and G8ZVM (CNL). He noticed a slight westward lift on Apr. 30. Martin Lowe, G4YCD, (AVN) had not written for a while so mentioned he worked 40 stations in the Feb. *Ar*, mostly G, GI and GM, but also OE5OLL (GI) on SSB and OE3JPC (II) on CW. He worked six GMs in the May 2 *Ar* in five different squares on SSB between 1700 and 1845.

June Charles, G4YIR, (ESX) quotes G1DOX as the best DX in a very poor month. Nothing new was found in the *Barking Club's* contest although she did hear, "... glowing reports of the EIs worked." Colin Ford, G4ZVS, (WMD) reckons conditions must have improved from the last half of April and beginning of May as he worked F6FLB twice on the 20th, the following weekend bringing GM4BES (DLG). On the May 3/4 weekend, three DLs were heard on CW and P14L1, none of whom seemed to want to work him.

G6AJE (LEC) had to wait till Apr. 20 to work his first continental this year in the shape of ON4ADC who was participating in a contest, but Mike heard no others. Ela Martyr, G6HKM, (ESX) found conditions up on Apr. 30 and for the first few days of May and she added nine more counties to this year's total. She contacted a number of PA and D stations, too. Ela has pointed out an anomaly in the *RSGB's* counties lists. In each January's *RadCom*, the Isles of Scilly are listed separately from Cornwall, with the code letters, IOS. But in the rules for its awards, Cornwall and the Isles of Scilly are lumped together, as they are in the latest information in their *Call Book*. As far as our tables are concerned, Scilly counts in addition to Cornwall, just as Sark and Alderney are additional to Guernsey.

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
G3PO1	—	—	448	448
G3IMV	—	108	383	491
G4IJE	—	—	338	338
G4KUX	—	36	301	337
G8GXP	9	133	290	432
G4ERG	—	16	278	294
9H1CG	—	—	276	276
G4DHF	—	—	272	272
G3BW	15	38	269	322
G4DCV	25	71	248	344
GM4IPK	—	—	245	245
G4DEZ	—	—	242	242
GJ4ICD	59	117	239	415
GW4LXC	45	98	235	378
GW4TTU	37	87	227	351
G8KBQ	34	99	214	347
G3UVR	61	106	213	380
G3FPK	—	—	212	212
G4NQC	61	90	211	362
G8XVJ	—	86	211	297
G4RKG	28	86	204	318
G4XEN	—	84	204	288
G4SFY	—	—	203	203
G4MCU	25	82	201	308
G3PBV	41	106	200	347
G4MEJ	—	—	198	198
G4OAE	—	46	195	241
G6ECM	—	—	194	194
G8LFB	—	—	189	189
G1EZF	32	85	182	299
G4IGO	—	—	181	181
G0CHE	—	—	181	181
G6HKS	—	58	180	238
G3XDY	70	123	176	369
G3COJ	43	99	174	316
G4TIF	—	104	173	277
G3JXN	77	119	172	368
G6XVV	5	40	172	217
G4YUZ	—	—	168	168
G6DER	53	95	164	312
G4BWG	—	68	160	228
G4MJC	—	18	160	178
G4DOL	—	—	148	148
G6CMV	18	53	144	215
G4XEK	—	—	143	143
G6HKM	—	88	136	224
G8HHI	23	96	135	254
G4MUT	16	86	134	236
G6MGL	45	83	133	261
G4NRG	5	47	132	184
G6DZH	—	79	130	209
G8ULU	36	91	127	254
G8TFI	79	141	126	346
G8PNN	53	91	126	270
GJ6TMM	—	22	125	147
G4HFO	—	70	120	190
G6JNS	5	53	119	177
G8ZDS	—	41	119	160
EI5FK	—	—	118	118
G4VPM	—	46	117	163
G0CAS	—	—	115	115
G1KDF	11	66	113	190
G8MKD	—	45	112	157
G1ECC	—	—	111	111
GM0BPY	—	50	110	160
G6XLI	—	36	109	145
GW3CIBY	18	46	107	171
G8WPL	16	70	105	191
G8RWG	—	12	103	115
G4TJX	—	60	100	160
G4XRK	—	—	100	100
G4FRX	—	66	99	165
GW8VHI	—	48	96	144
G4RSN	2	34	92	128
G8XTJ	—	—	92	92
G4TGK	—	—	90	90
G8ROU	1	43	88	132
G6YIN	—	58	87	145
G4CQM	—	52	87	139
G6AJE	3	36	85	124
G4ZTR	35	57	82	174
G1IZO	—	—	82	82
G4FRE	56	124	78	258
GW6OFI	1	—	75	76
G1DWQ	—	—	72	72
G6YLO	20	59	67	146
G4NBS	27	65	65	157
G4MAW	45	106	52	203
G0BPS	—	—	50	50
G4WHZ	—	8	49	57
GW6VZW	—	—	44	44
G1JOU	—	—	44	44
G6XSU	—	52	43	95
G1INK	—	42	42	84
G8UDV	—	2	42	44
GM8BDX	13	31	41	85
GM4WLL	—	—	39	39
G1HGD	—	5	38	43
G4WJR	—	—	37	37
G6CSY	16	39	34	89
G2DHV	—	1	34	35
G6SIS	—	1	31	32
G1DOX	10	14	29	53
G4JZF/P	—	63	—	63

Starting date January 1, 1975. No satellite or repeater QSOs. "Band of the Month", 2m.

John Fitzgerald, G8XTJ, (BKS) added WJ for a new square thanks to G0AEA who was an all-time new county. John

participates in the WAB nets on SSB and these have a growing following. He reckons that WAB square hunting is a substitute for continental DX when the band is in poor shape. Philip Hocking, G8ZDS, (CNL) had not written for some time so sent in his latest Squares Table figures, hoping that there will be something more interesting to report soon. Paul Baker, GW6VZW found conditions a bit better at the end of April and worked G6UUR (WMD), G1AZQ and G1EHJ (SFD) and a Cheshire station for new counties. On Apr. 30, GB3VHF was very loud and F6DBI (YI44e), FIGXB (X148j) and F1FJT (AJ) were worked, plus several GUs. Another rare county from Cwmbran was G1ITV/P on Winter Hill (MCH) on May 1.

OX3LX is QRV on the band from GP60QQ with 200W and a 10-ele. *Yagi*. Bo is equipped for CW MS up to 1,100 *l.p.m.* The distance to the Western Isles would be about 2,250 kms. which is a little ambitious for the likely *e.r.p.* available, but worth a try in the *Perseids* in August, perhaps? OX3LX has also recommissioned the OX3VHF beacon on 144.902 MHz.

The May 2 *Ar* was about the only event of any interest from G3FPK. It was discovered at 1715 and on CW, GM4UFD, GM3WYL and GM4AWA (TYS) were worked in this phase, the QTE being 10°. GM4AWA was beaming at 60°. It was still in progress at switch-off at 1830. After watching the snooker, the rig was turned on at 2330 and LA2AB (FT) was contacted on CW at QTE 0°. Several SMs were on, best QTE being 340° and SM4CFL (GT) and SM4KYN (HT) were worked, the latter beaming at 290°. Activity was low from the London area and the *Ar* was still going on at about 0015. Conditions in the May 3/4 Contest were flat with nothing further than the D line worked.

On Apr. 25 there was some excitement in the northwest when I0LYL and IWSBML (FC) were heard on the SSB calling frequency around 1300. The former was S9 for about 40 seconds. Did anyone work either of them? As usual, the *Eta Aquarids* shower produced the odd burst long enough to complete a QSO. On May 4, at 0935, John Hunter, G3IMV, had a swift CW QSO after answering YU4WEU in IE17. There were similar occurrences on May 5 in 1984 and 1985.

Seventy Centimetres

G1DOX has been busy up in Cumbria and has worked G8GXP (YSW) on Mar. 21, G18AYZ (ATN) and G6HKS (NOR) on the 23rd and G16ATZ (DWN) on Apr. 10 for another four table points. G1KDF added GW6ZMN (GNS), EI9Q (Waterford) and GM8BDX (BDS) on Apr. 27 and EI9ED (Meath) the next day. Bob thought that activity in the contest on May 3/4 was very low but he did find GM6LNM (SCD). Best DX were FF6KBF (JN09IT) at 484

Station	ANNUAL CW LADDER				Points
	4m.	2m.	70cm	μ Wave	
G0ABB	—	153	—	—	153
G4SFF	—	151	—	—	151
G4AGQ	8	133	4	—	145
G4YIR	—	129	—	—	129
G4XUM	—	105	—	—	105
G4ZVS	—	104	—	—	104
G4OUT	—	93	—	—	93
G4EIB	—	83	—	—	83
G4PPV	—	63	—	—	63
G0DJA	—	55	—	—	55
G4TJE	—	42	—	—	42
GW4HBK	25	—	—	—	25
G2DHV	1	14	—	—	15

No. of different stations worked since Jan. 1.

kms. and PE0MAR/P (JO21BX) at 582 kms. from Ormskirk.

G6AJE is enjoying his first "real" operation for five months from home. On Apr. 26, Mike worked GW1SSQ (GWT) for the first country outside of G this year and during the contest he found PE0MAR/P, FF6KBF/P, GW4BVY/P (PWS), G4CLA/P (LCN), F/PI4GN, G4THB/P (YSN), G1DOX, G1KDF, PA0PLY/P (CM) and PA0GUS/P.

After listening to the weather forecast on the evening of May 1, G6HKM turned her beam to Scandinavia and found a G in QSO with OZ1CTC (EP). They moved to 2m. but there was no propagation, so went back to 70cm. When they signed, Ela called Knud and got an RS55 report. At 2151 she heard OZ1KLU (EQ) calling "CQ Contest" so worked Ole who gave her RS54. Your scribe seems to recall that there is a 70cm. Scandinavian Activity Contest on the first Thursday of the month for a few hours in the evenings. Perhaps someone can confirm the times? May 2 provided another two new counties for G6HKM; G8KBQ (SOM) and Paul Brockett, G1LSB, from his new Lincolnshire QTH. In the contest on May 3/4, G activity was low but Ela got four more counties plus F and D.

Ken Willis, G8VR, is now operating from his new QTH near Broadstairs in Kent, about half a mile from the North Foreland Lighthouse. Unfortunately, there is a *Syledis* Tx on the building which precludes any serious DX-ing when the thing is operating, which it seems to be for most of the time. In the contest, G8XVJ reports that G4RNL/P made 297 QSOs from IO93AD, best DX being to DJ square.

GW4LXO is now doing some *E-M-E* work on the band. Jonathan's station comprises a grounded grid tetrode PA, eight 21-ele. *F9FT Yagis* and an MGF1402 preamp. In the *REF* contest in March and April, he contacted DL9KR, DF3RU, I5MSH, YU1AW, K2UYH, N4GJV, NC1I, K5JL and SM4IVE. Forty different stations were heard so obviously the system is working well.

The Microwaves

Dave Ackrill, G0DJA, (WMD) was out portable in the first leg of the 10 GHz

Cumulatives on Apr. 13. A wet day, despite which several people went out. Operating from Walton Hill, Clent, he had a 47 kms. QSO to Broadway Hill, near Evesham, and another 36 kms. one to Brown Clee Hill (SPE). Others made ten contacts or so. He has been building a transceiver for 24 GHz wideband FM and had hoped to have it finished in time for the May 3/4 UHF/SHF event. The *e.r.p.* is about 30W from a 5mW *Gunn* to a 16 inch dish with an estimated gain of 38 dB. The *e.r.p.* on 10GHz is 5W, the same dish giving 31 dB gain. Dave has a 23 inch dish for extra gain, if needed. He can run 10 GHz and 24 GHz side-by-side. Both dishes and the mounting bracket for his tripod are Army surplus, bought for a total of £5.

G1DOX has 2.3 GHz going from Holbeck with 750 mW. When he wrote in mid-April, John had nearly finished a cavity PA and only needed a snail fan. Some 20W was expected from this combination. Two out of three tests with G14CXH/P (DWN) were successful, that on Mar. 30 being G1DOX's first 13cm. QSO. On 23cm. John worked G8XIR (KNT), G8GXP (YSW), G6DER (YSS), G4FUF (ESX), G18AYZ (ATM) and G14CXH/P in March and GW8FKB (GDD) on Apr. 1. Daily tests are continuing with G6FK in Wolverhampton on 23cm. He runs a pair of water cooled 2C39BA valves in his PA. Finally, G1DOX is still looking for a GM contact on 23cm. Any offers?

G1KDF's new stations in April were G6VKA (GLR) on the list, and GW8FKB on the 16th. Bob has fitted some *Pope H-100* feeder in mid-April, then added a DX1296S preamp. in the shack on the 21st. These additions have made a vast improvement in the evening QSOs with G6FK on 23cm. Conditions in the May 3/4 contest were very poor with very low activity. Only eight stations were worked in about 19 hours; new counties and squares were thanks to G4KPX/P (BKS) in ZL and G4LIP/P (LCN) in AN.

John Tye, G4BYV, (NOR) reminds readers of the 13cm. beacon PE1GHG (CL03d) on 2,320.815 MHz run by 'GHG and PA2DOL. The power is 5W beaming to G but will later beam to the southeast. John now has a second YD-1060 cavity for 9cm. to provide 6W, the valve being like a small 2C39. He came on for the last hour of the Region 1 SHF Contest and worked four PAs on 13cm. and one on 9cm. Most stations were giving their real QTH locator when calling, which greatly helped in getting the beam in the right direction, and only gave the Maidenhead one in the report. To illustrate his feelings about Maidenhead on microwaves, John says he used his free Maidenhead map to wrap up a parcel.

G6AJE borrowed an 8W transverter for the contest weekend which, with a *JVL* loop antenna, enabled Mike to have a go on 23cm. However, any gain was wiped

out by the UR67 feeder and lack of a rotator. Even so, five QSOs resulted; G3CKR/P (SFD), G3UHF/P (SFD), G4LIP/P, G0ALE/P (KNT) and G6TRM/P (SFD). G8VR does not yet have a proper mast up but is on 23cm. to keep his hand in. The Warrington group's station G3CKR/P made 87 contest QSOs on 23cm. but the 13cm. station G4CDA/P had but two.

Gems of the Month

Heard on 2m. "I'm pushing 150 to 200 watts at you through a six *Ellie Yagi*. It's a small beam, I know, but if I put up a bigger one, I hear to much." — G1. . . From a G0, "He has a nice array there; ganged *Yagis*, I think you call them." Another, "The name here is Mike. I spell. *Mike*, item, kilo. echo."

Meteor Scatter

Colin Morris, G0CUZ, has been pondering over the mechanics of MS communication and observes that when using random meteors, bursts of less than half-a-second duration account for 90% of the reflexions. Consequently, at 600 *l.p.m.* such short bursts, many hardly more than pings, often result in incomplete characters being retrieved, so he thinks that keying speed should be at least 1,000 *l.p.m.*

Although he agrees that most long, yet low strength, bursts of 20 to 60 seconds duration are due to meteors which enter the upper atmosphere at a very shallow angle, he wonders if some may not be due to meteors at all. What about space junk re-entry? This material would have a velocity of about 8 km/sec. whereas most meteors would be travelling at three to nine times this rate. However, while most meteors are sand grain size particles, space junk debris could be quite large so could produce a long trail which would take some time to recombine.

Another explanation for those minute length "openings" on a dead band is reflexions from high-flying aircraft. A *Boeing 747* at 35,000 feet, with its large reflecting area, will cause a 20 dB or more signal strength enhancement for stations about 700 kms. apart. This effect can be observed on the 2m. Angus beacon from the London area as aircraft fly along "Amber One." These phenomena typically last for about a minute after which the signals gradually fade down into the noise as the geometry of the system becomes unfavourable.

Sign off

That's if for this month. All your news, views and claims should be sent to:— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL69EQ. See the box for the deadlines. 73 *de G3FPK*.

Thanet Electronics Ltd.

a story of achievement

KEN MICHAELSON, G3RDG

I FIRST became aware of Thanet Electronics way back in 1977 when I decided to go mobile with one of the then new 'black boxes' working FM on 2 metres. Up until that time my mobile equipment had consisted of ex-U.S. Air Force command receivers and transmitters operating in what was then called Top Band (160 metres), but now is sometimes named Granddad's band. (I pass no comment as to why this should be so!) A description of my operating experiences together with an outline of the type of gear I used appeared in another magazine, *Ham Radio Today*, February 1984. At all events, "Away with the old, and bring in the new", I said, and got in touch with Thanet Electronics to buy an Icom IC-22A crystal controlled 2 metre FM transceiver.

I must have approached the firm sometime soon after their beginning, and little did I know that I should have the pleasure some years later of visiting them installed in their new premises, preparatory to writing their history. However, I shall begin at the beginning. There were once two amateurs, both attending to their own jobs. Being enthusiastic, they were both mobile going to and from work. One was a fireman named Dave Stockley, whose call is G4ELP, and the other a researcher at the University of Canterbury, Paul Nicholson, G3VJF. In due course they met personally, and found that they had a great deal in common. Then Dave had an accident and injured his leg. This meant, of course, that he could not continue to work as an active fireman. The Fire Service offered him various inside jobs, but he wasn't happy and decided to take early retirement, together with the small pension which he had earned.

While waiting for the retirement date he gave considerable thought as to what he would do when the time came, and talked it over with Paul. They both came to the same conclusion, and this was to use their enthusiasm for amateur radio as a means of earning a living. There were several other firms operating in this manner at that time and they all appeared to be doing well. And so in 1974 Thanet Electronics was born, the only trouble being that they did not possess an agency for the importation of any equipment. The demand at that time was mainly for Japanese gear, so the first thing was to find a manufacturer who would be willing to supply them. Paul told me that they wrote to almost all the manufacturers in Japan, and finally got a reply from Icom

Incorporated who said, and he quoted, "We have no friends in England". By return Paul wrote and said that Thanet Electronics would be "Icom's friends in England" but that they wanted sole distribution rights in the U.K. Icom agreed, and that was the start.

Paul admits that they stuck their necks out a bit, but if you don't take a chance in business, you will never grow. They are very proud of the fact that they started the venture without "calling on the Bank Manager"! They did, however, call on him for advice. They had £7000 capital of their own and with that they placed their first order with Icom. The payment had to be by way of an Irrevocable Letter of Credit, which means, in effect, that the cash had to be deposited at a bank before the letter was issued. In this manner Icom were assured of payment of their goods. Of course, it is quite different today as Paul and Dave, as Thanet Electronics, have been dealing with Icom for many years. But to continue.

At first the two operated from a back room at Dave's Whitstable home. But after about a year that got too small and the business was transferred to a room at Paul's home in Herne Bay. During this time, both Dave and Paul continued with their normal full time jobs, as the idea was to plough back as much as they could into the business. Dave emphasised that the motto was "Don't run before you can walk", and the utmost economy was exercised. All the typing, etc., was carried out with an old typewriter on the kitchen table. Their first sale, Paul recalls, was on 28th May, 1974, the records being kept in an ordinary notebook. The first year's turnover was of the order of £20,000. Both he and Dave were, and still are, of the opinion that unless any capital expenditure can be seen to pay for itself within a reasonable time, then they will do without it. Where other firms went the whole way at the beginning with computers, word processors, etc., it was years before that sort of office equipment was purchased and used by Thanet Electronics. That time has passed, however, and there are now two computers in use at Sea Street with some 18 terminals.

Because of this rigid control of cash flow, they were able in 1977, to buy a shop at 143, Reculver Road, Beltinge, Herne Bay, and use that as their headquarters. After this point, the business steadily grew, and in addition to purely amateur radio equipment, the company started handling commercial marine units. This, of

The founders of *Thanet Electronics*: left, chairman Paul Nicholson, G3VJF, and managing director Dave Stockley, G4ELP.

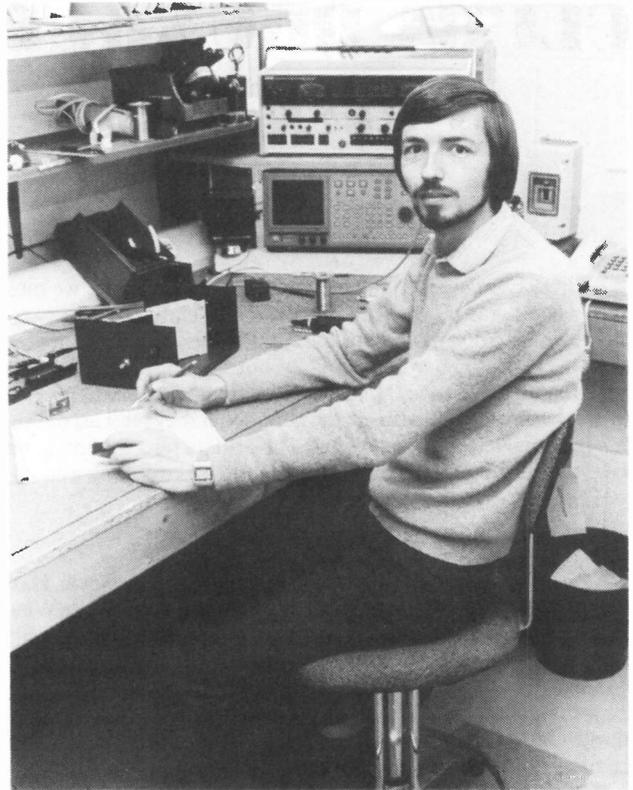


course, spread their business base and made their name known by more people. At the time of the Falklands war they found themselves the only company who could supply a suitable radio system which would be able to link all three services, the Army, Navy and R.A.F. Other British manufacturers were quoting as long as six months to deliver. In fact, what happened was that by using their enterprise and knowledge, they were able to adapt an existing Icom item. Once this had been accepted by the Ministry of Defence, signals were sent world-wide to obtain as many of this particular piece of equipment that they could. These units were modified and quickly despatched to the respective services. As a result of this quick action several Ministry of Defence contracts have been awarded to them. A letter from Vice-Admiral Sir Lindsay Bryson KCB, BSC, FEng, FIEE, FRAeS thanking the firm for its efforts is highly prized by the company.

Another facet shows itself here, because since Herne Bay is on the coast, the firm finds itself becoming involved with yachts and sailing. Leading on from this, many people realised that lives could have been saved in the recent Fastnet yacht race disaster if more yachts had carried long-range radios. Sales of marine radios increased and some enterprising companies bought large numbers of sets to hire out to yachtsmen. In fact, Paul tells me, the business is split about two thirds towards the commercial side, the other third dealing with amateur products. Within the last two years it was decided to open a retail shop at 95, Mortimer Street, Herne Bay, as a service to amateurs who wanted to call and try various pieces of equipment. I understand that the shop does not show much profit but helps to keep the name of Thanet Electronics before the public. There are over 20 authorised dealers covering the United Kingdom which makes the Icom products available to everyone. In the rare case of faulty units brought back to the dealers, the spares for the small jobs they undertake are supplied free, although of course Thanet Electronics has to pay in the end. Any trouble which cannot be cleared by the dealer is sent back to Sea Street for repair, where use is made of the very specialised and sophisticated service equipment available there. Paul reckons that the value of the test gear approaches £200,000, and as far as the spares are concerned, about £50,000 worth is held. I was shown the service area, which is on the ground floor of the building facing the front, with plenty of room between the test benches. While commenting on the service area, it might be fitting to describe the other parts of the building that were shown to me.

At the back is an exceptionally large loading bay, with ample height for vans to enter. On one side of this area is a flight of stairs leading to the staff canteen and rest room complete with television set. Proceeding towards the front of the building, one passes through the packing department, and then as mentioned above, the service area. The general office, together with the telephone operator and switchboard, are on the first floor, as is the office for the Chairman and Managing Director. The general office area is spacious, with the various working desks well separated, the arrangement being that of an open plan. There is a computer terminal on several of the desks and in each case this is connected to the mainframe. The firm employs 23 in staff, and I understand that the sons of both Dave and Paul work in the business. The majority of the staff are themselves radio amateurs which, of course, helps with the understanding of customers' problems. As well as the administrative side at Sea Street, there is a research and development section which in addition to carrying out testing in the normal way, conducts in-depth experimentation on equipment for the Ministry of Defence. In the recent past, Thanet Electronics were awarded the agency for British Telecom's new in-car 'Cellnet' mobile telephone system, and, in fact, have a PMR base station on the premises at Sea Street.

A word about the manufacturing company in Japan would not be out of place here. Icom Incorporated itself is situated in Osaka, Japan, and commenced business in 1963 employing some 700 people at the present time. All the equipment manufactured is for world-wide amateur use. Both Paul and Dave go to Japan every year to discuss the state of business with, amongst others, Mr Tomiro Ohmoto, the Icom export manager, and on the last



Phil Hadler, G4CZU, Thanet Electronics' sales director.

occasion they were invited to stay at Mr Ohmoto's private house. This was a great honour to be accorded to anyone of another nationality, and when they arrived they were treated like ordinary Japanese visitors, even to the extent of sleeping on the floor on a 'tatami' — a reed mat on which all Japanese sleep, covered with a 'futon' which is a type of quilt. They both said that they thoroughly enjoyed the stay. Every two years there is a meeting of all the world-wide dealers, usually held at some exotic spot; this is where all the gripes and queries from the distributors are discussed and solutions arrived at. When in August of last year, the firm moved to their new purpose-built premises in Sea Street, a number of personalities in the radio business world were invited to attend to celebrate the occasion. One of the most important was the export manager of Icom Incorporated, Mr Tomiro Ohmoto; other guests were representatives from British Telecom and the Ministry of Defence. Mr Ohmoto was asked to unveil a plaque commemorating the opening of the premises, and commented that he thought Thanet Electronics and Icom would have a great future together.

The theme of operation as far as both Paul and Dave are concerned has been hard work and consolidation. This, they say, has been brought about by the loyalty and application of all the staff. They say that there has been no question of a '9-to-5' job; all the staff have given a lot of extra work to get Thanet Electronics established at Sea Street. The growth of the firm is shown by the fact that, as I mentioned earlier, the first year's turnover was of the order of £20,000, and last year's figures brought it to over the £3,000,000 mark. The firm has six directors, four of whom are working directors. These are Paul Nicholson (Chairman), Dave Stockley (Managing Director), Phil Hadler (Sales Director) G4CZU, and Fraser Stuart (Technical Director) G8FEZ. The other two are non-executive directors. In their 10 years of operation they, with their staff, have built themselves up to be a force to be reckoned with in both the amateur and commercial fields, and when I said goodbye to Paul and Dave it was with the feeling that further expansion would be taking place in the years to come.

CLUBS ROUNDUP

By "Club Secretary"

BEFORE we get into the meat of our task this time, we must ask all readers who are members of a club to please check their own club details and put us right if necessary. There are one or two clubs which want publicity but at the same time seem reluctant to have their Hon. Sec's name and address, or even where they meet, appearing in the news-letter they send us, or even in a personal letter. Mistakes and out-of-date information could lose your club a potential new member and make us look a bit silly too. So — please check, *now!*

The Mail

As usual, the top of the pile is **Abergavenny & Nevill Hall**, where the group is to be found in the club room, above Male Ward 2 at Pen-y-Fal Hospital; 7.30 p.m. on Thursdays, with the first meeting of each month featuring a talk or video.

Acton, Brentford & Chiswick has its next meeting on June 17, for a discussion on "Trends in Receiver Design". The venue as always is the Chiswick Town Hall, High Road, Chiswick, London, and the start at 7.30 p.m.

Basingstoke has the main, pre-planned meetings at Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke, and the next ones are on June 2, for VHF NFD planning, and July 7 for G4NNS to talk on packet radio. In addition we gather they run, at short notice, other events such as fox hunts and visits — details from the Hon. Sec. *see* Panel for his details.

Now to **Biggin Hill** where we must refer you to the Hon. Sec. at the address in the Panel, although we believe that June 17 at Downe Village Hall, Downe, Kent, (next door to the 'George and Dragon' pub) might be the answer, and the subject moonbounce. Visitors are welcome and we understand they are 'encouraged' to join the club formally!

Now to the Isle of Wight and **Binstead**, which has the Scout Hq. in Drill Hall Lane, Binstead, Ryde, every Wednesday evening.

The **Bishops Stortford** crowd foregathers at the British Legion, Windhill on the third Monday in each month for the main meeting. In addition they are usually to be found nattering in the saloon bar of the "Nag's Head", Dunmow Road, on Thursday evenings.

North now to **Borders** where the routine is to gather at the Tweed View Hotel, Berwick-on-Tweed, on the first and third Friday of each month. Programme details from the Hon. Sec. — *see* Panel — or why not just go along and see?

Every Thursday evening Parkwood Community Centre is host to the local **Bredhurst** club. On June 12, G4DCV will talk about moonbounce, and on 26th *KW Communications* will be visiting them; the general routine is to alternate this sort of thing with more 'practical' or natter sessions. The venue, by the way is at Parkwood Green, Rainham, Kent.

First and third Wednesdays are the dates for **Brighton**, and their place is the Seven Furlong Bar at Brighton Racecourse; again the mixture of natters, talks, films, contests and whatever.

Bromsgrove A.R.S. has moved to Aston Fields Working Men's Club, Stoke Road, Bromsgrove; June 10 is the lecture night and 24th the club night, by which we think an informal is meant.

Our next stop is **Bury** where they foregather at Mosses Centre, Cecil Street, Bury, every Tuesday evening. June 10 is set aside for the month's talk night — subject not confirmed at the time of writing.

At **Cheltenham** they use the Stanton Room, Charlton Kings Library as Hq; June 6 is the pre-NFD natter, and June 20 they have a talk by G4ENA on slow-scan TV.

The **Cheshunt** crowd seems to have given up ideas of moving Hq. and have instead been spending time on doing-up as far as possible the present place. Find them on Wednesday evenings at Church Room Church Lane, Wormley.

The weekly meetings of the **Chester** group are held at Chester Rugby Union FC, Hare Lane, Vicars Cross; June 3 is the committee meeting, and on 10th they have a surplus equipment sale. June 17 is a barbecue to which you bring your own steaks, and on 24th GWIATZ will be talking about cellular radio.

The first six days of June are all important to the **Chichester** crowd; these are the days when they have GB2NM on the air for the centenary special event station at the Chalk Pits Museum, Amberley. In addition the normal meetings, on June 3 and 17, are taken at North Lodge Bar, County Hall, Chichester.

We don't have the details of the **Colchester** meetings to hand but we can refer you to the Hon. Sec. — *see* Panel — and be sure he will be pleased to put you in the picture.

The first Thursday of each month sees the meeting of the **Cornish** club, at the Church Hall, Treleigh (on the old Redruth by-pass). We also note that the Cornish Rally is to be on July 20 at Camborne Comprehensive School.

Every Friday evening the **Coventry** gang heads for Baden Powell House, 121 St. Nicholas Street, Radford, Coventry; for details of the current programme we are to refer you to the Hon. Sec. — *see* Panel.

The **Crawley** venue has been moved to the Crawley Leisure Centre, Haslett Avenue, and on June 25 they have a talk by G4TVC on weather satellites. The club also has informal gatherings, but as these are at members' homes we recommend a call to the Hon. Sec. first — *see* Panel.

Deadlines for "Clubs" for the next three months—

July issue — May 29th

August issue — June 26th

September issue — July 24th

October issue — August 28th

Please be sure to note these dates!

A computer evening is in prospect for June 21 at **Crystal Palace**; the venue isn't mentioned this time but we assume it is still the Church Room at the junction of Church Road and Beulah Hill, Upper Norwood, opposite the IBA mast. If there is any doubt, a call to the Hon. Sec. would resolve it — *see* Panel.

The **Denby Dale** club has its Hq. in the Pie Hall, Denby Dale, where they meet every Wednesday evening, alternating between formals and noggin-and-natter sessions. More details from the Hon. Sec. — *see* Panel.

Another club to have Wednesday of each week is **Derby** where they have the top floor at 119 Green Lane. However we notice that on June 25 they are going to have a barbeque at Drum Hill, Little Eaton.

The other club in Derby is the one at **Nunsfield House** where the main event has to be the Mobile Rally at Elvaston Castle on June 8. Thus June 6 is down for preparations for this and June 13 is the post-rally 'inquisition'. On June 20 'Pete and Dave' will be doing mobile ATV, and on June 27 Andy, G8IYZ, and Christine, G8WEN, will be organising a treasure hunt. Hq. is in Room 7 at Nunsfield House in Boulton Lane, Alvaston, Derby.

The second and fourth Tuesday of each month are set aside for the **Dorking** meetings and the Hq. is at the "Star and Garter", although they do seem to go elsewhere quite often. Get the latest details from the Hon. Sec. — *see* Panel.

Amateurs and SWLs in the **Dover** area belong to **SE Kent YMCA**, and as the club name implies has a base at the YMCA at Godwynehurst, Leyburne Road, Dover. June 4 is a natter, and on

Names and Addresses of Club Secretaries reporting in this issue:

- ABERGAVERNNEY: J. B. Davies, GW4XQH, 109 Croesonen Parc, Abergavenny, Gwent NP7 6PF. (0873 4655)
- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- BASINGSTOKE: D. A. Birleigh, G4WIZ, 14 Winchfield Gardens, Tadley, Basingstoke, Hants.
- BIGGIN HILL: R. Senft, G0AMP, Mill Hay, Standard Road, Downe, Kent BR6 7HL. (0689 57848).
- BINSTEAD (l.o.w.): D. F. Barnes, G4VJF, 2 Sherbourne Avenue, Binstead, Ryde, Isle of Wight. (Ryde 66298).
- BISHOPS STORTFORD: S. Mammat, G6HKK, 11 Twyford Gardens, Bishops Stortford, Herts. CM23 3EH. (0279 52297).
- BORDER: Mrs. M. Bottomley, 4 Home Farm Cottages, Ladykirk, Nr. Berwick-on-Tweed, Northumberland.
- BREDHURST: K. Fay, G0AMZ, 37 Sandringham Road, Rainham, Gillingham, Kent ME8 8RP. (0634 376991)
- BRIGHTON: P. Turner, G4IIL, Flat 6, 132 Marine Parade, Brighton BN2 1DE. Brighton 607737)
- BROMSGROVE (A.R.S.): A. Kelly, G4LVK, 8 Greenslade Crescent, Bromsgrove, Worcs. B60 1DS. (021-445 2088)
- BURY: M. Sivieri, G4ZTB, 47 Ramsay, Bacup, Lancs.
- CHELTENHAM: T. Kirby, G4VXE, 29 Tivoli Road, Cheltenham, Glos. GL50 2TD. (0242 36723)
- CHESHUNT: J. & T. A. Watkins, G4VMR/G4VSL, 'One Ash,' Frogs Hall Lane, Hautwick, Herts. SG11 1JH. (Dane End 250)
- CHESTER: A. Warne, G4EZO, 113 Queens Road, Vicars Cross, Chester. (Chester 40055)
- CHICHESTER: C. Bryan, G4EHG, "Marmanet", Salthill Road, Fishbourne, Chichester, Sussex PO19 3PZ. (Chichester 789587)
- COLCHESTER: F. R. Howe, G3FIJ, 29 Kingswood Road, Colchester. (0206 85119)
- CORNISH: N. Pascoe, G4USB, Bosuathick Farm, Constantine, Falmouth, Cornwall. (Falmouth 40367)
- COVENTRY: R. Tew, G4JDO, 4 Chetwode Close, Coventry CV5 9NA. (Coventry 73999)
- CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. (Crawley 882641)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DENBY DALE: G. Edinburgh, G3SDY, 37 Westerly Avenue, Shelley, Huddersfield HD8 8HP. (0484 602905)
- DERBY: J. Anthony, G3KQF, 77 Brayfield Road, Littleover, Derby DE3 6GT. (0332 772361)
- DERBY (Nunsfield House): J. Robson, G4PZY, 31 Melton Avenue, Littleover, Derby DE3 7FY. (0332 767994)
- DORKING: J. Greenwell, G3AEZ, Eastfield, Newdigate, Henfold Hill, Beave Green, Dorking Surrey. (030677 236).
- SE KENT YMCA: A. Moore, G3VSU, 42 Nursery Lane, Whitfield, Dover, Kent CT16 3HG. (0304 822738)
- DROITWICH: E. G. Taylor, G4HFP, 6 Marlborough Drive, Stourport-on-Severn, Worcs. DY13 0JH. (0299 33818)
- DUNFERMLINE: D. Ingram, GM10IN, 6 Greyfriars Walk, Inverkeithing, Fife KY11 1DE. (0383 414283)
- EAST LANCES: S. Westell, G6LXU, 19 Sussex Road, Rishton, Blackburn, Lancs. BB1 4BJ. (0254 887385)
- EDGWARE: J. Coble, G4RMD, 4 Briars Close, Hatfield, Herts. (Hatfield 64342)
- FELIXSTOWE: P. J. Whiting, G4YQC. (0473-642595).
- FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD.
- G-QRP CLUB: Rev. G. C. Dobbs, G3RJV, St. Aidan's Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE. (0706 31812)
- GRAFTON: J. Kaine, G4RPK, 74 Camden Mews, London NW1 9BX. (01-267 1000)
- GREATER PETERBOROUGH: F. Brisley, G4NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough, Cambs. (0733 231848)
- HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts. (0923 779942)
- HASTINGS: D. Shirley, G4NVQ, 93 Alfred Road, Hastings, Sussex. (Hastings 420608).
- HAVINGING: D. St. J. Gray, G1HTQ, 6 Devonshire Road, Hornchurch, Essex RM12 4LQ.
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk. (0473 44047)
- I.R.T.S.: G. Gervin, E18CC, 185 Elton Court, Leixlip, Co. Kildare, Eire.
- LERWICK: C. Roberts, GM0AVR, 4 Ladieside, Brae, Shetland Isles. (080622 406).
- LOTHIANS: E. Evans, GM6JAG, 56 Southhouse Road, Edinburgh, EH17 8EU.
- MAIDSTONE YMCA: G. D. Eady, G4AXD, 8 Farnborough Close, Maidstone, Kent ME16 8UE. (0622 29462)
- MAXWELLTOWN: C. D. S. Rogers, GM4NNC, 5 Elder Avenue, Lincluden, Dumfries DG2 0NL.
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787).
- MID-ULSTER: S. White, 19 Tragna Way, Lurgan, Craigavon, Co. Armagh BT66 8DL. (0762 22855)
- MORECAMBE BAY: W. E. Delamere, G3PER, 414 Heysham Road, Heysham, Morecambe LA3 2BL. (Heysham 52659).
- NENE VALLEY: M. R. Byles, G6UWS, 108 Kingsway, Wellingborough, Northants. (Wellingborough 71189).
- NEWBURY: M. J. Fereday, G3VOW, Spindlewood, Stoney Lane, Newbury, Berks. RG16 9HQ.
- NOTTINGHAM: I. Miller G4JAE, 93 Boxley Drive, West Bridgford, Nottingham NG2 7GN. (0602 232604).
- ORMSKIRK: R. Nixon, G1KDF, 4 Weldon Drive, Ormskirk, Lancs. L39 4RA. (0695 74868)
- PLYMOUTH: A. J. G. Veale, G4SCA, Valley View, 26 Manor Park Drive, Plympton, Plymouth, Devon PL7 3HT.
- POWYS: M. Smith, GW4DWX, Tonn Marr, Welshpool, Powys. (Welshpool 2068).
- PONTEFRAC: C. Mills, G0AAO, 27 Pendennis Avenue, South Elmsall, Nr. Pontefract, W. Yorks.
- R.A.I.B.C.: Mrs. C. Clark, G1GQJ, 9 Conigre, Chinnor, Oxford OX9 4JY.
- R.A.O.T.A.: G. R. Jessop, G6JP, 32 North View, Eastcote, Pinner, Middx. HA5 1PE.
- REIGATE: T. I. P. Trew, G8JXV, Hoath Meadow, Church Hill, Merstham, Redhill, Surrey.
- SHEFFIELD: P. A. Cardwell, 223 Chesterfield Road, Meersbrook, Sheffield S8 0PR.
- S.A.R.U.G.: P. Newman, G4INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ.
- SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitechurch, Bristol, Avon BS14 0EG.
- SOUTH CHESHIRE: C. Wiseman, G1PUV, 14 Whiteridge Road, Whitehill, Kidsgrove, Stoke-on-Trent ST7 4TH. (Kidsgrove 73185).
- SOUTH MANCHESTER: D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. (061 973 1837)
- STOURBRIDGE: C. S. Williamson, G1IEB, 7 Hanbury Hill, Stourbridge DY8 1BE.
- SURREY: J. Simkins, G81YS, 18 Riding Hill, Sanderstead, Croydon CR2 9LN. (01-657 0454).
- SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Surrey.
- THAMES VALLEY: J. Pegler, G3ENI, Brook House, Forest Close, East Horsley, Leatherhead KT24 5BU.
- TODMORDEN: Mrs. V. Mitchell, G1GZB, Parrock Farm, Shore Green, Todmorden OL14 8SF. (Todmorden 7572).
- TORBAY: B. Wall, G1EUA, 48 Pennyacre Road, Teignmouth TQ14 8LB. (Teignmouth 78554).
- TRAFFORD: P. Greenhalgh, G3XGE, 238 Derbyshire Lane West, Stretford, Manchester M32 9LP.
- VERULAM: G. Wimpenny, G4OBH, 30 Faircross Way, St. Albans, Herts. (St. Albans 52003)
- WACRAL: L. Colley, G3AGX, Micasa, 13 Ferry Road, Wawne, Nr. Hull, Yorks. HU7 5XU.
- WARRINGTON: P. Forster, G0CBN, 6 Birchdale Road, Paddington, Warrington, Cheshire WA1 3ER. (0925 814005)
- WIMBLEDON: G. E. Cripps, G3DWW, 115 Bushey Road, Raynes Park, London SW20 0JN. (01-540 2180)
- WIRRAL: R. Bridson, G3VEB, 14 Zigzag Road, Wallasey, Wirral.
- WIRRAL (IRBY): G. Scott, G8TRY, 19 Penkett Road, Wallasey, Wirral L45 7QF. (051-630 1393)
- WORTHING: R. Jones, G4SWH, PO Box 599, Worthing, W. Sussex BN14 7TT. (Worthing 208752)
- YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. (0935 75533).
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.
- 308: D. Davies, G6YQD, 13 Maple Road, Surbiton, Surrey.

June 11 they have a Top Band D/F hunt. June 18 is a natter, and on 25th they will be setting up a station for a spot of portable operation. We also see they will be at Waldershare Vintage Weekend over June 28 - 29.

The second Monday in each month is the **Droitwich** meeting date at 17 Ombersley Street West, and the fourth Monday has them at the Scout Hq. in Union Lane. In addition June 15 sees a Sunday devoted to GB2KCR at Kempsey Common Rally, and throughout June they will be operating GB2PWB. Other details from the Hon. Sec. — see Panel.

The **Dunfermline** crew has a lease on Outh Wireless Station,

about 7 miles north of Dunfermline, where they meet every Thursday. Transport from Dunfermline can be organised for newcomers — contact the Hon. Sec. for details.

Now **East Lancashire** and here the form is to head for the Conservative Club, Cliffe Street, Rishton, Blackburn. On the first Tuesday of the month they normally have a lecture or demonstration and the last Tuesday of each month is down for an informal.

What a pity that we got the note about the **Edgware** club straight key evening on May 29 this month rather than last . . . 80m CW around 3.550 kHz, and everybody who can get

on with a straight key calling CQ SKE. The club itself is at 145 Orange Hill Road, Burnt Oak, on second and fourth Thursdays.

We come next to **Felixstowe** and this normally means the back room at "The Feathers" pub, Walton High Street. On June 2 they make a visit to the bell ringing at St. Mary Le Tower, Ipswich, and on June 16 they have a social evening. June 30 is down for a visit and talk by G3ZNU, the chairman of the RSGB VHF Committee.

June 3 is a fox hunt on Top Band for **Fylde** members, and then on June 17 they have an inquest — always the best part! Meetings are at the Kite Club, Blackpool Airport. Details from the Hon. Sec. — see Panel.

If you are into low power transmitting, simple receivers or even home construction (way out, this!) then you should be a member of the **G-QRP** Club; details from the Hon. Sec. at the address in the Panel.

Grafton club has moved to the best Hq. is has ever had, namely *TS Wizard*, in White Hart Lane, opposite Haringey Football Ground, but they have lost members by going east of their old catchment area, and would like to hear from potential new members in Tottenham. So — old members please come back, new ones please join! June 13 sees a talk on first aid for electric shock, and on June 27 they have an open evening.

June 26 is a SWL evening for **Greater Peterborough**, at Southfields Junior School, Stanground, Peterborough, and we believe that in addition to the monthly meetings there is the odd visit in the offing — details from the Hon. Sec. at the address in the panel.

Fridays at Harrow Arts Centre is the place and time to join the **Harrow** club where you will possibly meet Uncle Oscar and maybe even Grubby Gremlin — if you aren't careful! June 6 is the Chairman's night, and June 20 a film show, leaving June 13 and 27 as activity nights.

Hastings has its monthly main meeting on the third Wednesday of each month at West Hill Community Centre — June 18 is down for 'Medical Electronics'. Every Friday they also have a chat night at Ashdown Farm Community Centre, off Harrow Lane.

June 4 is informal at **Haveing**; they are on NFD over the weekend June 7/8, and then on June 11 there is a pre-contest briefing for VHF NFD. June 18 sees a talk by Louis Varney, G5RV, which will be ticket-only, and on 25th G8VR will be talking about meteor scatter. Find the group at Fairkytes Arts Centre, Billet Lane, Hornchurch, on Wednesdays.

Now we come to **Ipswich** where they will be, by the time you read this, just recovering from the East Suffolk Wireless Revival; they are based at the "Rose and Crown", 77 Norwich Road, Ipswich, on the second and last Wednesday of each month, but we have it that there is often Morse tuition on the intervening Wednesdays in the same upstairs room. However we note that June 25 may well be a treasure hunt, so a call to the Hon. Sec. — see Panel — may be in order.

Next we go over the water to Eire and **IRTS**; this is the place to contact about anything pertaining to amateur radio in Eire, and particularly with the local clubs. Contact the Hon. Sec. — see Panel.

From EI we now head north, right up to Shetland, and the **Lerwick** radio club; by the time this reaches you they will have finished their club operation from Housay in the Out Skerries group. However, you can get the details on the other club activities and meetings from the Hon. Sec. — see Panel for his details.

Lothians have a base at the Harwell House Hotel, Ettrick Drive, Edinburgh, where they can be found on June 11 for the AGM, and then again on June 25 for a session of forward planning, which we assume refers to NFD.

It looks to be a question of every Friday at **Maidstone YMCA**, where the venue is the 'Y' Sportscentre, Melrose Close. Details on the current programme from the Hon. Sec. — see Panel.

The **Maxwelltown** club meetings are at the Tam o' Shanter Inn, Queensberry Street, Dumfries, twice monthly, but the letter indicates that for more details you should be in touch with the Hon. Sec. — see Panel.

Midland will have G8MWR on June 17 for his talk on microwaves — this replaces the February meeting which was, they claim, frozen out. (We got chewed off in their letter for forgetting to mention Drayton Manor in the Rally column a couple of months back, for which we have shot the offender and dumped the corpse in an acid pickle bath!) The Midland letter forgot to mention the club's venue; luckily we kept an earlier letter which refers to Unit 3, Henstead House, Henstead Street, Birmingham B5.

On the second Sunday of each month the **Mid-Ulster** club gets together at 3 p.m. at the Guide Hall, Castle Hill, Gilford — more details from the Hon. Sec. — see Panel.

Monday evenings are the ones for the **Morecambe Bay** crowd, based on the canteen of the Lunesside Engineering Company, Mill Lane, Halton, Lancaster, at 7.30. The arrangement is to alternate the club meetings with Morse class sessions.

For the details of the **Nene Valley** doings and venue, we have to refer you to the Hon. Sec., although if things are unchanged, a good bet would be Wednesdays in the "Prince of Wales" in Finedon.

June 10 has G3RZP visiting **Newbury** to talk about 'Inter-modulation, Phase Noise and Dynamic Range'. The venue is as usual Newbury College, and more details can be obtained from the Hon. Sec. — see Panel.

Nottingham has its second two-metre foxhunt of the season on June 5, and a talk on QRP operating and construction on June 12. June 19 is a 432 MHz foxhunt, and on 26th there is the summer junk sale. Find them at Sherwood Community Association, Woodthorpe House, Mansfield Road, Nottingham.

Ormskirk is at Ormskirk Community Centre, Chapel Street, where they have the first Thursday of each month, except in August. They have a full programme set up plus visits to local places of interest, and are looking for new members.

Plymouth Albion RFC, Beacon Park, Peverell, Plymouth, is the home of the **Plymouth** club; June 2 is a talk by Messrs. Terry and Melhuish about BBC engineering, and on June 16 they have a natter night.

The **Powys** club covers a large catchment area and has its Hq. at Lymore Park Cricket Club Pavilion on Thursdays; if you are thinking of joining we suggest a contact with the Hon. Sec. to get details on how to find them as the venue is well away from the nearest road!

Pontefract is to be found at Carleton Community Centre, every Thursday; they have a billet on the top floor, and we believe they are also there on an informal basis on Monday evenings.

Next **RAIBC** which as we all know is the club for the blind and invalid radio amateur or SWL. Details on membership, and on the vital supporting activities, from the Hon. Sec. at the address in the Panel.

Next we come to **RAOTA**, and this one is for the old timers; membership is open to amateurs or SWLs who can demonstrate 25 years or more in the hobby. Details from the Hon. Sec. — see Panel.

June 17 for **Reigate** means the Annual Surplus Sale. This one is at the Constitutional and Conservative Club, Warwick Road, Redhill.

Turning now to **Sheffield**, and how nice it is to hear from them again. The June dates at Firth Park Pavilion show a session on Oscar 10, and on 9th G4EJP, the RSGB RR, will give a talk. June 18 is RAE class and Raynet, and on 25th they have the minority group night, bookable by any small subgroup within the club — this is a novel and good idea.

SARUG is the Sinclair computer user group. There is always something of interest in the newsletter; details from the Hon. Sec. — see Panel.

G4TRN will be talking to **South Bristol** on June 4, about modifying CB sets to 28 MHz. June 11 is an HF activity night, and on 18th they are preparing for Longleat Rally. Find them at Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol, in either room 3, 4 or 5.

The **South Cheshire** group is now based at the Crewe LMR

Sports Club, Goddard Street, on a Monday in each month. Get the exact details from the Hon. Sec. — see Panel.

Over to **South Manchester** at the Sale Moor Community Centre, Norris Road, Sale; look for them on any Friday evening from eight pip-emma.

The **Stourbridge** crew has an informal on June 2 and the Summer Surplus Sale on 16th. There is a barbecue event on June 28 too. Club Hq. is at Robin Woods Centre, School Street, off Enville Street, Stourbridge.

June 11 and 25 are the dates for the **Stroud** club, at Nelson School, Stratford Road, Stroud, and there is a programme of events in being — details from the Hon. Sec. at the address in the Panel.

The first and third Mondays each month are the ones for **Surrey** at *TS Terra Nova*, 34 The Waldrons, South Croydon, where they have the use of the first floor mess deck. For programme details we must refer you to the Hon. Sec. — see Panel.

June 2 for **Sutton & Cheam** is a natter night in the bar, and on June 20 they have an inter-club quiz with CATS, at home. Downs Tennis Club is in Holland Avenue, Cheam, is the venue.

The first Tuesday of each month is the date for the **Thames Valley** gang at Thames Ditton Library in Watts Road. For June's entertainment they have G3SJK talking about HF receiver performance.

The June weather will cause the **Todmorden** crowd to go on a car rally for the G4HYY Trophy on June 2. June 16 is a talk by G3JWN in the form of his reminiscences. Venue is the Queen Hotel, Todmorden and visitors are welcome.

Turning to **Torbay**, they continue their weekly Friday meetings at ECC Social Club, Ringslade Road, Highweek, Newton Abbot; and they have a main meeting on a Saturday, details of which can be obtained from the Hon. Sec. — see Panel. We also note the Torbay Rally on August 24, at STC Social Club, Brixham Road, Paignton.

Now we come to the **Trafford** club, based on the Sea Cadet Hq. Bradshaw Lane, Stretford, Manchester, where they meet each Thursday evening.

There is an activity evening for **Verulam** on June 10, and then on 24th there will be a forum, led by Raymond Brooks, on the DTI and interference. Both at the R.A.F.A., New Kent Road, off Marlborough Road, St. Albans.

Next we come to **WACRAL**; this is the group for practising Christian radio amateurs of any denomination. Get the details from the Hon. Sec. — see Panel.

Turning to the letter from **Warrington** we see they have a place at Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, where they foregather every Tuesday evening. The programme is put together too late for a mention here but they say they do themselves proud!

The June meeting of the **Wimbledon** club is on 13th, for the construction competition, and again on June 27 when Dr. Gary Hunt will be talking about space exploration of the solar system. The Hq. is the St. John Ambulance Hq. 124 Kingston Road, Wimbledon.

Turning to **Wirral** there are two clubs; the one that is based on a clubroom at Ivy Farm, Arrowe Park, has G3UZU talking about the construction of regulated power supplies with limited facilities on June 4, and on the 18th a surplus sale for which you must contact the Hon. Sec. to get the venue.

The other **Wirral** group is at Irby Cricket Club. June 11 is a practice D/F hunt, and on 25th they have a film night; trop-scatter communications in the oil industry, and amateur satellite operation are the two quoted subjects.

The **Wolverhampton** crowd have their place nowadays at Wolverhampton Electricity Sports and Social Club, St. Marks Road, Chapel Ash, Wolverhampton. June 3 is a talk by G3RVA on 'Electricity in Water' and over the next weekend they have a demonstration station at Tipton Carnival and Show. June 10 is a committee meeting plus operating the club rig, and on 17th there is a talk on lightning protection. On 21st they have another demonstration station, at Danesmore School Fete. June 22 is a

VHF D/F hunt and on 24th they have another night-on-the-air.

At **Worthing** the locals get together every Wednesday evening from 7.30 at Lancing Parish Hall, South Street, Lancing, West Sussex; June 4 they have a video, and on 11th it is a ragchew evening. June 18 is an evening rally at Whiteways Lodge, and on 25th the club constructional contest.

The weekly meetings of the **Yeovil** chaps, on Thursdays, are at the Recreation Centre, Chilton Grove, Yeovil. We have only the July details which show the usual breakdown of two evening talks by G3MYM and one by G3GC, plus a natter session.

On to **York**, and this means the United Services Club in Micklegate, York, every Friday evening at 7.30. As usual their summer is filled with outside events, but sadly they have to miss the Great Yorkshire Show this year — but they will doubtless have fun in other places on different weekends!

Finally, **308** which is based on the Coach House, Church Hill Road, Surbiton, Surrey. What a pity we have no names, no dates, no nuffin' . . . ! However, in the newsletter there are references to G4XAL, G6UBB and G1JRR, so perhaps a dig through the latest Call Book and a contact with one of them might clear up the problem. The name and address we have in the Panel is another possibility, as he certainly used to be Hon. Sec. and may still be in the know.

Finale

That's the bottom of the pile for another month; and as always it's been fun reading all your news and views. Deadlines are in the 'box' and send your letters addressed, as always, to your Club Secretary, SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. And now . . . to the mower, men, and no shirking!

Mobile Rally

June 8, 17th Elvaston Castle Rally, Elvaston Castle Country Park (5 miles S.E. of Derby on B5010), free admission, over 90 trade stands, wide range of family attractions, full on-site catering throughout the day.

June Special Event Stations

To commemorate the landing of allied troops in Normandy in June 1944, **TV6JUN** will be operational from "Utah Beach" from **1st to 9th June**, SSB/CW on 3.5/7/14/21/28 MHz and 144 MHz. The HF QSL manager will be F5AM, with details for VHF given over the air.

To commemorate Marconi's experiments in 1897 and 1898, **GB01OW** will be active from the Royal Needles Complex I.o.W., and **GB40H** from Osborne House, East Cowes, I.o.W. during the **first week in June**.

Cray Valley Radio Society will be operating **GB2GF** at the Greenwich Festival, on behalf of the organisers, over **June 14/15**; activity will be on HF and VHF and special QSLs will be available.

As part of the bi-centenary celebrations of the Methodist Missionary Society, **GB8MM** will be activated by WACRAL from Trentham Gardens, Stoke-on-Trent, on **June 20/21/22**. Operation will be on LF/HF/VHF and special QSL cards will be available. For more information contact G3AGX or G4EBD, both QTHR.

June 21, GB4WPS will be operational at Westbury Park School Fair, North Bristol, from 0330 to 1700, working all bands as well as SSTV and RTTY; QSL's *via* bureau.

Expedition

An expedition by Stroud A.R.S. to Steepholme Island in the Bristol Channel has been arranged for **June 7/8**, using the call **G4SRS** and working HF (SSB) and VHF (SSB/FM); the WAB square is ST26 and Locator is IO81.KI. QSLs will be sent to all stations worked. Organisers are G4MOH, G4SJK and G4VZR; more information on Stroud 3303 ext. 75456 (day) or Stonehouse 4531 (evenings).

P.M. ELECTRONIC SERVICES

2 ALEXANDER DRIVE, HESWALL, WIRRAL, MERSEYSIDE, L61 6XT
Telephone: 051 342 4443 Telex 627371

THE QUARTZ CRYSTAL SPECIALIST

AMATEUR RADIO CRYSTALS FROM STOCK

4m, 2m, 7cm and transverter/converter

MICROPROCESSOR *from* MARKER
CRYSTALS *stock* CRYSTALS

DOUBLE BALANCED MIXERS M8 and M18
PIN compatible with MD108 and SBL1
but with superior spec available from stock.

WE CAN SUPPLY CRYSTALS TO MOST
COMMERCIAL AND PROFESSIONAL
SPECIFICATION INCLUDING COLD
WELD SPECS.

CRYSTAL SOCKETS for HC6/u, HC13/u
and HC25/u

MADE TO ORDER SERVICE

OVER FREQUENCY RANGE 6KHz to 250MHz with
express service if required
For full details of the above services,
please send s.a.e.

UPPINGTON

COMMUNICATION ELECTRONICS
G2BAR BERT RS8565 PAUL G1DFK PETER

G2BAR HAM BAND AERIALS

6metre Yagi Gamma Match 2element £18.50 3element £22.00

	2 element	3 element
10 metre Yagi GAMMA MATCH	£56.00	£66.70
15 metre Yagi GAMMA MATCH	£68.00	£80.50
20 metre Yagi GAMMA MATCH	£88.50	£103.50

4 and 6 element 6 metre — AS ABOVE AVAILABLE

These Antennas are made in BRISTOL. Please send for leaflet.

12-14 PENNYWELL ROAD, BRISTOL BS5 0TJ
TEL: 557732 — 558578

AMATEUR ELECTRONICS UK

AMATEUR RADIO SOFTWARE

by John Morris, GM4ANB

In this newest RSGB hardback publication, ready-to-run programs are presented for Satellites, CW, RTTY, Data, Antennas, Propagation, Locators, Sun and Moon, Circuit Design Aids, as well as 97 other useful programs.

328 pages

£8.60 inc. p/p

Publications Dept.

Short Wave Magazine Ltd.,
34 High Street, Welwyn, Herts. AL6 9EQ.

("SITUATIONS" AND "TRADE")

30p per word, minimum charge £3.60. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50 per cent for Bold Face (Heavy Type). No responsibility accepted for transcription errors. Box Numbers £1.50 extra. Send copy, with remittance, to the Classified Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. Prices include VAT

Copy must be received by Friday, June 13th to be sure of inclusion in the July issue.

TRADE

Curtis keyer chips ex-stock: 8044, £15; 8044B, £18. Plus 50p post/packing. Callers welcome at our new electronic components shop. — Eclipse, 166 Cross Street, Sale, Cheshire M33 1AQ. (Tel: 061-969 0619).

Parts for your project. We can supply them — let us know your requirements! — Businessland Ltd., Unit 15, Mochdre Industrial Estate, Newtown, Powys SY16 3LE. (Tel: 0686-24846).

July issue: due to appear on Friday, June 27th. Single copies at £1.60 post paid will be sent by first-class mail for orders received by Wednesday, June 25th, as available. — Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Course for City & Guilds, Radio Amateur's Examination. Pass this important examination and obtain your licence, with an RRC Home Study Course. For details of this and other courses (GCE, Career and professional examination, etc.) write or phone: THE RAPID RESULTS COLLEGE, Dept. JV8, Tuition House, London SW19 4DS. Tel: 01-947 7272 (9 a.m. to 5 p.m.) or use our 24 hour Recordacall Service, 01-946 1102 quoting Dept. JV8.

Amidon toroidal cores, ferrite rings and beads. Send s.a.e. for data and prices. Business hours: 10-5 p.m. Tues., Wed., Fri.; 10-4 p.m. Sat. — SMC (TMP Electronics), Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd CH7 3PL.

READERS

See information panel on page 163

Offering: FT-101Z Mk.III, nine bands, excellent external condition but needs attention. Offers? — Ring 01-952 9548.

For Sale: RTTY interface, G3LIV-type, new condition, complete with software and leads for BBC micro, £50. "R & EW" UoSAT receiver, needs attention, hence £15. BBC Eprom programmer for 2764/27128 with software on disk or tape, £35. — Ring 01-571 3551 after 7 p.m.

Selling: Eddystone 888A with S-meter, speaker, phones, spare valves, and mounting blocks, £70. Buyer collects. — Ring Cole, 0222-33204.

Wanted: Eddystone 888A receiver. Please state condition, price and phone number.—Forrest, 15 South Gyle Gardens, Edinburgh EH12 7SA.

For Sale: Sign Electronics AF millivoltmeter, £5. Microwave Modules 2m. converter, IF 28 MHz, £5. Xerox 800 daisy-wheel printer, no information, any offers? — Ring Ian, G3ROO, 0304-821588.

Wanted: 19 Set owner requires spares, also repair manual. W-H-Y? — Box No. 5820, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Sale: Codar 12V power supply, £5. Power supply chassis, unfinished, £2. Walsey aerial crossover unit, Bank I and III, 75-ohm, £2. Mains amplifier, 3-valve, 3-watt, £5. Partridge VFA and tuner, £5. KW aerial filter, £3. Field strength meter, £3. Assorted pots, s.m. capacitors, B7G and B9A valve holders and cans, valves, knobs, tag boards, variable capacitors, switches, RF chokes, jack plugs, insulators, electrolytic capacitors and clips etc. Buyers please inspect and collect, and make offer where price not specified. — Ring Sweeney, G3TFS, Ashted (Surrey) 72689.

For Sale: Icom IC-225 2m. FM transceiver, 80-channel, 10-watt, £75. Adonis 202S mobile microphone, as new, £15. Valves: QY3-125 brand new, 2C39A Eimac or STC used — offers. All carriage extra. — Tipper, G3WWL, QTHR. (Tel: 021-353 8874).

Wanted: Circuit diagram and handbook for Liner-2, to copy or buy; also details of any mods. All expenses paid. — Aspinall, G6CJL, QTHR. (Tel: 0422-54635).

Exchange my mint Satellit 2100 Rx, 21 bands continuous tuning, plus SSB adaptor, for Sony CRF-320 Rx (or cash purchase one if reasonably priced). — Amoroso, 60 Highfield Road, Salford, Lancs. M6 5LA (Tel: 061-743 1570).

Wanted: Diagram etc. for Boonton Model 63C inductance bridge. All letters answered. — Hatch, G3ISD, QTHR. (Tel: Sittingbourne 77431).

Selling: Yaesu FL-101 SSB HF Tx, boxed, excellent condition, £210. Advance J-1 signal generator, £15. Solartron 7040 digital multimeter, £20. U.S. Navy miniature 'scope, needs PSU, £12. Eagle bench PSU, 0-20V/3A, new, boxed, £8. Heavy-duty Variac, 5A, £10. 807 valves, new, boxed, £1.50 each. — Sirignano, G4FZG, QTHR. (Tel: 0242-580329).

Sale: Trio TS-820S with CW filter, microphone and manual, spare brand new 6146B's and driver valves included, £495. Drake SPR-4 general coverage Rx, fitted noise blanker, calibrator, all accessory xtals, with matching Drake MS-4 speaker, £350. Both absolutely mint condition. Might exchange either for TS-120S or 130S, plus accessories, with cash adjustment either way. — Clarke, G0AYZ, QTHR. (Tel: Gosport 589560).

Sale: Unused Howes ST2 sidetone, complete, £6.50. "Tomorrow's Television Today", by Stone, £3. "Giant Book of Electronic Projects" (73), £3. "Guide to Amateur Radio", by G3VA, £1.50. "Amateur Radio", by Judd, £1.50. **Wanted:** Heath RA-1's. — Marris, 35 Kingswood House, Farnham Road, Slough SL2 1DA.

Exchange: Storno 900 System 4 direct-dial car telephone, perfect condition, for UHF or VHF mobile or HF linear. — Ring McCallum, G4VNG, 0733-231639.

For Sale: MET 432/17T Yagi, new and unused, half-price, £20. Belcom Liner-2, 144 MHz SSB, fitted Wood & Douglas pre-amp and pip tone, only £60. 5-ele NBS Yagi, 144 MHz, £5. — Ring Hilleard, G4CQM, 01-928 5879 daytime from 5th June.

For Sale: Kenwood R-820 communications receiver with operating manual and Kenwood SP-230 speaker, used by SWL (cost £624 in 1982), £380 or near offer. Buyer to pay carriage. — Ring Blanchard, 0783-267125 (Tyneside).

Selling: Vibroplex bug, new, £48. Drake 7072 mic., new, £20. Joystick antenna and ATU, £12. Yaesu FRG-9600, offers. Carriage extra. **Wanted:** Drake T-R7A, Icom IC-R7000. — Robinson, G6RJ, QTHR. (Tel: 0677-70480, 8 p.m. onwards).

Sale: HW-32 20m. transceiver, needs alignment, with spare valves and home brew power supply, £30. Buyer collects. **Wanted:** VFO-120. — Piper, G0CHE, QTHR (Tel: 0243-265644 after 6.30 p.m.).

For Sale: Trio R-1000 communications receiver, 200 kHz to 30 MHz coverage, with handbook, £185 or near offer. — Ring Tame, East Grinstead (0342) 311049.

Wanted: Trio YK88SN 1.8 kHz SSB filter. — Ring 0926-498388.

B. BAMBER ELECTRONICS

Pye Base Station Type F30AM High Band & Low Band.	£ 220
Pye Base Station Type F30FM High Band & Low Band. .	£ 250
Pye Base Station Type F401 AM High Band & Low Band	£ 300
Pye Reporter Type MF6AM High Band & Low Band. . . .	£ 90
Pye Europa Type MF5FM High Band & Low Band.	£ 90
Pye Olympic Type M201 AM High Band & Low Band.	£ 65
Pye Motofone Type MF5AM High Band & Low Band. . . .	£ 45
Pye Westminster Type W15AM High Band & Low Band.	£ 50
Pye Westminster Type W15AM Mid Band.	£ 25
Pye Westminster Type W15AM Air Band, Crystaled 3 channels, complete.	£ 75
Pye M294 FM High Band.	£ 200
Pye M293 AM High Band & Low Band.	£ 180
Pye M296 UHF.	£ 220
Pye Base Station Type F9U UHF.	£ 90
Pye Base Station Type F9AM High Band.	£ 90
Pye Base Station Type F25FM High Band.	£ 90
Pye Base Station Type F412 UHF.	£ 200
Pye Base Station Type F414 UHF.	£ 200
Pye Base Station Type F461 UHF.	£ 90
ITT Base Station Type 30LRU43A UHF.	£ 150
Pye Pocketfone Type PF2FM High Band & Low Band Less Mike, Battery & Aerial.	£ 25
Pye Pocketfone Type PF2AM High Band & Low Band Less Mike, Battery & Aerial.	£ 25
Pye Pocketfone Type PF2UB UHF Less Mike, Battery & Aerial.	£ 25
Pye Pocketfone Type PF5UHF Less Battery.	£ 25
Pye Pocketfone Type PF8UHF Less Battery.	£ 45
Pye Pocketfone Type PF9UHF Less Battery.	£ 45
Pye Pager Type PG1 AM Low Band.	£ 35
Pye Mains Power Unit Type AC15.	£ 25
Pye Mains Power Unit Type AC200.	£ 120
Pye Power Amp. Type A200 High Band & Low Band. . .	£ 50
Pye Controller Type PC1.	£ 85
Pye Controller Type M81.	£ 195
Pye Westminster Type W30 AM Low Band Complete with control gear.	£ 45
Pye Westminster Type LW15 FM High Band Less control gear.	£ 40
Weather proof mobile P.A. speakers 9" with mounting bracket, 8 ohm, 15 watt.	£ 10
Pye Pocketfone Receiver Type PF1 UHF with battery & manual.	£ 6
Pye Pocketfone Type PF1 UHF Rx/Tx with manual less Battery.	£ 20
Pye Signal Generator Type SG5U 370 Mhz to 470 Mhz.	£ 90
Pye Signal Generator Type SG5V 70 Mhz to 170 Mhz.	£ 90
Airtech UHF Filter Duplexer, 3 Cavity Type. Model M450-3A/14.	£ 25

PLEASE NOTE it is illegal to operate a transmitter without a licence.

Secondhand Pye equipment does not meet DTI approval. All sets are sold less crystals, mikes, speakers, power leads, etc. unless otherwise stated.

CARRIAGE on RT equipment — Mobiles £2.00 each, Base Stations £15.00 each.

Please add V.A.T. to the total order including carriage.



5 STATION ROAD, LITTLEPORT,
CAMBS. CB6 1QE
PHONE ELY (0353) 860185



THE JOY OF QRP: STRATEGY FOR SUCCESS

The experts reviewed Ade Weiss's (WORSF) book and wrote: **George Dobbs, G3RJV, Radcom**: "I am most impressed both with the scope and content of the book . . . the sections on objectives, planning, operating techniques, band selection and propagation would help any amateur whatever power is being used — *SPRAT*: "a comprehensive guide to the whole subject of QRP . . . a great book for QRP'rs and a lot of QRO operators would benefit from reading it." **Doug DeMaw W1FB, QST**: "I found the book easy to read, and the text is interesting throughout. I would have no hesitation in recommending WORSF's book to any amateur interested in QRP operation. In fact, it will provide great reading for nearly any active ham." **Bill Welsh, W6DDB, Novice Ed., CQ**: "151 pages covering QRP from basics to fine points in eight interesting chapters . . . Novices will have no difficulty understanding the explanations." **Fred Bonavita, W5QJM, QRP Quarterly**: "In no other place have I encountered such a well-founded statement of the philosophy of QRP operating."

£ 10.40 post paid (cheques: G QRP Club)

NORMAN FIELD, G4LQF, 14 REGENT ROAD, HARBORNE, BIRMINGHAM 17

ALL VALVES & TRANSISTORS

Call or phone for a most courteous quotation
01-749 3934

We are one of the largest stockists of valves etc. in the U.K.

COLOMOR ELECTRONICS LTD. 170 GOLDHAWK ROAD LONDON W12

D. P. HOBBS NORWICH LTD. G3HEO

ELECTRONIC COMPONENT SPECIALISTS

AGENTS FOR:—

FDK — ICOM — YAESU — WELZ — JAYBEAM — DRAE

Part exchanges welcome

Access, Barclaycard + Credit Terms Available
13 ST. BENEDICT'S ST., NORWICH. Tel. 615786

AMATEUR RADIO

by Gordon Stokes and Peter Bubb

The Butterworth Press are the publishers of this book, which is intended for those wishing to study for the R.A.E. and comprises nineteen chapters, plus Introduction and Index, covering the basic, technical material the would-be candidate needs to obtain a 'pass'. Copiously illustrated with simple diagrams and excellent plates. Published in hardback.

192 pages

£9.60 inc. p/p

Publications Dept.

SHORT WAVE MAGAZINE LTD.

34 HIGH STREET, WELWYN,
HERTS. AL6 9EQ

"S.W.M." DX ZONE MAP

Latest 10th Edition!

Price £4.35 inc. p/p

Publications Dept.,

Short Wave Magazine Ltd.,
34 High Street, Welwyn, Herts. AL6 9EQ.

Selling: National Panasonic RF-8000 24-band receiver, £500 or very near offer. Sony CRF-1 continuous tuning receiver (two available), £500 each or very near offer. Sony CRF-320 receiver, £500 or very near offer. Microwave Modules RTTY decoder, £150 firm. — Ring Bedas, 01-243 1659.

For Sale: Over 350 valves, many ex-1930's/40's radios and ex-govt. surplus equipment etc., £50 the lot plus postage and packing. Or send s.a.e. for list. — Booker, 45 Annesley Road, Sheffield S8 7SD.

Sale: Realistic DX-400 AM/FM direct entry communications receiver, good condition, £120. — Ring North Shields 258289 after 6 p.m., or write to Box No. 5821, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: RCS-S1500 oscilloscope, 15 MHz, £125. ZX Spectrum, as new, £75. Daiwa 620A SWR/Power meter, as new, £58. Yaesu FR-101 Rx, £205. FDK Multi Palm IV, 70cm., £75. Hallcrafters SX-117 Rx, £120. Hallicrafters HT-44 Tx, needs power supply, £75. Creed/ITT 2300, 50 baud rate, £55. RTTY TU, £45. Pioneer radio cassette player, £45; Pioneer graphic equaliser booster, £40; Pioneer speakers in cabinets, £25 pair. All above in very good working order. — Ring Brian, G4TXD, 0603-624573 after 6 p.m.

Selling: Lafayette HA-350 amateur bands Rx, working well, £40. LCL 10m. FM rig, with mic., £25. Unused Andrews cable, 25 metres, £20. Would exchange any or all above for 70cm. FM equipment. W — H — Y? Ring 065671-8963 after 6 p.m.

Wanted: Manual for Marconi Model 1064/M VHF signal generator, 68-470 MHz. Buy manual or pay for photocopying. — Owen, G0ESR, 12 Wolverley Avenue, Wollaston, Stourbridge, West Midlands DY8 3PJ.

For Sale: Sony ICF-7600D portable communications receiver, £95. Realistic DX-100 communications receiver, 0.53 to 30 MHz, £40. Harvard H-407 CB base station, legal, £60. Realistic/Tandy CB handheld, legal, 4 watts, 40 channels, with extension mic., £65. Fantavox airband converter, £10. Realistic 2m. base station Rx, crystallised R2/R6/R7/S10/S12, with scan and lockout, 240VAC, antenna, £30. Car aerial, 934 MHz, £15. — 14 Doverfield Road, Brixton, London SW2 5NB (Tel: 01-674 0513, Thursdays 6-9 p.m.).

Wanted: Old wireless books, magazines, callbooks, service-sheets, QSL cards, valves, keys, equipment, etc., for museum. — Ring G3KPO, Ryde (0983) 67665.

Sale: "World Radio TV Handbook", 1986 edition, unwanted gift, unused, as new, £9. — Ring Blackburn (0254) 28969.

Sell or Exchange: S.E.M. Ezitune, cased, £20. Microwave Modules 28 MHz pre-amp, 20/30dB, £12. YW-3 SWR/power meter, HF to VHF, £8. Prices include post/packing. Or exchange any for good QQVO-640A valves. — Baker, GW6VZW, QTHR (Tel: Cwmbran 60921).

Sale: Yaesu FC-757 automatic ATU, unused, £230. FL-110 linear, 10 to 100 watts, £75. MK705 paddle key, £20. R.A.F. Type 'D' key, £20. Marconi 365 key, £25. U.S. Navy cranked-arm key, £10. Carriage extra. — Hunt-Duke, G4IOT, QTHR. (Tel: Folkestone 76063).

July issue: due to appear on Friday, June 27th. Single copies at £1.60 post paid will be sent by first-class mail for orders received by Wednesday, June 25th, as available. — Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: Yaesu FT-301 transceiver, 100 watts output, 160-10m. with aux. band position, USB/LSB/CW/AM/AFSK, 250 Hz CW filter, all 10m., built-in RF processor, with mic. and DC power cable, mint condition, original boxes, no PSU, £350 or near offer. — Shields, G3OIH, QTHR. (Tel: Preston 718580).

Selling: Ex-PMR VHF transceiver, 25W PA, 12V inverter, IF 10.7 MHz, with manual, useful components or convert to 2m., £10. Buyer collects (Birmingham) or pays carriage. — Ring Mike, 021-422 4217.

Selling: Belcom LS-102L, 11/10m., all modes, £160. Zattagi linear, 400 watts, £85 or near offer. Both in very good condition, hardly used. — Ring 0243-826286 after 6 p.m.

There is money waiting for your German W.W.II military radio equipment. Collector wants receivers, transmitters, accessories. — Box No. 5822, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: German military radio equipment of W.W.II vintage. Collector pays high prices for your gear. — Box No. 5823, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: Yaesu FT-75, with DC power supply and VFO etc. — G3LYK, QTHR.

For Sale: FT-1 transceiver, fan mod. kit, RAM memory, Curtis keyer, with Service Extender Card boards and workshop manual, complete, £1250 (finance or part-exchange for FT-757 or TS-430 etc. considered). Lunar 2m. linear, 25W input, 160W output, 12V, with gasfet pre-amp., (cost £200), yours for £100. CPB-78 70cm. linear, 10 watts, for Standard C78, new, boxed, £50. CMB-8 mobile mount for Standard, new, £12. Microwave Modules 144/30LS 2m. linear for FT-290 etc., never used, £70. Oscar 2NE 2m. mobile antenna, new, no base, £5. Maldol antenna duplexer, 435/145 MHz, unused, £10. Avanti 70cm. 5dB glass-mount antenna, boxed, £20. Ringo Ranger add-on kit for extra gain, unused, £10. FRG-7 battery holder box, £5. FT-208 MMB2 mobile bracket, £4. — Ring Richard, 0484-710313 daytime.

For Sale: Trio TS-520, fitted CW filter, immaculate, £300 (no hagglers). — Ring David, G3ZPF, Brierley Hill 263020.

Free lists of valves, books and components. Send s.a.e. — "Hamlyn", Saxon Avenue, Minster, Sheerness, Kent ME12 2RP.

Selling: Kenwood VOX-3 unit, suitable for TS-700/7010 Tx/Rx, £8 inc. postage. — Ring 0926-498388.

Exchange: My FT-708 70cm. handheld, with PSU/speaker/mic., two helicals and case, also Spectrum 48K computer with recorder, for FRG-7700 receiver or a transceiver — must be in first class condition. — Ring James, GW0DPN, 0492-78234.

Wanted: Codar PR-30 preselector and Codar CR-45 receiver. — Barnes, G3AOS, 3 Church View, Sutton Lane End, Macclesfield SK11 0DT. (Tel: 02605-2764).

Sale: Microwave Modules MMT432/144R with 15dB attenuator, very good condition, £90. VHF wavemeter, 65-230 MHz, £8. Sandpiper 4m. 3-ele Yagi, unused, £8. Prefer buyers inspect and collect. — Ring Leamington Spa (0926) 313669.

Selling: Kenwood TS-520SE transceiver, £315. Datong D70 Morse tutor, £37. Honest Model FC-6A DFM, 1 Hz to 250 MHz, £43. — Ring 0562-886272.

For Sale: Heathkit SW-717 receiver, £40. Realistic DX-302 digital receiver, £130. 1986 Maplin catalogue, 90p; "Newcomer's Guide to FM Simplex and Repeater Operation", 60p. — Wood, Sylvania, Enzie, Buckie, Banffshire AB5 2BN.

Sale/Exchange: Baumuster H2L/7 German military receiver, made by Philips Berlin, coverage 15 kHz to 21 MHz in 10 ranges, complete with German archive diagrams (1936) and matching multi-voltage power unit, swop for Trio R-600. Ex-Lancaster bomber R.1155 Rx, £30. S. G. Brown Type 'F' headphones, £5. Buyers collect. — Ring Lowestoft 64160.

Sale: FRG-7700 receiver, 150 kHz to 30 MHz, AM/FM/USB/LSB/CW, digital readout, with FRV/7700B converter, FRT-7700 ATU, FF-5 filter, DC kit, and all manuals and boxes, very good condition, £325 or near offer. — Ring Brown, Penzance (0736) 788316.

Wanted: Murphy Type 618 Tx (AP100333) and power unit (AP100336). Type 161 (10H/184) AM aerial plug. Marconi power units Type 889A or 966A with plugs and cables. — Bonson, G4FUY, QTHR. (Tel: Reading 733633).

FREE READERS' SMALL ADS.

Send the copy for your advertisement to the Classified Dept., SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. (If you require a Box No. send £1.50 to cover postage costs). Please write clearly!

Advertisements will be inserted in the first available issue on a strictly 'first come, first served' basis

We reserve the right to alter, shorten or refuse at our absolute discretion any advertisement as we may deem appropriate. We can accept no responsibility whatsoever for any losses or claims of any kind which may arise out of any advertisement; nor for any transcription, setting or proof-reading errors, although every possible care is taken to ensure such errors do not occur.

CALL BOOKS

RADIO AMATEUR CALL BOOKS (1986)	
International Listings.....	£17.20
North American Listings.....	£17.90
U.K. Callbook, 1986 Edn. (RSGB).....	£5.65

MAPS

"SHORT WAVE MAGAZINE" DX ZONE MAP (GREAT CIRCLE) in colour. Latest 10th edition	£4.35
AMATEUR RADIO MAP OF WORLD Mercator Projection — Much DX Information—in colour. Latest 15th edition	£1.85
RADIO AMATEUR MAP OF THE U.S.A. AND NORTH AMERICA State Boundaries and Prefixes, size 24" x 30", paper. Latest 7th edition	£1.20
RADIO AMATEUR'S WORLD ATLAS In booklet form, Mercator projection, for desk use. Gives Zones and Prefixes. Latest 12th edition	£2.75

LOG BOOKS

Amateur Radio Logbook	£2.70
Receiving Station Log	£2.75
Mobile Logbook	£1.20

(The above prices include postage and packing)

Available from:

Publications Dept.

Short Wave Magazine

34 High Street, Welwyn, Herts. AL6 9EQ

Tel: Welwyn (043871) 5206/7

(Counter Service, 9.30-5.00 Mon. to Fri.)

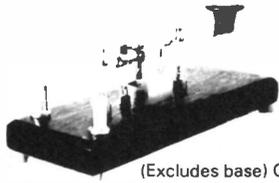
(Giro A/c No. 547 6151)



FOR THE PROFESSIONAL

WE STOCK AND DEMONSTRATE THE LATEST IN COMMUNICATION RECEIVERS — NRD 525 — ICR71 — FRG8800 — KENWOOD TR2000 — AIRBAND — MARINE — RECEIVERS & TRANSCEIVERS — VHF & UHF SCANNERS — HF TRANSCEIVERS

6 Royal Parade, Hanger Lane, London W5A 1ET. Phone: 01-997 4476



MORSE KEY KITS

BUILD YOUR OWN SOLID BRASS MORSE KEY only £19.95 + £2.00 P&P

(Excludes base) Goods in stock, by return

POLISHED WOOD BASES AVAILABLE £7.70 + £1 P&P

Kit contains all components and instructions. Just provide a base and assemble, alternatively use our finished wood base, average assembly time is less than one hour and requires no special tools.

Please send S.A.E. for further information.

R. A. KENT ENGINEERS

243 CARR LANE, TARLETON, PRESTON, LANCS PR4 6YB. Tel: Hesketh Bank (0774 - 73) 4998.

REG WARD & CO LTD

The Southwest's largest Amateur Radio Dealer

1 Western Parade, Axminster, Devon EX13 5NY

appointed agent for

- ★ Yaesu, Trio, Icom, FDK ★
- ★ Complete range stocked ★
- ★ Full demonstration facilities ★
- ★ Mail/Phone orders on all items ★
- ★ Barclaycard, Instant Credit, Access ★



Ancillary equipment by Adonis, AKD, AOR, Bencher, BNOS, Cap. Co., Datong, Diawa, Drae, Hansen, Himound, JLL, Kenpro, Microwave Modules, Mutek, SEM, Shure, Tokyo Hypower, Tono, Toyo, Welz, Wood & Douglas

Aerials by: G. Whip, Hygain, Jaybeam, Mini Products, MET, Revco, Tonna

full range of Wood & Douglas kits:

Opening hours: Tues-Sat 9.00-5.30 (lunch 1-2) Closed Mondays

Tel. Axminster (0297) 34918

RADIO AMATEUR PREFIX-COUNTRY-ZONE LIST

published by GEOFF WATTS
Editor of "DX News-Sheet" 1962-82

The List you have always needed, the list that gives you everything, and all on one line! For each country: -

- a. its DXCC "status" e. the continent
- b. the normal prefix f. the "CQ" Zone No.
- c. the special prefixes g. the ITU Zone No.
- d. the ITU call sign block allocation

Full information on Antarctic stations, USSR Klub-stations, obsolete prefixes used during the past 10 years, and much more.

The List is completely up-to-date, and includes all the latest information.

Everything arranged alphabetically and numerically in order of prefix. Ideal for Contest operators and SWL's.

Tell your Club-members about it. Order an extra copy for that overseas friend. 15 pages. Price £1.00 (UK), overseas (air mail) \$2.00 or 6 IRCs.

GEOFF WATTS

62 BELMORE ROAD, NORWICH NR7 0PU, ENGLAND

6 METRE EQUIPMENT

- Single dipole..... 9.99
- 2 Element beam..... 19.95
- MOSFET converter 50 to 28 MHz..... 28.80
- 50 to 144 MHz..... 29.95
- 50 to 3.5 MHz..... 29.95
- Single dipole 4 metres..... 7.99
- 2 Element beam 4 metres..... 16.90
- MOSFET converter 70 to 28 MHz IF..... 29.95
- 70 to 144 MHz IF..... 29.95
- 70 to 3.5 MHz IF..... 29.95

Prices include postage and packing

FANTEX RADIO

33 Alexandra Street, Carrington, Nottingham NG5 1AY

J. BIRKETT

13 THE STRAIT, LINCOLN, LN2 1JF. Phone: 20767

- TOKO MECHANICAL FILTERS Type MFH71T 455 kHz BW 7 kHz @ 95p.
- 2 GHz STRIPLINE NPN TRANSISTORS Similar to BFY90 @ 3 for £1.15.
- TOYCOM CRYSTAL FILTERS 10.7 MHz BW ± 7.5 kHz @ £2.50.
- GENERAL PURPOSE UNIJUNCTION TRANSISTOR Like TIS43 @ 20p each.
- AVX MULTILAYER CERAMIC AXIAL CAPACITORS 1000p.f. 100v.w. @ 25p doz.
- 144 MHz WAVEMETER KIT With instructions @ £4.60.
- LARGE GLASS 100 kHz CRYSTALS @ £1 each.
- GECALLOY RINGS For L.F. suppression, int. dia. 15mm, ext. dia. 38mm @ 39p.
- VARIABLE POWER SUPPLY KIT 6 to 22 volt 1 amp. consisting of transformer, 5K pot, regulator board with LM317 and instructions @ £4.95 p.p. £1.50.
- VMOS POWER VN10KM @ 50p. WM211 @ 40p. VN10LM @ 40p.
- HF POWER TRANSISTOR BLW60R with data @ £7.50.
- FETS J304 @ 6 for £1. BF256 @ 20p. 2N3819 @ 20p. J230 @ 5 for 60p.
- CRYSTALS 10XAJ TYPE 7010, 7012, 78, 7040 @ 60p.
- HCBU 50.1 MHz @ £1. HC18U 36 MHz @ £1. 10XAJ 1 MHz @ £1.50.
- FILM TRIMMERS 10p.f., 22p.f., 35p.f., 60p.f. @ 15p. 125p.f. @ 20p.
- VHF TRANSMIT-RECEIVE PIN DIODES 5 for 60p. UHF type 5 for 75p.
- 25 ASSORTED CERAMIC AND PAXOLINE COIL FORMERS @ £1.45.
- WIRE ENDED R.F. CHOKES 2.5mH @ 50p. 25 RUBBER FEET @ 35p.
- AIR SPACED VARIABLES Small 500 + 500p.f. @ £1.60. Medium size 500 + 500p.f. @ £1.60. Large 500 + 500p.f. @ £1.95.
- WOOD AND DOUGLAS KITS AVAILABLE BY POST AND FOR CALLERS.
- ACCESS & BARCLAYCARDS ACCEPTED, P.P. 60p under £5, over free.

GZVF Inventor and proprietor of Patent for VARIABLE HIGH FREQUENCY FRAME ANTENNA offers circuit and full assembly details for the modest sum of £5. A Do-It-Yourself project. Components required to be found in most Hamshacks. Most expensive components, two variable tuning capacitors. Antenna twenty-one inches square, mounts on top of control box, fully rotatable from operating position, tunable all the way 80 to 10 metres there being only one inductance. SWR One to One, 40, 15 and 10 and One Point Five to One 80 and 20. 59 on CW from JA, W areas 0 to 9, VE 1 to 6 and all Europe. Ninety awards obtained with frame. Maximum power 100 watts. NEW EFFICIENT L.W. AND M. WAVE FRAME ANTENNA. 21 inches square. D.I.Y. project. Circuit, parts list, assembly data £3. Ideal Caravan and flat dwellers. DIY SWL ATU 80 to 10 for LONG WIRE or LOOP ANTENNA. Parts List Assembly data £4. F. G. Rylands, 39 Parkside Avenue, Millbrook, Southampton SO19 9AF. Tel. (0703) 775064

QUARTZ CRYSTALS

STOCK CRYSTALS		FUNDAMENTALS		MADE TO ORDER CRYSTALS		PRICE
CRYSTALS FOR 2 METRES	HC25 £2.15 FOR ONE CRYSTAL HC62 £1.5 FOR ONE CRYSTAL	FREQUENCY RANGE	PRICE	FREQUENCY RANGE	OVERTONES	
TX CRYSTALS	RX CRYSTALS	5 TO 150kHz	£21.00	3rd OVT	21.00 TO 65.00MHz	£4.55
HCB/U 4 & 8 MHz 30PF	44 MHz SERIES RES	50 TO 150kHz	£11.00	5th OVT	60.00 TO 110.00MHz	£5.10
HC25/U 12 MHz 30 & 40PF	44 MHz SERIES RES	150 TO 500kHz	£7.80	5th OVT	110.00 TO 125.00MHz	£7.40
HC25/U 18 MHz 25 & 20PF	14/15 MHz 20 & 30PF	160 TO 999kHz	£11.90	7th OVT	125.00 TO 175.00MHz	£10.00
HC25	SCANNER XTLS (NOT SR9)	1 TO 1.5MHz	£10.75			
	Full list available on request; please send SAE.	1.5 TO 2.0MHz	£5.10			
4 METRE CRYSTALS FOR 70.26 in HCB/U AT £2.40 each		2.0 TO 6.0MHz	£4.75	DELIVERY 2.0 TO 175.0MHz 2 TO 3 weeks		
TX 8.78250 RX 29.78200		6 TO 21MHz	£4.55	5.0 TO 999.9kHz 6 TO 8 weeks		
70CM CRYSTALS £5.00/pr or £2.50 each		21 TO 25MHz	£6.50	1.0 TO 1.499MHz 3 TO 4 weeks		
For Pye PF1 PF2 & PF70 series. Wood & Douglas and FDK Multi Ull						
SU8 (43.2) SU20 RB0 RB2 RB4 RB5 RB6 RB10 RB11 RB13 RB14 RB15						
ALSO FOR MULTI U11 ONLY SU16 SU18						
CONVERTER CRYSTALS IN HC18/U AT £2.85 each						
22.000 38.666 70.000 96.000 106.666 101.000 101.500 116.000						
FREQUENCY STANDARDS £2.75 each						
HCB/U 1000kHz 3.50MHz 5.00MHz 10.00MHz 10.700MHz						
HC18/U 1000kHz 7.00MHz 10.70MHz 48.00MHz 100.00MHz						
Also HCB/U 200kHz 465 kHz £3.25 each						
TONEBURST, I.F. & MPU CRYSTALS IN HC18 £2.25 EACH						
7.188 MHz (for 1750 Hz Tone). 10.245 MHz (for 10.71 F.)						
3.2768 5.08888 14.3190 15.00000						
YAESU CRYSTALS for FT101's FT901 and etc. £4.00 each						
Many available ex stock. (A list is available on request; please send S.A.E.)						

WORLD RADIO/TV HANDBOOK 1986

Now in stock!

The World's only complete reference guide to International Radio & Television Broadcasting Stations. It includes: Frequencies, time schedules, announcements, personnel, slogans, interval signals and much more besides of value to the listener.

Lists all International short-wave stations, including frequencies, for each country; foreign broadcasts, long and medium wave stations (AM broadcast Band), TV stations and domestic programmes. Long recognised as the established authority by broadcasters and listeners. It is the only publication that enables you to identify BC stations quickly and easily. Enables you to fill more pages in your log book on the SW BC bands and helps you add more BC-station QSL cards to your collection.

No price increase!

£ 19.15 inc. p/p

from

SHORT WAVE MAGAZINE

34 High Street, Welwyn, Herts. AL6 9EQ

THE ARRL 1986 HANDBOOK for the Radio Amateur

63rd Edition

Each of the 40 chapters in this year's edition has had some revision, with over 500 new or revised diagrams, resulting in a page total increase to 1184; new material on today's major topics represents 532 pages and includes sections on Digital Electronics and Special Modulation Techniques. A new section covers remote control of model aircraft and vehicles. 27 new projects are described including PA's for 1.8, 50, 144 and 1296 MHz, and preamps and transverters for the VHF/UHF enthusiast. Remains, as always, the radio amateur's 'bible'!

soft cover: £ 16.00 inc. p/p

hard cover: £ 23.50 inc. p/p

Publications Dept.
SHORT WAVE MAGAZINE LTD
34 HIGH STREET, WELWYN,
HERTS. AL6 9EQ

1986 "CALL BOOK" NORTH AMERICAN LISTINGS

(lists licensed amateurs in all North American countries, plus Hawaii and U.S. possessions)

In this issue . . .

- ★ 470,896 licensed U.S. radio amateurs
- ★ 31,207 new U.S. licenses included, issued since the 1985 edition
- ★ 107,676 changes in listings
- ★ Then & Now — call letter changes
- ★ QSL managers
- ★ ARRL Countries list
- ★ Zip Codes and Licence Class on all listings
- ★ Standard Time charts
- ★ Plus many other features

NOW IN STOCK!

£ 17.90 inc. postage

Publications Dept.
SHORT WAVE MAGAZINE LTD.
34 HIGH STREET, WELWYN,
HERTS. AL6 9EQ

1986 "CALL BOOK" INTERNATIONAL LISTINGS

(lists all licensed amateurs outside countries in North America, Hawaii and U.S. possessions)

In this issue . . .

- ★ 431,929 licensed Radio Amateurs
- ★ 43,648 new licences included, issued since the 1985 edition
- ★ 79,994 changes in listings
- ★ QSL managers
- ★ Radio amateur prefixes of the world
- ★ ARRL Countries list
- ★ Standard Time charts
- ★ Census of world Amateur Radio licenses
- ★ Plus much, much more!

NOW IN STOCK!

£ 17.20 inc. postage

Publications Dept.
SHORT WAVE MAGAZINE LTD.
34 HIGH STREET, WELWYN,
HERTS. AL6 9EQ

Technical Books and Manuals

(ENGLISH AND AMERICAN)

AERIAL INFORMATION

Antenna Handbook (Orr and Cowan)	£7.75
Beam Antenna Handbook	£6.50
Cubical Quad Antennae. 3rd Edition	£6.90
Simple Low Cost Wire Antennas, by Orr	£6.20
Aerial Projects (Penfold)	£2.30
Antenna Book (ARRL) <i>latest 14th Edition</i>	£8.00
The (ARRL) Antenna Anthology	£4.50
Two-metre Antenna Handbook, F. C. Judd G2BCX	£6.35
HF Antennas for All Locations (RSGB)	£6.65
25 Simple Shortwave Broadcast Band Aerials (E. M. Noll)	£2.25
25 Simple Amateur Band Aerials (E. M. Noll)	£2.25
25 Simple Indoor and Window Aerials	£2.05
25 Simple Tropical and MW Band Aerials	£2.05
The ARRL Antenna Compendium, Vol. 1 (<i>new title</i>)	£8.95

BOOKS FOR THE BEGINNER

Amateur Radio (<i>Lutterworth Press</i>)	£9.60
Solid State Short Wave Receivers for Beginners (R. A. Penfold)	£2.25
Beginners Guide to Radio (9th Edition)	£5.45
Beginners Guide to Electronics, 4th Edition	£5.45
Beginners Guide to Amateur Radio (Newnes)	£5.45
Beginners Guide to Integrated Circuits, 2nd edn. ...	£5.00
Guide to Amateur Radio, 19th Edition (RSGB)	£3.40
Morse Code for the Radio Amateur (RSGB)	£1.70
Understanding Amateur Radio (ARRL)	£5.45
Radio Amateur's Examination Manual, <i>latest 11th edition</i> (RSGB)	£3.90
How to Pass the Radio Amateurs' Examination (RSGB)	£3.30

GENERAL

The Complete DX'er, by W9KNI	£8.25
Weekend Projects for the Radio Amateur (ARRL) ..	£3.05
Projects in Amateur Radio and Short Wave Listening (<i>Newnes</i>)	£4.20
How to Build your own Solid State Oscilloscope (Rayer)	£2.25
How to Design and Make Your Own PCB's	£2.25
How to Build Advanced Short Wave Receivers ...	O/P
Better Short Wave Reception, (<i>5th Ed</i>)	£6.20
FM & Repeaters for the Radio Amateur (ARRL) ..	£4.35
Easibinder (to hold 12 copies of "Short Wave Magazine" together)	O/S
World Radio & TV Handbook 1986 Edition	£19.15
The World's Radio Broadcasting Stations and European FM/TV (Newnes)	£8.10
Guide to Broadcasting Stations (18th Edition)	£5.50
International Radio Stations Guide (<i>new ed.</i>)	£3.25

Long Distance Television Reception (TV-DX) for the Enthusiast (<i>revised edition</i>)	O/S
An Introduction to Radio DXing	£2.30
Radio Amateurs DX Guide (14th Edition)	£2.45
Power Supply Projects (Penfold)	£2.80

HANDBOOKS AND MANUALS

Radio Communication Handbook, <i>5th ed.</i> , Vols. 1 and 2 combined (paperback), RSGB	£14.15
Teleprinter Handbook. New 2nd Ed. (RSGB)	£12.70
TVI Manual (<i>2nd Edn.</i>) (RSGB)	£2.20
The ARRL 1986 Handbook for the Radio Amateur, <i>soft cover</i>	£16.00
The ARRL 1986 Handbook for the Radio Amateur, <i>hard cover</i>	£23.50
The Satellite Experimenter's Handbook (ARRL) ..	£9.70
Test Equipment for the Radio Amateur (RSGB) ..	£5.75
Amateur Radio Operating Manual (RSGB) <i>3rd Ed.</i> ...	£6.10
Oscilloscopes — How to Use Them, How They Work (Newnes)	£5.90
Practical Handbook of Valve Radio Repair (Newnes)	£17.15

USEFUL REFERENCE BOOKS

Solid State Design for the Radio Amateur (ARRL) ..	£7.60
Foundations of Wireless and Electronics, 10th Edition (Scroggie)	£10.05
Amateur Radio Techniques, 7th Edn. (RSGB)	O/P
U.K. Call Book 1986 (RSGB)	£5.65
Hints and Kinks (ARRL)	£4.30
Radio Frequency Interference (ARRL)	£2.40
Amateur Radio Awards, (RSGB)	O/P
Electronics Pocket Book, 4th Edition (Newnes) ...	£6.20
Radio Data Reference Book, <i>new 5th edition</i> (RSGB)	£8.90
Amateur Radio Software (RSGB)	£8.60
The Radio and Electronic Engineer's Pocket Book (Newnes) <i>new title</i>	£5.90

VALVE AND TRANSISTOR MANUALS

Towers' International Transistor Selector, latest 1985 Edition (Up-Date No. 3)	£14.50
Semiconductor Data Book, 11th Edition (Newnes)	£8.50
International Transistor Equivalents Guide	£3.40
International Diode Equivalents Guide	£2.60

VHF PUBLICATIONS

VHF Handbook, Wm. I. Orr W6SAI <i>latest 3rd</i> Edition	£9.75
VHF/UHF Manual (RSGB) 4th edition	£11.20

O/P (Out of print)

orders despatched by return of post
THE ABOVE PRICES INCLUDE POSTAGE AND PACKING

O/S (Out of stock)

Many of these titles are American in origin

(Terms C.W.O.)

Prices are subject to alteration without notice.

Available from

SHORT WAVE MAGAZINE

Publications Dept.

34 High Street, Welwyn, Herts. AL6 9EQ — Welwyn (043871) 5206/7

(Counter Service: 9.30 — 5.00 Mon. to Fri.)

(GIRO A/C No. 5476151)