

The SHORT WAVE Magazine

VOL. XXVII

JANUARY, 1970

NUMBER 11

Introducing the new Eddystone EC10 Mk II



New for the 70's. The EC10 Mk II Transistorised Communications Receiver. This is in fact a de-luxe version of the world renowned EC10 which continues unchanged. The principal features of the new Mk II model are as follows:—

- Solid state design
- Wide application
- Fine tuning control
- 5 bands covering 30 MHz to 550 kHz with 1% calibration accuracy
- Standby switch
- Compact size (12½" x 6⅜" x 8")
- Integral speaker
- Carrier level meter
- Powered by 6 torch cells on type 924 power unit (A.C.)
- Guaranteed 10 years availability of spares
- All British design and manufacture

Send for full details today—see inside on pages 658 to 660 for name and address of your nearest Eddystone dealer where you may hear and inspect this outstanding receiver—the new EC10 Mk II—or in case of difficulties contact the main Eddystone distributors:—

Imhofs

112-116 NEW OXFORD ST.
LONDON WC1 01-636 7878

Who would like to wish you a happy new year with Eddystone

Announcing another world beater from

KW

THE NEW KW 2000B



SSB TRANSCEIVER: 180 watts P.E.P. 10-160
Metres complete with AC PSU, VOX,
P.T.T., I.R.T./I.T.T.

plus the usual KW Quality and Reliability

- TWO-SPEED VFO DRIVE
- IMPROVED VFO READ-OUT
- NEW, PRECISE METERING
- ATTRACTIVE PANEL LAYOUT

Other KW Products:
KW Antenna Switch
(3 position), KW E-Z
Antenna Match Unit, KW
PEP Meter, KW Match SWR
Indicator, KW Low-Pass
Filters, KW Trap Dipoles,
KW Dummy Load, KW
Q Multipliers



Write for illustrated detailed specifications on the KW 2000B; KW Atlanta; KW Vespa Mk II; KW 201; KW 1000 and our list of KW Tested Trade-ins.

K. W. ELECTRONICS LTD

1 HEATH STREET, DARTFORD, KENT

TEL: DARTFORD 25574 CABLES: KAYDOUBLEW DARTFORD

OUR BEST WISHES TO ALL
FOR A HAPPY NEW YEAR

LOWE ELECTRONICS

Wellington Street
Matlock
Derbyshire
Matlock 2817 (2430 after 6)
Bill G3UBO

4 Southwick Street
Southwick
Brighton
Southwick 4887
Alan G3MME

19 Ellismuir Road
Baillieston
Nr. Glasgow
No phone yet
Sim GM3SAN

Just to remind you that if you intend flinging your hard-earned bread away on Amateur Radio in 1970, you can do a lot worse than fling it in our direction. We seem to have acquired a pretty fair old reputation for honest dealing and we do believe that what we sell is the best value for money on the market. To refresh your memory, we generally have the following in stock :-

AERIALS : The popular Tavas whip, 160-10m., **£12 10s.**

AMPLIFIERS : Sommerkamp FL-2000, 1200W., **£110**

AMMETERS : 5 mA, 2 $\frac{3}{8}$ " sq., **30/-**.

CAPACITORS ; CHOKES ; COILS.

CONNECTORS : Belling Lee, UHF, and "C" type.

CONVERTERS : 15m., 10m. and the Emsac 2m. (which they tell me is pretty good).

CRYSTALS : CRYSTAL CALIBRATORS : 100 kHz transistor. Mounted on P.C. board. Require 6 to 12 volts d.c. Very accurate xtal free from spurious, **£3 10s.**

CW MONITORS : Katsumi with high speed keying relay, **£7 15s.**

FILTERS : 9 MHz, KVG, 3.75 kHz AM, 2.4 kHz SSB and 500 Hz CW.

FILTERS : 455 kHz Kokusai 5 kHz AM, 2.4 kHz SSB and 800 Hz CW.

FILTERS : Medco L.P. and Medco H.P. In an awful lot of cases a Medco H.P. filter at **27/6** fitted at the T.V. set cures the T.V.I. trouble—I recommend trying this first before buying a more expensive L.P. filter. Try them on a "sale-or-return" basis.

G.D.O.'s : We stock the Tech TE18 valve type, **£11 10s.**

GROMMETS : HEADSETS : Our low impedance padded job, **£2 2s. 6d.**

KNOBS : AR88 type 1-3" dia., **1/3** ; 1-6" dia., **1/6**.

MICROPHONES : Teisco PTT dynamic, **£2 15s.**

MORSE KEYS : Ball bearing, small, brass type, **18/6**.

MORSE BUZZERS : Horrible note, but not a bad key for beginners, **7/6**.

MORSE KEYERS : Katsumi EX-9X, **£7 15s.**

POWER SUPPLIES : Regulated low voltage from **£5 10s.** up to **£30**.

RECEIVERS : Sommerkamp FR-500, **£168**. Inoue IC-700R, **£85**.

RESISTORS ; SIGNAL GENERATORS (Note we have TF144 thermocouples at **£1** complete with installation instructions.)

SPEECH COMPRESSORS : Katsumi, **£7 15s.**

SWITCHES ; SWR INDICATORS : Hansen, **£3 10s.**

TRANSCEIVERS : Sommerkamp FT-150, **£215** ; FT-250, **£160** (p.s.u. now in stock, **£45**) ; FT-500, **£250** ; FT-500 plus CW filter, **£270**. Inoue IC-700, **£180**. National 200, **£145**.

TRANSFORMERS :

TRANSMITTERS : Sommerkamp FL-500, **£145**.

VALVE VOLTMETERS : Tech TE65 complete with r.f. probe, **£16 10s.**

In the second-hand line, we usually have an excellent selection of tested and recommended gear. Jealous of our reputation, we do not accept stinkers or rubbish in part exchange, so you may rest assured you'll not get sold a pup.

Service We give the best, because we employ the best, and in the case of electronic gear, anything less than the best is false economy. Having just expanded the Service Department, we are not yet snowed under with work, and so can offer a very speedy service.

A large S.A.E. will get you guff on any of the above which grabs you.

73 de Bill

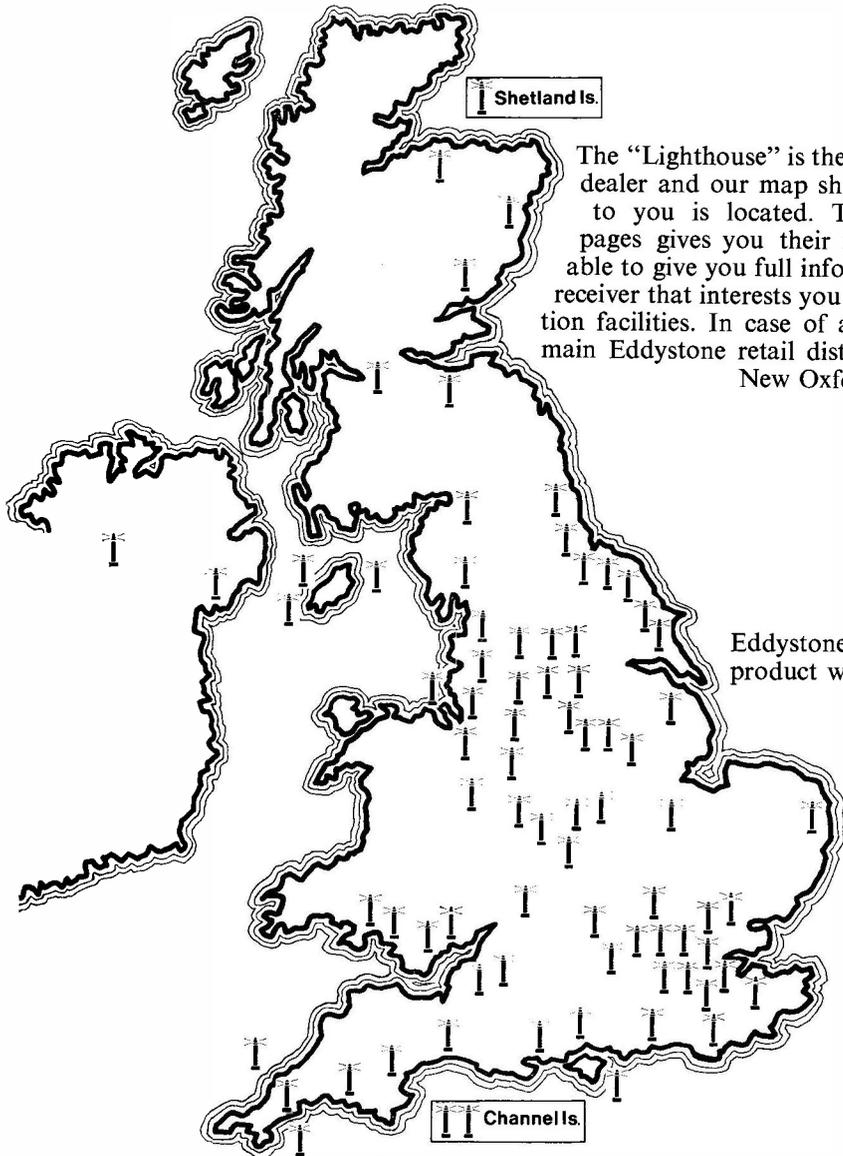
VE8DP/G3UBO.

P.S. We have just got a load of enamelled copper wire from 44 s.w.g. to 16 s.w.g. Write for dope.

P.P.S. FT-500 owners—want a simple C.W. mod.? Drop me a line whether you bought your rig from me or not.

Lowe Electronics have to announce with deep regret the death of Vic Newport G3CHW,
12 December, 1969.

where is your nearest lighthouse?



The "Lighthouse" is the symbol of your Eddystone dealer and our map shows where the nearest one to you is located. The list on the following pages gives you their full address. They are all able to give you full information on any Eddystone receiver that interests you and most have demonstration facilities. In case of any difficulties contact the main Eddystone retail distributors—Imhofs, 112-116 New Oxford Street, London W.C.1.

Eddystone receivers are an all British product with a guaranteed ten years availability of spares

THERE IS AN EDDYSTONE COMMUNICATIONS RECEIVER FOR ANY FREQUENCY BETWEEN 10 kHz and 870 MHz
—full details from your local Eddystone dealer.

Your local Eddystone dealer is:

BEDFORDSHIRE

Coventry Radio Ltd
189-191 Dunstable Road
Luton, Beds.
Luton 28201/2

BERKSHIRE

Loving Brothers
76 Kings Road, Reading
Reading 55449

CHANNEL ISLANDS

F. T. Bennett Ltd
13 The Arcade, Guernsey
Guernsey 0481-21137

Regent Radio Ltd
20 Beresford Street
St. Helier, Jersey
Central 30271-2

CHESHIRE

James McKenzie Ltd
21/29 Grange Road West
Birkenhead-Wirral
051-652 4833

Lloyd and Wylie
42 Bridge Street
Chester 26704

The Transistor Centre
(Wilmslow) Ltd
Green Lane
Wilmslow 24766

CORNWALL

S. R. Gear (Falmouth) Ltd
The Moor, Falmouth
Falmouth 312321

R. V. Heming Ltd
Cliff Road, Newquay
Newquay 2191

S.S.B Products
7 Little Castle Street
Truro
Feock 575

COUNTY DURHAM

The Specialist Radio Shop
Regent Buildings
58 Park Road, Hartlepool
Hartlepool 67961

CUMBERLAND

Misons
3 and 4 Citadel Row, Carlisle
Carlisle 22620

DERBYSHIRE

J. & A. Tweedy (Electronic
Supplies) Ltd
64 Lordsmill Street
Chesterfield
Chesterfield 4982

R.S.C. (Hi-Fi Centres) Ltd
26 Osmaston Road, The Spot
Derby 41361

DEVON

Graham Newbery
(Reg Ward G2 BSW) Axminster
Axminster 3163

D. O. H. Coles Ltd
13 Courtenay Street
Newton Abbot
Newton Abbot 3155

Tom Molland Ltd
110 Cornwall Street, Plymouth
Plymouth 69285

ESSEX

F. E. Smith
184 Moulsham Street
Chelmsford
Chelmsford 54594

Unique Radio Ltd
6 The Facade, High Road
Goodmayes, Ilford
01-590 8277

GLOUCESTERSHIRE

Audio-Bristol
Park Street Avenue, Bristol 1
Bristol 21931

Ray Electrical
(Cheltenham) Ltd
287 High Street
Cheltenham GL50 3HL
Cheltenham 22317

HAMPSHIRE

Wireless Supplies Unlimited
264-266 Old Christchurch Road
Bournemouth
Bournemouth 24567

Southern Marine Radio
(Southampton) Ltd
Solent House, Town Quay
Town Quay 22721

ISLE OF MAN

Peake & Hall
Michael Street, Peel
Peel 397

Peake & Hall
Church Road, Port Erin
Port Erin 2173

Electronics Ltd
Albert Road, Ramsey
Ramsey 2491

ISLE OF WIGHT

Sherratt & Son
81-82-83 High Street, Newport
Newport 3358-9

KENT

G. T. & R. Wilson
12-14-16 Queen Street
Gravesend
Gravesend 63527/8

Radio-Vision Service
2 Friary Precinct
High Street, Strood
Medway 79986

Percy Powell Radio Ltd
54 High Street
Tunbridge Wells
Tunbridge Wells 26534

LANCASHIRE

Imperial Battery Service
25 Bath Street, Colne
Colne 121

Lamberts (Lancaster) Ltd
6 Rosemary Lane
Lancaster
Lancaster 64012

Stephens-James Ltd
70 Priory Road, Anfield
Liverpool L4 2RZ
051-263 7829

N.W. Electrics
52 Great Ancoats Street
Manchester M4 5AB
061-236 6276

Croffilm Ltd
46 Friargate
Preston PR1 2AF
Preston 55244

LEICESTERSHIRE

A. K. Davey Ltd
New Street, Hinkley
Hinkley 2173 and 4288

S. May (Leicester) Ltd
12-14 Churchgate
City Centre
Leicester
Leicester 58662

R.S.C. (Hi-Fi Centres) Ltd.
32 High Street, Leicester
Leicester 56420

LINCOLNSHIRE

Cosalt Ltd
Marine Radio Division
Fish Dock Road, Grimsby
Grimsby 58881

LONDON

Imhofs (Retail) Ltd
112-116 New Oxford Street
W.C.1
01-636 7878

R. T. & I. Electronics Ltd
Ashville Old Hall
Ashville Road
Leytonstone, E.11
01-539 4986

MIDDLESEX

Odeon Radio
146 College Road, Harrow
01-427 5778

Gurney's Radio Ltd
91 The Broadway, Southall
01-574 2115

MONMOUTHSHIRE

K. F. Paull Ltd
14 Dock Street, Newport
Newport 67007

NORFOLK

The Record Shop
157 King Street
Great Yarmouth

NORTHANTS

Cotton T.V. Service Ltd
8-10 Broadway, Peterborough
Peterborough 67682

NORTHERN IRELAND

Frank Rea Company Ltd
24 Chichester Street
Belfast
Belfast 20822

Boylan Electronics
Warrenpoint, Co. Down
Co. Down 3262

John F. MacMahon
10 Church Street, Enniskillen
Enniskillen 2955 & 2469

NORTHUMBERLAND

Aitken Bros. & Company
35 High Bridge
Newcastle upon Tyne NE1 1EW
Newcastle upon Tyne 26729

Payne & Hornsby Ltd
3 Andrews House
Gallow Gate
Newcastle upon Tyne NE1 4SN
Newcastle upon Tyne 24604

NOTTINGHAMSHIRE

George Francis
93 Balderton Street
Newark
Newark 4733

OXFORDSHIRE

Westwoods
46 George Street, Oxford
Oxford 47783

SCOTLAND

L. Hardie
542 George Street
Aberdeen
Aberdeen 20113

Larg & Sons (Dundee) Ltd
16-24 Whitehall Street
Dundee
Dundee 26061/2/3

Bruntsfield Radio Co Ltd
14a Home Street
Tollcross, Edinburgh
677-3523

R.S.C. (Hi-Fi Centres) Ltd
326 Argyle Street, Glasgow
City 4158

W. K. Conochie Ltd
74 Commercial Street
Lerwick, Shetland
Lerwick 67

John Munro
26 Seatoun, Lossiemouth
Lossiemouth 2340

SHROPSHIRE

Medlicott Brothers
53 Mardol, Shrewsbury
Shrewsbury 3060

SOMERSET

Ryland Huntley & Company
15 Old Bond Street, Bath
Bath 4332

STAFFORDSHIRE

Worthington Brothers
(Newcastle Staffs) Ltd
Liverpool Road and Lyme Street
Newcastle
Newcastle 67636

Fenwicks (of Wolverhampton)
Pitt Street, Wolverhampton
Wolverhampton 24607

SURREY

Watts Radio Ltd
8 Apple Market
Kingston-upon-Thames
Kingston 4099

Home Radio (Components) Ltd
240 London Road
Mitcham CR4 3HD
648-8422

SUSSEX

Leonard Booth
35 South Street, Eastbourne
Eastbourne 31755

Cosh and Hammond
29 Beach Road, Littlehampton
Littlehampton 4477 or 4478

Eddystone dealers (cont.)

TEESSIDE

R.S.C. (Hi-Fi Centres) Ltd
106 Newport Road
Middlesbrough
Middlesbrough 47096

McKenna & Brown Ltd
135 High Street, Redcar
Redcar 3829

WALES

P & D Electrical Services Ltd
35/36 Mount Stuart Square
Cardiff
Cardiff 26144

Derrick's
11 Talbot Street &
13 Church Street
Port Talbot
Port Talbot 3355

Holt High Fidelity
Picton Arcade, Swansea
Swansea 53254

Holt High Fidelity
8 Portland Street, Swansea
Swansea 41032

WARWICKSHIRE

Chas. H. Young Ltd
170/172 Corporation Street
Birmingham 4
021-236 1635

W. G. E. Blackmore
12 Lower Ford Street
Coventry
Coventry 21243

WESTMORLAND

Lakeland Electric Ltd
Lake Road, Windermere
Windermere 2323/4

YORKSHIRE

Greens Radio & T.V.
Maintenance Unit
96 Shambles Street
Barnsley
Barnsley 5031

R.S.C. (Hi-Fi Centres) Ltd
10 North Parade
Bradford
Bradford 25349

John Dale (Sound & Vision)
8 Bradford Road
Cleckheaton
Cleckheaton 2620

Radio Craft (Huddersfield) Ltd.
38 King Street, Huddersfield
Huddersfield 20049

Short Wave (Hull)
24a Newland Avenue
Hull, HU5 3AF
Hull 408953

R.S.C. (Hi-Fi Centres) Ltd
5-7 County (Mecca) Arcade
Briggate
Leeds
Leeds 28252

Vallances
Arndale House, Market Street
Bradford
Bradford 31596

Vallances
Headrow House
The Headrow, Leeds
Leeds 33213

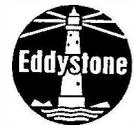
Vallances
20 New Market Street
Corn Exchange, Leeds
Leeds 36831

Derwent Radio
28 Hillcrest Avenue
Scarborough
Scarborough 63982

Philip Cann Ltd
Chapel Walk, Fargate
Sheffield S1 1GJ
Sheffield 29225/6

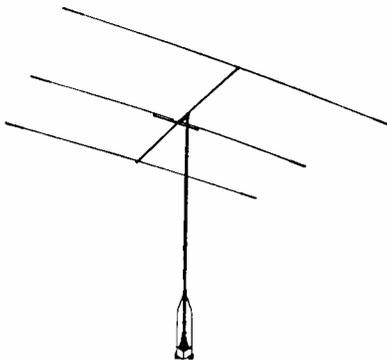
R.S.C. (Hi-Fi Centres) Ltd
13 Exchange Street, Sheffield
Sheffield 20716

R. A. Coates
5 Bridge Street, Whitby
Whitby 2622



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MASTER**



ELAN

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WHY BUY IMPORTED EXPENSIVE TYPES—
**BACK BRITAIN—BUY ANTENNA'S
MANUFACTURED 100% IN ENGLAND**

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ELAN
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TA-32 Jr.
TA-31 Jr.
V-3 Jr.
VTD-3 Jr.
TD-3 Jr.

DI-2
SWL-7
RD-5
A-315
A-215
A-310
A-210
TW-3X

Imported Antenna's

Classic-33	RV-4
A-203-C	Lancer Mobile
TA-36	A-92-S
TA-33 Snr.	TD-2
TA-32 Snr.	DI-10
V-4-6	R4-4RK

**Rotators, Towers, Polythene cord and rope, Coax cable,
Control cable, Twin feeder and many more Antenna
accessories.**

Provides outstanding performance on 10 and 15 metres, coupled with light weight (17 lb.). All Alloy and stainless steel construction, exceptional broad band tuning, exclusive trap design, single coax feed point. Power rating 300 watts AM/CW, 600 watts p.e.p. SSB input to final. Forward gain up to 8dB. Maximum element length 20ft. 3in. Boom length 12ft.

Send for **HANDBOOK/CATALOGUE** containing full details and prices of Antenna and technical information, 2/6 refundable on purchase of an Antenna.



V-3 Jr.

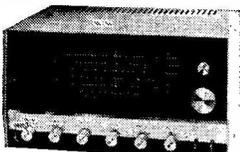
Regret increase in Antennae prices from November 1969. New price list on request.

Carriage and Insurance Extra

Telephone: Costessey 2861, orders only

Mosley Electronics Ltd. 40, Valley Road, New Costessey, Norwich, Norfolk Nor. 26K

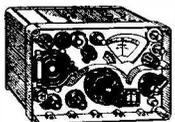
LAFAYETTE HA.800 SOLID STATE AMATEUR COMMUNICATION RECEIVER SIX BANDS 3.5-4, 7-7.3, 14-14.35, 21-45, 28-29.7, 50-54 Mc/s.



Dual conversion on all bands. 2 x 455 Kc/s. mechanical filters. Product detector. Variable B.F.O. 100 Kc/s. crystal calibrator. "S" meter. Huge slide rule dial. Operation 230v. AC or 12v. DC. Size 15" x 9 1/2" x 8 1/2". Complete with instruction manual, £57/10/-. Carr. paid (100 Kc/s. Crystal 39/6 extra).

TRIO TS 510 AMATEUR TRANSCEIVER with speaker and mains P.S.U., £12.
TRIO JR310 AMATEUR BAND 10-80 Metre Receiver, £77/10/-.

R209 Mk. II COMMUNICATION RECEIVER



11 valve high grade communication receiver suitable for tropical use. 1-20 Mc/s. on 4 bands.

AM/CW/FM operation. Incorporates precision vernier drive, B.F.O. Aerial trimmer, internal speaker and 12v. D.C. internal power supply. Supplied in excellent condition, fully tested and checked, £15. Carr. 20/-.

HAMGEAR PRESELECTORS mains operated 1.5-30 Mc/s., £7/10/-. P. and P. 4/-.

AR88 MAINS TRANSFORMERS Brand new, boxed, 59/6. P.P. 5/-.

ADMIRALTY B.40 RECEIVERS

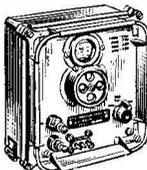


High quality 10 valve receiver manufactured by Murphy. Five bands 650 Kc/s.-30 Mc/s. I/F 500 Kc/s. Incorporates 2 RF and 3 IF stages, band pass filter, noise limiter, crystal controlled B.F.O. calibrator, I.F. output, etc. Built-in speaker, output for phone. Operation 150/230 volt A.C. Size 19 1/2" x 13 1/2" x 16 1/2". Weight 114 lbs. Offered in good working condition, £22/10/-. Carr. 30/-. With circuit diagram. Also available B41 L.F. version of above. 15 Kc/s.-700 Kc/s., £17/10/-. Carr. 30/-.

pass filter, noise limiter, crystal controlled B.F.O. calibrator, I.F. output, etc. Built-in speaker, output for phone. Operation 150/230 volt A.C. Size 19 1/2" x 13 1/2" x 16 1/2". Weight 114 lbs. Offered in good working condition, £22/10/-. Carr. 30/-. With circuit diagram. Also available B41 L.F. version of above. 15 Kc/s.-700 Kc/s., £17/10/-. Carr. 30/-.

DUMMY LOAD RESISTORS Carbon 30Ω 35w., 5/6. P.P. 1/6.

CRYSTAL CALIBRATOR No. 10

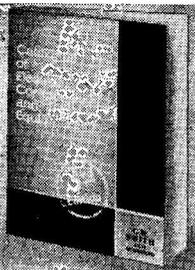


Small portable crystal controlled wavemeter. Size 7 x 7 1/4 x 4 1/2". Frequency range 500 Kc/s.-10 Mc/s. (up to 30 Mc/s. on harmonics). Calibrated dial. Power requirements 300v. DC, 15mA and 12v. DC 0.3A. Excellent condition, 89/6. Carr. 7/6.

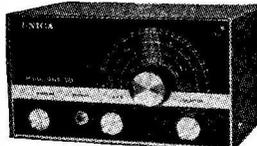
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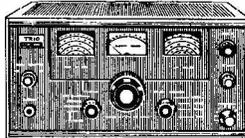


UNR-30. 4 BAND COMMUNICATION RECEIVER

Covering 550 Kc/s.-30 Mc/s. Incorporates variable BFO for CW/SSB reception. Built-in speaker and phone jack. Metal cabinet. Operation 220/240v. A.C., supplied brand new, guaranteed with instructions. £19/13/-. Carr. 7/6.

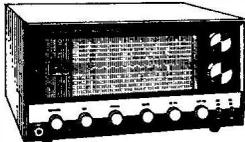
TRIO 9R-59DE

4 band covering 550 Kc/s. to 30 Mc/s. continuous and electrical bandspread on 10, 15, 20, 40, and 80 metres. 8 valve plus 7 diode circuit. 4/8 ohm output and phone jack. SSB-CW. ANL. Variable BFO. 5 meter. Sep. bandspread dial. IF frequency 455 Kc/s. audio output 1.5w. Variable RF and AF gain controls 115/250v. A.C. Size: 7" x 15" x 10" with instruction manual, £42. Carr. paid.



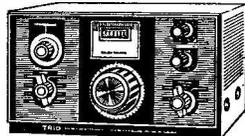
TRIO COMMUNICATION TYPE HEADPHONES. Normally £5/19/6, our price £3/15/- if purchased with receiver.

NEW LAFAYETTE SOLID STATE HA600 RECEIVER



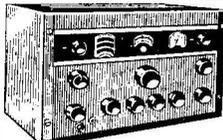
5 Band AM/CW/SSB amateur and short wave 50 Kc/s.-400 Kc/s. and 550 Kc/s.-30 Mc/s. F.E.T. front end. 2 Mechanical filters. H.E. Dial. Product detector. Crystal calibrator. Variable BFO. Noise limiter, S Meter. 24" Bandspread. 230v. A.C./12v. D.C. Neg. earth operation. RF gain control. Size: 15" x 9 1/2" x 8 1/2". Wt. 18 lbs. Exceptional value, £45. Carr. 10/-.

TRIO JR-500SE AMATEUR RECEIVER



Covers all the amateur bands in 7 separate ranges between 3.5 and 29.7 Mc/s. 7 valves, 2 transistors and 5 diodes plus 8 crystals: output 8 and 500 ohm and 5000 ohm phone jack. Crystal controlled oscillator. Variable BFO. VFO AVC ANL. S meter. SSB-CW Stand-by switch. special double gear dial drive with direct reading down to 1 kHz.

Remote control socket for connection to a transmitter. Audio output 1 watt. 115/250v. A.C. Mains. Superb modern styling. Size 7 x 13 x 10in. with instruction manual and service data, £69/10/-. Carriage paid.



RCA COMMUNICATIONS RECEIVERS AR88
Latest release by ministry BRAND NEW in original cases. 110-250v. A.C. operation. Frequency in 6 Bands. 535 Kc/s.-32 Mc/s. continuous output impedance 2.5-600 ohms. Incorporating crystal filter, noise limiter, variable BFO, variable selectivity, etc. Price: £87/10/-. Carr. £2.

CLEAR PLASTIC PANEL METERS

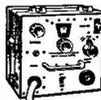


First grade quality. Moving Coil panel meters, available ex-stock, S.A.E. for illustrated leaflet. Discounts for quantity. Available as follows. Type MR. 38P. 1 21/32in. square fronts.

1-0-1mA	27/6	150mA	27/6	750v DC	27/6
2mA	27/6	200mA	27/6	15v AC	27/6
5mA	27/6	300mA	27/6	50v AC	27/6
10mA	27/6	500mA	27/6	150v AC	27/6
750mA	27/6	3v DC	27/6	300v AC	27/6
1 amp	27/6	10v DC	27/6	500v AC	27/6
50µA	40/-	200µA	35/-	2 amp	27/6
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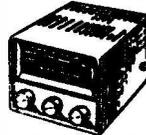


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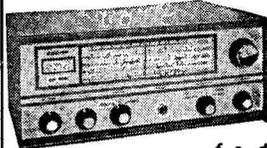
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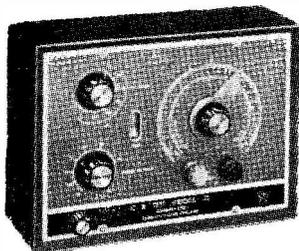
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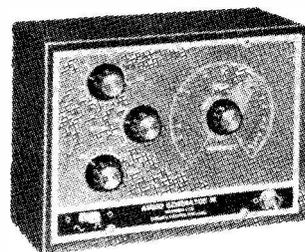
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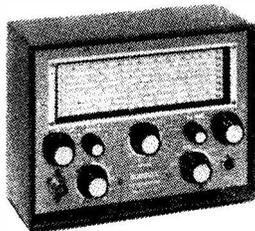
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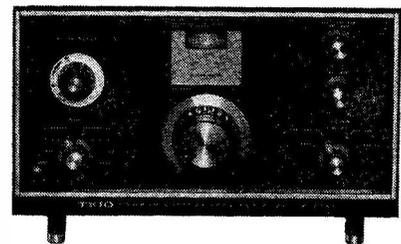
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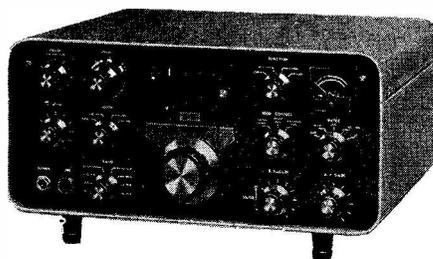
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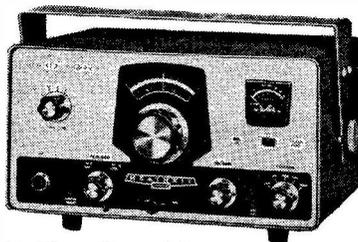
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(GB3SWM)

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JANUARY, 1970

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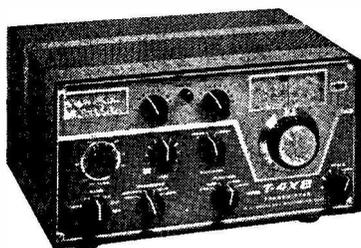


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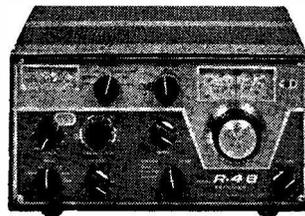
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The SHORT-WAVE Magazine

E D I T O R I A L

Situation *We are now at the peak of the season for activity on the amateur bands—whether we communicate across the parish or over the world. Top Band and VHF will be well populated, with (all being well) DX being found on the former and much local working taking place on the latter—for we cannot expect a lot in the way of EU/DX openings on two or four metres at this time of year, unless there are Auroral manifestations.*

But things are, perhaps, not so happy on the HF bands. From the point of view of the world beyond, there are—so we are told—not enough G's being heard in DX parts, and it is not the fault of conditions. It is said that as soon as TV opens up for the evening hours, U.K. activity on the HF/DX bands dies away.

This is understandable in urban conurbations, where 15 and 20 metres are obviously difficult in terms of local TVI, especially in those areas where the TV signal level is anyway marginal.

However, the fact remains that there is plenty of scope for late-evening and early-morning activity on the 40- and 80-metre bands, when they are full of DX—and (at this time of year) for day-time working on 15 and 20 metres for those who can be on before the evening hours, when TVI becomes the menace, lurking over the shoulder of any amateur surrounded by TV aerials.

This gloomy situation in the U.K. is not really understood at DX, where there is not much local TV in what we call the Band I frequency area—so the feeling tends to be that G's close down to watch TV! Well, some do—but the great majority would much rather be able to operate without having to worry about TVI.

It is a fact that many U.K. amateurs have overcome the problem—and much has been written about how it can be tackled. The first thing to do is to make sure one's own screen is clear. Then, if there are complaints from neighbours (often made anonymously and treated as confidential by the Radio Interference Dept.) it is a matter for the authorities to carry out an investigation and, if possible, to find a solution which, in most cases, they always try to do in the interests of all concerned.

★ ★ ★ ★

To all our readers, at home and overseas,

our trade friends and our supporters,

A Successful and Prosperous

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*Austin Forth,
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ONE-MAN FORTY-FOOT MAST AND BEAM ASSEMBLY

CONSTRUCTIONAL DETAILS

— LIGHT AND STRONG

— EASY TO HANDLE

R. V. MEACHEN (9H1R/G3WNZ)

THE need of a system whereby a three-element beam could be elevated to a height of 40 feet with the minimum of danger to neighbours and the antenna itself, and without having to press-gang an enormous work party into helping had long been felt at the QTH of 9H1R. However, in keeping with the usual principle of listing proposed modifications until something goes wrong and enforces remedial action, the opportunity never presented itself until March this year, when the rotator ground to a shuddering and permanent halt, with the beam in the opposite direction to the U.K., of course.

Upon subsequent inspection, it transpired that the drive ring in the CDR AR22 rotator had snapped in two places. This was the result of the wind and the fact that the existing home-made three-element three-band beam was far too heavy. It was a "plumber's delight" construction, using a 1-inch water pipe boom with welded cross pieces supporting three 6ft. 2 x 1 inch timbers which in turn supported the elements. It weighed 120 lbs.! True, it has stood up to 70 m.p.h. gusts for eight long years—but—Oh! what a job to raise and lower for routine maintenance, and what a strain on the rotator.

Having had five months to mull over the various plans for some means of elevating and lowering the beam more easily, preferably single-handed, the system described here was evolved and worked extremely well. Countless plans for crank-up and topping-lift-type towers were abandoned in the interests of simplicity. The specifications were broadly drawn up as follows:—

- (a) The beam itself had to be reduced in weight from 120 lbs. to approx. 25 lbs.,
- (b) It had to look acceptable aesthetically (no drooping elements, etc.),
- (c) It had to be capable of elevation up to 40ft. by one person and of being lowered again within seconds to allow ease of servicing and adjustments.
- (d) Access to the flat roof of the author's dwelling from the garden shack was needed to allow for the "forgotten tools" and obviate the danger of climbing through a bedroom window,
- (e) The rotator should be placed as *low* as

[cont'd p.672]



Impression of the 20 lb. Beam described by 9H1R, held aloft by the author prior to hoisting.

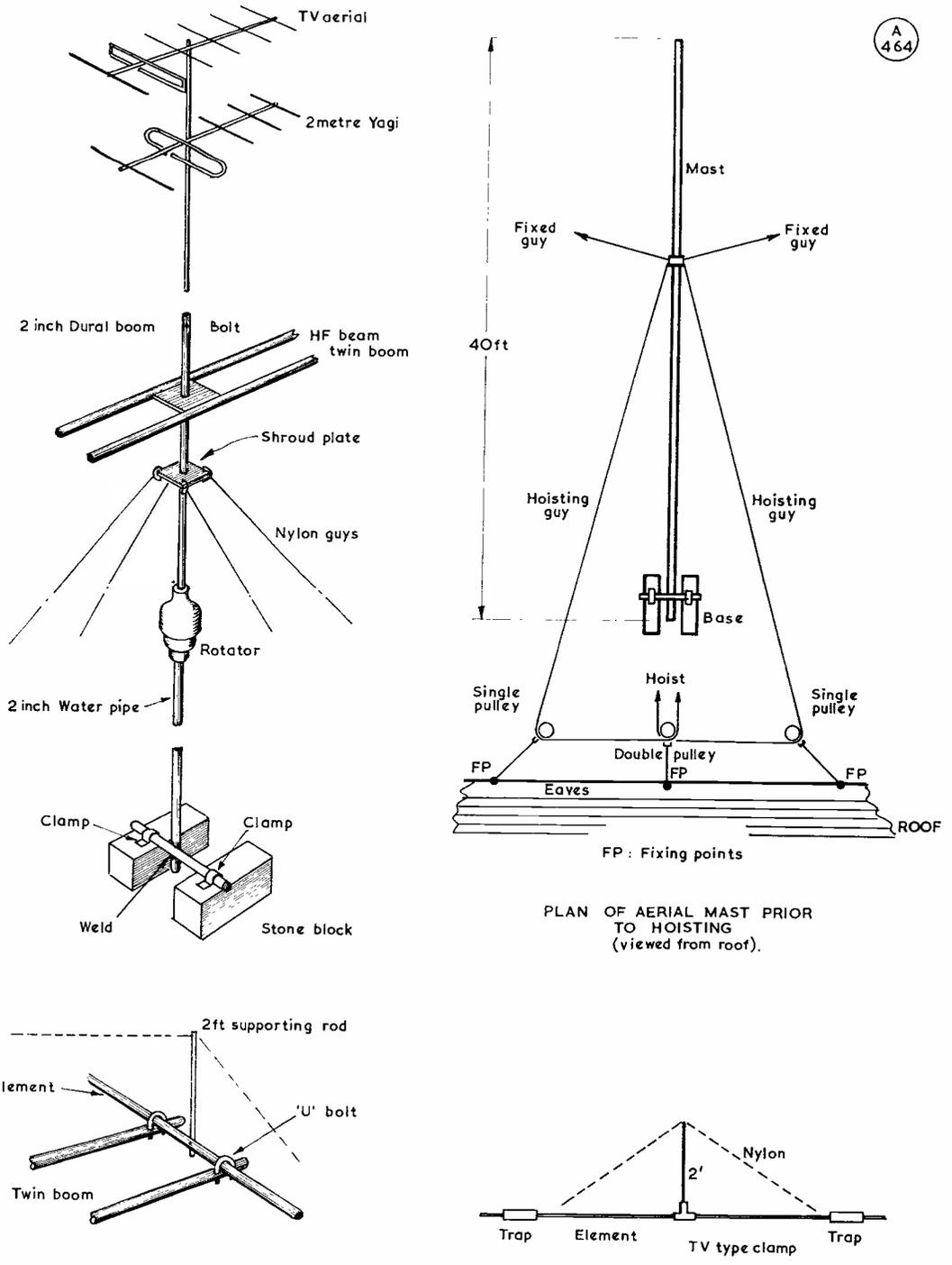


Fig. 1

Fig. 1. Showing main constructional details, and method of raising and lowering.

possible to reduce unwieldy top-weight.

(f) The whole assembly should also cater for the maximum number of uses.

With reference to the last item, the two-metre Yagi and the domestic TV aerials were stacked six feet above the HF beam assembly so the rotator performed three jobs as did the mast.

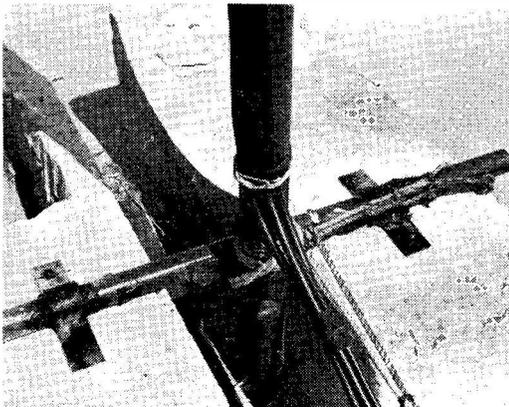
The repaired rotator was placed halfway between the two 20ft. mast sections, the lower half of which was 2-inch heavy water pipe and the upper section of 2-inch dural tubing. The rotator therefore acted as a convenient "joint" between the two sections and being lower placed than previously, lessened the top-weight. This satisfied the requirement of item (e).

The reduction in weight of the beam was achieved by substituting the old water-pipe boom and cross-pieces by a twin aluminium boom and the aesthetic problem was solved by the use of small diameter aluminium supports and nylon cords supporting the elements, indicated as in one of the photographs. The drawings show the general arrangement, including the method of raising and lowering—see p.671.

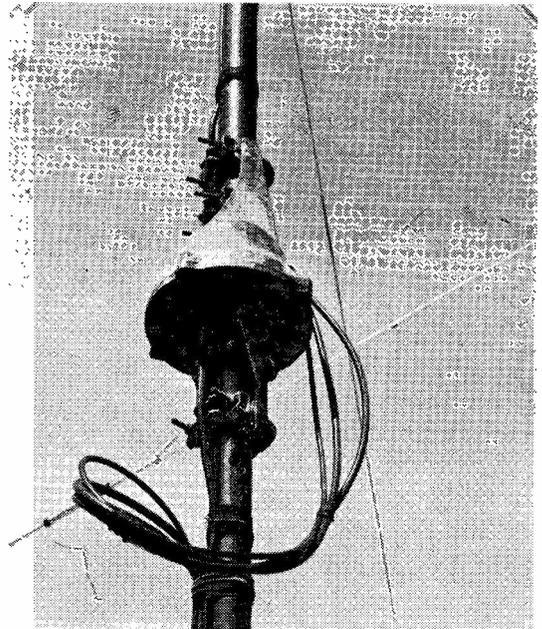
Nylon cord with a B/S of 1000 lbs. was used for the guys and these were pre-cut to the exact lengths by trial-and-error—raising and lowering the mast without the antennae fixed. Bowlines were used to prevent slip and the loose ends were secured by whipping with light wire. The upper guys were attached by "D" shackles to a prepared shroud plate to allow the whole assembly to rotate freely. The lower guys went to the bottom of the rotator which is static.

One pair of the upper guys was permanently fixed and the other pair ran through pulleys at the corners of the rooftop and back through a centre double pulley (see Fig. 1), so it was a simple matter to pull on the two guys simultaneously and elevate the whole structure. The lower guys were fitted after erection as a form of insurance and to bolster the author's self confidence!

The swivel base action was achieved by welding a 3ft. piece of 1-inch water pipe across the mast base, and clamping it to two large blocks of Maltese limestone with rawlbolts and suitable clamps—see photograph. About



The swivel-footing for the mast, as designed by 9H1R—and see drawings Fig. 1, p.671.



Beam rotator positioned half-way up the mast, as opposed to the top, thus reducing top weight and windage—see text for discussion.

2in. clearance between the heel of the mast and the foot was needed.

Up It Went

The HF beam was clamped in place on the mast, the two-metre Yagi and domestic TV antennae, already fixed to their 6ft. poles, were inserted into the end of the mast and bolted in position. The coax feeds were taped to the mast and the tape whipped with binding wire to prevent its natural tendency to unfurl after some time exposed to the weather. The author's 17-year old son then heaved on the nylon guys and the whole assembly soared into the air in about 5 seconds. The ends of the hoisting guys were secured and the lower guys attached.

As flat roofs in the U.K. are not very usual there is no reason why this same approach should not be employed at ground level—indeed, one would not be limited to

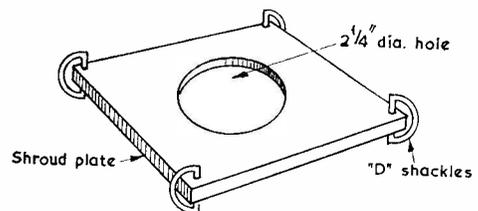
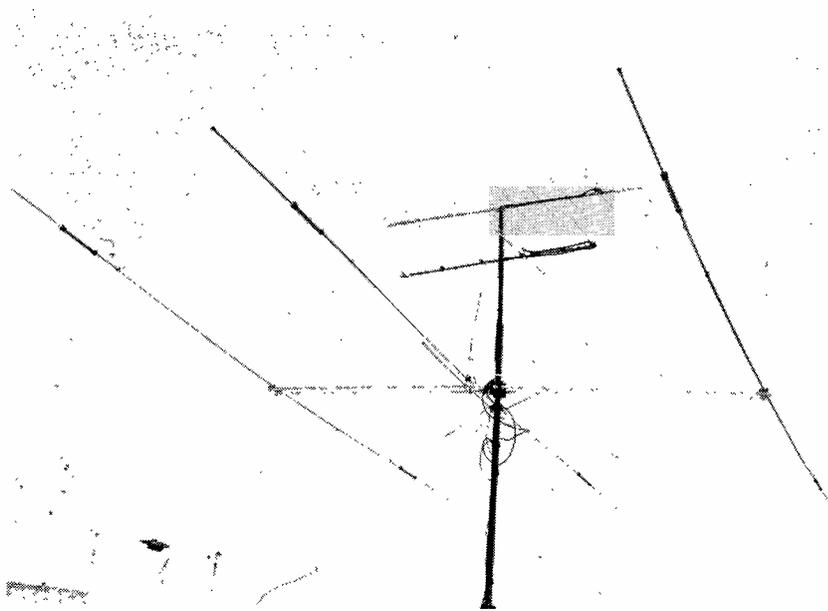


Fig. 2

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Fig. 2. Detail of the shroud plate—see Fig. 1.



The 9H1R array in position. Above the three-element HF tri-bander are a two-metre Yagi and a TV aerial.

guy length (and therefore purchase) by such physical limitations as the area of the roof.

In conclusion, the mechanical arrangements for elevating and lowering provided ideal. The electrical side, however, showed that in spite of the six feet of separation, the stacking of the 2-metre Yagi and domestic TV aerials had slightly upset the previous low SWR of the HF beam. This was no longer a serious matter since it only involved lowering the assembly and unbolting the two offending antennae and removing them, which was now a simple job.

Anti-Climax!

Still, the benefits of the arrangement were not to be savoured to the full, since twenty-four hours after erection the author was informed by the Malta Education Department that he was being sent on a year's course of study at the Plymouth College of Technology and down it all had to come! However, it speaks well of the system that, no longer the onerous task of the past, it took only two hours to dismantle the whole set-up and store it away for future use.

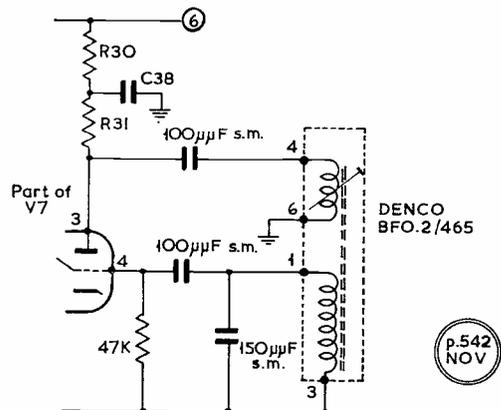
JOIN YOUR LOCAL CLUB

Each month, in the "Month with The Clubs" feature in SHORT WAVE MAGAZINE, we publish a list of the secretaries of those Clubs reported for the current period—see p.643 December issue. Over three or four consecutive months, practically all active Clubs are covered. Thus, anyone interested in joining a local Club should be able to find out if there is one in his

locality, with the address of the honorary secretary. For the beginner in Amateur Radio, there are great advantages in joining a Club—the collective advice of members is available on all manner of topics, based on experience and more can be learnt in one evening than by hours of reading or letter-writing.

"TOP BAND MOBILE TRANSCEIVER"

Further to the Editorial note on p.614 of the December issue, herewith the circuit diagram to use with the *Denco* BFO.2/456, substituting for the HSO.460 shown in the main circuit diagram on p.542 of the November issue.



ECONOMICAL AM PHONE ON TWO METRES

QQV06-40A RF AMPLIFIER,
SERIES-GATE MODULATED

B. A. PICKERS, B.Sc. (G3YUA)

THERE is quite often considerable difficulty and expense involved in going QRO up to the legal maximum input on two metres. It was found at this station that a reasonable approach was to rebuild from scratch and use modern techniques for modulation. Series-Gate control seemed to offer chances of success because of the simplicity of the circuit and the very good signals heard on VHF from other stations using this transmission mode. It is simple to set up and is capable of very good results.

With the carrier running at high level, the transmission, at long range, sounds like very heavy plate-and-screen control, and certainly has anti-QSB properties. As the carrier sinks down in the noise, the modulation will bring it up an S-point or two and this has a very definite tendency to combat fading. No fancy equipment (apart from a 100-watt lamp) is needed to set the system up, and in the author's view, it is as simple to use as normal high level (plate-and-screen) modulation, with the added advantage of giving complete control over the transmitted power, ranging from a few watts right up to the maximum legal input. Due to the low duty-cycle of Series-Gate modulation (it compares with SSB in this respect), it is possible to get high peak powers with quite modest equipment.

Fig. 1 shows the circuit of a two-metre transmitter which is Series-Gate modulated, and capable of taking a DC input varying from about twenty watts to 150 watts. Fig. 2 is the arrangement for the modulator, which is built as a sub-chassis unit to afford maximum screening.

The circuitry has been kept as economical as possible while still retaining desirable features, such as ample drive and the ability to key various stages. For low power levels, anode keying of the last driver stage is quite adequate, but when using maximum input it is preferable to key the screen of the power amplifier. This can be done by simply inserting a key socket in series with the screen feed. A more sophisticated method would be to key the cathode of the Series-Gate modulator. Either is quite satisfactory.

Description

Valve V1 is the triode half of an ECL80, and is used as an overtone oscillator. The anode of this stage is tuned to 24 mc, as this offers the facility of using 8, 12 or 24 mc crystals. To compensate for the rather low level of drive from this stage when using 8 mc crystals, V2, an EF80, is used as a buffer amplifier, also tuned to 24 mc. V3 is a conventional 5763 frequency tripler to 72 mc and V4 is a further frequency multiplier to 144 mc.

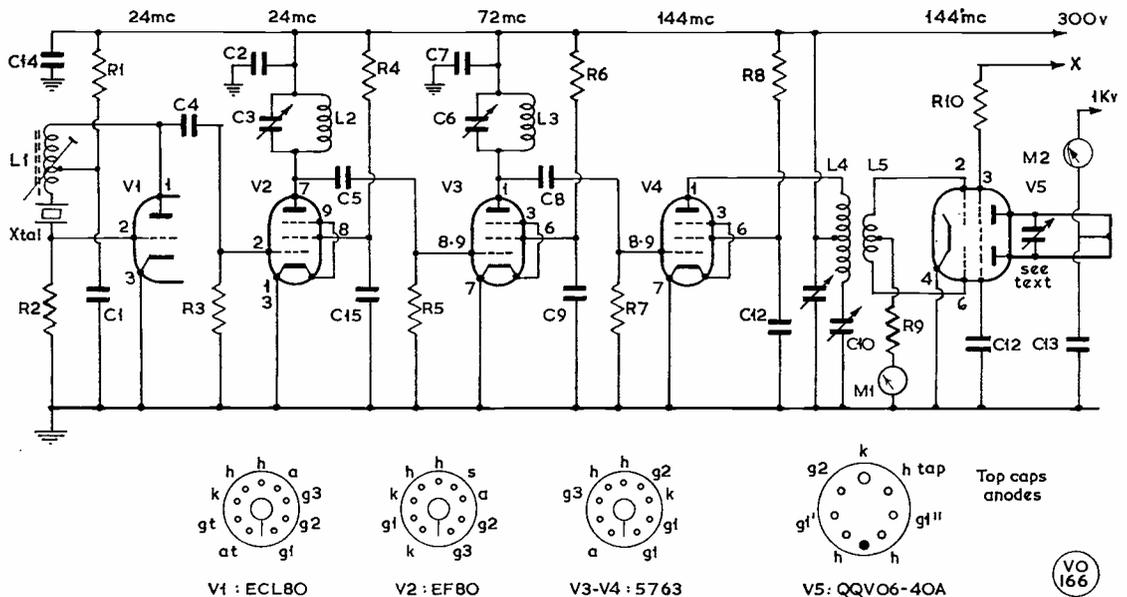


Fig. 1. Circuit of the RF Section.

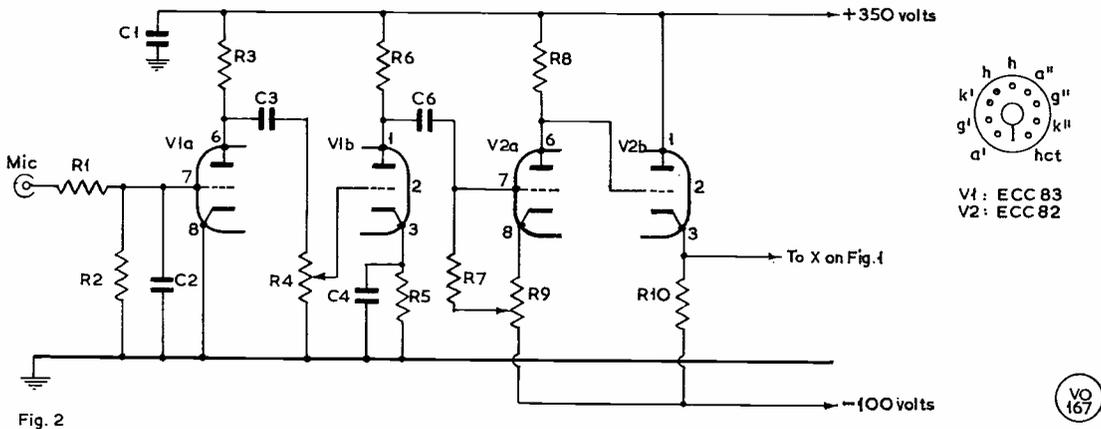


Fig. 2. Series-Gate Modulator Unit.

The exciter sequence is therefore 24-24-72-144 mc.

With this choice of exciter stage, 48 mc is not boosted, avoiding a large harmonic content on or about 190 mc which in the Midlands can cause considerable trouble with ITV transmissions.

The anode of V4 is tuned with a *pseudo* push-pull circuit to suit interwinding with the grids of the power amplifier. The power amplifier, V5, is of conventional design using the well known QQV06-40A. The HT required for this stage is 1000 volts at 150 mA. Power requirements for the exciter chain and modulator are 350 volts at 150 mA. It may be noted that with 1000 volts on the anodes of the power amplifier, a millimeter will give direct readout of DC input to that stage, e.g. 150 mA = 150 watts, etc.

Construction

The construction of the transmitter follows the normal lines for any VHF transmitter. Thus, it is very important to by-pass *all* heater leads, and power leads to and from

Table of Values

Fig. 2. Series-Gate Modulator

C1 = 16 μ F	R6 = 3,300 ohms
C2 = .001 μ F	R7 = 2.2 megohms
C3 = .02 μ F	R9 = 25,000 ohms
C4 = 25 μ F	(carrier level control—see text)
C6 = .05 μ F	
R1 = 56,000 ohms	V1,
R2 = 4 megohms	V1A = ECC83
R3, R8,	V2,
R10 = 220,000 ohms	V2A = ECC82
R4, R5 = 250,000 ohms	

Table of Values

Fig. 1. Main Circuit Diagram

C1, C2,	R3 = 33,000 ohms
C7, C9,	R4 = 12,000 ohms
C12, C13,	R6, R8 = 10,000 ohms
C14, C15 = .001 μ F	R9 = 27,000 ohms
C3, C6,	R10 = 100 ohms
C10, C11 = 30 μ F, var.	M1 = 0.10 mA
C4 = 39 μ F	M2 = 0.300 mA
C5, C8 = 50 μ F	V1 = ECL80
R1 = 15,000 ohms	V2 = EF80
R2, R5,	V3, V4 = 5763
R7 = 56,000 ohms	V5 = QQV06-40A

TABLE OF COIL DATA

- L1 — 20 turns 23g., tapped 6 turns from grid end.
- L2 — 12 turns 23g., on $\frac{3}{4}$ in. dia. former.
- L3 — 7 turns 23g., on $\frac{3}{4}$ in. dia. former.
- L4 — 4 turns 23g., self-supporting, $\frac{3}{4}$ in. dia.
- L5 — 4 turns 14g., self-supporting, 1 in. diameter.
- PA — Tank circuit lines to dimensions given in *Radio Communications Handbook*.

the main transmitter. The power amplifier valve base must be mounted below chassis level to ensure that the internal screen in the valve is level with the top of the chassis. It is preferable that the base of the PA be in a screened sub-compartment to ensure that the grid circuit is isolated.

Several switched crystals could be used in the oscillator, but at G3YUA it was thought that a front panel-mounted crystal holder would be better. This resulted in rather long leads between the crystal and the oscillator stage but in practice this was not found to be troublesome.

Linear lines were used to tune the anodes of the power amplifier because they have a higher Q than a lumped circuit on VHF and so help to suppress any harmonics present. They are also slightly more efficient.

The design and construction of the Series-Gate modulator is quite straight forward, but it was found necessary to build the entire unit in a small die-cast box under the main transmitter chassis next to the PA compartment.

Generous screening and by-passing is required, and great care must be taken to eliminate hum loops in the screened wiring. All heaters must be by-passed with .001 μ F capacitors, and the usual filtering precautions be taken when wiring the microphone amplifier. Adequate gain is available using an ECC83 as microphone amplifier and the series-gate modulator can be an ECC82 or similar valve.

[over

Setting Up

The heaters should be allowed to reach operating temperature and the microphone gain reduced to zero. At the same time the residual carrier level control should be turned anti-clockwise so that the DC input to the power amplifier is at minimum.

Tune all stages for correct RF functioning with a dummy load on the power amplifier. Using an absorption wavemeter, check that the frequency multiplier stages are on the right channels. It should be possible to produce 6 mA of drive into the QV06-40A; if this figure cannot be obtained, it will be necessary to alter the position of the centre-tap on the coil in the anode of the last driver stage.

At this point, with the transmitter tuned to 145 mc on a dummy load, the DC input to the power amplifier should be about 30 watts. The microphone gain can now be increased, and when it is at about the half-way position, a whistle into the microphone should increase the DC input to 150 watts.

This indicates that the modulator is working. The residual carrier level can now be varied at will, and the

DC input to the power amplifier is controlled by adjustment of the *audio* gain.

Results

In practice it has been found that best results were obtained when the resting carrier level was set to 100 watts and the system then talked-up to 150 watts. This gave distant stations a strong carrier to tune and hold. TVI was much less troublesome when the resting carrier was brought down to 20 watts and talked up to high power on speech peaks.

This form of modulation is capable of very good results provided that the audio from the microphone amplifier is clean. On-the-air-reports are the best guide. If a reflectometer is available with a headphone socket, this will give a very good indication of the audio quality as transmitted.

When this new transmitter was put into service, very good results were obtained straight away and a consistently strong signal was radiated into the Continent. In two months the SHORT WAVE MAGAZINE VHFCC award was obtained.

VERSATILE ATU FOR TOP BAND

MULTI-MATCH DEVICE FOR ANY
TYPE OF AERIAL

P. R. CRAGG (G3UGK)

LONG wires, short wires, medium-length wires, high wires, low wires, end-fed wires, centre-fed wires—at one time or another most Top Band operators will have tried one or more of these, or their variants, in the never-ending search for a Better Signal. Having got the aerial up, the problem of feeding power into it is the next consideration—and always a problem because there are very few transmitters capable of coping with much outside the usual 50-75 ohms of input impedance. And how many 160-metre aerials present this magic figure to the Tx? Virtually none.

Many and varied are the configurations of ATU to be found in the literature—but none of them can cope with impedances that depart very much from the design figures.

The ATU described here is a combination of the three most commonly-needed configurations, selectable at the turn of a switch, to enable high or low impedances, balanced or unbalanced, to be transformed into a suitable match for the transmitter.

Design Considerations

No matter what the height or length of your aerial, or its feed point, it will look like one of the following to the transmitter: (1) *Low impedance, unbalanced*; (2) *High impedance, unbalanced*; (3) *Low impedance, balanced*; and (4) *High impedance, balanced*.

To deal with *Case* (4) first, the reader will realise that it would be unrealistic to cater for this, because a high-impedance balanced feed necessitates the use of a folded dipole at a height of not less than one half wavelength, say, 265ft. for Top Band. Anyone able to put up such an aerial would not need a multi-match ATU to couple it to the Tx.

Thus, we are left with the more usual types of long wires and dipoles. End-fed quarter-waves and the like need the series-tuned circuit of Fig. 2A to match the Tx into the low-impedance unbalanced feed. A half-wave dipole (by definition, centre-fed) presents a balanced, low impedance feed point and would need an ATU to the circuit of Fig. 2B. On the other hand, the end-fed wire, of up to half a wavelength or so, will offer a high-impedance unbalanced feed point, and will call for the circuit of Fig. 2C. There are variations on Fig. 2B, but the arrangement shown here has been used successfully for years.

Circuit Description

By the circuit of Fig. 1, any of the three required configurations can be selected by Sw1, a rotary switch of the low-loss type. Posn. 1 gives the Fig. 2A arrangement; posn. 2, Fig. 2B; and posn. 3, Fig. 2C.

When on posns. 1 or 3, transmitter loading is adjusted by selecting any one of the 12 tapping points on the coil, by Sw2, and on posn. 2 by the number of turns and the degree of coupling of the link (centre winding). In the writer's case, the link coil was found by experiment to enable a dipole anywhere between 25 and 60 feet to be loaded, this being considered a sufficient range for normal use. This link coil is open-circuited on posns. 1 and 3, when it has a negligible effect on the operation of the ATU. On posns. 1 and 3, the main windings are connected in series by the action of switch SW1B, and act as a single inductance.

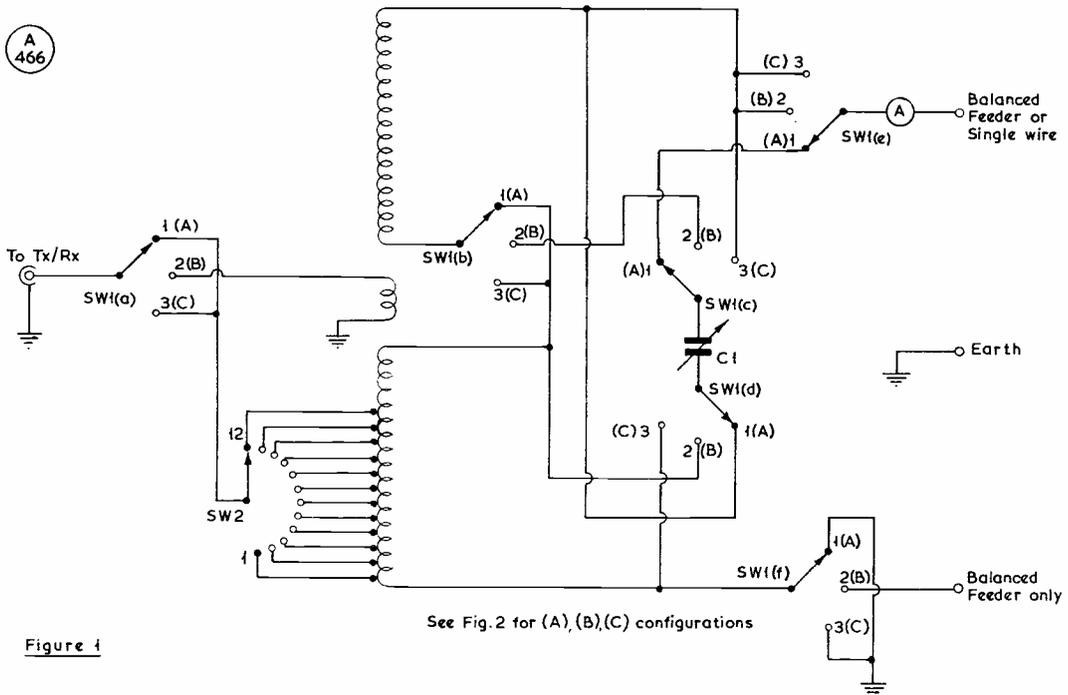


Figure 1

Fig. 1. Circuit of the Tuner, and see Fig. 2. Values can be : C1, 500 $\mu\mu\text{F}$, Rx type variable; SW1, 6-pole 3-way rotary switch; SW2, single-pole 12-way rotary; Coil, see text and Fig. 3; meter, 0-1 amp. RF.

Construction

First, the coil. Close-wind 50 turns of 22g. enam. copper wire on a 1 1/4 in. dia. former. Cut the centre turn and solder leads on to each end of the severed turn, ensuring that they are long enough to reach the tags on Sw1. Close-wind six turns of p.v.c. insulated wire over the centre of the main winding, making sure to get three turns each side of the two centre leads. (Be careful to

wind the link coil in the same direction as the main winding). Tape the link in place. Scrape away the enamel from one point of each the first 12 turns of the main coil, and solder suitable leads at these points, being very careful not to short turns; it is advisable to offset each tapping point alternately by about a quarter-inch.

The capacitor C1 must be insulated from ground,

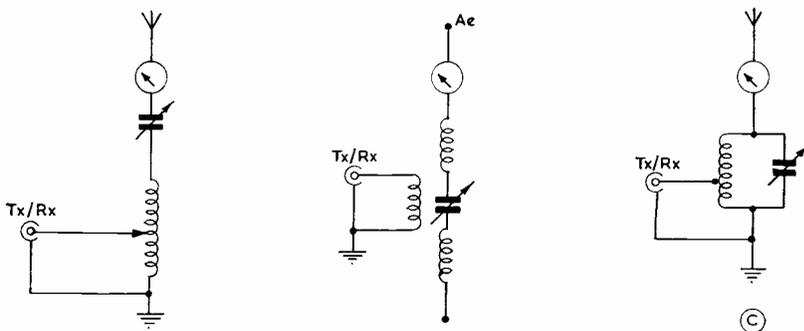


Fig. 2

For Coil details see Fig. 3

Fig. 2. Configurations evolved from circuitry of Fig. 1.

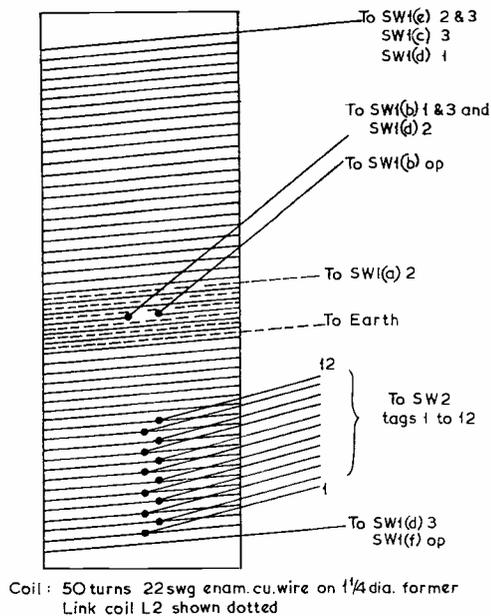


Fig. 3

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Fig. 3. Details of the coil tapping.

and mounted on a piece of paxolin or similar material, control being by an insulated drive shaft. Alternatively, run the shaft through a rubber grommet on the front panel. The coil assembly should be mounted as far as possible from the sides of any metal cabinet housing the ATU, to avoid damping effects by any large area of metal in close proximity. Keep all leads as short as possible.

Operating the ATU

If an SWR meter is available, connect it in the line between the Tx and the ATU, feed in power, adjust the capacitor for minimum reflected current and then, starting from posn. 1 of Sw2, increase loading until the Tx is delivering full power. The Tx PA loading condenser should be pre-set at about the middle of its range, and only re-adjusted if not enough loading can be given by Sw2 (a most unlikely occurrence). It may be necessary slightly to alter the setting of C1 to maintain minimum reflected current under full-power conditions.

Without an SWR meter, adjust C1 for maximum signal or noise with the receiver, tuned to the desired frequency, and load up the Tx as already described.

Concluding Notes

The prototype as discussed here has performed every bit as well as expected, and has proved extremely useful over the last few months. It has had to cope with half-waves, end-fed wires, quarter-waves, an inverted-Vee, and a "5RV" with feeders strapped, in locations as varied as a field in Huntingdonshire, Dartford Heath,

the West London Air Terminal, a hotel in Guernsey, various local stations, and the home QTH. It has tasted AM/CW/SSB using a Codar, a Vanguard, Vespa and KW-2000A—in other words, "I don't know what I'd do without it." The writer acknowledges help and advice from G3XTJ, G3XPE and G3RVV.

SUBSCRIPTION NOTE

A direct subscription to SHORT WAVE MAGAZINE costs 45s. (or 48s. "1st class mail") post free for a year of 12 twelve issues, starting any month. Despatch is guaranteed on the day before the last Friday in the month (which is publication day). Orders, with remittance, to: Subscription Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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THE "NEW QTH" PAGE

Periodically, as this month, we take some extra space to reduce the back-log of QTH's for publication, mainly changes-of-address—see pp.708-709 this issue. As explained on previous occasions, it behoves all interested in having their call sign/address published in the *Magazine* and the international *Radio Amateur Call Book* to let us know as soon as possible. It is a fact that new QTH's and changes-of-address come in literally daily, and so have to be taken strictly in rotation. And if you are notifying a change of address, please do not fail to say whether you are, or are not, a direct subscriber.

ALWAYS WANTED

Photographs of Amateur Radio interest, suitable for publication in SHORT WAVE MAGAZINE—either of equipment, stations, personalities or Club groups. They should be good quality prints, clear and sharp, and can be of any reasonable size, though post-card is preferred. Details should be on a *separate* sheet accompanying the picture and attached lightly to it—not written on the back of the photograph itself. All that we can use are paid for immediately on publication, and they should be addressed: Editor, SHORT WAVE MAGAZINE, BUCKINGHAM.

GETTING THAT BOOK—MAKE A NOTE

We can obtain for you any technical or scientific book, on any subject, in the English language, provided you can indicate (a) Its correct title, (b) The publisher, and (c) If possible the name of the author. This sort of enquiry usually demands a good deal of research, so all possible details should be given with any enquiry. There are tens of 1,000's of technical books published in English every year and, though we do not claim to be able to trace them all to source, we will certainly do our best for anyone with a firm enquiry in the radio-electronics field.

INVESTIGATING VHF PROPAGATION EFFECTS

AMATEUR INSTALLATION FOR OBSERVATION ON TROPOSPHERIC ANOMALIES, SPORADIC-E, AURORA AND SOLAR FLARES

R. HAM

FOR many years it had been noted that the amateur and broadcast VHF bands can be disrupted by Sporadic-E and tropospheric scatter, so it was decided to make a study of the cause and effect of these disturbances.

These phenomena can occur at any time, so radio equipment to check the bands at a moment's notice must be at the ready. To receive the signals a tower supporting three Yagi beams for the four, two-metre and 70-centimetre amateur bands was installed near the radio room; short, good quality coaxial cables take the signals to three appropriate converters.

The three amateur-band converters are connected to communication receivers which perform as tunable IF amplifiers in the accepted manner. To enable broadcast stations to be monitored a Hallicrafters S36A with an independent aerial fixed north-east is used. An audio switch circuit is arranged so that the tape recorder can be connected to any receiver.

There are three main pointers to unusual VHF conditions, which can summon an observer to his rig, to start a long period of interesting listening, recording and logging.

First pointer is the TV service in Band I (41—68 mc); when the BBC pictures are disturbed one can look for Sporadic-E, and when the ITV pictures in Band III (174—216 mc) are disturbed or greatly increased in strength one can expect a tropospheric opening.

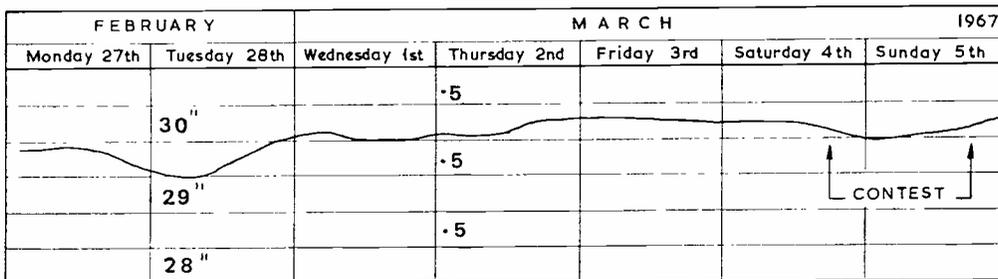
Second pointer is the beacon service, which has proved of great value to all who study propagation. A Sussex station can turn his two-metre beam through the compass and look for the beacons which are listed, with

their respective distances, in the Table (to follow).

The beacon at Thurso (GB3GM) also radiates a signal on the four-metre band, and its aerial direction alternates every five minutes between North and South. For observers living in the South, the four-metre signal from GB3GM can be a good indicator of intense Spor-E. A welcome addition to the beacon service came in May 1969 when ZB2VHF was installed at Gibraltar, providing a signal on the 2-4-6m. bands.

The *third* pointer is the atmospheric pressure, which is measured by a barometer against a scale marked in millibars or inches of mercury. Over the years I have noticed that when the atmospheric pressure is above 30 inches and then rises, one can look for a tropo. opening at the point when the pressure starts to fall. This has been recorded many times and as a result signals on the two-metre band have been logged from LA to ON, DJ to EI and F to GM.

I have selected for an example the barograph chart (below) for the week February 27 to March 5, 1967. As will be seen, the week started with the atmospheric pressure at 29.9 inches and fell to 29.5, picking up rapidly to 30in. by midnight on Tuesday. Wednesday was an indecisive day, but at midnight the pressure started the important rise through Thursday to 30.3 inches and held this until early Saturday morning, when a slow fall started and turned rapid at 1400, continuing this sharp decline until 1600 on Sunday. The 144 mc Open Contest (March 4-5 started at 1800 to last for 24 hours until 1800z on the Sunday. Here we had the rare coincidence of the pressure making the vital change at the time of a Contest when the two-metre band would be activated over a wide



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Reproduction of barograph trace discussed in the text.

area of Europe. The writer's own log for this Contest was enough to prove the point that the band had opened! Some 126 stations were entered in the log, spread over 19 QRA locators—eleven in the United Kingdom, and eight on the Continent, signals from DJ, PAØ, F, ON, GW and Northern G being RS-59. An additional 26 stations were heard, making the total up to 152 stations in 17 hours.

Sporadic-E

As a general rule Sporadic-E will bring DX between 30 and 100 mc, which makes the four-metre amateur band of particular interest as it lies almost in the centre of this frequency range. Continental radio stations up to 1,000 miles away using this same frequency area for their national broadcasting can be heard in Great Britain when the E-layer is disturbed. The Amateur Radio organisations provided two vital beacons to enable scientific observations to be made on the 4-metre band during the summer of 1969, these beacons GB3GM and ZB2VHF both being heard over fantastic distances during this period.

Many amateurs kept watch for sporadic-E during the summer period June 1 to August 31, 1969, and a lot of data is now in the logs. The writer, for his part, checked the frequency range 30 to 75 mc three times per day at approximately 0730, 1230 and 1900 hours, noting the maximum and minimum usable frequencies and recording Continental broadcast stations for later identification. The chart opposite gives the usable frequency range at these observational times when spor-E was present.

Most radio amateurs who enter a VHF Contest hope for the coincidence of unusual conditions like spor-E or extended tropo. so that DX can be worked. The contest on July 4, 1965, was enhanced by an extensive spor-E cloud centred over Europe, disturbing the two-metre band. It was a great surprise to those who took part to hear Hungarian amateur stations being worked from the U.K. The effect of sporadic-E is rare on the two-metre band, and had it not have been for the Contest this event would have gone by unrecorded, and many of us would not hold the rare QSL card of HG5KDQ/P, some 900 miles away.

Meteors

Leaving for the moment the DX possibilities under spor-E conditions, one can also use the four-metre band to watch for DX by *Meteor Scatter*. The earth during its annual orbit round the sun encounters meteor particles which strike the atmosphere and burn up, leaving an ionised trail from which radio signals can reflect. There are meteor particles entering our atmosphere all the time, and if one tunes to GB3GM, or one of the Continental broadcast station frequencies in the 4m. band, random "pings" from these stations can be heard. At certain times of the year the earth encounters large numbers of these particles—known in the astronomical world as a meteor shower—and a special watch is kept during April, August, October, November and December for these events. The visual astronomer during peak shower periods can estimate the hourly rate of particles entering the area of the sky which he can see. The *Perseids* each August, the *Leonids* in November and the *Geminids* in

Table I

DATE	0730	1230	1900
JUNE 1	37—73	41—50	—
" 3	—	50—80	—
" 7	37—73	36—39	—
" 8	32—72	—	—
" 10	—	40—44	—
" 13	—	—	35—50
" 14	—	—	36—41
" 15	32—42	—	—
" 17	35—73	—	—
" 18	—	—	31—42
" 19	36—70	—	33—68
" 21	30—50	—	40—73
" 25	37—72	35—72	36—73
" 26	32—71	—	—
" 27	34—50	—	37—41
" 28	34—50	—	—
" 29	37—40	—	—
JULY 2	—	32—47	35—64
" 3	—	37—40	—
" 4	30—47	—	30—72
" 5	33—43	—	—
" 7	—	32—73	—
" 9	—	—	36—47
" 11	40—70	—	34—73
" 12	32—37	—	—
" 16	—	39—72	—
" 20	—	40—70	—
" 26	—	33—72	—
" 28	—	30—47	31—44
" 29	33—47	31—38	—

Table I. Minimum and maximum frequencies of sporadic-E as observed by the author from his station at Storrington, Sussex, during the period indicated.

December are expected to produce the highest hourly rate, and can cause a high level of ionisation in the atmosphere. It is interesting to look back through the VHF reports in *SHORT WAVE MAGAZINE* and see how much DX radio amateurs have worked during these peak showers.

For the *Perseid* shower of August 1969 the four-metre beam was set north-east; the frequency of the

broadcast station at Gdansk, some 850 miles away, was monitored and the signal fed *via* the equipment to a pen-recorder with a chart speed of 30 inches per hour. This *Perseid* observation took place each evening during 2000 to 2300z, August 1-16. This consumed 50 feet of triplex chart and 44.5 hrs. of equipment time. The result was an average of 82 pings per hour during my observational time, and the peak was on the 11th, when the rate was 130 to the hour.

Solar Observations

The years of these unusual VHF conditions inspired the building of a radio telescope to advance interest in both radio and astronomy. As an amateur radio astronomer useful work could perhaps be done for the British Astronomical Association and other interested bodies.

There is a multitude of radio stars in the Universe, but the star that puts the change into VHF is a minor star in our galaxy, which we on Earth call the Sun.

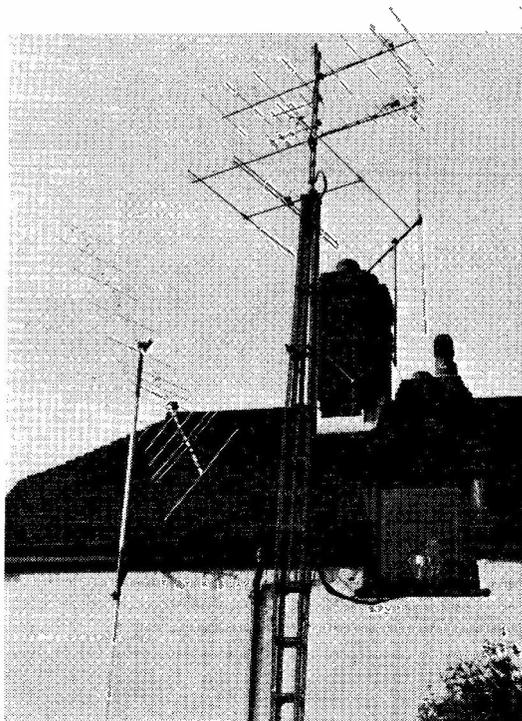
Radio astronomy is a new and growing science and a large part of the galactic and extra-galactic work is outside the amateur field because of the very large aerial systems and absolute accuracy required to resolve the minute signals which travel through space for millions of years before they reach Earth. The Earth is very hostile to minute extra-terrestrial radio signals, resisting them with its complex atmosphere and the large amount of electrical hash it generates daily.

The Sun is a different proposition. It is only 93 million miles from Earth and its radio signals only take 8 minutes to reach us. The Sun's radio spectrum extends from 30 to 10,000 mc. When it becomes active, strong bursts and noise storms are most prominent between 30 and 300 mc.

The writer's solar telescope is a full-power radio-meter, working two hours daily between 1130 and 1330



The solar aerial for 136 mc—see text



The 70 cm-2m-4m. beams on their tower outside the radio room. The aerial on the left is an independent array for VHF broadcast station monitoring.

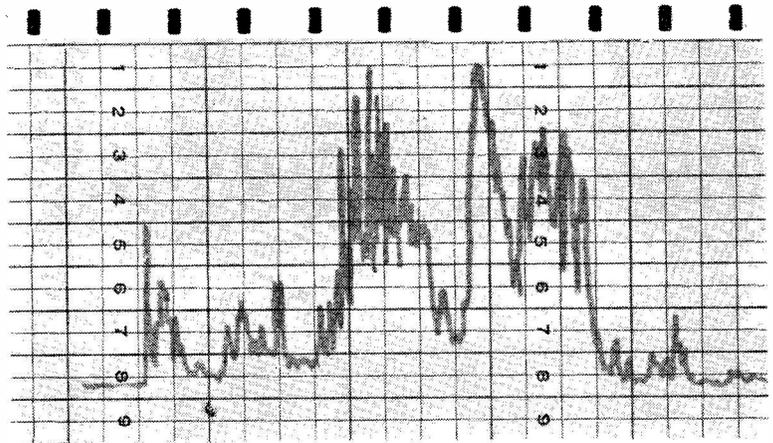
UT, at 136 mc in which time 5 feet of recording chart is produced—see p.682. This aerial is home-built.

Equipment Notes

The reflector, measuring 10ft. by 6ft., is made of wood batten and covered with half-inch wire mesh. The aerial frame is hinged on its bottom rail so that the altitude can be adjusted about 5 times per year to keep the sun in the vertical beamwidth. The parts to construct the four Yagis were supplied by *J-Beam Engineering, Ltd.* who kindly made up the four folded dipoles to centre on 137 mc. The completed beam has an estimated horizontal beamwidth of 15° and a gain of 15 dB and was tested on a satellite signal to prove that it was working well. The aerial is carried through the Sun's path by Earth drift.

The solar signal from the aerial is fed to the 136 mc converter housed in a nearby shed. This converter is home-built using four AF139 transistors—one as RF amplifier; two in the crystal oscillator chain; and a mixer. The signal leaves the converter at 26 mc IF and is carried by coax underground to the radio room proper, where it feeds an AR88D tuned to 25.9 mc (for 135.9). This actual frequency was selected because it is just outside the satellite band and free from other

Tracing of a burst, taken on the 136 mc beam, at 1234 Universal Time, on November 13, 1968—see text for discussion.



terrestrial signals. If one selected a quiet frequency inside the satellite band to observe the Sun you can bet your boots that XYZ-satellite would orbit with a 9+ signal and draw a high-amplitude trace on your chart for some seven minutes and could be, if not audio monitored, confused with a solar burst. In general, radio astronomers use a bandwidth of at least one megacycle and would not select such a tight observational frequency as 135.9 mc. Using a wide bandwidth system one can see much smaller solar bursts, but in the writer's case the interest is in the large bursts and noise storms which can be correlated with VHF activity. The detector circuit of the AR88D is connected to a home-built DC amplifier using a double-triode valve with the pen-recorder (0-1.5 mA) connected between the valve anodes.

When the completed telescope was put into operation, RF gain control on the AR88D was set to a level such that the pen would draw a straight noise-line with the aerial disconnected, and so give a reference point to receiver noise level. The solar telescope switches on and off automatically for the period that the Sun is in the aerial beam.

It has been found essential to audio monitor whilst solar observations are in progress, to enable a comparison to be made between sound and pen deflections. Should any unwanted interference occur it can be noted and action taken.

One must not expect to record solar outbursts every day. Often there is only receiver noise on the chart, but when a solar outburst occurs there is no mistaking it; the pen makes a sharp deflection and through the speaker comes the "whoosh" or series of "whooshes," depending on the burst. Individual solar bursts have been recorded which have lasted from one to eight minutes and noise storms which have lasted several days.

Interesting Result

The largest solar noise-storm recorded using the equipment described took place at the end of October 1968 and showed the following pattern.

October 29: The telescope switched on at 1130 UT and the noise trace was quiet. A short time elapsed and the noise level slowly increased until the pen (which

has a full-scale deflection of 1500 microamps) was peaking just over 700 μ A and only reduced slowly as the Sun left the aerial beam at 1330 UT. The Earth then carries the aerial around for 22 hours before the beam is again towards the midday sun.

October 30: It was obvious from switch-on at 1130 that the storm had developed since the previous observation, but this time the intense noise was accompanied by bursts, the pen during this observation peaking at 1050 μ A and was still very active at the end of the observation period.

October 31: At switch-on the solar noise level on the chart was only a little above receiver noise level although odd solar spikes were deflecting the pen to 650 microamps and there was every indication that the storm was passing. However, during the following delay period of 22 hours the storm revived to a new level.

November 1: As soon as the sun entered the beam the noise was terrific. The pen was peaking around 850 μ A, the audio monitor was emitting sounds like the brushes on a drum skin—but this was "whooshes" on a speaker cone and the drummer was the Sun at 136 mc. The noise continued like this until the observation finished and the Sun was out of the beam.

By November 2 all was quiet and this storm was over. But these few days of massive solar disturbance had caused an Aurora and during the evening of November 1 two GI stations and one northern G were heard on the four-metre band with the characteristic *Ar* note. The Sun was the cause, the GI's *via* Aurora being the effect.

Toward the end of January 1969 another interesting solar storm developed and was recorded on several frequencies by amateur observers. For seven days from January 19-25th the solar charts showed only receiver noise, until on . . .

January 26: The little noise spikes increased in amplitude and were shortly accompanied by bursts deflecting the pen some 500 microamps, while through the speaker came the familiar solar sounds. During January the sun is low in the sky, so when it left the telescope the tower beams were directed south-west into the path of the setting sun. Bursts and noise on both the two-

and four-metre bands were recorded. When the sun set it was still very noisy and must have remained that way through the inactive period (of the equipment).

January 27: At starting time the noise level had increased to 650 μ A and the two-hour observation included bursts one of two minutes and one of five minutes duration. At the end of the telescope observation the tower beams were directed for the second time into the path of the setting sun and again noise and bursts were heard on two and four metres.

January 28: The solar noise level had reduced the pen deflection to 400 μ A, increasing on the 29th to 650 microamps; and on the 30th it reduced to 350 μ A and gradually died out.

Beam for 81 Mc

A second aerial has now been built to observe the sun at 81.5 mc—see below. This is at present a two-element Yagi mounted on a reflector 6ft. square, made of wood batten and covered with half-inch wire mesh, as before. The signal feeds a transistor converter in the shed, and the converter IF of 5 mc is carried by underground to coax the radio room to feed an AR88LF Rx, DC amplifier and pen recorder. This will enable the midday sun to be watched at two frequencies.

Some Concluding Notes

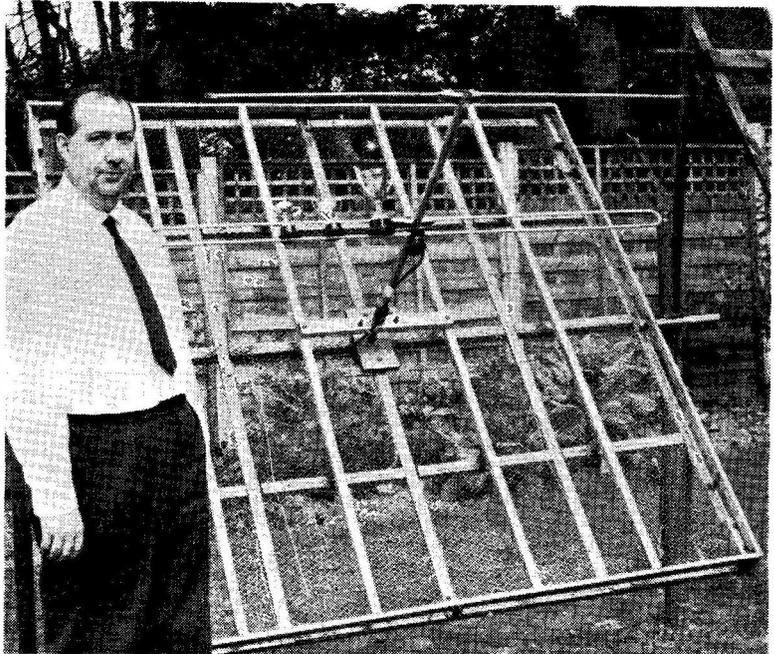
To conclude, let us look briefly at the Sun's vital statistics: It is like millions of other stars in our galaxy, a nuclear furnace burning up hydrogen and converting it to helium. The centre core of the Sun where the nuclear reactions take place maintains an average temperature of 15 million degrees and, according to the latest astronomical literature, the solar core is burning

up hydrogen at the fantastic rate of 500 million tons per second. This gaseous mass of energy is a minor star without importance in the galaxy and even less in the Universe but this, our Sun, has a diameter of 865,000 miles and its volume is so great a million Earths could be packed away inside it. Given clear skies, we can see the Sun from earth every day, and according to the mathematicians, the inhabitants of Earth will go on seeing it for millions of years to come before it finally burns up all its fuel and ends its life as an ember in the galaxy where it was born millions of years ago.

The human being on Earth can detect the Sun's light directly with his eyes and the solar heat directly with his sense of feeling, but other emissions such as those in the radio frequency part of the spectrum can only be detected by instruments. Man's radio instruments convert the solar radio outbursts into noise which the human ear can detect, and lines on a pen recording chart which the human eye can see.

The author's radio telescope has been working daily for 20 months and has proved a most interesting addition to the VHF radio equipment. In his opinion the amateur radio astronomer will not make a major discovery, but he can by his daily observations provide vital information to all radio operators who are studying the propagation of radio signals.

During the preparation of this paper, the atmospheric pressure rose to 30in. and above for a few days and then fell on October 18, and on this day the two-metre band opened to GM, LA, DJ, PAØ and F. The last week in October saw a giant spot-group move across the disc of the Sun, and for several days noise and bursts were recorded, also sporadic-E manifestation between 30 and 42 mc.



The 81.5 mc beam for solar observations, with the author, SWL R. Ham, who contributes the accompanying article on his equipment and results. He keeps regular watch on the Sun, on this frequency and on 136 mc, and the whole installation is home-built.

THE TWENTY-FOURTH MCC

The Magazine Top-Band Club Contest November 8-9, 1969

IN our MCC Report this time last year, we were remarking that the handicapping system was at the mercy of conditions; this year it would possibly be fairer to say that aeriels were at the mercy of weather and wind; many log reports referred to aeriels coming down, or to arriving on site before the battle to find only the wreckage of the skywire, so carefully put up for the event. While operators of many stations risked life and limb to get going again, if the number of logs is compared to the number of identification codes allocated, it becomes quite clear that others (possibly wisely under their particular circumstances) decided to "give it best." And who could blame them?

Band Conditions

By and large, pretty fair, although in some parts of the country, stations who were noted by the invigilators as being apparently without receivers came up with logs which indicated that rain static or local noise was the prime cause of difficulty.

Disqualifications

It is most unfortunate to have to bring up such a subject in the MCC context—but the number of complaints that were raised about the Verulam, G3VER, signal (confirmed by the invigilators) gave us no option but to disqualify them. Their signal was very strong all over the country, and would have put them into second place, but regrettably it was also possessed of loud clicks which were plastering well in excess of 10 kc, and appeared to be worse if anything to LF of the marker. It was probably due to no more than the gain (drive control) on their KW-2000 being turned up too far for clean CW operation. The pity of it is that G3VER would probably have been warned if only a few honest reports had reached them in the early stages. However, that is the way of it—we got the complaints they should have had.

Maesteg *nearly* landed a disqualification, thanks to a practical joker, so-called, who came up as "GIL, Ilfracombe Radio" and ordered a QRT. This little affair was also mentioned in more than one log. However, a check with GW3UUZ, who at first was much disturbed over the business, revealed that in the first place GIL did *not* order them to QRT (and was prepared to say so in writing) and in the second local stations were able positively to identify the offender from a most opportune tape-recording. This Swansea pirate is also known to have called G3KMO, but without success, on the same frequency, about 5 kc away from the Ilfracombe channel.

While on the subject of disqualifications, every year we have requests for "disqualification for excess power," usually made by backmarker stations. This time the

gripes were directed against three stations, all as it happens known personally to your scribe and all known to be using *less* than the legal input level!

The Results

This year **Kirkcaldy**, GM3FXM, ran up a magnificent 770 points to take them up to the top—all the more creditable when it is realised that with conditions and scoring down on the 1968 levels all round, they managed to scratch up more points—nearly a hundred more, in fact—than last year, and that on a somewhat inferior "bent-aerial" as compared with the one used previously.

As already indicated, Verulam would have made second place but for misfortune. However, **Maesteg**, GW3UUZ, filled the bill beautifully with a massive 624 points from Nash Point, Glam., in spite of the alarm and despondency created by the joker already mentioned.

Only a hair behind at 617 points came the Veteran Operators Club for Telegraphists, **G3VOC**, from the Southern Zone, although it is not quite clear exactly where they were located, nor what is their constitution and membership—points that we must look into as far as the Rules are concerned for next year. They gave your conductor a chuckle just when he was on the point of bursting into tears at the sight of 90+ logs on the doormat; a correction letter read "delete OA4ALY, 1 point, insert OK4ALY 1 point—never did work Peru!"

To all these three, our heartiest congratulations; and to show it all for the statistically minded, Table II shows the placings and scores of the first six stations this year, last and 1967.

Some DX Stations

Here there were several of note. Although the GM participation was down this year, Clubs were on from GI, EI, and GC; among the single-point contacts one noted the leaders piling up quite large tallies of OK/OL's, while PA, DL, DJ and HB stations added to the sport for those who were able to work them.

Check Logs

Here, oddly enough, the weather helped—this simply by way of the fact that several stations who were put out by aerial troubles send in their logs to help the checking work. In addition, as for so many years past, we had the one from SWL Law (Leicester), who over the years has become part of the very fabric of MCC from the point of view of those of us who have the review to write up. Apart from the fact that he misses little or nothing of what goes on, SWL Law has the gift of being able to see the funny side of things, and to express these in a word or two.

The Equipment

Considering the leading stations, **Kirkcaldy** seem to have won with the same gear that has served them so well for years, consisting of a home-brew transmitter ending in a 5763 as PA, Eddystone S.750 receiver and, this year, a bent dipole at 25 feet in place of the more potent antenna of earlier years, since they were operating from the warmth and comfort of GM3FXM's shack.

G3VOC also used a home-built rig, this time with an HRO receiver, and for aerial a half-wave wire firing over a natural salt bed, alleged to be of density 698 tons 12 cwt.!

At **Maesteg**, they had an end-fed horizontal half-wave at 90ft. as main aerial, with a "quarter-wave plus" near-vertical against earth as the backup system. At the shack end, there was an HQ-170 receiver plus a Heathkit DX-100U combination with spare receivers and transmitters stacked at one side in case of accidents.

* * *

Running on down the logs, one is sad to note the almost complete eclipse of the HRO on the receiving side, with various versions of KW-2000 in the majority, a couple of RA-17's, some home-built outfits, kit RA-

TABLE I
Positions and Scores, Twenty-Fourth MCC

PLACE	CLUB	CALL	REGION	POINTS	PLACE	CLUB	CALL	REGION	POINTS
1	Kirkcaldy	GM3FXM	GM	770					
2	Maesteg	GW3UUZ	GW	624	45	Reigate " B "	G3NKS	S	338
3	Veteran Operators	G3VOC	S	617		Chester	G3GIZ/A	M	338
4	Maidstone	G3TRF	S	599		Cheltenham G.S.	G3GIZ/A	S	338
5	Kings Norton	G3GVA	M	596	48	Liverpool	G3AHD	N	332
6	University College of South Wales	GW3UWC	GW	595	49	Salisbury	G3FKF	S	330
7					Govt. Communications Cheltenham	G3SSO	S	573	50
8	Guildford	G3KMO	S	563	52	Isle of Wight	G3SKY	S	320
9	East Barnet	G3RFS	S	556	53	Pudsey	G3XEP/A	N	319
	Nottingham	G3EKW	M	556	54	Fareham	G3VEF	S	317
11	Southampton University	G3KMI	S	554	56	Silverthorn	G3SRA	S	315
12	Radio Club of Scotland	GM3RCS	GM	532	57	Southend	G5QK/A	S	315
13	Cambridge University	G6UW	S	515	58	Edgware	G3ASR/A	S	313
14	Staffs. Coll. of Tech.	G3VZI	M	501	59	Chippenham	G3VRE	S	308
15	Surrey	G3SRC	S	477	60	RAF, Digby	G3KQB	M	300
16	Vange	G3YCW/A	S	475	61	Chesham	G3MDG	S	299
17	Hereford	G3HVX	M	473	62	Derby (Nunfield)	G3EEO	M	293
18	Crawley " B "	G3TNO	S	460	63	Grimsby (Wheatshaf)	G3VIP	M	292
19	Leyland Hundred	G3GGS	N	455	64	Purley " C "	G3XOO	S	282
21					Bristol	G3TAD	S	454	65
22	Finchley	G3YPV	S	449	66	Crawley " C "	G3XNS/A	S	278
24	Keele University	G3UOK	M	449	67	Southampton	G3SOU/A	S	270
25	North Staffs.	G4QD	M	445	68	Scarborough	G4BP	N	268
26	STC, Harlow	G3NIS	S	443	69	Purley " B "	G3XMW	S	257
27	Wirral DX	G3VVA/A	M	430	70	Bromsgrove	G3VGG	M	257
27	University College of North Wales	GW3UCB	GW	429	71	Worthing	G3WOR	S	256
28					Derby	G2DJ	M	427	72
29	Greenford	G3YEL	S	416	73	Verulam " B "	G2AIA/A	S	246
30	Addiscombe	G3VYI/A	S	405	74	Southgate	G3SFG/A	S	246
31	Mid-Sussex	G5RV/A	S	401	75	Cray Valley	G3RCV	S	243
33					Reigate	G3REI/A	S	401	76
34	Grimsby	G3XDY/A	M	386	77	South Shields	G3DDI	N	223
35	Torbay	G3NJA/A	SW	383	78	Sunderland	G3STC	N	210
36	Sheffield	G4JW	N	383	79	Mansfield	G3GQC	M	207
37	Jersey	GC3DVC	GC	380	80	Cambridge	G3RZP/A	M	207
38	Wirral	G3NWR	M	373	81	Limerick	E14LRC	EI	200
39	Purley	G3TJW	S	366	82	Echelford " B "	G3SAZ	S	195
40	Crawley " A "	G3WSC	S	361	83	Newark	G3ELJ	M	192
41					Gospport	G3ROK	S	361	84
42	Lincoln	G3IXH	M	354	85	Clifton	G3GHN	A	159
43	Echelford	G3UES/A	S	351	86	Chiltern	G3XRR	S	154
44	N. W. Durham	G3UTS	N	351	87	Wimbledon	G3WIM/A	S	142
	Nuneaton	G3XTU	M	350	88	Haverfordwest	GW3XOT	GW	131
					89	Eccles	G3GXI	N	123
					90	Stratford	G3RPJ	M	92
						Oxford	G8IB	S	76
						Maidenhead	G3WKX/A	S	56

1's and a sprinkling of others. The transceivers, other than KW-2000, included (at Kings Norton) a brace of Project '66 transceivers cross-coupled to each other, a single Project '66, and the odd home-spun "special." In separate transmitters, there were A.T.5's, TCS, and home-constructed rigs, the latter probably in the majority.

As for aeriels, which, as far as equipment goes, is where the battle is really won or lost, the vast majority went in for half-waves, centre or end-fed to choice, the odd inverted-Vee dipole, and so on. The highest scorer with a quarter-wave was East Barnet, their aerial being up at 60 feet, and fed against an *earth* system which is the secret of their signal, and driven by an extremely talented array of operators and loggers.

Operating

Pretty good in general, with the netting most definitely better than last year. One or two stations were using outrageously long calls—for example, the character who sent 34 CQ's followed by one MCC and one call-sign! Anyone tangling with that particular chap took all of ten minutes to complete a QSO! However, later, the same station was going much better, and, oddly, it rather sounded to your scribe that the same operator was at the key, so clearly here was the training of a future good op.

Not so bright was the misuse, and in some cases downright neglect, of good operating practice and even of licence conditions. At least four stations were noted as not using correct procedure to the point where they were even omitting to send their complete call, let alone BK in their contacts. This is, to put it mildly, somewhat confusing to other, and relatively untrained, operators, and certainly cost its practitioners several points from lost QSO's and at least one lost place in the final results. An additional Rule will have to be added to cover this next time, and enforced rigidly.

Otherwise, it was clean and sporting, with very few people swishing VFO's around with the power on, pretty good Morse, and most of it as fast as could be regarded as reasonable—although, as ever, there were folk who got tangled up in their dots by reason of trying to drive bug-keys too fast. Some there were who were sending too fast for the slower stations and then found they were also going too fast for themselves when they raised one that came back at their own speed! But, as far as the vast majority at all levels were concerned, only a purist could cavil, and the sportsmanship was virtually one hundred per cent.

Here and There

We have already commented on the East Barnet station, who had G3RFS and G3RPB—both well known on the CW DX Top Band scene—as the spark-plugs, with another name well-known to Top Band DX-men logging, namely Rolf Rasp, whose SWL activities on the band from PY-land did much to raise enthusiasm for 160 metres in South America.

Another group, Royal Navy ARS, had G3RFH, who was in the winning Moray Firth side last year, assisting DJ8EK, G3VRY and G3YGM to put up their tally. Incidentally, DJ8EK is a member of RNARS and is at

present in U.K. "on a course," as the Navy have it.

Kings Norton were a bit cross before the start at having being left out of the original Ident. list, due to an error on the part of one of the *Magazine* staff who, having spent his early years in Kings Norton, should have known better! However, they got their code all right, and settled down to the battle. A little time was lost on the second evening due to major aerial troubles—did *anyone* get off scot-free?—and then had the biggest shock of all when, on totting up the score they realised they had made *exactly* the same as last year! However, as the scoring generally was not as high as for the 23rd MCC, they move up to take fifth in the Table.

Changing tack a little, it was quite surprising how many stations missed the GDY calling them, in favour of something else a little nearer and louder. As for instance, this made things very hard indeed for GC3DVC and EI4LRC, both of whom were laying down a good signal at your scribe's aerial, but having considerable difficulty raising enough stations to make it worth while—which was tough, as both had had more than their fair share of technical problems to overcome. GC3DVC found a shortage of operators and assistants because of the gales, and so GC2LU (who for so many years was the leading light in Coventry) and GC3ULZ, aided by SWL Bottrel had to do it all themselves, while OT GC3GS did the coffee-brewing.

At EI4LRC, the boys were well equipped, with an HRO and Drake R4B as receivers, plus a Central Electronics Exciter as transmitter, all to a dipole which blew down and had to be put up again just before the start; but only the top-scoring stations seemed even to be aware of their existence. As there are only seven or eight EI's licensed for Top Band and at least two of them were out as "privaters," they must have had more than a fair share of organisational problems to cope with, too.

The Scoring System

As usual, there were comments, for and against. But it is an interesting thought that none of those who went in to win had strong feelings either way. There is a case possibly for changing the loading a little to make it easier for GC and EI. But when it comes to the crunch one doubts if there were others who could have run up the number of QSO's the winners made with a similar aerial system from *any* part of the country—they seemed to attract takers like a magnet, and were getting down to the Southern Zone from the word "go," albeit with a weak signal. It was quite uncanny to your scribe the way they seemed to sense where the callers were to be found and yet themselves to remain "in the clear" right down South.

However, many people seem to have the idea that scoring is biased against the Southerners; just how much so it is *not* can be gained by mentally inserting Verulam into the first four stations, and then looking how the Southerners dominated the picture, under the conditions of the Contest which were about par for the handicapping system.

However, between now and next year, your organisers will be doing some serious thinking about the whole business and maybe inventing a new twist to the game.

TABLE II

Top Scorers for 1967, 1968 and 1969

Place	1967	1968	1969
1	Burslem (641)	Moray Firth (825)	Kirkcaldy (770)
2	Moray Firth (598)	Manchester U. (698)	Maesteg (624)
3	Kirkcaldy (580)	Kirkcaldy (695)	Veteran Ops. (617)
4	Newcastle U. (561)	Spenn Valley (661)	Maidstone (599)
5	E. Barnet (557)	Stourbridge (608)	Kings Norton (597)
6	Spenn Valley (552)	Keele U. (604)	U. Coll. S. Wales (595)

NOTE: Figures in brackets are allowed scores.

Privateers

There were of course plenty of these. GM3UKG and EI9J were laying about them with gusto, and appeared in many logs, GM3UKG indeed in most, which is not so surprising when one notes that he is up in Banff and probably had a hand in Moray Firth efforts of past years.

Both from Penzance, were G3XAR/A and G2JL who looked to have been on for most of the time between them (and it could be added that the call G2JL was used by West Cornwall to win MCC back in 1947). Others appearing in many logs included OK1IQ, OL4AMU, OL2AIO, G6HD and G3AAQ. However, a tendency that disturbed your conductor somewhat was the large increase in the number of single-point contacts with stations whose calls appeared as loggers or operators of the club station. There is nothing at all against press-ganging all the locals into coming on the band for a point, but it seems to be bending the spirit of things somewhat to slip home for a quick QSO while another op. is on the Club station!

Comments from the Logs

Here, as usual, everyone came into their own. SWL Law's log, as always, was a model and many of his observations have already been embodied in the piece so far. The Kings Norton one displayed a drawing of "Chad," of hallowed memory to all older cartoon lovers and Service radio types, with a caption "Wot, no non-clubs?" on one page of Saturday's log, while on Sunday's the theme was set to music, followed by "Ah! here they come" a little later; the single-pointer signals then piled in quite fast until near the end comes the comment "Damn! Another one!". "Aerials took three weeks to prune and match" (Verulam) . . . "Bonus is stupid and ridiculous" (Maesteg) . . . "Some stations obviously lax in logging" (Veteran Operators) . . . "Forgive us our late entry and let us in please (Maidstone)"—we did. "Found it great fun after some years absence" (Guildford) . . . "Operating standards showing slight improvement" (Nottingham) . . . "AR88D had to be carried on a moped!" (Southampton University) . . . "Sorr for the poor signal; someone had chopped 100 feet off the end of the aerial and left another 500 feet

lying on the ground" (Radio Club of Scotland "Would have had a large vertical, but the hydrogen generator exploded with spectacular results on Saturday morning!" (Staffordshire College of Technology) . . . "We prayed the aerial would not be carried away by the wind; prayers were answered" (Surrey) . . . "Hope to get help next time" (Hereford) . . . "Too many shortened numerals" (Crawley "B") . . . "Here's to the 25th!" (Leyland Hundred) . . . "Too much QRM" (Finchley) . . . "Look forward to next year when we hope to keep our 1000 feet of wire in the air and not about three feet up!" (Wirral DX) . . . "An enjoyable contest; many absent friends, though" (Derby) . . . "After putting pole back up, keying hand had to be thawed out in hot water for five minutes!" (Greenford) . . . "Please excuse the couple of T7 reports on the first night; the VR-150 took off!" (Addiscombe) . . . "Near-calamity on Sunday but fortunately caretaker came back at 1700. Aerial got wrapped round tree first night so didn't get out very well" (Mid-Sussex) . . . "One contact took ten minutes to complete!" (Reigate) . . . "Apologies to those who called and were not heard; rain static was 40 over nine many times" (Sheffield) . . . "At this rate should finish top in 1971" (Jersey) . . . "Next year, a new aerial" (Purley) . . . "One station, not a local, radiating clicks plus and minus 10 kc or more" (Gosport) . . . "Dark Mutterings about next year already!" (Echelford) . . . Having dislodged our aerial from the apple tree, score on Sunday much improved" (Chester) . . . "Many loggers!" (Cheltenham Grammar School) . . . "Fundamentally wrong to use short figures in a mixed letter/number group" (Salisbury) . . . "My thirteen-year junior op. logged for me throughout" (Dursley) . . . "Guess which club is 90 per cent SSB!" (Stratford-upon-Avon) . . . "At least our entry will not cause you time or trouble in checking!" (Maidenhead).

Personalities

As always, there is this thread of continuity that runs through the MCC story over the years. We have already mentioned several in this write-up, but one must not forget the performance put up by Mid-Sussex, using G5RV/A, with the illustrious owner of the call

TABLE III
Top Scorers in the Regions

Southern			
1	Veteran Operators (G3VOC)	...	617
2	Maidstone (G3TRF)	...	599
3	Gov't. Comms. (G3SSO)	...	573
Northern			
1	Leyland Hundred (G3GGS)	...	455
2	Sheffield (G4JW)	...	383
3	N.W. Durham (G3UTS)	...	351
Scotland			
1	Kirkcaldy (GM3FXM)	...	770
2	Radio Club of Scotland (GM3RCS)	...	532
Midland			
1	Kings Norton (G3GVA)	...	596
2	Nottingham (G3EKW)	...	556
3	Staffs. Coll. of Technology (G3VZI)	...	501
Wales			
1	Maesteg (GW3UUZ)	...	624
2	University College of South Wales (GW3UWC)	...	595
3	University College of North Wales (GW3UCB)	...	429

banging away as though the years had never been, and coping with all the things that go wrong even in the best-regulated circles when a contest is on. And it should be noted that G5RV, VHF big-shot G3HBW, G3BMY and others well-known in the MCC context did not make all the mis-reading mistakes so evident in some other logs—if some of the OK/OL boys could but see the logs they would laugh to see where they had been placed by bad code-reading.

The Regional Aspect

Table III shows how the regional battle went in all those areas where enough entries came in for separate tabulation, and shows the leading stations in each, ready for some one to try and dislodge them next year. And it is to be hoped that someone *will* try—going in with the will to win, whether regionally or nationally, is something a contest-minded gang should attempt seriously every once in a while. It was noted once or twice during MCC that there were, here and there, stations who, as one of the invigilators expressed it, “nipped out for a drink” while three or four stations were calling them, only to reappear several minutes later! On the other hand, stations who were known to be out to make mincemeat of the rest seemed to have just that little edge of decisiveness or snap which proved the mettle.

Conclusions

As always a hard and well-fought contest. For next year the thoughts to consider are possibly, from our point of view, some new twist to the theme (no promises!) and from the competitors, more accurate timekeeping, and close attention on the part of those operators using transceivers where a tone is keyed to ensuring that none of the contest operators of the group is allowed to wind up the drive to the point where a broad spectrum is radiated—we shall really jump on them next time!

And there it is for another year. Back to normal next month, with a deadline of **January 9** for your news of *February* events, addressed as always to your “Club Secretary,” SHORT WAVE MAGAZINE, BUCKINGHAM.

CLUB SECRETARIES, PSE NOTE!

The “Clubs” feature will resume as normally with the next (February) issue, due out on **January 30**, for which the deadline for “The Month with The Clubs” is **Friday, January 9**. Any reports already received with details for the February activities are being held.



Impression of a sound/colour commercial TV studio control room, this being at I.T.N. House, London, from where full colour is now radiated. The sound facilities for the control complex—consisting of a 24-channel mixer, gram. desks for each of two news studios, a dubbing mixer and editorial talk-back system—have been provided by the firm of Elcom (Northampton), Ltd., one of the P.ainton Group. It is interesting to note that the well-known firm of P.ainton & Co., Ltd.—of which the principal is Cedric Benham, C.B.E. (G4TZ)—has recently become merged financially with Plessey's, though continuing to operate as a separate entity, with J. B. Kaye, G5BG, as vice-chairman and Robin Addie, G8LT, as managing director.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

THE month under review has seen us dropping into winter conditions—in more ways than one! As far as those of us are concerned whose work keeps us away from the rig until the evenings (unless we are able to spend time in the shack before the day's work begins), things seem to have been pretty flat as far as the HF bands are concerned. Indeed as this is being written, your conductor has dismissed Twenty in favour of a mite of background music on tape! However, the bands, as ever, have had their moments for those lucky enough to have been on at the right times.

As far as G3KFE personally is concerned, matters were not exactly improved by the realisation that he had forgotten, in a moment of aberration, to include the deadline in the tailpiece to last month's piece; with the result that this month there will probably be time for a more discursive approach to our subject!

Top Band

Anyone looking at this band of late, having not investigated it since the early part of the summer, would probably be amazed at the increased collection of funny noises which inhabits this part of the spectrum. Indeed, it seems to be the case that it is all but impossible to find an even reasonably clear channel on which to put out an SSB call. This thought was prompted by the realisation that a QSO started on what looked to be about the only clear spot around the 1875 kc mark had in fact found its way so close to Humber Radio that the latter found it necessary to request a QSY—a request which was couched in such pleasant terms that one has to salute his forbearance.

However, there is no doubt whatever that the CW end of the band is in far better shape, as G2DC (Ringwood) points out. Jack is, as we all know, far from being a part of the scenery of Top Band; indeed, he has only mentioned it

three times during the period G3KFE has been conducting this piece. However, the converter tacked on to his receiver had to be tested last month, a "soak" to make sure it continued to operate, and out of the exercise came contacts with all the U.K. countries, also DL3FF, HB9IN, HB9NL, PA0VB and EI9J.

Cambridge University Wireless Society have a traditional trip out to some interesting spot each Easter; this year, they will be on from March 17 for a period of a week or ten days, using all bands, and signing

GD6UW. Most of the operation will be SSB, and no skeds are planned, so as not to spoil the holiday atmosphere which is, after all, the main reason for going. Nonetheless, one hopes that among the *ten* operators concerned there will be some Top Band, and some CW. The VHF chaps will be up on a cold and windy hill-top, while the others hope to be using a spot near Port St. Mary. Among the gear will be Sommerkamp FL/FR-500, plus a home-built linear, a Heath HW-32A and a TA-32 beam, if all goes as planned.

[over

SIX-BAND DX TABLE

(All-Time Post War)

Station	Countries	28 mc	21 mc	14 mc	7 mc	3.5 mc	1.8 mc
G3IGW	206	127	156	168	125	100	42
G3SED	136	31	26	66	43	40	39
G3WPO	101	35	20	63	49	29	21
G2DC	336	172	308	328	166	115	20
G3VPS	135	46	42	114	59	38	14
G3WJS	66	—	8	55	41	45	14
G3PQF	161	105	47	98	84	56	13
G3IAR	221	126	161	193	91	73	12
G3XAP	92	44	46	43	38	28	12
G3KMA	249	191	178	187	123	54	11
G3DO	337	202	242	330	90	83	9
G3LZQ	259	140	156	208	72	38	8
G3RJB	164	64	50	150	59	37	8
W6AM	348	131	140	347	116	54	7
G3MDW	116	47	66	83	20	15	7
G3XBY	161	104	113	97	69	56	6
G3NOF	317	186	219	300	35	41	2
9H1BL	163	95	95	123	56	48	—
G3VDL	145	59	105	101	53	31	—

Note: Placings this month are based on the "1.8 mc" Column.

Now to G3VLX (Sidcup), who for long has been pretty well exclusively Top Band, albeit he has threatened for long to attack the other bands. The reason was simply that he had a Mini-5 rig on the stocks, but try as he would, it would not behave itself on 21 mc, and the linear—passive grid—gave only fifteen watts of RF output for the eight it demanded of drive! However, Deryck now has a FL-200B to match the FR-100 already in the shack and so will not be such a steady Top Band operator as of yore. Indeed, this month, only two contacts are noted as worthy of mention, those with GM3BQA in E. Lothian for the 97th county, and G5PPP, Coventry, during the Midland and Bristol Societies Contest.

Sad to say, G3PQF (Farnborough) was, as they say, horizontally polarised at the time of writing. Dave mentions seeing G3LXD, his competitor in the Tables, and says they hissed at each other like stage villains! An interesting contact was with G6LX, who was running 200 milliwatts to a transistor exciter—the interest in this one being that G6LX was in QSO with a GM who was completely inaudible at G3PQF. Other news is that G5XB will probably be back on the band during the winter for anyone who is really in need of an Oxford contact. Other QSO's mentioned are with most of the U.K. countries, plus a new TV set.

November 30 was a good day for G3LXD (Church Crookham); an early morning session produced contacts with K1PBW at 0310, followed by K1JGD, who came back to a CQ. W2FJ was also consistently audible right up until 0520z, when a noise like a vacuum cleaner suffering from QSB(!) came up to S6 and obscured the DX signals. John is stuck, on the counties side, for Huntingdon, like so many more of the newer operators. In this context it is of interest that G3KPO (Eye) says Peterborough is now divorced from Northants and is part of the entirely new county of "Peterborough and Huntingdon." The point here is that G2NJ for one is now in the county and should be pretty easily workable—he is at the top of both Phone and CW sections of the Counties ladder, and for the second time round, to prove it!

During a recent Top Band contest GD was well and truly put on the map by "the maestro" himself, signing GD3SVK, thanks to some much appreciated help from GD5APJ. The site was the Albert Tower, on top of a 500-foot hill; an inverted-Vee was suspended from the flag-pole above the Tower, putting the apex at 65ft. above ground. Some 200 QSO's were knocked up, CW during the contest, and some SSB beforehand. Sadly, G3KFE did not get wind of this effort till too late to make a contact. Incidentally, G3SVK mentions the possibility that he may return to GD for the CQ WW 160 Contest; also that he has sent out a circular to most of the well-known county-chasers to ask what counties are wanted, so that he can plan his expeditionary activities for 1970. One of his trips will involve landing on Stroma, in the Pentland Firth, with some Scottish counties being activated on the way up and back. Other news of interest is that Fred has been trying to get them at 4U1TU on to Top Band again. If anyone still lacks a card from G3SVK in Rutland, there are some left.

A new entrant to the lists is G3YXM (Leicester) who complains that the G3KFE signal has not been heard on the band for ages—not quite true, even if it has to be admitted that your conductor has not been around on 160m. much lately. Dave uses a home-built sideband rig—good for him!—and an inverted-Vee with the apex at 25 feet, soon to be raised another ten.

Another one on for the Top Band contest was G3XAP (Stowmarket), who made a total of 89 contacts, which broke down to one EI, 9 OK/OL, a couple of DL's, and an assortment of G stations. Nothing to write home about according to Phil, but nevertheless quite a good crop.

G3IGW (Halifax) returns to the fray, and mentions that during the night of the CQ Contest, he listened on 160 between 0200 and 0300z and found the band jam-packed with W's, including W1EXI, W1WY, K1JGD, K1PBW, W2FJ, W3FE, W3MSK, W3MFW, K3MBF, W4BVV, W8CIJ and W9BKA/8—pretty nice for 160m.

As for Ted, G2HKU (Sheppey), he has had his regular sked SSB QSO with PA0PN, who has been down with 'flu but by now should be back on and dishing out CW QSO's; and on the CW side, OL5AMT and OK3TOA were both very consistent signals around 2300z.

Still on the Top Band tack, your conductor made one of his rare appearances on the band on the evening of December 7, to be told that various W's had been worked during the early morning; that VP9GJ was on, but would be back in U.K. in three weeks from the date of the QSO, which means by the time this is in print; and that ZD9BM would be active on Sunday mornings, 0430-0630z, transmitting on 1827 kc and listening in the region 1800-1845 kc; this is a shame, because of the near impossibility of hearing him on this frequency, and it is understood that "representations" are being made to see if something can be done about getting him to try 1803 kc for his "transmit" channel to give the G's a better chance at him. Other news from the same quarter included a buzz that G3RFS may not do his 6Y5 trip, and a rumour that a station signing HR2HH has been heard and worked in U.K. on Top Band.

Eighty and Forty

As always, neglected by reporters, but nonetheless carrying traffic on occasions, under the layers of drivel which so often constitute the upper three layers.

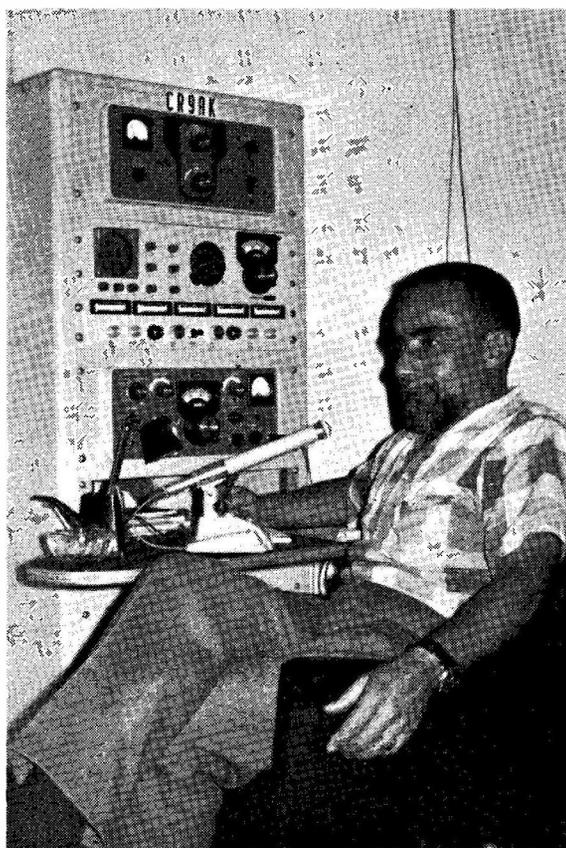
For the first few days of the period G3XAP tried 0600-0800z to operate 3-8 mc Sideband, a ploy which resulted only in a few W's. However, one of the W's was a little surprised to find Phil listening on 3807 kc with a KW-2000A. The method is really quite simple: Set the '2000A to 3804 kc; when transmitting use ITT and full clockwise on the ITT knob—hard against the stop. Thus one always appears transmitting on 3798 kc. When receiving, swing to IRT and tune up the band on the vernier from say 3804 up to as high as 3810 kc. A little complicated, but capable of netting many W signals that otherwise would of necessity be passed up. Over to *Forty*, where G3XAP disliked the lack of countries in his scoring, and so spent a whole week of his

holiday setting up a quarter-wave vertical, trenching in eight radials, building an L-network to match it into, and getting the VSWR right down to unity at 7025 kc. This aerial is complementary to the existing dipole at 50ft. First impressions were that the dipole was probably better on reception, thanks to the lower static level and dipole polar pattern, but on the transmit side the vertical performed mighty deeds. The first evening found UA6, UO5, UB5, just to show it was radiating, then PJ2VD, W1FIR/3, all between 0100 and 0300. Catch up on some sleep, then enter the *CQ Contest*, CW end. On the Saturday morning in came sundry U's and EU's, followed by 4Z4BR, 4X4WN, 9Y4AA, TF2WLW, VE3WQ, PJ0CW and 31 assorted W's, W7 being the only missing call area. The following morning saw the W total up to 72, another 4X4, PY, KV4FZ and also, significantly, G3XAP found himself at the business-end of a pile-up, which made him feel more than sympathetic to some of those he has cursed in the past!

G3KMA (Woking) was confined to *Forty* for the month, as his beam rotator had to go away for repairs, and all that remained was the dipole. Conditions in the RSGB Contest were pretty poor, but the *CW CQ Contest* was rather better. In the former contest SSB raised CN8DW, EA8FF, EP2BQ, UA9KAX, VK2AVA, YV1BI and YV1EM. CW in the latter raised 64 assorted W's, KV4FZ, PJ0CW, ZF1AN (who came back to a CQ call for a new country on the band), VE's, 4X4 and assorted rarer U types.

As already mentioned, G3VLX (Sidcup) has broken out on *Eighty*, his first tentative exchanges raising DJ, LA, GC, OE, SM5 and an F6 to prove things are "go," though a VO and a 5Z4 eluded his grasp. As Deryck remarks, even if the *J*'s are fairly common, it is good for the ego when a Continental station proclaims you to be the loudest signal on the band!

Eighty made a good start in November, in the opinion of G2DC, who found that between 0700 and 0800z at least three continents could be raised with ease; but later in the period things fell right away, even ZL3GQ being inaudible. Two good



Dr. Fern Pinto, CR9AK, Macao, Portuguese territory off the mainland of South China, who had a visit from JA3AER for a DX weekend, August 30-31. Between them, they logged 780 QSO's in 33 countries, on 10-15-20m. Cards for this particular operation go via JA1AG. The QSL address for CR9AK himself is as for CT1BH, QTHR.

ones that were workable every morning were CT3AS and VP9GJ, the latter around 3510 kc. A couple of new countries for the band pleased Jack mightily—he has been static for some time—in YN1CW and CT2AT, the former in the morning and the latter around 2120z. Others included OY6FRA, OH3XZ/OH0, ZL1CH and assorted W's; one QSO that was pretty rickety to start with was with W6AM; it came to a sticky end underneath a G who called CQ. *Forty* yielded a couple of J's at 1530z, EA8FJ, TF2WLW, PY4OD, all W call areas and VE1-4.

G3LZQ has been wearing his "other hat" as GW3LZQ/A, although not very often. Just 29 days of activity there has accounted for

92 countries in total; in the current month the 204ft. top, centre-fed, has accounted for W1-4 and OY on *Eighty*, and on *Forty*, PY's, W1-4 and W8-0 were all "seen off."

Quite a crop was rustled up by G3IGW during the *CQ WW Contest*, including CN8PR, CT2AT, FB8ZC /FC, KV4FZ, PJ0CW, UA0AG, UL7GW, UI8KBA, UM8FM, VK3AW (at 2000z), VP9GJ, W0NA, ZF1AN and 4X4MU; of these ZF1AN (who came back to a CQ) was the 100th country, with UM8FM as the last of the Russian countries. Heard, but not worked, included KR6NG (1530z), VK2EO (1630z), ET3USA, 5H3KJ, plus UD6, UF6, UH8 and UJ8. Known to have been around, but neither heard

nor worked, although they were getting into Europe, were HM1AQ, HM1AT, JA's, UK0AA, and XW8CR. Finally, just to prove "how fast the sunspots are disappearing," Mike mentions that ON4UN worked ZL3GQ at 1604z and ZL1BHO at 1645z!

Incidentally, G3IGW draws attention to the fact that, by tacit agreement, 3500-3510 kc and 3790-3800 kc are reserved for international DX'ing, the point here being that many stations having worked some DX have a distressing habit of then enjoying a local natter. A good

Reporting the HF Bands

point, this, and all the more shame that in this case it is often the DX-chasers who are offending, by not shifting far enough off the DX channel.

G2HKU found little of interest on *Eighty*, other than one signing OE3GEA/P3, in Moedling, near Vienna, who was a Technical College station with a special call. On *Forty*, at 2105z, EP2BQ was S9 plus, and OD5LX has been doing a roaring trade on CW, peaking 589 on some evenings.

G3VPS (Wartling) mentions that 9H1BL has been hearing strong G's on 80 metres in the afternoon; and so they arranged a sked on CW at around 1600 clock, and made it 559 each way. SSB saw seven new countries booked in on the band, by way of TI, YV's, PY's, HK, EP, UA9, EA6, EA8, CN8, 9H1 and 9Y4, to make Peter well satisfied.

Finally, a note from G2NJ (Peterborough) mentions that he is still after the Maritime Mobiles, and heard another one on November 11, signing HP9FC/MM. A QSL is to hand from OH1WP/MM which indicates he was operating from m.v. *Outokumpu*.

The HF Bands

As we have already commented, winter is upon us with a vengeance, and conditions have shown up this fact—though there are *some* parts of the world where it is not too darn cold to go out to the shack!

Nonetheless, there have been the odd lifts when ordinary mortals could be expected to be around, and it is fair to say that on most evenings there have been one or two signals of non-DX nature audible, at least on Twenty.

Taking *Ten* first, G3KPO mentions an occasion when it turned up trumps. A neighbour called and enquired what the monster TV aerial was doing. A quick spin round the dial revealed Ten wide open, and S9 contacts were made on SSB in rapid order with K4MG ('way down South in Alabama), W5TXZ (who literally yelled out "You're my first G-station), W6BAC, VE7AIT

and finally VE2AIO, who commented "Say, don't you remember me? We met when you were over in Montreal in June." So—now Doug has *one* neighbour who thinks Amateur Radio is just marvellous. This sort of thing makes G3KFE green with envy; for him, showing the visitor his rig *always* means the bands are utterly and completely dead!

For G3NOF (Yeovil) *Ten* was only open during daylight, and none too well at that. SSB gotaways were VS6AD and 9N1MM, but FR7ZG, HK0BKC, MP4TCE, VP8KD, VQ8CG, VU2TJ, VU0OLK, W5, W6, ZS, 7Q7JG, 8P6AZ and 9J2DT were raised.

9J2DT was also heard but not worked by G3PQF, who recalls it as the sort of signal that used to emanate from there five years ago—which augurs ill for the expected 28 mc DX! As for your scribe, with his usual unerring skill, he tuned up on the band *whenever* it was going out, so that by the time he was ready to go, it had gone.

On the other hand G2DC found things quite reasonable, other than the T6 stations from Eastern Europe, which are not really *so* bad—they usually drift off the frequency pretty quickly! Thus, his 10-metre log shows CW with CV2AA, CR6IK, CR7IZ, ET3USA, EA8FH, dozens of UA9's, UD6BW, UL7BB, LU5EH, LU8BJ, PY4OD, VK2VN, VK3EO, VK2AHM, VK3KR, VK6DS, VK6RU, VS6AA, ZE3JO, ZE8JN, ZS2RM and ZS6AYU, VP9AT, VE1-7 and all W call areas.

CW was the only mode used at GW3LZQ/A, and on 28 mc raised CR6, CR7, ET3, ZE, LU and all W call areas from a very poor location. Using the same mode, G3VPS came up with three new ones—PJ0, UR2, and UQ2—to go in the same bag as ET3, UA0, XW8, and 9H1 and some smaller fry.

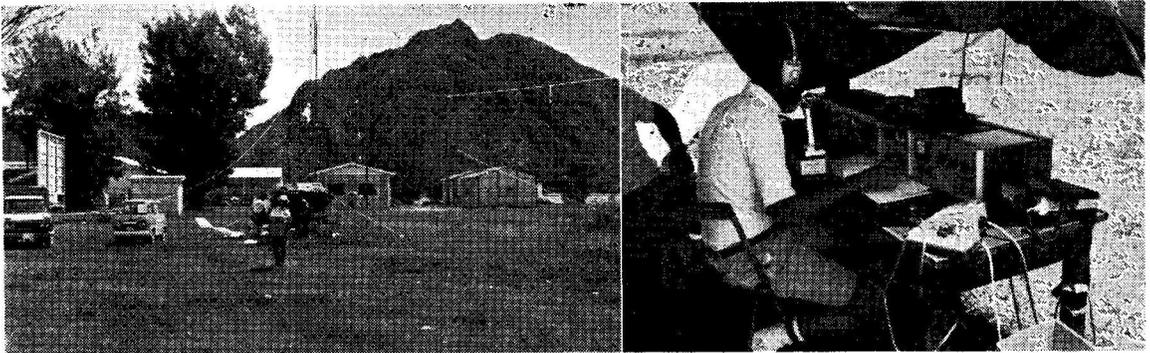
Fifteen Metres

G3NOF first: Don reports that KG6, JA and VK have been in over the long path from 0800, and the same areas again *via* the short

TOP BAND COUNTRIES LADDER

Station	Confirmed	Worked
<i>Phone and CW</i>		
G2NJ	98	98
G3HDO	98	98
G3NPB	98	98
GM3OXX	98	98
G2HKU	96	96
G3WPO	94	94
G3SED	93	96
G13WSS	89	92
G3VLX	81	97
G3XDY	79	91
G8HX	76	83
G3XTJ	63	88
G3XTL	62	78
G3WJS	60	86
G3KFE	48	66
G3XGD	42	55
G3LXD	37	65
<i>Phone only</i>		
G2NJ	98	98
G3TSL	94	97
G3SED	91	92
G3WPO	88	89
G3VGB	84	95
G3PQF	81	92
G3XDY	39	67
G13WSS	38	58
G3NPB	17	62

(Failure to report for three months entails removal from the Table. Claims may be made at any time. Six months of "Nil" reports will also result in deletion.)



This interesting composite picture is of the JD1YAB expedition to Ogasawara Is. (formerly Bonin and Volcano Is.) in the North Pacific, to the south-east of Japan. First amateur operation from this area was by KG6IG, during the post-war U.S. trustee period. To signalise the return of the territory to Japan, and the prefix JD now allocated to it, the JA's mounted a DX-pedition during August 28-31, with six operators. Two stations were set up, for all bands Top to Two, and they made no less than 5,000 QSO's in 92 countries, including KH6 and W7 on 160 metres.

route at 1100, with North Americans from 1200, but the band has normally closed with the onset of darkness. In terms of SSB QSO's, the log shows DU3ZAS, JA, MP4TDA, VK2AU, VK2AVT, VK2FA, VK3TG and VK2WX /VK9 (Papua).

The early closing of *Fifteen* is also commented on by G2DC, who nonetheless found conditions quite fair; Don says that once the noise and hubbub from North America has cleared it is well worth another look, for Central and South America, often quite clear and finding few takers. No new ones were booked in among (worked) FP8CS, HC2GG, HPIIE, KZ5WJ, PJ0CW, OA4MS, LU5AQ, PY4OD, CE2AD, CX1CO, VK5FM, VO2KR, XE1ZV, YNICW and a "4M5ANT" of doubtful ancestry.

Another one to look at this band was GW3LZQ/A, who scratched around a bit and raised VK's, CR6, CR7 and ET3, to keep his score moving nicely along from the /A location.

Our 21 mc king, GM3JDR (Golspie) found conditions pretty patchy, quite apart from the fact that the band up there is closing by 1830z. This means the end of the JA QSO's until the Spring—the last one was booked in during the early part of November. Even the morning session was considered to be such as to force a man to go to work(!), which leaves only the lunch-time session and the odd pick-up over weekends, all of which

were on CW. Thus, we find PY7VOU, VP9GK, ZS5HN, VK3AUT, VK6SA, OX3ZO, ZS1ACD, CR6AI, CR7IZ, VK5DS, UL7JJ, JTIAD, 6W8GE, G5NX /LA/MM (near 6W8!), JA's, KR6NG, OD5LX, UJ8AB, VK3MJ, EL0C/MM (in mid-Atlantic), UL7KAA, VS6FX, VK3RJ, PY1CPC, 9Y4AA, LU2JV, UA9CT, UA9OS, UA0SH, UA9BZ, UW9BB, UA9PP, UF6LA, UF6AM, UA9RR, UA9TT, 5H3KJ, CV2AA, KV4FZ, ZS5VF, 4M5ANT, 5H3LV, PJ0CW, TJIAK, KP4AN, UH8KAA, UI8KBA, all W call areas, and all W call areas with *Novices*.

Twenty-Metre Band

Broadly, *Twenty* has been quite good when it was open, but tended to close shortly after dark. Further, the cold snap towards the end of the period resulted, for your scribe at least (and probably for most DX-ers in urban areas) in a whole lot of electronic clicking noises, mainly ascribable to thermostats and central-heating gear. G3KFE is ashamed to admit that one, at least, was finally run to earth in his own shack heater—but that was far from being the only one! Just what one does when one's aerial system is in the field of the mains wiring of about half-a-dozen houses is difficult to explain.

G2DC found the early-morning period, which used to be so productive, pretty awful but contents

himself with the philosophic reflection that perhaps it makes one scratch around a bit for DX on the other bands. Fair comment, at that. CW came up with KR6VX, PJ0CW, PY4OD, UK0A (Zone 23), UF6KPA, UL, UI, UM, UH, VK1-9, W1-O and VE1-7.

For G3NOF the tale was broadly the same, with the exception of FK8BH from the Pacific area. However, SSB rang the bell with C21JW for a new country (hooked after a long search), K7UZV, JA, MP4TCF, TN8BK, VK, VP2EQ (Anguilla), W7APA, W7CHZ, ZD3K, ZL and 9G1GT.

On to GW3LZQ/A, still paddling his key, who found VK's, ZL's, LU and PJ0CQ.

The activities of G3VPS have been directed to other than DX working; in the main, on *Twenty*. An interesting one was a three-way with IIANE and IIAHO, both being in the same town; it transpired that IIANE is blind, using a linear built for him by IIAHO. A new all-time country worked was CE3FI, around 1400 clock; again an interesting QSO, in that Rolf was beaming from CE towards VK when the QSO took place, which in the time-context makes it a little odd for a long-path contact. Others worked included 9M2 and UL7, both the latter being on CW.

Talking of odd propagation, G2HKU has noticed that weird things have been happening on his 0700 sked with ZL2KP, ZL3SE and ZL3JQ. "Beastly Summer

Time" has hit them, and signals change from S3 to S7 as dawn breaks—but at the precise period when the change comes, the SSB signals rise a couple of S-points above the CW level. Explain that one away, you propagation and aerial types! Another G2HKU contact was with 9Q5MW, an ex-ZL missionary, 400 miles into the jungle, with only his XYL and one other white man with them—which must make the Amateur Radio quite a boon.

Contests and Awards

Taking things in back-to-front order, it is perhaps of interest to note that the first 5-Band DXCC awards have now been taken up, the initial certificates going, in order, to W4QCW, DL7AA, W1EVT, W8GZ, W8BT, W4IC, W1AX and W4BRB. Interesting to note how many of these are old-timers and therefore capable and proficient operators.

RTTY enthusiasts should put a ring around the calendar for March 21-23. Starting at 0200z on the former, and going on till 0200z on the latter date is the BARTG Spring Contest. Any 36 hours of the period may be used for operating, provided rest periods are taken of two hours or more, with times on the air and off clearly marked. All bands 3.5-30 mc, working a station not more than once per band. Country status is determined by the ARRL Countries List, but KL7, KH6 and VO count as separate countries. The exchange consists of time in GMT, Message Number and RST. Points are scored at the rate of two for a QSO within one's own country, and ten for a different country; all stations receive a bonus of 200 points per country worked including their own. Any one country may be counted again if worked on another band, but Continents are counted once only. Scoring is as follows: For A, multiply QSO Points by Countries Worked; for B, multiply total country points by the number of Continents worked. Final score equals A plus B. Use one log for each band, and indicate any rest periods. Logs to show Band, Time in GMT, Message and RST numbers sent and received, and exchange-points claimed. All logs to be in to E. Double, G8CDW, QTHR,

before May 25, 1970. Certificates go to the two top scorers in each country, and the final position in the results will be taken into account in deciding the "World RTTY Champion."

And of course, not to forget the CQ WW Top Band affair, January 24-25, the details of which we gave on p.625 in this piece last time out; there were *thirty countries* on last time, and all but three U.S. States, not to mention several VE provinces, so there is plenty to go at. DL9KRA was second only to KV4FZ last year, which means that a G who is on and "loaded for bear," as the W's have it, is in with a sporting chance of collecting the silverware.

On the more local plane, the Chiltern Club are having a two-hour shindig from 1000 to 1200 clock, on Sunday February 1. Phone only, Chiltern members to try and work as many counties as possible, for multipliers, and stations. Top Band, of course, and, a good thought, players are specially requested to try to avoid creating QRM for those who don't like contests. Non-members to work as many members as possible in the time. Details from, and logs to, G3IQF (85

Oxford Road, Marlow, Bucks.).

From W1WY we have a provisional list of claimed scores—not results—for the 1969 CQ WW DX Phone Contest, and we are sorry to see that among the top scores nary a G is to be found. LA0AD tops the all-band single-operator category, with 2,512,695 points claimed; the top multi-operator single-transmitter category goes to W9LKJ with 1,459,860; and the multi-op. multi-transmitter to W6VSS who pegs 4,700,000. Among the single-banders, 28 and 14 mc both took half-a-million to be top, with OZ3SK and KP4CL making the claims; 21 mc shows 250K from OD5FA, while on *Forty* the top claim was merely five thousand from CT1CD. *Eighty* showed up better with a top claim of thirteen thousand-odd from VE7BDJ. As for conditions, W1WY reckons that, by and large, they were good for the Phone weekend, but a bit rough during the CW leg. A pity the G stations who played did not put in their entries because, on the basis of the claims noted here, it is quite certain that those who are known to have entered would have shown up very well.



Members of the staff of Sveriges Radio ("Radio Sweden") have their own Club callsign, SKOAC, which is kept active on the DX bands, especially for contests. Left to right, some of the SKOAC operators are: SM5AWO, SM0CER, SM5RN (also G5ARN), SM0DHH and SM0OY. Taking part in the recent Swedish national DX contest, they made about 216,000 points. So far, SKOAC has worked some 100 countries and made WAC.

The Tables— and Other Matters

Thanks to that silly boo-boo your scribe committed in forgetting to put in the deadline last time, the final entries for the Tables for 1969 will go down in the February issue—that is, taking in all the offerings up to the deadline for that piece, which is January 12 latest, and including any which filter through too late for this time.

GW3AHN (Cardiff) has a few pertinent comments on the size of an aerial farm: He does *not* envy W6AM his mammoth stack, which, Tom feels must take up much time in routine maintenance. To make his point, GW3AHN mentions his own aerial system—an “X” beam for Twenty, a rotary dipole on Fifteen, and an indoor ground-plane for 28 mc. The beam is at 35 feet, which enables the pole to be insulated and used as a vertical on the LF bands. Power input is at the rate of 25 watts AM/CW or 100 watts p.e.p. output SSB. As to what it can achieve, GW3AHN has *all* the current countries worked and confirmed, an achievement matched only by G3FKM in the U.K. All this leads to a comment on the make-up of this piece, as seen from the viewpoint of one of the real top-notch DX operators in the world-context. Tom would very much like to see the Six-Band Table revised to include only current countries, which would give the new chaps a chance to fight on an equal basis with the experienced DX'ers. He would also prefer to see, associated with

callsigns worked, details of times and frequencies, which are, quite definitely, very useful to the operator lying in wait for a new country.

However, GW3AHN would not, your conductor is sure, mind if at the same time we express another point of view—which is that by the time a month goes by, from issue to issue, most of the top-flight chaps will have found and worked the “new one” which has popped up from somewhere-or-other. However, the top-flight chaps are in the minority as compared with the much larger group who are only interested in DX if it comes up under their nose, and like to read and find out how the many others are doing. There are points for and against on both sides, and it will be of great interest to hear from readers as to their own views—after all, there is nothing like trying to please as many people as possible on an issue of this sort.

There is another point here, too, in that the majority of the regular correspondents who make this feature possible are themselves of such a calibre that G3KFE can find them little or nothing new—but on the other hand the majority of readers, the chaps who have followed CDXN for years, rarely or never write in with news of their own doings unless it is pretty earth-shattering, and so give us little or no lead as to what they would like to see.

As far as your conductor is concerned, he would prefer to keep the “communications” aspect well to the fore, in that he has never

forgotten that memorable first QSO with “Joe Blow down the road,” or his first W, or the first time he “retired hurt” from a pile-up, and he suspects that most amateurs feel the same.

Thank You!

This point, while turning over the pile to look at the odd bits, is as good as any at which to record G3KFE's thanks to all those who rushed out to the post in response to his agonised yell for help, and by doing so made the piece as here presented possible. No doubt about it, some of these DX wallahs may play rough in the pile-ups, but they surely “came good” when it was a matter of producing news at about an hour's notice! *Thanks, chaps.*

Sign-Off

By the time this comes out, our GM readers will have celebrated their night-of-the-year, and the rest of us will already be wearing off the effects of our excess celebration, and creeping back to the shack to see what DX 1970 will bring. To all of you, wherever you may be, may it mean good DX, an adequate challenge to bring out the best, and a Happy New Year in every way. Deadline for next time, **January 12**, addressed to CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. Till then, good hunting, and don't work too many TV sets. *73 de G3KFE.*

MOBILE RALLY FIXTURES

Though at the moment of writing it is bitterly cold and snowing, next summer will come and already there are some Mobile Rally dates fixed, as follows:

May 10: Ealing & District Amateur Radio Society, at Hanwell Community Centre, London, W.7.

June 20-21: Anglian Mobile Rally, at the Anglian Show Ground, Ipswich.

June 21: Univ. Coll. of Swansea Amateur Radio Society, Singleton Park in the Abbey Meadow.

We will be glad to have notification of such other dates as may already be decided. Later, we will as usual be publishing details of individual events, to appear about two months ahead of the date of the Rally. Organisers who want publicity are reminded that they should send us information well in advance.

“LIGHT-ACTIVATED CHANGE-OVER SYSTEM”

In the circuit of Fig. 1, p.609 of the December issue describing this device, it should be noted that coil L1 is *not* directly connected to the Tx lead but merely presented to it, in the manner of an RF probe, or “sniffer.” The proximity is adjusted for the required degree of pick-up.

CLUB MOVE—BANBURY

We are asked to say that plans are in hand for the formation of an Amateur Radio club to cover Banbury (Oxon.) and the neighbourhood. There are already about a dozen prospective members, and premises are being sought. Others who may be interested are invited to get in touch with: Pete Moore, G3TUW, 79 Nursery Drive, Banbury, Oxfordshire.

VHF BANDS

A. H. DORMER, G3DAH

Conditions—Ugh!

VHFCC Awards

POSSIBLY due to the attractive callsign, Jack Butrovich, G15ALP, has achieved a QSL return rate for his two-metre activities which is rather higher than average, (165 QSO's and 100 QSL's), and this has earned him the Award in what must be the record time of just about six months. He runs SSB and CW on two metres with an NCX-200 transceiver on 14 mc into a Swan TV-2B transverter, with about 240 watts p.e.p. input. The first contact was made in May of this year using a dipole antenna, and that was followed by an eight-over-eight *J-Beam*, which was used for about 45 days and then replaced with a *Cushcraft* 20-element Colinear/Yagi, which seems to give a better gain than was suggested by the published data. This is now down for repair, as the high winds really played havoc with it, but it will go up again in the Spring with another similar one by its side. In current use is a ten-element *J-Beam* Yagi. The mast supporting the colinear extends about ten feet above the rotator, and fairly whips around in the winds above Dun-

given. The velocity was measured as 98 m.p.h. in gusts last Winter, and this coincided with snow and ice! Recently acquired is an FET converter and a Drake R4B, and so split working is now possible. Jack still runs skeds from his location (at the U.S. Naval Communications Station) with G3CCH (Scunthorpe, Lincs.) at 0700 BST on Mondays and Thursdays, and breakers are welcome. Even when conditions are poor, this 285-mile path is workable on SSB for some 70% of the time, up to 90% last summer, and shows what can be done with decent antennae, SSB or CW and regular skeds. It seems that Jack is due to return to the United States in July 1970. He will be missed.

Robin Hewes, G3TDR, operating on two metres from Laleham, Middlesex, uses nothing but home-built gear. The main transmitter runs 75 watts into a QQV06-40A modulated by a pair of EL34's in Class-AB1. A smaller Tx is also available for standby or field day operations, and has a QQV03-20A PA with 25 watts input, modulated by a pair of EL84's. The larger Tx is being modified for SSB, and will then be driven by a solid-state exciter with about two watts p.e.p. output; this has been in use with a pair of 6146's on ten metres for some time, with satisfactory results. From his early SWL days, Robin has used a Nuvistor converter, and a tunable IF strip at 4-6 mc, but under pressure from "pundits of transistors" he has now constructed a dual-gate MOSFET job with a TA7153 in the RF stage, a 3N159 as mixer and BF194's in the oscillator and doubler stages. The original beam, a six-over-six slot, fell to pieces, and the present radiator is an 8-ele Yagi at 40ft., the QTH being 45ft. above Thames level. Next Spring it will be joined by a second eight-over-eight in phase. So G3TDR gets the two-metre Award.

From Ashstead in Surrey, G8BTF, Vic Caley, gains his VHFCC Certificate for operations on two metres. He runs 25 watts input to a QQV03-20A. The receiver is a Nuvistor converter with an IF of 2-4 mc feeding into an AR88. The antenna is a six-over-six slot at 15 feet, rotated by a cowl-gill motor, and the QTH is about 50ft. a.s.l.

Congratulations to them all.

G2JF—Jim Foster

There must be few two-metre operators, in this country or in Continental Europe, who have never heard of G2JF, and now that he has just worked his 5,000th different station on two metres, this seems an appropriate time to congratulate him, and further inform readers on what has led up to this remarkable achievement.

Jim Foster was first licensed in 1935 and operated from the North of Scotland on the HF bands and 112 mc, although QSO's on the latter band were a bit hard to come by at that QTH, and at that time! With the outbreak of war, transmissions ceased, and, after a period abroad with the Air Ministry Directorate of Works, Jim returned to this country and took up an appointment as the Maintenance Engineer at Wye College (University of London), near Ashford, Kent, a position which he still holds today. In 1946, transmissions were recommenced, this time on Top Band, and such was his skill, that he won both the premier awards for operation on 160 metres—the Victor Desmond and the Somerset Trophies. In search of fresh fields of interest and activity, G2JF turned his attention to VHF, and it is in this respect that he is now best known.

It quickly became obvious that Wye itself was not much good for VHF, and negotiations with the local Water Board resulted in the acquisition of a site about 625ft. a.s.l. on the top of the local reservoir. There a hut was constructed, antennae erected, gear installed and Jim was very much in business with the results that we now know. Equipment currently in service comprises, for two metres, a pair of 4CX250B's, plate-and-screen modulated by TZ40's, and VFO controlled, with an input of 150 watts. The beam is a 24-element array consisting of two pairs of six-over-sixes. The receiver is an HRO fed from a Nuvistor converter. On 70 cm, the PA is a single 4X150A in a box cavity, again VFO controlled, and again plate-and-screen modulated by TZ40's. The antenna is a 14-element Skybeam at 60 feet, and the receiver another HRO with an FET converter. This set-up has produced over 37,000 QSO's on two metre since June 1953, and over 1,500 on

THREE-BAND ANNUAL VHF TABLE

January to December, 1969

70 cm, on which band he has been operational since January 1969.

Always a keen contest man, G2JF has on three occasions gained the PZK Trophy awarded to the winner of the IARU Region 1 September Contest on two metres, and in 1968 he won the overall Senior Trophy, the first time that this has gone to a British station under the present rules.

He is at present chairman of the South East UHF/VHF Group, and a member of the Radio Amateurs Old Timers Association and the First Class CW Operators' Club.

For all this, Jim is still one of the most approachable of men, always ready to help his fellow operators, particularly the newcomers, and one would have to go a long way to better the example set by "The Kentish Beacon."

TVI Points

Much TVI is due to radiation on frequencies other than that in use at any particular time—that is, harmonic or spurious emission, the latter embracing the former.

A good definition of spurious radiation might be to say that it is any radiation from a transmitter which is outside the frequency band normal for the type of transmission employed, including any component whose frequency is an integral multiple, or sub-multiple of the carrier frequency, spurious modulation products, key clicks, transient phenomena and parasitic oscillations. In other words, spurious radiation is any radiation other than the fundamental signal. So, if the station transmitter were absolutely clean, and if the TV receiver were clear of all built-in defects due to poor design, construction, or adjustment, and was fed from a suitable antenna, there would be *no* TVI unless one was radiating co-channel with the TV transmitter, a not very likely state of affairs. But, alas, life is never quite so simple, and thousands of words have now been written on the subject of TVI, its cause and possible cure, without hard-and-fast procedures being evolved which enable the operator to deal with every possible cause of this bane of Amateur Radio. The reason for this lacuna is not hard to find—there isn't any general panacea.

Most of the fairly obvious cases

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3DAH	25	3	70	16	19	6	139
G3COJ	15	2	60	13	28	7	125
G2JF	—	—	60	14	29	7	110
EI6AS	29	7	55	12	—	—	103
G3LAS	26	2	49	11	13	2	103
G8ATS	—	—	43	7	39	8	97
G8AUE	—	—	44	5	39	8	96
G3EHM	—	—	56	11	23	4	94
G8BMD	—	—	51	9	29	4	93
G2AXI	28	3	41	8	10	1	91
G3KEP	34	6	24	6	11	3	84
G8APZ	—	—	47	8	20	5	80
GD2HDZ	—	—	50	7	17	4	78
GI5ALP	14	6	43	10	—	—	73
G8BYV	—	—	28	9	22	8	67
G8BWW	—	—	54	10	—	—	64
G8ADP/A	—	—	36	6	19	3	64
G8AYN	—	—	32	6	19	6	63
G8AUN	—	—	43	11	—	—	54
G8CEZ	—	—	45	8	—	—	53
G8ABA	—	—	41	7	—	—	48
G8BJK	—	—	39	6	—	—	45
GW5NF	—	—	37	8	—	—	45
G8APJ	—	—	26	6	8	2	42
G8ASR/A	—	—	35	6	—	—	41
G3TDH	35	5	—	—	—	—	40
G8BJC	—	—	34	6	—	—	40
G3AHB	—	—	24	4	8	1	37
G8BDJ	—	—	23	6	4	2	35
G8BKR	—	—	16	2	10	2	30
G3KMI	12	1	14	3	—	—	30
GW8CGN	—	—	26	4	—	—	30
G8ARM	—	—	—	—	23	5	28
GC8AAZ/P	—	—	22	4	—	—	26
G8CZD	—	—	17	3	—	—	20

TWENTY-THREE CENTIMETRES			
STATION	COUNTIES	COUNTRIES	TOTAL
G8AUE	14	2	16 (Also 1 + 1 on 13 cm)
G8ARM	7	1	8
G8ADP/A	5	2	7
G8BAV	3	1	4
G8AYN	1	1	2

The THREE BAND ANNUAL TABLES show total claims to date from the year commencing January 1st, 1969. Readers are reminded that the next issue will show the final positions, so please send in your claims in plenty of time.

TWO METRE FIRSTS

G/DL	G3DIV/A-DL4XS/3KE	5/6/50
G/DM	G6NB-DM2ABK	27/10/58
G/EA	G2JF-EA1AB	11/6/64
G/EI	G8SB-EI8G	23/4/51
G/EL	G6CW-EI5BH (RTTY)	10/10/69
G/F	G6DH-F8OL	10/11/48
G/GC	G8IL-G2CNC	24/5/51
G/GD	G3GMX-GD3DA/P	29/7/51
G/GI	G3DA-GI2HML	26/6/49
G/GM	G3BW-GM3OL	13/2/49
G/GW	G5MQ-GW5UO	22/10/48
G/HB	G6OU-HM1IV	12/9/53
G/HG	G3BLP-HG5KDQ	4/7/65
G/I	G5NF-I1KDB	14/6/59
G/LA	G6NB-LA8RB	29/6/53
G/LX	G5MR-LX1AS	23/7/55
G/LZ	G3LTF-LZ1DW	6/6/64
G/OE	G3HBW-OE1WJ	4/1/60
G/OH	G3LTF-OH0AA	19/10/69
G/OK	G5YV-OK1VR/P	23/10/58
G/ON	G6DH-ON4FG	25/9/48
G/OZ	G3WW-OZ2FR	1/6/51
G/OY	G3CCH-OY2BS	15/11/69
G/PA	G6DH-PA0PN	14/9/48
G/PX	G2JF-PX1OX	16/6/64
G/SM	G5YV-SM7BE	1/6/51
G/SP	G5YV-SP6CT/P	23/10/58
G/YO	G3IMV-YO7VS/P	4/7/65
G/YU	G3GOP-YU1CW	7/5/61

GC/DE	GC3EBK-DL3VJ/P	22/3/53
GC/EA	GC2TR-EA1AB	11/6/64
GC/EI	GC2CNC-EI2W	8/10/51
GC/F	GC2CNC-F9OK	17/11/53
GC/GD	GC3WMS/P-GD3NUE/P	3/9/67
GC/GM	GC2GC-GM3RUF/P	29/8/65
GC/GW	GC2FZC-GW8SU	16/6/54
GC/LX	GC2FZC-LX1X1	11/10/63
GC/OK	GC2FZC-OK2AEI	27/6/65
GC/ON	GC3EBK-ON4BZ	4/3/53
GC/OZ	GC3EBK-OZ2FR	2/3/53
GC/PA	GC3EBK-PA0HA	16/7/55
GC/SM	GC3SIT/P-SM6PU	4/9/66

GD/EI	GD3DA/P-EI2W	30/7/51
GD/F	GD3FOC-F9NJ	9/10/65
GD/GI	GD3DA/P-GI2FHN	29/7/51
GD/GM	GD3DA/P-GM3DA/P	29/7/51
GD/GW	GD3DA/P-GW5MQ	28/7/51
GD/ON	GD3FOC-ON4MVL	10/10/65
GD/OZ	GD2HDZ-OZ26OL	31/8/69
GD/PA	GD3FOC-PA0LB	10/10/65

GI/DL	GI3GXP-DLISE	5/1/56
GI/EL	GI3GOB-EI2W	13/6/51
GI/F	GI3GXP-F8MX	31/7/57
GI/GM	GI2FHN-GM3OL	1/7/49
GI/GW	GI2FHN-GW3ELM	8/7/49
GI/HB	GI3GXP-HB9RG	7/10/60
GI/ON	GI3GXP-ON4BZ	5/1/56
GI/OK	GI3GXP-OK1VR/P	27/10/58
GI/OZ	GI3OFT-OZ5CE	3/12/62
GI/SM	GI5ALP-SM7DTT	31/8/69

GM/DJ	GM2FHH-DJ1XX	29/5/55
GM/EI	GM3BDA-EI2W	12/6/51
GM/GW	GM3OL-GW2ADZ	10/5/49
GM/HB	GM3HLH-HB9RG	4/8/57
GM/LA	GM2FHH-LA7AE	6/7/58
GM/ON	GM3EGW-ON4BZ	21/11/53
GM/OZ	GM2FHH-OZ2IZ	18/6/57
GM/PA	GM3EGW-PE1PL	22/4/53
GM/SM	GM2FHH-SM6ANR	22/7/55

GW/DL	GW5MQ-DL4XS	22/9/51
GW/EA	GW3MFY-EA1AB	27/3/65
GW/EI	GW2ADZ-EI8G	19/4/51
GW/F	GW2ADZ-F3LO	14/5/50
GW/HB	GW2ADZ-HB1IV	14/9/53
GW/ON	GW2ADZ-ON4YV	13/5/50
GW/OZ	GW2HIY-OZ5AB	14/6/59
GW/PA	GW2ADZ-PA0HA	13/5/50
GW/SM	GW2ADZ-SM6QP	1/7/53

EI/DL	EI2W-DL3VJ/P	29/8/52
EI/F	EI2W-F8MX	9/8/56
EI/ON	EI2W-ON4BZ	21/9/51
EI/HB	EI2A-HB9QQ/P	26/9/66
EI/ON	EI2W-ON4BZ	21/9/51
EI/OZ	EI2W-OZ5AB	14/6/59
EI/PA	EI2W-PA0FC	10/10/53

of spurious radiation which cause TVI have been described in current literature, and methods of obviating them have been suggested, and so the following paragraphs look only briefly at the perhaps less well-known aspects of this problem, and only at shortcomings at the transmitter end.

First, the basic generator, be this crystal or VFO: Very rarely is the output of this device a pure sine wave, deliberately not if it is to be followed by harmonic amplifiers, and if it isn't, then harmonics must be present, which can cause trouble, even from quite high order multiples. The badly adjusted Squier, for example, has earned a quite unjustified reputation for drift and erratic operation, and as a very prolific generator of all sorts of nasties, merely because it is so often over-driven by the application of excessive potentials and/or too much

anode/grid feedback due to the selection of an incorrect tapping point on the coil. It is good practice to operate *all* oscillators at low DC levels, with just enough feedback to maintain oscillation, and to follow them with suitable buffer amplifiers. Put them in a screened box, and filter *all* leads to and from it, except that carrying the output to the next stage. Feed-through capacitors are all right, but a suitable RFC in series, and a disc ceramic bypass with *short* leads, can reduce the unwanted output, which may be inadvertently radiated, by a factor of 100. Use as high a fundamental frequency as possible for the crystal oscillator stage, around 70 mc if you can. HC6U crystals on these frequencies are available at reasonable cost, even if they are a few shillings more than the FT243 type, and a modern, hermetically sealed crystal, correctly operated, in a suitable circuit, may save an awful lot of grief with the neighbours.

Direct radiation off the aerial of harmonics from high-power multiplier stages can cause a tremendous amount of trouble, and the cure, if you *must* use high power multipliers, is adequate screening of the whole transmitter and high-Q bandpass filters, but remember that it is no earthly use having a screened filter if the Tx itself is unscreened, because all that happens is that the unwanted RF nips smartly down the outer of the output link coax and bypasses the filter. Faraday links can also be a great help here. It is better practice to do all frequency multiplying at low level and then amplify the final frequency to the level required at the PA stage.

However attractive the idea may be in saving cost and space, and getting a bit more drive, capacity coupling between stages is *not* to be recommended. All the unwanted harmonic muck from earlier stages will get through. Double tuned, inductively coupled, circuits are infinitely to be preferred, and will considerably reduce the chances of TVI from this cause.

However efficient the screening afforded by well constructed metal housing for the Tx may be, and however good the lead filtering (including the ingoing mains lead) is made, there will still be leakage through any large holes such as are

70 CENTIMETRE FIRSTS

G/DL	G2WJ-DL3FM	10/8/53
G/EI	G5YV-EI2W	14/7/55
G/F	G3DIV/A-F8GH	6/9/51
G/GC	G5ZT-GC2FZC	23/9/64
G/GD	G2JT-GD3DA/P	26/8/51
G/GI	G5YV-GM3FYB	30/8/62
G/GW	G4LU-GW2ADZ	3/9/50
G/HB	G3LQR-HB9RG	?
G/LA	G3LQR-LA9T	4/12/62
G/LX	G3LTF-LX1SI	11/10/63
G/OE		
G/OK	G3LTF-OK1EH	10/10/65
G/ON	G3DIV/A-ON4UV	15/10/51
G/OZ	G3JMA-OZ9AC	3/12/62
G/PA	G3DIV/A-PA0PN	15/10/51
G/SM	G2XV-SM6ANR	17/5/59

GC/F	GB2GC-F8MX/A	23/8/65
GC/GW	GB2GC-GW3MFY	28/8/66
GC/ON	GC3VXX/P-ON4ZK	2/9/67

GD/EI	GD8AGY/P-EI2W	-/7/66
GD/GI	GD3DA/P-GI3GOB	17/6/53
GD/GM	GD8AGY/P-GM3FYB	-/7/66
GD/GW	GD3DA/P-GW5MQ	29/7/51
GD/PA	GD2HDZ-PA0CRA	10/10/69
GD/ON	GD2HDZ-ON4HN	10/10/69

GI/GM	GI3GOB-GM6WL/P	7/9/53
GI/EI	GI3KYP/P-EI2W	24/10/64

GM/EI	GM3FYB-EI2W	16/10/62
GM/GW	GM2JT/P-GW6DP/P	8/10/49
GM/OZ	GM3FYB-OZ7SP	10/11/64
GM/SM	GM3EGW-SM6ANR	1/9/64

GW/DL	GW2ADZ-DL3FM	1/3/53
GW/EI	GW2ADZ-EI2W	10/7/54
GW/GD	GW8AHI-GD8AGY/P	28/7/66
GW/GI	GW8AHI-GI5AJ	22/9/66
GW/ON	GW2ADZ-ON4UV	1/3/53
GW/PA	GW2ADZ-PA0PN	17/5/53

EI/F	EI2W-F8MX	9/8/56
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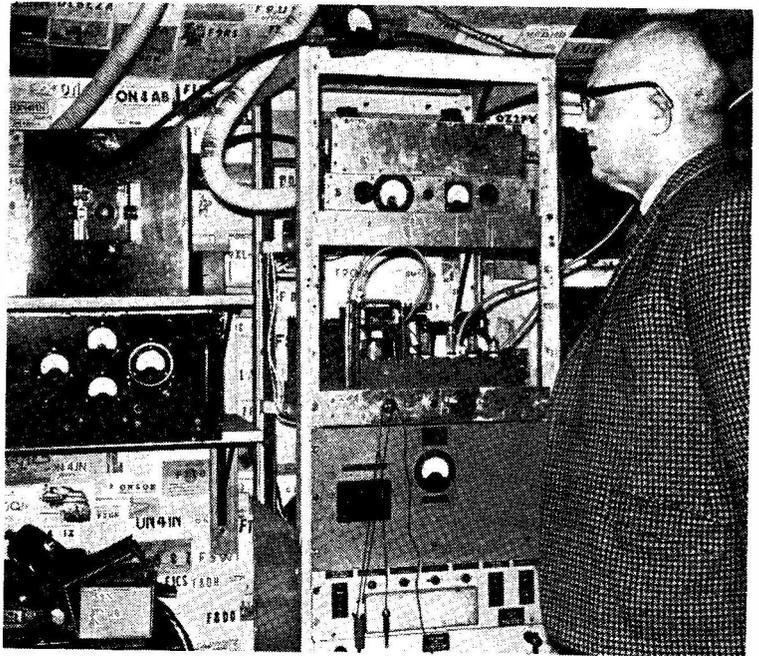
required for meters and dials. There isn't much that one can do about the latter in some cases, but the meters are another matter. Leads to meters should be run in screened cable and, where possible, the backs of the meters should be boxed in with an earthed screen and the leads filtered with some RFC and ceramic bypass capacitors. Try a GDO up against an untreated anode current meter some time, and see how much comes out! Cases have also been reported where radiation has been observed from pilot lamps on the front panel of a transmitter, so, if in doubt, leads to these should also be decoupled. It isn't difficult at VHF—use a RFC consisting of about ten turns of 20g. to $\frac{1}{4}$ in. diameter and $\frac{3}{4}$ in. long, and a 1,000 $\mu\mu\text{F}$ disc ceramic capacitor.

Finally, an open chassis with a 3-20A on the far end is a *menace*, not only to the fingers of the careless operator, but also as a possible TVI generator. Professional-type cabinets can be expensive, and not always that good from the screening point of view, but it is a fairly simple and inexpensive job to make up a framework with aluminium angle, enclose it with some sort of expanded metal (rather like the stuff the old-fashioned larder door was made from) and bolt the whole thing to the Tx chassis, making sure that it is RF tight and that any external leads are adequately filtered where they leave the enclosure.

Of course, these comments only scratch at the surface of the problem and in certain instances are applicable both to fundamental and spurious radiation, but they may set a train of thought going which will help to alleviate, if not cure, some cases of TVI which have not yielded to other measures.

Group, Guild and Club

The South East UHF/VHF Group meeting on December 5 at the University of Kent was attended by some 50 amateurs who had come to hear Don Hayter, G3JHM, talk about operations on four metres. Don's lucid explanation of the propagation modes involved, both normal and abnormal, was very welcome, and it is to be hoped that it will lead to an upsurge of activity on that sadly neglected band, in Kent anyway. The next meeting of



The famous VHF station G2JF, Jim Foster, Wye College, (University of London), Ashford, Kent—see text for notes.

the Group is planned for January 23 at Wye College, University of London, near Ashford, Kent, when Captain Bill Ingle, G3OIZ, will be talking about VHF in Civil Aviation. Incidentally, although he cannot transmit, Bill finds that the VOR receiver in his aircraft will tune up nicely on two metres, and he has been hearing some reasonable DX on that band during some of his Sunday morning trips to the Continent. This meeting is also the occasion of the AGM of the Group, so it is hoped that as many supporters as possible will be there.

The City and Guilds of London Institute Radio Amateurs' Examination held on December 3 this year, looked pretty reasonable. Only two questions involved any calculation, and the remainder were answerable virtually on sight by anyone who had read the Licence Regulations and the first few chapters of the *Handbook*. Best of luck, chaps. One could wish that there were more operators holding G8/3 calls who would have a go at the Morse test, though. Not only would they get

more fun out of operating, with a lot of DX to be had which is at present denied to them, but perhaps a few would then come on four metres and help to fill some of the large gaps there.

The South Bucks VHF Club has laid on a "Home Brew" display for their next meeting at Bassetbury Manor, High Wycombe, on Tuesday, January 6 at 8 p.m. R. Idiens is the hon. sec. and can be found at 77 Amersham Road, High Wycombe, Bucks.

Four Metres

EI4BK forwards the *authentic* dope on the four-metre beacon, EI4RF. It is an IRTS beacon, but the Limerick Radio Club were responsible for getting it on the air in time for the official opening ceremony, performed on November 15 last. Further details are: *QRG* 70.325 mc; *QTH* Mullaghanish, Co. Cork, by permission Radio Telefis Eireann; Lat. and Long. are $51^{\circ} 59'$ North and $09^{\circ} 07'$ West, which gives it a QRA of VLO5a. Height above sea level is 2133 feet

and the four-element Yagis, one bearing North and the other East, are at 20 feet above ground. The keying cycle is: EI4RF (four times), a 22-second dash, EI4RF (three times) followed by a 33-second dash. Total keying time is two minutes and twenty-two seconds, and after the first dash the antenna beam heading is changed. Reports of reception will be welcomed by EI4E, Avenue House, Countess Road, Killarney, Co. Kerry.

A good indication of how conditions have been on four metres this year comes from Mike Gibbings, G3FDW, a very well-known and successful operator on that band. Quote:—"1969 has been the worst year yet for me on four metres. Only one new county has been worked, Northumberland, for my last G county; no contacts with ZB2 compared with fifteen QSO's in 1968. The band has been very dead all summer with only the odd openings. Things were good for VHF/NFD, though, so that made up for a very flat year." This appears to be the general view as far as your scribe can ascertain from talking to other operators and from personal observation, although there appears to be no facile explanation for such poor propagation conditions. Mike is still running 110 watts p.e.p. of SSB and 50 watts of NBFM or CW, but has recently gone for asymmetrical modulation, with negative peak clipping at the 95% level, and with positive peaks going up to 200%; the Tx runs only 20 watts to a QV03-10 in the PA, but it has produced one First, one Second and one Fourth in recent Contests. It attracts more attention from the home QTH than does the SSB rig, but the local TV sets don't care awfully about it at the moment, although undoubtedly that problem will be licked. The glint in Mike's eye is a 50-watt Tx and 60-watt modulator operating on the same principles.

Firsts

G3CCH in Scunthorpe worked OH2BEW during the *Perseids* on August 14, so although the Table shows G3LTF credited with G/OH, and this was still the first extended tropo. contact, Johnny appears to have got in with the first one by

M/S, unless there are other claims. Many operators will have heard his regular weekly transmissions on two-metre CW which preceded this fine contact. He also got the first G/OY QSO on Two with OY2BS in the Faroes on November 15, 0300-0500z, and on November 16 he repeated it between 0830 and 1030. His two-metre total is now 25 countries worked, which by any standards is first class. G3CCH is now concentrating on UP, UN, UQ, I and LZ for M/S contacts. Congratulations and good luck.

It is known that the late GD2CZM/P worked both YU and HG during the great opening of July 1965, but no details of the other end of the contact can be found. Can any reader help?

General

As reported last month, GD2HDZ is now QRV on 70 cm. He would welcome reports on his transmissions from stations over 100 km. distant. He has skeds on Tuesdays, Thursdays and Saturdays with PAØEZ and ON4HN, 1910-1930z, CW on 432-45 mc, and is, of course, open for contacts after those times. All reports and QSO's will be QSL'd. It was with ON4HN that Arthur had the fine DX contact on 70 cm on October 10 last for a new "First." Signals were five and 8/9 then, both ways.

G8AMG has produced a very stable VFO operating on 24 mc. It is transistorised and constructed on a p.c. board. The output, after suitable buffering, is 1 volt RF into 75 ohms. The whole thing is not only temperature compensated, but also temperature controlled. The frequency determining circuits are 2N3819's, and details will be published shortly.

G5JO, *QTHR*, has a magnificent museum collection of vintage radio and TV equipment, both professional and amateur, and, fortunately, enough room to store and exhibit it. Among the rare items are the microphone and loudspeaker used by Gerry Marcuse, G2NM, for the first Empire broadcast. However, he lacks a good example of a pre-war crystal set, and would be very grateful if any reader could help.

For those who, like the writer, have wondered what had happened to G3JON in Sheffield, *QTHR*,

who hasn't been heard on the band for ages, the answer is that he moved QTH in April of this year, and has not yet got all the gear reinstalled. He has become an expert on the design and installation of domestic central heating, he says, and one hopes that this plumbing expertise will stand him in good stead when he comes on to the UHF's. He should be back on two metres in the New Year with his eight-over-eight from a site which has a good take-off, particularly to the South.

G2AXI (Basingstoke, Hants.) has been busy on a construction project which has now nearly reached finality. The NBFM system has been replaced by phase modulation, a mixer VFO has been built to cover the lower 500 kc of both the two and four-metre bands, and 50 watts are now available on Four, and 120 watts on Two. The separate exciter unit comprises the VFO on 2050 kc and a crystal oscillator on 5960 kc to give either 8 mc or 3.9 mc output from the mixer *via* a bandpass coupled buffer stage and treblers to the output of the unit. Phase modulation is applied to the buffer amplifier. The main RF deck has two complete transmitters taking input at either 24 mc or 11.7 mc, depending upon the desired radiated frequency. The two-metre final runs a QV06-40A with a linear tank, and the four-metre PA is a QV03-20A with lumped C and L. The power unit includes all the necessary relay switching and variable high voltage supplies for the PA's. Sounds a nice job.

Contests

Very good to see that the 70 cm. Cumulatives are starting up again in this New Year. The first round is on January 16 and the second on January 29. The 144 mc SSB event is dated January 12, from 1900 to 2200 GMT, and the 144 mc CW Contest makes an early start, 0600 to 1200z on January 25.

Deadline

Deadline for the next issue is **January 10, 1970**. The address for claims, news and comments is: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now, 73 and a very happy New Year from G3DAH.

• • • **SWL** • • •

SHORT WAVE LISTENER
FEATURE

IDEAS ABOUT EARTHING — SAFETY FACTOR
— DISCUSSION ON TECHNICALITIES —
READERS' NOTES, NEWS AND QUERIES —
THE HPX LADDER

By *Justin Cooper*

SOME few months ago, J.C., it may be recalled, hung his preamble to this piece around the fact that most of the preceding month had been spent under the car, and drawing therefrom a moral of use to the SWL. Oddly enough, this ancient barouche has once again taken unto itself the role of Delphic Oracle, this time in the context of Ohm's Law.

With the onset of the cold winter weather, it began to protest, in no uncertain fashion, that if it continued to be neglected as to its routine maintenance, and its warm garage put to other uses, then it would protest by refusing to start until a handle were taken to it.

Three days of this treatment was enough to bring your conductor to terms, and a search began for the cause, in the midst of which exercise it was discovered that if the main lead to the electricians were removed from the starter to the battery terminal, with no other changes, the thing would start like a good 'un every time. The effect of moving the wire was to make the car-electrics see the terminal voltage of the battery rather than the voltage of the battery less the drop in the leads between battery and starter—possibly a matter of a couple of volts or more on a cold morning!

How can we apply this lesson to our SWL experiences? Imagine you are using, say, a mains earth as part of the aerial system, from an outside shack, and imagine that the mains earth actually goes down to ground at the rising water main which is at the front of the house. Now, it follows that the earth wire, which meanders all round the house under the floor to each socket is connected, say, to the socket in which the TV is plugged. The TV has no earth, but the noise it throws back along the line leads is capacitively coupled to the earth wire. The shack power is plugged into another socket. The noise from the TV is in the form of minute earth currents—and, by Ohm's Law, give rise to a voltage across the resistance of the lead. The same resistance, and hence the same voltage, is in series with the aerial-earth system of the shack receiver and so is coupled to the receiver front-end by way of the "common" resistance in the earth lead. This is bad enough in normal operations, as the noise so induced into the receiver is usually pretty broad-band and is a nuisance under weak-signal conditions; but under fault conditions with some appliance it could be downright dangerous.

Now, the average spike driven into the ground has a resistance of 30 ohms or more, and so is useless as a safety earth, although it is quite helpful from the receiving point of view when there is a long run to the

mains earth connection—but if the receiver is in an outside shack and everything is to be grounded to it, then great pains *must* be taken to reduce the earth resistance. Several spikes, all paralleled up at the earth terminal of the receiver or ATU plus radials, plus old chassis or galvanised water-tanks duly buried and connected to the system, all go to make for better listening and greater safety. Earth resistance can be found (to DC) if there are three or more earthing points. Let the earth connections be "lifted" from their common point, and called A, B, and C. Measure the resistance with a meter on the ohms range, between A and B, A and C, and B and C. Then solve for A, B, and C to give the three values of resistance (or get some "bushy-brains" to solve it for you!) and then your total resistance from the safety point of view is the value of these in parallel. This resistance should be low enough, so that, assuming a dead short from live to earth on the mains, enough current will flow to produce *at least* twice the rated current of the fuse, to ensure the fuse does not "hold in" instead of blowing. Thus, if a transformer in the receiver should go down, the fuses will blow and safety be assured.

Reading Matter

Last month's enquiry about books of Amateur Radio interest other than technicalities brought some interesting letters from G3IDG and G3XCS, to whom thanks. G3IDG lists several, and first one should mention G3MAC's account of himself in *Horizontal Man*, which is in Pan Paperbacks. *London Policeman* (Angus & Robertson) is by S. C. Harvey, ZL2AIQ, ex-G4KY. *A Boy's Quiet Voice* is by Ruth Cohen, mother of the late K2IVH. *The 14-Karat Trailer*, by Myron Zobel, is an account of the wanderings of W6NMC's caravan.

In fiction, there are *Isle Royale Calling*, by Helen Cloutier, W8GJX; three adventure stories for boys by Walker A. Tompkins, K6ATX *SOS at Midnight*, *CQ Ghost Ship*, and *DX brings Danger*. All these titles were mentioned by G3IDG and G3XCS between them; also the latter adds *A Backroom Boy*, a Life of Dr. Eric Megaw, the late GI6MU, published by W. Erskine Mayne of Belfast. (In the late 1920's, GI6MU was a prominent Sunday-morning operator on the 45-metre band, and will be remembered as such by many an old timer of today. *Editor*.) To round off, a puzzle for readers to think over! Hodder & Stoughton published in 1942 a book called *For Murder Will Speak*, in which the murderer's alibi is a QSO using his callsign

"GM6EB." Now just *why* did author J. J. Conington pick this call, knowing it would not give offence to any licence-holder of that time?

Contact?

Are there any SWL's around the *Stroud*, Gloucestershire, area? *Jim Fawkes* has been a listener since back in 1924, but he only knows of Mike Quintin. He would be interested to hear from any others, young or old-timers—his address is *St. Chloe Green, Amberley, Stroud*.

Prefixes

As ever, we have our fair share of oddities to comment on: *C. J. A. Morgan (Wallsend)* found a type who was signing "HX1" during the *CQ WW* battle, claiming to be in the country of "Bhalnapur" in Zone 22. If *that* is a good one, then J.C. has a ZA1 callsign!

Talking of ZA, which must be quite the most pirated prefix in the book, *R. Nicholls (Narborough)* found yet another, this time "ZA1LA"—just why ZA is so popular for pirating, Heaven only knows!

Still with the oddball prefixes, *J. Haig (Hitchin)* found a station signing KY5AEW; the prefix as such was quite definitely Ungood if it was copied correctly, but J.C. has a shrewd suspicion that John misread it for a quite legitimate prefix—the old problem of a gabbled callsign!

B. J. Gilbert (Tonbridge) has completely retyped his HPX list, to bring his total to 700, plus quite the largest list of phoneys ever to be sent in for our perusal—17 of them, and not a good one among the whole boiling! One suspects that it is in the nature of things that the SWL's spot the phoneys more readily than the licensed types, who so often pass them up instinctively without noting the calls down on paper or, sadly, are often so inexperienced, by the fact that they put off buying a receiver till R.A.E. is passed, that they are easy meat for any trickster.

Who is He?

Here we have to mention a letter from "a reader" who puts in a first entry at 203 in the Ladder, accompanied by a most interesting typed screed, addressed from Ruislip HA4-6BT—but this mystery-man forgot to sign his piece!

Changing tack somewhat, that paragraph last time discussing the "way in" the craft of SWL'ing and Amateur Radio through a casual hearing of an AM station on the BC receiver now being very rare (due to the widespread adoption of SSB), touched off an answering letter from *F. G. Rayer (Upton-on-Severn)*, who, by way of his text for the R.A.E., *Amateur Radio*, has done so much to help get chaps to their ticket. G3OGR appeals to all those with AM rigs to fire them up as much as possible, just to give the new listeners a chance of hearing amateur telephony the easy way. J.C. is not at all sure he would go along with this, if only from the fact that ere long AM will be completely barred (as was spark in its time so many years ago) because of the pressing need for bandwidth conservation. However, G3OGR has a point worth thinking about.

Technical Points

Now to things technical. *M. Williams (Sleaford)* is very pleased with his receiver, but has come to the conclusion that he needs to do something to the aerial to improve range. Maurice appears to be in "a bit of twist" in this context, insofar as he feels a Q-Multiplier might help—but the Q-multiplier is used in the *IF strip* to sharpen up the *selectivity*, and can do nothing to help the case of the signal that is too weak to impress itself on the first stage of the receiver. What is needed here is an ATU, or, if that is already doing its stuff in the shack, a better aerial—a rhombic, for instance!

It is pleasant to hear from an SWL happily getting into his first constructional project; *H. Wright (Pontefract)* is doing just this, by way of a pre-amp. for 21 and 28 mc, and a PSU. Harry, incidentally, has just become a member of the Wakefield club, and seems to be liking it.

That paragraph on the subject of counting frequency raised a doubt in the mind of *R. Smith (Basingstoke)*, who is puzzled as to how one could measure the frequency of a single-sideband suppressed-carrier signal. Easy! One measures the frequency at which the carrier would have been had it *not* been suppressed! What this really means is that either one inserts a little carrier at the transmitter and looks at that, or, at the receiver one re-inserts carrier in the usual way and measures *that*. The latter method is, of course, subject to all the limitations of the receiver. J.C. has a way out of this: Knowing the frequency of the BFO by measurement, and the actual frequency of the first mixer local oscillator, both by counting, one then does a simple sum and arrives at an actual signal frequency for the carrier one is looking at. The advantage of the "counter" digital process over the "analogue" methods using a heterodyne wavemeter is simply the increased accuracy of the former.

J. H. Wrench (Kidderminster) has a problem in that the two-volt accumulator in his R-1082 needs replacement after Heaven-only knows how many years accumulating—sorry!—cobwebs in the loft and then being put back into service. The R.1082 is proving itself a very satisfactory performer.

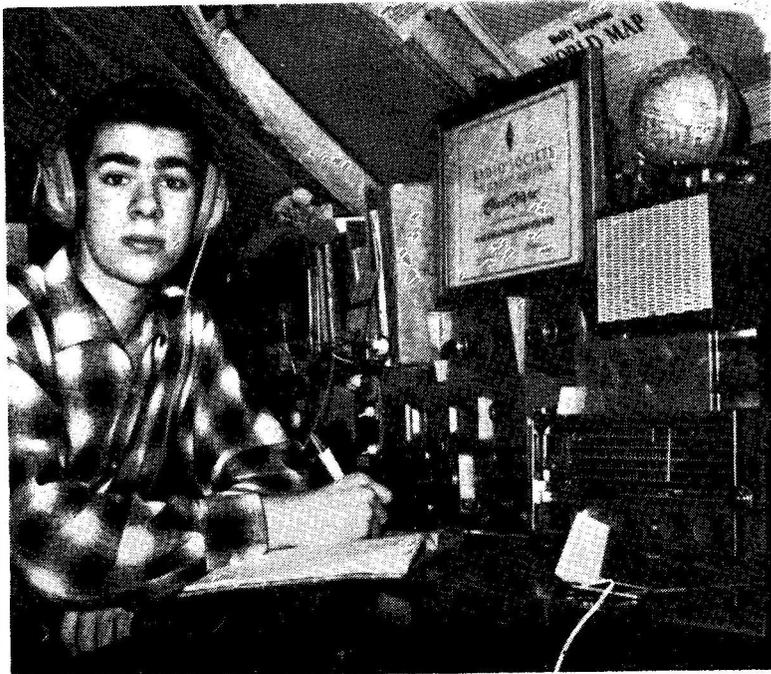
Between starting and ending his letter, *I. Poole (Leeds)* has a visit from the postman, bearing his new callsign, G3YWX—congratulations! Ian has a transistor crystal-oscillator transmitter which uses a 2N706 at 300 milliwatts which can be pushed up to 380 on CW, the mode Ian prefers. With this is a change-over unit which covers all the assorted operations to make the station go from "receive" to "send," all ready for the first QSO, which should be an accomplished fact by now.

John and Shelagh Singleton (Hull) are to be congratulated on the arrival of a son since last time round, an event which has resulted for them both in a change of listening habits; Shelagh only gets a look at the bands at nights nowadays, while John, in what spare time he has, is busy taking down aeriels and putting up others. The interests of these two have extended to the reception of TV/DX—a subject on which a year or so ago we had quite a following.

* * *

A shamefaced *S. Foster (Lincoln)* wrote in after the deadline, but luckily J.C. had other commitments which

Robert Dinning, Bloakholms Farm, Dunlop, Ayrshire, is a 17-year-old GM/SWL who has heard some 220 countries on three HF bands, running an HA-350 with Codar RQ-10X and PR-30X, also an HRO. At the time he wrote, he had passed R.A.E. and got his Morse up to 10-12 w.p.m.—with a ticket as a near-prospect. Robert is lucky in that he has ample scope for antennae. One of his other interests is MW/EC DX.



delayed the processing of this piece a day or so, and that got S.F. into the pile. Stewart mentions Uruguay CW contest prefixes; OG as the one used by Finnish operators, also during the CQ Contest; and the ZM's. 3Z is one which has been around for quite some time, but it is odd how people continue to query these quite ordinary SP (Polish) stations.

Incidentally, it should be noted that where a country allocates an odd prefix—as, for instance, with the ZL's using ZM till the end of the Cook Bi-Centennial Celebrations, across the board, then the correct way to locate the actual station is to look him up in the *Callbook* against the equivalent ZL. In other words, ZM4BX is the same as ZL4BX—which answers the question of *N. Crampton (Romford)*.

From *N. Henbrey (Northiam)* a welcome return to the fray—we thought Norman had sunk without trace—after a period when listening-time was very much restricted, due to gardening and a change of job. The EA-12 has gone to “Bandit Bill” and in return a Sommerkamp FR-DX500 is now occupying the place of honour in the shack, with an ATU being dreamed up to add in for the space between aerial and Rx.

Another lost sheep returned is *J. Fitzgerald (Gt. Missenden)*, who has now come up from yet another “/A” location, this time in Finchley, where he is teaching. Incidentally, it is interesting to note John's digs. are just about on top of the Finchley Club Hq. at the Cherry-Tree, Southgate (meeting every Friday evening).

Again in the way of special prefixes, one notes the 915 being used by the Zambian stations to celebrate the fifth anniversary of their independence; this one J.C. could hardly have failed to notice, as a colleague

applied for a call in Zambia and much time was spent going through the detailed clauses to find out just what could, and could not, be done in that country, Amateur Radio-wise.

Listening with a purpose is *D. Robinson (Birmingham)* who has got himself the special log-book and is busily chasing the HAB award. As a matter of interest, many G stations are mentioning their HAB locations in QSO's on Top Band without being asked, the reason being that any profits from the award fees are given to RAIBC, which renders the exercise doubly worthwhile. G3ABG is the man to write to all about this one—*QTHR*.

Still in *Birmingham* we have a first entry from *R. Thompson*, who recently upgraded himself to an RA-1 receiver, built from a kit, which he operates in conjunction with a 66ft. wire at forty feet, the anchorage being a most opportune beech-tree.

G. Dover (Nottingham) sent in a photograph of a very nice rig, which unfortunately was not quite of the standard that will permit good reproduction. Geoff has much to say in his letter about the “bit between the ears” of last month, as he finds that, as he works up the Ladder and gets more experienced as a listener, he is pulling more of the stuff out of the speaker; it is a knack of concentration and comes from experience of the noises the receiver makes.

QSL Cards

M. Fisher (Bradford) brings this one up. To get a reply, the report must be of use to the operator it is sent to, or convey the idea that it is based on some intensive listening and can tell said op. something of interest. For instance, a station calling CQ and finding no replies does not know either whether he is getting

SWL station of Geoff Brown, 2 Fearnville Close, Dibb Lane, Leeds 8. He is hon. secretary of the North Leeds Radio Club and runs an all-Trio Rx installation, with a long-wire aerial. Geoff is also interested in reception on two metres.



The reference to Bob Iball last time round made *H. M. Graham (Harefield)* dig back into his memories to those halcyon days before Hitler's War when the only complaints about the state of the bands came from "Uncle Tom" in the then *T. and R. Bulletin* each month—the same who for so many years after that War graced these pages in his own name, G6QB, and still displayed his sense of humour. H.M.G. comments in his letter on the odd fact that with all the years he has been DX'-chasing on the bands he has seen some weird differences crop up—for example, he has never heard a DU in the post-war era, although in those earlier years they were almost ten-a-penny in his 'phones. Another similar case is that of Indonesia, albeit there they have only lately come back on after a prolonged official QRT.

How to connect a 33-foot vertical is a question that is taxing *S. Palmer (West Wickham)*. Probably the best way is to feed it into an ATU at the bottom of the vertical, preset to give a good match to coaxial, which can then be run to the receiver. If peaked to mid-point on each band, the aerial trimmer on the receiver also being at mid-point, the latter should be enough to compensate for slight mistuning. However, the whole system *must* be fed against a good earthing system.

M. G. Toms (Ilford) gave his old receiver to his sister, and has found to his surprise (and, we suspect, mild annoyance!) that she is amassing almost as many QSL's as he, and that on an eight-foot whip.

No such problems in the *Hyder* family at Southampton, where three HPX experts share a station. *Lynne* reports this time, with a formidable new collection of prefixes to keep the rest of the family on its toes.

QSL'ing as an interruption to rather than a facet of SWL'ing is the lot for the moment of *C. Jones (Mold)* who has the task of dealing with the cards for the GB3NEF exercise. However, some time was spent around the bands, as the Table shows.

Talking of interruptions, *Jim Dunnett (Preston)* has

the burps of the new harmonic to add to the QRM from the burps which some stations seem to generate electronically on the bands!

From *Rev. D. P. Brewster (Oxford)* comes news of a very sharp reduction in the possible hours of listening time, arising from additional responsibilities. David has, however, managed to spend the odd few minutes listening round, and will no doubt be able to do so occasionally in the future—we hope so, anyway.

Long letter from *W. H. Butcher (Towcester)* gave your scribe a great deal of amusement with his—sadly, unprintable!—description of the funny noises to be heard on the bands, and his difficulties in extricating the signal he wants out of the sludge. On a more serious note, W.H.B. found a couple of phoneys, also USARTEK; but the latter is perfectly OK and has been around for quite a time, though possibly rather less active than of yore.

First Entries

Quite a few this time, with *Bert Glass (Plymouth)* at the top of the clip. Bert did 25 years in the Royal Navy as an operator, and has now retired from the Civil Service; he now listens to the CW end of the bands using a Trio JR-500S and a multi-band trap dipole.

Sending in an entry may be provoked by all sorts of factors. May 13, it may be recalled, was a significant date for *Malaysia*, where *F/Lt. A. T. Cheesley* was and still is. To while away the curfew hours, a KWM-2A was borrowed, which relit the spark which had been out since the early post-war years. It led to the purchase of an FT-DX400, used with a four-band trapped vertical, a "5RV" being available as back-up. Conditions have been pretty fair out there, by and large, although, not surprisingly, both the static and the JA QRM have been a little fierce at times.

A. E. Bandy (Wimborne) has some pertinent points to make on the subject of earthing receivers and isolating

them from the aerials as a safety measure, and also brings up the TV dealers' gripes about transistor front-ends in TV sets which "pop" the transistors every time there is a bit of aerial fireworks in the way of thunder-and-lightning to contend with. (And if you have a colour TV Rx, even on BBC-2, it is as well to have its aerial plugs out if you are radiating a few hundred watts on the HF bands off an aerial within a few feet of the TV array! *Editor.*) The thing that matters is that the TV aerial be isolated from earth to DC, by way of the blocking capacitor in the TV. The safe answer is to earth the TV aerial feeder's outer braid somewhere *en route* from aerial to TV set, and to arrange a DC shunt from the inner to the outer—a high value of resistor, fitted when the aerial is erected, from inner to outer of the feeder in the junction-box on the aerial is one way to deal with the problem.

Yet another first entry comes from someone signing "Stewart" with an *Aberdeen* address, who uses a Windom, and end-fed sixty-six footer, dipoles for Forty and Twenty, and a 15-metre beam, all hooked to an MR-44/11 receiver. All we need is a *name* to enter it against in the Table!

Can Anyone Help

S. McKinley (*Kirkby-in-Ashfield*) has a 22 Set Mk. I, plus ATU and 50ft. of wire running N/S. He would very much like to lay hands on some data covering this equipment both from the point of view of servicing it, and as to possible modifications. Anyone able to help? If so, write to S.McK. direct, at 96 Forest Street, Kirkby-in-Ashfield (2459), Notts. NG17-7DU.

Plenty of time for listening has been available to M. Bass (*Nottingham*) as a result of an operation for a perforated appendix, and so he has come into the Table for the first time. Malcolm, who has passed R.A.E., is thinking about a G8 ticket, and wondering about the requirements for frequency measurement. No worse than on the HF bands, but not quite so direct. For instance, knowing the oscillator frequency of the converter, one knows its IF range; thus, one measures frequency at IF and expresses at RF. Taken in conjunction with some direct-reading marker arrangement, such as a 1 mc crystal "pipper" as a cross-check, you can measure to as close accuracy as you are needing, and indeed quite as close as you can on HF.

Apart from a first entry, and a chatty letter, N.W. Mundy (*Gloucester*) raises a few problems. First he says he has an ATU which peaks the incoming signals but the S-meter doesn't show any improvement. Sounds like a good case for mending the S-meter or its associated circuitry—not forgetting the AGC line.

B. P. Livesey (*Beckenham*) comes in for the first entry in the Table, although it is not his first letter. Brian has a somewhat modified BC-348. He has just found three OK's, for the first time since the invasion, and wonders why? Luck, Brian, they've been around all the time, as a look in a few other logs, such as for instance the Top Band operators, would immediately show.

D. J. Lee (*Hemel Hempstead*) has been two years in amassing his 209 for a first entry, initially on a CR-70A, later on his brother's Sommerkamp FR-500DX and

trap vertical; then, when the arrival of G8CQR resulted in him wanting his own receiver back, a return to the CR-70A, now hooked to a Joystick.

Always a keen correspondent, D. J. Browning (*Bishops Stortford*) wonders if there are any overseas readers who would care to exchange ideas on matters of mutual interest. Letters to Douglas direct, please: at 214 Stansted Road, Bishops Stortford. Incidentally, he mentions that he finds a shortage of G4 stations on the bands—which J.C. also notices, and wonders why. (The G4 licensing sequence was started just before the War, and there was not time to get many of them out! *Editor.*) Certainly, as time goes on more and more gaps will appear in the ranks.

Afternoon activities on 4.85 and 6.62 mc using such calls as "Regency One" and "Delta X-Ray One" puzzled S. Lowe (*Exmouth*), as well it might. But, to judge by the fact that one of them admits to a 19 Set, they are almost certainly Army Cadet stations.

D. J. Reynolds (*Dudley*) is all-of-a-dither about OF1VR and OG1VR, both as prefixes and as stations. No need to worry; OF1VR was OK and OG1VR was also OK!

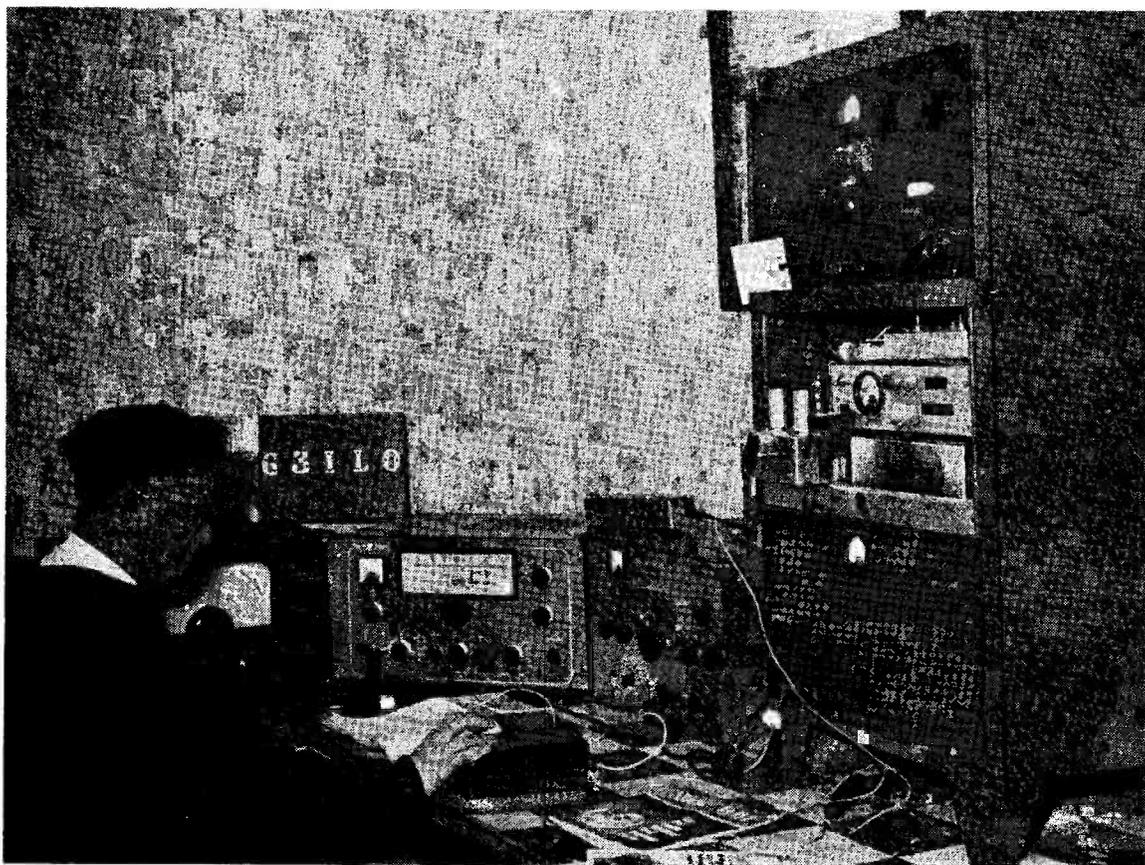
Apart from giving 21 mc a whirl in the Contest, to the advantage of his score, R. A. Treacher (*Eltham*) seems to have become addicted to early-morning sessions on 3.5 mc before setting off for the office—which is far and away the best time to look at the band, unless one is prepared to sit up till the small hours when the pundits and other funny-noises go to bed and the DX (which was there most of the time) can be heard. For an alternative, a listen down at the CW end is well worth while—there are some *very* smart operators about on 80m. CW, from whom much can be learnt.

Although not yet ready to send in the first list E. Bamforth (*Oldham*) wants to know how much information we want. Prefixes are the criterion, and so we must have them; but in the case of an "odd 'un" it helps to have just about everything you can tell us, so that we can compare with any other reports and puzzle out the truth. And, while we are on the subject of Heard Prefixes, the Table says you start at 200—a lot of people write and ask if we mean prefixes, Zone points and all sorts of weird things—even to the suggestion that it could mean a "credit" of 200 before you started! What we want, and what we generally get, is a first list containing a list of 200 or more *Prefixes*, with additional information as considered needful by the individual. Some, with a typewriter to hand, give us The Lot—band, date, time GMT, station in QSO with, reports, comments, and so forth. This is fine—but for those with writer's cramp we need just enough to establish the validity of the claim. And remember that 200 is the lowest score with which you can start.

Deadline

Which leaves us to thank you all for your letters and support during the past year, for its continuance this year, and to wish all readers of "SWL" a Very Happy and Prosperous New Year.

Deadline for next time is a little bit easier at **January 16**, addressed "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM. 73!



THE OTHER MAN'S STATION

G3ILO

G3ILO is the station owned and operated by Tom Spencer, 1 Field Lane, The Quarry, Cam, near Dursley, Glos. He started on the air in August 1952 and has been regularly active ever since—very few weeks have passed without the station being operational in one way or another.

Coverage is all bands 10 to 160 metres, AM/CW/SSB, and additionally AM/CW operation on two metres, running 12 watts and a 10-element beam at a height of 40 feet. With this equipment, at a QTH 350ft. a.s.l., some 12 countries have been worked on VHF.

On the other bands about 170 countries have been accounted for, with contacts taken as they come. The aerials for the HF side include a TA-33Jr. at 34ft., inverted-Vees for 40-80m., and a long-wire for Top Band, also worked from G3ILO—indeed, the station represented the local Club in the recent MCC fandango.

Receivers are an AR88D (not visible in this picture) and a Radiovision "Commander" which, though an early post-war type, has a number of interesting design

features and is particularly effective for CW working.

On the transmitter side, a K.W. "Viceroy" is used for SSB on the 10-80m. bands, and a modified Labgear LG.50 is also available for AM/CW. The rack to the right in the photograph carries a home-built "Elizabethan" Tx, put into service some 16 years ago, since when it has given something like 14,000 QSO's. Also in the same rack are the two-metre Tx with its modulator.

Future plans at G3ILO include breaking out on the 70-centimetre band, for which an 18-element beam will be available.

Within the G3ILO household there is a junior operator who is interested in Amateur Radio and can already read Morse at about 10's—so it looks as if a shared rig should be a possibility in due course.

As a footnote, it might be added that G3ILO is a "non-professional amateur," in the sense that he is employed on the service side for a well-known local firm of diesel-engine manufacturers.

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 are 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.

- EI4BZ**, D. F. Moore, Communications Division, Haulbowline, Cobh, Co. Cork.
- G3EDG**, W. G. Pitfield, 36 Ecclesden, Grove Hill, Brighton, Sussex. BN2 2NG. (Re-issue.) (Tel. Brighton 683109.)
- G3TZI/A**, A. Senior, 18 Connaught Road, Harlesden, London, N.W.10. (Tel. 01-965 0997.)
- G3VDO**, I. Hacking, 9 Thornhill Avenue, Rishton, Blackburn, Lancs. BB1 4EZ. (Re-issue.) (Tel. Gt. Harwood 2059.)
- G3VDO/MM**, QSL via G3VDO.
- G3WHO**, P. J. Harris, Blagdon House, Grimms Hill, Gt. Missenden, Bucks.
- GM3XXP**, J. R. Clark, Glenmore, South Edward Street, Dunoon, Argyll.
- G3YKV**, Amateur Radio Society, Cheltenham Grammar School, Princess Elizabeth Way, Cheltenham, Glos. GL51 OHG.
- G3YNZ**, J. Bakewell, 23 Huntick Estate, Lytchett Matravers, Poole, Dorset.
- GW3YPH**, W. E. Turner, 18 Heol Mynydd, Gilfynydd, Pontypridd, Glam. (Tel. Pontypridd 3050.)
- G3YPN**, A. R. Turner, 7 St. Davids Way, Wickford, Essex.
- G3YSK**, A. J. Button, 2 Rowlings Road, Weeke, Winchester, Hants.
- G3YSZ**, C. B. Minns, 41 Rangemore Drive, Eastbourne, Sussex. (Tel. Eastbourne 32687.)
- G3YTU**, C. J. Coward, 48 College Road, Ardingly, Haywards Heath, Sussex.
- GW3YUC**, D. Davies, 5 Wern Street, Penywern, Dowlais, Merthyr Tydfil, Glam.
- G3YUF**, I. Webster, 34 Armitage Road, Balby, Doncaster, Yorkshire.
- GW3YVC**, O. W. A. Wade, 1 Lomond Crescent, Cyncoed, Cardiff, Glam. CF2 6ES. (Tel. Cardiff 755190.)
- GM3YVE**, W. Skilling, 44 Denholm Crescent, East Kilbride, Glasgow.
- G3YVP**, J. Twiss, 16 Masefield Avenue, Lamberhead Green, Orrell, Wigan, Lancs.
- GW3YVQ**, R. Ellis, Chalcot, Pwllmelin Road, Llandaff, Cardiff. (Tel. Cardiff 71577.)
- G3YVV**, R. H. M. Outhwaite, 23 South Eden Park Road, Beckenham, Kent.
- G3YVY**, D. Hanley, 15 Thornton Crescent, Billingham, Tees-side.
- G3YWH**, F. Hill, 11 Goodwood Avenue, Blackpool, Lancs. FY2 OTT.
- G3YWI**, G. W. H. Grayson, 88A Kaye Lane, Almondbury, Huddersfield, Yorkshire. HD5 8XU.
- G3YWN**, K. Birchall, 61 Silk Mill Drive, Tinsill, Leeds. LS16 6DN.
- G3YWP**, P. J. H. White, Sycamore, Lower Lane, Freckleton, Preston, Lancs. PR4 1HJ. (Tel. 0772-879 486.)
- G3YWQ**, W. J. D. McClure, 7 Coulton Street, Barrow-in-Furness, Lancs.
- G3YWR**, Westmorland Radio Society, 24 Park Road, Milnthorpe, Westmorland.
- G3YWT**, P. Smith, 7 Vaughan Avenue, Linby, Notts. NG15 8BT. (Tel. Hucknall 2541.)
- G3YWU**, S. Fisher, Nestofirs, Leatherhead Road, Gt. Bookham, Surrey.
- G3YWX**, I. D. Poole, 41 Linton Rise, Leeds. LS17 8QW.
- G3YXM**, D. Pick (ex-G8CTM), 9A Long Lane, Billesdon, Leicester. LE7 9AL. (Tel. Billesdon 229.)
- G3YXW**, P. J. Dunford, 2 Newton Road, Swanage, Dorset. BH19 2DZ.
- G8CXU**, B. S. Anley, 20 Abbotsford Road, York. YO1 3EE.
- G8CZA**, J. A. James, 46 Meadow Road, Berkhamsted, Herts.
- G8CZD**, D. Palmer, 59 Meadowbank Road, Fareham, Hants.
- G8DAO**, J. R. Durrant, 19 High Street, Watton, Norfolk.
- G8DBM**, P. A. L. Beaumont, Newlands, Bolton Percy, York. YO5 7AD. (Tel. Appleton Roebuck 329.)
- G8DCI**, C. Moorhouse, 17 Woodend Avenue, Maghull, Lancs. L31 7BE.
- G8DDB**, W. Kirby, Handling Flight, R.A.F. Coningsby, Lincs.
- G8DDJ**, G. Shepherd, Berwyn, Runshaw Lane, Euxton, Chorley Lancs.
- G8DDM**, R. E. Finch, 6 Cherry Tree Way, Tylers Green, Penn. Bucks. (Tel. Tylers Green 483.)
- G8DEF**, C. J. Leigh, Ravenstone, The Park, Cheltenham, Glos. GL50 2RP.
- G8DEM**, B. T. Willetts, 21 Chestnut Road, Oldbury, Warley, Worcs.
- G8DFA**, D. C. Hyde, 33 Hartford Road, West Ewell, Epsom, Surrey. (Tel. 01-397 7350.)
- G8DFF**, C. R. Adams, 89 Oakdale Drive, Heald Green, Cheadle, Cheshire.

CHANGE OF ADDRESS

- EI4LRC**, Limerick Radio Club, c/o John Casey, 19 Elm Place, Rathbane, Limerick.
- G2BCH**, J. P. O'Brien, 11 Cheryl Court, Uplands Road, Clacton-on-Sea, Essex.
- G2FSJ**, E. Thorne, 47 Rownhams Lane, Baddesley, Southampton. SO5 9HR. (Tel. Rownhams 2567.)
- G2FXA**, G. D. Davies, 35 Kensington Road, Stockton-on-Tees, Tees-side.
- GW2RV**, S. Higson, Garneddwen Bungalow, Lixwm, Holywell, Flintshire. CH8 8JS.
- G3AGF**, R. L. Edginton, 92 Shurdington Road, Cheltenham, Glos.
- G3BOR**, D. W. Hudson, 21 Hallas Lane, Cullingworth, via Bradford, Yorkshire.
- G3DAA**, E. Cockayne, 9 Foresters Terrace, Teignmouth, Devon. (Re-issue.) (Tel. Teignmouth 3303.)
- G3GJX**, E. B. Grist, 37 The Shimmings, Boxgrove Road, Guildford, Surrey. (Tel. Guildford 60163.)
- G3GSN**, T. N. Reekie, The Skerries, Bury Ring, Billington, Stafford.
- G3GYR**, J. H. Woodward, Greenacres, Brookside, Arclid, Sandbach, Cheshire. (Tel. Sandbach 2140.)
- G3JFY**, M. J. I. Lillington, 14 Kingston Caravan Park, Canada Road, West Wellow, Romsey, Hants.

- G3JKT**, J. Huggett, Greenlands, Second Green, Thorpe-le-Soken, Essex.
- GM3JOI**, J. Murray, 122 Kirke Park, Methilhill, Methil, Fife.
- G3KFN**, A. R. Baker, 74 Tavistock Road, Stoke, Plymouth, Devon.
- G3KOL**, Dr. J. Caplan, 2 Ormond Avenue, Richmond, Surrey.
- G3KSF**, R. E. Harper, 1 Vicarage Lane, Curdridge, Southampton.
- G3LBX**, Rev. J. L. R. Crawley, 54 St. Mary Magdalene Hospital, Claremont Road, Newcastle-upon-Tyne. NE2 4NN. (Tel. Newcastle-upon-Tyne 23162.)
- G3LRM**, S. H. W. Tanner, c/o 6 South Street, Uley, Dursley, Glos. GL11 5SS.
- G3MIX**, F. Parsons, 5 Oakley Close, Maudlin Drive, Teignmouth, Devon.
- G3MNJ**, J. C. Yates, 15 Marlfield Road, Grappenhall, Warrington, Lancs.
- GW3MSY**, A. C. Davies, 1 Manor Hill, Miskin, Pontyclun, Glam. (Tel. Pontyclun 449.)
- G3NBK**, A. M. Thatcher, 15 Dunstan Crescent, Worksop, Notts.
- G3NTM**, W. T. Brown, 18 Georgian Close, Leacroft, Staines, Middlesex.
- G3OGE**, J. Rose, 12 Stirling Close, Banstead, Surrey.
- G3OHL**, D. S. White, 84 Chantry Road, Romanby, Northallerton, Yorkshire.
- G3OSB**, A. D. Taylor, 21 Sweet Briar, Welwyn Garden City, Herts.
- GW3PEA**, C. G. Jarrett, 5 Overdale Walk, Croespenmaen, Crumlin, Mon. NPI 4PY.
- G3PQL**, L. M. Holyhead, 34 Hillcourt Avenue, Finchley, London, N.12.
- G3SOA**, W. A. McCartney, 49 Gainsborough Rise, Manton Heights, Bedford.
- GM3SSB**, D. K. McDermott, 22 Fettercairn Avenue, Glasgow, W.5.
- G3STG**, G. A. Griffiths, 28 Pine-wood Close, Bourne, Lincs.
- GW3TBG**, G. Goulbourn (ex-G3TBG), 4 Westbury Drive, Buckley, Flintshire. (Tel. Buckley 3634.)
- G3TOH**, C. P. Ford (ex-G13TOH /GD3TOH/9HIAR), 115 Burden Road, Beverley, Yorkshire. (Tel. Beverley 885026.)
- G3UID**, K. A. P. Baldock, 19 Theydon Avenue, Woburn Sands, Bletchley, Bucks.
- G3UNB**, R. S. Fairhead, 73 Longfield Avenue, Fareham, Hants.
- G3VBX**, R. M. Luther, 1 Range Road, Eastchurch, Sheerness, Kent.
- G3WET**, J. G. Evans, B.Sc., C.Eng., F.I.C.E. (E12VAQ), 104 Stonnall Road, Aldridge, Staffs. (Tel. Aldridge 51551.)
- GM3WHT**, M. J. Smith, Upperhouse, Hamnavoe, Lerwick, Shetland Islands.
- G3WSF**, A. R. Hey, 42 Glendene Park, Bashley, New Milton, Hants.
- G3WXB**, K. Watmough, 128A Baldwins Lane, Croxley Green, Rickmansworth, Herts.
- G3WXO**, P. V. Harman, 9 Calverton Road, Stony Stratford, Wolverton, Bucks. (Tel. Stony Stratford 3346.)
- G3XQL**, R. Johnstone, The Villa, Withington, Shrewsbury, Salop.
- G3XQM**, T. Finch, 77 Edburton Avenue, Brighton, Sussex. BN1 6EQ. (Tel. Brighton 507803.)
- G3XZV**, J. M. Sonley, 30 Astbury Avenue, Wallisdown, Poole, Dorset.
- GM3YHJ**, P. J. Simmons, 11 McPhie Road, High Overtoun, Dumbarton, Dunbartonshire.
- G4GA**, J. J. Hollington, 10 Woodland Close, Great Clacton, Clacton-on-Sea, Essex. (Tel. Clacton 26203.)
- G4HZ**, E. C. W. Beale, Netheredge, Gaddum Road, Bowdon, Altrincham, Cheshire.
- G6ACA/T**, W. A. McCartney, 49 Gainsborough Rise, Manton Heights, Bedford.
- G6AU**, C. C. Algar, 3 The Croft, Heyhouses Lane, Lytham St. Annes, Lancs. FY8 3RS. (Tel. St. Annes 27818.)

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2s. 3d., total 11s. 3d. Where there is doubt about "how words are counted," readers often send in a blank cheque (yes!) endorsed "not over £2," or some such reasonable amount, and leave it to us to fill it in; the amount charged is notified to the reader concerned when acknowledging his advertisement. Because every month we have a large carry-over, send in your notice as early as possible, economically drafted and using the accepted abbreviations, with remittance, to: Small Advertisement Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SHOPPING AROUND

Though it is usual in *Magazine* constructional articles to specify certain components by make, e.g., coils, valves and transistor types, it is only in special cases that these cannot be substituted by items having similar characteristics. Indeed, it has been found from the experience of many years that few constructors nowadays either follow a design to the last detail, or even want elaborate constructional information. What most prefer is detail about the circuitry, its functions and what values should be used—and this is what we aim to give, so that those interested can use either what they already possess in the way of components or shop around for what they need.

- PYE RANGER** 15 2202 68 174 mc. AM 12 volt, boot mounting, 15 watts output, QQV03-20A PA, PP 6V6 mod. Less vibrator and accessories. Carr. 30/- £12
- COSSOR 103BE** FM MOBILES, TX/RX, 12 volt P.S.U. boot mounting. TX valves: 6BH6, 6BH6, 6AM5, 6AM5, 6AM5, QQV02-6, QQV03-20A, with control unit, mic., cables, speaker. Carr. 30/- £12
- COSSOR 103B**, similar, dash mounting. Carr. 30/- £15
- COSSOR 102** FM WALKIE-TALKIE, will mod. for 2m. Carr. 10/- £10
- COLLINS ART13** TX, 2-18.5 mc. 813 PA PP811 modulator, clipper, vfo or xtal, manual or auto. tuning. Size: 24 x 10 x 12. Carr. £2 £15
- COLLINS ARR15** RX. 1.5-18.5 mc. COLLINS PTO local oscillator and BFO, 500 kc IF. Size: 11 x 8 x 20. Carr. £1 £25
- Both COLLINS require P.S.U. for mains use, 24 volt dynamotors at carr. cost if required.
- MR820** 2 metre mobile TX/RX, QQV03-10 driver and PA, 12 volt transistor P.S.U. Size: 5 x 8 x 14, supplied less xtals and mic. Carr. 10/- £20
- CR 100** Marconi RX. Carr. 30/- £18

FOR YOUR BOAT OR AIRCRAFT :**Bendix :**

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- MN26** A.D.F. System, 12 or 24 volt.
- SCR269G** A.D.F. System, 24 volt.
- R5/ARN7** A.D.F. System, 24 volt.
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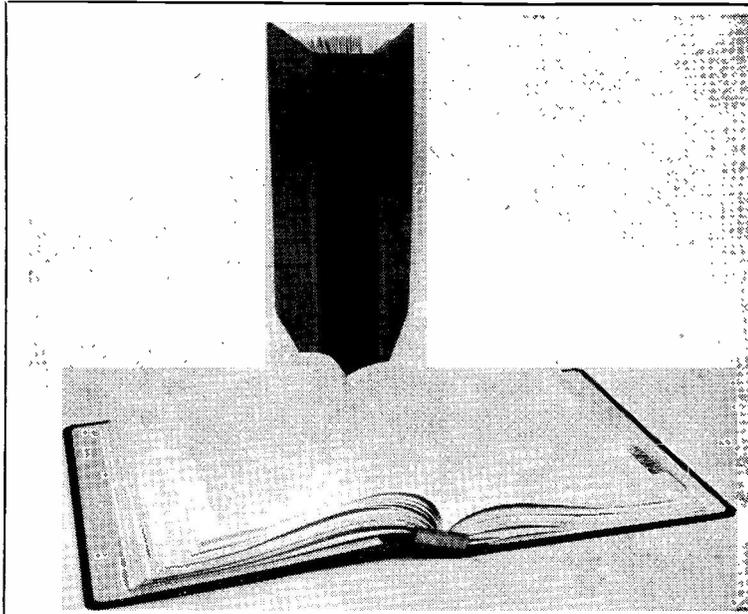
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SALE: Heathkit RA-1 receiver, in excellent condition, price £28. Prefer buyer collects.—Tibbert, 397 Uttoxeter Road, Derby (32180).

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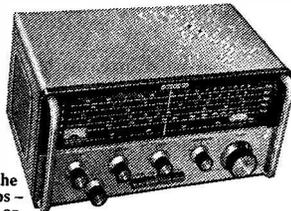
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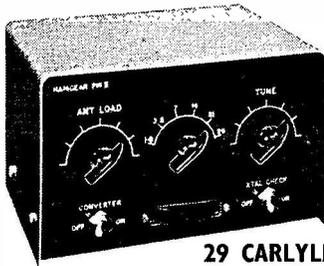
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EXCHANGE or SELL: Cossor 1035 'scope, in good condition, £15—or Exchange for complete B.2 outfit in working order. Prefer buyer collects.—Nadauld, G3RFQ, 25 Blenheim Drive, Highfield, Bicester, Oxon.

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FOR SALE: An Eddystone 940 communication receiver, six months old, as new and including plinth speaker and pair noise-excluding headphones, price £100 or near offer.—Ring Mills, Lincoln 24922.

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SALE or EXCHANGE: Heathkit RA-1 amateur-band receiver complete with speaker, xtal calibrator and Q-multiplier, in immaculate condition. Will sell for £35, or EXCHANGE for Heathkit RG-1, GC-1U or (preferably) GR-54.—Ring Parfitt 01-636 3735 (London).

EXCHANGE or SELL: Eddystone EC-10 receiver, in mint condition, hardly used—will sell, or Exchange for Codar CR-70A in corresponding condition, with cash adjustment.—Roberts, 28 Mumbles Road, Swansea, Glam., South Wales.

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SALE: Valves: R.C.A. 7094, Mullard QV2-250C, new and boxed, £5 each.—Surman, G3FPD, QTHR.

SELLING: Heathkit DX-100U transmitter, covering 10 to 160m., factory built and no mods., excellent, £45. K.W. DC/PSU 12v., positive earth, suitable for KW-2000A or Atlanta, unused, price £25. Q-Multiplier, 465 kc, as per "Handbook," £4 10s.—Edwards, G3XUO, 99a Wilton Crescent, Shirley, Southampton (74352), Hants, SO1-2QF.

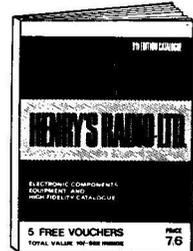
FOR SALE: Nova-Pal transistorised D/F receiver, 190 to 4500 kc, condition as new, £15. Collins TCS-12 receiver, built-in PSU, in very good condition, £7. R.1475 Rx, with original PSU, a little shabby, but in good working order, £6. Buyers to collect.—Grigg, G3PRX, 72 Elmstone Road, Rainham, Kent.

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SALE: Vanguard Mk. I AM/CW Tx, five-band coverage, in very good condition, £30 or near offer. Also a "Cornishman," 90% completed, with valves, filter, PSU, two transformers, 300v. exciter, 800v. PA. Offers?—Hetherington, GM3BRF, QTHR.

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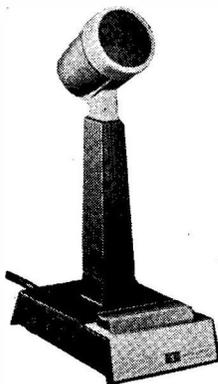
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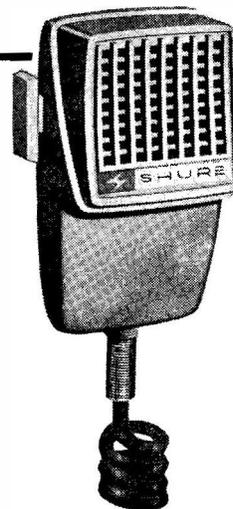
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