

The

SHORT WAVE

Magazine

25p

VOL. XXXI

DECEMBER, 1973

NUMBER 10



WORLD WIDE COMMUNICATION



Merry Christmas and a Happy New Year



from

LOWE ELECTRONICS

MAIN DISTRIBUTOR FOR YAESU MUSEN EQUIPMENT

Head Office and Service Department (Bill G3UBO, Alan G3MME and John G3PCY)

119 Cavendish Road, Matlock, Derbyshire, DE4 3HE

Telephone : 9 a.m. - 9 p.m. Matlock 2817 or 2430

Southern Sales (Dave G8FAY)
Goring Road, Steyning, Sussex.
Telephone : Steyning 814466.
Just off the A283 on the Shoreham side of the village.

Midland Sales (Peter (G3XWX))
Soho House, 362-364 Soho Road,
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Telephone : 021-554 0708

Just off Exit 1, M5—follow the A41 into town for 1½ miles to the Regal (Bingo Hall) Cinema. We are directly opposite, on the first floor. Within easy reach of the South-West or North-East by Motorway.

NO PROBLEM PARKING AT ANY BRANCH

In addition to the above shops, which are open 9 to 5.30 Tuesday to Saturday, we have part-time Agents who are available evenings and weekends :—

John G3JYG
16 Harvard Road, Ringmer, Lewes,
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Telephone Ringmer 812071

Sim GM3SAN
19 Ellismuir Road, Baillieston,
Nr. Glasgow.
Telephone 041-771 0364

Alan GW3YSA
35 Pen Y Waun, Efail Isaf,
Nr. Pontypridd, Glam.
Telephone Newton Llantwit 3809

So, wherever you are, we have a branch or a part-time Agent not too far away. At Matlock, the Branches, or our Agents you will see and can try out the best in both new and second hand, H.F. or V.H.F. along with every conceivable accessory for the complete station.

**NEW
MODEL
FT101B**



This is a new and improved version of the well-known FT101. It is fitted with a cooling fan as standard and is improved in several respects :—

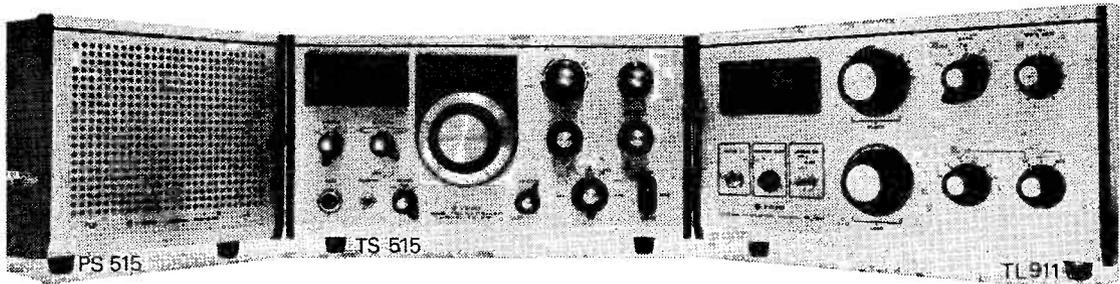
- | | |
|--------------------------|----------------|
| New noise blanker | New R.F. board |
| New inverter transistors | New 2nd mixer |
| New 8 pole filter | |

Further details may be obtained from Matlock. Our catalogues are free but we would appreciate postage, etc., so please send 8p in stamps for our V.H.F. catalogue, 8p for our H.F. catalogue, 3½p for second-hand list, or send us 15p in stamps and we will send the lot.

STOP PRESS : VENUS SSTV - Give us a yell !

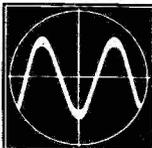
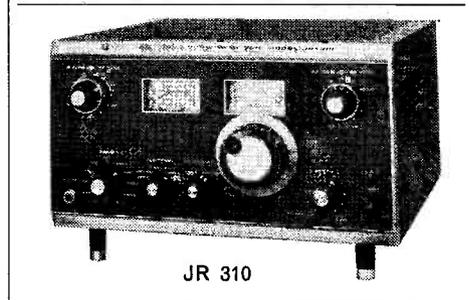
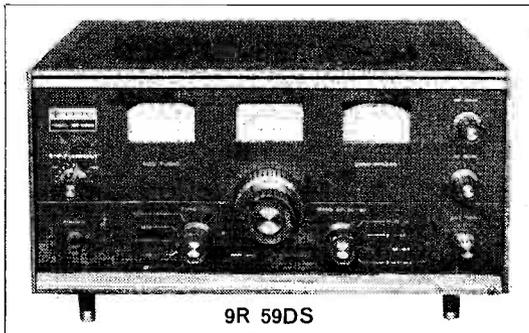
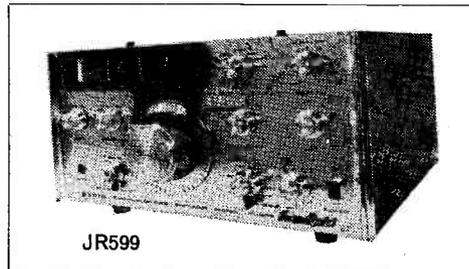
TRIO

communications at its best



9R 59DS	General Coverage Receiver	£49.50
JR 310	Amateur Bands Receiver	£75.00
JR 599	Amateur Bands Receiver	£160.00
TX 599	Matching Transmitter to JR 599	£160.00
TS/PS 515	SSB Transceiver	£210.00
TL 911	2KW PEP Linear Amplifier	£156.50
TR 2200	2M Personal Transceiver	£79.50
TR 7200	2M Car Transceiver	£129.50

ALL PRICES EXCLUDING VAT



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Western Electronics (UK) Ltd

TOTTON
SOUTHAMPTON

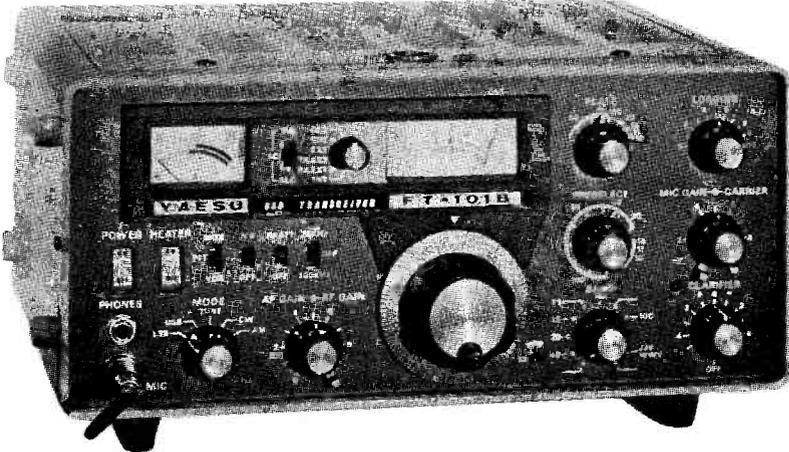
. . . wish to take this opportunity of wishing you
A Very Happy Christmas
 and thank our customers for their support throughout
 the year

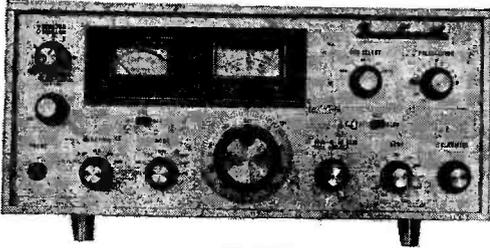


YAESU MUSEN U.K. DISTRIBUTOR

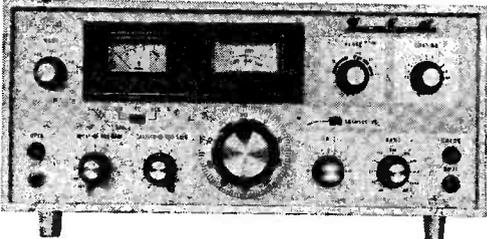
★ FIRST WITH YAESU
★ FIRST WITH SECURICOR

NEW FT-101B





FR 400



FL 400

The NEW FT-101B. There are over two dozen various circuit changes in this new model of the famous "101," some of them very minor. The main differences are —1, New plug-in noise blander; 2, New 2nd mixer; 3, 3SK40M transistor on the RF board with different bias; 4, LED's to indicate VFO and RIT operation; 5, o/p socket for sidetone; 6, i/p socket for anti-trip from 2nd receiver; 7, New crystal filter.

When you compare the superb value and craftsmanship built into this fine unit don't forget that you are buying a DC PSU and microphone all in one package plus our technical "know-how" and the finest after sales service in the country, and if any Yaesu unit goes wrong (which is most unlikely) then all you have to do is write/telephone us and we will collect the unit from you AT NO COST TO YOURSELF by Securicor and deliver back to you free of charge on all warranty work. You just can't do better!

The FR400SDX (Super de luxe) receiver is made especially for us fitted with 4m. and covers 160, 80, 40 20, 15, 11, 10, 4 and 2m. 4 filters are fitted for SSB (2.4 kHz), AM (5 kHz), CW (0.6 kHz) and FM 24 kHz. Dial readout to 1 kHz from stable VFO. Rejection tuning to notch-out unwanted heterodynes. Clarifier control permits adjustment of SSB/CW received signals when working transceive. VFO select for internal or 4 crystal frequencies. Monitor facility enables transmitted signal to be monitored at all times. Squelch circuitry silences receiver for noise-free AM/FM reception. FM discriminator fitted to SDX model, 25/100 kHz calibrator, WWV band to check calibrated, 3 step AGC. Built-in noise limiter.

The FLDX400 Transmitter runs 240w. p.e.p. and is designed to transceive with FR100B or FR400. AM and "breaking-in" CW keying are fitted. SPECIFICATION: Frequency coverage 3.5-4.1, 6.9-7.5, 13.9-14.5, 20.9-21.5, 27.9-28.5, 28.5-29.1, 28.9-29.5 MHz. Selectable USB or LSB. Stability: less than 100Hz/½ hr. after warm-up. Sideband suppression 50dB. Carrier suppression better than 50dB. Netting facilities for zero-beating. Provision for listening on transmit frequency as well as the frequency to which the receiver is tuned. ALC fitted to secure effective performance and a "clean" signal. VOX/PTT operation. Relays operate linear amplifier and receiver. Dial read-out to 1 kHz.

Western Electronics (UK) Ltd

TOTTON
SOUTHAMPTON

For your LINER 2 144MHZ SSB Transceiver



Price £120 (plus V.A.T.)

24 hour SECURICOR DELIVERY.

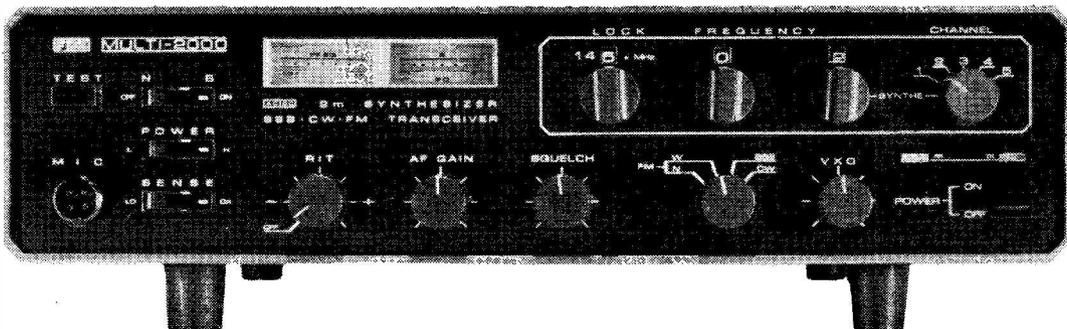
Ex-Stock. We have 2 models :

- (a) Covers 145.25-145.48
- (b) Covers 144.10-144.34 for the new band plan.

At last . . .

What you've all been waiting for!

A 2m. SSB/FM/CW TRANSCEIVER, the FKD Multi 2000



2m. SSB/FM and CW Synthesised 200 Ch. AC/DC. 10w o/p. (S.A.E. for details please)

LOWEST PRICES — HIGHEST QUALITY — ACT QUICKLY!

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Most valves are of First Grade TOSHIBA Manufacture.

572B ... £9.40	OA275	6EW635	6EA842	6BM640
6AH656	12AX739	6KD6 ... £1.50	6GK645	6BM870
6AW851	5763 ... £1.35	OB250	6LQ6 ... £1.50	6CB633
6BN840	6AM645	12BY7A... .42	12AU740	6EJ742
6CH675	6BA631	6AN845	12DQ6 ... £1.95	6GW862
6EH742	6BQ540	6BE633	7360 ... £3.30	6U848
6JS6C ... £1.50	6CL665	6BZ633	6AV628	12AT745



BATTERY CLOCK (£6.82 inc. V.A.T.)
This operates for about 6 months on one battery (provided). Ideal Christmas present for the shack or XYL. Available in red, blue, orange, ivory and brown; list your choice in order of preference.

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Hours of business: 9-5.30; 9-12.30 (Saturdays)

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TELEPHONE: TOTTON (04216) 4930 or 2785
CABLES: 'AERIAL, SOUTHAMPTON'



YOUR MIDLAND STOCKISTS

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UK715 Photo Cell Switch	£8.49	20p
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UK325 Channel Splitting 1000/2000 Hz	£7.86	20p
UK330 Channel Splitting 1500/2500 Hz	£7.86	20p
UK300 Four Channel R/C Transmitter	£6.55	20p
UK310 Radio Control Rx.	£3.28	20p
UK345 Supermet R/C Rx.	£6.55	20p
UK120 Hi Fi Amp 12W	£5.20	20p
UK165 RIAA Equip. Stereo Preamp	£5.06	20p
UK110/A Stereo Amp 5 + 5W	£11.07	20p
UK92 Telephone Amp	£7.91	30p
UK145 Amplifier 1-5W	£3.64	20p
UK160 I.C. Amp 8W.	£11.07	20p
UK220 Signal Injector	£2.57	20p
UK135 Hi-imp Preamp	£2.09	20p
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00/3009-10 Cabinet 120H 224L 138D	£4.40	20p
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SR2A 30 Projects	£8.49	25p
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RAYMART

2M Converter Kit (less crystal) ...	£4.13	10p
Crystal for above 70 or 75 MHz ...	£3.00	4p

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CHAS. H. YOUNG LTD.
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EDDYSTONE "EDOMETER" MkII



- Standard Dip Oscillator
- Absorption Wavemeter
- Heterodyne Wavemeter
- Simple Signal Generator
- Modulation Monitor
- Audio Tone Source

The frequency coverage when used as a Dip Resonance Indicator is from 1.25 MHz to 115 MHz, two additional coils being provided for signal generation over the range 380 kHz to 1.25 MHz.

All units new and complete with wooden case.

Rec. Retail Price £32.45

OUR PRICE £15 p.p. 35p

This Edometer has now been discontinued and does not carry a guarantee.

The prices shown in the advertisement do not constitute a contract and are subject to change without notice.

All prices include VAT
NO C.O.D. PLEASE PRINT YOUR ADDRESS. YOU MAY ORDER GOODS BY PHONE AND PAY BY ACCESS OR BARCLAYCARD. SIMPLY QUOTE YOUR CARD NO. Enquiries S.A.E. please.
 TEL.: 021-236 1635

SENTINEL

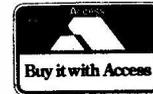
2M Converter 4-6 or 28-30 MHz	£15.12	22p
70 Cm. Converter 144/146 MHz	£15.12	22p
PA3 Preamp for 2M Equipment ...	£5.50	6p

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OSKER SWR200 SWR/Power Meter 52/75 Ω	£20.35	30p
KW107 ATU/SWR	£51.00	50p
KW101 SWR 52 or 75 Ω	£9.10	30p
KW103 SWR/Power 52 or 75 Ω	£13.80	45p
TMK TP10s 2k/v	£8.06	30p
TP5s 20k/v	£10.63	30p
500 30k/v	£15.04	30p
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SANWAP2B 2k/v	£7.33	30p
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U50DX 2k/v	£12.00	30p
A303TRD 20k/v	£16.53	30p
38OCE 33.3k/v	£24.01	30p
TECH ITI-2 20k/v	£5.69	30p

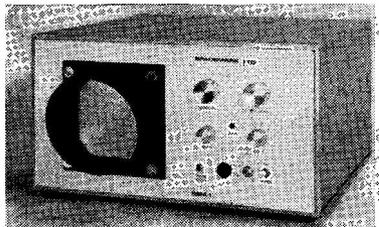
AERIALS and ACC.

Bantex Fibre Glass 2M 1/2 wave	£3.14	cost
Bantex Fibre Glass 2M 3/4 wave	£4.90	cost
New J Beam Fibreglass 1/2 wave	£7.00	approx. £1
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ML1 (100 yd.) 100lb Line	...	69p 22p
ML2 (100 yd.) 200 lb. line	...	£1.38 25p
ML4 400 lb. line	...	3p 25p
AT Insulators (centre T)	...	15p 6p
14 swg H/D Copper Wire 140ft.	...	£2.04 30p
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7/029 Soft Stranded PVC covered 140ft.	...	£2.04 30p



NOW THE NEW SPACEMARK

SLOW SCAN TV MONITOR SSM-I



Plug it into your receiver phones jack and watch SSTV pictures on the Monitor screen from DX stations all over the world.

If desired, SSTV pictures can also be recorded on an ordinary tape recorder for viewing again on your Monitor.

- All solid state except 5" CR tube with 7 IC's, 17 transistors.
- Tuning indicator. ● Conforms to international SSTV standards.
- 4 switched inputs. ● Manual. ● Two tone pvc coated cabinet, 13" w. x 7" h. x 13" d. Weight 17 lbs.

SSM-I MONITOR—£143 (includes V.A.T. and U.K. carr.) ... Why pay double for an imported Monitor ?

ALSO AVAILABLE IN KIT FORM. COMPLETE KIT SSM-IK (less case), £82. SET OF PCB's only with full data, £7.50. Special transformer and some other parts available. Kits come with instructions, circuits, layouts, parts lists. SSTV TAPES and CASSETTES with sync. pulses and patterns for setting up Monitors, £1.80. COMING : SSTV Camera and Fast Scan Sampler.

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SPACEMARK LTD.

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- COPIES 850/400/170 HZ SHIFTS
- BUILT-IN SINGLE AND DOUBLE CURRENT PSU
- F.S. KEYER FOR TX (AND OPTIONAL AFSK)

Complete and ready-to-go for send-receive RTTY with TX, RX and teleprinter.

- Advanced circuitry, 6 ICs, 25 semi-conductors. ● Input matches receiver outputs 3-8 or 500-600 ohms. ● 3-pole Butterworth input bandpass filter. ● Switched 850/400/170 Hz Amateur/Commercial shifts. ● 2-pole low-pass filter. ● Tuning meter. ● Monitor scope outputs. ● Mark Hold and Normal/Reverse shift switch. ● Built-in loop PSU—Instant switch-selection of single- or double-current printers. ● Narrow-shift CW identification. ● F.S. Keyer output for TX. ● Socket and circuitry already fitted for optional plug-in AFSKeyer module, 850/170 Hz. ● Manual. ● Two-tone pvc-coated case, 9" w x 3 3/8" x 14" d. Weight : 7 lbs
- SRD-1, £54.45.**

(Optional plug-in AFSK module, SRD1-AK, £6.32. SRD-1 complete with SRD1-AK, £60.50).

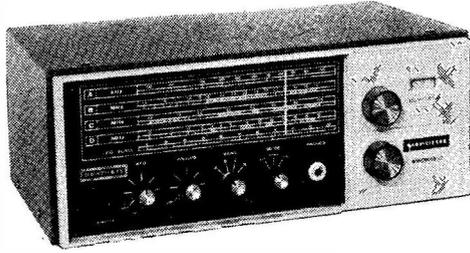
RTTY CONVERTER-KEYER Model TTU, £132. ST-5 PCBs and datasheets, £4.56. ST-6 PCBs and datasheets, £12.92. ST-6 KIT complete less case, with datasheets, £68.75. 88 MH TOROIDS, 38p each plus 10% VAT. SAMSON ETM-2b, £34.79. ETM-3b, £38.55. JUNKER Precision hand key, £16.59. BAUER keying lever, £5.88. SSB 90° AUDIO PHASE SHIFT NETWORKS, £3.24. PRINTSET Basu kits.

ALL PRICES INCLUDE V.A.T
 (except Toroids - add VAT please).

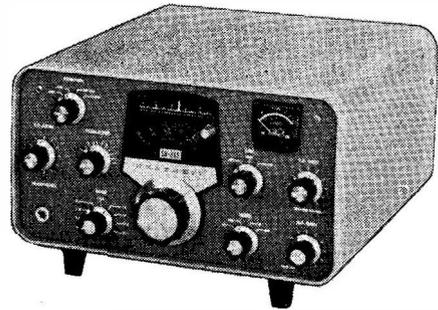
All goods post-paid U.K. Send stamp for Catalogue SP5.

THORNFIELD HOUSE, DELAMER ROAD, ALTRINCHAM, CHESHIRE.
 (Tel. 061-928 8458)

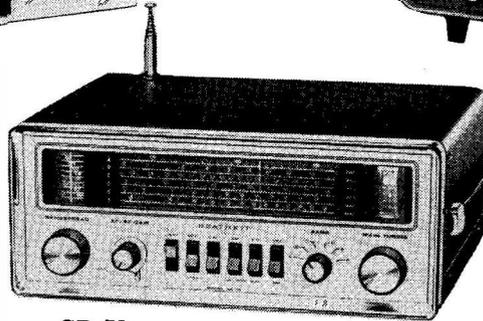
SW-717



Monthly Budget Plans available— Send for details



SB-313



GR-78

Big sellers for the SWL from Heathkit

TRANSISTOR GENERAL COVERAGE RECEIVER, SW-717

SW-717 SPECIFICATIONS: Frequency Coverage Band A. 550 kHz to 1500 kHz. Band B. 1.5 MHz to 4 MHz. Band C. 4 MHz to 10 MHz. Band D. 10 MHz to 30 MHz. Meter indicates relative signal strength. Headphone jack. Headphones or an external speaker. Loud-speaker built-in. Controls: VOLUME with on-off switch. MODE (AM, standby and CW) BFO, MAIN TUNING. BANDSPREAD TUNING. ANL (on-off). Power Supply: Transformer operated. Full wave bridge rectifier. Power Requirements: 120v. A.C. or 240v. A.C. 50/60 Hz 6 watts.

Kit K/SW-717 £34.65 Carr. 77p (VAT £3.22 incl.)

SOLID-STATE GENERAL COVERAGE RECEIVER, GR-78

• 190 kHz to 30 MHz in 6 bands • 11 transistors, 5 FET's and 7 diodes • Four ceramic IF filters • Double conversion superhet circuit above 18 MHz for excellent image rejection • Built-in 500 kHz crystal calibrator • Relative signal strength meter • Switchable Automatic Noise Limiter • Switchable Automatic Volume Control • Switch-selected AM, CW or SSB tuning • Receive/Standby switch and receiver muting connection for amateur operation • Operates from built-in rechargeable nickel-cadmium battery • Charges from 120v. A.C. or 12 to 15v. D.C. with internal charging circuit • 240v. AC wiring option • Size: 6½" H x 11½" W x 9" D.

Kit K/GR-78 £75.90 Carr. 55p (VAT £6.95 incl.)

HEATHKIT PROFESSIONAL SOLID-STATE SWL RECEIVER SB-313

SB-313 specification: Frequency range (MHz) 3.5 to 4.0, 5.7 to 6.2, 7.0 to 7.5, 9.5 to 10.0, 11.5 to 12.0, 14.0 to 14.5, 15.0 to 15.5, 17.5 to 18.0, 21.3 to 21.8. Intermediate frequency (IF) 3.395 MHz. Frequency stability less than 100 Hz per hour after 10 minutes warm-up under normal ambient conditions. Less than 100 Hz drift for ± 10% line voltage variation. Sensitivity: less than 0.5 microvolt for 10 dB signal-plus-noise ratio for SSB operation. Selectivity AM 5.0 kHz at 6 dB down. 15 kHz maximum at 60 dB down (crystal filter supplied). SSB 2.1 kHz 6 dB down, 5.0 kHz maximum at 60 dB down (crystal filter available as an accessory). CW 400 Hz at 6 dB down, 2.0 kHz maximum at 60 dB down (crystal filter available as an accessory). Image rejection: 60 dB or better. IF rejection 3.395—greater than 55 dB. 8.595—greater than 40 dB. Spurious response: all below 1 microvolt equivalent signal input except at 10.0 MHz and 15.375 MHz. Dial accuracy: electrical—within 400 Hz after calibration at nearest 100 kHz or 25 kHz point. Visual—within 200 Hz. Calibration every 100 kHz or 25 kHz. Dial backlash: no more than 50 Hz. Antenna input impedance: 50 Ω nominal unbalanced. Audio output impedance: matching speaker 8 Ω. Matching headphones low impedance. Audio output power: 4 watts at less than 10% distortion. Muting: open external ground at Mute socket. Power requirements: 105 to 130 or 210 to 260 volts A.C., 40 watts max. Overall dimensions: 7 15/16" H x 12½" W x 14" D.

Kit K/SB-313 £209.00 Carr. 99p (VAT £19.09 incl.) less speaker

FREE Catalogue

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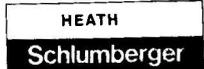


Please send me free the Heathkit Catalogue and details of your Monthly Budget Plan.

NAME

ADDRESS

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Waters & Stanton Electronics

★ Wish all readers a Very Happy Christmas ★

MINI-BEAMS

Now available from your local dealer or direct from us.
Mini-Hybrid Quad (HQ-1) (p.p. £1.50) **£46.75**
Mini-Beam (B24) (p.p. £1.50) **£35.75**
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The only R.F. Speech Processor available in the U.K. Up to 400% effective power increase—Send S.A.E. now.
 Models to suit Collins, Heath, Yaesu, Trio and Drake.

★★ Less than half the price of a linear and just as effective !

***TRIO COMMUNICATIONS EQUIPMENT.** Whilst chaos reigns in certain sectors of the Japanese import market in respect of prices, Trio stays cool (and so do their P.A. tubes!) We saw the trouble coming many months ago—that's why we backed Trio. For an unbiased report read Radio Communications review of the T3515 in September 1973.

TS515 Transceiver and p.s.u. **£231.00***
TX599 Transmitter **£176.00***
JR599 160-2 metre Receiver **£176.00***
9R599DS Receiver **£54.45**
TL911 Linear 2kW **£172.00***
7200 2m. Transceiver **£142.45***
 *Free Securicor delivery on these items

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4 element 4 metre beam **£6.16**
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70 cm. converters (144 if) **£15.12**
2 metre pre amp **£7.15**
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- ★ Barclaycard welcome—simply quote your number.
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10-15-20 metre, all metal quad (p.p. £1.10) **£27.50**
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 NEW _____ NEW _____ NEW _____

OUR LATEST ADDITION

80 / 40 MINI-DIPOLE

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NEW _____ NEW _____ NEW _____
KW 2000B. Superb **£175.00**

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2 metre $\frac{1}{2}$ wave (p.p. 20p) **£2.40**
2 metre $\frac{3}{4}$ wave (p.p. 50p) **£3.35**
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High power Vwightraps (p.p. 20p) pr. **£3.68**
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1 1/2" ferrite rings **23p**
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Tel: 051-928 1610

9 a.m. - 8 p.m.

ALL OUR EQUIPMENT CARRIES AN UNCONDITIONAL 12 MONTHS GUARANTEE INCLUDING FREE SERVICE

144 MHz MOSFET CONVERTER

I.F.s available ex-stock : 14-16, 18-20, 24-26, 27-7-29-7, 28-30 MHz
 Price inc. VAT **£16.72**

432 MHz MOSFET CONVERTER

I.F.s available ex-stock : 14-16, 18-20, 24-26, 28-30, 144-146 MHz.
 Price inc. VAT **£19.91**

144 MHz DOUBLE CONVERSION MOSFET CONVERTER

I.F.s available ex-stock : 2-4, 4-6 MHz
 Price inc. VAT **£16.72**

1296 MHz CONVERTER

Gain 25 dB, N.F. 8-5 dB
 I.F.s available ex-stock : 28-30, 144-146 MHz
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144 MHz DUAL OUTPUT PREAMPLIFIER

Gain 18 dB, N.F. 2-8 dB
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432 MHz VARACTOR TRIPLER

Maximum input power at 144 MHz : 20 watts. Typical output power (at maximum input) : 14 watts
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5 watts input, six channel crystal controlled. Supplied with crystal for 145 MHz
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1296 MHz VARACTOR TRIPLER

Maximum input power at 432 MHz : 24 watts. Typical output power (at maximum input) : 14 watts
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We can supply such a preselector, in fact we have four models to choose from, solid state or valve over a considerable price range. These units used properly with their gain turned up and your receiver's R.F. gain control turned down as far as possible will bring up the signal to noise ratio of almost any receiver.

Used like this we think that control over signal to noise ratio is left entirely to the preselector, with your receiver's R.F. stage acting as a tuned buffer giving very little gain on its own account. The preselector with its antenna tuner and gain doing a better job of getting the R.F. into your receiver than the receiver on its own. Under these conditions cross modulation should be no worse than the receiver and signal to noise ratio a lot better. Also image rejection will be improved on receivers with low I.F's.

As this is our 10th year of producing almost entirely preselectors it is just possible that we speak from experience in this field, try us and see.

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Pye Cambridge FM10D, dash mount, good cond., 25 kHz channel spacing, Low band only. Single channel £27.50. Six channel, £33, carriage 50p.

Pye Vanguard AM25B, sets only, no control gear. High or Low band, 25 kHz channel spacing, with 2nd conv. xtal and circuits, £8, carriage 75p.

Inverter Transformer. 12v. in, 260v. at 150mA out. With winding for quick-heat YL1080 valves, with circuit, £1.25.

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We try harder to satisfy you, the customer, and follow a policy of continual development to improve our equipment as new techniques become available. This is how we have established the leading position in the amateur V.H.F. market. Incidentally before we started using the Sentinel name on our converters we labelled them as "Dual Gate MOSFET Converters" and this is the name that stuck. So, many people refer to our converters as "Dual gate MOSFETS" or simply "mosfet converter".

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The Sentinel Dual Gate MOSFET 2 Metre converters.

- * By far the most popular converters in this country.
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I.F.s AVAILABLE—EX. STOCK

2-4 and 4-6 for use with most general coverage receivers. Double conversion design using 2 mixers and no crystal oscillator multiplication. These techniques minimise breakthrough from out of band signals. Size: 2½" x 4" x 1½".

28-30 and 27.7-29.7 and KW 2000 type. For use with amateur band receivers or transceivers. These converters use 116 MHz range crystals with no frequency multiplication. This overcomes the problem of unwanted signals from the fundamental and harmonics of the 38 MHz crystals generally used in other converters. Other I.F.s in stock 9-11, 14-16, 18-20, and 24-26 MHz. Size: 2½" x 3" x 1½". Price: £15-12.

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This is a de luxe version containing an internal mains power supplier or battery operation. It has a front panel RF gain control. Size: 5" x 1½" front panel 4" deep.

Stock I.F.s: 2-4 MHz, 4-6 MHz, 27.7-29.7 MHz, 28-30 MHz. Price: £21-45.

THE SENTINEL M.F. DUAL GATE MOSFET 2 METRE TO MEDIUM WAVE CONVERTER—EX STOCK

Receives 2 metres on a conventional M.W.B.C. receiver, very good used with a car radio. IF output 0.5 to 1.5 MHz for 144-5 and 145-6 MHz in two switched bands. Double conversion design with two switched crystal oscillators. Isolated supply lines. Size: 5" x 1½" front panel, 4" deep. Price: £20-62.

SM70 70CM. CONVERTER

This one uses an IF output of 144-146 MHz. This has enabled us to produce a very high performance converter with a noise figure of 4.5 dB for only £15-12.

2 METRE PRE-AMPLIFIERS (2 MODELS TO CHOOSE FROM) — EX STOCK

The Sentinel low noise FET Pre-Amplifier.

- * Built in a box which matches our converters.
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* Small (about 1 cubic inch) printed circuit pre-amplifier developed to fit inside transceivers where it can be wired into the receive aerial lead after the c/o relay.

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"I wish people would tune up on a quiet channel". How often do you hear this on the H.F. bands? The fact is that often there isn't an unused frequency to tune up on. We have an answer to this problem—put your transceiver on 2 metres. You use the transceiver just as you would on the H.F. bands with all the same facilities.

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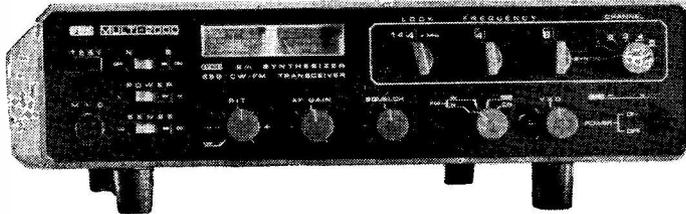
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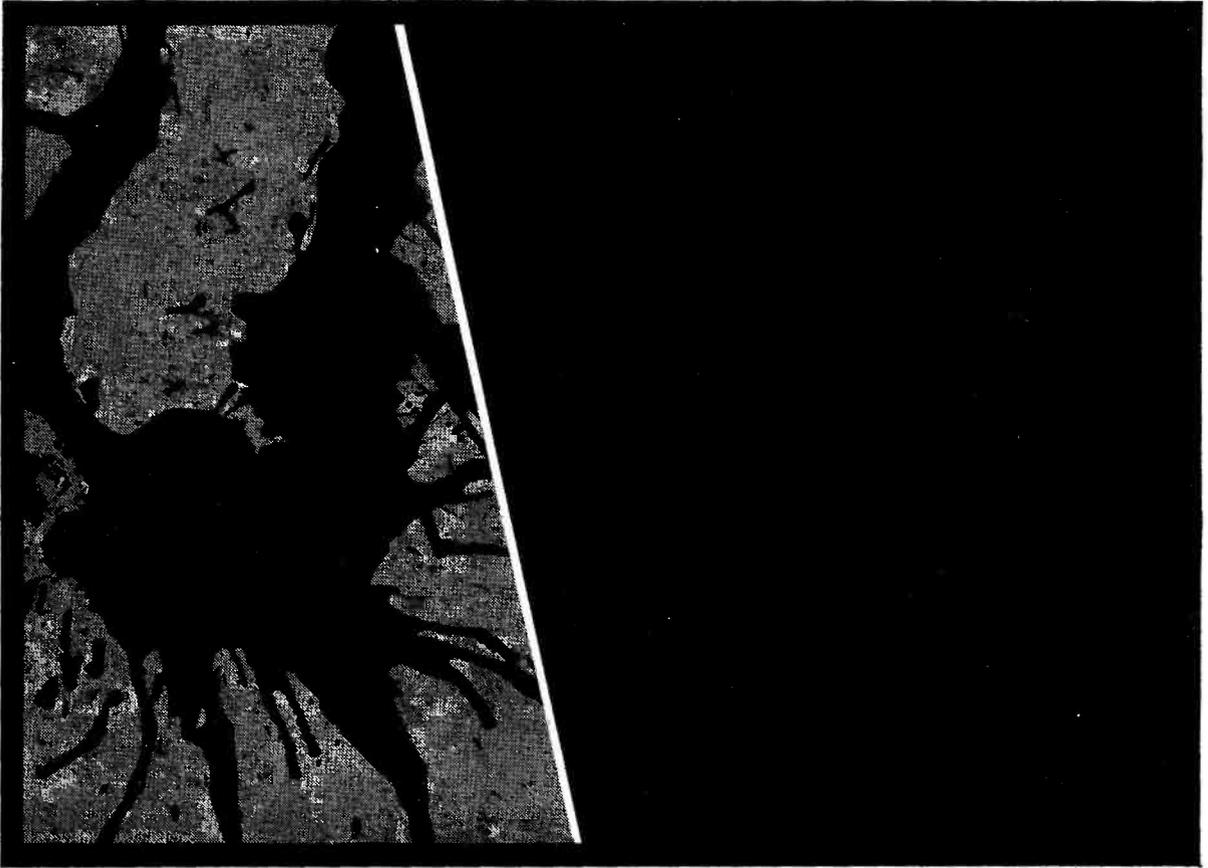
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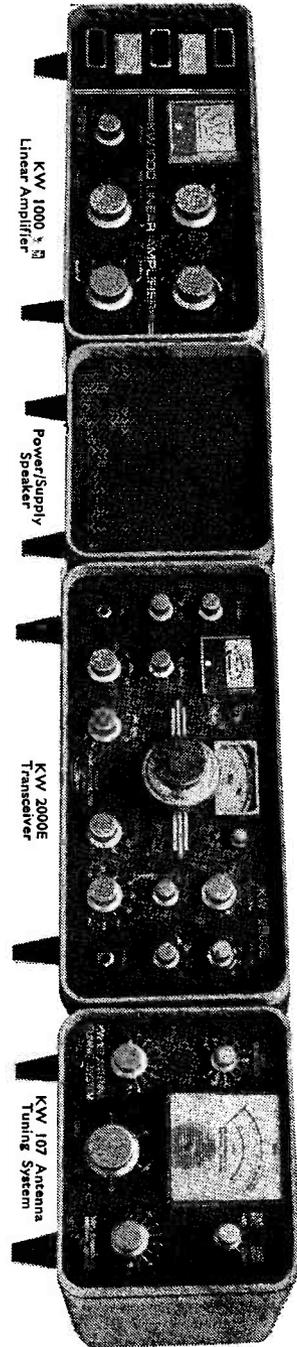
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(GB3SWM)

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DECEMBER, 1973

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The
SHORT-WAVE
Magazine

★ CHRISTMAS ★

The writer of this piece offered his first Christmas message to readers of SHORT WAVE MAGAZINE in our issue for December 1938, thirty-five years ago.

It is a long time since then, and much has happened — but the message remains the same:

*To all who may see these lines — at
home or abroad — Happiness for Christmas
and Prosperity in the New Year*

from

The Editor, Management and Staff of
SHORT WAVE MAGAZINE

★

*Austin Forsyth
G6FO*

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

HERE we are, on the final run-up to Christmas, and conditions to suit. It's enough to make one take up construction or read a good book! Nevertheless, the keen types press on and DX is there to be found, on some band or other, most of the twenty-four hours. However, the long slow decline in the sunspot count will in due course be followed by the faster rise up the slope to a peak, so even if the bands are not very productive at the time we can get on, we can at least anticipate the super-DX to come as the next peak arrives!

This being the case, perhaps we should reverse the normal order of things and take account of Top Band first.

One-Sixty Metres

Here first on the clip is W1BB, with his first bulletin of the season. If we took all Stew's items into the piece, we'd have no room left for anything else. Perhaps the most interesting news is that at 70 years W1BB has married again; and he says Marguerite is tolerant of his Top Band activities, so we may hope he will be very happy and active for many years yet. Congratulations to both.

Next we must mention the **Transatlantics**—from 0500-0730z, on November 18, December 23, January 13, and February 10. W/VE stations will be on 1800-1807 kHz, Europeans in the Stateside "DX Window" area 1825-1830 kHz. The procedures are as follows: W's call "CQ DX Test" for the first 2½ minutes, from 0500-052½, and at alternate five-minute periods. Europeans call "CQ Test DX" for the first 2½ minutes of the next five-minute period, 0505-057½. This means calling for 2½ minutes, listening for 7½ minutes. Keep strictly to the timetable unless actually in QSO.

The 1973 **Transequatorial Tests** seem to have gone off very well. It seems only a few weeks ago that we were reporting SWL Rolf Rasp helping out at a station operating

in MCC—but Rolf has had PY1DVG a while now, and is already up to 43 countries worked on the band. Active countries included LU, PY, VP8, CX3BH, ZP9AY, CP1EU, ZD9BM and DL2GG/YV5 from the South American side, while Africa offered 5Z4KL, 9J2LF, ZS6GE and ELØM/MM; as for Asia, there were EP2BQ, 4W1AE, JY9FOC, ZXØVG. Another station not heard in Europe, to the best of the writer's knowledge, was JA1MCU/C21.

GM3YOR (Kirkcaldy) writes to tell us of the fate of his Scottish counties tour earlier in the year. The first stop, East Lothian, had to be missed due to power-supply troubles, but then by leaving out the VHF side it proved possible to appear from all the other places on their list, a total of 179 contacts being made from the various spots. DX worked included OE3SGA on SSB and CW, DJ5BL, DJ7SW, PAØHIP, OE3KKC, OK1DOK, OK1JCW, OK1FCW, OK1MCW, and OK2PDJ. He has thanks for the chaps who looked out for him at each stop and thereby made the expedition the more interesting.

If you are looking for GI counties, the City of Belfast YMCA Radio Club are organising a couple of activity periods, namely the weekends 12/13 and 19/20 January. All bands, Top to Ten can be tried, and specific requirements for skeds should be aimed to GI6YM, *QTHR*.

A memory of the very early days departs, with the death of Paul Godley, ex-2XE, at the age of 84. He was for a time working with Marconi, but is primarily remembered for those first Trans-Atlantics, back in 1921, which really started the idea of amateur DX as an international possibility. He was one of the giants of his day.

Quite a long list comes to hand this time from G2HKU (Sheppey), who offers 160m. SSB contacts with DJ8WL, DK3BJ, DLØPG, DLØWW, OH2BO, PAØHIP, PAØPN and GM3YCB, while a

trip on CW yielded GM3PFQ.

The Top Band bug seems to have bitten deeply enough at G3ORP (Maidstone) who has an enormous list. HB9XO/P, OH1SJ, W1AXA, W2DEO, W1BB, GM4ALK, GM3PCX, GM4BFQ, KV4FZ (four times) add up to the run-of-the-mill operating QSO's, plus a party when Peter found PAØHIP, GM3OLK, GM3YOR, DJ4KWA, DJ8WD, GI2FHN, DK3BJ, KV4FZ, PAØCFW, GM3PFQ, GM8MJ, GM3FXM, DJ8WL, GI3OLJ, GM3GJB, and a couple of dozen OK/OL stations—no doubt the receipt of the 250 and 500 Hz filters for the Drake R4C account for some of the increased enthusiasm for CW, which must be good.

Rutland, as you will be aware, will be disappearing from the geographical counties scene by April and over the last two days of its separate existence the Havering group will be operating GB3RUT on CW and SSB, Top Band and Eighty, plus VHF, with a special commemorative QSL card. Details from G4CAF, D. J. Hogg, 17A Askwith Road, Rainham, Essex RM13-8EL.

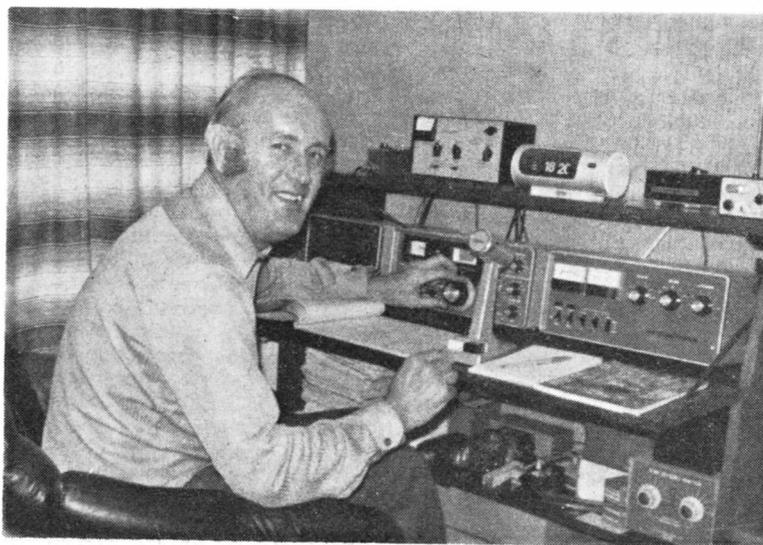
The latest additions to the roster of Top Band WAC holders, says W4WFL/1, are WA8IJI, VK3CZ, W5RTQ and W4EX. For himself, Morgan is finding his operating time severely limited—he has so many interests it is hardly surprising that Amateur Radio has to compete for its time allocation.

Eighty Metres

Not a deal of reports, but GM3YOR had his call activated as a JOTA station for the Fife Boy Scouts, using 3.5—21 MHz. Lots of Scout stations all over the world were worked in this tryout for the *CW WW DX Contest*, and on Eighty the tally of interest to us was CT2JAM, with a goodly crop of Europeans.

G2NJ (Peterborough) continues his crusade on behalf of the QRP concept. Nick mentions that he

Terry Russell, G3JFH, 15 Orchard Walk, Bishops Cleeve, Cheltenham, Glos., runs an FT-101/Linear combination. He works all bands including two metres and is particularly well known under his call G3JFH/M, being one of the pioneers in that mode for which, over the years, he has designed and built much mobile equipment.



worked PAØGG and G3JQL on Eighty, both being 579 signals with a couple of watts apiece. On his other interest, working the /MM lads, G2NJ raised LA6AI/MM aboard the *Dagfred* (JWXI) when that ship was in the Bay of Biscay, and LA2MA/MM who was in the Bay of Biscay bound for Nigeria on the tanker *Sonja* (LCUG). (Wherever possible we give the ship's own commercial callsign for the interest of other /MM operators).

Eighty is a favourite band for GW4BLE (Newport, Mon.) although he is doubtful whether the 18AVT/WB, which is a low-angle device, is the right aerial for his location and interests, although he worked KZ5CQ, ZL4KE, ZL4LE and ZL4NH with it on 80m. However, since the planning permission for his tower is still apparently as far away as ever, Stephen has lashed out on a Telomast to be a centre support for an inverted-Vee, which he reckons will knock up his band score a bit, with its rather higher-angle radiation.

The weekend January 12/13, from 2100z to 2100z, will see the CW end of the band stirred up somewhat, as the YU's are running their CW DX contest. If you want to have a go for the prizes, swap RST plus serial number starting at 001. Score one for a station in your own country two for countries other than your own on the same continent, and five for other continents, not to mention

ten points for your YU QSO's. Multiplier of one for each DXCC country and YU prefix. Final score, QSO points times multiplier. Certificates to top scorer in each continent or call area in W/K, VE, PY, VK, ZL, JA UA9 and UAØ. Check your log for duplicates, and send it, with the usual declaration, to SRJ Contest Committee, P.O. Box 48, 11001 Belgrade, Yugoslavia. One notices this contest, partly because it is an 80m.-only affair which some folk will want to avoid, but partly because its scoring system seems to provide a nice balance between the two prime objectives of such a contest, namely to increase activity for the YU's and to interest the relatively DX types into taking part. And, having marked the odd contest log ourselves, we like the idea of making the entrants sort out their own duplicate contacts.

Our only other report on this band was from G2HKU, who had a little dabble on SSB, to raise LX1JAE, LX1JAI and WA5VKJ/P/OHØ. On a different tack, Ted remarks that colour TV started in ZL at the beginning of November, and wonders just how much TVI trouble that will cause the boys.

Forty

As usual, neglected, but with DX there if you are skilful enough an operator to *hear* it first—this is maybe the reason G's talking about Forty divide into two camps. The

first agree it to be full of DX, and often work it, and the rest, the majority, one would think, deny ever having heard anything outside Europe, and the nearer parts of Europe at that. Your old scribe is of the opinion that the guy who knows how it's done can do it with almost any receiver, but the other chap would never hear a thing without months of training and practice. It is one unfortunate result of our recruiting system into Amateur Radio that the majority of candidates for the R.A.E. do not use their *receiver* to any significant extent, or indeed even own a receiver, and so come on to our bands completely without operating know-how. They have to be taught how to make a QSO, and seldom do they get any training in the use of a receiver to its best advantage—though this does *not* apply to the keener SWL's who graduate to a full licence.

G3RFG (Henlow) guessed that our deadlines would be a little tight for the *next* CDXN, and so divided up and held back a bit for next time—good man, Stan! On Forty his crop of CW contacts included K1PKZ, K4EJN, KP4DHD, PY2CJW, VK3AGW, VK3MR, W1ARR, WA1AIP, W3VA, W4BBP, ZY1BMB from PY-land, LU2DKG, PY1MA and VK3MJ, the operating time being about evenly distributed between 0700-0830 and 2030-2230z, and all save the KP4 being found right at the LF end of the band,

say 7—7.012 MHz.

On October 27, G3VLX tackled Forty for a spell, using SSB, and from this exercise he gleaned 59 both ways from UK2FAA, UK9AAN, UP2NV and UP2OU.

GW4BLE tackled a few hours of the recent 7 MHz Phone contest, and managed to make new ones for the band in 5U7 and CR4, out of a pick of CR4BS, 5U7BB, ZL1HY, ZL4BO, VK3HW, VK3XI, VK3ZL, KZ5PW, UK5ICD, UK9ABA, YV4AGP, YV4TI, HR1RF, OD5BA, PY1AW, PY7OS, EP2TW, YV5MO, DL2GG/YV5 and KZ5GM. Incidentally, the first day of operation with the FL-2000B linear produced a report of 15 dB over S9 from VK!

G2HKU seems to have spent a bit less than his usual time on the band, as the only contacts he feels worth mentioning were with UK9AAN and UP2OU.

Here and There

A fat packet came to your scribe from GI3ZIA (Enniskillen) containing a copy of the local paper, *The Fermanagh Herald*, for October 27, carrying a good write-up and picture of the GI3ZIA effort in JOTA. Clearly, the reporter had not come across Amateur Radio before, but one has to say that in spite of that limitation he produced an

eminently readable report which also made it clear, reading between the lines, that GI3ZIA is no mean exponent of the DX art.

A letter arrived for the piece this time with a great long list of juicy DX call signs worked—the snag is that the only identification is the name “Barry” and the location Basingstoke! (Please identify yourself, OM, we do like to know who we are talking about!)

Ten-metre addicts may be interested in having a sniff round the band from noon on December 15 through to 2359z on December 16, when the ARRL **World-Wide Ten-Metre Contest** will be on. A station may be worked once on CW and once on Phone, but *not* cross-mode. W/K types give RS(T) plus their state or province, the rest of us RST plus serial number starting at 001. Two points per QSO, or four for working a Novice. Multiplier is the sum of the U.S. states, VE provinces, ITU Regions and DXCC countries worked. Mail by January 21 to ARRL Communications Dept., 225 Main Street, Newington, Conn 06111.

A bit farther ahead is the **CQ WW DX 160 Contest**, running from 2200z on January 25 till 1600z on January 27. Rules are as they have been for some years past.

An RTTY Contest lies further still in the future, namely the week-end of March 23 to March 25. Rules, as for all these RTTY affairs, are pretty complex, and we suggest that intending entrants, either licensed or SWL, should get in touch direct with BARTG's Ted Double, G8CDW, *QTHR*, for a full copy containing the details you need, posting dates, QCA and RTTY WAC awards, and other material.

Now the **REF Contest**, always a good one, for which the CW leg is 1400z January 26 to 2200z January 27, and the Phone session February 23-24, same times. Full details on this one can be obtained from Lucien Aubry, F8TM, 53 Rue Marceau 91120 Palaiseau, France, but essentially the aim is to work the F, HB, 4U, LX, ON and all the *ex-Congo* countries.

On the Awards front, G2FUX, writes to say that due to the falling off of interest, and a change in status of the Ockendon Venture, the Ockendon Award will be terminated as and from December 31, although it is intended to issue certificates for any applications still in the pipeline until the word gets around. It seems the Award raised a total of over £318 for Ockendon Venture, which is pretty good going.

G3FYR relates some of his

Mrs. Christine Tuff now signs G181BH from 16 Glenwell Crescent, Glengormley, Newtonabbey, Northern Ireland. She is the wife of G14ANX and they have three children—so she has done extremely well to get her R.A.E. pass to become the first G1/YXL. She will have the world at her fingertips when she passes the Morse Test! Her brother is G18HLL and their father is working for his R.A.E.—where will it end!



Reporting the HF Bands

earlier history as GM3FYR, at Stornoway, GW3FYR at Aberporth, VS9AI in Aden, and now G3FYR in St. Ives, Cornwall, Bill refers to the writings of Moxon, G6XN, and supports the conclusions there obtained by his own activities with QRP. Basically, the argument is that by using the terrain to best advantage to give aerial gain in the right direction, consistent SSB contacts with VK/ZL could be obtained with an input to the final of no more than *one watt*. As Bill says, G6XN's conclusions fitted his St. Ives situation perfectly so that with an R.1155 and Vanguard on Forty CW he was getting consistent 599 reports from ZL and JA on a long-wire, due to the terrain to the North of him, while at Petts Wood, he would need a beam at 50 feet or better, plus his FT-101, to come even near to the St. Ives results, purely due to the difference in the local topography. A good point, and it's a pleasant change to hear an amateur who ascribes his results to something other than QRO!

G3IDG (Basingstoke) harks back to the Abraham family of licensed amateurs (p.468, October) and crowns it by mentioning the case, from *QST* of June 1960, of the YL W8WUB, whose father, mother, grandfather, brother, two sisters, an uncle, two aunts and a cousin were at the time licensed, respectively as W8PFL, W8WUE, W8FXV, W8PGA, KN8RXX, KN8CHX, WOKCP, KOAUG, K5WKK and K5WFD. Some family—one hopes they never tried to share one rig!

Slow-Scan TV now. G3WW (Wimblington) writes on various points, and comments on the number of Robot SS/TV operators who were to be seen at the Leicester Show. Well now, the very next letter on the pile refers to a SS/TV Contest, on February 9-10. Again it has both licensed and SWL classes, and all details may be obtained from Prof. Franco Fanti, Via A. Dallolio n.19, 40139 Bologna, Italy, to whom also the logs must be sent, to arrive not later than March 20 1974.

Incidentally, SS/TV is only permissible on SSB, not by FM or AM—this is pretty obvious when you come to think about it. Refer to this column a few months back, when we quoted the Ministry's licensing regulations. You will see that *only* SSB can meet the rules.

G2HLU (Reading) has some regretful words to say about conditions of late; it seems Harold has always been busy with other things when conditions were good, and with time for radio only when the bands were flat. On a different tack, G2HLU feels that it would be no bad thing if band-planning were written into the licence—he doesn't like to see CW in the Phone section of the bands, but he *hates* Phones in the CW area. Perhaps the best way to move them is to sit on 'em and call CQ interminably until the message of their unwantedness gets through into their tiny little minds!

Now a pirate problem. Not so long ago, we mentioned G3EPU (Wimbledon Park) as having a pirate using his call—now, just to make his own legal operations sound like piracy, he finds he has been left out of the *Call Book*! So, G3EPU is nowadays operational on all HF bands, with a KW-2000E, which means you should take care if you are thinking of denouncing him as a pirate!

Ten Metres

Here we can make a start with DJ0EQ (Berlin) who finds little time to spare now term has started—he teaches English at the Technical University—but still was able to come on Ten and work LU6BBA, PY7AOR and EL8G.

G3RFG (Henlow) has a separate list from his other activities of stations worked and heard on Ten. Stan offers JH6SIS/MM in CR6, LU8FEU, RA9FDL, VP2MDX, W1HCW, WA3KBV, W8IKC, YN1AA, ZD3Z, ZE1AV, ZE6JN and ZS6AO, all on CW, while the Heard list is longer and includes the dots and dashes from K3AV, KP3DBR, LU6EF, PY1ZAE,

PZ1AC, UA9FBA, VP9BA, W1AD, W2IQ/4, W2MUM, WA3ATP, W4BJ, WB4UYD, W9DLZ, W9HUZ, 3B8MS and 5B4AP—quite an impressive collection for a band most people write off as “dead” at this time of the sunspot cycle.

G2BON (Aldridge) seems to have found most of the pay-dirt on 14 MHz, but he still checked the other bands, and was rewarded by ten-metre SSB contacts with CR6CN, WA3FXW, K1CPF and UA6JAD.

At G3VLX the maestro seems to

BRIEF DX DATA

AP2KS Khalid, QSL via SM1CNS. Has been heard on 14225 around 1400z and on 14190 kHz SSB at 1715z.

TA... TA2QR, QSL to Box 699 Karakov, Istanbul (*don't* mention radio on the envelope); TA1HY/2 and TA2QR have both been reported asking for QSL's via W5QPX; TA1MB, QSL to DK3GL.

XU1AA Now being operated by F5IQ, back there for another year. QSL to P.O. Box 59, Phnom Penh, Khmer Republic (Cambodia).

ZK1MA Tuatal Tupou goes QRT on November 20 and will QSY to Rarotonga. QSL's, and those for ZK1AI and ZK1TA, go to W6KNH. May be some delay in replying.

KA1BL Minami Torishima, or Marcus Is. Try 14171 kHz, around 0715.

SJ9WL/SK9WL SJ9WL was operated during the Contest Weekend from Morokulien, on the LA/SM border. Normal station is SK9WL/LG5LG. Include three IRC's as your contribution to Morokulien fund for handicapped LA/SM amateurs, plus one IRC for QSL and one more for airmail reply. Details about Morokulien, and its Amateur Radio station, write to ARIM, S-67044, Morokulien, Sweden.

TY1UW QSL to ET3ZU. Look around 14180-14195 kHz.

VQ9HCS Astove Is. Try 1730-1830z, 21276 kHz. Harry will be there for two years.

SEANET 14320 kHz, 1200z, 4S7PB often MC.

have given Ten his own particular brand of magic, because his SSB produced contacts with YV6AW, ZS4KC, KP4DKX, CR6AA, VP2VBU, PJ9GIW, ZD8AB, YV3VU, ZF1GW/VP7, LU5HFI, VP2GBL and 5Z4LO.

It is a rare for G2HKU to mention Ten, but Ted plied his SSB to good effect on such as CR7FP, CX8BE, PY1MB, PY1ZAE, ZS6ZE and 9M2DQ—nice coverage.

21 MHz Band

For many people, even at this low period in the sunspot cycle, a favourite band, where QSO's can be taken like gentlemen, and there is none of the short-temper and back-chat of Twenty.

G2NJ (Peterborough) comments on the QRP scene, and G3KPT who has now reached the half-century mark in prefixes with his *two watts* which on Fifteen went out as far as CX1, EA8, K, KZ5 and PY.

Fifteen for DJ0EQ, says Martyn, was all SSB and the most interesting contacts were with VU2BX, 5N5ABG, CR6RJ and ZE8JB.

On to G3RFG, who reports on Fifteen for November 1-10, during which period his CW and vertical connected with CX2XA, HC1XG, JA3EA, JH1JCP, JH1WKS, JF2XID, JR1LNF, K3PNS, a clutch of PY's, VP2MDX, lots of W's, WP4DRT, YV3VU, ZS5AN, ZS6JK, ZY1RMB, ZY2GAT and ZY8EL,

the latter being, as most people will by now be aware, a contest prefix coming from PY land.

G2BON only made a few contacts on the band this time, his catch being UW9CR, OH7RM and Europeans, a poorer crop than he got on Ten!

As for G3VLX (Chislehurst) Deryck found Fifteen not too much to his liking and therefore went elsewhere—but while plumbing the depths before the decision to QSY he connected with ZF1GW/VP7, IH9AA, TI2AJF and KG4DS.

Just one contact is mentioned under the 21 MHz head by G2HKU, his choice being 9M2DQ.

Twenty Metres

For G2HKU it seems to have been mainly a matter of his early morning sked contacts, as he reports SSB QSO's with ZL1NW, ZL1VN, ZL3RS and ZL3SE; a solitary CW exchange was with PY7APS.

Twenty for G3VLX meant in at least one case conducting a QSO in Spanish by help of the *Hams Interpreter* as a phrase book; this one was with TI6JP, but there were also exchanges with ZD7SS, ZD7SD, TU2CV, KZ5UL and 5U7AZ.

G2BON doesn't seem to like the look of things on the HF bands, and reckons his future reports will get shorter, or else he will "emigrate" to Forty or Eighty and try his luck there. Tom didn't do so badly,

though, as his list of SSB includes JY6BM, HB0NL, UK6JAA, VK6CT, OJ0AM, OY7CT, UA9WS, UK9CAE, TI2WD, UK9FAA, VP2SA, VE1AL, UK9AAN, OD5FB, FL8DJ, VE1AMT, TF5TP, EA6CF, 3A2CF, ET3ZU and YV3VU.

On Twenty, apart from working K, KV4 and VE3, UA9 and UA6 were worked by G3KPT, says G2NJ; and the interesting thing about this QRP is that on at least one occasion a K gave the two watts rig a report of 599, and a UA9 589 report.

The QRM rather got up the nose of DJ0EQ, who has his home call of G3RFX, but nonetheless, Martyn rang the bell with CR6GA, CR6IK, FC2CD, WB6IIF/KG6, 4S7BR, JA2HGA, JA3PPH, TU2DR, KV4IG, VK2CX, VK4VU, ZL1AIW, ZL1BIX and ZL3VI.

Our 14 MHz specialist is G3UZ (Goring-by-Sea) who wasn't all that impressed by conditions on the band. He keyed with UA0RS, UA0ABV, UA0YAF, UD6DGV, UD6DHU, UD6AI, UF6DX, UF6FAY, UI8LAC, UG6SW, OX3CS, OX3MP, VK2EO, TI2MV, PY7APS, PY6LF, PY6WF, HS2AJG, EA8JH, EA8AT, EA6BD, CN8CG, YB3CW, LU6FA, KX1MUM, YV3VU, KP4BBN, 5B4BA and the usual run of UA9 and W's. On a different tack, he worked a UA9 who came straight back with his



Donald Macleod was VQ9DM when out in the Seychelles. Now home again at Loanhead, Midlothian, he will be up with a GM call as soon as his gear reaches him from the other side of the world. There were six VQ9's active from Mahe when VQ9DM was out there.

name on the first over; when challenged, he explained to G3UZ that he knew him from reading this piece each month—nice to know we have at least one reader! Salutes to our unknown UA9 supporter.

For G3DCS (Ipswich) it seems to have been a rather lean month, particularly as some time was spent in disposing of the gear of an old buddy now deceased. However, Enver did manage to use CW to VK2WWW, VE3EQF, PY2FRW and PY2BIB, while SSB accounted for F6CVE/P, G4CJP (real DX, that!) W3WJD, and W4UMF. On the RTTY front there is still the interest, but Enver comments that he heard nothing worth working during the period under review.

Another QRP buff with an HW-7 is G3BGR (Worcester) who has his looking into a dipole and operated on Sunday afternoons, his crop being UK2, UB5, UW3, OE3, OK3 and W1, all with the two watts. Stan makes a good suggestion when he asks "How about a QRP Club?" There is one in the U.S.A. of course, but their idea of QRP is what most of us would regard as normal power.

W4WFL/I is well in time—he sent his contribution in for the January 1974 issue! Morgan has been much occupied outside Amateur Radio, but nonetheless found time to get on Twenty and work a couple of new ones in XV5AC and TY1UW, which all help to keep his DXCC score creeping up towards the magic 200 mark.

In operating for JOTA, GM3YOR did quite well on Twenty, his crop including SSB with ZL4FT, OD5HU, 9G1GG, ZC4ASG, PY7BSD,

PY2WF, PY1MT, VK5QG, AX2DA, 9H4K, 9H4G, 9H1BZ, PJ2RC, PJ2RR, VP9BS, G3MZV /VP9, ZB2FFS, HS3AIG, W's, VE and ZE1UM.

G3IDG listens around on Twenty, and was amused one day to hear a QSO between F0AXA and SM0BRR, in which the SM kept on calling the F "FoAX" while the F was continually going back to "S0BRR"—and they never did get the calls right!

Valuable SWL reports are mentioned by G2HLU, who was having a session working the odd W and PY at about S5. He was a bit startled therefore to receive an SWL report on his QSO's from a W6 listener who was getting G2HLU's signals at S8 over there, even though Harold was hearing nothing further afield at the time than his W3 contact. As he says, that is a worthwhile report, and well worth sending a QSL for in return.

QSL Addresses

A few more which may be of interest to someone, somewhere. *JY6BM*, to P.O. Box 7698, Amman; *CO8QS*, to P.O. Box 44, Santiago City; *XX6FL* (special exhibition station) via CR6LA; *CN8BD*, to Box 299, Rabat; *HS4AIA*, to VE6AKY; *VU2MX*, P.O. Box 9122, Bombay; *OY7CT* to P.O. Box 217, DK-3800, Torshavn, Faroe Is.; *TI2WD*, to P.O. Box 4808, San José; *OD5FB*, P.O. Box 8888, Beirut; *FL8DJ*, to P.O. Box 157, Djibouti; *VP2MDX*, via W4PRO; and *AP2KS*, to P.O. Box 1270, Lahore. All these, thanks due to G2BON.

G3VLX has a couple to mention;

KP4DKX, to P.O. Box 1163 Fajardo; *ZFIGW/VP7*, QSL to WB4TAF; *ZD7SD*, P.O. Box 16, St. Helena; and *SU7AZ*, through CN8CG.

W4WFL/I has lots of snippets on this front; this month he mentions that WA2MVQ says he now handles QSL's for *ZB2CF*, and 9GI's *GG* and *GV*. *OD5EJ* is now in Spain, and anyone requiring a QSL for his Lebanese operation can write to him at: Emanuelsson, c/o Intelsa, C/. Torres Quevedo, 2, Poligorno Industrial, Leganes (Madrid) Spain. Cards for *VP2EN* should be sent to G3TXF; *FG0ZZ/FS0* go to F2QQ.

Winding Up

It is understood that yet another (enlightened African) country is to stop all Amateur Radio activity. This time it is 9U5, Burundi, in Zone 36, and it is understood all operation will cease by the end of 1973—marvellous, isn't it! But one can hardly blame them for being afraid of something they don't understand—like black magic!

Signing Off

Which is where we come to the end of the tale for another month; the deadline this time is *tight*—so tight that it is best expressed as "just as fast as you can get pen to paper!" Please do your best to help your poor old scribe who is imprisoned in a time-scale of almost zero, if the mails do their usual Christmas thing and the *Magazine* is to come out on time—which, as always, it will. Meantime, have a Merry Christmas, and a Happy New Year. 73 de E.P.E.

PORTISHEAD RADIO, GKD/GKL/GKU

One of the world's best known long-distance communication stations, standing on a commanding site overlooking the Bristol Channel, Portishead Radio (signing some 50 c/s on numerous frequencies between 130 kHz and 22.5 MHz) is to be moved further inland to Somerton, Somerset, also a Post Office station covering a wide acreage for the erection of aeriels. The function of Portishead Radio is to work ships world-wide, running from 500 watts to 15 kW on its various frequencies, and it handles an enormous volume of traffic. The move to Somerton is expected to take about four years, because in the meantime all services will have to be maintained. As a footnote, it might be mentioned that GKL always

threw healthy harmonics into what, years ago before Hitler's War, was our five-metre band, enabling the South Wales amateurs of those days to find a reliable calibration point—the writer of this note can hear "VVV de GKL" even now!

BOOK TOKENS

As it is now the time of year when such presents are given and exchanged, this is to say that, with regret, we are *not* able to accept book tokens—in fact, in common with many other publishers and booksellers, we never have accepted them in the 25 years we have been dealing in books for the radio amateur.

Sixteenth Jamboree-on-the-air

JOTA, October 20-21, 1973

THOUGH conditions generally for this annual all-band event were not so good this year from the U.K., activity and support were as enthusiastic as ever.

A preliminary assessment suggests that over 250 British Isles stations were on the air specially for JOTA, with approximately the same level of overseas participation as last year, but with more countries represented—63 against fifty in 1972. This assessment (incidentally, by Leslie Mitchell, G3BHK, the Jamboree organiser for the U.K. and the originator of the JOTA concept) can take no account of the late and "final" reports yet to be received.

For those unfamiliar with this event—which we have supported ever since it was first instituted 16 years ago—it is essentially an international Scout QSO Party, conducted through Amateur Radio on the amateur bands. Because relatively few Scout groups, anywhere in the world, have their own radio amateur set-up—meaning Scouts licensed as amateurs with an active station on the air—it is usual for licensed operators to entertain local Scout groups to listen-in on contacts being made with other Scout stations, the preference being, of course, for DX.

Licensed U.K. amateurs have always supported JOTA very generously and following are some notes on the Scout-station activity in various parts of the world.

Godalming District Scouts, G3ZDD/A: Running a K.W. Vespa Mk. II with a linear amplifier, a KW-201 Rx, into a "5RV" Ae., 30 Scout groups were worked in six countries.

1st Ascension Island Scout Group, ZD8MH: Under very

poor DX-band conditions, they made 18 JOTA contacts in seven countries, including GB2SS and ZS6JAM (Mafeking, where Baden-Powell was serving during the South African war).

Newton Abbey Scouts, G3GDW/A: Using a pair of dipoles slung from St. Luke's Church tower, twenty U.K. Scout stations were worked on 80-40-20m., with nine overseas Scout stations, mainly in Europe, including OH3FA, who represented a Scout group started in 1917!

Gibraltar Scouts, ZB2FFG: Of the 50 JOTA stations worked, 38 were in the U.K., including G3PFM on Brownsea Island in Poole Harbour, Dorset (where Baden-Powell held the very first Scout camp in 1907).

Hailsham Scouts, GB2HS: Three stations were set up by the Southdown A.R.S. in the Scout Hut, to work 2m., 15-20m. and 80m., to give a total of 207 Scout stations in 31 countries, including VK and the Americas—one of the best results turned in by a U.K. JOTA group.

Maidstone & District Scouts, GB3MLA: From the permanent Camp site, where the Scouts built a version of a wind-up mast, using ropes and spars, which could be raised to 70 feet. The four HF bands were used, but apparently there was not much DX about for them. However, many EU Scout stations were worked on short-haul by G3POY, G3XUN, G3YJS, G3ZHZ and G8EGX, the latter three being connected with the Scouts locally.

Durrington Sea Scouts, Worthing, G4AOI/A: Using an FT-101 into an inverted-Vee trapped dipole and a ribbon folded dipole for 20m. (which could be swung through about 120°) some 50 stations were raised on 80/20m. They also had a one-way A/TV contact with G6RZD/T at about 9 miles. CC/TV was provided by G6AIY/T to entertain the Scout visitors.

Bromsgrove Scouts, G3VGG/A: Eleven countries were

Demonstration station G3ASR, of the Edgware and District Radio Society, put on for the open evening of the Watling Community Association. The Mayor of the London Borough of Barnet was present for the occasion.



For JOTA over the week-end October 20/21, the Scarborough Amateur Radio station at Scout Hq. signed G4BP/A. They also had a two-metre link back to the Malton Scout Hq. for the exchange of band news and information—see text.



worked using KW-2000 and FT-401 transceivers, into large antennae. Their most interesting QSO was with II4FGM, Bologna, at Marconi's birth-place.

Blewbury Scout Group, Berks., GB2FBS: Out in Gan, G3ZVV (a Scout leader with this troop) was operating VS9FBS and duly succeeded in raising the home group signing GB2FBS—nice going! The Gan station also worked, *all* Scout stations, ET3JH, YB2KZ, JA5GAL, HS4AGN, 9M2PV, ZE1JUM, 9V1SJ, 4S7AB, VU2MAH, VK9FV and HSØBSJ—so the DX was there, even if much of it did not percolate into the U.K.

Olton Scout Group, Solihull, GB2OLT: Organised by local members of the Royal Signals A.R.S., they made 90 JOTA contacts, of which 46 were overseas. Running two stations, they logged over the week-end 163 QSO's, before an audience of Scouts, Cubs and their parents. Operators concerned were G3ZDP, G3ZMT, G4AEJ and G4BSJ—well done.

Icknield (Luton) Scout Association, G3XWS/A: Here the JOTA exercise was combined with a course for the Scout communication badge, 20 boys taking part. Of the 56 JOTA stations worked, 16 were on two metres (for which they ran G8CBU/A) there being notably increased JOTA activity on VHF this year.

Scarborough Scout Group, G4BP/A: To get the boys interested—some 100 of them, with their Scout leaders—preliminary talks were given the week before the event by G3VAN. During the operational period, a two-metre link was maintained with the Malton Scout group (also taking part in JOTA) for the purpose of exchanging information about band conditions and activity. Bands used were 15/20m. and 80m., with a KW-2000A/KW-600

linear, a beam for the HF bands and a "5RV" type for 80 metres.

Belfast Scout Group, GI4ANX/A: Taking part in JOTA for the first time, they could use the hall in which the station was installed for six hours only—but in that short period out of the 48 hours available they made 75 contacts in 15 countries, of which 25 were with Scout stations, including ZS4JAM.

Saltash Scouts, GB2SS: Put on by the Saltash & District A.R.C. (who also provided a second station, GB3SGS, for the Dowderry & St. Germans Scouts), in 34 hours' operating they worked no less than 106 Scout stations in 31 countries, out of a total logging of 168S in 43C. Their best Scout DX included 5Y4XNS (Kenya), 7X2SMA (Algiers), KP4ID (Puerto Rico), PY1CHP (Rio de Janeiro), PY1MT (Volta Redonda), PY7AEW (Recife), ZD8MH (Ascension Is.), ZE1JAM (Bulawayo), ZS1KRS (Bellville), ZS3OBS (Oranjemund, S.W. Africa), ZS6DO (Jo'burg), ZS4CDW (Bloemfontein) and ZS6JAM (Mafeking).

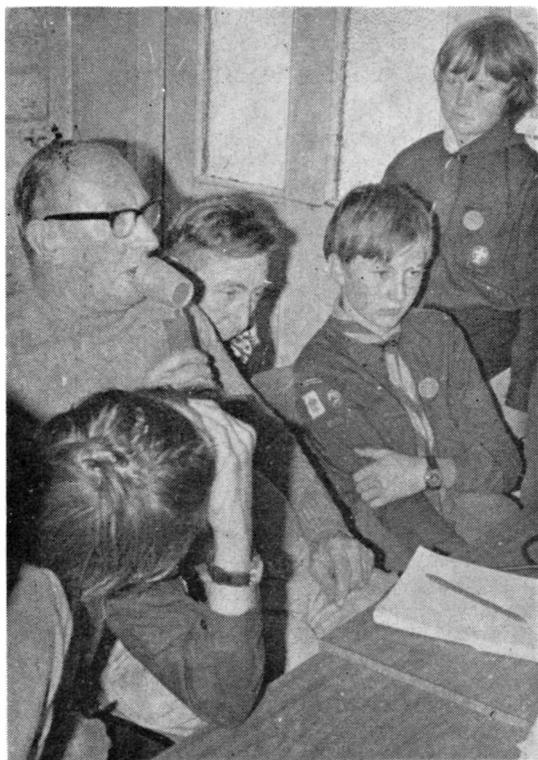
Conditions on 15m. were very variable, while on the Saturday evening on 20m. short-skip "doubled the usual QRM level," several G/Scout stations in northern U.K. being workable. Eighty was only tried by the GB2SS boys when the HF bands had nothing to offer. It is noteworthy that GB2SS worked more Scout stations this year than ever before, 63% of their contacts being in the JOTA interest.

GB3SGS: The second Saltash Scout station was on for 16 JOTA hours. They made 25 Scout contacts in 12 countries, using a KW-2000B into a trapped dipole, operators here being G2KA, G3XWA and G3ZHM.

[Over



Over in Northern Ireland, they also kept the JOTA vigil, with GI4ANX/A showing the St. Brigid's Pack how it is done. Broder Tuff, GI4ANX, is the local scoutmaster. Some 25 Scout stations were worked in 15 countries.



The Icknield (Luton) Scout Association had G3XWS/A going for this year's JOTA and the exercise was combined with a badge course for Scouts interested in communication. More than 50 JOTA stations were worked by G3XWS and G3YUI.

The Scouts of St. Germans were keen participants and entered fully into the spirit of the event, tape-recording many of the QSO's.

Rugby Scout Troops, G4ACY: Though as a single-operator station able to be on for limited periods only, using the 80m. band 22 Scout stations were logged in five countries, the more interesting being LA2QP and EI2CBS.

International Dept., Scout Hq., GB3BHK: Operated from Slough, Bucks., by G3BHK, G3UKS, G2CAJ, G4AYL and G8HRD, a good tally of 80 JOTA contacts in 18 countries was logged, using dipoles for 20 and 80m. Among their noteworthy QSO's were ZB2FFG, OY6NRA/A in the Faroes, and HB9S/P, representing the World Scout Bureau, Geneva.

Wadebridge Sea Scouts, G3YJX/A: Running two transceivers some 160 stations (about twice as many as last year) were worked on the HF bands, the operators being G2DUP, G3WJO, G3XC, G3THT, G4BYS and G8GOR, with the DX being found on 15 metres. To amuse the visitors, the Cornish Club (who provided the radio facilities for the occasion) also laid on some transistor Morse oscillator kits, complete with key and instructions for putting them together.

The foregoing can only be a short summary of the reports received on this year's JOTA. But what we are able to print proves a high level of support, in the Amateur Radio context, for the Scout Movement, in itself very much a worth-while concept in the times in which we live.

A.J.F.

END-FED MULTI-BAND AERIAL

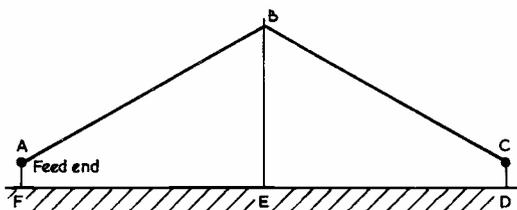
DISCUSSING A VERSATILE WIRE SYSTEM

D. J. BRADFORD, B.Sc. (G3LCK)

THE writer's housing situation has always favoured the use of an LF/HF band aerial system in which the RF energy is fed in at one end. Poor results with centre-fed trap or '5RV arrays—and a lack of enthusiasm when faced with the cost of coaxial cable—has always resulted in the end-fed wire as the main answer to the problem of radiating on all LF/HF bands. At a time when a decent window box seems larger than the little fringes of earth which pass for the modern suburban garden the idea of putting up 240 feet or more of wire may seem a pretty silly idea. However, quite reasonable results are obtained with 180, 120 or 60 foot lengths. The merit of the system discussed here is that it takes only one mast (40-50ft. high) to support it and it will produce very high gain in some directions at quite low angles on the 10-15-20m. bands while giving excellent results on the LF bands. It is an excellent portable, field day and expedition array for the same reasons.

Description

The set-up is as Fig. 1. It is essential to employ two items at the feed end of the array. The first is an ATU with SWR bridge and dummy load. The second is a satisfactory earth and/or counterpoise system. Without the former the old fashioned "poke-it-into-the-coax-socket" philosophy, still employed by some operators, will simply guarantee TVI. The *pi*-network which is designed to match out of the gear at 50-100 ohms will either not tune up at all when presented with the high impedance of this array, or it will do so with very low values of output capacitance and hence a much reduced HF harmonic rejection. Likewise, low-pass filters do not work unless they are in coaxial lines with a low value of SWR upon them and with an impedance at or very close to their design value. (Before the experts start getting huffy about such elementary advice consult with your



- A-B-C = 264ft
- AF = 6ft
- CD = 6ft
- BE = 40-50ft

Fig. 1



Fig. 1. General layout of the G3LCK aerial system.

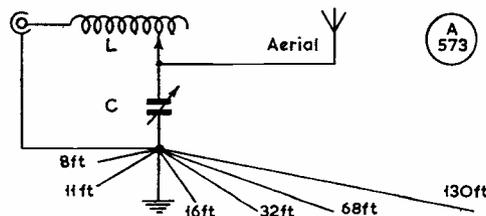


Fig. 2

Fig. 2. The L-Match Unit—see text.

local GPO interference chap for his experiences in this area of radio amateur general "expertise"). Without a decent ground system a great deal of RF will be found all over the gear. RF feedback and minor RF burns will then become a problem. Furthermore, where the earth content is very low the array will simply fail to radiate and no amount of fiddling and twiddling will make it do so. In this event, that fairly recent rediscovery in Amateur Radio aerial design, the counterpoise system, will be found essential.

Aerial Matching Procedure

Ideally, the matching unit shown in Fig. 2 should be made from a large rotary inductor. These appear from time to time on the surplus market and at junk sales. Failing this, a multi-tap coil should be wound on a suitable 2-3in. diameter former in 16g., to about 30 turns spaced one turn. Taps should be made on the first five turns, five more taps spaced every three turns. The capacitor needs to be wide spaced if high power is to be run. Its maximum capacitance should be 200-500 μ F.

The setting up procedure involves a certain amount of "trying and twiddling". With 264ft. of wire a large amount of inductance and 50-150 μ F of capacity will usually be found to be right for 80 metres. An extra "outboard" inductor of 20 turns close-spaced (18g. enamelled) on a 1½in. former will be needed for 160 metres—see Fig. 3—and the entire system is as Fig. 4.

Full procedure is to match the Tx into the dummy load. The values of L/C are then adjusted for minimum SWR. The tap and dial readings are noted for each band. Readjustment every 25 kHz is needed on Top Band; at 75 kHz intervals on 80m.; a point around 7025 and another at 7075 kHz for 40 and three or four spots through 20, 15 and 10 metres respectively. A table of settings is useful in this context. With a roller inductor a 1:1 SWR is obtainable on each band. It's a good idea to run low power when finding these settings. It is especially important to tune up at reduced level when running the TV line-valve type of final amplifier.

Directivity

The aerial is a half-wave on 160 metres. If it were high and in the clear radiation at right angles to the wire would be expected. In practice it does very well in all directions for inter-G working. On 80 metres good all-round coverage seems available, although a 132ft. end-fed seems occasionally to give better signals at short (less than 100 miles) range. On 40 metres very good DX

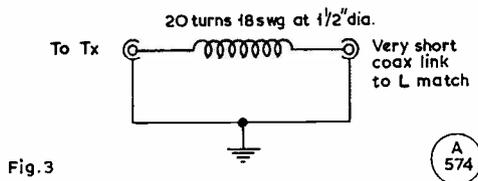


Fig. 3

Fig. 3. Additional Top Band Inductance, as discussed in text.

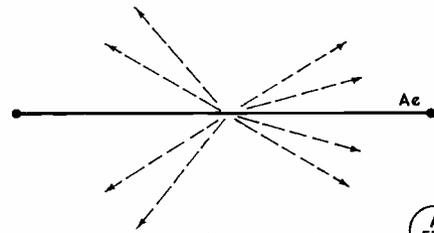


Fig. 5

Fig. 5. Presumed radiation directivity on the HF bands—see text.

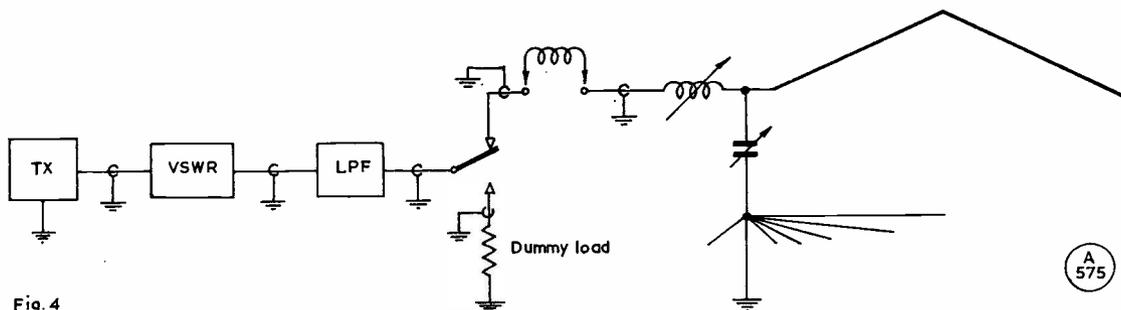


Fig. 4

Fig. 4. Layout of the entire G3LCK system.

performance toward U.S.A. has been experienced. No real attempt to chase DX on the LF bands has been made.

On 20, 15 and 10 metres the most concentrated lines of fire seem to be off the ends of the wire (see Fig. 5). The writer's array points about 280° true and is fed at the eastern end. On the HF bands the results towards the U.S. and Carribean, and towards the eastern end of the Mediterranean are very satisfactory under all conditions. On the other hand, results on 10 and 15 metres towards Africa (South and West) are poor. Clearly, the scope for directing RF according to these trends will depend on the alignment of the home QTH garden. When out portable the choice is yours.

TVI Points

Very often end-fed aerials produce a higher level of of TVI, by RF overload, due to the very intense field around the low down end. This was observed at the writer's QTH. The cure was a pair of ferrite rings on the coax feed to the TV Rx. Of course, the rig needs to be properly "treated" for harmonic radiation problems before this cure can be employed.

The Earth System

The writer regularly uses this system at the home QTH in Kent and in the Welsh Mountains near Conway. In the former, the house central-heating pipes afford a very good earth indeed. The system goes to ground via a metal rising main. No counterpoise or earth spikes are employed as the distance from rig to rising main is

less than six feet. In Wales a single 130ft. counterpoise has been used and seems to "convince the radiator that there is a reference ground plane," even on 80-10 metres! Multi counterpoises do represent an improvement.

Other Points

Since the writer never runs more than 80-90 watts p.e.p., no more complicated feed-through system for the feed end of the wire than to pass it through a small hole in the window frame has ever been employed. If you simply must blast away with 400 watts p.e.p. out then a visit to a yacht chandler or a boat yard will yield a pyrex feed-through system. It will be necessary as very high voltages will be present at the higher power levels. Also in this event, it would be a good idea to keep the aerial matching unit on or near the window sill with coax from it to the Tx. The voltage is enough to strike a neon held close to the matching unit end of the radiator wire with only 20 watts p.e.p. on 160 metres. By the same token keep the far end high enough to prevent it being touched.

A modification to the system which has yet to be evaluated is to terminate the far end in a 500-ohm non-inductive resistor, the far side of which has a fan of quarter-wave wires attached. If Terman is to be believed (and how can he be questioned) this should give a reduction in the performance off one end with enhanced gain off the other. It works with a rhombic and at least over a good earth this array must "look like half a rhombic on its edge".

DIGITAL ELECTRONIC KEYER

COMPLETING DESCRIPTION — FINAL DIAGRAMS

P. R. CRAGG (G3UGK)

Part II

THE first part of this article appeared in our November issue and here we go straight on from the foot of p.547.

The sequence for a dash is very similar, inasmuch the dash store, IC1C and D, is set up in the same way, and the dash gate, IC2B, allows the dash through to start the pulse generator and inhibit the dot gate. However, as well as doing these things, the dash gate has two further functions. First, while a dash is being processed, the Q output, pin 11 of IC2B, is at '0', holding IC5A pin 2 at

'1'. This prevents the changing levels of IC6B pin 4 from triggering the dot reset monostable, IC5A. Also, the CLR line to IC4B is set to a '1', allowing this flip-flop to change over with clock pulses on pin 9.

This time, the second pulse onto IC4A pin 12, puts the Q output, pin 3, back to '0', which in turn causes IC4B pin 6 to go to '0'. So, although the transistor might have

Table of Values

C1, C2,	= .002 μ F	VR1 =	100K linear, speed control
C3,	= .002 μ F	RL =	Relay, G.W.M. Radio, see text
C4, C5	= 1 μ F	D1 =	On relay
R1, R2,		Tr1 =	BC107
R3, R4,		IC1,	
R5,	= 1,000 ohms	IC6 =	SN7400
R6, R7,		IC2 =	SN7475
R8 =	10,000 ohms	IC3,	
R9 =	68,000 ohms	IC5 =	SN74123
R10 =	100 ohms (see text)	IC4 =	SN74107

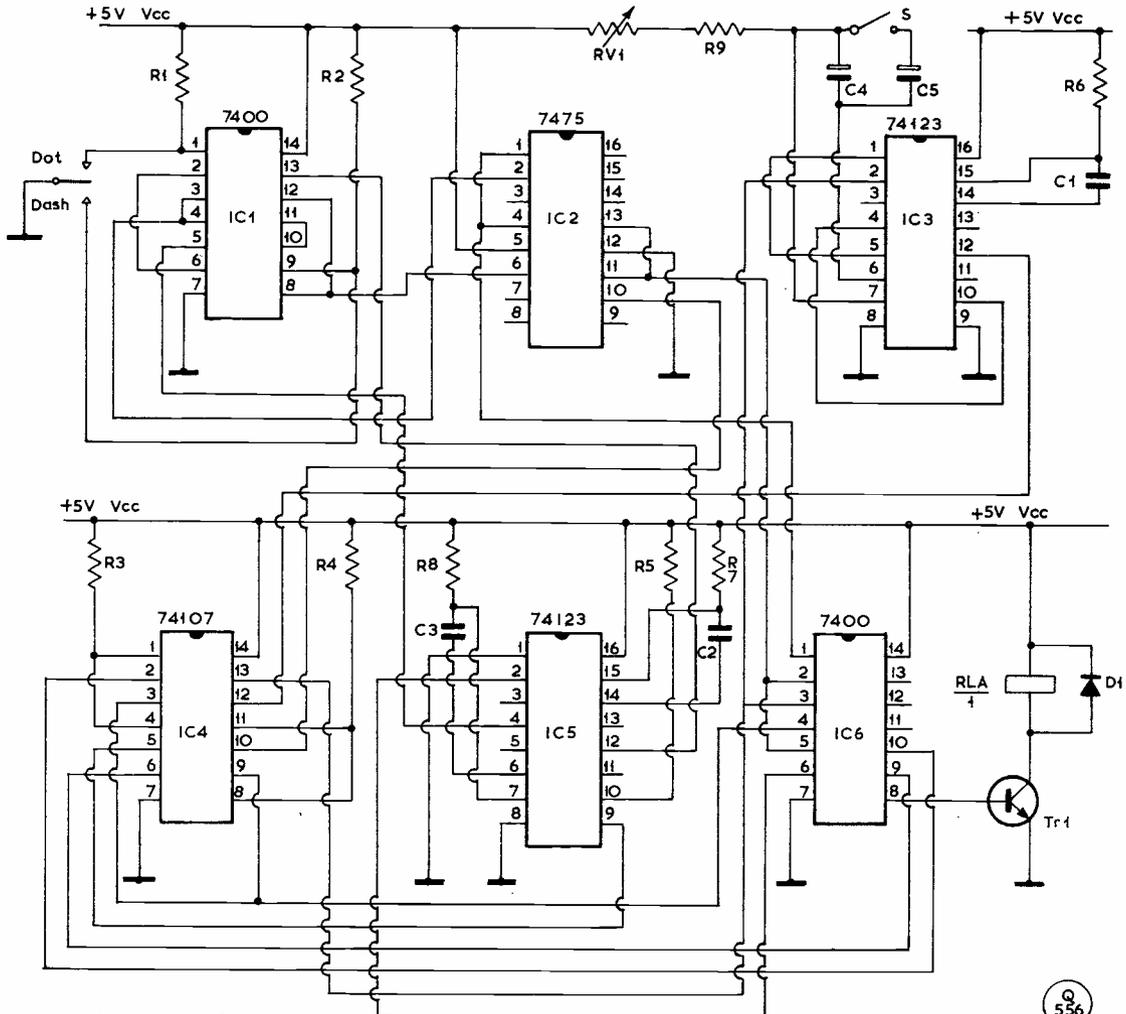


Fig.6 WIRING DIAGRAM

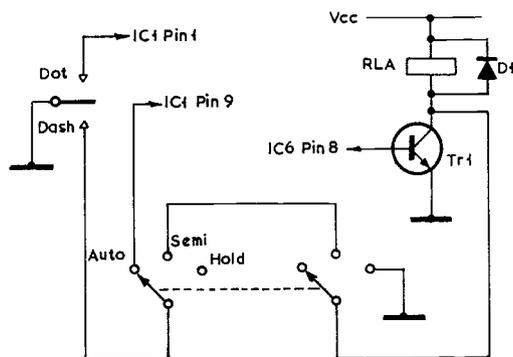


Fig. 7 Optional Switching arrangement

been turned off when IC4A pin 2 went to '1', it is held on via IC6C pin 9. The third clock pulse changes IC4A pin 3 back to '1', and the fourth one finally resets it to '0', and thus changes back IC4B. At this point, IC4B pin 6 goes to '1', dropping out the relay, and pin 5 goes to '0'.

This change to '0' at pin 5 triggers the dash reset monostable, IC5B, giving a negative-going pulse to IC1D pin 13. Thus the dash store is reset, pin 10 of the dash gate, IC2B, goes back to '0', pin 11 goes to '1', and the pulse generator is stopped. The dot gate enable-line IC2A pin 13 goes to '1', and the CLR input to IC4B pin 10 goes to '0'.

Operation

Assume both dot and dash stores had been set up, as is quite likely to happen during QRQ operation when the operator might transfer the paddle from one side to the other very quickly, *i.e.* before the completion of the first character. If he were sending a letter "N", the dash would be still in process while the dot was set up. In this case, the output of the dot store would be a '1' at IC1A pin 3, but the enable-line, pin 13, would be '0'.

So all the while the dash is in process, the \bar{Q} output of the dash gate would hold off this '1' from the dot store. At the end of the dash, the dash store would be reset, IC2B pin 11 would go to a '1', enabling the dot to be processed via IC2A pin 1, and the dash gate enable-line, IC2B pin 4, would prevent further dashes.

This feature has the effect of smoothing out the operator's paddle movements, especially at high speeds, but does assume fairly sensible manipulation of the paddle. Any keyer will corrupt characters if the paddle is operated much too fast for the speed at which the CW is supposed to be running. This circuit merely allows for a greater leeway before corruption occurs, and the paddle would have to be operated at some 50 w.p.m., with the speed set at 10 w.p.m. to enable the operator to beat it, on a dot-dash or dash-dot sequence.

Construction

Construction of the keyer should present no problems if the wiring diagram, Fig. 6, is followed. Care should be taken when counting the pin numbers, as IC's 2, 3 and

5 have 16 pins each, while the others have only 14. The relay used was as specified for the G3FCW keyer (obtainable from G.W.M. Radio of Worthing, Sussex) and comes complete with a surge suppressing diode. The 100-ohm resistor R10 may not be necessary, but was added after an attempt to key an FT-200 nearly welded together the relay contacts. (It is not necessary in the writer's HW-101).

It is very important to prevent stray RF from getting into the keyer, and decoupling of connecting leads will most likely be necessary, but the requirements will vary with each installation. Again, no decoupling was found necessary with the HW-101.

Useful additions may be a monitor and mains power supply, as well as some extra switching to enable semi-automatic keying, and a "hold" position for tuning up. The monitor can be that described by G3FCW, but the power supply will require a larger output transistor. In the writer's case, a spare 2N3055 is more than adequate.

For those who wish to add the extra switching, Fig. 7 is included.

Finally, a word to those who may be unwilling to risk their hard-earned cash on "little black boxes". IC's are more reliable and rugged than transistors, and *much* easier to deal with.

CORRECTION — CORRECTION — CORRECTION

The last paragraph of the November Editorial stated that G2/3's were not required to pass a Morse Test—in fact, they were, but the requirement was waived if they held exempting qualifications, which most did by virtue of having served during Hitler's War, the G2/3 licence having been restored on the resumption of Amateur Radio activity after the War.

In the same issue, anent the warning on p.536, "Point of Law," which was inserted at the request of the Ministry, it should have been made clear (as the Ministry now informs us) that the *possession* of transmitting gear is not prohibited, only its *use* without the appropriate licence—which, of course, has been known all along to everybody within the orbit of Amateur Radio.

The article "Another Two-Metre Converter" in our October issue contains several errors. In Fig. 1, p.476, Tr3 should be shown as an FET, with gate connected to top L7, source to D1 and drain to L6. Capacitors C1-C4 should be .0047 μ F, C5 4.7 μ F, and not as given. In the coil data, L6 should read "as L2," and L7 "8 turns stretched to $\frac{3}{8}$ in., with diode tapped 2-3 turns from cold end."

PLEASE IDENTIFY

When writing to us on any subject, as well as your name and address clearly written, please quote your callsign if you have one. This particularly applies to readers using our Small Advertisement columns, or notifying a change of address (for the "New QTH" page, for instance) when it is most helpful if it is clearly stated whether or not you are a direct subscriber. It can save so much office time in checking the Subscriber Index. Junior staff cannot be expected to know that *you* have been a subscriber for *years*, or that you've known the Editor since you were a boy!

TEN-WATT TRANSISTOR PA FOR TWO METRES

CIRCUITRY AND DESIGN

D. S. JONES (GW3XYW)

THE construction of this unit was undertaken for two reasons: First, to fulfil the requirement for a portable SSB linear, RF amplifier and secondly, to experiment with currently available semiconductors. Having successfully constructed various other published designs it was felt that devices now in existence could give a really worthwhile output on two metres. This unit is currently being used to amplify the 144 MHz output of a balanced mixer in a home-built solid-state transverter.

Circuit Description

The first stage Tr1 (2N3866) takes an RF input of around 20 milliwatts and amplifies this up to about 200 mW. The quiescent current of this stage is about 10-15 mA. Link coupling, using a short length of coax between the transverter and the input, was employed.

The quiescent current of the second stage was rather critical to set up—hence the two series resistors. The 4.7K* (R4) may have to be varied to give a standing current of around 20-25 mA. This stage produced an output of about one watt with 200 mW drive, and Tr2 is a 2N3553.

The PA stage should have a power gain of times 10 with the collector fed from a +24v. supply. The forward bias to give a quiescent current of 50-60 mA was fed from a 1.5K resistor; this was not so critical in set up with the transistor samples tired. The PA output was matched into 80ohm coax.

Setting Up

The author found it convenient to test the unit stage-by-stage, starting with Tr1 and checking the outputs with progressively larger bulbs as dummy loads. Tr1 output was observed with a 6v. .04A bulb connected across CT3 (L2 disconnected). Tr2 output was checked with a 12v. 2.2w. bulb across CT5 (L4 disconnected). The output of the PA was monitored with a 24v. 6w. bulb across CT7.

Table of Values

Fig. 1. Circuit of the Transistor PA

C1, C2,	R10 = 47 ohms
C3 = 47 μ F, cer.	R11 = 220 ohms
C4 = .01 μ F, cer.	RFC1,
C5 = 10 μ F, 63v. poly.	RFC2,
CT1,	RFC3,
CT2,	RFC6,
CT3,	RFC8 = Five turns 26g. on
CT4,	ferrite bead
CT5,	RFC4 = Four turns 18g.
CT7 = 30 μ F beehive	to $\frac{1}{2}$ in.
trimmer, Philips	RFC5 = Eight turns 22g.
CT6 = 140 μ F mica	enamel to $\frac{1}{2}$ in.
trimmer	RFC7 = Four turns 16g.
FT = .001 μ F feed	$\frac{1}{2}$ in. i.d., spaced
through	out
R1 = 12,000 ohms	Tr1 = 2N3866
R2 = 470 ohms	Tr2 = 2N3553, with heat
R3 = 330 ohms	sink
R4 = 4,700 ohms	Tr3 = 2N4127
R5 = 3,300 ohms	(PT4176C) or
R6 = 220 ohms	2N4128
R7 = 680 ohms	(PT4176D) with
R8 = 22 ohms	heat sink, see
R9 = 1,500 ohms	text

TABLE OF COIL DATA

L1 = Pri. two turns 22g. p.v.c. wound into 4t. secondary, 18g. $\frac{1}{2}$ in. i.d. by $\frac{1}{2}$ in. long.
 L2 = Three turns 18g. $\frac{1}{2}$ in. dia. by $\frac{1}{2}$ in. long.
 L3 = Three turns 16g. $\frac{1}{2}$ in. by $\frac{1}{2}$ in.
 L4 = One turn 18g. by $\frac{1}{2}$ in.
 L5 = Three turns 16g. $\frac{1}{2}$ in. i.d. by $\frac{1}{2}$ in.
 Notes: All coils self-supporting. All resistors rated $\frac{1}{2}$ w. except R9, $\frac{1}{4}$ w. Meter 0.1 amp. f.s.d. moving coil, or shunted to read 0.2 amps. see text.

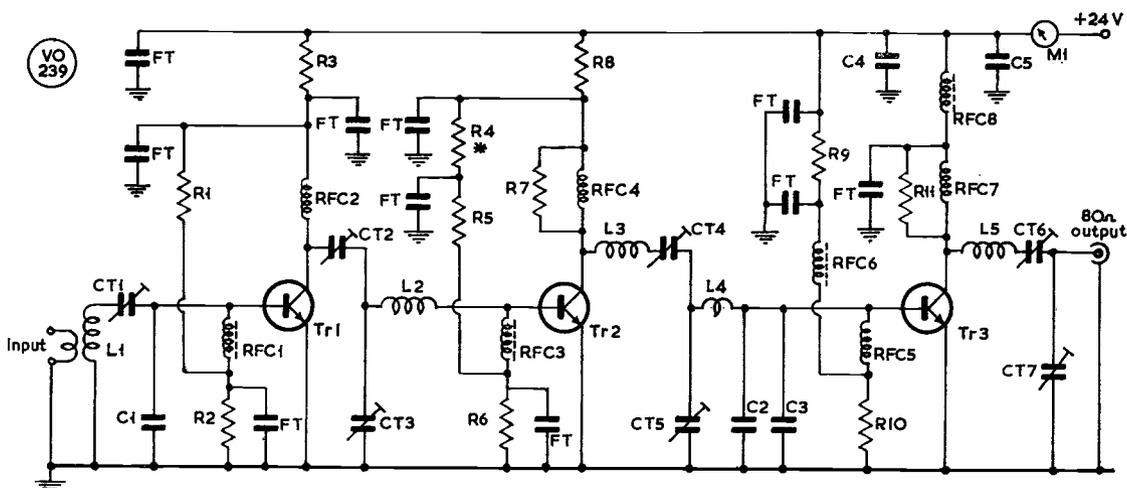


Fig. 1

* R4 nominally 4.7K but adjust on test to suit Tr2

Fig. 1. Circuit of the two-metre Transistor PA.

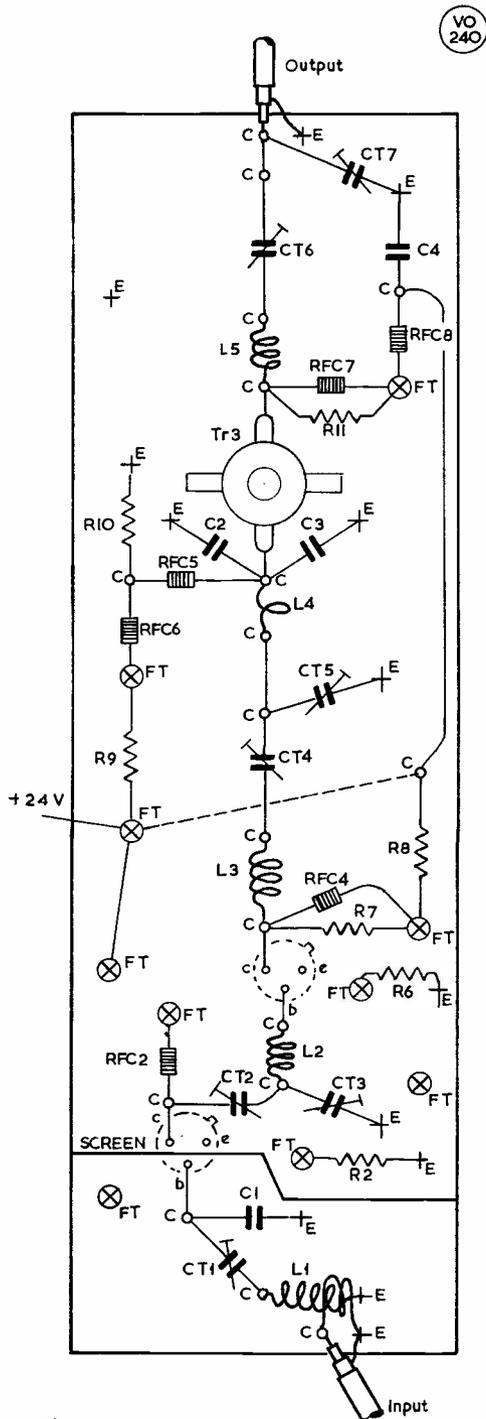
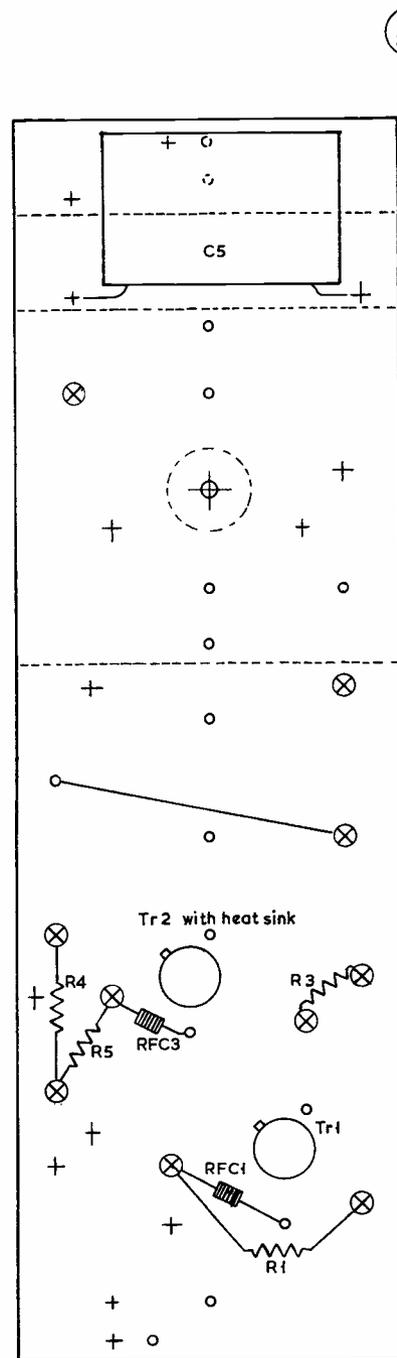


Fig. 2

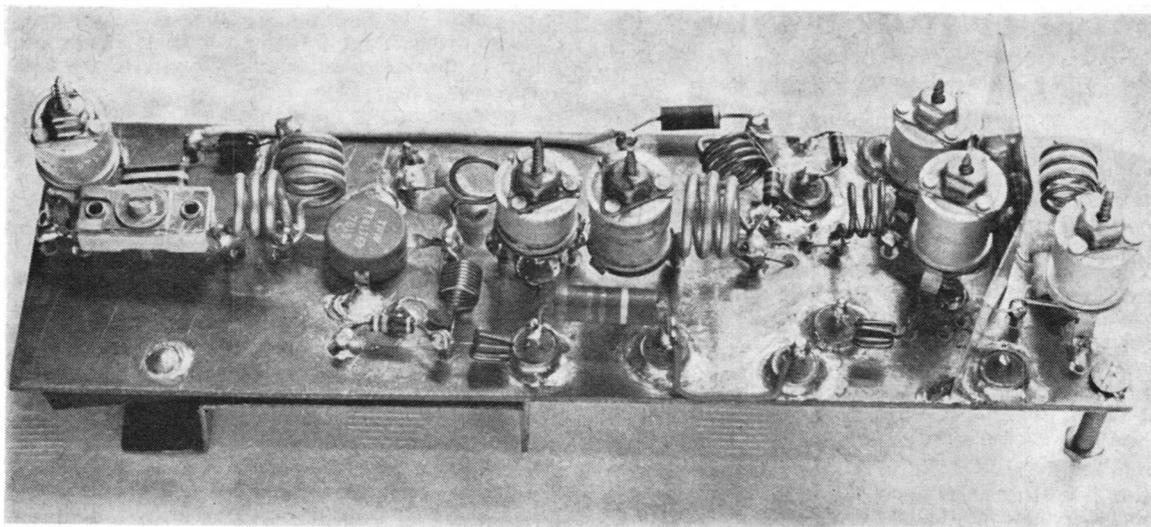
Fig. 2. Upper chassis layout, and see photograph.



Tr1 and Tr2 mounted this side (laminated) with leads pushed through

Fig. 3

Fig. 3. Construction under chassis of the two-metre transistor RF amplifier.



Construction of the Two-Metre RF Amplifier
—read with layout diagram Fig. 2.

For the first set-up, the PA was run on 12 volts. (Re-peaking of the trimmers will be necessary after removal of the bulbs and reconnection to the next stage). If any trimmer is at its limit for resonance it may be necessary to compress or open out some of the inductors. TR3 is directly bolted to the single-sided P.C. board as its stud is isolated from the collector. Extra heat sinking of the PA may be required, for which a small copper sheet (2 x 2 x 1/32 in.) bolted to the underside of the board, with a brass spacer to prevent contact with the S/S pins, was quite adequate.

Comments

Since construction of the unit described and illustrated here a further stage has been built using a 2N4128 (PT4176D) which is identical to the final stage (Tr3) just described, but with a much larger heat sink. With six walls of RF input this peaks 2A of collector current at 24v., i.e., 48 watts input, thus running the transistor at virtually its full rated output.

It may be necessary to include a filter in the output cable if any problems are encountered with out-of-band emissions.

MORE HELP NEEDED

We are asked to say that there is a growing need for helpers, or "supporters" as they are called, for the RAIBC—the Radio Amateur Invalid and Bedfast Club—in the sense of radio enthusiasts, preferably licensed and with transport, for visiting local RAIBC members, helping with their practical problems and perhaps doing such occasional jobs as putting up an aerial, arranging an outing, and such. No subscription is called for (unless you care to make a donation)—all that is asked is help. Every full RAIBC member is incapacitated in one way or another, either by blindness or by some chronic medical condition. Many are licensed and many more are SWL's. They all need, not charity, but practical assistance in one way or another. By February 20 next, RAIBC will have been in existence for 20 years. It is very much a worth-while organisation and deserves the support of all radio amateurs.

If you think you can do anything to help, write (with an s.a.e., please) to the hon. secretary, RAIBC, Mrs. Frances Woolley, G3LWY, Woodclose, Penselwood, Wincanton, Somerset, BA9 8LT, outlining your

availability. For all you know, there could be an RAIBC member right in your neighbourhood, who would welcome a visit. G3LWY will be able to tell you.

As many readers will be aware, we report regularly on RAIBC affairs and it has always had our support.

RADIO AMATEUR COURSES

An Advanced Course—mainly for those already holding a licence and who would like to know more about what goes on inside their black boxes—is offered at the Slough College of Technology, on Friday evenings. The syllabus is an interesting one, covering the ground from SSB to RTTY, with full laboratory facilities, and students may bring their own gear for checking or calibration. All details from E. C. Palmer, BA, G3FVC, Dept. of General Studies, College of Technology, Wellington Street, Slough, Bucks., SL1 1YG (Tel.: Slough 34585).

At Durham Technical College, an R.A.E. course is now running, of which full details can be obtained from F. L. Frith, B.Sc., MIEE, G8JD, 7 Deyn Court, Durham.

BUILD IT OR BUY IT

WHERE THE APPLIANCE OPERATOR STANDS

F. G. RAYER, T.Eng. (CEI), A.I.E.R.E. (G3OGR)

THIS is not intended to be a criticism of the appliance operators, or those who purchase everything ready made, but rather a reminder that they could probably be builders too—at least within limits. There are undoubtedly many whose joy it is to sit in a shack full of gleaming equipment, furnished with gear from a deep pocket. They are the operators, heard on all bands, at all times, from all countries (conditions permitting!) Good luck to them.

In fact the state of the art has now reached the stage where it is increasingly impracticable for many to construct everything they want. Given that Amateur Radio is a hobby, and that many can only give it limited time, the home fabrication of an item such as the main SSB transceiver could easily take a year, which anyone might well prefer to use as time actually on the air. There is also the sad disparity between the second-hand value of a commercial rig and one that is home-built. Furthermore a sound second-hand commercial rig will usually cost far less than new components to build something similar for oneself.

Despite this, there are good reasons for building certain items of gear. These will generally be accessories—adjuncts to the station, such as aerial tuners, SWR indicators, VHF converters, electronic change-over devices, and similar items, which can often be home-constructed for less than they would cost ready-made, or which are not available at all in the wanted form. These are small projects, which can often be put together in a week end or so, and which may well need no elaborate metal work or time-consuming preparation of cabinets and panels.

There are also simple transmitters, effective enough to be wholly practical, and not merely novelties. In this category comes many a Top Band transmitter, having no more components than the old popular domestic radio sets of years ago, but putting out a good, clean signal. Also (as in the writer's case) a CW 5763-plus-807, with a few old crystals, running 40 watts, and containing not more than a dozen components in all, yet unailing in its ability to produce a QSO.

Among acquaintances and friends over the years have been many greatly admired for the way they built small items of gear. These include a very modest mobile rig, designed to fit a certain small space; a blind amateur who built his own 160m. Tx; a lad who assembled a Morse oscillator with paper clips and oddments on a cardboard box lid—and numerous others who had been ready to jump in and make something they wanted. Somewhere behind this building activity, whether it produces the simplest item, or a 300-watt transceiver from a kit, is the fulfilment of a creative urge which gives particular satisfaction in the knowledge that one made

it oneself.

And that can apply to the admirable Heath kits, which in themselves are such a pleasure to the keen home constructor.

BOOK REVIEW

A Course in Radio Fundamentals (ARRL)

THIS new book, *A Course in Radio Fundamentals*, comes from the ARRL and hence will be recognised as complementary to the famous *ARRL Handbook*. Indeed, the original concept of *Course in Radio Fundamentals* was 'way back in Hitler's War, and used the *Handbook* as the basic text. However, the edition now under review is complete in itself. There are 26 chapters, each of them dealing directly with some aspect of Amateur Radio. For instance, Chapter 11 covers Transformers, while the first ten discuss basic AC and DC theory. Chapter 18 covers transmission lines, and then there are sections on FET's and Bipolar Transistors.

Apart from the text material, each chapter is provided with some question-and-answer material, the answers being given at the back of the book. Probably, the most interesting part is right at the end, where there are the instructions for doing ten experiments using very simple equipment which, if properly carried out, will go a long way to deepen the understanding of the experimenter.

While this book is useful for anyone, particularly the R.A.E. student, one would feel that it has a particular usefulness for the "loner" or student with no local technical college facilities to keep him on the path of correct understanding. Such a student, wondering but doubtful about trying constructional work, could well be greatly encouraged by following completely the experimental programme, to a point where confidence is gained to tackle with success a project taken from the pages of, say, *SHORT WAVE MAGAZINE*.

To sum up: This is one of the very best works of reference to recommend to a student of radio and electronics for use as his basic study—whether his main interest is in Amateur Radio or the wider professional field.

A Course in Radio Fundamentals, well illustrated, 26 chapters, 182 pages (including 30 pages covering Experiments, Answers to Problems and Appendix), price £1.17 post free. Orders, with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

THE APPLETON LABORATORY

What we have always known as the Radio Research Station—latterly the Radio and Space Research Station (Ditton Park, Slough, Bucks.)—is now The Appleton Laboratory. It is named after the distinguished physicist the late Sir Edward Appleton, GBE, KCB, FRS, who for a long period was closely connected with the work of the Station, and who himself contributed so much to our understanding of radio propagation and ionospheric measurement, leading eventually to the concept of radar.

RECORD-PLAYBACK WITH THE FT-DX401 TRANSCEIVER

USING A CASSETTE PLAYER

B. S. SUTHERLAND (G3IES)

As many owners of FT-DX401 transceivers may be aware, there are two phono-sockets on the back of the set, marked "600 Ohm" and "Patch" respectively. As we in the U.K. are denied the use of phone-patch facilities, it is apparent that these accessories could be utilised for a more practical purpose, such as record and playback.

On examination of the circuit, this application is very simple, and the modification can be easily undertaken in half-an-hour. First obtain a cassette recorder that has an input additional to the mike input, with preferably ALC rather than manual volume control. Decouple the first two audio amplifying stages, base to chassis, with .001 μ F disc condensers, also decouple input at the input jack—this is most important as there will be a lot of RF floating about, and the slightest whiff of this will tend to render any recordings unintelligible. It may be necessary to decouple every stage, should the suggested decoupling be insufficient. As it is desirable to be able to tape both sides of a QSO it will be necessary to utilise the existing change-over relay in the Tx for this purpose.

Pick up the outgoing audio from the first stage, tee-in at any point between R252 and C253, which can be got at from either side of the p.c.b. take this feed *via* screened cable and a .0068 μ F capacitor to pin 8 of J5 socket, *first removing earth wire from rear socket*; connect this earth to screen of lead.

On J5 plug, pin 10 goes through 0.5 megohm to tape input, also pin 9 *via* 200K to the 600-ohm input socket. With output from the tape recorder *via* 200K with 10 ohms in parallel, wattage of the latter will be dependent on maximum output of recorder. Should monitoring of output not be possible, add a small 2in. 8-ohm speaker to the circuit *via* 100-ohm pot. across a 10-ohm load; this feeds into "patch socket"—see diagram.

Using It

This completes the job. For recording set the Rx audio control at maximum and RF gain at lowest practical level for ease of listening—the ALC on "recording" will take care of the rest. On "playback" the recorder level should be about half-open to get a comparable result. If desired, the microphone can be left in circuit without inhibiting the playback, so any necessary comments can be added over the playback, and direct comparisons made. An expensive cassette player is *not* necessary. That used at G3IES is a £10 item which is quite adequate for the job. Great care should be taken when wiring the jack plug J5, as this has 800 volts on it.

Another useful gadget is a closed loop cassette, constructed from an old container; a 10in. loop provides just about enough "coverage" to send audio tones, repeated *ad infinitum* until switched off, very useful for testing for TVI when an operator is not available.

CURRENT THAT KILLS

While voltage is required to pump current through the human body, the killer is the *current*—which can be as low as 10 mA or as high as 200 mA, depending on the voltage and the resistivity of the body path. Voltages as low as 100v. DC are quite capable of delivering a lethal shock if the path permits a high current density. At 20 mA, breathing becomes difficult and ceases at 75-100 mA, when the heart is severely affected, with violent muscular contractions, becoming clamped at 200 mA or so.

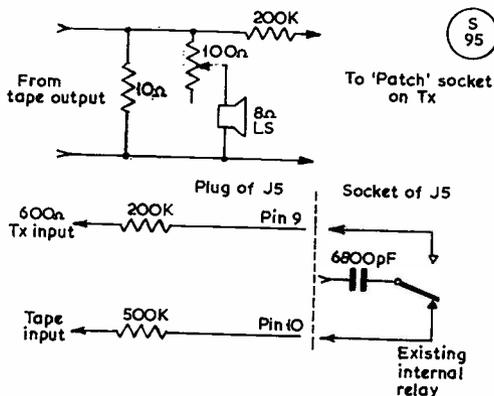
Body resistance varies widely, from only 100 ohms between the ears to 500 ohms hand-to-foot, up to 500K across a long path of dry skin.

In an actual incident, there is no time to study the physiology, and all depends on the rescuer, who must get the victim off the contacts as rapidly as possible and then apply artificial respiration, keeping at it till medical help arrives. Even if the subject appears to be dead, this could be due simply to shock effects and it could take several hours to bring the patient round. Take no notice of any skin burns.

The moral of all this is obvious. Be Careful. Never Take Short Cuts with Electricity. Remember That 100v. Can Be Lethal.

FROM THE NEW U.K. CALL BOOK

We get it that there are now more than 240 G5/3 calls in issue in the U.K.—these being the nationals of other countries who have been granted a G licence under the reciprocal arrangements. The latest such c/s listed is G5BDN. Most of these G5/3's are U.S. Forces personnel serving in the U.K., with something of a concentration round the operational American air bases, like Upper Heyford, Oxon. Also, there are now some 48 columns of G8/3's—holders of the B-Licence, VHF only—the latest entry being G8HMI. This new (1974) issue of the U.K. or *G Call Book* (which also includes a listing of EI stations) is obtainable from our Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF, at 75p post free. It contains the callsign/addresses of some 18,000 amateurs licensed in the U.K.

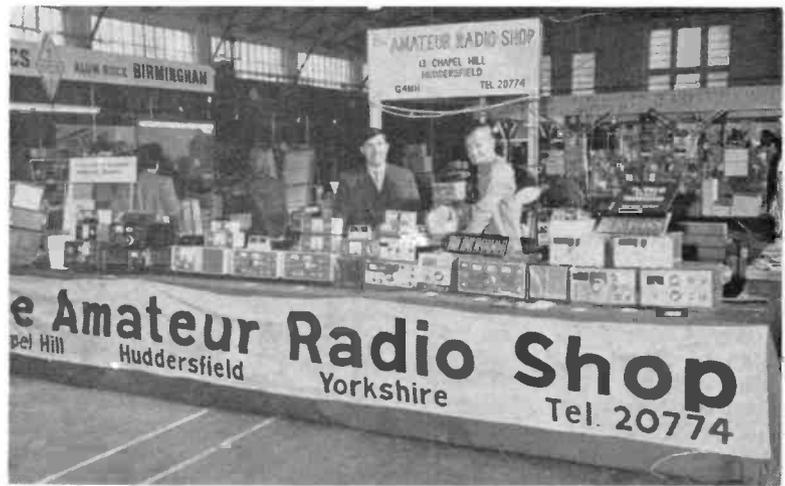


The Leicester Exhibition

Part of the "Short Wave Magazine" stand at the Amateur Radio Exhibition in Leicester during October 25-27. It was a very successful affair, organised by the Amateur Radio Retailers Association, and is the second such exhibition away from London, this year with a paid attendance of over 5,000. Our own visitors' book had more signatures in it than the last London exhibition we were at, in 1968. Below is our picture of the Leicester exhibition, taken on Friday afternoon.



Jim Fish, G4MH, was at Leicester with a nice stand layout over his Amateur Radio Shop marquee. He has been a regular and reliable advertiser for many years now and has gradually built up a very successful business.



Naturally, the well known firm of Heath (Gloucester) had a fine professional stand at the Leicester Exhibition, with a display of all they have of interest to the radio amateur, including their sophisticated kit sets for the home constructor.

Bill Lowe, of Lowe Electronics, had his sales team with him for the ARRA exhibition. If you may wonder where are the customers, this picture was specially arranged and taken on the Friday morning before the Exhibition opened. Left to right are: GW3YSA, G3MME, G3UBO (the Bandit), G3XWX and G3PCY.



Band Planning at VHF

THE Scheveningen IARU Conference and the Baunatal meeting of Region 1 VHF managers have come and gone, and the result has been agreement among the European nations to an up-dated band plan for VHF/UHF. For two metres, this is shown opposite and the intention is that it shall be introduced on February 1, 1974. A few comments may, therefore, not be inappropriate.

First, may it be noted that *SHORT WAVE MAGAZINE* was kept fully informed of the proposed changes and that the plans as they are reproduced here have our full support.

Major changes are the establishment of SSB just above the CW allocation at the lower frequency ends of the bands, the reallocation of high power beacon frequencies, the establishment of frequencies for repeater and FM simplex working, the designation of frequencies for space communication and the abandonment of geographical zoning in favour of what is virtually a "mode" notation. Let us look at these in rather more detail.

CW Allocation: Here we note that the frequency allocation has been increased from 100 kHz to 150 kHz and that it includes spot frequencies for EME and random MS working. This is in accord with current practice.

Beacons: The regional high power beacons move to the low ends of the bands; on 2m. they are centred on 144-150 MHz with a planned spread of ± 25 kHz, and on 70 cm. and 23 cm. will be located below 432.05 MHz and 1296.05 MHz respectively. Regional beacon planning for the whole of IARU Region 1 will be undertaken by RSGB, but low power beacons, which may operate anywhere within the amateur spectrum, will be established by national agreement only.

SSB: The move of the SSB channels from around 145.41 MHz is probably the most significant change of all. It is logical that SSB, as a DX mode, should find a place alongside CW, the other DX mode. Until now, it had not been possible to shift down to the lower end of the band, as required by the Scheveningen decisions, due to the fact that the German repeater input channels were located down there, but the German authori-

VHF BANDS

A. H. DORMER — G3DAH

ties, with great self-sacrifice and self-discipline, have agreed to adopt 600 kHz spacing between repeater input and output channels, and move up above 145.0 MHz, thus permitting the change to take place. Inevitably, this will entail some modification to certain commercial equipments in common use, but it is understood that the distributors, who have been kept in the picture on xtal requirements, have made arrangements for the necessary changes to be effected at a very moderate charge. Of course, since no band plans are mandatory but depend upon the goodwill of the users for effective operation, there will be some operators who feel, for one reason or another, that they do not wish to incur this expense. In that case, they will presumably decide to continue operating around 145.41 MHz, although it is doubtful if they will make many contacts there, and they must be prepared for some fairly hefty FM QRM. On 70 cm. and 23 cm., SSB appears at the lower frequency ends of the bands for the same reasons. It will be noted that the upper limit of SSB is shown as "flexible," and it could be argued that this is unsatisfactory since it will perpetuate the old problem of mode overlap, which engenders so

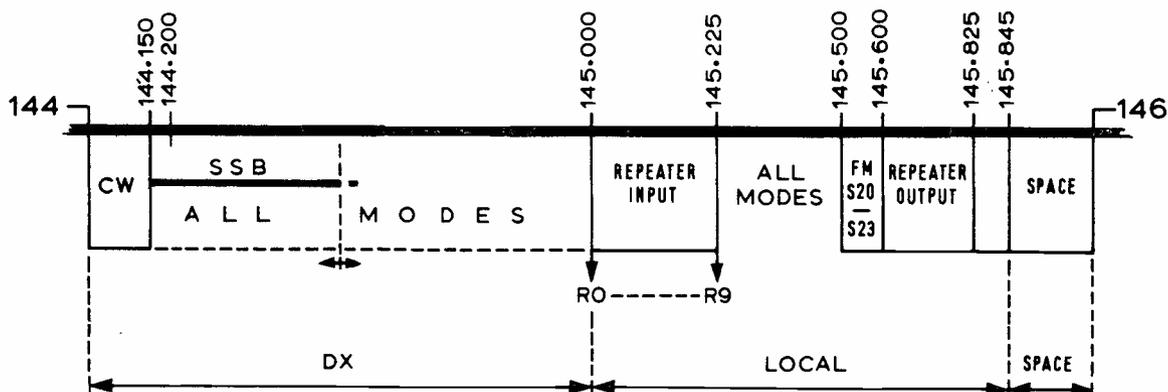
much rancour and general ill-will at the present time and under the present system. A good case can be made out here for defining the upper limit—perhaps at 144.35 MHz to give a 200 kHz wide band—which should be adequate for current usage and allow a bit for future expansion. Since there is no 4m. allocation on the Continent, a national plan must be evolved for this band, and this could well make 70.2 MHz as the centre frequency for SSB. Readers views on these last two points would be welcome.

FM and Repeaters: Very adequate provision is made in the plan for repeater and mobile FM working with channels spaced at 25 kHz from 145.0 MHz up. It has been calculated that no more than eight repeater frequencies will be required in the U.K. and this means that channel RØ on 145.0 MHz will not be allocated as a repeater channel, but will remain as a *national* mobile calling channel to supplement the *international* calling channel on 145.55 MHz. It will be more than ever necessary under this plan to respect the word "Calling" here, and to ensure that other channels are used as working frequencies and 145.0 MHz left clear for its designated purpose once the initial contact has been made.

Other Aspects: Since there is no correlation between the emergency services of the European nations, the National authorities will have to designate RAEN channels. Discrete frequencies have been allocated, with international agreement, for RTTY purposes and will be allocated for SS/TV should the need arise. The "Space" allocation at the top end of 2m. and middle of 70 cm. will accommodate future OSCAR and other airborne repeaters.

The foregoing is an abbreviated resumé of the new plans, and is designed to give you rather more detailed information than the bare outline drawing can provide on which to base your comments which we shall hope to deal with in due course.

Any band plan can only work with the goodwill of those operating it. The one now presented, although requiring a bit of give-and-take here and there, represents a workable solution to the problem of pleasing all of the people all of the



The Revised Two-Metre Band Plan

time, it meets current demand for frequency/mode operation and incorporates many of the proposals made by active amateurs over the past few years. As such it deserves your support.

Contests

Results: The July 432 MHz Portable contest produced a win for GW3ZUL operating from Brecon, followed by G3PRM in Northants, who was runner-up. Very few logs were submitted for this event, and it seems possible that the contest will revert to "open" next year.

The August QRP contest attracted more entries, the fixed station section being won by G8CKZ and the portable section by G8DML.

The report in "VHF Bands" in October that conditions were particularly good for the August two-metre SSB contest was borne out by the results which show that in a majority of cases the best DX was over 500 km—a monumental 1,000 km contact being that between G8CMG/P in Devon with DJ4GM. GW8BHH/P in Radnor took a 400 point lead over GD8FFX/P to win the event. The number of entries (58) reflected the growing popularity of this mode on 2m.

The August fixed and portable 4m. contest produced a comfortable win for G3OHH in the fixed station section and for G13VPK/P operating from Co. Antrim in the portable section.

The BARTG 5th VHF/UHF RTTY contest in September was

won by DJ8EA, the first British station to appear in the lists, in fourth place, being G3YKB, who was one of only four stations to put in an entry for 432 MHz as well as 144 MHz. Conditions were reported poor in this country but somewhat better in DL.

Reports: Conditions continue to be unremarkable for the 4m. and 70cm. Cumulative events, although 4m. showed a bit of a lift on October 28 and the 70 cm. propagation was reasonable, without being outstanding, on October 29. The November 144/432 MHz CW contest came just too late to enable advantage to be taken of the good 2m. opening to the Continent on November 1/2 when DL stations were at exceptional strength at times. (Your scribe even made it with HB9!). However, the nearer EU/DX was there and 200+ mile contacts were possible without great difficulty. 70 cm. was another story, and both conditions and activity appeared generally low, although it was noted that G3EHM from Stoke made 23 contacts.

Forthcoming Events: 4m. Cumulatives on December 16 and January 6, and the last of the 70 cm. Cumulatives on November 30. The last major contest of the year is the 144 MHz fixed station event on December 9.

The Scottish Scene

The Glenrothes High School Radio Society has now been allotted a GM4 call and is already active on 2m. on Thursday evenings between

1900 and 2100 hrs. The Lothians Radio Society can be expected to enjoy an increase in mobile operation among their membership following the talk by GM8GEC and the demonstration of some mouth-watering equipment for mobile use.

Two new calls are being heard on the two-metre air, GM8HQZ in Edinburgh and GM8HSY in Falkirk. The former has an interest in /P working and one looks forward to hearing signals from some of the rarer GM counties. This is likely in any event, since GM3OXX has returned to the fold! GM3PQU has also made a welcome reappearance on Two. GM3BQA is reported to be fully recovered from the shock he received recently when an Edinburgh station gave him an S2 report on 2m.! He was well enough to make the journey to the Leicester show anyway, even though it meant leaving home at 0630 in the morning and returning at 0330 the next day. There's enthusiasm for you!

GM4HR is the beacon keeper for the Angus beacon, GM3ANG, and he is having a bit of a job maintaining the device as fully operational as he would like due to shortage of QQV06-40A and 6BH6 valves. Can anyone help? He is *QTHR*.

Activity on 70 cm. continues to increase in GM in spite of the difficulties encountered with the terrain. GM6XI (Edinburgh) with his *Microwave Modules* varactor tripler and converter seems to be getting out very well although he notes that the 46-ele. beam is probably a bit sharp for genera

working. This is a fairly common observation and although it is obviously a good thing to have plenty of gain in the right direction, something like a 6/6 to give wider horizontal coverage when calling "CQ" and tuning, is a very useful supplement. GM3OXX is up with his QRP solid-state transceiver, doing very nicely, as is GM3BCB.

The Kohoutek Comet

Several readers have asked for details of this visitor from outer space and queried whether it would be possible to use it for amateur communication purposes. So, here goes with a brief summary of the salient points.

First discovered in June of the year by the German astronomer from whom it derives its name, this comet is likely to be the celestial event of the century in that it is calculated that it will pass within 75,000,000 miles of Earth and, at its nearest approach, will be of such brilliance as to be clearly visible during daylight hours! At that time, mid-January, the tail will be some 20° in length stretching in a great arc across the Eastern sky and exceeding in appearance, therefore, even the Halley comet of 1910. Calculations show that the comet is not periodic, that is it will not return to earth again after its *rendez-vous* with the sun at the end of the year, so it is a strictly one-off event. As to its origin, it seems most likely that it was formed beyond the outermost planets from the same clouds of interstellar dust that led to the creation of our solar system nearly five billion years ago. The attraction of a nearby star occasionally pulls such a comet into an elongated orbit, bringing it closer to our Sun and, therefore, to the Earth also.

Both optical and radio telescopes will be focussed on *Kohoutek*, the Americans in particular putting in a tremendous effort to investigate the phenomenon. NASA will be flying special infra-red telescopes and is sponsoring the construction of a special comet observatory in New Mexico. Several rockets will be launched during the time of the closest pass and *Mariner 10*, an unmanned spacecraft *en route* to Venus and Mercury, will transmit

THREE BAND ANNUAL VHF TABLE

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3ZMD	59	6	69	11	41	7	193
G3NHE	43	6	75	13	43	9	189
GD2HDZ	41	5	78	10	33	7	174
G3DAH	48	5	58	15	32	8	166
G4BMM	37	3	57	11	34	7	149
G3OHH	59	6	57	10	9	2	143
G3FIJ	43	4	52	9	25	7	140
G4BEL	23	2	60	11	30	6	132
G2AXI	48	5	46	8	20	3	130
G8FUI	—	—	78	11	28	3	120
G8EOP	—	—	64	10	31	6	111
G8GNE	—	—	64	11	17	7	99
G4ASR	28	2	58	10	—	—	98
G8BXX	—	—	62	12	19	2	95
GW8FOL	—	—	82	11	—	—	93
G8FMK	—	—	45	9	32	5	91
G8DNK	—	—	76	13	—	—	89
GW8FKB	—	—	76	11	—	—	87
G8ECK	—	—	67	13	6	1	87
GW3ZTH	—	—	66	14	—	—	80
G3BW	—	—	71	9	—	—	80
G3XDY	—	—	65	11	—	—	76
G8FQE	—	—	61	13	—	—	74
G8CKY	—	—	53	10	7	2	72
G8CKZ	—	—	60	11	—	—	71
GW8DUP	—	—	58	9	—	—	67
G8BKR	—	—	41	5	18	2	66
GM3ZVB	9	1	46	8	—	—	64
G8HET	—	—	50	12	—	—	62
G8FWB	—	—	53	9	—	—	62
G8GPR	—	—	55	6	—	—	61
G4AEQ	—	—	36	4	17	3	60
G18EWM	—	—	48	7	—	—	55
G8ATY	—	—	43	7	2	1	53
G3SMU	18	3	10	2	16	3	52
GW8EHK	—	—	44	8	—	—	52
G3FPK	—	—	43	6	—	—	49
G4AJE	—	—	38	8	1	1	48
G4BKG	—	—	40	7	—	—	47
GW8BXQ	—	—	39	8	—	—	47
G8CBU	—	—	36	3	7	1	47
GW3CBY	7	2	21	5	5	2	42
G8DGR	—	—	32	2	6	1	41
GW4BXE	—	—	35	6	—	—	41
G8COG	—	—	28	3	5	1	37
G8EMS	—	—	27	7	2	1	37
G8DOT	—	—	27	8	—	—	35
G8HRJ	—	—	32	3	—	—	35
G8GXE	—	—	28	5	—	—	33
G8GNC	—	—	28	2	—	—	30
G8GBV	—	—	19	3	5	1	28
G4AEZ	—	—	23	5	—	—	28
G4BOW	—	—	24	3	—	—	27
GD4BJL	4	3	13	5	—	—	25
G4CMV	—	—	19	3	2	1	25
G8FUL	—	—	23	2	—	—	25
G8GJB	—	—	21	3	—	—	24
G8ECU	—	—	19	2	—	—	21
G3KEP	8	3	4	2	2	2	21
G3WHK	—	—	17	3	—	—	20
GW8CMA	—	—	14	3	—	—	17
GW8CGH	—	—	12	2	—	—	14

The Table shows claims to date from January 1, 1973 and will close on December 31, 1973. Claims to that date should be sent to "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ for the year's final placings to appear in the February issue.

VHF writers all! At left, Mike Dormer, G3DAH, of "VHF Bands," and on right Jack Hum, G5UM, of "Radio Communication." At centre is Austin Forsyth, G6FO, Editor of Short Wave Magazine who, as A. J. Devon, for many years wrote "VHF Bands." Perhaps on this occasion, at Leicester, they were discussing the new VHF band planning! It can be taken that, between them, they know a good deal of what goes on in the VHF field.



TV pictures. Important observations will also be made by the astronauts in Skylab. *Pioneer 8*, already in orbit from the Sun, should be in a position in early January to transmit radio signals through the comet's tail and the Space Agency's large Goldstone antenna in the Mojave desert will be used in an attempt to bounce signals off the nucleus. And that brings us to what we, as amateurs, could try.

The quick answer must be—very little. At some quarter of a million miles, the earth-moon-earth path loss demands exceptional equipment for communication. At 75,000,000 miles that loss becomes truly astronomical and quite beyond amateur reach with the gear we have available to us. The difficulty of making a contact with a time lag of 16 minutes or so for the go-and-return path must also be considered.

The tail of the comet is directed away from the sun by the pressure of the solar wind and, although it is calculated that it will be some 50,000,000 km long at the time of closest approach, will not intersect the orbit of the earth when we are in the vicinity—fortunately! No direct atmospheric ionisation need be expected, therefore, so don't start looking for an Aurora or Sporadic-E effect! At no time will the comet be between the sun and earth in such a position as to interrupt the flow of solar particles

in a way which could affect radio propagation. From all this one must conclude that *Kohoutek* will have no more influence on our VHF bands than did the *Arend-Roland* comet of 1957. A pity, but there it is.

News Items

Some reports have come in commenting on the good propagation on 2m. around October 28. Of particular interest is that from G3KFN (Plymouth) who reports contacts with two Spanish stations, EA1KC and EA1CR, on the Sunday morning. Signals were 5 & 9 both ways. In addition, he raised some 17 French stations, quite a few of them in the Bordeaux area. GW4BXE (Pontypool, Mon.), also had quite a time of it on October 26 when he had contacts with 13 PAØ, three DC, two ON, a few F and GC8AAZ in Jersey—all with 10 watts of RF to an 8-ele Yagi. It was at this time that he learned that YU and OE were being worked by the French stations, although no reports of such DX have been received from the U.K. (Many of us must have missed out on this opening which coincided with the Leicester Radio Show.) In the North, GM3OXX and GM4BWT had quite a ball on the Cairn 'o Mounth on the Saturday and Sunday. They worked 50 EU stations on 2m. SSB using either a

quadruple quad antenna or a 12-ele. colinear array. Strangely enough, although the gain of the two systems is comparable, the quad appeared to give the best results for Continental contacts while the colinear outperformed it for subsequent G working. Operations on 70 cm. were a dead loss. Incidentally, GM4BWT (Edinburgh) is looking for CW contacts on 145-94 MHz each evening between 8 and 8.30 p.m.

Beacons are in the news again. GB3DM has been off for some time, the official explanation being that the gear is being modified so that the same keyer will operate with both the 2m. and 70 cm. beacons. GB3SC developed a fault on October 26 and was running on the driver only for a few days, but all is now well again. GB3SX is silent, as is F3THF, the latter having run into more problems with QRM to the nearby Met. Centre.

The beacons on *Mirabel II* (see p.577, November) were logged at good strength in this country on October 28. At G4BYV (Norfolk) the 23 cm. transmission was up to S7 at times, as it was with G8FJG in Essex, who noted peak signals at 1525z with a second peak at 1138z. DJ2HF, the beacon on 432.0 MHz, is being copied in this country.

G2AXI finds that having a 60ft. *Versatower* pays off. He measures an increase of 20 dB on the GB3SC signal on 70 cm. compared with the



E. Waddington, G8EDI, 18 Barnwood Road, Earby, Colne, Lancs. has an HW-17 with FET pre-amp., all built into a neat console, with outside an 8-ele flat-top at 35ft. The Rx on the left is a Mohican GC-1U, the Heathkit full-coverage transistor receiver.

signal received on the 30ft. antenna and notes similar increases on the other bands. G8EOP (Dewsbury, Yorks.) is now QRV on 70 cm. with 10 watts but will soon be running a higher power linear. Others active on 70 cm. SSB in the North are G3ZYC, G8AWS, G8BCL and G8EPG.

Newly active on 2m. is G3HXM (Norwich) who now has an 8-ele. *J-Beam* at 110ft. and is on 145.2 MHz with "all-Collins gear". His aim is to contact Spain. Portsmouth Polytechnic is also QRV on 2m. with a "Liner 2" and dual-gate mosfet converter. The antenna, a 13-ele Parabeam, is at 100ft. They use the call G6PU at present and are applying for G8/3. Operators are G8FGP, G8CEH, GW8HRR, G8HUL, G8GNR and G4AVX (secretary).

G4AUP will be operating from 12, Ryley Field Road, Milnthorpe, Westmorland on 2m. SSB between December 15 and January 6, and would be pleased to arrange skeds. Write him at 28, Pemberton Avenue, Gidea Park, Romford, Essex before those dates.

G4BYV (Dereham, Norfolk) reports that he worked ON4HN on November 2 on 23 cm. and learned that Henri's absence from that band recently was due to antenna trouble which has now been

rectified. John also reports that, as soon as he can get his wife to dig the 6ft. hole, he will have a tilt-over tower up!

Things are moving fast in the repeater field. The Bristol Channel project has been viewed with favour by the MPT and negotiations are in the final stage. The Mid-Severn Valley and the London repeater

schemes are now with MPT for consideration. It is planned that the Bristol repeater shall use the same input and output frequencies as GB3PI but the access tone is likely to be different—probably 1750 Hz. The site is north of Newport, Mon. and the antennas at 1,600ft. or so, should give good coverage as far East as Berkshire. While on the

OSCAR VI—Prediction Data

Orbit	Date	Time	Position	Direction
S242	Dec. 8	0751	30°E	N/S
S243		0946	01°E	N/S
S244		1141	28°W	N/S
S247		1702	42°E	S/N
S248	Dec. 15	1857	13°E	S/N
S249		2052	16°W	S/N
S250		2247	44°W	S/N
S330		0831	20°E	N/S
S331		1026	09°W	N/S
S332		1221	38°W	N/S
S335		1741	32°E	S/N
S336		1936	03°E	S/N
S337		2131	25°W	S/N
S417		Dec. 22	0715	39°E
S418	0910		10°E	N/S
S419	1105		19°W	N/S
S423	1821		22°E	S/N
S424	2016		07°W	S/N
S425	Dec. 29	2211	35°W	S/N
S505		0755	29°E	N/S
S506		0950	00°E	N/S
S507		1145	29°W	N/S
S510		1706	41°E	S/N
S511		1901	12°E	S/N
S512		2056	16°W	S/N
S513	2251	45°W	S/N	

Times shown are for crossings at 52°N on Saturdays. Orbits beyond 45°E or W are not included. To calculate later orbits deduct 1.15 minutes and add 1.29° each 25 orbits. Time in GMT. Position referred to Greenwich.

At left in this picture is Tom Douglas, G3BA, of BBC Sutton Coldfield, well known not only for his regular-on-the-air VHF activity but also for the numerous effective and well-organised DX-peditions he has mounted to EI, GM and GW—to say nothing of EU forays—in collaboration with Brian Meadon, G3BHT (right).



subject of repeaters, readers may care to note that the latest version of the "Emumarker", advertised recently, has an additional output on 25 kHz—very useful for checking repeater frequencies.

It is regretted that due to pressure on space, some VHFCC award notices are held over till next month.

Echelford Communications have taken over the responsibility for the distribution of *VHF Communications* kits and will be distributing that periodical from the first 1974 issue.

Finally, don't be surprised if you

hear French stations using the callsign prefix "HW" in place of "F" between November 15 and December 15. This is to mark the 50th anniversary of the first amateur trans-Atlantic QSO on 109 metres on November 23, 1923, between 8AB in Nice and IMO in Connecticut. It seems a long way back from *Oscar VI*, doesn't it?

Deadline

Deadline for the next issue is **immediate!** This is because of the anticipated mail delays and the necessity for clearing the January issue before Christmas. Correspondence to "VHF Bands," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK181RQ. 73 for now from G3DAH.

BR PCM

British Rail has placed further orders with Marconi for their U1310 24-channel Pulse Code Modulation telephone system. BR's regional communication network is being expanded and updated to cater for its forthcoming national integration, aimed at increasing operating efficiency.

The PCM system increases the capacity of telephone junction circuits without the necessity of laying new cable routes. Integrated circuits are extensively used for reliability, and Marconi has perfected a manufacturing process incorporating flowline production techniques together with very advanced automatic test facilities.

C.A.F.

To keep in touch with the world of Amateur Radio, read "Short Wave Magazine" regularly — Independent, Unsubsidised and now in its 31st volume.

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, as issued or changes of address of transmitters already licensed. All addresses published here will be reprinted in the U.K. section of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

- GW4CAQ**, R. G. Miles (*ex-GW8FHP*), 12 Fairhill Drive, Baglan, Port Talbot, Glam., SA12 8EE.
- G4CBQ**, P. R. Daniells, 16 Shaldon Drive, Littleover, Derby, DE3 6HZ. (*Tel. Derby 25558.*)
- GW4CBR**, M. D. Hunt, Munster House, Priory Road, Milford Haven, Pems.
- GM4CEA**, R. D. McCracken, 6 Binnie Street, Gourrock, Renfrewshire.
- G4CIA**, W. E. Cooper, 20 Planton Way, Brightlingsea, Colchester, Essex.
- G4CJG**, J. P. J. Goldsmith (*ex-G8EDO*), The Garden House, Fir Tree, Crook, Durham, DL15 8BP.
- G4CJQ**, J. Bundock, 28 Retingham Way, Chingford, London, E4 6RR. (*Tel. 524 3169.*)
- G4CJU**, G. A. Gayton (*ex-MP4BBL*), 5 Westlands, Kirklevington, Yarm, Yorkshire. (*Tel. 0642 781122.*)
- GM4CJW**, Amateur Radio Club, James Watt College, Finnart Street, Greenock, Renfrewshire.
- GM4CLW**, J. D. Cochrane, Briarwood, Dunhill Drive, Jedburgh, Roxburghshire. (*Tel. Jedburgh 2260.*)
- G4CMF**, A. F. Jones, 4 Longthornton Road, Streatham Vale, London, S.W.16.
- G4CMK**, R. A. Harker, 65 Whitby Road, Bradford, Yorkshire, BD8 9JN. (*Tel. Bradford 43971.*)
- G4CNC**, K. H. Smith, 37 Lonsdale Drive, Enfield, Middlesex, EN2 7LJ. (*Tel. 01-363 1653.*)
- G4CNO**, R. Turner, Netherleigh, Linkadells, Plympton, Plymouth, Devon. (*Tel. Plymouth 37816.*)
- G4CNT**, L. E. Turner (*ex-G8GSC*), 12 Brookside Drive, Blurton, Stoke-on-Trent, Staffs. (*Tel. Stoke-on-Trent 35169.*)
- G4CNU**, A. G. Davison, 6 Forbeck Road, Sunderland, Co. Durham, SR4 0DJ.
- G4CNY**, S. H. Jesson, 181 Kings Acre Road, Hereford, HR4 OSP. (*Tel. 0432 3237.*)
- G4COM**, J. R. Compton, Aysgarth, Snakemoor Lane, Durley, Southampton, Hants., SO3 2AR. (*Tel. Fair Oak 3017.*)
- G4COY**, S. G. Crouch, 56 Delph Common Road, Aughton, Ormskirk, Lancs. (*Tel. Aughton Green 421292.*)
- GW8GLG**, D. E. Thomas, 87 Pantyffynnon Road, Ammanford, Carm., SA18 3HH.
- G8HOM**, J. L. Martin, 11-A Macoma Road, Plumstead, London, SE18 2QW.
- G8HPQ**, A. Turford, 17 Iron Cliff Road, Bolsover, Chesterfield, Derbyshire.
- G8HSX**, R. Phipps, 26 Spinney Hill Crescent, Parklands, Northampton, NN3 1DL.
- G8HSZ**, J. W. Redfearn, The Cottage, 5 The Square, Pentewan, St. Austell, Cornwall.
- G8HTI**, R. T. Allen, 5 Partridge Terrace, Wingate, Co. Durham, TS28 5BD. (*Tel. 042-984 425.*)
- G8HUH**, T. M. Rabbitts, 39 Vandyke Close, Woburn Sands, Milton Keynes, MK17 8UU. (*Tel. Woburn Sands 3706.*)
- G8HUW**, A. Piper, 116-A Church Road, Teddington, Middlesex, TW11 8QL.
- G8HWE**, J. Handley, 37 Money Road, Caterham, Surrey, CR3 5TF. (*Tel. Caterham 43369.*)
- G8HXD**, M. J. Ledger, 34 Freemantle Road, Bagshot, Surrey, GU19 5LY.
- GM8HXM**, R. Brown, 58 High Street, Prestonpans, East Lothian, EH32 9AF.
- G8IAO**, D. K. Whitty, 27 Rooksmead, Brickhill, Bedford, MK41 7QX. (*Tel. Bedford 64148.*)
- GM8IAP**, J. W. Smith, 6 Rodger Street, Cellardyke, Anstruther, Fife, KY10 3HU.
- G8IAQ**, A. Smith, 28 Lambs Terrace, Edmonton, London, N9 9UG.
- G8IAR**, P. Smith, 28 Lambs Terrace, Edmonton, London, N9 9UG.
- G8IAT**, B. S. Smith, 58 Blackburn Road, Rishton, Blackburn, Lancs., BB1 4ER.
- G8IBB**, D. Boniface, 11 Holmefield Road, Ripon, Yorkshire, HG4 1RZ.
- CHANGE OF ADDRESS**
- G3GZN**, E. Buckingham, D.S.M. (*ex-VQ8BT/ZB2BG*), 14 Oakwood Avenue, Bedhampton, Havant, Hants. (*Tel. Havant 5761.*)
- GM3KJZ**, G. Paterson, Tigh an Druim, 7 Scotstarvit View, Cupar, Fife, KY15 5DX. (*Tel. Cupar 4416.*)
- G3LGW**, D. G. Spencer, Paladin, Watling Street, Hints, Tamworth, Staffs.
- G3LQI**, S. G. Williams, 58 Grinstead Lane, Lancing, Sussex, BN15 9DZ. (*Tel. Lancing 4017.*)
- G3MSV**, A. D. Bishop, France Cottage, Sainthill, Kentisbeare, Cullompton, Devon.
- G3RHL**, R. W. Rous, c/o 10 Lesley Avenue, Canterbury, Kent.
- G3WAL**, J. W. Barker, 57 Portland Road, Rugby, Warks., CV21 3RX. (*Tel. Rugby 6275.*)
- GC3XQM**, A. Finch (*ex-G3XQM*), 57 Bath Street, St. Helier, Jersey. (*Tel. Central 25922.*)
- G3YMM**, T. F. C. Davis (*EI4BY*), 1064-A London Road, Thornton Heath, Surrey, CR4 7ND. (*Tel. 01-689 4471.*)
- G3YRU**, P. R. Wilby, B.Sc., 31 Hereford Road, Acton, London, W.3. (*Tel. 01-992 0984.*)
- G4AKV**, T. H. Allen, Five Mile Farm, Wissington, King's Lynn, Norfolk, PE33 9RU. (*Tel. Southery 376.*)
- G4APF**, M. Richards, Waterside Cottage, 17 Brunswick Place, Dawlish, Devon, EX7 9PB.
- GM4BBL**, A. R. Thackery, 3 Westerloch Brae, Lerwick, Shetland Isles.
- G4BYX**, K. J. Plumridge, 23 September Close, West End, Southampton, Hants.
- GM8CAT**, J. Currie, 71 Lamberton Road, Kildrum, Cumbernauld, Glasgow, G67 2HT.
- G8CZS**, A. K. Arblaster, 38 Ruthyn Avenue, Barlborough, Chesterfield, Derbyshire, S43 4EX.
- G8GCS**, C. J. Coker, Hamden, 2 Causeway Cottages, East Street, Ippelen, Newton Abbot, Devon, TQ12 6TF.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for February issue: January 3)

Address all reports for this feature to "Club Secretary", Short Wave Magazine, Buckingham, MK18 1RQ

MCC was down in numbers this year but some good operators, some obviously under training, and a high standard of sportsmanship all round. Great!

Because this space in the January issue will, as usual, be taken up by the MCC Contest Report, the next "Clubs" feature will be in February, 1974. Please report accordingly.

Now, to turn to the matter of "Clubs." In this month's pile comes a bleat from a p.r.o. who enquires why his Club "never gets a mention!" This gink made the writer's blood boil—for the complainant concerned seems never to have heard of a *deadline*, invariably reports late, or later than just late, in which case it has inevitably to be held over *till the following month*.

The moral for Club scribes and others is this: If your note about the club you belong to doesn't seem to appear when you expect it, first look at the Short Notices box to see if it's there, and if not, then check the deadline from the previous month's piece and see if you missed the boat. You will invariably find that you did, unless of course you did something daft (like sending your news to the London office right against the deadline, in which case it will have had to go through the mails again to get to Buckingham), before it can be seen for processing. And if you missed the deadline, you missed the 'bus, because if we are to appear on the due date, which we always do, then we must go to press on the due date, and the copy has to be done over a particular week-end, with *no exceptions*. So, now you know!

Even when we give dates forward, as we often do, it seems not to be noticed by certain correspondents responsible for sending in their Club report. For the next few months, then, the dates to catch this feature are: January 3, February 1, March 7, April 4, and May 9, 1974.

Extra-Territorial

British Rail are first in this clip, catering for all those who are in the British Rail and its ancillary workings. The current *Newsletter* is mainly about the recent congress of the international railwaymen's Amateur Radio group, FIRAC, to which the British Rail group belongs.

A.R.M.S. covers another specialist group, namely the mobileers, mainly by way of *Mobile News*. There are certificates to be obtained for DX worked from the

car and an advisory service, to name but a few of the benefits of membership.

Then there is R.A.I.B.C. which, as its title implies, is devoted to the invalid, the bedfast and the blind who are interested in Amateur Radio, whether as licensed or aspiring to a licence, or just plain SWL—but that means there must be as many "supporters" as members, to do the little chores locally that sometimes crop up. The Hon. Sec. is the first contact.

Royal Signals types should all be in the Corps Club; this month in *Mercury* there is a most amusing account of a day in the life of 9M2DQ, as well as much membership news.

Southern

As usual, the biggest pile, with **Stevenage** at the top of the clip. They are still, as they have been doing for years, getting together at the Hawker Siddeley Dynamics Canteen, reached from the main entrance to the Works in Gunnels Wood Road, where there is a nice room and parking off the road. On Thursday, December 6, G8DUY does the honours, talking about the telecommunications system of the local Gas Board. In addition, there will be an informal meeting at the same venue, December 20.

A new one—or, rather, an old one reactivated—is at Portsmouth, and called Portsmouth Polytechnic **Electropol** Society; they have 94 members, no less, divided into strictly Amateur Radio and Audio/Electronics groups, with test gear and a station signing G6PU for the RF types. Their room is on the second floor of the Students Union.

Farnborough get together in the Air Scouts Hut, Rectory Road, Farnborough, normally on the second and fourth Wednesday in every month but for December they are keeping it to one meeting, December 12, when

NEXT "CLUBS" REPORT

Will be in the February issue of "Short Wave Magazine", due out on January 25, 1974. Club reports should be in by January 3 to catch that issue. The "Clubs" space for January issue (published on December 28) will, as usual, be taken up by the Report on MCC.

they will be visited by Western Electronics.

At **Worthing** a change of plan is noted for the coming season. Tuesdays will be kept for general R.A.E./Morse classes, ragchewing and constructional work, and on the second and fourth Thursdays in each month there will be some sort of organised entertainment "in comfort," by way of a talk or film show or whatever.

We are asked by **Kingston** to give, once again, the details of their Hq. address, as it is understood there is still some difficulty about finding it. Berrylands Scout group Hq. it is, in Stirling Walk, Raeburn Avenue, Surbiton—Stirling Walk, it seems, lies at the back of Surbiton Lagoon. As to the details, for December 12, they have a Surplus Equipment Sale.

One session of the **Edgware** Club is scrubbed, it being so near to Christmas, but there still remains the December 13 date, for a Junk Sale, at the Hq. in Watling Community Association, 145 Orange Hill Road, Edgware.

The AGM for **Verulam** club comes up on December 19, at the Market Hall, St. Albans, where the group have

their Hq., so all members are asked to attend this important session.

A new Hq. for the **Barking** group, at Westbury Adult Centre, Ripple Road. Here there are Morse classes on Mondays, R.A.E. classes on Tuesdays, on Ops. night on Wednesdays, and the general meeting on Thursdays, which last is set aside for visits, lectures and similar activities.

Echelford foregather at St. Martins Court, Kingston Crescent, Ashford, Middx., on the second Monday and the last Thursday of each month; as the programme we have to hand does not carry into December, for the latest details we have to refer you to G3VWJ—see Panel, as below.

December 1 and 15 are the dates for the **Basingstoke** gatherings, starting at 7.30 at Chineham House, Popley. The first date is for a Receiver Rally, when members bring along their receivers to talk about them and compare with others—a good idea, this. As for the 15th, they have a programme on tape and slides.

Names and Addresses of Club Secretaries reporting in this issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
 BARKING: H. G. Davidson, G3FZP, 223 Salisbury Avenue, Barking.
 BASINGSTOKE: R. H. Oakley, G8FKT, 81 Camrose Way, Basingstoke.
 BEDFORD: G. E. Parker, 12 Dawlish Drive, Bedford.
 BRISTOL (Shirehampton): R. Fineman, G4BOL, 5 Hillside Close, Frampton Cotterell, Bristol, BS17-2RG.
 BRITISH RAIL: L. C. Carter, G3ILC, 35 Barnfield Gardens, Kingston-on-Thames, KT2-5RH.
 BROMSGROVE: J. Dufrene, 44 Hazelton Road, Marlbrook, Bromsgrove (76941), Wores.
 CHELTENHAM: J. Pickles, G8DVA, Flat A8, 23 Lansdown Place, Cheltenham, Glos., GL50-2HX.
 CHELTENHAM (RSGB): E. Jones, G2FWA, Hillside, Bushcombe Lane, Woodmancote, Cheltenham.
 CHILTERN: F. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks. (Penn 4240).
 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.
 COVENTRY: G. A. Whendam, G3TFA, 33 Chapel Street, Bishops Itchington, Works.
 CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidcup, Kent.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN. (01-699 6940).
 DUNSTABLE DOWNS: C. G. Powell, G8BPK, 1 Wenwell Close, Buckland Wharf, Aston Clinton, Aylesbury (630600), Bucks.
 ECHELDFORD: V. W. Higgs, G3VWJ, 205 Commercial Road, Staines (57021), Middx., TW18-2QT.
 EDGWARE: A. J. Masson, G3PSP, 62 Coldharbour Lane, Bushey, Herts. (01-950 6827).
 FARNBOROUGH: J. Maidment, G8FWE, 2 Giffard Drive, Cove, Farnborough (Camberley 22887).
 HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford (3237).
 HULL: F. Moss, 334 Ings Road, Kingston-on-Hull, HU8-ONA.
 KINGSTON: R. S. Babb, G3GVU, 28 Grove Lane, Kingston-on-Thames. (01-546 2801).
 LICHFIELD: R. Smethers, G3NLY, 46 Church Road, Burntwood, Walsall, WS7-9AQ, Staffs.
 LOTHIANS: B. Howie, GM8DIJ, 39 Marionville Road, Edinburgh.
 MID-CESHIRE: A. Greenwood, G3SIQ, 83 Ash Road, Cuddington, Northwich, Cheshire.
 MIDLAND: A. Walton, G3ZKQ, 243 Barnes Hill, Birmingham, B29-54J.
 MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (3552), Surrey.
 NORTH BUCKS: R. S. King, G8CHK, 7 Brackley Road, Towcester, Northants.

NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax (44329), Yorkshire.
 NOTTINGHAM: S. F. Claringburn, 49 Fernleigh Avenue, Westdale Lane, Nottingham, NG3-6FN.
 NORTH KENT: R. Wells, G4ARQ, 12 Bullbank Road, Belvedere, Kent.
 OXFORD: A. E. Dennard, G4BHR, 31 Netherwoods Road, Headington, Oxford, OX3-8HF.
 PLYMOUTH: C. Mitchell, G3UVS, Kechil Rumah, Green Lane, Yelverton (2986), Devon PL20-6BW.
 PORTSMOUTH (Polytechnic): A. Newman, G4AVX, 93 Salterns Avenue, Milton, Southsea, Hants., PO4-8QJ.
 PORT TALBOT: G. Walton, 19 Kelvin Road, Clydach, Swansea.
 PURLEY: M. H. Roach, G3TWT, 104 Old Lodge Lane, Purley.
 R.A.I.B.C.: Mrs. F. Woolley, G3LWY, Woodclose, Penselwood, Wincanton, Somerset, BA9-8LT.
 REIGATE: F. H. Munday, G3XSZ, 2 Conifer Close, Reigate (43130), Surrey.
 ROYAL SIGNALS: Capt. J. Cooper, G3DPS, Royal Signals, Blandford Camp, Blandford Forum, Dorset.
 SLADE: J. E. Drakeley, G8GRC, 186 Conway Road, Chelmsley Wood, Birmingham, 37.
 SOLIHULL: L. G. Boswell, G4AEJ, 170 Kestrel Avenue, Yardley, Birmingham 25.
 SOUTHGATE: J. Batchelor, G3XMV, 22 Faversham Road, Bush Hill Park, Enfield. (01-360 6537).
 SPALDING: R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs. PE11-1QX.
 SPEN VALLEY: J. Milnes, G8DSB, 19 Cliffe Street, Staincliffe, Batley, Yorks.
 STAR: T. Leeman, G4BUU, 115 Asket Drive, Seacroft, Leeds, LS14-1HX.
 STEVENAGE: C. Barber, G4BGP, 473 Canterbury Way, Stevenage, Herts., SG1-4EQ.
 STOCKPORT: G. R. Phillips, G3FYE, 6 Ross Avenue, Davenport, Stockport.
 SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Sutton, Surrey.
 THANET: P. O'Brian, G3DNR, 18 King Edward Avenue, Broadstairs, Kent.
 TORBAY: M. Yates, G3UIQK Top Flat, 23 Waverley Road, Newton Abbot (3025), Devon.
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford (25633), Herts., WD2-5JQ.
 WEST OF SCOTLAND: M. Parks, GM8HBU, 18 Netherplace Crescent, Newton Mearns, Glasgow, G77-6BT.
 WHITE ROSE: K. R. Robson, G3VIY, 6 West End Rise, Horsforth, Leeds.
 WINCHESTER: D. H. Wright, G4BKE, 19 Fordington Avenue, Winchester (6133), Hants.
 WIRRAL: F. Smith, G3YGL, 72 Church Road, Bebington.
 WORTHING: G. Hooper, G8ETL, Bramble Crescent, Durrington, Worthing (62013), Sussex.
 YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

At a recent meeting of the Thames Valley Amateur Radio Transmitters Society (actually, their 40th anniversary) the guest speaker was Harold Barnard (right) recently retired as Editor of "Wireless World". He was presented with a hand-made plaque by Alan Mears, G8SM, chairman of T.V.A.R.T.S.



One of the month's meetings of Cray Valley is given over to G8DNF's "Expedition to Andorra" talk, while the other is to be a pre-Christmas session at a venue yet to be named. Dates are December 6 and December 20 respectively. The Hq. is at the United Reformed Church, Court Road, Eltham, but for the venue for the other meeting, listen to the club net on 1975 kHz on Fridays at 2100.

Just the informal is retained in December by the Chiltern chaps, this being on December 11, at the Ernest Turner works canteen, Totteridge Avenue, High Wycombe.

We are a bit behind the times as far as North Kent activities are concerned, but from the *Newsletter* we find the second and fourth Thursdays in each month are the ones, the venue being the Congregational Church Hall, near Bexleyheath Clock Tower.

The weekly Dunstable Downs get-togethers are at Chews House, 77 High Street South, Dunstable, on Fridays. It seems to be mainly "between weeks" of an informal nature during December, saving that on December 21 there is a Christmas Special.

That's the way to get members to attend! Crystal Palace, on December 15, are combining a Junk Sale and a Christmas Party. Eight in the evening it is, at Emmanuel Church Hall, Barry Road, London S.E.22.

Bedford have their own room at the rear of the "Dolphin" in The Broadway, Bedford, which is in use every Thursday evening. December 6 sees G2CLP talking about Power Supplies, followed on the 13th by G4BCZ and his Drake TR4c rig. December 14 is the Christmas dinner date, and on December 20, G3XKB takes the programme in hand for "Fun and Games with

Charlie Whisky." A nice easy one is down for the 27th, by way of some Candid Recordings.

We don't have the latest "gen" from Mid-Sussex. However, we can say they have Hq. at Marle Place Further Education Centre, Leylands Road, Burgess Hill, on two Thursdays in each month. For the rest, we must refer you to G3RXJ—see Panel opposite.

Sutton and Cheam should by now be well settled in their new home, which is the Cheam Village Library in Park Road; enter by the north door and take the stairs on the right-hand side. Starting time has been brought forward to 7.30. The date to remember is December 18, and the programme is yet to be announced.

On the first and third Fridays, at 8.0, the Purley people wend their way to Landsdowne Hall, Landsdowne Road. However, here again your scribe is not updated far enough to enable him to say what is on the agenda for December's meetings.

VK2FU will be the guest of the Acton, Brentford & Chiswick Club on December 18, at 66 High Road, Chiswick, which is the Chiswick Trades and Social Club Hq. He will be showing a film of his QTH, gear, and aerial system, which will doubtless make the membership all wish for VK calls!

One often hears it said that Oxford is a "rare county," but there is still activity, and plenty of it, at the Oxford meetings, held at the Mansfield Road Club, on the second and fourth Wednesday of each month, starting at 7.30.

West Country

Torbay still accumulate new members, with 93 on the books at the time of their report. December 15 will be a Christmas party with the Plymouth and Exeter

Clubs coming over, and a Quiz against these two Clubs will be part of the entertainment.

Decorating the clubroom is going a bit slower than they had hoped, say **Plymouth**. However, even though it won't be quite completed by the meeting on December 4, it will be well worth the effort the faithful few have put in. For December 18 films form the entertainment. The Hq. is at Virginia House, Bretonside.

Shirehampton is in the Bristol Area, the Hq. being at Twyford House, High Street. However, although we gain from their letter the impression of a keen group, with plenty of R.A.E. and Morse passes being produced at regular intervals, we can't tell you the exact details as to meeting nights.

Midlands

We of the *Magazine* who braved the cannibals said to be existing North of Watford are pleased to say the country is not so wild as has been reported—and you don't need a passport. For instance in Birmingham there is a Club called **Midland**; they have a cheese-and-wine Party on December 11, together with an exercise to select the best bit of home-brew gear entered in their contest, for which there will be a trophy given by G6XJ, Arthur Edwards, lately of Eddystone.

Mondays and Fridays are busy evenings for **South Manchester** with the first given over to VHF at the Club shack and the Fridays to formal meetings at Sale Moor Community Centre, Norris Road. These Friday dates are laid out as follows: December 7, a review of the Club activities and discussion; December 14, G3VIW talking about the Manufacture of Plastic Insulants; December 21, a Christmas party; and *no meeting* on December 28.

Now we must be careful! **Cheltenham** Radio Society—not to be confused with the other group down there—are in session every Wednesday evening at St. Marks and Hestersway Community Centre, Brooklyn Road.

On to **Slade** who have a place at the Committee Room, Church House, High Street, Erdington, Birmingham on alternate Friday evenings. This gives December 14, when there will be a selection of films on show, and December 28, which last has, by general consent been cancelled as being so near to Christmas.

A new Secretary reports in on behalf of **Solihull**; he remarks that he will be reporting in regularly in future. Good show! December 18 is the next date of interest, at the Manor House, High Street, but it was not possible at the time of his letter to say what was to happen, as he had not had the chance to sort it out since the AGM. We know the feeling!

The big event for **Spalding** in December will be on the 14th, when they have their annual Christmas Social and Surplus Sale, for which there will be an admission charge of 10p to cover refreshments and a raffle—you buy your own ale if you want any. This regular event, which is popular for miles around, is at the "Ship Albion" 37 Albion Street, Spalding, where plenty of parking is available.

Lichfield can be found at the Swan Hotel in that town, on the first Monday and the third Tuesday of each month. December 3 should be an interesting one, with G3NSO

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING MONTHLY
Cheltenham (RSGB Group)	Royal Crescent Hotel, Clarence Street	December 6
Cornish	SWEB Clubroom, Pool, Camborne.	December 6
Coventry	Baden-Powell House, St. Nicholas Street, Radford Road	December 7, 14, 21
Hull	592 Hessle Road	December 7, 14, 21, 28
Mid-Cheshire	Winsford Verdin School, Grange Lane, Winsford	December 5, 12
North Bucks.	Wolverton Youth Club	December 10
Northern Heights	Peet Pitts Inn, Ogden, Halifax	December 19
Port Talbot	Rail and Transport Club, Station Road	December 4
Reigate	St. Marks Church Hall, Alma Road, Reigate	December 18
Southgate	off Wilson Street, Station Road, Winchmore Hill	December 13
Spen Valley	Grammar School, Heckmondwike	December 6, 13 (visit)
Thanet	Hilderstone House, St. Peters Road, Broadstairs	December 7, 14, 21
Winchester	Antrim House, St. Cross Road	December 7, 14, 21, 28
Wirral	Sports Centre, Grange Road West, Birkenhead	December 5, 19

N.B.—In each case, the Secretary's name and address appears in the Panel on p.622.

talking about Digital Frequency Measurement. A hearty welcome is extended to old and new members, whether licensed, SWL or just interested in radio.

Hereford could almost go into the Westerlies pile, but our geography never was much good, anyway! The group have their corporate being at the County Control, Civil Defence Headquarters, Gaol Street and they can be found there on December 7, when they have a visit from G3ZUL, and on December 21 for a "normal" meeting.

No argument where **Bromsgrove** lies on the map—it is certainly in the Midlands, and your scribe can vouch for it! The locals foregather in the Royal Oak, Barley Mow Lane, Catshill, on December 14 for a social evening. Looking ahead to January, the session on the 11th should be of great interest as there will be a talk about Antique Radios and Gramophones.

Up North

As remarked earlier, our geography is none too good; We filed the two Scottish letters under the "Midlands" clip! The first of these two is Edinburgh's **Lothians** who have sorted themselves out a new Hq., which is in

Riddles Court, Lawnmarket, near the Castle. The only session they are having in December is on December 13, which is down as a Visitors' Night—so take the chance and go along.

81 Virginia Street, Glasgow G.2 the home of **West of Scotland**. Every Wednesday they are open for such activities as VHF, trouble-shooting, construction work and other such practical goings-on, while on the Fridays the accent is a little more formal, with lectures, film shows, demonstrations and so on.

A vital date comes up for **Stockport** on December 12, in the form of the Annual General Meeting. There would normally be a session falling due on December 26, but this one is cancelled. All meetings are at the Blossoms Hotel, Buxton Road, Stockport.

Harrogate and Knaresborough have a quite simple format newsletter, but it gives all the desired information. They get together at Further Education Annex, adjacent to 64 Chain Lane, Knaresborough, at 7.30 each Monday. December 3 is booked for G2CAS to talk on Simple Transmitters, December 10 is a Junk Sale, and December 17 is Films Night. Then, on December 24, there is to be an Open Night—which should put the married members well into the doghouse!

The details at **Nottingham** are left fairly loose for December, although they will follow the usual pattern of a talk in the first week, Activity Night the second, Forum the third, and another talk for the fourth week; and of course the meeting night each week is Thursday the Hq. being at Sherwood Community Centre, Mansfield Road.

Every Wednesday is the routine at the **Star** group, who have a place at the New Inn Hotel, Bramley Town Street, Leeds 13. On December 19 is the Big Show, when the evening will be filled partly by a Junk Sale, then come films, and a bingo session to round off, with many prizes.

NEXT "CLUBS" REPORT

Will be in the February issue of "Short Wave Magazine," due out on January 25, 1974. Club reports should be in by January 3 to catch that issue. The "Clubs" space for January issue (published on December 28) will, as usual, be taken up by the Report on MCC.

Not so far away is the **White Rose** formation, with their Hq. at 83 Town Street, Armley, Leeds. They also will be throwing a Christmas Party and Open Night, to which the local Clubs around are all invited, on December 12; the normal weekly Wednesday sessions are also "on" of course.

We have two letters from **York**, which tell us that they are booked in at the British Legion Club, 61 Micklegate, every Wednesday. They also make clear that one evening at least each month is devoted to a lecture—November was G3TMN's own individual way of approaching, and talking about, DX and the chase, which seems to have left a deep impression on the lads, and the December one, for the benefit of the distaff side, is all about "Silverware."

Wind-Up

That's it all taken in, either to the body of the piece or in the "Short Notices" column; there will be no Clubs feature in January, the space being taken up with the MCC report, so your deadline is **January 3**, with all the news of *February's* doings at the Club. Meantime, all good wishes for Christmas and the New Year from your "Club Secretary." Send your letters to beat the deadline, addressed to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ.

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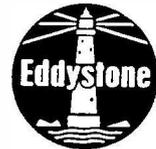
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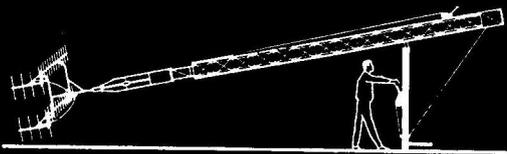
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WANTED: Pye Cambridge or similar 2m. Tx/Rx. Details and price, please.—Rossiter, G4CMX, 40 Papplewick Lane, Hucknall, Notts.

SELLING: Heathkit GR-64 Rx, AM/CW/SSB, coverage 550 kHz to 30 MHz, with bandspread, ANL, phones, Q-multiplier and aerial terminals at rear, little used in two years, £15.—Tucker, 8 Hawkswell Gardens, Oxford.

SALE: Trio JR-310, as new, less than 10 hours use, with handbook and in maker's packaging, £50.—Hopewell, 34c Station Road, Carlton, Nottingham.

SALE: Trio TS-510 with PSU, extra VFO, CW filter, microphone, headset, all manuals, immaculate, little used, £150.—Jennings, G3PWV, QTHR. (Tel: 021-373 2956).

SELLING: FR-400DX, £140; Sentinel 2-metre converter, £10; Stolle rotator and 8-ele beam, £17; Trio TR-2200 portable FM transceiver, two months old, £75. All equipment in as-new condition. Will deliver reasonable distance. (North Notta).—Box No. 5181, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SALE: Trio JR-500SE Rx, £40 or near offer; Heathkit DX-100U Tx, 160-10m., £35; Johnson valve T/R switch, 4 kW p.e.p. rating.—Stone, G3JFC, 26 Crayford Way, Crayford (22489), Dartford, Kent, DA1 4LQ.

SELLING: HW-32 with home-built PSU, £45; HP-13A, £20; DX-40U, £15; Trio 9R-59DS, £35; BC-348, £10; Codar preselector and Q-multiplier, both powered, £4 each; Japanese bug key, £2.—Johnson, G3XOV, QTHR. (Tel: Kingswinford 79104).

SELLING: Panda PR-120V transmitter, 150-watt, coverage 80-10m., AM phone or CW, complete with manual and in working order, £20 or near offer.—Beaumont, G3NGD, 28 Barton Road, Urmston, Manchester. (Tel: 061-748 2238).

FOR SALE: KW-2000B with speaker and PSU, recent factory service, no modifications, twelve months old and little used, dial adapted with Braille markings, £210, no offers.—Taylor, G4NBI, 26 Valley Drive, Loose Court, Maidstone (43976), Kent.

FOR SALE: Codar CR-70A Mk. II receiver, as new, £20.—19 West View Road, Sutton Coldfield, Warks.

SELLING: Eddystone 730/4 receiver, in excellent condition, with manual and spare set of valves, £55. Buyer must collect.—Ring Bach, 01-794 9790 after 6 p.m.

SALE: Eddystone 888A, with speaker, S-meter and tilts, mint condition, £75. — Snowden, Swainsea Lane, Pickering, Yorks.

FOR SALE: Heathkit SB-200 linear, 1200 watts p.e.p., 10 hours use, excellent throughout, £95.—Selman, 14 Beacon Hill, London N.7.

OFFERING: Eddystone EC-10 Mk. I receiver, mains and battery; also Eddystone 940 Rx. Offers?—Bray, 176 Percy Road, Whitton, Middlesex. (Tel: 01-894 1792).

SALE: Eddystone 730/4 receiver with speaker and manual, excellent condition, £65 or near offer.—Ring Lance, 021-706 0557 (Birmingham).

SELLING: Trio 9R-59DE, immaculate, £30. Buyer collects.—Moyle, 77a Bute Road, Wallington, Surrey. (Tel: 01-647 5190).

SALE: Trio J-310, full coverage, mint condition, price £55, buyer collects.—50 Sunray Avenue, Herne Hill, London, S.E.24.

FOR SALE: Complete Station, comprising K.W. Viceroy Mk. IV Tx with AC/PSU, Drake-9B Rx with Q-multiplier, Sansel SWR meter and Class-D wavemeter with mains PSU, price £130 or will split.—George, G4AMT, QTHR, or ring St. Buryan (Cornwall) 324.

SELLING: Yaesu receiver FR-50B with calibrator, 10 to 80m., new Feb. '73, in mint condition, £58. Matching S.T.C. headphones, £3. Eddystone S/W dipole antenna, £2. Joystick VFA, £2. Joystick ATU, £2. Eight-section mast with guys, £3—or £65 cash The Lot.—Carson, 31 Nursery Road, Nether Poppleton, York (794847), YO2 6NN.

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SALE: AR88D receiver, in excellent condition and working order, with speaker and headphones, £35 or near offer. Buyer collects.—Thomas, Mellock Farm, Neston, Cheshire, or ring 051-336 4374.

FOR SALE: "Radio Constructor," 141 copies, Vol. 2 to Vol. 18. "Wireless World," 20 copies, August '70 to October '73. Electrolytic capacitors, 120, 2 mF to 200 mF, 250v. to 1 kv, Plessey, TTC, etc. Six Plessey 6SR7, 12 Bush LOPT's, gang capacitors, selenium rectifiers, various other items. Offers, details—Kelday, 436 Uxbridge Road, Hayes, Middlesex, UB4 0SD.

FOR SALE: Lafayette HA-500 amateur band receiver, in good condition, £30, buyer to inspect and collect.—Moore, 34 Roseneath Road, Great Lever, Bolton, Lancs.

CIRCUMSTANCES Force Sale of Trio TS-515 Transceiver, with remote VFO, Joystick, ATU and accessories, unused in maker's cartons (cost over £300) price £200 The Lot.—Tinsley, Wakefield 50753 (Yorkshire).

SALE: Codar CR-70A receiver, £20; Eddystone 840C Rx, £35. Both very good condition. Buyer arranges collection.—Ring Knowles, Penarth (Glam.) 709456, evenings.

WANTED: Star SR-700 or 600 receiver, in good condition. Details and price, please.—Box No. 5188, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

SALE: KW-2000A with AC/PSU, in good condition, with microphone and spare valves (including PA), RF indicator and handbook, £140 or near offer.—Leach, G4AMZ, 27 Grosvenor Road, Heaton Moor, Stockport, Cheshire. (Tel: 061-432 2985).

SELLING: Codar AT.5 Tx, checked by manufacturer 12/10/73, £15. Also T.28 Rx, in good condition, £10. Codar AC/PSU, only little used, £10. Z-match coupler for 10 to 160m., requires coax input socket, £3. All items carriage extra.—Palk, G3RDU, QTHR.

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SALE: Garex two-metre Tx/Rx, Tx has 6 channels with trimmers, 145.00 MHz crystal included, as new, £80; 8 MHz crystals on 145.15, 145.45, 145.65, 145.80 and 145.925 MHz, £1 each.—Leighton, G3UKM, QTHR. (Tel: 061-439 5756).

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WANTED: T.1154 ex-R.A.F. transmitter, model M or H only, must be complete. £10 offered and £2 towards carriage. (Co. Durham).—Box. No. 5183, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SALE: HRO Rx complete with nine coilpacks and PSU, £20; Eddystone S.640 Rx, £20.—Foley, G13SOO, QTHR. (Tel: 076-253 210).

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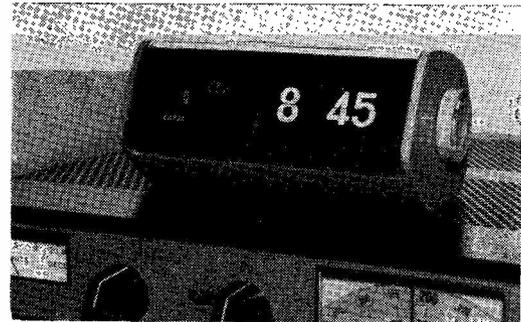
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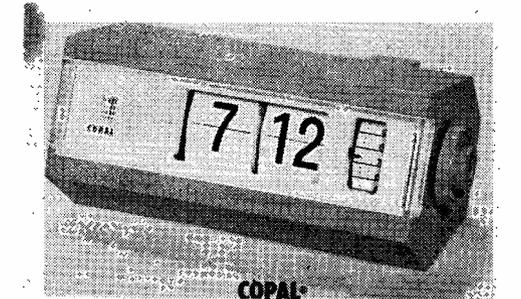
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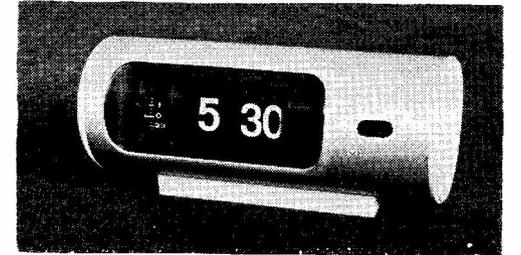
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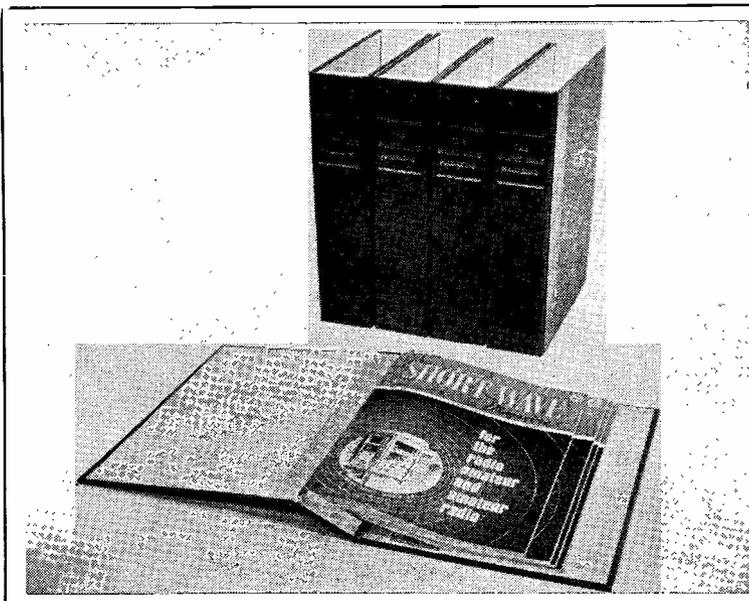
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