

Electronics (UK) Ltd

NEW/USED EQUIPMENT

Hallcrafters SX101 complete with auto tran.	£55.00
Hammarland HX50	£79.00
Heath SB300, very good	£79.00
Heath SB300	£80.00
Heath SB400	£80.00
Heath SB303, new, complete with CW Filter (inc. VAT)	£230.00
Heath SB303, very good	£150.00
Heath HMI02	£18.00
Heath HPI3 DC p.s.u.	£29.00
Heath HR10	£32.00
KW Viceroy 4	£70.00
KW107, as new 52 ohm	£42.00
KW2000B	£165.00
National NCX3, good, 20, 40, 80	£98.00
Racal MA150, synthesiser for RA17/RA17	£89.00
Racal MA197 preselector, 1-30 mc/s.	£65.00
Sommerkamp FR400DX	£105.00
Star SR200	£28.00
Trio 9R59DS. New	£49.50
Trio JR310. As new	£65.00
SSM 2m. AM TX and RX (incl. mic.)	£45.00

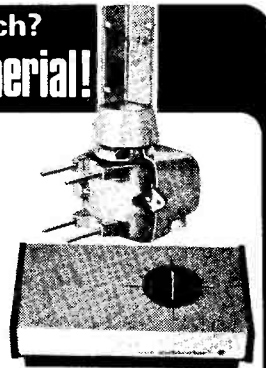
No hold-up

Why wait somewhere else when Western Electronics' ex-stock service can bring you the goods almost by return? All orders are normally dealt with the same day as received, and communications equipment too heavy for post is despatched by Securicor for delivery on the next working day. You can hardly do better. This is the quality of service which we initiated and of which we are still the leaders.

TV stations just out of reach? get the most out of your aerial!

For the best possible T.V. or radio reception, your aerial should point towards the transmitter. Now, with just a flick of the wrist, the CDE AR30 Autorotor makes this possible. This easily installed device rotates any aerial through 360° and will bring new radio and television stations into the range of your receiver.

Fully guaranteed unit comprises a weather-proof, heavy-duty die-cast housing which will last a lifetime. The mast clamp type mounting ensures best distribution of antenna weight. Attractive console compliments any decor and incorporates on/off light. Send for details now.



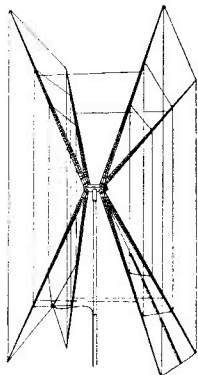
Antennas - Antennas - Antennas - Antennas - Antennas

ANTENNAS (Carriage/VAT paid)

GEM-QUAD £81.95

for 10, 15 & 20m.

- ★ Weighs only 21 lbs.
- ★ Withstands 100 mph winds.
- ★ Forward gain up to 8 dB.
- ★ Balun included.
- ★ Converts to 3 or 4 element quad.
- ★ Fibreglass tri-dectic spreaders.
- ★ Front/back ratio 25 dB.
- ★ Low angle radiation.



HY-GAIN 18AVT

HY-GAIN 18AVT/WB THE GREAT NEW WIDE BAND VERTICAL SELF-SUPPORTING FOR, 10-80m. (ex-stock) £39.05. Take the wide band, omnidirectional performance of Hy-Gains famous 14AVQ/WB add 80m. plus extra heavy duty construction and you have the new 18AVT/WB ★ True 1/2-wave resonance on all bands ★ 52Ω/I/P ★ SWR or 2 : 1 or less at band edges ★ 1 kW (AM) ★ Radiation pattern has an outstandingly low angle ★ Roof or ground mounting.

Hy-tower, 10-80m. (self-sup.)	£121.00	402BA	...	t.b.a.
18V, 10-80m. vertical (self-sup.)	£14.13	204BA, 20m. 4 ele. beam	...	£88.00
12AVQ, 10-20m. vert. (self-sup.)	£18.15	203BA, 20m. 3 ele. beam	...	£79.20
14AVQ, 10-40m. vert. (self-sup.)	£26.95	153BA, 15m. 3 ele. beam	...	£40.15
18AVT, 10-80m. vert. (self-sup.)	£39.05	103BA, 10m. 3 ele. beam	...	£31.35
LC800, 80m. coil for 14AVQ	£8.52	LA1 Lightning arrestor	...	£15.95
TH6DX, 10-20m. 6 ele. beam	£106.00	LA2 Lightning arrestor	...	£2.75
TH3MK3, 10-20m. 3 ele. 2kW	£82.50	261 1/2μ + roofmount	...	t.b.a.
TH3 Jnr., 10-20m. 3 ele. 600w.	£56.65	262 1/2μ + magnetic mount	...	t.b.a.
Hy-Quad, 10-20m. 2 ele.	£81.95	263 1/2μ + book lip mount	...	t.b.a.
DB10-15, 10-15m. 3 ele.	£37.50	265 3 dB gain + mag. mount	...	t.b.a.
DB24B	...			t.b.a.

Western Electronics (UK) Ltd

Agents: G3ZUL Droitwich (090 57) 4510
G3PRR Chesham (02405) 4143

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

OSBORNE ROAD TOTTON SOUTHAMPTON SO44DN
TELEPHONE: TOTTON (04216) 4930 or 2785
CABLES: 'AERIAL', SOUTHAMPTON'



Western Electronics (UK) Ltd

STANDARD RADIO CORPORATION 144 MHz



CV110 VFO

The CV110 is a remote VFO for the C140 Transceiver and has a centre tuning meter plus RIT (± 5 kHz) and CAL position to accurately calibrate the VFO.

The C140 is a 10w. 12 Channel transceiver + 1 Memory Channel and measures only 3 1/2" wide x



C140 TRANSCEIVER

2 1/2" high! The microphone has two switches, the normal PTT switch plus the MEMO switch. A flick of the switch and the transceiver overrides the Channel selector and you can transmit or receive on another frequency. The C140 takes the CV110 Remote VFO or SY-200 Synthesizer and comes complete with microphone, the filter and mounting hardware.

FT-2FB OWNERS!
CRYSTALS
ex-stock for 145.5, .525, .55, .575 and 145.6 MHz at £3.96 pr. inc. VAT/postage.



C826MB TRANSCEIVER



CV100 DUAL VFO

The C826MB is a 12 Channel 10w. o/p unit. Tone burst and separate transmit and receive crystals permit repeater operation and are readily accessible via a hinged lid underneath. Receiver sensitivity is excellent being 0.4 uV or less (20-dB quieting). Transmitter and receiver test sockets are fitted at the rear for servicing. The C826MB has provision for the CV100 dual VFO giving separate VFO's for transmitter and receiver operation. Each 826MB carries its own test certificate so you get guaranteed performance. Line filter and microphone are included. The CV100 has a centre signal meter and calibrate (CAL) position to zero the transmitter onto the receiver's frequency.

CI46A is a 2W 5Ch. Hand transceiver with tone burst and the capability of repeater operation. Ni-cad batteries and many accessories are available (but not fitted) making this superbly built unit the finest available. Complete with leather case and fitted crystals on 145-00 and 145-15.

432 MHz

The C432 is a UHF 2 Watt 5 Channel Hand transceiver with a full range of accessories as the CI46A. The C430 is a 10 Watt 12 Channel highly compact and efficient unit of the same size as the C140. This is the first professional 70 cm. transceiver available and will enable you to get going on 70 cm. with the advantage of smaller antennas and greater band space.

PRICES (Carriage/VAT Paid)

CV100. VFO for C826MB	...	...	£33.50
CV110. VFO for C140	...	...	£45.50
C140. 2m. Transceiver	...	...	£119.90
CI46A. 2m. Hand Transceiver 5 channel	...	...	£89.90
C 826MB 2m. Transceiver	...	...	£135.00
SY-200 Synthesizer	...	...	£96.00
C 430. UHF Transceiver	...	...	£159.00
C432. UHF Hand Transceiver 5 channel	...	...	£114.00

ACCESSORIES

C-12/230-5AE AC PSU/SPKR. for all models	...	...	£23.50
C-12/230-6E AC CHARGER for CI46A and C342	...	...	£3.00
Ni-cad Batteries, set to 10	...	...	£12.00
2-205K remote speaker for all models	...	...	£9.00
CAD external antenna coupler	...	...	£1.95
CAT08E. Rubber flexible antenna	...	...	£2.75
CMPO8 External microphone for CI46A and C432	...	...	£9.00
CMPO2 Telephone handset for all models	...	...	£25.25

The Standard Radio Corporation produce only VHF/UHF Communications equipment and in this field they excel. All transceivers have automatic final protection circuits and are very well engineered. Because of the quality, the units are not cheap but nevertheless you will find their prices highly competitive and you have many advanced design features not found elsewhere. Delivery is ex-stock at the time of going to press but some callers at Totton have already "snapped-up" some of our initial stock! We regret the Standard accessories are only available to purchasers of Standard Transceivers.

VHF EQUIPMENT (Prices Carriage/VAT Paid)

BELCOM. Liner 2 145.25-48 or 144-1 0-34 Ex-Stock	...	...	£132.00
BRAUN. SE600 Digital 2M AM/FM/SSB Transceiver	...	...	£780.00
FDK. Multi 2000	...	...	£264.00
TEMPO. 6N2WE 2KW 144 MHz SSB/FM amplifier	...	...	£385.00
12v. DC Amplifiers 502 (50w. o/p)	...	...	£62.70
802 (80w o/p)	...	...	£107.80
1002-3 (100w o/p)	...	...	£130.90

We're doing our best, but due to manufacturers' price increases and the unfavourable rate of exchange, prices quoted in this advertisement may have to be increased in the near future.

Western Electronics (UK) Ltd
Osborne Road Totton Southampton SO4 4DN

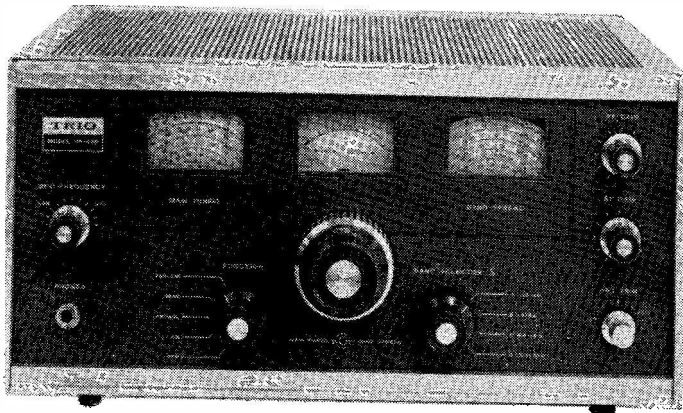


SPECIAL TRIO OFFERS

9R59DS RECEIVER

Four bands covering 550 kHz to 30 MHz continuous and electrical band-spread on 10, 15, 20, 40 and 80 metres. 8 valve plus 7 diode circuit. 4 to 8 ohm output and phone jack. SSB-CW, ANL, variable BFO. S Meter and separate band spread dial. IF frequency 445 kHz, audio output 1½ watt. Variable RF and AF gain controls. 115/250v. AC.

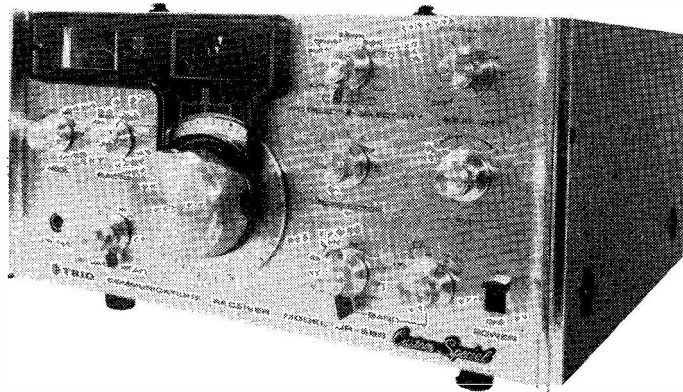
£42.50 Plus £4.25
VAT
Carriage paid



JR599 RECEIVER

Nine wave-bands covering 1.8-29.7 MHz, 144-146 MHz and 10 MHz WWV, SSB, CW, AM and FM. AF output is more than 1 watt. S Meter. Squelch control. BFO. Variable AF and RF controls. 4-16 ohm output and jack for phones. Power requirement 100/240v. AC, 12/14v. DC. Size: 270 x 140 x 310 mm.

£132.50 Plus £13.25
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- 207 Edgware Rd. W2 01-723 3271
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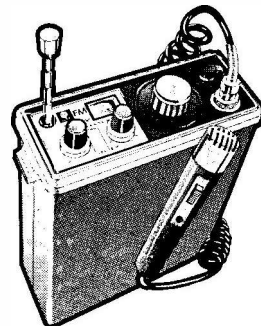
All Branches open from 9 a.m. to 6 p.m.
MONDAY TO SATURDAY

TR2200 RECEIVER

Fully transistorised portable VHF transceiver. Will transmit and receive on six channels between 144-146 MHz. 1 watt transmitter. 12v. DC internal or external supply. Built-in charger. Complete with microphone and 144-48, 144-72 and 145-32 crystals.

£79.50

Plus £7.95 VAT. Carriage paid.



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2nd generation slo-scan

Venus Scientific brings ten years of space-age technology development to the production of the latest breakthrough in HAM Equipment . . . the SS2 Slo-Scan Monitor. The following unique features of the SS2 have been designed to offer the HAM operator the maximum functional performance in SSTV.

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PHONE : 061-224 4911

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9" x 4" x 3"	£1.54	5 $\frac{1}{2}$ " x 3 $\frac{3}{4}$ " x 4"	£1.37
5 $\frac{1}{2}$ " x 2 $\frac{3}{4}$ " x 2"	42p	7 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 5"	£2.20

Postage 16p. Large case can be supplied with panel cut to fit 7" x 4" speaker. 20p extra for hole.

Ξ-CAST BOXES. With fitted lid, post 16p box.

Cat. No. 7969P	3 $\frac{3}{8}$ " x 1 $\frac{1}{2}$ " x 1 $\frac{1}{32}$ "	...	43p
Cat. No. 7134P	4 $\frac{1}{4}$ " x 2 $\frac{1}{4}$ " x 1"	...	50p
Cat. No. 6908P	4 $\frac{1}{4}$ " x 3 $\frac{1}{2}$ " x 2"	...	71p
Cat. No. 6857P	7 $\frac{1}{4}$ " x 4 $\frac{1}{2}$ " x 3"	...	£1.14
Cat. No. 6357P	7 $\frac{1}{4}$ " x 4 $\frac{1}{2}$ " x 3"	...	£1.24

Sizes shown are approx. internal dia.

ALI. MINI-BOXES. With fitted lid, post 10p box.

3" x 2" x 1"	36p	5 $\frac{1}{2}$ " x 4" x 1 $\frac{1}{2}$ "	46p
4" x 2 $\frac{3}{8}$ " x 1 $\frac{1}{2}$ "	41p	4" x 2 $\frac{1}{4}$ " x 2"	41p
4" x 4" x 1 $\frac{1}{2}$ "	41p	5" x 2 $\frac{3}{8}$ " x 1 $\frac{1}{2}$ "	41p

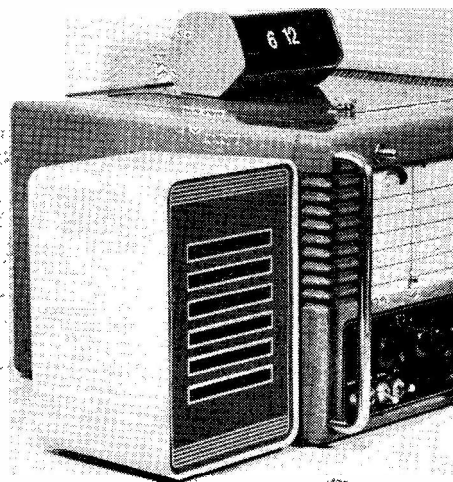
POLYPROPYLENE ROPE. 500lb. Strain. 100yd. reel, £1.10, post 25p.

All prices are inclusive of V.A.T.

HOURS OF BUSINESS : 9 a.m.-5 p.m. Closed 1-2 p.m. and all day Mondays

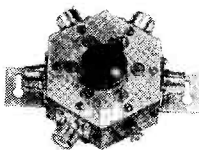
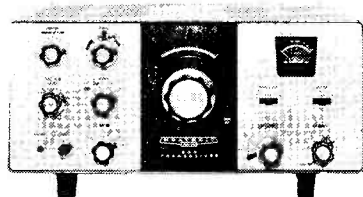
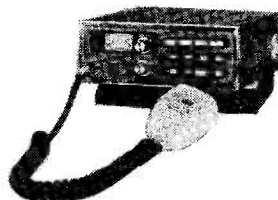
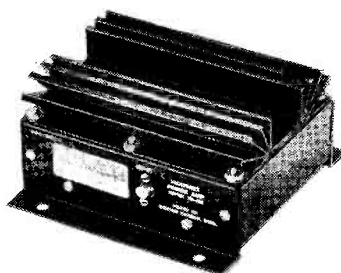
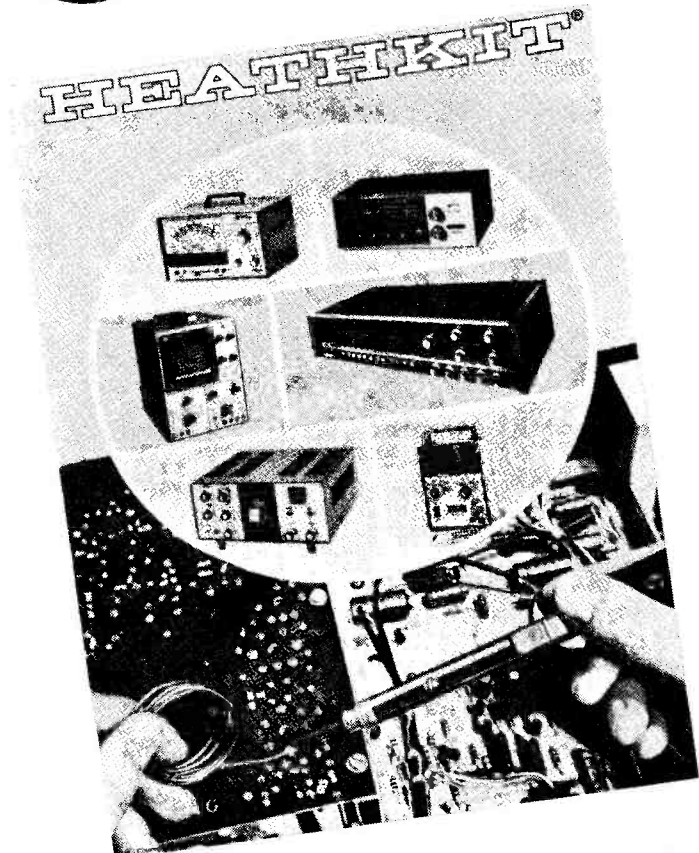
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LOWE ELECTRONICS

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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)
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Telephone : Steyning 814466.
Just off the A283 on the Shoreham side of the village.
Halfway down the road on the left—look for the tower.

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Just off Exit 1, M5—follow the A41 into town for 1½
miles to the Regal (Bingo Hall) Cinema. We are
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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 :—

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Nr. Glasgow.
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Alan GW3YSA
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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.

For some years we have given the Amateur a wide range of the best in equipment, the fastest possible delivery and the best possible after-sales service. We still do and will continue so. Old timers know this, but the newcomer may need to be convinced—if so, all you have to do is to ask any experienced Amateur.

INSTANT H.P. A PLEASURE

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Our catalogues are free but we would appreciate postage, etc., so please send 8p in stamps for our VHF catalogue, 8p for our HF catalogue, 3½p for second-hand list, or send us 15p in stamps and we will send the lot.

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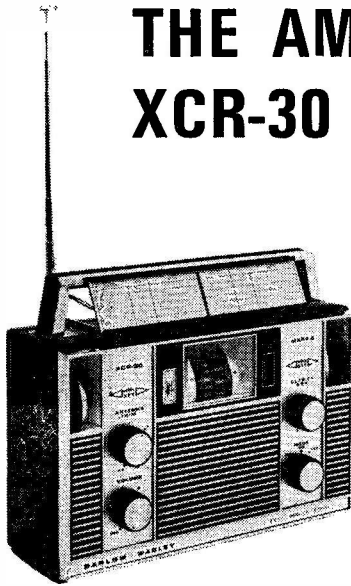
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1. 0.5 to 30 MHz continuous coverage—direct readout.
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6. Headphone jack.
7. Drift free reception.

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TR801 FM TUNER, **£17.25**. Postage 25p.

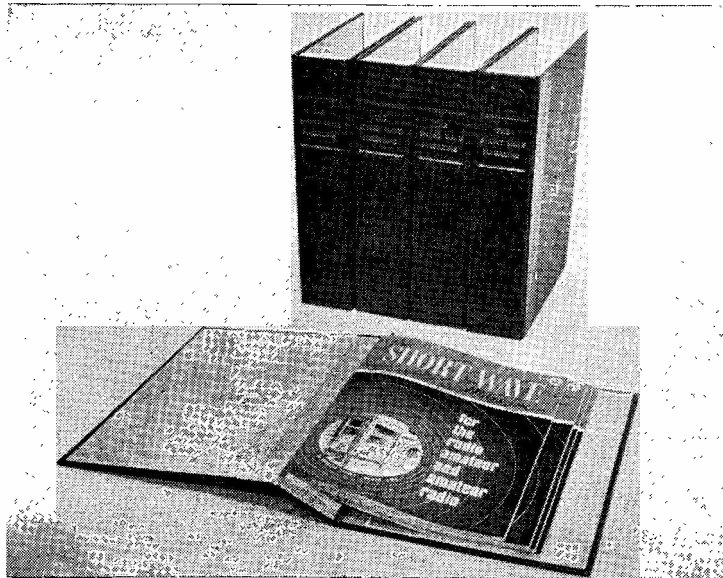
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(Available end of February 1974)

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TRANSCEIVERS			
HALLICRAFTERS SR400 Cyclone.	400w., cw filter, noise blanker, PSU/Speaker	...	£350.00
KW 2000E with P.S.U.	...	...	£210.00
DRAKE TR-4	...	...	£185.00
KW2000A with P.S.U.	...	...	£154.00
RECEIVERS			
EDDYSTONE 990S.	250-850 MHz	...	£330.00
HEATHKIT SB-310.	10-80m.	...	£93.50
R-390A/URR.	500 kHz-32 MHz	...	£350.00
DRAKE R-4B	...	...	£185.00
EDDYSTONE 730/4.	General coverage	...	£95.00
YAESU FRDX500.	2m.-160m.	...	£120.00
KW 201.	10-160m.	...	£90.00
HEATHKIT SB-303 with AM filter.	10-80m.	...	£165.00
COLLINS 75S-1.	10-80m.	...	£165.00
TRANSMITTERS			
COLLINS 32S-3	...	...	£440.00
KW 204	...	...	£132.00
ACCESSORIES			
COLLINS 312B-4 Console	£99.00
HALLICRAFTERS R-50 Speaker (new)	£11.00
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HALLICRAFTERS HA-20 V.F.O.	£55.00
HALLICRAFTERS HA-19.	Crystal Calibrator 100 kHz	...	£9.50
HALLICRAFTERS HA-16 VOX	...	...	£3.85
HEATHKIT AV-3U Valve Millivoltmeter	...	...	£11.00
DRAKE RV-4 V.F.O.	...	...	£40.00
KW Amateur Band Converter.	10-80m.	...	£10.00
YAESU FP2AC with Battery Pack	£27.50

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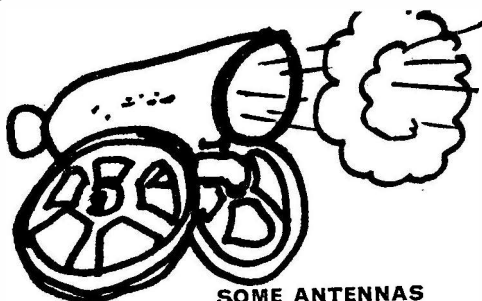
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The SHORT WAVE Magazine

VOL. XXXII

MARCH, 1974

NUMBER 1

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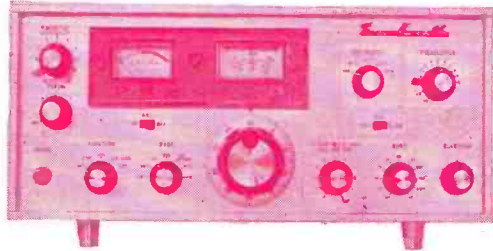
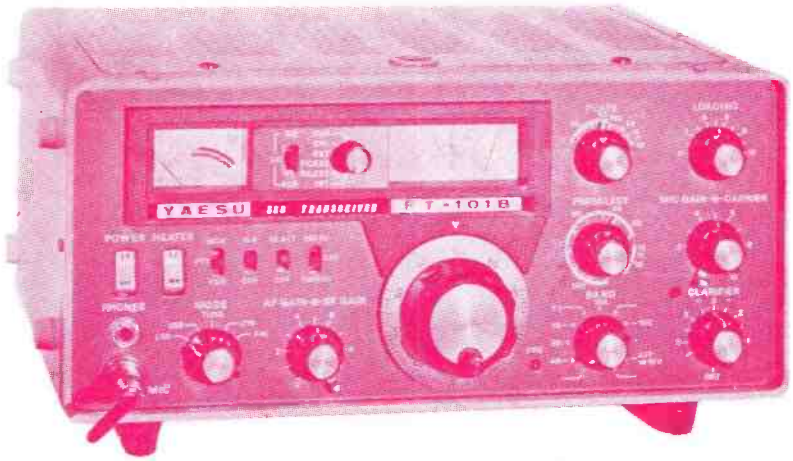
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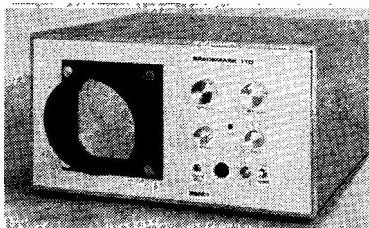
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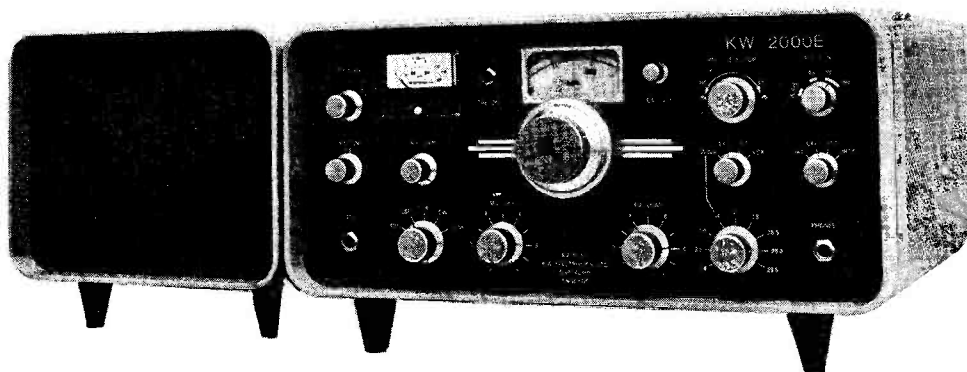
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SHORT WAVE MAGAZINE

(GB3SWM)

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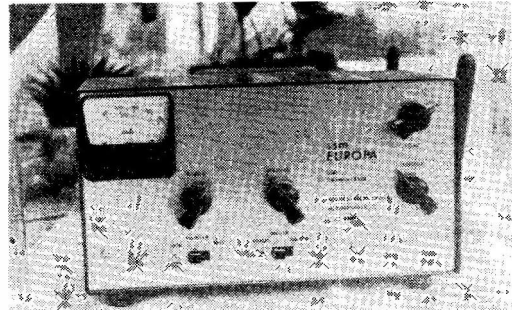
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The SHORT-WAVE Magazine

EDITORIAL

DAILY TELEGRAPH ON "HAMS"

Yes, we saw it—that piece in the *Daily Telegraph Magazine* of February 15, purporting to describe Amateur Radio activity. It seemed that the author (described, incidentally, as "an associate director of the National Theatre"—so well qualified to write a piece on Amateur Radio, you might think?) had been quite well briefed but the use he made of the material he was given—freely larded with that tiresome word "ham"—made it plain that he still doesn't know much about it.

Readers who did not see the article—entitled, fatuously enough, "Getting in on The Buzz"—might be interested to know that Amateur Radio was equated, as a hobby, with keeping cage-birds, fretwork and home-conjuring, the general conclusion (of this associate director of the National Theatre) being that despite its nuisance value (sic), Amateur Radio is "one of those totally superfluous activities" for which it seems worth making space (!!).

To spare them embarrassment, we will not mention the names/callsigns of those who apparently provided the brief for the twaddle that appeared in the article as finally published.

* * *

CECIL GOYDER, 2SZ

Many readers, and especially those in the real OT category, will be interested to hear that (with the assistance of G2NJ and Cecil's younger brother), we have succeeded in tracing Cecil Goyder, *ex*-2SZ, who, in October 1924, from Mill Hill School, London, made the first-ever two-way contact with New Zealand, on a wavelength of "about 95 metres," as it went in those days.

The excitement this engendered is well remembered by the writer of this piece (himself a schoolboy at the time). Along with other radio amateur achievements

of the period in terms of real DX, it proved, much to the surprise and annoyance of the professionals, the potential usefulness of the short waves for long-distance commercial communication.

Cecil Goyder now lives in retirement in Princeton, New Jersey, and is still concerned with electronics—actually, as might be expected in these days, with computers! He is about 69 years of age, and a bachelor. Some years ago, he was made C.B.E. On the purely technical side, 2SZ will also be remembered as the originator of the Goyder Lock, a system of MO-PA transmission in which the stable master-oscillator was inductively coupled to an oscillating power amplifier, to hold it on frequency. It was exceedingly tricky to adjust. When they both ran wild (as they often did), the jest was "He's on Goyder Lock but he's lost the key"! Well, it may be old, but it was funny then.

* * *

R.A.E.—USE OF CALCULATORS

Anent the comment on p.744, February, regarding the use of pocket electronic calculators of the type now generally advertised, it seems that the City & Guilds of London Institute has no objection to their being used in C. & G. examinations provided they cannot be programmed.

* * *

REMARKABLE ACHIEVEMENT

We were very interested to see, from a recent issue of *Radial*, newsletter of the RAIBA, that G4CTS is now licensed at the age of 22, having been interested since he was 16. What makes this noteworthy is that not only is he blind but also a spastic. As they say in *Radial*, no amount of coaching (and naturally he has had to have a lot of help) can succeed if such a pupil is not both receptive and hard-working. We congratulate him and his local Loughton & District Radio Society on overcoming such handicaps.

Austin Forsyth
G6FO

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

STILL the same position as last month as far as the three-day week goes, which must be affecting many amateurs quite seriously; and on the day this was being written, news in the national press indicated that widespread cuts of 6% in voltage would be coming along at times of peak demand—the next thing, QSL's and log books will become "short supply" items!

As for conditions, things have been well down, and we must hope for a reasonable Spring lift to get the bands warmed up again. However, conditions or not, the keen DX'er and communicator still sticks at it, and many kind souls have taken time out to report what goes on—so let us see what they all have to say.

Top Band

First things first. WIBB's second bulletin of the season, at about the midway mark in time, makes the point that so far, while things on Top Band, DX-wise, have not been too bad, they have also not been superb, by a long chalk. On the other hand, there have been more countries to choose from—like DU, VS6, ZS, ZD3, TI2, ZE7, KZ5, XV5, 4X4, VP8, KL7, XU8, not to mention the European DX signals about. However, there are reports that phoneys have been signing "ZE3JO," "VQ2JF," and "ZL2BT." Conditions for the first session, on November 18 were fair, but December 23 and January 13 were both washouts, with very few getting over the water at all.

On a different tack, Stew mentions the W2WLN/2 set-up, and it gives an indication as to what is required really to make a dent in the DX. They have a quarter-wave, with 120 quarter-wave radials (capable of handling a megawatt when used for the testing of Loran-A) guyed with fibreglass; on the receiving side there was a 1000-foot Beverage aerial aimed on Europe, and again terminated in 120 radials, which gave very fine copy of many

Europeans who were all but inaudible on the vertical. Then they had another Beverage, this time 1700 feet long and headed on the West Coast W's, and at the back of it the Drake R4C-T4XB line, plus a couple of automatic contest-machines which were programmed to churn out "Test" exchanges at the press of a button!

G2HLU (Earley) has recently acquired himself a KW-77 receiver, and has been putting it through its paces, to the detriment of his old home-built job which has now been relegated to the post of reserve receiver. With it, Harold set to on Top Band (which for him is very much new territory) using his W3DZZ trap aerial with the feeders strapped together. So far, there have been several CW contacts around the South of England, plus a shock when DJ5BL came back to a CQ, and a gotaway in the form of GC4CHY.

Things seem really bad to G3VLX (Chislehurst) who attributes his lack of activity to lack of time, abysmal conditions when he could get on, and perhaps most important, a lattice mast which fell down, bringing with it the TA-33, the trap dipole and the inverted-Vee, but luckily not doing any serious damage, even to itself. However, with all that bother, on January 30 Deryck made a QSO with PA0CFW.

G3ORP (Maidstone) has a very fine list of DX worked on Top Band, including 21 W's (two in W5), VX1KE, KP4AST, LU5HF1, VP5GS, KV4FZ, plus GC3SVK and OH2BH, all worked during the CQ WW 160 contest.

GM3IGW/A, back in business for the same contest, knocked up 19 countries and 14 States for his collection, with in addition VK6HD and VE1CD worked before battle began. Our old friend GC3SVK made it with 17 countries and 13 states during the contest.

On a more local note, G2HKU (Sheppey) mentions a SSB contact

with PA0PN and CW to DK4NJ, GC3SVK, GW3UCB/P, GM3YOR, OE5XXL, OH3XZ, OK1MMW and PA0HIP.

Finally, as an encouragement to those who always claim "they haven't a chance against the QRO boys," heed G3XAP (Stowmarket) who, having made his WAC on nine watts, is now going the rounds again with his power input cut back to five watts—all six continents on five watts of Top Band energy and a bit of careful planning and constructing of the *aerial* system, which is where the pay-off always comes, as the receiver itself attests.

Eighty Metres

The recent absence from this piece of G3DCS (Ipswich) is now explained—simply an inability to get on the bands when they were "giving" to any extent, a problem shared with most of us, at that! However, during the last month a CW QSO was made with VX1KE (VX is a Newfoundland prefix of the "commemorative" variety), and various Europeans were talked to by way of SSB.

G2NJ reports on his QRP and /MM interests. On January 22 at lunchtime, Nick worked SM6EPJ /MM when the latter was in the English Channel and the band was all but devoid of other signals; on the other hand, when LA6KM/MM came on late on the night of February 3, there was a regular pile-up of stations eager for a QSO. Despite the ups-and-downs of conditions, G2NJ worked quite a few QRP signals, G3NEO being the lowest power station at two watts. Nick reckons, in agreement with a certain well-known Yorkshire amateur, that much of the success of QRP working lies at the receiving end; the G2NJ HRO has a product detector built in. A couple of interesting ones fell to the bait laid down on CW by G2HKU, the victims being M1C and M1FOC.

ON5KD, Meenstrat 79, B-8700, Izegem, WV, Belgium, runs the Yaesu F-Line, in this case a FR-DX400 Rx with a FL-DX500 Tx, the aerial being a 3-element three-bander.



G3ORP even took a little time out from Top Band to look at the SSB end of Eighty, where he tangled with 9H1BX.

For G3VLX, most of the activity was SSB on Eighty, his crop including 7X2MD, EA9EY, CT3AB, LX1PD, and 9H1BB.

G2HLU put six watts of RF on 80m. during the QRP Contest, and managed to raise a few stations with it; but he came out of it full of admiration for the fine aerial systems which the QRP Top Dogs must have and for the chaps who use QRP as their normal station power level. Agreed, very much so!

GM3CFS (Eday Is., Orkney) found conditions poor on the HF allocations and so spent more time on Eighty, where his CW accounted for 4L30A, JY9GR, UA9NX, UA9YAR, YV4AGP, UH8AC, UL7HD, M1FOC, ZC4BI, PJ2VD, VO1AW, JX7AX/UA1 (Franz Josef Land), XV2AB and UD6DHU. Just to prove it still works the SSB was also used, and came up with HZ1AB, 9L1JT, and CN8BF.

From DL1CU of *QRV* we have news that the Greek Government are proposing to open part of Eighty to the SV amateurs, understood to be the area 3.5-3.6 MHz, from either March 1 or April 1. DL1CU himself, with some of his SV allies, will be mounting a DX-pedition to Mount Athos, SY1MA, to put that spot well and truly on the eighty-metre DX map. Talking of SY1MA reminds your scribe that he also has a letter direct from DL1CU about the

Athos DX-pedition last April and the QSL situation. Seems that SY1MA cards are only acceptable to ARRL for DXCC credit if they carry a special stamp on the back. DL1CU has the needful, and promises to QSL everyone provided they send the needed dates and an s.a.e., with his apologies for the "break-down" over QSL's earlier. Just to make it sure, he sent a copy QSL, with the stamp on the back, and a nice map of the area.

Forty

A marked lack of reports. Your conductor can still receive tolerably well on the band, even though his ground-plane lacks radials thanks to the weather conditions, and he took the odd 15-minute listen around the low end, finding CW signals from VK, JA, KP6 and South Americans, not to say the odd W's, all at workable strength on the KW-2000B with the Q-Multiplier tuned to its absolute peak and operating with a very low beat-note to get the best out of it, and all heard through a complete QSO without once going lost under QRM.

G2HKU tried both modes of action, his SSB going out to YV1BI, and the CW to CN8CF and UD6AR.

G3ORP took a look at Forty CW and found KP4DJE to swap 599 reports with. Perhaps more important, G3ORP noticed the gaps between 7 and 7050 kHz, largely empty of serious occupation, and he has determined that, when the work QRM abates, he is going to

have a serious sortie on Forty.

Only one SSB contact falls to be mentioned by G3VLX, namely UK9AAN, a 59 signal at 1612z.

GM3CFS also tried 40m. although from his lists it is clear Jim spent more time on Eighty and Twenty; however, his CW winkled ZC4BI, CR6AI and ZS5BS out of the murk.

Most of his operating time was spent on Forty, says GW4BLE (Newport, Mon.). Stephen mentions the licence anomaly involved in working W's above 7.1 MHz, and understands the ruling to be that it is allowable to do so, provided you are able to check your transmitted frequency is clear while also listening up above 7.2 MHz, implying either the provision of split-frequency working with a transceiver, or the use of two receivers. However, although it is done, GW4BLE is far from happy that it is really legal under present regulations. To return to the DX-GW4BLE used SSB for CO2DC, CX4CR, YN8JES, YV1BI, YV5ABH, YV5MO, YV4TV, UO5BZ, UO5DM, UR2EG, ZL1BKX, ZL4BO, ZL4NH, OJ0AM, JA1DJL, JA7OEM, JA7EAI, PY4QJ, PY7BOU, PY7BVW, PY8AKF, PY8RW, VK2AVA, VK3XI, VK5PB, TI2GI, SV1HA, 3A2AH, 3A2CN and 8P6AU and lots of W's.

Twenty Metres

Sad to say, even the old standby has been affected seriously by the

fallaway of conditions, which have brought 21 MHz to the state that Ten was in a year ago, and at the time of writing it would be fair to say Twenty itself was almost in need of artificial respiration.

G2BON (Aldridge) envies these chaps with 400 watts and beams, but at the same time reckons it is probably better to have to struggle for one's DX, as it makes the game more interesting! Tom does not believe in being downhearted, and so he attacked 14 MHz to the tune of VK3JF, VK6NS, FC2CH, VO1CV, FC2C1, VP9GE, UD6DER, VQ9HCS, 4Z4KB, UI8MV, VK3ACN, UF6CQ, UA9VB, VE3AII/SU, ET3ZU, OX3LW and UK6APA.

G3UZ (Goring-by-Sea), unlike most of our correspondents, reckoned the band was a wee bit brighter this time. His CW list includes HK7BDA, UA0BBC, PY7TY, WA7FBP, KP4DCY, KP4DLC, FG7AH, 9H1N, VK2BEK, UI8AHZ, VK2IN, ZL2AFH, PJ1VD, SV1WBB, CX1EK/KP4, plus the odd ones like 4L30C, 4L30D (both in Leningrad) and VX2AB in Labrador. Harking back to the discussion about LBIC some little time back, G2BON settles the question by saying he now has the appropriate QSL card.

G3YRR (Grimsby) woke up one Sunday morning, went into the shack and found the bands dead—as usual!—and worked off his frustration by writing in. Charles has found his new Mini-Quad works FB on 21 MHz, but on 14 MHz, for which he bought it, there has still been no joy—only ZL, VR4, VK, and KL7 in the years since he was first licensed, as compared with scads of stuff on 21 MHz. The aeriels used on Twenty have been, initially, the 18AVQ, and more recently the Mini-Quad, both of which should produce plenty of DX—it must be something to do with the site.

G3DCS (Ipswich) managed to get outside Europe for the first time in months, to key with various W's and Europeans, and talk by SSB with PY1BMB and 9H1CD.

CW on Twenty kept GM3CFS (Eday) amused for some of the time at least, his haul including such signals as XV5AC, 5T5FP, VK8OM,

Reporting the HF Bands

VK2BPN, VK3KS, VK3XB, VS5MC, PJ2VD, CR6AI, 5Z4LW, ZS5BS and HI8LCS.

GW4BLE has a problem, in that he lent the manual for his 18AVT to an SWL some time ago, and has not received it back—if the gentleman concerned should see this piece, will he please do the needful, *pronto*. Seems Stephen has finally received his planning permission, but hedged well about by "ifs and buts." It is provisional till the end of December, at which point he is to apply for a further period of consent. It is to be kept in the collapsed state except when actually being used for transmission, and it is to be maintained in a state of "amenity and appearance" to the satisfaction of the local authority—which presumably means paint the beam sky blue! However, all GW4BLE has to do now is rake up the boodle to buy the thing! On the DX-Front, the old vertical still does yeoman service and this time his SSB tangled with FG7XE, VP2DI and VP2MUS in one twenty-minute lunchtime period, the VP2D being another new country into the bag.

W6AM is pleased to report his kilowatt linear in the /M rig continues to work very well. It has not been serviced in two years of hard work, though there has been some slaughter of heavy-duty batteries, and shows quite an improvement over the 600 watts input possible with the Swan-400 rig which is the prime mover. Look out for him on 14025 kHz, where he puts out his first CQ, then he moves to 14008, and finally, if that fails to 14085 kHz. Don usually works a complete CW QSO on the one-mile trip to the golf club, and his last one at the time of writing was an SM, so he is quite workable in U.K. from his mobile rig.

G3NOF (Yeovil) returns to the DX scene after a period of absence due to work commitments and other problems. Don found daily activity on 14 MHz but conditions even then were not too bright, even the Big

Signals from U.S.A. being well down in strength; a few good openings to Africa in the evenings, and weak signals in the morning from VK/ZL and JA have been noted. The band is generally closed by 1900, although a few late openings around 2200 have been noted in the direction of South America. In terms of actual contacts, it added up to CR3WB, FG7XL, G3RSP/MM in the South Atlantic, JA1HBC, JA2AEY, JA3BRI, JA3RWJ, KV4AD, LU, PY, PZ1AC, PZ9AC, UA9IF, VE3AII/SU, VE4FN, VE7BD, VE7MT, VK, YV, ZD7SD, ZD7SS, ZD9GD (Gough Is.) ZE1DP, ZL's, ZP5GO, ZS1CZ, ZS2MI (Marion Is.), ZS6AHB, ZS6BDS, ZS6BKW, ZS6VX, ZS6WY—a good crop indeed, considering the band conditions. (And anent the remark by G2BON last time, Don mentions that he, too, has been a reader since No. 1—which means just 37 years!)

GM4CUX (Edinburgh) has just obtained his ticket and is in the process of setting up a station; he heard a QSO on Twenty between a W1 and an SM, where the latter had trained his *tame parrot* to call CQ for him, and wonders whether this is an infringement of the licence. Can't see it, after all, what is the difference between an electronic or mechanical CQ-caller and a parrot doing the same thing saving only the risk of the parrot not being so reliable? Graham is, he says, having difficulty in convincing his XYL that a tame parrot is part of the equipment of every well-dressed DX'er.

How nice to hear again in one month from correspondents who had been silent for some long time—G3NOF, W6AM and now W4WFL/1. Morgan wonders if he is being pessimistic, but has cancelled his stay over here this Spring and now intends to take a leave in Europe, and come to this country in the autumn if all goes well, complete, of course, with his G5AYL call, FPM-300 rig and fishing rods (for fishing, not aeriels!) Morgan, like

Picture taken in the radio room of the m.s. "Holstendeich" (c/s ELGP) whence Emil Dolinsek also operates as EL0U/MM. His amateur-band rig is a Swan 500CX into a 4BTV aerial. With him are G13XL (left) and G13YDH (right).



the rest of us, has found conditions pretty shocking by and large, and his only QSO of note is one with 4W1GM, which was a new one to add to the DXCC collection. On a different tack, Morgan now has a nice big 95-foot tower at the back of the house, with single-band beams for 10, 15 and 20 metres stacked up on top—but they weren't a fat lot of use when Murphy's Law struck him by freezing the rotator solid with everything headed South!

G2HKU seems to have done more than usual on Twenty this time, with SSB contacts to WB5DVU/MM/Region 3 bound for the Philippines, ZL1VN and ZL3SE, plus CW with ZL1AXM (who is ex-G2KK just arrived in ZL).

Fifteen & Ten

Might as well be lumped together—we can summarise Ten by commenting that no-one mentions any contacts on the band at all.

G3FYR (Petts Wood) has been doing some comparisons with his 12AVQ aerial and a trap dipole, to the advantage of the vertical when conditions are very poor. Bill made his number with 9J2BO, VE1TX, K1TMD, WOTRF, 4Z4KF, W3SQ, WN8PMF, W9CSL, W4BW, W9CSL, WB4ZKX, and WA5PQX.

GM3CFS only operated Fifteen on one day—otherwise the band seemed pretty dead—and on that one sortie his CW raised ZS5K1, ZS5BS, ZC4BI, CR6AI, PY2DBU, ZS1OU and 5B4AU.

G3DCS (Ipswich) must have picked the right day to look over Fifteen. He managed contacts with VE3BZ and W1TW, plus an interesting one when he worked, for the first time, Ipswich U.S.A., and found the operator on the far end was none other than G3DCU, next to him in the *Call Book*. There's coincidence for you!

G3YRR finds his Mini-Quad working well on 21 MHz, and on the day before his letter managed contacts on SSB with TI, 9J2 and ZS on it.

For G3NOF to return a *nil* report is quite unusual—but on 21 MHz, nothing had been heard, whatever openings there were having been during Don's working hours.

Forthcoming Events

Having covered the question of what has happened already, we turn to what is to happen in the foreseeable future, with a mention here and there of that which should have happened but for one reason or another didn't.

Palmyra (Zone 31) operation later

in the year is a strong possibility, together with a trip to Kingman Reef (also KP6 and in the same area) which latter would appear to have been cleared with ARRL as constituting a "new country" to add to the list—although it is only about 600 yards square at high tide!! Indications are mid-July as the starting date, and operation mainly CW.

Some 9Q5 stations are still showing up despite the suggestions in the Amateur Radio press of a fantastic increase in licence fee, based on the mileage of the QSO! 9Q5ZT and 9Q5DX have both been reported, the latter on SSB, around 2030-2200z, and working into the States on Twenty.

That Bhutan DX-pedition by VU2KV and W6KNH to activate A55KV from Bhutan appears to have come unstuck, and our information is that this one will have to wait for another season.

Mellish Reef operations some time back by VK9JW and VK4FJ/Mellish have now been cleared by ARRL, and confirmations will be accepted from April 1, 1974.

Between March 30 and April 6, TI2WD, TI2CF and TI2BY are planning a trip to Cocos Is., where they will sign TE9RC on the HF bands, and TE9VHF for QSO's

made through *Oscar*.

That JX7AX/UA1 is an interesting one—it belongs to JX7AX for the period, around the time of writing this, during which he was at the Franz Josef Land weather base—the first case known to your conductor of the Russian administration granting a licence to an amateur from the West. QSL's should go to LA7AX, *QTHR*, and will be dealt with when he returns.

Two letters comment on the Irish situation; GI3GTR wishes us to make known that, due to the difficulties being experienced in working enough GI stations to qualify for the Marconi-Kemp and the GI6YM Golden Jubilee Award, the period of time available has been extended to May 31, 1975. Details from the Award Committee, GI6YM Radio Club, Wellington Place, Belfast.

GM3MTH informs us of the Worked All Ireland award, somewhat similar to the WAB, with any profits being divided between RAIBC and a charity nominated by Dundalk Club, whose idea it all was. Details and record-books can be obtained by getting in touch with GM3MTH, *QTHR*.

During the coming month, we will be seeing the first of the annual WAB contests, and over the weekend March 30-31 we have the *CQ WW WPX* SSB contest to stir up activity. This one goes from 0001 March 30 till 2359 March 31, with 18 hours of that period taken out for rest purposes in up to five spells, clearly marked as such in the log. Scoring seems a bit complex, in that contacts on 14, 21, 28 MHz count three for a different contact, but six points if made on the LF bands, for contacts to a different continent. You can work your own country for a multiplier but no QSO points; for stations in your own continent but out of your own country, count one point on the HF bands and two points on the LF's (W's score slightly differently); the multiplier is the total number of valid prefixes worked. Entries can be single operator single band, single operator multi-band, or multi-operator, and to qualify for the award list you must be on for at least twelve hours for a single-op entry or 24 in the multi-operator case. Logs to be post-marked no later than May 1, and

should include the usual declaration, summary sheet, and so on, addressed to CQ WPX SSB contest committee, 14 Vanderventer Avenue, Port Washington, L.I., N.Y. 11050.

The DX-putation of the Month organisation is still quite active, and their latest bulletin gives much detail on the stations for whom they handle QSL's. DOTM's address is Box 7388, Newark, New Jersey, 07107, U.S.A.

The next one of the series of QRP contests, sponsored by DLAG, is down for July 6/7, with details obtainable from G8PG, who in his note mentions how the QRP chaps, despite clashing with other contests on both Top Band and Eighty, still had a good time, working their fellows in 23 countries and three U.S. States.

South Birmingham Radio Society run an award for working, on Top Band, Eighty, or VHF, All Birmingham Postal Districts, the minimum requirement for the award being 25 of them. Details on this can be obtained from R. Thompson, G8GDZ, *QTHR*.

QSL Addresses

Starts with G2BON, who offers *VE3AII/SU*, via VE1AL; *VQ9HCS*, to WA1HAA; *HZIAB*, P.O. Box 79, USMTMSA, APO New York City, 09616; *YS1MAE*, Box 1566, San Salvador, Republic of El Salvador; *DUIJMG*, P.O. Box 1381, Manila, Philippine Islands.

From W4WFL/1 we hear that QSL's for the ZS3KC/ZS4KC stations should be sent direct to K4TXJ's *Call Book* address, and not via the Bureau.

From G3NOF we get *TR8SS*, to DJ5IO; *ZS2MI*, to ZD6LW; *ZD9GD* to ZS6AO; *CR8AG* to PY7YS; and *ZD7FT*, to VE1AIH.

GM3CFS chips in with his offerings, including *JY9GR*, via DK4PP; *VX2AB*, through VO2 Bureau; *9LIJT*, via W3HMK; and *H18LC*, Box 88, Santa Domingo, or alternatively to W2KF. Thanks to all for this information.

Snippets

A few more odd points noted among the main items. W7PVZ writes to say he divides his time between Amateur Radio and short-wave listening; activity on the bands is CW in the main, and on the

constructional side he is in the process of building up a Quad for 31-metre reception, which will be quite some aerial to get up once its built!

A reader signing himself as just H. Oxley (*no call given*) picks us up on the point about operating procedures last time out; he feels we should publish a complete guide to desirable operating practices and customs, and even to make such notes into a pull-out supplement—*crikey!* Seriously, one's preferred operating method would surely be a matter of common courtesy, and respect for one's power level and location—obviously a DX station's practice is quite different from that of a top DX-er, say, in W6, or a non-DX type in England, simply because of the vastly different circumstances.

An interesting letter came in from the Far East, and refers to the BBC's *Summary of World Broadcasts*, wherein we find that in Mongolia, 1000 people have completed six-month courses in Amateur Radio at the Central Radio Club, Ulan Bator.

GM3AWW reckons the last time he wrote in was for the third issue—not exactly yesterday! Touching on many things, Bill is at the moment noticing the number of non-QSL'ers among stations who themselves are asking for his card.

Signing

Once again we come to the end of the clip, with our hearty thanks to all the chaps who came up with news, and made this offering possible; not to forget Geoff Watts' *DX News-Sheet*, and the *West Coast DX Bulletin*, courtesy of WA6AUD. For next appearance, the deadline must again be set at **immediately**, the address being, as usual, "CDXN," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18-1RQ.

While we hope to maintain a monthly appearance, continuity depends entirely upon the industrial situation and how it develops in the immediate future. Nor can we give any definite dates for publication. Readers would help us enormously by continuing to send their CDXN reports in regularly without regard to deadline dates. —*Editor*.

MARCONI CENTENARY YEAR

AN HISTORICAL NOTE

This article is based on material supplied by the Press Dept., GEC-Marconi Electronics, Ltd. and covers the 50 years or so of the active life of Guglielmo Marconi.—Editor.

ONE hundred years ago (April 25, 1874) Guglielmo Marconi was born in Bologna, the younger son of a wealthy Italian landowner, Giuseppe Marconi, and his Irish wife, daughter of Andrew Jameson, the whiskey distiller from Co. Wexford in Ireland—and you can still buy Jameson's if you like Irish whiskey.

To Guglielmo Marconi must go the credit for seeing the possibilities of wireless as a means of communication. His work, and that of the brilliant men with whom he surrounded himself, laid the foundations of the electronics industry as we know it today.

From an early age he was interested in science and by his late 'teens, at his home the Villa Grifone, he was experimenting with electro-magnetic waves as a communication medium. By the summer of 1895 he had succeeded in transmitting signals over a few yards of space and in August of that year, using an earth and an elevated aerial at both transmitter and receiver, he was able to pass Morse code over $1\frac{3}{4}$ miles.

The Italian Government was not greatly interested in Marconi, so in 1896 he came to England where he filed the world's first patent for "a system of telegraphy using Hertzian waves." A letter of introduction to Sir William Preece, Engineer-in-Chief of the GPO, led to a series of demonstrations culminating in 1897 in a record transmission across 8.7 miles of the Bristol Channel (where Preece himself was experimenting with inductive methods, with far less success).

The potential of wireless telegraphy was becoming evident and in 1897 the world's first radio company was formed to develop Marconi's apparatus commercially. First called the Wireless Telegraph and Signal Company, it was later renamed Marconi's Wireless Telegraph Company and in 1963 became The Marconi Company.

By the end of the century, wireless had been adopted by the Royal Navy (and the Italian Navy), it had spanned the English Channel, it had proved its worth in the mercantile field as a life saver and Marconi had introduced his system to the U.S.A. where he registered "The Marconi Wireless Telegraph Company of America"—later to become the Radio Corporation of America (R.C.A.).

Development

In 1900 the Marconi International Marine Communication Company was created to operate an exclusive licence for all maritime purposes. (At this time also he took out his Four Sevens patent for tuned coupled circuits).

In 1901, the world's first wireless school opened at Frinton, later transferring to Chelmsford where it still flourishes as Marconi College. 1901 was a vintage year for Marconi. Having achieved communication over 198 miles between the Isle of Wight and the Lizard, he

embarked on his famous Trans-Atlantic experiment. After many vicissitudes he succeeded in receiving a signal, at St. John's, Newfoundland, transmitted from Poldhu, Cornwall. Even at the moment of this, his greatest triumph, some of the experts (still with us!) said that he mistook atmospheric noises for the Morse letter "S". Two months later, signals from Poldhu were recorded (on a Morse inker) on the s.s. *Philadelphia*, 2099 miles away, thus dispelling any doubt about his original claim. In December 1902, Poldhu's permanent opposite number was built at Glace Bay, Nova Scotia.

During the next few years, many important patents were filed, notably those for the magnetic detector, the radio valve developed by Dr. Fleming, and the directional aerial, which was used at Clifden, in Ireland—a station that took over the transatlantic service from Poldhu. In 1909, Marconi shared a Nobel Prize for Physics in recognition of his contribution to wireless telegraphy. He was then only 35 years old.

The decade that preceded the First World War also saw the first use of wireless in the air, transmission initially being achieved from a captive balloon and then, in 1910, from an aircraft. It also saw wireless used to assist the capture of the notorious murderer, Crippen, and to save lives when the ill-fated *Titanic* foundered.

When war broke out in 1914, the Admiralty at once took over the Marconi radio factory, the first in the world. The Clifden station and Marconi's operational equipment in Chelmsford and London were also taken over, along with the first long-wave station for direct communication with the States, completed by Marconi during 1914.

The Company, having developed D/F techniques before the war, established a chain of stations that were used to devastating effect against enemy Zeppelins, submarines and surface ships, and led, indeed, to the Battle of Jutland. For the Royal Navy's world-wide communications network, the Company built a dozen widely dispersed stations.

Air-to-ground telegraphy was perfected and the difficulties of ground-to-air telephony were overcome by three Marconi engineers—Prince, Round and Furnival, the last named also supervising the achievement of interplane telephony in 1917.

In 1919, Marconi bought his yacht, *Elettra*, which he equipped as a laboratory; a Marconi engineer made the first east-to-west transatlantic telephony transmission; and the embryo of broadcasting took shape in Chelmsford.

In 1920, from Marconi's Works, came Britain's first advertised public broadcast. Twenty months later the Company was licensed for regular broadcasting and erected the famous 2MT station in an ex-Army hut at its Writtle Laboratories. A licence was also granted for the 2LO station in Marconi House, London. Later in 1922, at the instigation of the PMG, Marconi's and five other manufacturers formed the British Broadcasting Company, superseded in 1926 by the British Broadcasting Corporation.

The Marconiphone Company, formed in 1922 to satisfy the demand for domestic receivers, was sold to R.C.A. in 1929 and later merged with two other companies to become E.M.I., of which Marconi was President.

(over)

Meanwhile, the Company supplied the equipment for the BBC's new longwave station at Daventry, which took over the 5XX callsign of an earlier station built at Chelmsford.

The Empire Network

Running parallel with the Company's broadcasting activity was Marconi's own involvement with the Government plans to link the Empire through a wireless communication network. First mooted in 1906, the Imperial Wireless chain contract was awarded to Marconi in 1924, exactly fifty years ago. The first station was opened in 1926 and, in common with all those that followed, used the Marconi-Franklin Beam System—a newly developed form of short-wave directional transmission. The Company, too, built its own beam stations for communicating with countries outside the Empire.

The success of the Imperial Wireless Chain so threatened the Empire cable companies that, in 1929, at the instigation of the respective governments, their interests were merged with those of the Marconi Company in a new organization, Cable and Wireless Limited.

This step shattered Marconi's life-long ambition to control an Empire-wide wireless network. Disappointed and in ill-health, he was increasingly drawn to his home in Italy, from which he conducted *microwave* experiments, installing the first microwave telephone link in 1932, and in 1935 was demonstrating the principles of radar.

Meanwhile his company in England was advancing the new medium of television, its interests then being merged with those of E.M.I. to form the Marconi-EMI Television Company Limited (later dissolved) whose system was adopted in 1936 by the BBC for the world's first public high definition television service.

In Italy, Marconi's health was deteriorating rapidly. He was taken ill on July 19, 1937 and died the following day, at the age of 63. Of all the tributes that followed, the most impressive, the gesture that was unique, was the closing down for two minutes of radio stations throughout the world. The ether was as quiet as it had been before Marconi.

During the period end-March to end-April, II4FGM will be on the air to commemorate the birth of Senatore G. Marconi, with a special QSL card for all amateur-band contacts taking place on April 25, the actual date of Marconi's birth in 1874. There will be an international Amateur Radio meeting at Bologna, organised by the Italian Amateur Radio Society (ARI) over the week-end March 30-31. Detailed information covering the programme, with hotel reservation forms, can be obtained from: *Comitato Celebrazione Marconiana, Box 3113, Bologna 40100, Italy*. Some of his original apparatus will be on view at the Villa Griffone, where Marconi lived and died.

MOBILE RALLY CALENDAR

There are three more fixtures to enter, following the first list appearing last month—but there are doubts about the A.R.M.S. event, previously notified for May 19, at R.A.F. Cosford; it may have to be postponed till later in the year, at another venue.

At the moment of writing, there is some uncertainty about the whole Rally programme for this year, in view not only of the industrial situation but also that the high cost of petrol may deter visitors who normally make long journeys to visit the popular Rallies. There is also the problem, for the organisers, of the high initial cost of mounting a Rally under present conditions.

However, we shall see—and anyway it can be taken that, whatever the apparent difficulties, organisers concerned will be doing their best to lay on an attractive event.

March 31: White Rose annual Mobile Rally, at Lawnswood School, Leeds, junction of A.6120/A.660, opening at 11.30 a.m. Secretary: K. R. Robson, G3VTY, Flat 7, 34 St. James Drive, Horsforth, Leeds.

April 21: North Midlands Mobile Rally at Drayton Manor Park, as in previous years. Located near Tamworth, Staffs., on the A.4091, within 12 miles of Intersection 4, M6, with AA signposting one mile from the A.5. Secretary of the organising committee is A. Walton, G3ZKQ, 243 Barnes Hill, Birmingham, 29. (Tel.: 021-427 3088, evenings).

May 5: Spalding Tulip-Time Rally, Surfleet, as in previous years. Trade stand bookings as early as possible, to R. Harrison, G3VPR, *QTHR*.

May 12: South Leicestershire Mobile Rally, Hinckley with trade applications to M. B. Farr, G4CAJ, 23 Waterfall Way, Barwell, Leics.

May 19: Amateur Radio Mobile Society (A.R.M.S.) Rally at R.A.F. Station, Cosford—but *subject to postponement and transfer to another venue*. Information from Norman Fitch, G3FPK, *QTHR*.

May 19: Northern Mobile Rally, at a new venue—details later. D. G. Mott, G8BZY, *QTHR*.

May 26: Hull & District A.R.S. event at the East Riding College of Agriculture, near Beverley, Yorkshire, as in previous years. Organiser: L. D. Colley, G3AGX, *QTHR*.

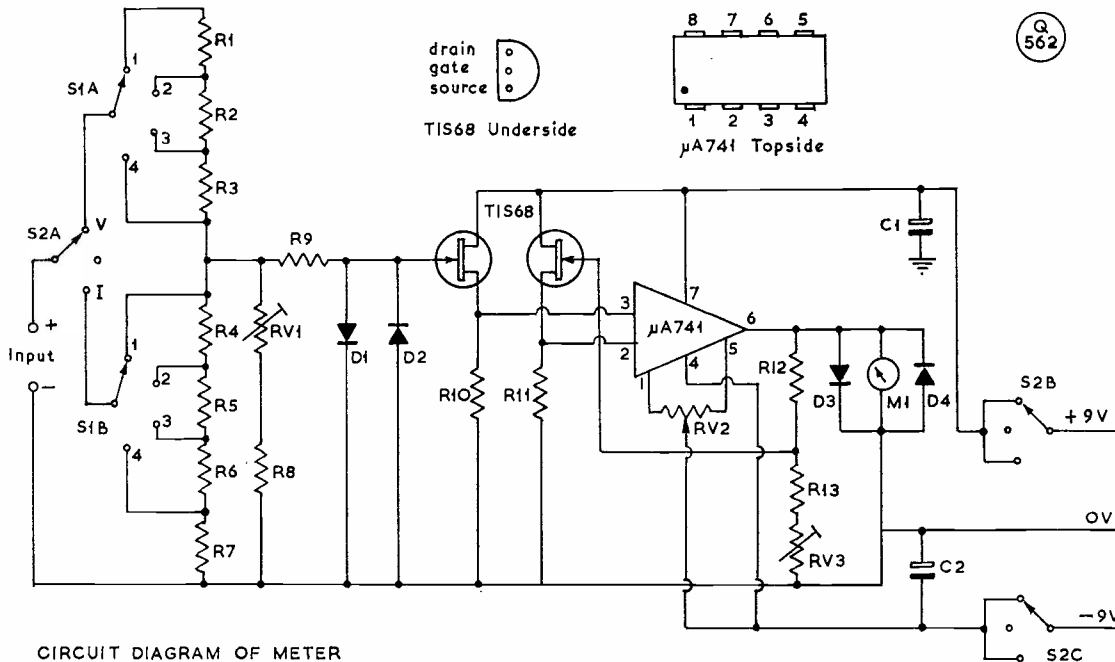
June 30: Upton Mobile Rally, Worcester. Information from B. A. Jones, G8ASO, *QTHR*.

July 7: West of England Mobile Rally at Longleat, Wilts., as in previous years. Details: Brian Croker, G3ULJ, *QTHR*.

July 21: Cornish Club Rally, at venue yet to be arranged. Information from M. C. Locke, G3NKE, *QTHR*.

August 11: Torbay Amateur Radio Society annual Mobile Rally at Newton Abbot Rugby Club ground, as last year.—L. H. Webber, G3GDW, *QTHR*.

Organisers are asked to note that we can only give publicity to events notified directly to us, with the name/QTH of the responsible correspondent, and as an item separate from all other correspondence, addressed to: "Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.



CIRCUIT DIAGRAM OF METER

Circuit of the Sensitive V/I Meter

SENSITIVE VOLTAGE-CURRENT METER

IMPROVED CIRCUIT FOR LOW-RANGE READINGS

MANY designs have been published over the last few years which make use of FET's to give high input impedance inputs to multimeters and which use operational amplifiers to provide the required sensitivity. One such appeared in *Wireless World* for February, 1971, by Johnstone, and it seemed that, with modifications to bring it up-to-date and changes to the ranges covered, this could form the basis of a sensitive meter which would permit measurements of voltages and currents much below those possible with most commercial multimeters.

The changes from the original design are as follows:—

- (1) Substitution of the $\mu A709$ Op. Amp. by the $\mu A741$, thus saving the frequency compensation components,
- (2) Use of off-set voltage null circuitry for zero setting, saving more components,
- (3) Range restriction, permitting simplification of the input potential divider and shunt circuits,
- (4) Addition of meter protection devices.

The circuit diagram is quite straightforward. The following points should be noted: The TIS68 balanced FET pair specified, which is accurate to within 1%,

could be replaced with the TIS69 (5% balance) or the TIS70 (10% balance) if such tolerances are acceptable. These devices may be difficult to obtain, although they are quite widely advertised. It is *not* recommended that 2N3819's be tried as substitutes because the spread of performance is so great that it is an uneconomical proposition trying to find a pair with sufficient accuracy for this design; 3N203's are a possibility, but they are expensive and are not fitted with the common heat shunt as are the TI devices.

In other words, it is strongly recommended that you shop around until you find a source of supply for the FET's specified. Meter protection is afforded by the OA91 (or similar) germanium diodes which are to be preferred to silicon types in this application.

Layout is quite straightforward, the amplifier components being mounted on copper strip Veroboard. (over)

Table of Values

Circuit diagram of Meter

R1 = 900,000 ohms	RV2 = 10,000 ohms
R2 = 90,000 ohms	C1, C2 = 200 μ F, 16v. wkng.
R3, R4 = 9,000 ohms	M1 = 0-100 μ A (Henry's Radio, Type MRA 85)
R5 = 900 ohms	SW1 = 2-pole, 4-way "Makaswitch"
R6 = 90 ohms	SW2 = 3-pole, 3-way "Makaswitch"
R7 = 10 ohms	D1-D4 = OA91 (or equivalent)
R8 = 330 ohms	
R9 = 4,700 ohms	
R10, R11 = 33,000 ohms	
R12 = 100,000 ohms	
R13 = 100 ohms	
RV1, RV3 = 1,000 ohms	

Note: All fixed resistors are hi-stab, 1% carbon film types.

An 8-pin DIL holder is used with the IC and p.t.f.e. 3-pin holders with the FET's. Variable resistors preferably should be multi-turn pots (and you will have to shop around for these also) but they could be replaced by ordinary wire-wound types if cost is a consideration.

Setting-Up

The amplifier has a gain of about 200 and VR3 should be adjusted to give FSD on the 1 mV range of the meter with an input of 1 mV. This setting holds for this and the 1 mA range. For other ranges it is necessary to correct the overall value of the shunts and inputs divider by means of VR1. Apply one volt to the input terminals and adjust VR1 for FSD on the 1v. range of the meter. No further adjustments are required, other than the setting of the meter zero and this is done with VR2. The zero will remain sensibly stable from a few minutes

after switch-on.

The sensitivity of the meter is such that *any heavy breathing near the works* will upset the balance and readings will fluctuate erratically! It is essential, therefore, that the instrument be mounted in a metal box to protect it thermally, and from strong external electric fields. The meter, function and range switches, input terminals and the set-zero control can be mounted on the front panel, all other variables and the batteries being enclosed within.

FSD ranges are as follows:—

SW1	Position	1— 1v.,	1 μ A
	"	2— 100 mV.,	10 μ A
	"	3— 10 mV.,	100 μ A
	"	4— 1 mV.,	1 mA

A.H.D.

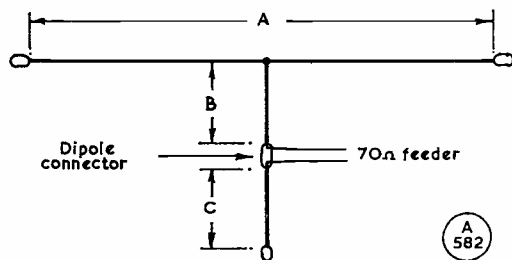
TEE-DIPOLE REDISCOVERED

INTERESTING SINGLE-BAND AERIAL CONFIGURATION

R. L. GLAISHER (G6LX)

In need of a low-angle omni-directional wire aerial as a short-term replacement for a damaged 21 MHz beam, the writer rediscovered the Tee-Dipole, a design that was very popular in the late 1930's. For some unexplained reason, this high performance DX aerial does not seem to have been used to any great extent during the post-war years and it will probably be new to many readers.

As will be seen from the diagram, the Tee-Dipole consists of a full-wave horizontal section and a (half-wave) vertical dipole. The two sections are connected together so that one end of the vertical dipole is used to feed the centre of the full-wave. As the feed point is at



The Tee-Dipole configuration described by G6LX. Dimensions are, for 28 MHz, A = 34ft. 6in., B = 8ft. 7in., and C = 8ft. 4in. For 21 MHz, A is 46ft. 8in., B 11ft. 8in., C 11ft. 1in. And for 14 MHz, A = 69ft. 3in., B = 17ft. 3½in., and C = 16ft. 5½in. The shorter length on the C-arm is to compensate for ground-effect. For true resonance and a good SWR on the feeder, these lengths might require some adjustment, depending upon height above ground. Fundamentally, what the system involves is a full-wave top length A, fed with a half-wave coupling B-C, itself connected as for a dipole. Up to 2 dB of gain, omni-directionally, can be expected with the system at resonance.

a voltage max., proper transfer of power is obtained between the two sections. The aerial is fed dipole-fashion by 70-ohm line connected to the centre of the vertical section.

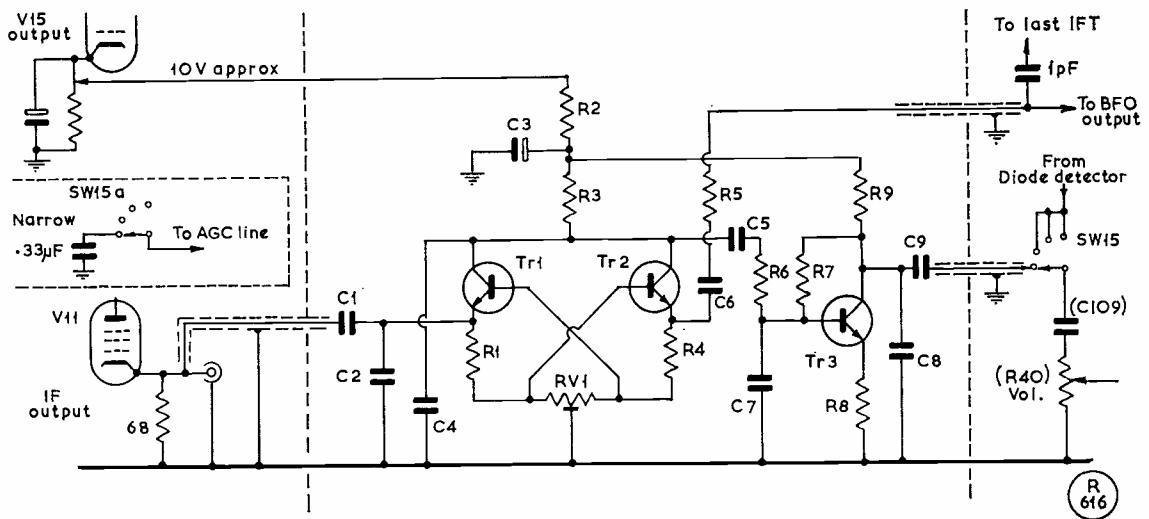
It will be noted that the exact dimensions differ from those of conventional half and full-wave aerials. This is because there is some interaction between the two sections, but the lengths given appear to be optimum, for aerials mounted about 1½-wave above ground.

Comparison with a half-wave dipole at the same height has shown that it has good omni-directional coverage, a lower angle of radiation and a gain of between 1.5 and 2 dB. For best results the aerial should be mounted as high as possible so that the bottom end of the vertical dipole is at least 1/6-wave above ground. This required a minimum height of 23ft. for 28 MHz, 30ft. for 21 MHz and 45ft. for 14 MHz. However, good results have been obtained on 14 MHz with the bottom of the vertical section only 4ft. off the ground. The B-C section should be strained away with cords to hang vertically.

Although the intention was to use the Tee-Dipole as a stop gap until the beam could be rebuilt, it has performed so well that it has become a permanent fixture.

POINT OF VIEW

From the Club newsletter *Mid-Sussex Matters* we extract the following, slightly gisted: "Where have all the radio amateurs gone? . . . I wonder why so many people are disappearing up to the higher frequencies? It does leave the HF bands freer for the enthusiasts. Let the VHF types matter over the garden fence and get hysterical working F's from mountain tops. It's so horribly clinical on VHF, lost sleep over lost dB's, signal-to-noise ratio and so forth—and when you actually contact someone you might as well work him on an Aldis lamp. No, the real stuff, real Amateur Radio, is an xtal oscillator, an 807 going blue, a surplus-type Rx, and a piece of wire thrown up a tree, giving worldwide communication" . . . Well, it is a point of view that will be understood and appreciated by many readers!



Product Detector for the Eddystone 730/4 as circuit between dotted lines

PRODUCT DETECTOR FOR THE EDDYSTONE 730/4

EFFECTIVE ADD-ON UNIT

D. A. S. DRYBROUGH (G8HEV)

THE Eddystone receiver type 730/4—and its military equivalent coded ZA.51262—is a good, general-purpose valve HF receiver but it suffers from the deficiencies of most receivers in this category when single-sideband reception is attempted. This stems mainly from the design of the diode second detector, the inputs of which are adjusted in level to suit AM and CW detection. The signal (IF) input level is high and the BFO level is fairly low. Other parameters, such as local oscillator and BFO frequency stability are good and so it seems worthwhile to fit a detector more suitable for the SSB signals which now predominate in the amateur HF bands.

As is usual with Eddystone designs, the 730/4 presents a clean top layout of the main deck and so it was thought best to fit the new unit underneath, in the IF box. Space here is not great and this restricted the choice of product detector to those using low-volume components. The final choice was of a cross-coupled transistor mixer as shown in the diagram above.

It was felt that the existing switching on the front panel of the 730/4 should be left untouched as far as possible and so it was decided to use the "narrow" IF bandwidth position for product detection. This position could still be used for CW and the IF crystal filter could still be switched in, if required. The IF bandwidth selection switch has two wafers for miscellaneous switching and this was re-arranged to allow the

audio to be taken either from the diode detector, via the limiter if switched in, or from the product detector. Further changes were made to switch in a longer time-constant capacitor in the product detector case across the AGC line, which can be left on or cut off by a panel switch.

The problem of feeding the rather low input impedance of the product detector, without extra switching, was solved by connecting it across the very low impedance IF output socket. This works well except for a tendency to limit for very high input signal levels (presumably it was intended for an FSK output where this would be no problem). The level had still to be adjusted downward a little and this is done by the capacitive input potentiometer. The BFO input was intended for a high-impedance load but it was found that the inclusion of a series resistor between the existing output and the product detector gave sufficient voltage at the product detector for adequate mixing and did not load the oscillator too much. It was found that feed-through of the BFO output via the original capacitor coupling it to the diode detector was rather high and distortion on

Table of Values

Product Detector for 730/4 Receiver

C1, C6,	R2, R8 = 1,000 ohms
C9 = .01 μ F	R3 = 56,000 ohms
C2, C7 = .005 μ F	R5 = 3,300 ohms
C3 = 40 μ F, elect.	R6 = 47,000 ohms
C4 = .022 μ F,	R7 = 120,000 ohms
polyester	R9 = 22,000 ohms
C5 = 0.33 μ F,	VR1 = 5K potentiometer
polyester	Tr1,
C8 = .001 μ F, ceramic	Tr2,
R1, R4 = 560 ohms	Tr3 = BC-107, or equiv.

Note: All resistors $\frac{1}{2}$ -w. size. Capacitors can be met. paper, except where stated. Layout on Veroboard not critical if normal practices are followed.

SSB reception was minimised by reducing that capacitor from 8pF to 1pF.

Construction

The unit was built up on a piece of Veroboard approximately $3\frac{1}{2}$ by $2\frac{1}{2}$ ins. which was inserted vertically in the IF box and held by a bracket fixed by one of the screws holding the cover of the RF box, moving a cable cleat forward to free the necessary fixing point. Connections were made by screened cable except for the DC power connection which was made to the cathode of the output valve. Residual audio at this point was removed by an R/C filter in this lead.

The only setting-up necessary was the adjustment of the pre-set potentiometer and this is quite uncritical. The best point was found by looking, on an oscilloscope, for least distortion on the audio output from the product

detector but it would be good enough just to listen for the best-sounding signals.

Operation

In use for SSB reception, the bandwidth switch is set to "Narrow," AGC is left at "On," RF gain is set at maximum and the BFO is switched on and its tuning knob set about $\pm 15^\circ$ of centre according to the RF band in use (*i.e.*, the sideband to be received). Signals are then tuned in and optimised for sound, resetting the BFO knob if necessary to get best results. In conditions of heavy QRM the crystal filter can be switched in and tuning re-adjusted to clean up the wanted signal but some sensitivity is then lost.

The suggested modification provides much-enhanced SSB reception with a minimum of disturbance to the receiver.

TWO-METRE PORTABLE DIAMOND

SIMPLE AERIAL FOR MOBILE

C. C. ALGAR (G6AU)

THE two-metre transceiver installed in the writer's car is normally used with a three-quarter-wave whip as, although the radiation pattern off this aerial is not particularly desirable, it was already fitted on the vehicle and could not be retracted to the more usual quarter-wave.

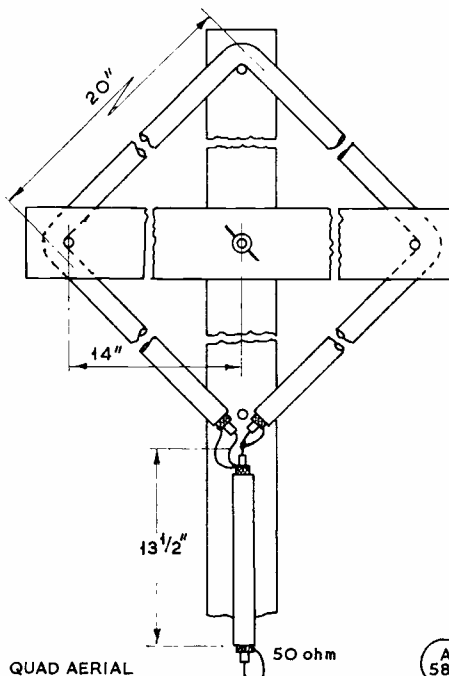
It was decided it would be worth carrying when /M an aerial which would give better results when static but at the same time be easy to fabricate, to carry and to erect. The configuration shown here has been found to meet these needs and it gives a worth-while improvement, particularly when working stations with horizontal polarisation.

The aerial is merely a single-element diamond shaped Quad fed at the bottom corner *via* a quarter-wave coaxial transformer matching the aerial impedance of around 100 ohms to the 50-ohm feed to the transceiver. It can be made from a piece of 75-ohm coax approximately 94 inches long.

At a point 80 inches from one end carefully remove about one inch of the outer insulation. (Try not to damage the copper braid). If the cable is then bent double at this point it will be found possible to part the braid without cutting or breaking any of the strands, so that the inner insulated wire protrudes and can be cut. Leave the insulation intact on the shorter end but the inner wire on the longer 80 inch end should be bared and connected to the outer braid. The inner and outer of the remote end of the 80 inch length are then shorted together and connected to the insulated inner at the point of the cut thus forming an 80-inch loop. Measure $13\frac{1}{2}$ inches from the point where the inner wire emerges from the outer braid at the loop end and trim the insulation from the coaxial. Form a tail from the outer braid and connect this to the outer of an appropriate length of

50 ohm coaxial feeder, the inners also being connected together.

The 80-inch loop is then supported in a diamond shape on a wooden frame made up of a 4 foot length of "inch by inch" planed deal with a 30 inch cross member of the same material fastened by means of a 2 BA bolt and wing nut 15 inches from one end. Insulated pegs or hooks are then fixed 14 inches from the centre of the crossed members. These pegs or hooks should be inserted in the inner faces of the crossed members. The quarter wave coaxial transformer can be fastened to the lower portion of the vertical member. All joins in the coaxial



cable should be protected against the weather using an insulating compound.

Vertical Extension

The vertical support can be extended by two further 4-foot sections of "inch by inch" planed deal and easily supported against the car. Suitable coupling pieces for these wooden sections can be made from two sides of a half-size square biscuit tin which can be bent around a spare piece of "inch by inch" and soldered to form a square-section tube. (If the rolled edge of the biscuit tin is intact and running lengthwise it adds strength to the couplers). Each of the two lower vertical members

should be inserted half way into one of the couplers and anchored by means of a panel pin or screw.

The aerial has similar directional properties to that of a half wave horizontal dipole with the minimum more sharply defined than the maximum. The standing wave ratio of the writer's version as illustrated measured 1.8 : 1 and this was considered quite acceptable so no adjustments were made, which might have resulted in a lower figure.

A similar aerial was used with success on four metres for some years and the two-metre version seems equally worth while. It can be easily assembled and dismantled and takes up little space in the car boot.

TAPE RECORDING-PLAYBACK FOR THE FT-101

CIRCUITRY AND APPLICATIONS

B. S. SUTHERLAND (G3IES)

FOLLOWING the article on the FT-401 series, published in the December issue, it has been suggested that a similar discussion on the FT-101 would be of similar interest. The basic concept is the same, though due to circuit differences the approach is not the same. Before progressing further, readers are referred to the previous article, both in respect of de-coupling the tape recorder and the "play-back" circuit. This is suitable for any tape recorder with a low impedance output, into any transmitter with a 50K input—see circuit. The only difference is that the screen of the input lead, which in this circuit may require to be left o/c in other applications is connected to chassis.

The actual modification is slightly more complex than that with the '401, but should present no difficulty to the average amateur—there is, however, one small snag, which is that should the accessory plug be in use for external switching, an additional external relay will be required, and the circuit routed *via* spare pins on J13 (VFO plug).

Procedure

Pick up the out-going audio on the AF p.c.b. (No. 4) at the junction of Q4 pins 3 and 10 at the feed point to Q5, continue feed *via* a .068 μ F to pin 18. (When viewed from "solder side" this connection is at about "two o'clock"). It will be necessary to remove the AF board from the socket to make this connection; great care should be taken not to overheat the IC's as they are prone to thermal effect.

Turn the Tx on its back, and remove the base plate and speaker to gain access to the AF board socket. Remove earth connections from pin 18.

Solder in a twin screened phone lead, screen to chassis, red wire to pin 18, and connect to C8 of RL1 (normal open). Connect black to C7 of RL1 (normal closed).

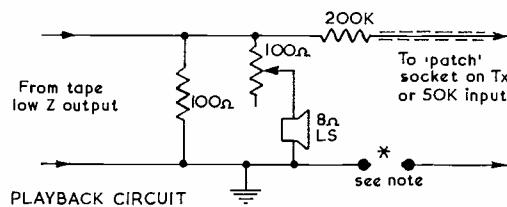
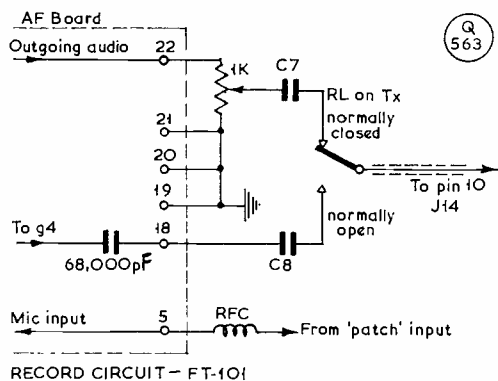
Remove Earth connection from B7 of RL1, making sure to leave on other half of change-over circuit (B5).

Take off the existing connection going to pin 10 of

J14, and refix on to B7 of RL1, so that the audio line is switched from C7, on "receive", to C8 in the "transmit" mode.

The received signal is picked up on pin 22, and is fed *via* a miniature pre-set 1K potentiometer connected across pin 22 and chassis. The tap is taken to C7, RL1; this should be adjusted so that both signals are equal; it should be noted that the audio signal is constant, and independent of mike gain setting. Should any instability occur it will be necessary to add a small value RF choke in the feed line; this should be fitted at pin 5 of socket.

Should a mains/battery cassette be used, AC hum could be a problem. This can be eliminated by removing the screen connection of the input lead, at the "patch" end of the plug, the common earth connection then being only on the input-pin 8 of J14. For details of decoupling of tape recorder see p.611 of the December 1973 issue of SHORT WAVE MAGAZINE. (Over



FT-101 circuitry for recording and playback.

Auto-Control

A further refinement is the inclusion of an automatic start/stop facility on the recorder, so that when transmitting the recorder is switched off and the possibility of re-transmitting your own previous transmission is avoided, and the licence conditions are not broken. This can be done by extending the spare pair of contacts on the mike to the remote switching jack on the recorder, either by fitting a 4-wire lead to the mike, or a separate feed (which must be totally isolated from chassis).

In the last paragraph of the previous article, a home-made 10-second loop tape was mentioned. It should be explained that there are now commercially-available loop cassettes with playing times of between one and five minutes; these are made by both Sony & Philips. An application of these is a continuous recording of all QSO's—should an interesting bit of DX (or whatever) turn up, the tape can be immediately stopped, and re-dubbed on a "master tape" for reference at any time in the future.

NORTH SEA TELECOMMUNICATIONS

WORKING THE RIGS AND BARGES

S. CRABTREE (G3OXC)

This is one of the occasional general-interest articles in our series on commercial radio activity on or near the amateur bands. It discusses the communication systems provided for the North Sea rigs engaged in gas and oil exploration and recovery. Editor.

WHAT are commonly termed "Off-Shore" operations have been going on since 1963 and have now reached an advanced state. A comprehensive system of telecommunications is essential for the efficient running of all the services connected with exploration and production of oil and gas and this had developed over the years and is still improving as fast as circumstances demand it. Basically, locations requiring the provision of communications are (1) Drilling rigs, (2) Platforms, and (3) Barges for drilling and pipe laying.

Drilling Rigs, either "jack-up" or "semi-submersible," are generally on "wild-cat" expeditions, *i.e.*, drilling in areas of promising seismological reports. Depending upon Company requirements they are generally fitted with varied telephony equipment. Officially they are not classed as vessels but legislation provides that rigs operating in U.K. waters come under the Department of Trade and Industry and also must be licensed as to frequencies and types of emission by MinPosTel.

Some 80% of off-shore locations are in the British sector, approximately west of a line running down the North Sea. Therefore rigs communicate with their respective offices in the U.K. through the four East Coast Radio Stations—Wick GKR, Stonehaven GND, Cullercoats GCC and Humber GKZ.

Communication System

The main system now employed is on Independent Sideband (ISB, or A3B) transmission, generally in the shared portion of the 80-metre amateur band. One sideband is used for normal telephony subscribers in the U.K. (or indeed anywhere in the world) *via* nearest Coast Station and London Telephone Exchange. The other sideband carries Telex traffic, an RTTY circuit being permanently available between rig and Company office on shore. By the use of FSK methods, many

teleprinter lines can be accommodated within one sideband, *i.e.*, shift keying is effected within a bandwidth of less than 1 kHz. In this way a dozen off-shore installations can maintain communication on a nominal carrier frequency. A "net" system is used on the other sideband, with each station taking its turn as available.

Equipment used for this service is of course crystal controlled and permanently operated on this single channel. Power inputs usually run up to about 500 watts p.e.p. Usually, the PA is running under Class-AB1 conditions. A tone signal is permanently radiated on the telex frequency in order to phase in with the terminal equipment at the Coast Station (and *vice versa*.) The receivers employed are highly stable, solid-state units with switched crystal input channels. Two audio frequency outputs are of course available to loudspeaker (or line) and to the teleprinter.

In addition there is always another transmitter-receiver combination, usually battery powered, for emergency operation. Input power of 80-100 watts is normal with provision for A3H, A3A and A3J working on the main calling and distress frequency of 2182 kHz and also switched crystal positions giving working frequencies in the 1625-2850 kHz area for inter-ship working and ship-to-shore channels. An associated Rx gives reception of switched channels in this band, all crystal controlled. A general coverage, tunable receiver is also normally available.

For communicating with helicopters a VHF transmitter and receiver are provided, working on a single channel in the Aeronautical band around 125 MHz. This is used with a vertical dipole antenna. Supply boats are also worked on VHF when they are within range, as is the stand-by boat. The latter is usually a trawler standing off the rig in case of emergencies. Communication is within the Marine VHF bands of 156-174 MHz, with switched crystal positions giving the main marine calling Channel 15 (156.80 MHz) and various inter-ship working channels.

The Antennae

Separate aerials are used for transmitters and receivers, the type and design depending on the availability of convenient sites. Where the radio room is away from the helicopter landing deck, whips are generally used, cut and base loaded to the required frequency. When the rig is initially set up on location it is arranged that the aerials are located so that they are on the shore side of the rig with respect to surrounding metalwork.

VHF aerials are usually ground-plane or vertical dipole types as omni-directional effect is necessary. Some aerials may have what might appear to be extremely

long co-axial runs but due to careful tuning and adjustments to minimise SWR (and possibly because normally only a narrow band of frequencies is used) very little loss occurs. Extra equipment on some rigs is a beacon transmitter of about 100 watts for helicopters to home-in on installations during fog. Operating in the Marine D/F band around 285-400 kHz the A2 emission is keyed by a notched wheel on a slow-speed governed motor closing the key contacts to give the two-letter identification. These are only switched on at the request of pilots during poor visibility conditions.

Anchored Platforms

Platforms are essentially the same in outward appearance as drilling rigs, the chief difference being that they are usually smaller and also they are supported by steel pillars driven into the sea bed and thus immovable. Even in a Force 10 gale they give no more than the occasional shudder. These installations are used to drill where it is known that a product is available and merely to run in casing pipe so that the oil or gas may be tapped and brought out to a nearby production platform for processing prior to piping ashore.

Up to the present time the majority of platforms are within about 60 miles off-shore and in many cases this means they can use VHF channels within the bands 156-174 MHz, working directly to their own offices ashore. There are many locations off the East Anglian coast working into Great Yarmouth with inputs of 10 watts. Eight-element Yagis are usually a minimum requirement on the platforms and antenna arrays ashore are erected on 350ft. masts. In addition to this many platforms use micro-wave links.

Little provision is generally made on platforms for normal marine R/T working. However, where there may be a group of such installations situated within sight of each other one platform may have a slightly more elaborate radio installation with a radio operator on board. The radio room is generally within the accommodation beneath the heli-deck and aerials, especially for 2 MHz (Top Band), present a problem as normally no erection is allowable higher than a few feet above deck level. Various methods are used, some resulting in a long-wire effectively encircling the heli-deck but this can produce loading difficulties due to the amount of metalwork in close proximity. Another approach is to suspend aerials from poles stretching outward at heli-deck level. Again, it is necessary for these to be mounted towards the shore side of the rig. Most manned platforms have the 2182 kHz facility, this being one of the MF distress and communication channels but with the direct VHF link, these are rarely used. Helicopters and supply boats are similarly catered for by VHF channels, as they work over relatively short distances.

Each year, barges used for drilling and laying pipes are increasing in numbers in the North Sea and newcomers on the scene are derrick barges. These can only be described in appearance as a section of floating dock, some with an enormous crane towering over the entire length but capable of all-round operation. Some of these barges are actually ships both in appearance and operation but all have tugs spread around them.

In general they are used for a variety of lifting and

engineering projects to do with production platforms. The pipe-laying barges can have up to 250 persons on board, usually of many nationalities. Many of these floating workshops are American with the odd Dutch or Panamanian registration. In the pipe-laying barges, additional 30ft. lengths or joints of pipe are welded to the free end and then the barge is drawn away from the submerged pipe by tugs. This operation is administered from a control room with a dozen closed circuit TV cameras.

There are many pipe lines now in process of being laid in various off-shore sections of the North Sea installations but perhaps the longest planned single run is from Efofisk in the Norwegian Sector to the North Teesside complex. With good weather steady progress can be achieved but such is the state of the wind and sea in the North Sea that pipe can be laid for barely 50% of the time.

Barge Communication Equipment

Because of the personnel complement and also the fact they are essentially deep-sea craft available for operation anywhere in the world the radio installation is usually very comprehensive. A typical radio station would have a 1.5 kW p.e.p. transmitter capable of all modes of operation, including RTTY and facsimile, driven by a synthesised exciter with digital read-out and frequency selection from 350 kHz to 30 MHz in 500 Hz steps. Similarly, they have a synthesised general-coverage receiver calibrated from 10 kHz to 30 MHz in 1 kHz divisions. Provision is generally made to enable any distant contact to be switched through to a number of points on the Barge and it is not necessary for persons making calls to present themselves in the radio room. Most of the working is by SSB through, if possible, the Coast Station in the required country. CW operation is rare although it may be necessary to contact distant stations by key to arrange a telephony sked.

In addition to the usual VHF equipment for local helicopter and marine channels, emergency 2182 kHz transmitter and receiver combinations are fitted for battery operation in the 1625-2850 kHz bands.

For telex operation, contact is first established by phone or CW with the appropriate Coast Station and then after establishing code-number settings direct communication is available with any telex subscriber in the U.K. or Europe. At the moment this service is available only through Cullercoats, Portishead Radio and Scheveningen Radio (PCH) in Holland, but a recent innovation at Cullercoats is that preliminary R/T contact is not necessary. The shore operator sets his equipment to the caller's identification code, dials the required shore-side telex number and providing this is not engaged, contact is established. As telex lines are charged on a time basis traffic is usually prepared on tape and run through at speed after connection.

Although most of the U.K. and Continental calls are by SSB in the bands 1625-2850 kHz and around 3.3 to 3.8 MHz, world wide communication is of course possible at the right time and frequency. It is customary, during the summer months, to work right into the East Coast of the U.S.A. each evening around midnight, when many of the Americans on board take the opportunity to make phone-patch contacts with home.

VHF BANDS

A. H. DORMER—G3DAH

THE amazingly good tropo. opening around January 20-22 produced some unusual DX for so early in the year. On 2m., everything seemed to be there from OH (heard but not worked), SM, OZ, DL, DM, PA, OK, SP, I, ON, F, HB9, OE and EA. There is much evidence of considerable ducting, particularly on the 19/20th, when Continentals were audible at exceptional strength in the West and North and barely readable at East and South coast stations. The top end of 2m. was full of German repeater stations and it is interesting to note that the majority are now at 0.6 MHz spacing. Your scribe got into the Frankfurt repeater (DB0DX, input on 145.05 MHz) and had 37 QSO's in 1½ hours after the initial call. This is mentioned to illustrate the point that the German stations appear to *welcome* calls on their repeaters even when there is considerable local traffic. Courtesy demands, however, that, after the first contact, no stations be *called*, only *answered*, with pauses for local traffic to develop. In the event quoted above, none did.

Conditions on 70 cm were equally good, much to the delight of participants in the SSB contest on the Sunday. Outstanding results were those of GW8AWS/P operating from Flintshire (YNO4j). He worked 14 DL, six F, four ON, three PA0 and three OE, to give him 16 countries on the band since he started in 1968. OE2CIL/2 was in

GH16c, which makes it about 820 miles—not quite far enough to beat the GD2HDZ/OE2OML contact of last year—and all this on A3j with 9 watts only! Incidentally, 'HDZ heard OE2OML on SSB and CW again this year, but did not make contact—which is a pity, since he is still waiting for a QSL from Austria! However, he had a fine contact with DJ4VN for a first GD/DJ on that band. He also logged two OK and one DM on two metres. G8FHO (Winsford, Cheshire) walked right into the opening. Having just completed his 70 cm. converter, he heard F1KGG, F1CAL/P, F6CJD and F3FR, with GW3UCB/P for good measure. G3LTF worked OK on 70 cm. (and nine Czech stations on 2m.). G4ALN made it with OE and G8AGU/P in Devon raised DM2BCD.

Going even higher in frequency, there was the spectacular contact between G3LQR (Woodbridge, Suffolk) and DJ2HF/P on 13 cm. which could be a *world* record. G4BEL (Ely, Cambs.) made it with OE2OML on 23 cm. which could also be a record. G3TYE (Dereham, Norfolk) logged OE2OML working F2TU and DJ/DL stations on 23 cm. and worked three OE on 70 cm. He also had a look at the DB0VU transponder, which accepts all modes ± 16 kHz on 432.63 MHz and retransmits on 145.5 MHz ± 16 kHz, but could not get into it. G3PQR (Frinton-on-Sea, Essex) had cruel luck when the gales removed his antennae. As he had gear for 23 cm., 13 cm. and higher, we could have seen a few more records.

Here are a few highlights from the two-metre scene. G8EQN (Chesham, Bucks.) heard a station signing in French, called "QRZ" on his channel and was surprised to get a return call from EA1CR in Gijon, which puts the QRB at nearly 1,000 km. Language presented a bit of a problem but, fortunately, Mrs. G8EQN is Spanish and was able to help out with translation and the QSO was completed to the mutual satisfaction of both parties. *Muy buen!* Tony Petts considers that this path is open more frequently than might be supposed, and is going to try to set up skeds to prove the point.

For G3BHW (Margate, Kent) the opening was first observed on

January 19 when contacts were made during the evening with many DK and DM stations, followed by HB9QQ (QRA, EH45e) at just after midnight. Two further contacts with HB9 were made during the morning of the 20th and in the afternoon with OE2CAL and OE2KBL, both in GH16c. The evening session produced OK1MJB (HJO2b) and OK1ATQ (HK50h) as well as strings of DM and some SM, SP and OZ. Two more OK were worked just before midnight. His tally for the two days was two SP, four OK, two OE, three HB9, one SM, two OZ, 25 DM and a mass of ON, PA, F and DL. That gives a pretty fair idea of the extension to the North and Northeast.

Another imposing list of contacts comes from Peter Barville, G3XJS (Holmer Green, Bucks.). Over January 19/20 he booked in some 24 stations in DL, DM, OZ, SM and OK—all with 50 watts of CW. To digress for a moment, he also worked 13 countries and four countries on 70 cm. with a mere two watts of AM! He confirms the considerable ducting which was present on both 2m. and 70 cm.

Up in Mow Cop, Staffs., G3OHH heard/worked a useful bag of Continentals, the most remarkable being DJ3JC who was copied through the HB9 repeater on 145.82 MHz. G8HBN (Weybridge, Surrey) got off to a good start on 2m. SSB with a contact with HB9BP, while G3OUF (Amersham, Bucks.) netted four new countries on SSB including OK, HB9 and OZ. G3KMS (Bolton, Lancs.) made it with HB9 on Two with a couple of French stations in Cognac and Strasburg for 1,000+ km contacts on 70 cm. In the Isle of Man, GD2HDZ was hearing OK, OE and DM but was unable to get them through the QRM in spite of his attractive call.

Over in Pontypool, GW4BXE was alerted to the opening by QRM on the box, and within a few hours had worked seven new countries. A night-shift duty in the salt mines curtailed activities a bit, but he was still knocking off the DL on Monday. His New Year resolution, he says, was never to complain again about the poor take-off from his site. In Co. Antrim, G18EWM made it with PA and DK for two new countries and heard OE2OML, but

could not penetrate the wall of QRM to work him. He notes further that DK1FG/A was at 5 & 9+ from 1500z on the 20th to 2200z on the 21st, when he went out like a light.

The evidence for ducting is reinforced by the report from GW3ZTH (Bridgend) who shows a total of 80, yes, *eighty*, Continentals worked during the opening, including four HB9, one EA and two OK. He also heard a couple of OE who both shifted to 70 cm. before he could get at them! Signals were mostly around the S9 mark for long periods and would then disappear suddenly only to reappear at full strength after a short interval.

To cap all this, there was a bit of an aurora on January 25 between 1700z and 1915z, but it was weak in this country.

Well, there it is, and it would be nice to think that we were going to get this sort of propagation at more regular intervals, although perhaps that might destroy some of the fun in DX-chasing.

Twenty Three

We shall publish for the first time next month a Table for all-time scores on the 23 cm. band in the hope that this may stimulate activity and interest in SHF. Entries so far received come from G8ARM with 20 + 2, G4ALN with 10 + 3, G8AOD with 11 + 1 and G5DF with 3 + 1.

There is a growing disenchantment with the two-metre band—several long-established operators have said that they are going to give it up entirely—and this would imply a move to, in a lesser degree, 4m. and to a greater degree to higher frequencies. Interest in 70 cm. is on the increase, the cogent arguments from G3BA advocating the use of SSB on that band providing additional impetus to the exhortation to “use or lose,” and the step from there to 1.3 GHz need imply no more than a suitable tripler. Agreed that techniques at this frequency call more for plumbing than wiring, but several excellent, albeit simple, designs have been published, and commercial equipment is already on the market. The challenge offered by this opportunity to explore a field new to many need not be a deterrent to any but the most faint-hearted.

The following descriptions of equipment used by three of the potential claimants to the 23 cm. Table will demonstrate that one does not need to be an Honours Graduate in Electronic and Mechanical Engineering to have a go.

G4ALN (Romford, Essex): Tx runs 8 watts to a varactor tripler. The Rx is a BFR90 pre-amp into a hybrid ring mixer with a 40602 mosfet at the centre of the ring as an IF amplifier. Further gain at IF is provided by the 2m. converter. The beam is a gamma-matched, 22-ele. Yagi fed with UR67 coax.

G8ARM (Blackheath, Kent): The Tx is a 2C39A in a box cavity operating as a tripler and, with cathode co-axial cavity feed, produces 3-4 watts output on a xtal controlled frequency of 1297.3 MHz. The converter is a transistorised, double conversion job with the first IF at 63-65 MHz and the second at 12-14 MHz. A hybrid ring Schottky diode mixer is used with injection

at 1,232 MHz. The antenna is a 34-ele. Yagi with a measured gain of nearly 19 dB and the QTH height of 150ft. a.s.l. brings Brian to the top of the Table.

G8AOD (East Grinstead, Sussex): Tx is a 2C39, box cavity tripler driven from a QQV02-6 on 432 MHz and runs at 9 watts DC input. The Rx is a BFR90 pre-amp to a troughline converter, IF 10-12 MHz. The antenna is a 22-ele Parabeam at 37ft. at the 400ft. a.s.l. QTH. Best DX to date with this set-up is with G4ALN/P in Rutland, a QRB of 166 miles, so don't run away with the idea that 23 cm. is just another cross-town natter band!

So there we are for a start. When sending in your first claim, it would be much appreciated if you would include details of your particular set-up so that they may be published here for the guidance of others. And just to forestall “the next question,” G3DAH has the Tx and Rx for 23 centimetres, and once the gales have abated hopes to get the

THREE BAND ANNUAL VHF TABLE

January to December, 1974

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G5DF	21	1	30	12	20	4	88
G3NHE	19	2	26	11	18	7	83
G3DAH	16	1	28	9	15	3	72
G3OHH	21	3	20	2	6	2	54
G3FIJ	14	1	15	7	5	3	45
G3XDY	—	—	19	6	13	4	42
G8FWB	—	—	28	6	—	—	34
GD2HDZ	1	1	9	8	8	3	30
G8HQQ	—	—	24	2	—	—	26
G3FPK	—	—	24	1	—	—	25
GW3KDG	—	—	14	9	—	—	23
G8GXE	—	—	15	1	1	1	18
G18EWM	—	—	11	7	—	—	18
GW4BXE	—	—	8	9	—	—	17
G3FPK	—	—	15	1	—	—	16
G8BPJ	—	—	10	2	—	—	12
G8HQA	—	—	8	2	—	—	10

The Table shows claims to date from January 1, 1974. It will close on December 31, 1974. Claims should be sent to “VHF Bands,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ at monthly intervals, to keep the Table up-to-date.

beam up and be on the band regularly!

Contests

Results: Our VHF Tables winner for 1973, G3NHE of Sheffield, adds to his laurels by winning the 144/432 MHz CW event of November last. Runners-up were G3LTF and G3NNG.

Reports: Comments have been made elsewhere in this piece on the excellent propagation conditions during the 432 MHz SSB contest on January 20. It suffices to remark that there was a significant increase in the number of operators using this mode and that the quality of the transmissions seemed uniformly good. However, many operators seemed not to appreciate until quite late on in the contest that cross-mode working was permitted under the rules, and many must have lost points through this oversight.

Conditions were not particularly good for the 70 MHz Fixed Station event of January 27, although G3VPK reports that he had heard GM3WOJ/P in Ayr. Best signal in the South appears to have come from G3OHH (Mow Cop, Staffs.) and in the Midlands from G5MA in Surrey.

The 144 MHz CW contest on February 3 produced some good DX, notably from GM3WOJ/P in Patna, Ayrshire, who was working stations in the South of England. Best direction for DX appeared to be North/South, although G3FYX (Bristol) and G3CHN (Salcombe) seemed to be getting out pretty well. **Forthcoming Events:** The 432 MHz Cumulatives have started but look out at 2000-2200z on March 9, 17 and 25 for the last three. The Microwave contest is slated for June 15/16, 1600-1600z.

VHFCC Awards

Andrew Benham, G8FSL, operates from Southgate, London and gains 2m. Award No. 206. He was first licensed in February, 1972 when he was 15 years old, but did not come on the band until September of that year. He runs a much modified Pye Ranger, the output from which, he says, has fallen considerably over the years due to the modifications which he has made to it! Initially, the converter was a G3HBW type

into a CR45, but this has been replaced by a *Microwave Modules* job and an HA-600A. The antenna is an 8-ele. at 30ft. at a site 250ft. a.s.l. which is screened from West through North to Northeast. (Andrew is the secretary of the Haberdashers' Aske's School Radio Society which can now boast 9 licensed members with another 11 taking the next R.A.E. There must be a record here somewhere).

Award No. 207 goes to Hugh Goodwin (Streetly, Sutton Coldfield). He was licensed in February, 1972 and started out with a mere two watts on 2m. and it took a fortnight before he got his first QSO! He now operates QRO with all of 15 watts and a 4-ele. beam, and is finding contacts a little easier to come by. The Rx is a Trio with a *Sentinel* converter. Although the QTH is at 550 ft. a.s.l. with an excellent take-off in most directions, Barr Beacon about ½-mile away, rising to 750ft., cuts off most signals to the Southwest, and those which do get through are subject to severe scattering and the beam heading is irrelevant over 100° or so.

Tony Collett operates on 2m. from Stoke Poges, Bucks. and receives Award No. 208 for his efforts as G8GXE. Although first licensed in December, 1972 and having worked more than 600 stations, and sent out more than 500 QSL cards, it was not until the end of January, 1974 that the 100th came through to authenticate his claim for membership of the VHF Century Club. He uses a much modified Pye AM10D with BFY90's in the RF stages, varicap tuning and a 40600 mixer which has improved the performance considerably. His main interest is in portable operation, and he hopes to be out with both 2m. and 70 cm. gear this summer.

We get many enquiries during the year about the qualifications for membership of the VHF Century Club, in spite of the fact that details are published at fairly regular intervals, so here goes again. You must have worked, *and hold QSL cards for*, 100 contacts on any one of the VHF bands. All your contacts must have been made from one QTH—you cannot mix contacts made while you have been mobile

or portable. A list of these contacts should be sent to "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ, together with a description of your station. You will then be asked to forward six QSL cards, chosen at random from your list, in support of your claim. These will be returned to you with the Award if all is in order. Separate Awards are made for operation on any of the three bands, 4m., 2m. or 70 cm., so it is possible to collect three Certificates, although this has yet to be achieved—it would be quite an achievement!

VHF Convention

The Twickenham VHF Convention is to be held this year over Saturday/Sunday April 6-7 at the "Winning Post" Hotel, Whitton, with certain innovations.

The lecture programme includes presentations on Plessey IC's in the 600 Series, deviation measurements, vehicle ignition suppression, beacon monitoring and portable operation in Scotland.

The Convention has been extended to include Sunday when there is to be a morning presentation by Paul Widger, G8AGU, on "SSB at 432 MHz" and an afternoon discussion group session. The all-in charge is £2.75, ticket applications to: VHF Convention, c/o Mr. Deakes, 35 Doughty Street, London, WC1N 2AE.

Group and Society

The mid-Midlands VHF Group have their next meeting on Thursday, March 28 at the "Heart of England" Social Centre, Berkeswell Road, Meriden near Coventry, Warks. There will be a talk by G3HAZ and G8AVH on equipment for 23 cm., followed by a buffet. Further details from G3BA, *QTHR*.

The Cambridge University Wireless Society are laying on an expedition to Guernsey over Easter and will have 4m., 2m. and 70 cm. with them. They plan to stay from March 28 to April 4. Callsign will be GC6UW and 2m. activity will be on 144.125 MHz CW and 145.46 MHz SSB from a (presumably unmodified) "Liner 2". Frequencies on other bands at present unknown. Skeds for 2m. and 4m. (CW) can be arranged by s.a.e. to M. Naylor

John Males, G8HAC, 12 Wantage Close, Moulton, Northampton, runs a Sentinel two-metre converter, IF 28-30 MHz, into a Trio JR-310 receiver, also an Eddystone EG-10 with a second Sentinel unit for local monitoring and netting. Tx is a modified Pye Vanguard, and antennae a slot-fed four-over-four and a halo.



G4CDF, Christ's College, Cambridge.

Scottish News

The recent gales created a fair bit of havoc in GM. GM3BQA lost his 80ft. mast and all the antennae, with the exception of the 2m. Parabeam, were ruined. He hoped to have repairs completed by the time this appears in print. GM6SR also lost all his radiators, but is still managing to keep his daily two-metre sked with GM6XI across Edinburgh with a battered 8-ele. lying on the flat roof.

It is in the mountains around Callander in Perth that GM3OXX is now doing his camping training in anticipation of more of his very welcome 2m. and 70 cm. /P operations next summer—and this in February with the sort of weather they have been having up there. It is reported that the locals think he is mad—but lovably so!

GM8FM (appropriately enough) is secretary of the newly formed Central Scotland FM Group, and would like to hear from those interested in this mode. The aim of

the Group is to foster FM working on the simplex channels allocated in the new Band Plan, the ultimate goal being to get a repeater to link the Forth and Clyde valleys. There is already a fair amount of FM activity, mainly in western GM, and the formation of a Group to canalise this and improve standards is likely to pay the same sort of dividends as it has for similar Groups in the South of Britain. Write GM8FM, *QTHR*.

The East Lothians lads now welcome GM8ILV to the fold. Despite a severe physical handicap, John passed his R.A.E. successfully and received his Certificate on January 31. Off went his application for a Licence, and on February 6 the MPT came back with it. Nice work in these times of delays in the delivery of just about anything!

Activity on Two in Fife continues unabated with GM3YOR and GM3OLK keeping the level high, aided in no small measure by GM3AEY, whom they had the pleasure of welcoming back to the band recently.

GM8DIJ is near Edinburgh,

whence a few milliwatts of 2m. SSB emanate to such good effect that the locals are slightly apprehensive about what will happen to their front ends when he adds his linear!

OSCAR News

G3WPO and G3IOR are producing an *Oscar News Bulletin*, the first issue of which is crammed full of gen. They plan to circulate up-to-the-minute information on *Oscar VI* and *Oscar VII* (when operating) with a special "hot line" service to those who lodge three s.a.e. with G3WPO, *QTHR*. This sounds to be a useful project since information in the American journals is at least two months old when we get them over here, and the various nets which were established on HF to disseminate *Oscar* news seem to have been singularly unsuccessful. They ask that you send them the news, views and comment they deserve for this private venture scheme which they are personally underwriting.

The latest information from the States puts the launch of *Oscar VII* back to July, 1974, as the ITOS-G

satellite will not be ready until then.

Oscar VI times are now: Monday 1200z—Tuesday 1200z, Thursday 1200z to Friday 1200z and Saturday 1200z to Sunday 1200z. The orbital period remains at 114-99 minutes, the height varying between 1,451.7 and 1,481 km.

News Items

SM6CEN, of the Gothenburg Technical College Radio Society, SK6AB, is looking for a British station who would be willing to run skeds with him on Two—any evening after 8 p.m. between Monday and Thursday inclusive is suitable, but he suggests that those interested should be able to run the legal power limit and use CW. (SK6AB has a pair of 4CX250's with 2.5 kV on the anodes and an antenna with 18 dB gain!). If you reckon you qualify and would like to have a go, write to Hakan Berg, Landalagängen 8, S-411 30, Gothenburg, Sweden. He also sends details of an award offered by SK6AB to those two-metre operators who have QSL's from 100 different QRA Locator squares. Send your list to: Award Manager, SK6AB, PO Box 25049, S-400 31, Gothenburg, Sweden, together with five IRC's.

Also from overseas comes confirmation from our old friend EA4AO, Jesus Martin-Cordova in Madrid, of his QSO with GW3NJW during the *Quadranids* on January 3 last, which has given him, and GW3NJW, a new country in the M/S propagation mode.

GD2HDZ is on Four most evenings after 2200z and now has the Tx keying. He is also making progress with the 70 cm. SSB gear, both of which facts should make him an even more attractive target.

* * *

G3LEQ (Knutson, Cheshire) is another who can offer all modes (except TV and SSB on 70 cm.) but including RTTY on the three VHF/UHF bands. He runs an FL-DX400 driving a *Solid State Modules* Europa transverter on 2m. and triples this in a *Microwave Modules* varactor to 70 cm. The Rx is the FR-DS400 with appropriate converters, and this gear gave him some very nice DX during the January

openings. He reports that RTTY nets function in his area on Sundays at 3.30 p.m. and 8.30 p.m. using 170 Hz shift in 145-30 MHz. Other channels available are 144-60 MHz and 144-30 MHz, which suits the "Liner 2" operator. Others in the district having RTTY facilities are G3MWI, G8DVR and G8GIW.

G8HQA (Shrewsbury) is offering 2m. skeds on Sundays. His equipment consists of a Telford TC9 feeding an 8-ele. Yagi at 15ft. with the DL6HA converter, a Codar PR-30 preselector and Codar CR-70A Rx. His address is: 3, Cruckton Close, Shrewsbury SY3 8XE.

G3OHH reports that SSB operation on 144.20 MHz began early in January in the Midlands and is increasing. However, it appears that poor-quality transmissions are seriously interfering with CW working. No excuse for this at all. He also notes that the sked between G2FNW (Melton Mowbray) and ON4HN on 432.38 MHz at 1900z works most of the time. These two stations also completed a QSO on 23 cm. in December.

G3XDY was one of those at GW8DAD/P in Wrexham during the 432 MHz contest in January, and reports their best DX as DL6LN, east of Munich, and this with only 1 watt output to a Multibeam! He will be active from the home QTH near Grimsby during April and is looking for SSB contacts on 70 cm. He is *QTHR*.

* * *

The latest issue of the UK FM Group (Southern) *Newsletter* contains a timely warning. After pointing out that in the new Band Plan VHF-FM enthusiasts have got nearly all the channels they wanted for duplex and simplex working, they remind such operators that they can no longer expect to retain "self-assigned frequencies" as 144-48 MHz as exclusive for their use since they fall within the "All Modes" allocation. Bully for them! This attitude will remove several bones of contention. All we want now is to hear that FM nets at the top end of Two will move to their assigned channels and stop beefing about, and interfering with, legitimate *Oscar* operations up there.

We are still collating reports and comments on the new Band Plan and should be pleased to hear from you if you have any strong views about it—either for or against.

UHF Antenna

Not that many amateurs will be able to benefit directly from it but of interest just the same is the new fibreglass dish produced by Marconi-Elliott Avionic Systems (Rochester) for investigation into propagation in the satellite communications band 10-30 GHz, to be installed for the Appleton Laboratory, Slough, Bucks. The dish is three metres in diameter and is not only one of the biggest fibreglass antennae ever produced, but is also the most accurate for its size to be made in the U.K. It has a beamwidth of 0.2° and, because the contour is accurate to within 0.08mm., the propagation pattern is very precisely defined. Heater wires are embedded in the dish and a servo-control system has been devised to compensate for the periodic motion observed with geostationary satellites.

Used in conjunction with five aerials of one-metre diameter, the system will enable practical data to be obtained on multiple-station diversity networks by which satellite communications can be maintained under weather conditions which would severely attenuate propagation from a single aerial. The move to 10-30 GHz has become necessary "because the 4-6 GHz band has become crowded." *Ye Gods*, QRM at those frequencies and with that sort of bandwidth!

Deadline

Again this month, it is not possible, under prevailing conditions, to tell you by what date your news-views-claims-and-comments should be in to catch the next issue. All we can say is that the deadline remains **immediate** and that our offering for April will be produced to appear as soon as possible after March 29.

It could be that by the time you read this we shall have some idea about how things are going to pan out on the industrial front.

In the meantime, the deadline is **right now**, addressed "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

73, de G3DAH

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for April issue: Immediate!)

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

THIS piece falls to be started almost immediately after the date on which the last issue landed on to the direct subscribers' mat. Many of the regular Club secretaries and scribes (to whom our thanks are offered) used their initiative by sending their material in before sighting the issue for a deadline. Their action, plus that of those who took the deadline "immediate" at its face value, ensured that at least some of the story of Club life in March can be told.

For a change, we will run straight down the pile this time.

The Reports

For **Verulam** the March meeting falls on Wednesday March 20, and the entertainment will comprise talks and discussion on "Contests" by various members who can claim to be dab-hands at this branch of the art of communication. The venue, as usually of late, will be in the Market Hall, St. Albans, 7.30 for 8.0 p.m., and of course the odd visitor will be very welcome.

Mobile News comes to us from **A.R.M.S.**, and as the name implies, the group caters for the mobile enthusiast in our ranks. This month, the lead article is by **GM4AIE** who gives a round-by-round account of his battle to obtain perfect electrical suppression on his car—a piece which is full of ideas of use to all who have the same problem to any degree. It is possible that they may have to cancel their proposed Mobile Rally, listed for May 19.

Bolton have a booking on the third Wednesday of each month—note this is a change of day—at the Clarence Hotel, Bradshawgate. They are trying to attract the attention of all licensed amateurs in the area as likely candidates for membership. For the March date the Secretary will be talking about VHF Contests and looking on to April there is a demonstration of Amateur TV lined up.

Cornish next, down in the West Country. They have Hq. at the **SWEB Clubroom**, Pool, Camborne, where they may be found on March 7, when they will be entertaining Mr. D. Smith from Lands End Radio, GLD, who will talk to them about Ship-Shore Communications.

St. Martins Court, Kingston Crescent, Ashford, Middx., is the venue for the **Echelford** crew, on the second Monday and the *last* Thursday of each month. At the

time of writing, nothing had been fixed up for March 11, but on the 28th there is the important AGM to which all members should go.

Lots of correspondence with **Chiltern** who are determined to make sure they are taken in! The reason is quite simple, that they have had to *cancel* their gatherings at the Ernest Turner works for the duration of the emergency—a note will go round to all members just as soon as a resumption of some sort becomes possible.

For **Wirral** the subject on March 6 is "Japanese Morse" by **G3CSG**; and then on the 28th Mr. Morrow will be talking about Hi-Fi. Both these are at Hq., the Sports Centre, Grange Road West, Birkenhead—but the annual dinner will be taken on the 28th at Heatherlands, Thurston.

Midland wrote in to mention the North Midlands Mobile Rally, which is slated for April 21, at Drayton Manor Park, near Tamworth. However, for themselves, we can say they have Hq. at the Birmingham and Midland Institute, Margaret Street, Birmingham 3, and for the rest of the details we must refer you to **G3ZKQ**—see Panel.

Again at **Hereford** we know the Hq. is at the County Control, Civil Defence Hq., Gaol Street. Again, it is a matter of getting in touch with the Secretary at the address shown in the Panel, the reason being that their programme details only went as far as the end of February.

For March, the **Stevenage** crowd have a "between week" on March 7, followed by the Annual General Meeting on March 21, which of course all members are requested to attend.

Cray Valley will be listening to **G3RZP** of **KW Communications Ltd.** on March 7, at the United Reformed Church Hall, Court Road, Eltham, London S.E.9. There again on March 21, comes a Natter-Nite to complete the doings for the month; looking forward a bit, April 4 is down for the AGM.

Every Monday evening the **Mid-Warwickshire** crowd get together, their Hq. being at 28 Hamilton Terrace, Leamington Spa. The evening of March 4 is to be given over to a talk about, and demonstration of, Slow Scan TV, by **G3YQG** and **G8DLX**.

It is always nice to hear from a group where the hon. secretary is able to say the meetings are well-attended.

This is the case at the Peat Pitts Inn, Ogden, Halifax, where **Northern Heights** assemble. March 6, is a committee meeting, and on the 13th, they are to be shown how to adjust and set up a AM transmitter. Then on March 20 comes a ragchew evening.

Another group to remark on the good attendances of late is at **Torbay**. They have the Club station on the air each Tuesday evening at the Hq., Bath Lane, Torquay, and there is also the annual dinner to be mentioned, falling on March 9; as well as all this there is the Saturday meeting, for which the date is not given—we understand that this will take the form of a lecture on VHF by G3ABU.

* * *

March 14 and 28 are the dates to book if you belong to **Edgware**, at the Watling Community Association, 145 Orange Hill Road, Edgware. For the former date, there is to be a talk entitled "TVI—Prevention or Cure?" by G3OHX and G3VUQ, while the 28th is down for a Film.

There is always a long list of things to do if you belong to **South Manchester**. There are the Monday evenings of the VHF group, for instance at the Club shack at Greeba, Shady Lane, Manchester 23, plus the Friday do's at Hq., Sale Moor Community Association, Norris Road; for these, the list runs something like this—March 1, "Chaos, or /A Holidays" by G3SMM; March 8, Radio Theory Parts 7 and 8; March 15, Technical Questions and Answers; March 22, G8CZW on Digital Frequency Meters; and on March 29, an evening on Two.

For **Plymouth** we note a routine of get-togethers, on Tuesday evenings at the Virginia House Settlement, Palace Street, Plymouth, the dates being the first and third Tuesdays—a film Show on March 5, and an Open Evening on March 19.

Their annual constructors contest, plus films of radio-electronic interest, together form the programme for the **Mid-Herts.** chaps on March 14. This one is at the Civic Centre, Prospect Place, Old Welwyn.

Back to the Midlands, for the **South Birmingham** programme; the lads foregather at Hampstead House, Fairfax Road, West Heath, Birmingham 31, on March 6, for a lecture on Raynet, by Mr. A. Dennis.

For **Reigate** we see the annual dinner and dance, at the Russ Hill Hotel, Charlwood, on March 9. In the way of routine meetings, there is the Natter at the "Marquis of Granby," Hooley Lane, Redhill, and the main meeting on March 19, when Colleague G3DAH will be talking about VHF, the venue for this one being St. Marks Church Hall, Alma Road, Reigate.

A new secretary takes over at **Lincoln**, and he says the group would like to record its appreciation of his predecessor, Fred Day, G4BXL, for all his good work—fine! On the matter of the group meetings, we note a weekly date, at Lincoln Astronomical Society Lecture Room Westcliffe Street, off Burton Road. March 6 is a Project Night, the project being a two-metre Converter; March 13 is down for films; March 20 is a talk, details yet to be finalised, and March 27 sees G3IXH, the Club call, on the air.

The usual form holds good at **Yeovil**, where they get together every Thursday evening, at the Youth Centre, 31 The Park, Special attention is drawn to a talk on Metalwork and Home-Building, by G8FCF on March 7, and also to March 21 when there will be a Brains Trust,

with all your questions to be answered by G8AFA.

Milton Keynes have a representative from Tektronix coming along on March 11 to talk about Test Gear, which should make an interesting evening at Wolverton Youth Club.

Southgate are now holed up in the Scout Hq. in Wilson Street and the subject of the lecture will be the electrical activity of the heart; on March 14, with a Junk Sale laid on for April.

Strange how a change of venue for a Club will sometimes cause a rise in the attendance, and at others will result in a falling of interest; the latter has unfortunately happened at **Redbridge** since the move into their new place at St. Andrew's Church Hall, The Drive, Ilford, Essex, where they will be running *fortnightly* meetings from February 12 onwards. For the other details we have to refer you to G3JTS—see Panel.

March 1 is a Garex Sale, March 8 and 22 both "between weeks" and March 15 a talk on VHF/UHF radio for Aircraft and Airfield Control, by K. R. A. Cepa, at **Dunstable Downs**. The Hq. address for this group is Chews House, 77 High Street South, Dunstable.

On March 26, the **Sutton & Cheam** lads will have the tape-and-slide talk "DX-pedition to Andorra" for their entertainment, at the usual venue, The Library, Cheam. In addition it is understood that the annual dinner falls on March 2, at the Woodstock Hotel, Stonecot Hill, Sutton.

The next assemblage of **Acton, Brentford and Chiswick** members is on March 19 at the Trades and Social Club, 66 High Road, Chiswick, when they hope to have a delayed showing of the film by VK2FU, which had been held up in transit.

Sad to say, we do not seem to have any detail on the March doings for **Harrow**. However, we know they get together at the Sea Cadets Hq., Woodlands Road, and that the general pattern is of a meeting every Friday evening.

At **Harrogate** they foregather at the Further Education Buildings, Chain Lane, Knaresborough each Monday evening. As there is some doubt as to whether the heat-and-light position will allow meetings to run normally, we suggest you get in touch with the Secretary, address as in the Panel, to find out the latest position.

March 17 it is at **Crystal Palace**, the subject being Part 2 of G8HAX's lecture on Digital Circuitry, this one being devoted to Counters. As to the "where" you must look for Emmanuel Church Hall, Barry Road, London S.E.22.

While we have no details of the March programme for **North Kent**, we do know that they get together on the second and fourth Thursdays in each month, at the Congregational Church Hall, Bexleyheath, by the Clock Tower. As to the doings, it is understood that there has recently been a committee meeting to get the programme organised for the coming months, and a poor wight has been, as they say, "lumbered."

Now to **Medway** where the group can be found any Friday evening at the Aurora Hotel, Gillingham. For any more details on this one, we must refer you to the Secretary, as Panel.

* * *

An early bird was the secretary of **Solihull**, by sending

in his details for the March 19 meeting as early as January 16—it is a tape lecture on DX antennas and station operation for contests, by G3IOR. Another date is the Open Day, March 16, at Hq., when they will have stations on Top Band and Two signing the Club call, G3GEI. Hq., incidentally, is The Manor House, High Street, Solihull.

A new Secretary takes over at **Bury & Rossendale**, and they also report moving into a new Hq. at the Civic Hall, Bury. Meetings are on the second Tuesday in each month, but on the other Tuesdays there is an R.A.E. and a Morse class running at the same venue.

During the first year of existence the **Denby Dale** group has averaged 17 members to each meeting. Now they have changed to the second Wednesday of each month, at the Pie Hall, Denby Dale. Details from G3FQH, as Panel.

The **Wolverhampton Newsletter** gives their forward dates as March 11, 18, 25 and April 1 (this latter being for a junk sale) as usual at Neachells Cottage, Stockwell End, an interesting programme including Constructional Practice and Uses of the Oscilloscope. This is one of the oldest Clubs in the country (founded 1922) and the current Newsletter is No. 214. It contains much useful and interesting material.

Over at **Coventry** they have dates for March 8 (night out!); 15th, tape lecture; 22nd, night on the air, with G2ASF activated; and on the 26th a tape lecture on /P, by G8FFX.

Shirehampton wish to make it clear that they are one of two Bristol Clubs, the other being on the east side of the City, whereas they are right across town to the west. There is contact between them and they hope to organise joint activities, and social events. Meetings are on Friday evenings at Twyford House, High Street, Shirehampton. This is an active Club, looking out for new members and always having a welcome for visitors.

Colchester Radio Amateurs meet at the Army Amenities Centre, Reed Hall Avenue, though they hope for a new QTH "soon". They have their own call, G4CRA, but at present nowhere to activate it.

A very live group in Leeds is **White Rose**. They have a meeting on March 6 and on the 31st their annual Mobile Rally, with the prospect of at least 15 trade stands. They hope for a good attendance, as this would help to knock off the balance required for the purchase of a new Transceiver for the Club station, at 83 Town Street, Armley, where meetings are held.

Conclusion

That's about it for this month. By the time it comes to be read, we shall be through the General Election and may have some idea as to what is likely to happen, towards a return to normality.

In the meantime, deadline for the next issue must remain **immediate**, with Club reports for April addressed to: "Club Secretary," **SHORT WAVE MAGAZINE**, BUCKINGHAM, MK18 1RQ.

Names and Addresses of Club Secretaries reporting in this Issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3-8LB.
A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens Purley, Surrey, CR2-1EZ.
BOLTON: S. MacDonald, G4AOB, 8 Archer Avenue, Bolton (20668), BL2-2SJ.
BURY & ROSSENDALE: C. Kirby, G8HQW, 2 St. Peters Place, Rossendale (4915), Lancs.
CHILTERN: F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks. (Pen 4240.)
COLCHESTER: E. T. Jacobs, 26 Pond Field Road, Colchester.
CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905).
COVENTRY: G. A. Whenham, G3TFA, Lavernock, Chapel Street, Bishops Itchington, Leamington Spa, Warks.
CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidcup, Kent.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, S.E.23. (01-699 6940.)
DENBY DALE: J. Clegg, G3FOH, 8 Hillside, Leak Hall Lane, Denby Dale, Huddersfield, HD8-8QZ. (Skelmanthorpe 2390.)
DUNSTABLE DOWNS: C. G. Powell, G8BPK, 1 Wenwell Close, Buckland Wharf, Aston Clinton, Aylesbury. (630600.)
ECHELFORD: V. W. Higgs, G3VWJ, 205 Commercial Road, Staines (57021), Middx., TW18-2QT.
EDGWARE: A. T. Masson, G3PSP, 62 Coldharbour Lane, Bushey, Herts., WD2-3NY. (01-950 6827.)
HARROGATE & KNARESBOROUGH: R. Troughton, G4AZJ, 2 King James Road, Knareborough. (3494.)
HARROW: L. Light, G3KDL, 22 Chippenham Avenue, Wembley. (01-902 2570.)
HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford.
LINCOLN: G. F. Coggon, 4 Fourth Avenue, Scampton, Lincoln, Lincs.
MEDWAY: H. E. Willis, 111 Laburnum Road, Strood, Kent. (Medway 76953.)
MID-HERTS.: A. Marshall, G8BUR, 33 Brookbridge Lane, Datchworth, Herts. (Knebworth 2229.)

MIDLAND: A. L. Walton, G3ZKQ, 243 Barnes Hill, Birmingham, B29-54J.
MID-WARWICKS: A. C. Outhwaite, G8GDY, 2 St. Annes Close, Leamington Spa.
MILTON KEYNES: R. S. King, G8CHK, 7 Brackley Road, Towcester, Northants.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax. (44329.)
NORTH KENT: R. Wells, G4ARQ, 12 Bullbank Road, Belvedere, Kent.
PLYMOUTH: C. Mitchell, G3UVS, Kechil Rumah, Green Lane, Yelverton (2986), Devon, PL20-6BW.
REDBRIDGE: T. L. Stokes, G3JTS, 62 Dudley Road, Ilford, Essex.
REIGATE: F. H. Mundy, G3XSZ, 2 Conifer Close, Reigate (43130), Surrey.
SHIREHAMPTON (Bristol): R. E. Fineman, 5 Hillside Close, Frampton Cotterell, Bristol, BS17 2RG. (Winterbourne 774300.)
SOLIHULL: L. G. Boswell, G4AEJ, 170 Kestrel Avenue, Yardley, Birmingham B25-8QX.
SOUTH BIRMINGHAM: R. J. Thompson, G8GDZ, 23 Fox Hill, Selly Oak, Birmingham, B29-4AG. (021-472 0533.)
SOUTHGATE: J. Batchelor, G3XMV, 22 Faversham Avenue, Bush Hill Park, Enfield, Middx. (01-360 6537.)
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VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford.
WHITE ROSE: K. R. Robson, G3VTY, Flat 7, 34 St. James Drive, Horsforth, Leeds.
WIRRAL: F. Smith, G3YGL, 72 Church Road, Bebington.
WOLVERHAMPTON: J. P. H. Burden, G3UBO, 28 Coalway Road, Wolverhampton, Staffs., WV3 7LX.
YEovil: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

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SHORT WAVE LISTENER
FEATURE

By Justin Cooper

SOME POINTS ON VHF—MORE READERS
GETTING INTERESTED—IMPROVISATION—
COMMENTS ON THE CORRESPONDENCE—
—HPX CLAIMS AND TABLES

ONE of the modern trends that rather upsets the old-timer in Amateur Radio is the tendency never to make anything that can be bought; this was brought home to your old J.C. recently when he was describing how it came about that he could now once again lend an ear to the goings-on on 144 MHz, to the amazement of some local SWL's. His approach was rather like this:

First of all there was the matter of designing and building a converter using transistors and FET's, and then comparing it with the ancient valve job which lay gathering dust in the shack but in its time had been a very hot piece of equipment. Having established that things were thus-and-thus with the new converter, a local G8 possessed of a good set-up was visited, and it was established that his and J.C.'s converters all seemed to have comparable noise figures—good. Stage Two was to organise some sort of an aerial, and this was how it was done:

Years ago we acquired and repaired to working condition a lightweight beam rotator, which had never been used as being deemed not man enough to turn a TA-33 beam outside. It was now brought out and hoisted up to the loft, to be there fixed to the flooring at a convenient point. The "mast" comprised an old broom-handle with a thing rather like a bulldog clip on the business end. A look around the debris in the loft disclosed a bit of offcut hardboard about a foot long by a half-inch, which jammed nicely in the bulldog clip jaws and thus became the boom of the aerial. Then there was a bit of "chocolate-block" connector which provided the point of support for the coax connections and the ends of the driven element. A couple of pieces of 14g. wire 19½ inches long fixed into the chocolate-block as already indicated formed the dipole elements, and were straightened to make them stand out nice and square. As for the reflector, a piece off the same reel of wire, this time forty inches long, was clipped on to the boom by means of a rubber band, a fixing method which made it easy to set the spacing between the dipole and the director to be 10¼ inches.

Then the coax feeder was taped back from the boom to the mast in such a way that its weight did not drag on the boom but was taken by the mast. It and the rotator cable were both neatly cabled back to the operating position, where the old Eddystone 888 was pressed into service to sit alongside the transceiver used for the HF bands, with the rotator control-unit and the converter sitting on top of the '888. Measurements of front-to-back and front-to-side ratios indicate the impromptu

beam is working well—and since the gales last weekend brought down the ground-plane radials and the long-wire for the HF bands it is effectively, for the moment, your scribe's only contact with active Amateur Radio, until repairs are completed outside.

However, the moral is financial more than anything. J.C. has tried out the two-metre band, after years of absence, with all the latest technological advances and a reasonable aerial for a total cost of precisely *nothing*—the lot came out of the junk-box, one way or another. Why spend money buying gear till you have the "feel" of a new band and have decided whether you really want to lash out?

On the theme of improvisation, the Editor tells how, when his elaborate roof-mounted TV aerial was carried away in the gales, he contrived (much to the astonishment of his XYL) a simple dipole arrangement hung up in the sitting-room which restored the colour/TV picture on all channels. The original outside Ae. gave 500 μ V or so into the Rx from the TV stations about 25 miles away. The indoor contrivance gave 150 μ V, quite good enough to lock on the signal and produce a watchable picture. (Reaction from the XYL was "Why do we need all that gubbins on the roof?"). Of course, you do have to know the formula to use to cut the dipole accurately for the Band/Channel you are on locally and also whether the signal is vertically or horizontally polarised—though you can easily find that out by juggling with the plane of the aerial. All done in half-an-hour by working from first principles, with a bit of practical know-how.

The Mail

Perhaps the first thing to say before we go into the correspondence in detail is that since it was all written, word has come to your conductor that the results of the autumn 1973 R.A.E. paper are now in the hands of those who entered—doubtless there are both congratulations and sympathies to be handed out to readers, according to whether they passed or "came unstuck." As a matter of interest, for the first time ever this paper asked candidates to explain what is meant by AM, SSB and FM and to draw a block diagram of a receiver suitable for reception of each of these modes. We *are* getting modern!

K. M. Duggan (*Exeter*) has been out of the game since back in 1961, but the overhearing of some nice CW at an Army display rig at a local show soon inspired the urge to copy; next came a change of job and the finding of a local G3/3 working at the new place stirred it all up again. One of those great old BC-312 receivers is the "inhaler" and does its sniffing of the output from a Joystick, thanks to being in a flat; a converter for Ten and Fifteen is on the way. The change in the form of

amateur prefixes since 1961 has provided most of the puzzles, a lot of genuine amateur signals being classed as commercial intruders until the new varieties became understood.

Coming back after more than twenty years, R. A. Calvert (*Robin Hood's Bay*) notices that the Editorial of the last copy of SHORT WAVE MAGAZINE he bought back in 1951 dealt with the same subject as the one with which he picked up the threads again in 1973, 22 years later—the subject of both Editorials was *paper shortage*—how the wheel comes full circle! And, it is interesting to notice, as Dad comes back to the old hobby, Junior gets the bug also, and wants his own rig—why not, indeed?

G8HSZ (*St. Austell*) raises again the question of the cost of Amateur Radio. Some years back a lighter job was called for, and G8HSZ came into electronics, so reviving a schoolboy interest; G3WKF worked at the same firm and added fuel to the fire, so much so that last year, at the age of 51, he studied for and passed R.A.E. first go; a Heathkit Two'er formed the VHF station in a very poor location, with a home-brew turnstile array on top of the cottage. Now, there is regular Morse for the G4/3 ticket, and soon there will be frantic construction of HF equipment ready for the great day—but it hasn't so far cost very much, and it isn't intended to allow it to cost much—there is more fun in doing it the hard way. True indeed, and we could add that G8HSZ's letter should be an inspiration to anyone amongst the older generation who hesitates about having a go at R.A.E.

A recent lift on Two is mentioned by A. Salisbury (*Brymbo, Wrexham*), who listens on the band with his FR-400SDX. Alan seems to have heard most of Europe during the opening, and the GB3PI repeater was also at full strength all that day from his shack—quite a long haul in itself.

G. George (*Woodmancote*) seems to have the right ideas. He is just passing his fourteenth birthday and has a JR60 receiver, plus two-metre beam, and has plans which should, if all goes well, lead to a G4 licence and a TA-33 beam ere long. He wants to know why your old J.C. is not licensed—sorry, Gareth, to disappoint you, but the old greybeard is a transmitter type, and spends his time on the air after the DX anywhere between 1.8 and 144 MHz—but he still finds more fun listening and for every hour transmitting, three are spent listening.

P. Davies (*Stoke-on-Trent*) suffers from “experienced SWL friends” who have tried to tell him the rules of HPX—but it seems they believe that, say, G2XY counts differently from G2XYZ! No, Paul, don't listen to them, 'cos we have no intention of altering the rules to fit *their* ideas! It's the *prefixes* that count.

P. Barker (*Sunderland*) has treated himself to a new receiver, namely an FR-DX500, and at the time of his letter was still “getting the feel” of it. On the SS/TV front, several more stations, some of them very DX'y, have been seen.

S. Lawrence (*Market Harborough*) has been helped along the way by G3UGK and G3XTJ. However, Stephen is getting a little tangled-up with the band-spread tuning dials on the 9R-59DS which has just replaced the old B40. Perhaps a careful read through the “book of words” that should go with the box will sort

HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
<i>PHONE ONLY</i>			
W. Bingham (Carrickfergus)	1463	M. Cuckoo (Herne Bay)	731
R. Shilvoek (Lye)	1428	R. H. McVey	
T. Rootsey (Ilford)	1405	(Weston-super-Mare)	720
S. Foster (Lincoln)	1345	C. K. Verstage (Old Basing)	709
K. Kyezor (Perivale)	1237	L. Thomas (Castleford)	674
J. Fitzgerald		H. A. Londesborough	
(Gt. Missenden)	1169	(Swanland)	669
A. W. Nielson (Glasgow)	1138	P. L. Barrett (Welwyn)	634
L. A. S. Poole		B. Cushing (Hove)	611
(London N.21)	1090	J. R. Cowan (Rochford)	590
R. Carter (Blackburn)	1078	P. Barker (Sunderland)	581
H. Alford		C. L. Lee (Ilford)	580
(Burnham-on-Sea)	1034	M. J. Stringer	
B. Hughes (Worcester)	973	(Southend-on-Sea)	577
M. J. Quintin		S. Eldridge (Crawley)	554
(Wotton-u-Edge)	948	M. Kitchener (Hitchin)	533
G. W. Raven		G. Lucas (Kennoway)	528
(London S.E.13)	912	R. Smye	
J. H. Sparkes (Trowbridge)	904	(Shrewsbury School)	526
C. Henderson (Beckenham)	873	Mrs. J. B. Jane (East Looe)	522
A. West (Herne Hill)	870	M. Smith	
N. Henbrey (Northiam)	856	(Matamata, New Zealand)	503
P. L. King (Emsworth)	843	<i>CW ONLY</i>	
N. Askew (Coventry)	841	A. Glass (Plymouth)	965
W. B. Taunton (Meopham)	796	T. Rootsey (Ilford)	723
H. M. Graham (Harefield)	786	G. Proud (Letterston)	693
E. W. Robinson		W. B. Taunton (Meopham)	656
(Bury St. Edmunds)	780	C. Henderson (Beckenham)	617
P. C. Jane (East Looe)	772	H. A. Londesborough	519
A. Judge		W. Hutchinson	
(Bishop Stortford)	770	(Hornchurch)	262
E. Parker (Hove)	756	A. W. McNeill (Newbury)	218
J. Carvell (Burry Port)	748	S. J. Proud (Letterston)	201
O. L. Cross (Bexleyheath)	735		
B. Thomas (Pontefract)	734		

Starting score 500 for Phone, 200 for CW. Listings include only recent claims. Rules for HPX—see Panel, p.43.

ANNUAL HPX LADDER

Final List for year 1973

SWL	PREFIXES	SWL	PREFIXES
<i>PHONE ONLY</i>			
L. Craven (Alvechurch)	499	S. Sharred (Birmingham)	324
D. Johnson (Clitheroe)	465	S. Hall (Hucclecote)	304
B. Rhead (Stoke-on-Trent)	421	A. May (Bromsgrove)	303
P. Davies (Stoke-on-Trent)	427	W. McFaul (Londonderry)	260
M. Wickstead (Taplow)	376	G. George (Woodmancote)	257
M. Eccles (Lancaster)	365	R. Kell (Seahouses)	248
W. H. Smyth (Hartlepool)	355	S. Lawrence	
G. Ridgway (Darlington)	352	(Market Harborough)	232
M. Rodgers (Harwood)	335	J. Bell (Hampstead)	214
M. Hartley (Preston)	328		

Starting score 200, in accordance with the HPX Rules. All prefixes on this list heard in 1973. Next list will include only 1974 hearings.

things out, but if any other SWL would like to help, perhaps they will write to him direct, at 7 Ashfield Road, Market Harborough.

W. Hutchinson (*Hornchurch*) has just acquired a BC-221T frequency meter, and wants to run it from the mains; J.C. has passed on to him the suggestion that he should scrounge around for one of those old transformers used for driving ITV converters when the second TV channel first opened up and most people had only BBC on their TV sets.

(over)

Mrs. J. B. Jane (*East Looe*) has added another fine crop of prefixes to her tally and now goes into the all-time Ladder. Since the OM got himself a Trio JR-599 for Christmas, Jacqueline has stepped up to his 9R-59DS for her own rig, but of course she gets a look at the new toy when she can.

* * *

P. C. Jane (*East Looe*) was at the time of his letter still getting to know the JR-599. One problem that has hit them is UHF TV timebase QRM. This is a bit of a nuisance, and the first thing to do is to see whether it is entering the receiver by way of the mains; this can be done by tuning to one of the line-timebase harmonics and then pulling the aerial out of the Rx, when, if the interference is coming through the mains, it will stay in the receiver. If on the other hand, taking the receiver aerial off makes the QRM go, then it is being picked up by the SWL aerial. A good lot of it is often passed through by the SWL receiver earth—so it follows that if the receiver mains earth is disconnected and a good outside separate earth is used, often the trouble will be markedly abated.

R. H. McVey (*Weston-super-Mare*) found band conditions well down in comparison with the equivalent period last year, and wonders just when we can expect the sunspot cycle to start on its rise again. It is difficult to say with any certainty, but one would not expect it to happen till 1975, and maybe not till '76.

Oh dear! An ominous silence from the loudspeaker followed in short order by white smoke from the inside of the receiver convinces R. Smye (*Wirral*) that he has a problem—which sounds like a reasonable deduction!

D. Smith (*Matamata, New Zealand*) mentions the new P29 prefix for Papua and New Guinea and adds that his personal QRM problem with five local operators within a half-mile radius have been much improved by the addition of a Yaesu FR-50B receiver to the shack. As for the queries in his first HPX list, all look to be duds, and oddly enough all those in his second list are OK.

E. Parker (*Hove*) is in the process of giving his old B.40 what he calls a "face-lift" with more modern valves replacing the old B8B series—but no reduction in the receiver's weight of all but 100 pounds.

A new correspondent is J. Bell (*Hampstead*) who uses the Barlow-Wadley XCR-30, after a very long period when the enthusiasm was there but for one reason or another could not be allowed to run its course, and now he is starting to learn what it is all about. John has some amusing comments on the way human nature on the bands reacts to a given situation.

A very quick note from someone with a vaguely familiar handwriting signs "Dave D." (*Glasgow, C.A*) and provides the QSL details on C31FV asked for by M. Porter of Newbury some time ago. The answer is that they should go to DL2AK or DK4TP; the operator is DL2AK, and the activity was from Pas de la Casa, Andorra. So now you know!

Please, readers, do not ask us to shunt your HPX ladder entries backwards and forwards to you—there are so many of you, and the chance of an error is so great, that we must ask to be excused, even though you include stamps and an addressed label—as has A. W. McNeill

(*Newbury*) who listens to the CW stuff on his modified R.1155B and 33 foot end-on aerial and in that way gathered the prefixes for a first entry to the CW table.

C. Henderson (*Beckenham*) is one of the versatile lads with an entry in both halves of the Ladder, a chap who spreads his listening time around on all bands and both modes. Crispin mentions how the Cray Valley chaps had less support for their entry in the CW leg of the "CQ WW Contest" and poorer aeriels—only Delta Loops for 80 and 40 metres, with a TA-33 at 46 feet for the HF bands!—not to mention the use of a Tx which wanted to drift a bit. The overall effect of these handicaps was the return of a score which was 1,137,000 less than the one claimed on Phone!

His usual comprehensive band report on conditions came in with the letter from C. L. Lee (*Ilford*) who seems to have changed his long-wire to a K.W. trap-dipole. Ten was absolutely flat, Fifteen the same save for one VK, Twenty carrying the majority of the traffic but being very noisy and full of powerful Italians, Forty showing the odd ZL and lots of assorted Russians, Eighty all continents mentioned except for Africa, and on Top Band quite an assortment of good EDX.

J. R. Cowan (*Rochford*) seems to be well on the way to becoming a ship operator, as he now is swotting up for a radar certificate pass before joining Cunard. All this has cut into listening time, and John's letter is as much as anything a holding entry to retain his place in the Ladder.

A sixty-six foot wire is made to cover from 1.8 MHz upwards by N. Askew (*Coventry*) who bought the ex-Australian Government Rx from a shop in Loughborough with all the linking details for the frequencies marked on the storage bag. However, Norman has, for this time, a "nil" return mainly due to spending so much time on Top Band.

G. Lucas (*Kennoway*) wants to know if prefixes heard on VHF count towards one's total—of course, provided they are not duplicated on some other band.

* * *

K. Kyezor (*Perivale*) found conditions very variable, but made up for this by going through his old logs and finding some prefixes previously not, for some reason, added to the total. On a different tack SWL Kyezor was thinking his receiver had gone west, but eventually traced the fault to a broken coax connection—something that also happened to J.C.'s mobile rig recently.

For A. Glass (*Plymouth*) things were not moving along as he would have liked in the way of prefixes, to the extent that Bert was on the point of trying his hand at the Phone end of the band for a change. However, he intends to wait and see how conditions pick up in the Spring.

As his retirement is coming up, and he has been trying to sell his house in consequence, L. A. S. Poole (*Winchmore Hill*) has not been too active. There is still the question of whether to take R.A.E. this year or to leave it till next after all the moving is completed, so that in the absence of power, reader Poole has plenty of time for study.

Three queried prefixes in the list from S. Eldridge were all found to be good ones, so his total goes up to 554, all found during the little spare time taken off from

learning the Morse Code. Reader Eldridge wants to know if J.C. himself collects prefixes and if so what his score is! As a matter of fact your conductor has been collecting prefixes for years, but has never got around to counting them all up; but one would hazard a guess that the sum is at the four-figure mark.

The filing system of *L. Craven (Alvechurch)* uses half-postcards, and is not geared to the idea of an all-time list and a separate 1974 list—so having got to 499 in the 1973 table, he intends to go straight on to the All-Time with his next entry.

Changing one's listening times is a good thing, says *A. West (Herne Hill)* who tried a couple of hours in the morning from 0730-0930 with some good results but did rather better when he went to 2330-0130 on Eighty; this had to come to a stop once the holiday was over as being incompatible with college studies!

H. M. Graham (Harefield) found his only new one on an otherwise barren Fifteen in the shape of YS1MAS, but otherwise it was a rather bread-and-butter month on the bands—lots of promise for the future but little actual DX! Still, philosophises Maurice, that's half the fun, hoping to catch the new one.

A. May (Bromsgrove) sends in his final entry for the 1973 Table and reckons it will be about July by the time he makes up the required number to get a start on the 1974 Ladder!

It gets more difficult to find new prefixes when the bands are poor and you are getting older, avers *H. Alford (Burnham-on-Sea)* who claims that is the main reason for a "nil" entry this time—however, we would suspect that it is a question of an already high score and the bands being flat when H.A. was on.

Although the receiver is not very far from the fire, the fire pulled hardest for *R. Carter (Blackburn)* during this winter season. However, Ben doesn't miss much of what goes on—in fact, he netted another 19 prefixes.

An urge to get back on Top Band came upon *D. J. A. Noakes (Cranbrook)* by the acquisition of an EA-12. The stringing up of a bit of wire took only a little while, and Sam was back on the band where he started out. His first reaction was along the lines of "Ain't it noisy!" but after a while he came to the conclusion that there is a surprising amount of activity in between the assorted clonks, carriers and buzzes that afflict the 160-metre band.

H. A. Londesborough (Swanland) made no comment this time saving to query the DL50 and DA20 prefixes heard by almost everyone—these were, as surmised, special-activity stations in Germany.

J. Fitzgerald (Gt. Missenden) is still plodding away with the CW classes, though held up by the fact that as yet the class as a whole has not yet come up to the speed John already has, slow though it may be. Nonetheless, it will come in time and with application.

C. K. A. Verstage (Old Basing) has managed to come by an RA-17 receiver and is now putting it through its paces, albeit not as much as he would like because of other commitments of one sort and another. His Rx station now covers all bands from 1.8 MHz right up to 430 MHz with the recent acquisition of a converter for the latter band. Nice going—shall we soon have to introduce VHF ladders?

HPX RULES

- (1) The object is to hear and log as many *prefixes* as possible; a prefix can only count once for any list, whatever band it is heard on.
- (2) The /M and /MM suffixes create a new series; thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.
- (3) Where a suffix determines a *location* the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE2UJ/P/SU, they are arbitrarily counted as SU1 and SU2 respectively, and the same holds good for similar callsigns.
- (4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 both count.
- (5) The object is to hear *prefixes*, not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.
- (6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate callsigns will not be credited, nor may any MARS stations be claimed.
- (7) G2, G3, G4, etc., all count separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, WB2, WC2, WN2, all count separately, even though they may be in the same street.
- (8) Send your HPX list, in alphabetical and numerical order showing the total claimed score. With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, if possible to arrive before the SWL deadline for that particular month.
- (9) Failure to report for two consecutive listings, i.e. four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.
- (10) Starting score 200. Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.
- (11) Lists will be based on those shown in the current SHORT WAVE MAGAZINE list of Countries and Prefixes, dated September 1973, and with the current edition of the *DX Zone Map*.

Handy little point from *S. Foster (Lincoln)* who has recently put up an 18AVQ in the back garden. Stew was at a loss how to get the coaxial feeder into the shack without drilling holes in glasswork or windowframes; the solution was to carry the coax feeder through the cistern overflow pipe, and then tidily run it round corners to the shack!

The Ladders

It will be recalled that last time we said this issue would carry the final showing of the 1973 Table; this means that *next* time your entries will either be into the

All-Time or into a new 1974 list, the starting date for which was January 1, 1974.

In future—please be it be noted—the Annual will be strictly annual and there will be no transfer of 500+ scores to the All-Time. The idea of this is to see what it is actually possible to achieve in the way of total prefixes heard in the course of a twelvemonth. All-Time scores should be put in separately.

For convenience, the HPX Rules are re-printed in this piece.

Now The Others

As ever, there are some who prefer just to put in an entry for the Table, and we here acknowledge their contributions to the proceedings; *J. Searle-Page* (Swinbrook); *C. B. Wood* (Stafford); *W. McFaul* (Londonderry); *M. Rodgers* (Harwood); *R. Shilvock* (Lye); *D. Johnson* (Clitheroe); *M. Hartley* (Preston); *W. H. Smyth* (Hartlepool); *M. Eccles* (Lancaster); *E. W.*

Robinson (Bury St. Edmunds); *M. J. Quinton* (Wotton-u-Edge); the *Binghams* (Carrickfergus); *M. Cuckoo* (Herne Bay); *G. Ridgway* (Darlington); *J. Gravell* (Burry Port); *W. B. Taunton* (Meopham); *T. Rootsey* (Ilford); and *B. F. Hughes* (Worcester).

Close-down

As this finale is being written, it seems unlikely we will be in any better a situation as far as all-week working goes; this being the case, we would ask you to get your offerings off as soon as you can, even if you think you may have missed the deadline—we may still be working later in the month, and if in fact you do miss the bus, your letter will be covered in the following piece. So, your deadline for next time must be **immediate**, with your first entry for the 1974 Table, addressed as ever to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ. Thanks!

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.

CHANGE OF ADDRESS

G2BXZ, K. Hinch, 12 Main Street, Willerby, Hull, HU10 6BU.

G2BY, H. E. Whatley, 56 Stenbury View, Wroxall, Ventnor, Isle of Wight, PO38 3DD.

G2CVY, W. H. J. Yeo, Eberly House, Newport Road, Barnstaple, N. Devon, EX32 9BW. (Tel. Barnstaple 3355.)

G3KDP, A. G. Bounds, Amberley, 70 Mount Pleasant Road, Camborne, Cornwall.

G3LZV, C. A. Berry, 9 Cripps Close, Aylesham, Canterbury, Kent.

G3MCY, G. C. Moore, c/o Highfield Farm, Glentham, Lincoln. (Overseas).

GM3NZI, Dr. B. G. Taylor (HB9ANY), N. P. Division, Cern, 1211 Geneva 23, Switzerland.

G3OGY, S. H. Andrews, 5 Beech Copse, Teg Down, Winchester, Hants.

G3PDK, G. J. Newnham, 45 Dartmouth Hill, Greenwich, London, S.E.10. (Tel. 01-692 0615.)

G3PVH, D. J. Sumner, Rozel, Andrews Road, Southwater, Horsham, Sussex, RH13 7EU.

GW3TWA, E. W. Humphreys, Tan-Y-Ffordd, Bethel, Caernarvon.

G3UUZ, H. Bluer, 1 Trinity Cottages, St. Mary's, Isles of Scilly.

G4CJH, M. J. Roche, 87 Barberrly Avenue, Davis Estate, Chatham, Kent.

G4COD, P. E. J. Parker-Jones, A.R.I.B.A., Hillside, 17 Ridgebourne Road, Shrewsbury, Salop., SY3 9AA.

G4CQK, A. Allnutt, 18 Crofton Avenue, Walton-on-Thames, Surrey, KT12 3DB.

G4CSA, F. F. Whitehead, Tarnhows, 91 Blackpool Road, Ansdell, Lytham St. Annes, Lancs. (Tel. Lytham 7680.)

G14CSO, J. McCormack (ex-G18GTX), 17 Victoria Avenue, Newtownards, Co. Down, BT23 3ED, Northern Ireland.

G4CTR, R. P. Morris, 188 Sandbanks Road, Lilliput, Poole, Dorset, BH14 8EN.

G4CUN, T. C. Berryman, Hawfield, Threemilestone, Truro, Cornwall, TR3 6BU. (Tel. Threewaters 622.)

G4CUO, D. W. Rowan (ex-G8CUO), 13 Fleming Drive, Newark, Notts., NG24 2BA.

G4CUQ, B. R. Hughes (ex-G8HEP), 46 Leinster Gardens, London, W2 3AT. (Tel. 01-723 2562.)

GM4CUX, G. R. Winchester, 25 Bruntsfield Avenue, Edinburgh, EH10 4EN.

GW5BCD, G. C. Moates, Greenfields, Marford Hill, Marford, Wrexham, Denbighs.

G8GGN, R. V. Yorke, 12 Derby Road, Borrowwash, Derbyshire. (Tel. Derby 62380.)

G8HVR, W. J. Jackson, 10 North Avenue, Stafford, Staffs., ST16 1NP.

G8HZT, R. Tandy, 13 Edith Road, London, S.E.25.

G18IDB, G. Alford, 57 Sunnyhill Park, Dunmurray, Belfast, BT17 0PY. (Tel. Dunmurray 3552.)

G8IDP, G. R. Eddowes, 3 Albion Way, Hoveton, Norwich, Norfolk, NOR.06-Z.

G8IEU, C. Guy, 34 Kings Crescent, Boston, Lincs., PE21 0AP. (Tel. 0205 4362.)

G8IHT, S. B. Chambers, 7 Mowbray Road, Northallerton, Yorkshire, DL6 1QT. (Tel. Northallerton 3380.)

G8IJS, R. J. Sayer, 5 The Laurels, Bletchley, Milton Keynes, MK1 1BL. (Tel. Milton Keynes 75786.)

G8IKY, B. Callaway, 81 Irene Avenue, Lancing, Sussex, BN15 9NY. (Tel. Lancing 62134.)

G8ILA, P. J. Freeman, 1 Littleworth, Greens Norton, Towcester, Northants. (Tel. Towcester 50632.)

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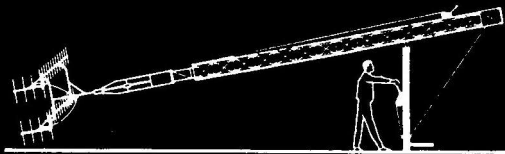
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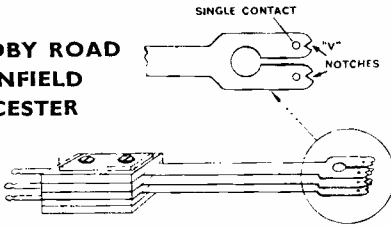
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TRANSISTOR PSU CAPACITORS 1650 + 1650 MFD at 63vw common negative, 40p each.

SMOOTHING CAPACITORS 700 MFD at 200vw, ideal to put in series for high voltage PSU can type, 20p each or 10 for £1.35 (all new and unused).

PACK DRILLED PC BOARDS these were made for a cancelled project and are ideal for mock ups, etc., 1½" x 4", some available 5½" long, only in packs of 25 at 25p per pack.

SLIDESWITCHES 2 pole change over, small type new, 12p each.

HC6/U PLUG IN CRYSTAL OVENS 80 deg. C, 6/12 volt with base, new, unused, 35p each.

EDDYSTONE KNOBS. ½" dia. ¼" spindle fitting (black), 10p each, 6 for 50p.

CRYSTAL FILTERS 21.4 MHz type TQF-3806 no gen., unused, £1.75 each.

B9A CERAMIC VALVE BASES, 8p each, 10 for 55p.

HI-FI SPEAKER CABINETS manufacturers seconds rejected for slight faults but perfectly usable, in most of these you would not see the fault, three types —

No. 1. 7½" x 16½" x 8½" to take 8 x 5" elliptical speaker, teak veneered, £2.75 each + 50p post.

No. 2. 17" x 10" x 7½" to take 8" round and 3½" tweeter teak veneered £3.00 each (buyer to collect by arrangement).

No. 3. 12" x 21" x 10½" to take 13 x 8" elliptical and 3½" tweeter teak veneered, £4.50 each, £8.00 pair (buyer to collect by arrangement).

BULK TRADE ENQUIRIES WELCOME ON THE ABOVE CABINETS.

LABGEAR TOPBANDER TRANSMITTER mains input 10 watts RF output on top band in excellent, original condition, £25.00 (buyer to collect by arrangement).

MAGNETIC TAPE READER made by UNIT DATA LTD., model No. 901, 9 tracks, as new condition. Untested but deck works OK (we have no way of checking the electronics). Reasonable offers, buyer to collect by arrangement.

TRANSISTOR DISC CERAMIC CAPACITORS (50vw).

3.9pf	68pf	220pf	680pf	4700pf
18pf	82pf	270pf	820pf	6800pf
22pf	100pf	330pf	1000pf	0.01mfd
33pf	120pf	390pf	1500pf	0.015mfd
47pf	150pf	470pf	2200pf	0.022mfd
56pf	180pf	560pf	3300pf	0.033mfd

PRICES: —22 to 1000pf = 18p for 10;
1500pf to 0.015mfd = 23p for 10;
0.015 to 0.033mfd, 28p for 10; or all above
less than 10, 3p each.

METALIZED FILM CAPACITORS

0.01 mfd 250vw (small rectangular type), 5p each, 40p for 10.

0.1mfd 250vw (small rectangular type), 5p each, 40p for 10.

0.22mfd 100vw (MULLARD), 5p each.

0.1mfd 10vw (MULLARD), 5p each.

2.2mfd 100vw (MULLARD) 10p each.

RESISTORS (carbon film) ½, ¼ and ⅓ watt types, 22 ohm to 1 megohm in E12 series, i.e. 1, 1.2, 1.8, 2.2, 2.7, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2, 10k. Prices: ½ and ¼ watt, 1p each; ⅓ watt, 2 for 2½p (All 5% tol.).

1000pf 500vw feed through capacitors, solder in type, ⅓" dia., 2p each; 18p for 10.

RADIOTELEPHONE 10.7 MHz CRYSTAL MARKER

OSCILLATOR solid state and built into die cast box 3½" x 1½" x 1½" high stability with voltage and temperature variations fibre-glass PC board and built-in battery, guaranteed 6 months with free calibration service to 12 months, brand new, our own make, £8.00 (VAT paid) + 20p post. Trade enquiries welcomed for quantity.

59 WAVERLEY ROAD, THE KENT, RUGBY, WARKS.

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