

# The SHORT WAVE Magazine

VOL. XXIX

OCTOBER, 1971

NUMBER 8

# TRIO



Stand by to receive  
full information on the  
great new all band solid state  
Trio communications receiver Model JR-599

Ask at your local dealer or send for full information on the JR-599 receiver £185.00 and all other Trio models including:  
TS-510 transceiver and PS-510 power supply £180.00 (the pair); VFO-5D (Variable Frequency Oscillator for TS-510) £25.00;  
9R-59DS receiver £47.50; JR-310 receiver £77.50; SP-5D speaker £4.38 and HS-4 headphones £5.98.



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## 2 Great Transceivers DELIVERY IMMEDIATELY, FROM STOCK



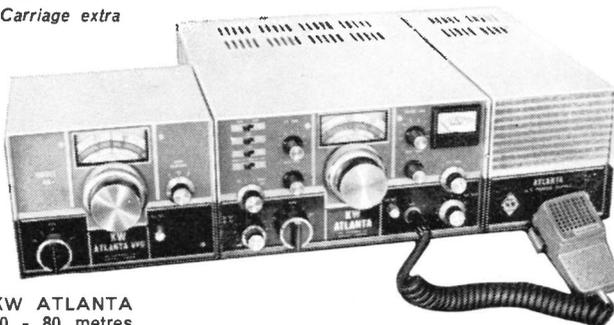
**KW2000B** 10-160 metres

SSB TRANSCEIVER : 180 watts  
PEP 10-160 metres, complete with  
A.C. P.S.U., VOX P.T.T.,  
I.R.T./I.T.T.

**£240**

Carriage extra

- Two-speed VFO drive
- Improved VFO Read-out
- New, precise metering
- Attractive panel layout
- D.C. P.S.U. for mobile
- Break-in c.w.



**KW ATLANTA**  
10 - 80 metres

**£200**

carriage extra

KW Atlanta and  
A.C. P.S.U.

- Extremely good audio (crystal filters fitted)
- 500 watt PEP SSB Transceiver
- Operation on all amateur bands from 10 to 80 metres
- A.N.L. and A.L.C.
- 100 kHz Crystal Calibrator.
- Two speed VFO drive
- Built in speaker.

Both transceivers available with remote VFO unit

KW offers a complete  
range of equipment—  
ensure your investment  
in equipment pays  
dividends—buy KW\*

\*KW equipment holds its value longer—  
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equipment, with other makes. Spares, for  
all KW equipment stocked for a minimum  
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CW, with Mechanical Filter, built-in 'Q' Multiplier  
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Two-Speed VFO Drive. Excellent Sig./Noise  
and sensitivity performance. Very attractive  
(similar in appearance to KW2000B). 100 kHz  
Crystal Calibrator price £140 carriage extra.  
**KW204 TRANSMITTER**. 10-160 metres SSB/  
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—Perfectly matches the KW202 Receiver and is  
similar in appearance. 180 watts p.e.p. from  
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Provides "side tone" cw monitoring. A beautiful  
compact efficient unit. Price £142 carriage extra.  
**KW 101**—Standing-Wave-Ratio meter £9.25\*.  
**KW 103** SWR/Power meter 0-100 & 0-1000 watts  
£12.50\*. **KW 103** with Dummy Load and Coax  
Lead £20.50\*. **KW 105** Antenna Tuning System  
including E-Z Match, SWR Ind., Dummy Load,  
Antenna Switch, 5 position, £36.00\*. Also KW  
Trap Dipole with twin feeder and 4 other types  
(only the original Trap from KW is good enough  
for you). KW E-Z Match ATV, KW Low Pass Fil-  
ters, KW & HZP Baluns, etc.

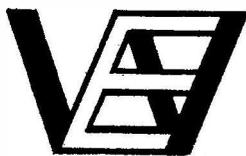
**KW for HY-GAIN, MOSLEY, G-WHIP,  
POLYQUAD, WEBSTER, HUSTLER  
ANTENNAS. SHURE Microphones, CDR  
Rotators. VIBROPLEX Keys, etc.**

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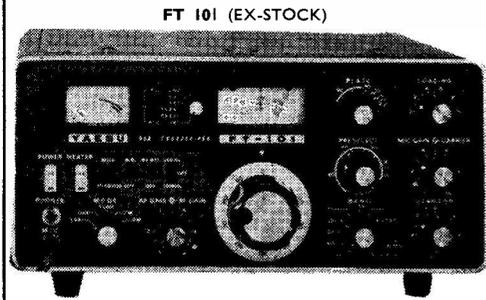
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**24hr. Delivery!** We guarantee delivery within 24 hours. (48 hrs. to remote parts of Scotland) of cash sales of items which are in stock. The cost of this special service is £1 per parcel and applies to all **TRANSCIEVERS, ROTATORS**, and certain **AERIALS**. **10% DEPOSIT ONLY ON H.P.** You will find our Interest Rates are about the cheapest too.

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**FT101**  
 Price **£230.00**  
 Deposit **£23.00**  
 Now available with 160m.  
 Price **£245.00**  
 Deposit **£24.50**

- 10 FET's, 3 IC's, 31 TR and 38 diodes.
  - Highly advanced computer-type plug in modules.
  - 240w. p.e.p. 3.5-30 MHz.
  - 12. D.C. and 100/240v. A.C. supplies built-in.
  - Break-in C.W. keying (180w.)
  - Dual gate Mosfet's for 0.3  $\mu$ V sensitivity for 10 dB S/S + N ratio.
  - ★ Noise Blanker is standard.
  - ★ Built-in WWV band.
  - ★ Built-in speaker.
  - ★ 25 and 100 xtal calibrator.
  - ★ Comes complete with microphone.
- All this for our low PRICE of **£230** (carr. £2).

**YAESU/SOMMERKAMP** 12 month Guarantee backed by full Service and Spares.

FT101/277 Transceiver ... ..	<b>£230.00</b>	FV200 Remote VFO ... ..	<b>£36.00</b>	FT560/747 Transceiver ... ..	<b>£195.00</b>
FT101 CW Filter ... ..	<b>£11.90</b>	FR400/500 Receiver ... ..	<b>£120-£160</b>	FT401 Fitted CVW Filter ... ..	<b>£215.00</b>
FV101 Remote VFO ... ..	<b>£36.00</b>	FL400/500 Transmitter ... ..	<b>£130.00</b>	FV401S Remote VFO ... ..	<b>£36.00</b>
SP101 Speaker ... ..	<b>£10.00</b>	SP400 Speaker ... ..	<b>£10.00</b>	FF50DX Low Pass Filter ... ..	<b>£6.20</b>
FT200/250 Transceiver ... ..	<b>£132.00</b>	FL2000B Linear 1.2 KW ... ..	<b>£130.00</b>	YD844 Table Mic. ... ..	<b>£11.00</b>
FP200/250 A.C. Supply ... ..	<b>£36.00</b>	FL2500 Linear 2 KW ... ..	<b>£118.00</b>	YD846 H and Mic. ... ..	<b>£5.00</b>
DC200 D.C. Supply ... ..	<b>£40.00</b>	FT2F 2m. Transceiver ... ..	<b>£80.00</b>	FP2AC A.C. p.s.u. for FT2F ... ..	<b>£25.00</b>

**DIGITAL 500.** This transceiver is a highly advanced digital read-out high power transceiver using semiconductors and tubes. There are 28 IC's and 10 Tr. in the counter alone, **£298** (see July advert).

**K.W.** We are now South coast distributors of K.W. equipment. Ex stock Alanta Mk. II, **£203** (carriage £2). KW2000B, **£240** (carriage £2). E-Z match **£13.50** (40p). Dummy Loads Z 50  $\Omega$  each, **£7** (25p).

<b>MOSLEY</b> (ex-stock, carriage extra).	TA33 Jnr., <b>£31.50.</b>	Mustang, <b>£38.00.</b>	Atlas 10-40m. vertical, <b>£19.00.</b>	TA32 Jnr., <b>£22.00.</b>	
<b>HY-GAIN</b> (carriage extra).					
<b>Verticals :</b>	Hy-Tower, 10-80m. ... ..	<b>£90.00</b>	18v., 10-80m. vertical ... ..	<b>£10.00</b>	
	14AVQ, 10-40m. vertical ... ..	<b>£19.00</b>	LC80Q, 80m. loading coil ... ..	<b>£6.70</b>	
<b>Tri-Band Beams :</b>	TH6DXX, 10-20m., 6 ele. ... ..	<b>£85.00</b>	TH3K3, 10-20m. 3 ele. ... ..	<b>£68.00</b>	
	Hy-Quad, 10-20m., 2 ele. ... ..	<b>£62.00</b>	DB10-15, 10 and 15m. 3 ele. ... ..	<b>£51.00</b>	
<b>Mono Band Beams :</b>	204BA, 20m. 4 ele. ... ..	<b>£69.50</b>	203BA, 20m. 3 ele. ... ..	<b>£67.00</b>	
	103BA, 10m. 3 ele. ... ..	<b>£14.50</b>	LAI Lightning arrester ... ..	<b>£14.50</b>	
	Balun BN86 ... ..	<b>£8.00</b>			
<b>J BEAM</b> (ex-stock, carriage paid).					
2/4Y, 2m. 4 ele. ... ..	<b>£2.65</b>	2/10XY, 2m. Cross polarised ... ..	<b>£11.00</b>	2/HO, 2m. Halo ... ..	<b>£1.20</b>
2/6Y, 6 ele. ... ..	<b>£3.20</b>	2/100V, 2m. Omni/bi-directional ... ..	<b>£6.50</b>	2/HM, 2m. Halo/mast ... ..	<b>£1.50</b>
2/8Y, 2m. 8 ele. ... ..	<b>£3.80</b>	2/8, 2m. 4 over 4 ... ..	<b>£4.60</b>	70/16, 70 cms., 8 over 8 ... ..	<b>£5.10</b>
2/10Y, 2m. 10 ele. ... ..	<b>£8.20</b>	2/12, 2m. 6 over 6 ... ..	<b>£6.15</b>	70/14Y, 70 cms. 14 ele. ... ..	<b>£6.45</b>
2/4P, 2m. 14 ele. ... ..	<b>£13.00</b>	2/16, 2m. 8 over 8 ... ..	<b>£7.65</b>	70/18P, 70 cms. 18 ele. ... ..	<b>£6.50</b>
				70/MBM/46, 70 cms., 46 ele. ... ..	<b>£9.60</b>
<b>G. WHIPS</b> (ex-stock, carriage extra 65p)					
Tri-bander 10, 15 and 20m. ... ..	<b>£9.45</b>	Multimobile 71, 10, 15 and 20m. ... ..	<b>£11.50</b>	Base mounts ... ..	<b>£1.45</b>
LF40, 40m. coil ... ..	<b>£4.00</b>	MM40, 40m. coil ... ..	<b>£4.00</b>	Thread adaptor ... ..	<b>25p</b>
LF80, 80m. coil ... ..	<b>£4.00</b>	MM80, 80m. coil ... ..	<b>£4.00</b>	SAE for leaflet please.	
LF160, 160m. coil ... ..	<b>£4.00</b>	MM160, 160m. coil ... ..	<b>£4.00</b>		
Telescopic section for LF coils ... ..	<b>70p</b>				
<b>WE QUAD 10-20m.</b> "boomless" type. Cast aluminium centre. bamboos, etc. <b>£23.00</b> , carriage paid.					
<b>NEW W.E.</b> Trapped dipoles for 10-80m. All are fitted with resin encapsulated traps and a high quality commercial grade centre assembly with cable strain relief.					
	Type S, 500 watts, <b>£11.50</b> ; Type HP for 1 kw p.e.p., <b>£13.50</b>				
	Type P with a special copper/terylene braid element for ease of coiling up.				
	Supplied with winding spools and 70' co-ax. <b>£14.90</b>				
<b>BANTEX.</b> Fibreglass whips.	BM 2m. $\frac{1}{2}$ wave vert., <b>£2.75.</b>	B5, 2m. $\frac{3}{8}$ wave, <b>£4.35.</b>	Magnetic Mounts, <b>£4.95.</b>		
<b>ROTATORS</b> (carriage extra).					
ARI0, <b>£18.00</b> (carr. 40p).	AR22R, <b>£25.00</b> (65p).	TR44, <b>£40.00</b> (75p).	HAM-M, <b>£70.00</b> (80p).	Hy-Gain 400, <b>£98.00</b> (80p).	
<b>OSKER POWER METER</b> (see June advert.), <b>£18.50</b> (30p) including plugs.					

**LONDON AGENT—Roger Wilkins.** Tel.: 01-845 6290 After 6.0 p.m.  
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G3UGY

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## CRYSTALS FROM STOCK AT KEEN PRICES

SENATOR CRYSTALS proven record shows them to be the field-leaders in the art of catering for crystal requirements. Upon review, it becomes fairly obvious why this should be. At SENATOR, prior to despatch, every crystal is tested on internationally approved test-sets in conjunction with frequency counters, thereby eliminating error and assuring that every crystal unit is despatched in perfect working order.

55,000 BRAND NEW, modern crystals under our control and actually in our own stock-rooms, is sufficient reason for our customers, who range from amateurs to the Post Office government departments, universities and leading electronics manufacturers, to order from SENATOR time and time again, particularly when they need crystals in a hurry.

Here are just a few of the popular frequencies actually in STOCK now:

100 kHz in HC11/U ...	£2.50	26-500 MHz in HC18/U*	£1.60
1-00 MHz in HC6/U ...	£1.75	30-000 MHz in HC6/U ..	£1.60
2-000 MHz in HC6/U ...	£1.50	32-500 MHz in HC18/U*	£1.60
3-500 MHz in HC6/U ...	£1.75	34-000 MHz in HC18/U*	£1.60
5-000 MHz in HC25/U*	£1.50	34-500 MHz in HC18/U*	£1.60
7-000 MHz in HC6/U ...	£1.50	35-000 MHz in HC18/U*	£1.75
9-000 MHz in HC6/U ...	£1.50	35-500 MHz in HC18/U*	£1.75
10-000 MHz in HC6/U ...	£1.50	38-666 MHz in HC18/U*	£1.35
11-000 MHz in HC6/U ...	£1.50	40-000 MHz in HC18/U*	£1.60
19-500 MHz in HC6/U ...	£1.60	70-000 MHz in HC18/U*	£2.00
24-500 MHz in HC18/U*	£1.60	71-000 MHz in HC18/U*	£2.00
25-000 MHz in HC6/U ...	£1.60		

\*—Also available in HC6/U.

And here's our STOCK range of BRAND NEW HC6/U 8 MHz for 2M:

8-007 8-012 8-018 8-021 8-032 8-041 8-043 8-047 8-048 8-0555 8-058 8-061 8-070 8-081 8-092 8-100 8-104 8-107

All at £1.25 each, post free. These crystals will pull well if used in a VXO.

Here are some popular frequencies for VHF, home station, mobile channels and R.A.E.N., ALL IN STOCK:

8-0555 MHz in HC6/U for TX x 18 to 145-000 MHz 2M Mobile Channel ...	£1.25
44-7666 MHz in HC6/U for RX x 3 + 10.7 MHz to 145-000 MHz 2M Mobile Channel ...	£1.80
8-100 MHz in HC6/U for TX x 18 to 145-800 MHz 2M RAEN Channel ...	£1.25
45-0333 MHz in HC6/U for RX x 3 + 10.7 MHz to 145-800 MHz 2M RAEN Channel ...	£1.80
12-975 MHz in HC6/U for RX x 12 + 10.7 MHz to 145-000 MHz 2M Mobile Channel ...	£1.60
11-1916 MHz in HC6/U for RX x 12 + 10.7 MHz to 145-000 MHz 2M Mobile Channel ...	£1.50
12-0933 MHz in HC6/U for TX x 12 to 145-000 MHz 2M Mobile Channel ...	£1.60
8-7825 MHz in HC6/U for TX x 8 to 70-260 MHz 4M Mobile Channel ...	£1.60

You'll find the above frequencies may be suitable for your PYE Cambridge, Ranger, Vanguard and other makes of ex-commercial

R/T gear for the now popular and well-used mobile call channels. Check up with crystal multiplication data in equipment manuals for suitability.

For 10M walkie-talkies with I.F. of 455 kHz to transceive on 28-500 MHz, we have in STOCK 28-500 MHz (TX) and 28-045 MHz (RX), at £1.60 each.

AVAILABLE SOON:

6746-667 kHz for PYE Ranger to receive on 70-260 MHz (4M Mobile Call Channel).

11-710 MHz for transmitters multiplying x 6 to 70-260 MHz.

72-500 MHz for x 2 to 145-000 MHz (useful for walkie-talkie projects, etc.).

CLUB and other GROUP projects: If your club or group is contemplating a constructional project requiring crystals, we can offer real keen prices for quantity orders.

Also, 200 kHz, 500 kHz, 8797-190 kHz for R.A.E.N., most crystals for G2DAF and other designs, and crystals for every amateur band always in stock. There are so many 1,000's more useful frequencies in the Bank that to list them all would take too long.

Why not telephone or write your enquiry to us? Experience proves that we are sure to have something very close to—if not spot-on—the frequency you require from 50 kHz thru 132 MHz in stock.

When telephoning, you can be assured of a speedy answer to your enquiry. All our stock is recorded (no computers—just hard-working staff).

Should you require crystals made to order—no problem. We can supply as follows: (PLEASE NOTE however, our crystals can only be as accurate as your specification).

3rd, 5th and 7th OVERTONE to an adjustment tolerance of ±0.005% will hold 50ppm from -20 to +70 deg. C. Available in HC6/U, 18/U and 25/U:

175 MHz to 200.0 MHz	£12.50	60 MHz to 109.9 MHz	£3.25
140 MHz to 179.9 MHz	£8.75	17 MHz to 59.9 MHz	£2.50
110 MHz to 139.9 MHz	£7.00		

FUNDAMENTAL MODE to an adjustment tolerance of ±0.005% available in HC6/U, 18/U and 25/U:

11.5 MHz to 20.00 MHz £2.50 4.0 MHz to 11.49 MHz... £2.50

The following in HC6/U only ±0.005% tolerance:  
1.4 MHz to 3.9 MHz £3.00 1.0 MHz to 1.39 MHz £3.20

The following to ±0.01% tolerance:

500 kHz to 999 kHz in HC1/U	£4.50	150 kHz to 449 kHz in HC6/U	£3.85
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450 kHz to 500 kHz in HC6/U	£3.50	50 kHz to 149 kHz in HC13/U	£4.60
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Below 50 kHz and to closer tolerances, by quote.

Types available: Flexural Mode; NT Elements; J Plate; Duplex Elements.

SENATOR can supply crystal units to British and U.S.A. Defence specs.

Now you've read this advertisements, we naturally hope that you are "hooked" on SENATOR CRYSTALS; however, if you are not, deal with us once and we are sure that you will be. SENATOR know-how and 55,000 units actually in stock practically assures this.

Mail Order SENATOR CRYSTALS Dept. SW. 36 Valleyfield Road, S.W.16.

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## MINITENNA COMMUNICATIONS

Make your signal really heard with the  
NEW ALAND  
Compressor—Amplifier

Gain up to 2.5 points and really add the talk power.

- ★ PP.3. 9v. operation
- ★ Five Transistors
- ★ Input and output controls
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- ★ NO DISTORTION
- ★ FET input for low noise
- ★ 3 pole jack sockets
- ★ Size 7" x 4" x 2" high

Each unit built and tested on the premises

Immediate delivery

Price: £11.25 P.P.25p

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Tel. Eaton Bray 297

## The Amateur Radio Shop

(G4MH)

13 CHAPEL HILL, HUDDERSFIELD. Tel. 20774	
TRIO JR599 (160-2m)	£185.00
JR310	£77.50
9R59DS	£42.50
TS510 and P.S.U. (Unbeatable)	£180.00
Filter, Phones, Xtals, Mic, SWR ind.	
KW KW2000B	£240.00
KW204	£142.00
KW202	£140.00
KW1000 L.N.	£135.00

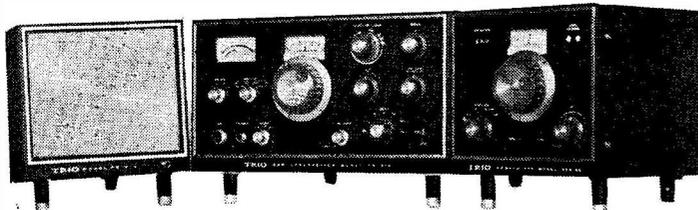
EZE Match, VSWR meter, Filter, etc.  
CODAR: ATS £19.50, T28, £17.50, PR30X, £9.50.  
FOR VHF: The 4MH Tx £10, SSM converters, £13.75, J. Beams, Halos.  
CRYSTAL At 75p inc. post, Type 10XJ New. 8002, 8007, 8006, 8008, 8015, 8020, 8029, 8036, 8037, 8044, 8046, 8035, 8047, 8058, 8060, 8064, 8071, 8108.

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All Goods Guaranteed.

Northern Agents for Strumech versa Tower.  
Shortly Available: The "Boom Mike": A Headset Microphone unit designed for mobile or home station operation.  
For details of any of the above items s.p.e. required.  
Closed all day Tuesday. Ample parking. Late closing Thursday (8 p.m.)  
Speedy repair service.

# Laskys

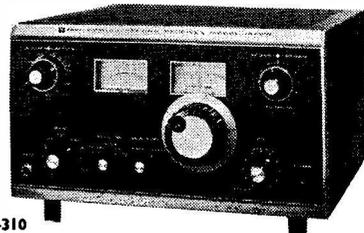
## TRIO COMMUNICATION RECEIVERS



PS-510 — TS-510 — VFO-5D

**TS-510 SSB Transceiver** covers all ham bands from 3.5-29.7 MHz Emission SSB (A3J), CW (A1) Input 160W at 3.5-21 MHz; 120W at 28 MHz. Antenna input imp. 50-70 ohms. Uses 14 valves, 2 FET's, 13 transistors, and 29 diodes. Circuits include VOX, PTT, amp, AGC, RIT, CAL, switching multimeter indicates 1p, RF, HV, ALC and signal strength. AGC switch terminals for external VFO, ALC and receiver input and output terminals. Size: 13 x 7 x 13 3/4". **PS-510 power supply** for TS-510. Incorporates 6 1/2" communications speaker. Frequency response 150-5,000 Hz. Size: 7 1/2 x 8 1/2 x 11 1/2". **VFO-5D Variable Frequency Oscillator**. Frequency range. Bands, 3.5-29.7 MHz. Oscillation frequency 4.9-55 MHz. Output voltage 1v. Power: A.C. 12-6v. 8-mA; D.C. 150v. 30 mA. Size: 7 1/2 x 8 3/8 x 7 1/8".

**Lasky's Price, TS-510 & PS-510, £180.00 (the pair), Post £2.50**  
**VFO-5D, £25.00 Post 75p**

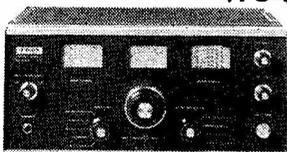


JR-310

**JR-310 SSB receiver**. Frequency range: 3.5 MHz-29.1 MHz in 7 bands. Output SSB CW. Power supply A.C. 110-120v./220-240v., 6 valves, 6 transistors, 2(FET's) and 19 diodes. Crystal controlled BFO for SSB reception. S meter, ANL and calibrator circuit switch are provided. RIT circuit. Power output 1w max. Size: 13 x 7 1/8 x 12 1/8".

**Lasky's Price £77.50 Post FREE**

**JR-500SE communications Rx.** We have two only of this excellent model, S/H but perfect at £50 each from our Cavell Street address only.



9R-59DS

**9R-59DS SSB receiver**. Frequency ranges: 550-1000 kHz: 1.6-4.8 MHz; 10.5-30 MHz. Bandsread: 3.5 MHz 80m.-28 MHz 10m. Audio output 1.5 watts. Power A.C. 115/230v. Circuits ANL; A.V.C. Headphone jack. Size: 7 x 15 x 10".

**Lasky's Price £47.50 Post FREE**



JR-599

**JR-599 SSB receiver**. All solid state. Frequency range: 1.8 MHz-29.1 MHz in 8 bands. Reception SSB, CW, AM and FM. Antenna input imp. 50-75 n.A.F output more than 1w. 10 FET's, 1 IC, 30 transistors, 37 diodes, A.C. 110/117/220/240v. 50/60 Hz. D.C. 12-15v. Size: 10 1/2 x 5 1/2 x 12 7/32".

**Lasky's Price £185 Post FREE**

Ask for full information on the above, and all other TRIO models and accessories.

### ACCESSORIES

- TRIO HS-4 Headphones ... £5.98
- TRIO SP-5D Communications speaker £4.38
- Leson TW-205A Base station mic. ... £7.95
- TTC G-1120 Head set/boom mic. ... £6.75
- TTC H-1010 Wireless code practise oscillator ... £1.50
- TTC F-1003 Morse code practise set £1.40
- TTC F-1001 Key ... 45p
- TTC F-1005 Semi-automatic bug key £4.50
- TTC F-1009 Code practise set ... £1.20
- TTC S-1020 Antenna selector ... 95p
- TTC C-3041 Field strength meter ... £2.75
- TTC C-3042 Field strength and SWR meter ... £4.25
- TTC C-3005 SWR and power meter... £7.25
- TTC H-1011 De luxe 5 band field strength meter ... £3.95
- TTC R-1014 A.C.-D.C. converter ... £2.95
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Post 15p on all above

Full range of JOYSTICK aerials available from stock (see separate advertisement).

### AIRCRAFT CONVERTER

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An item for the radio enthusiast bringing instant reception o the ground-to-air, air-to-ground waveband, for use with any standard AM or FM radio covering 535-1600 KHz, 88-108 MHz respectively—with no electrical conversion or connection required. The VHF 105 is self powered by one 9v. batt. placed close to the receiving set, volume and reception effectiveness is adjusted by moving both sets to the most favourable position and balancing the volume controls of each. Black plastic cabinet with brushed metal front panel. 18" chrome telescopic antenna. Size only 4 x 2 1/2 x 2 1/2". Comp. with batt.

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Below we show our current stock position, demonstration facilities for which are available for the caller and all items on offer may be tried on our premises without any obligation whatsoever on the part of the prospective purchaser. This facility, of course, also applies to new gear available from stock, i.e., Trio, KW, and Yaesu Musen and we would point out we have good stocks of the JR-310 Receiver which received such an excellent write-up in the last issue of "Radio Communication".

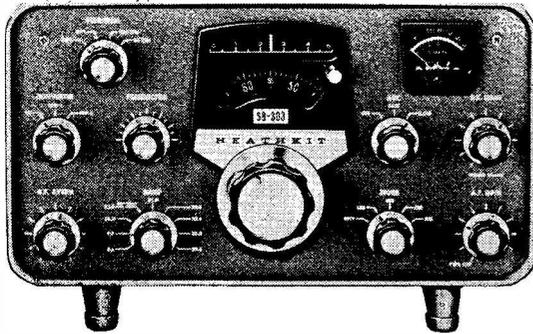
<b>COLLINS 51-J4 GENERAL COVERAGE RECEIVER.</b> Fitted all filters, superb performance and a delight to handle. Slight superficial external marks ... ..	252-50	<b>TRIO 9R59DE RECEIVERS.</b> Several in stock in first-class unmarked condition ... ..	38-00
<b>COLLINS 75-A2 AMATEUR BAND RECEIVER.</b> Again typically Collins in performance and condition similar to above ... ..	137-50	<b>EDDYSTONE 740 RECEIVER.</b> Externally poor but FB for its price ... ..	21-00
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<b>HAMMARLUND HG145 RECEIVER.</b> Typical Hammarlund construction and performance, good condition ... ..	65-00	<b>G-WHIP MOBILE ANTENNAE.</b> All models available ex stock. ... ..	
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<b>HEATHKIT DX100 TRANSMITTER,</b> fairly clean condition ... ..	39-50	<b>TTC C3042 50 ohm SWR BRIDGES</b> ... .. each	4-50
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Kit K/SB-303 £175. Carr. 70p.

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■ State-of-the-art solid-state circuit using 27 silicon transistors including 4 dual-gate, diode protected MOS-FET'S plus 1 IC ■ Heath factory assembled solid-state Linear Master Oscillator for instant warmup, improved stability & more accurate tracking ■ A unique Heath design using 9 modular plug-in circuit boards ■ Receives USB, LSB, AM, CW & RTTY ■ Complete 80-10 M coverage plus 15 MHz WWV for exact calibration ■ 25 kHz & 100 kHz calibration markers ■ Front panel selection of antenna & power connections for up to two VHF converters with rear panel jacks built-in ■ Fast & Slow AGC selectable from front panel ■ Front panel selection of built-in 2.1 kHz SSB crystal filter or optional AM & CW crystal filters ■ Built-in extremely stable solid-state power supply with circuit breaker protection ■ Speaker and/or headphone selection from front panel ■ Hand-some SSB-Series styling in a smaller package than the famed SB-301 ■ Easy, enjoyable assembly with the famous Heathkit manual.

## PROFESSIONAL SHORTWAVE, SB-310 KIT

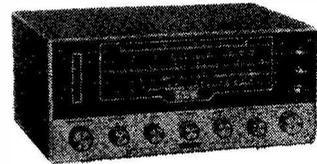
Frequency range (MHz)  
3.5-4.0; 5.7-6.2; 7.0-7.5; 9.5-10.00; 11.5-12.0; 14.0-14.5; 15.0-15.5; 17.5-18.0; 26.9-27.4; (other options).  
Less than 100 Hz drift.  
Selectivity 5.0 kHz at 6 dB-15 kHz at 60 dB.  
8 ohms ext. speaker  
110-240v. A.C.



SB-310 £125 Carriage 70p

## DE-LUXE SHORTWAVE, GR-54 KIT

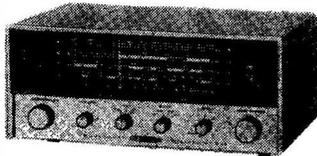
2 MHz to 30 MHz plus  
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Sleek styling. Charcoal  
grey metal cabinet. 120-  
240v. A.C.



GR-54 £53 Carriage 60p

## LOW COST 4-BAND, GR-64 KIT

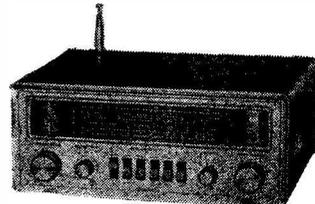
3 shortwave bands cover  
1 MHz to 30 MHz, plus  
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Built-in 5" speaker. 7"  
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superhet circuit. Hand-  
some styling. 110-240v.  
A.C.



GR-64 £25 Carriage 50p

## SOLID-STATE GENERAL COVERAGE, GR-78 KIT

Tunes from 190 kHz to  
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Double conversion above  
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Nickel Cadmium Battery  
charges from 240v. A.C.  
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construction. Durable  
charcoal and matching  
finish.



GR-78 £69 Carriage 45p

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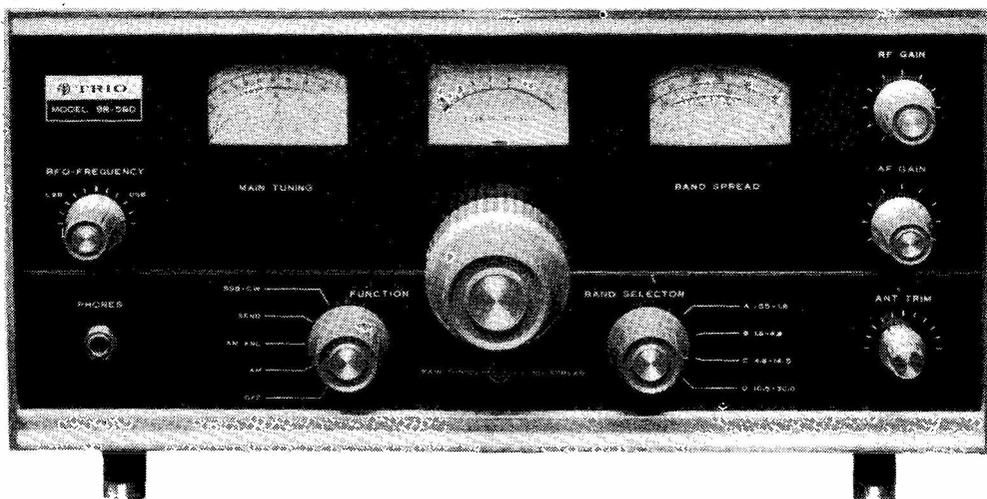
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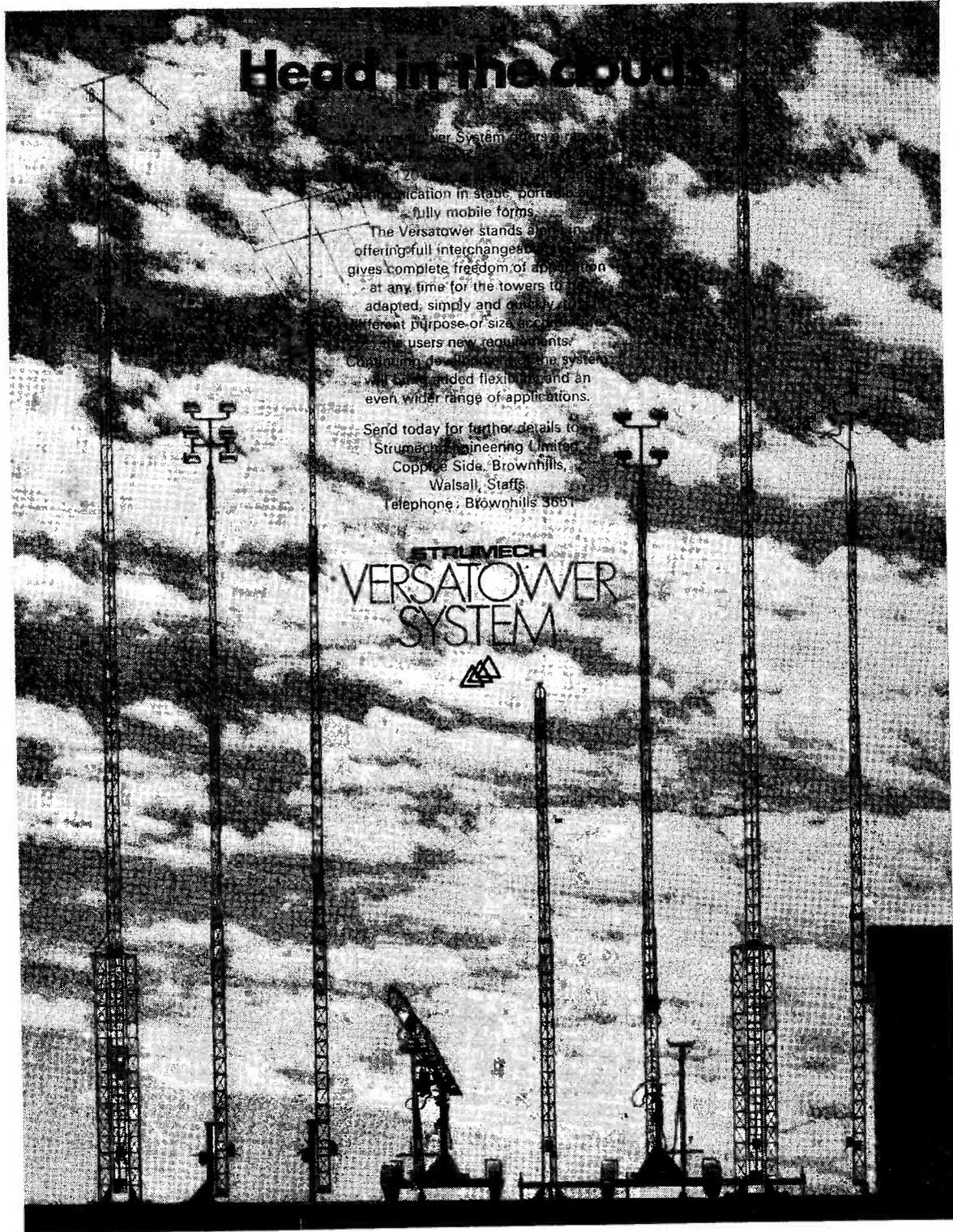
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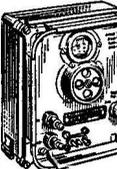


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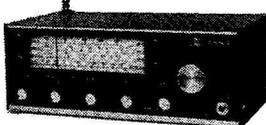
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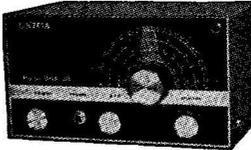
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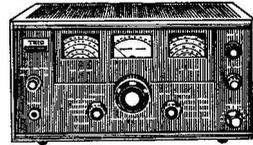
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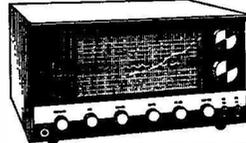
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# SHORT WAVE MAGAZINE

(GB3SWM)

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OCTOBER, 1971

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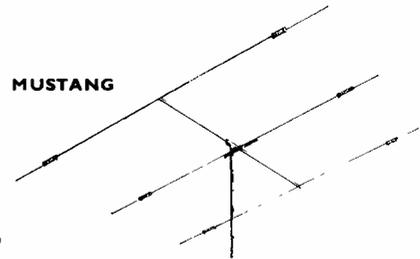
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# The SHORT-WAVE Magazine

## EDITORIAL

**Market** *Whether one is or is not in favour of the U.K. joining the European Economic Community ("Common Market") it is interesting to consider the implications for us in the Amateur Radio context. The first fact to emerge is that the Six are relatively under-populated in the radio amateur sense—a check from the latest available IARU figures (end 1970) with an adjustment to allow for the probable growth of licensing since, shows that France, Germany, Italy, Belgium, Holland and Luxembourg have together only 29,700 licensed AT-stations.*

*The U.K. total is 16,500. Our entry would make it 46,200 for the Seven and the U.K. proportion of the whole 28%. As the U.K. rate of amateur-station licensing appears to be rather higher than in the six countries, this proportion would likely increase as time went on. Not only would the U.K. be the dominant partner in terms of AT-stations licensed (no one country has more than we have, though Germany has approximately equal numbers) but Britain would also be the only member with an indigenous industry manufacturing for the Amateur Radio market—of course, relatively a very small part of the electronics complex as a whole, but nevertheless efficient, well-established and already doing world-wide business.*

*In the strictly Amateur Radio context, there would not appear to be any advantage, one way or the other, by the U.K. either joining the Market or staying out of it. The possible exception to this is in the long term, when an Amateur Radio Federation of the Seven (as it would then be if we went in) might be formed as a strong organisation within the Community. This would really be essential for the proper conduct of affairs because the existing IARU Region I set-up—being composed of 36 countries, many of which are politically opposed to the Common Market and its aspirations—could not be an entirely satisfactory organisation through which to handle Amateur Radio affairs within the Seven. And, of course, by the time such an "A.R.F. of the Seven" has been formed, the Community itself would probably have been enlarged by the joining of the fringe-countries of Northern Europe, from the EFTA group.*

*Quite apart from any Amateur Radio consideration and the possibilities outlined in the foregoing, it would seem that the U.K. would in the end do better by remaining outside the Common Market altogether—but that will be for Parliament to decide, in due course.*

*Austin Foster,  
G6FO.*

---

# COMMUNICATION and DX NEWS

A. J. Devon

JUST as this issue was due for press, most unhappily Paul Essery, became too ill for any work. So the contribution this time has been compiled by another hand—that, in fact, of none other than A. J. Devon who, roused from his slumbers, was handed a peremptory brief by the Editor saying, in effect, "Get on with it, let's have it on time and try to make it good". So herewith A.J.D. does his best to keep the fire in for G3KFE. . .

\* \* \*

General opinion is that the seasonal improvement in HF-band conditions is undoubtedly beginning to show—the evidence for this is in the 21 MHz band, which is getting much livelier. With a truly-resonant dipole showing an SWR of 1 : 1.1 (better than which you could not expect to see) and 150 watts it is possible to find something interesting to work any day. As the season goes on, this will relieve the heavy pressure on *Twenty* and may permit a little more real DX to be worked more easily on that band—for it is our 14 MHz frequency area that is the best, in terms of propagation potential, for any part of the world. The only trouble is the QRM!

*Forty*, for DX, is used mainly by the specialists, who have attenuators in their Rx inputs and can be on towards midnight or very early in the morning, when the QRM reduces to fairly tolerable proportions.

The 80m situation is that while conditions are improving for DX (which *is* there and is workable by the dab-hands) the congestion and the general slap-happy operating does make things very difficult. *Eighty* is probably at its quietest and most urbane on weekday mornings, when the regular "retired gentlemen's nets" can be heard gently discussing affairs of absolutely no importance.

Top Band is, as always, in a category of its own. With conditions improving steadily some extraordinary DX is being worked, having

regard to the frequency. We have reports of W1BB, MP4BJI and KV4FZ being heard regularly in the U.K. and, on the American side, the said KV4FZ made a 160m. WAC in 24 hours during August, the U.K. station involved being GW3AEC. (*Astounding*, says Stew Perry, W1BB, and we can only concur.)

## Contest Programme

There are several important events coming off during the next few months, of which we should apprise you. Unfortunately, there are so many that we cannot possibly print the rules for each, even in an attenuated form—but full details can be obtained from the addresses given (except that the VK/ZL affair is right on us). In general, the exchanges are on the usual signal report + serial number basis. The point is that high activity can be expected during the periods shown; it is possible to join in (even if not intending to send in an entry) by first listening round for a few minutes to see what the form is, and making QSO's accordingly; then sorting out the paper-work

afterwards, when there has been time to get the detailed rules.

**VK/ZL—Oceania:** *Phone* section, 1000z Oct. 2 to 1000z Oct. 3. *CW* session, 1000z Oct. 9 to 1000z Oct. 10. Paper-work from, and logs to (by Jan. 30, '72): W.I.A., Federal Contest Committee, Box N1002, G.P.O. Perth, 6001, Western Australia.

**"CQ" World-Wide DX:** *Phone* section, Oct. 30-31. *CW* section, November 27-28. Rules and log forms from: Contest Dept., *CQ Magazine*, 14 Vanderventer Avenue, Port Washington, Long Island, N.Y., 11050, U.S.A.

**ARRL Sweepstakes:** *Phone* session, Nov. 13-14. *CW* leg, Nov. 20-21. Paper-work from: ARRL, 228 Main Street, Newington, Conn., 06111, U.S.A.

**ARRL 160-Metre Contest:** December 11-12. Logs, etc., as above.

**"CQ" World-Wide Top Band CW:** January 29-30. Contest entry address as given.

Foregoing are the big events, open to all on a world-wide basis. When



Showing the Hungarian call sign allocation, by districts indicated by the first letter after the prefix, e.g. HA2G - - Kaposvár and HA0D - - Debrecen. All stations in the district of the capital, Budapest, are prefixed HA5. The total of licensed HA's is about 700.

Map acknowledgement "DL-QTC", August.

sending for the rules, log forms, etc., use airmail and enclose at least two IRC's for return postage.

There are, between times, many other contests of local or lesser import, which it is not possible to list here. You find them going on as you tour the bands and your QSO will always be welcomed by the participants.

### Top Band Test Series

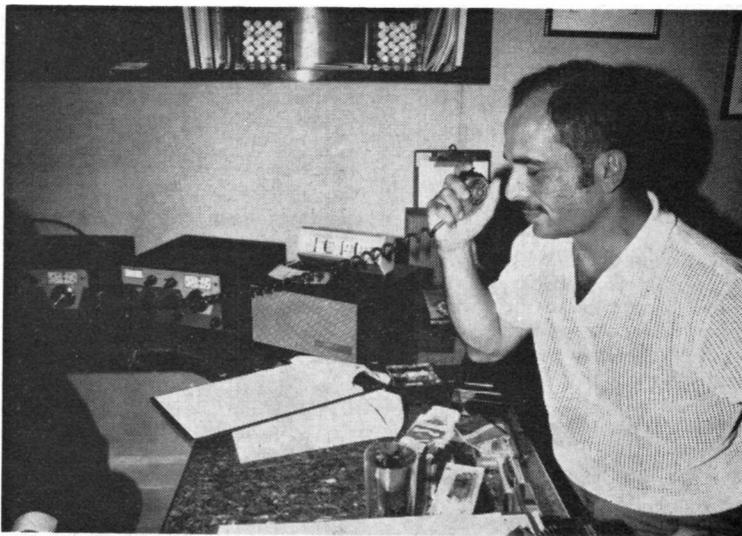
These are always of great interest to U.K. stations, with a high level of participation. The **Trans-Atlantic Tests** are on (GMT dates) Nov. 28, Dec. 26, Jan. 9 and 23, and Feb. 13, 0500-0730z each day, with the W/VE stations on 1800-1810 kHz and Europeans (which means us) using 1823-1830 kHz. Call "CQ DX Test" at 5-min. intervals, our times being 0505, 0515 *et seq*, the W/VE's calling at 0500, 0510 and so on. Note that this implies not only accurate time-keeping, but *cross-frequency working*—you will be more than somewhat unpopular if you are heard calling a W station on his frequency; anyway, he probably won't hear you because he will be searching for Europe over 1823-1830 kHz. The calling-listening periods can, of course, be broken if a QSO is started—which remember, should be kept strictly cross-frequency. (The idea of this is, of course, to minimise mutual QRM locally.)

There is another—but for us a good deal more difficult—160-metre test event on Nov. 6 and 20, Dec. 4 and 18, Jan. 1 and 15, and Feb. 13, when the W/VE's try to work across the Pacific, in particular to JA, ZL and VK. There is one period when it could be worth trying from where we are—0730-1000z on those dates, when the JA's will be on 1907.5-1912.5 kHz, the VK's on 1802-1805 kHz and the ZL's on 1876 kHz. We should keep to 1823-1830 kHz.

Reports from U.K. stations taking part, for coverage in this feature, would be greatly appreciated.

### Items of News

ZL4JF/A, Campbell Is., has been heard working EU's on 3798 kHz . . . . . W6AM now has a *kilowatt* mobile rig in his Cadillac, for which the battery leads are of No. 2g. copper, more than a ¼ in. in diameter; he will be signing W6AM/M on 14025 kHz CW (*phew!*) . . . . .



JY1, Amman, H.M. King Hussein of Jordan, at the operating position in his study at the Palace—well known on the HF bands as a courteous and efficient operator and very conscientious about his QSL'ing. He has worked many U.K. stations (nobody need write in to us any more about this!) and spends a little time on the air almost every day.

KF4SJ is a genuine call, to do with the founding anniversary of San Juan, Puerto Rico . . . . . Same goes for VA2UN, which is a special c/s issued to McGill University, Montreal, for operation on all bands till the end of the year . . . . . G5ZT, of SS/TV fame (*see* p.405, Sept.) has now had slow-scan television contacts with 15 countries, all two-way on 20 metres, some of the more interesting being KL7DRZ, VK6ES, ZL1DW and 4X4VB, with more than 50 U.S. stations pictured . . . . . 4X4NJ has obtained special permission to operate over 1800-1830 and 1870-1900 kHz "during contests only"; his present xtal frequency is 1827.5 kHz . . . . . G3ZNZ worked JY1 recently and when he asked if he could speak to Princess Muna, H.M. put her on; the gear used at both ends is British K.W. equipment . . . . . G2NJ has again found YO4ASG/MM, on 7 MHz, whom he has worked before on s.s. *Moldova*; and by about now G5NX/LA/MM aboard m.v. *Torrens* should be home again . . . . . G3ZYY, H.M.S. *Cleopatra*, is off on tour to the Far East and will be looking up VS6DO to find out who-and-what he really has worked on 160m.; the ship will be visiting a number of DX localities

and G3ZYY hopes to go reciprocal at least in 9V1 and VS6 . . . . . G3ZOJ, our "Other Man's Station" subject in the August issue, would like to report, and us to record, an instance of considerate and gentlemanly behaviour on 20m.: He called "CQ VK" at 1545 clock on Sept. 1 (when of course the band was full of first-skip Europeans) and back came VK6OV—a nice response if ever there was one; every one of the EU's on the channel held off and gave G3ZOJ/VK6OV a clear frequency for a good 579 CW contact . . . . . You would probably never have known it but between Norway and Sweden there is a small, independent territory called Morokulien, which is an international refugee area; for it, the prefixes LG and SK9 have been specially issued, with LG5GL and SK9WL regularly active; the QSL address is P.O. Box 1, N.2242/S 67 044, Morokulien, Scandinavia . . . . . Our inside information is that stations using the BY prefix and giving Chinese locations are likely to be genuine; they will QSL through Hong Kong . . . . . Other interesting, and genuine, calls heard recently or about to appear are: AC3PT, ET3ZU/A, HK0AA, KC6RS,

SV0WXX (Crete), VK3UV/9 (Solomon Is.) and ZL3PO/C (Chatham Is.) . . . . The ET3's (and there are now several of them) can be QSL'd via P.O. 379, Asmara, Ethiopia.

**Individual Reports**

As always, there has been a good intake of mail from the correspondents who provide the hard-core background for this feature. Though it is possible to some limited extent to make bricks without straw when reporting activity on the amateur bands, one does need to know what the real practitioners of the art are doing.

One of these is Jack Drudge-Coates, G2DC (Ringwood, Hants.) who has not only been touring the DX bands for the best part of 40 years but also, nowadays retired, is able to keep almost a daily check on what is happening on 10-15-20-40-80m., and occasionally he looks at Top Band, too. G2DC (whose ground-wave on the HF bands is within range of where A.J.D. listens) is not only a very competent and experienced CW operator but also expert at winking out the difficult stuff. His report for this month covers a wide range of CW/SSB DX on all the HF bands, among the most interesting being ZD6CW, worked out of the blue at 599 both ways on an otherwise-dead 10m. band, and a flock of PY's on 80m.

G3ZZX (Wakefield, Yorks.) says he "neglects all bands except 15 and 80m."—he is now working SSB with a Heath HW-100, and got ZL2LE on Eighty; he has a two-element Quad for 15m., and has been quite successful with CW/SSB DX on that band.

G3NOF (Yeovil, Som.) is another of our regulars who searches all bands and always comes in with factual information. With him, Ten has been the poorest in terms of workable DX since he started in 1959. Fifteen is much more forthcoming, with the Far East there in the mornings and Asia in the afternoons, though the band has been closing early. As regards Twenty, G3NOF agrees that mornings after about 0730 clock is the best time for working the DX—why, you may ask? Answer is that around 0730 our time is when the EU's start going to work and the QRM noticeably lessens! A.J.D. has

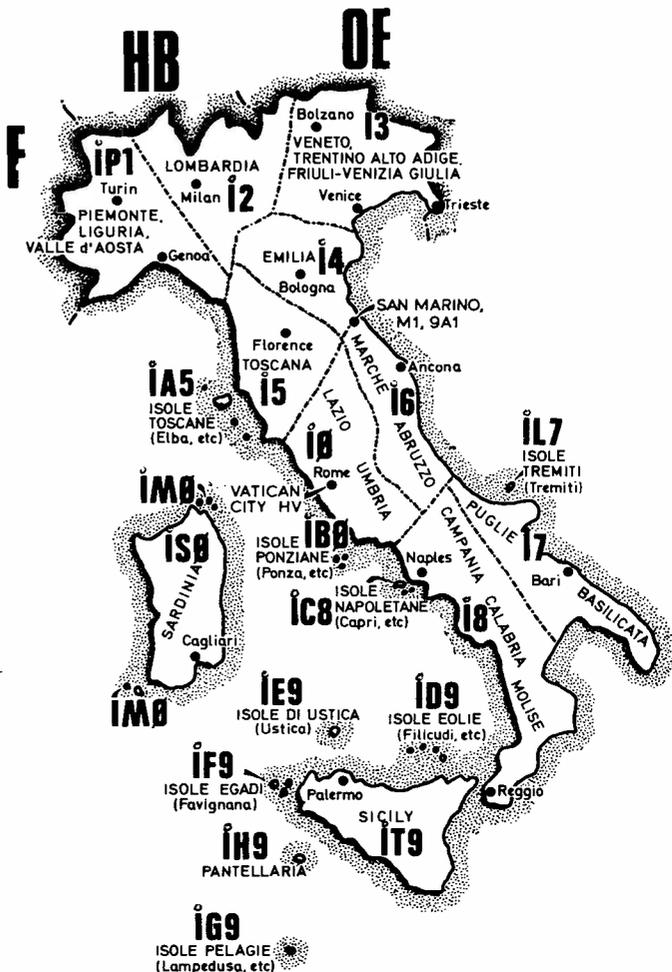
found this, too, as he searches for the rarer stuff in the UA9, UA0 areas; as a matter of fact, much interesting Far East DX can be worked on 20m. by picking out the right stations, always glad to be called by somebody different from the usual run of Mittel-Europa countries—and you can be sure that, in due time, you will get a QSL.

G3DNF (Leeds) writes to say he has come to life again, with an interesting record of stations worked on the 7-14-21 MHz bands. We pick out UA9CAO on Forty, HI8MMA on Twenty and G3TZZ/MM on Fifteen. G3DNF is working his antenna to get low-angle radiation on 7 MHz, trying a sloping

wire, feeling like  $\frac{1}{2}$ -wave against a good earth connection. He says "at last I can hear the DX, and seem to be able to work it". Well, there you are—there's an idea for a simple aerial.

For years, A.J.D. has been using closely-resonant dipoles for all bands 10 to 80m. and, within the usual limitations of band conditions and QRM, can be reasonably sure of working anything that the Rx can hear. GW3AHN (Cardiff), one of our king-pin DX operators, has worked 328 countries on 15 metres alone, using no more than a rotary dipole.

G3VLX, now of Chislehurst, Kent, started on the air five years ago when, as he says, he was "very green",



Sorting out the Italian prefix system. Not all I's are obliged to use this and some keep to their original call signs—which only adds to the confusion.

Map acknowledgement August "Region 1 News", G2BVN.

and described how he had buried a 60-gal. water tank for an earth. He feels that this is almost where he came in—because at the new QTH he has just buried another 60-gal. water-tank for an earth! (And he can't go wrong!—*Editor*).

For G8HX (Mansfield), the R. & D. department of Rediffusion, Ltd. have made a considerable effort and have at last rid him of the TVI he was causing—by reason of the 7 MHz pass-band in their system, for which he was held *not* to blame by the Post Office. It has taken about a year and many hours of testing, but always on a completely amicable basis; success was celebrated by a session at the local, for which the firm paid! G8HX runs a DX-100U, CW only, and a dipole (balanced feeder through a balun) on 40m. and has worked some nice run-of-the-mill DX. Particularly interested in one of the German awards, he has worked more than 330 W. German stations, with a QSL return of no less than 62%. He notices a lot of difference in the quality of signal as between West and East German stations, the latter being markedly inferior.

GM3JDR (Wick), another of the stalwarts behind this feature, also



**G3ZBA** is Dr. Sidney Sefton, 8 Sandmoor Avenue, Leeds, LS17-7DW, who runs K.W. gear on the Tx side and an Eddystone 830/7 receiver—a nice range of modern British equipment, with which he has got more than 150 countries confirmed. Being a doctor of medicine he is strictly a “non-professional radio amateur”.

keeps to 7 MHz and has an impressive worked-list; he has three antennae cut for that band—a dipole, a delta loop and a bobtail curtain and finds that by switching them he can not only pick his direction but also cut back a lot of the EU QRM.

W4WFL/1 (Hartford, Conn.) who is a member of the ARRL Hq. staff and likewise a regular correspondent, mentions that he is modifying his Drake 2-B for 160m., *à la* G6LX's article in the March issue of **SHORT WAVE MAGAZINE**. He gives us another ET QSL address—Telecoms. A.R.C., P.O. Box 1047, Addis Ababa, Ethiopia, though this does not apply to all ET3's or 9E3's; best thing is to ask where the card is to be sent when in QSO. For C31EF, cards go to W4WFL himself, at BM/W4WFL, London, W.C.1. (which is a Monomark address, and quite sufficient).

Over in Ipswich, G3DCS is still working away with antennae and has a balun-connected rectangle (somewhat as G6LX suggested in the June issue, one presumes) and shows a good CW/DX list using it on 15-20m. with a KW-2000.

G3YRR (Grimsby) had some rewarding sessions on 15m., though he remarks that “one terrible evening on 15 I heard ZP, CE, PZ and just about the whole S. American firmament without getting a bite”. That's how it goes!

#### Ten Metres

Though we have heard little enough of anything in the way of DX happenings on Ten, this band should not be neglected—hence the heading to itself. For one thing, it is ideal for local net working and



**John Sainsbury, 9J2HE** (Box 696, Kitwe) was first licensed in 1937 as G8HV. He has been in Zambia for the last seven years and the shack is actually a 4-wheel caravan trailer. John has also operated from ZE6, VQ1, VQ3, VQ4, 5X5 and VS9. His pre-War U.K. recollections go back to the time when G3CY first started listening to those mysterious noises from outer space on a home built Rx in his father's garage—G3CY is now Sir Martin Ryle, the eminent scientist and radio astronomer at Cambridge University.

should be used much more for that purpose when it is in the doldrums in the DX context, and for another it can spring the odd surprise.

Some years ago, we used to run Activity Periods on 10 metres, just to stir things up and see what could happen. The results were always extremely interesting and proved two things: One that activity generated more occupancy, and the other that G's on ground-wave could be heard up to 100 miles or so.

#### The Tabular Matter

There is none again this month because of course G3KFE holds all the details and it was not possible in the time available for A.J.D. to get the Tables together.

#### Apologia

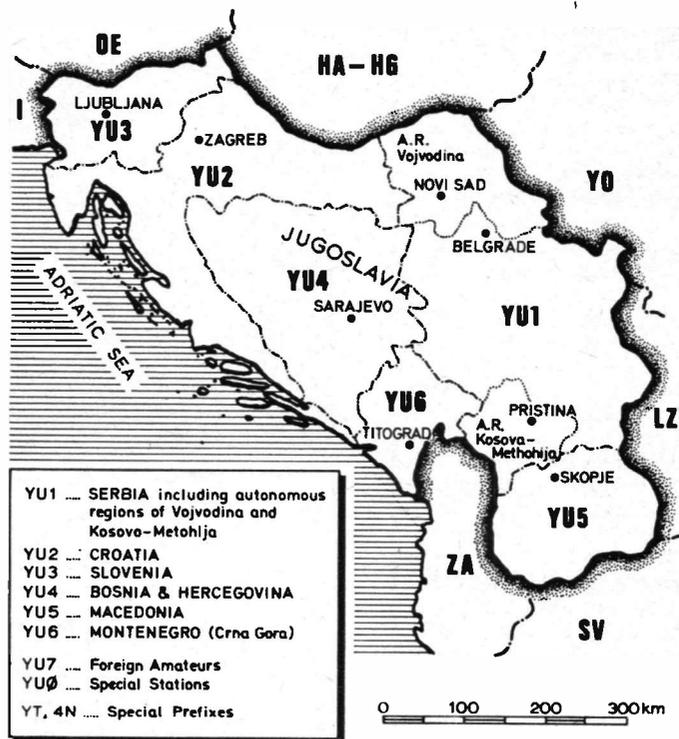
It is only too well appreciated that this offering of CDXN is scant compared with what we usually get from G3KFE—but not only did A.J.D. come to the job stone-cold, as the saying is, but he had less than two days in which to do it.

Anyway, it is much to be hoped that Paul Essery will be back on his beat by next time.

#### Deadline

And for next time, the closing date for this feature will be **Monday, October 11**, addressed CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. Keep the bands busy, es 73 de A.J.D.

Station set-up, G4ACF, of the Worcs. Army Cadet Force, Rubery Troop, Callowbridge, Rubery, Birmingham. Main operating interest is 80m. SSB working on Monday and Thursday evenings. They would particularly like to contact, or to hear from, any other amateur station directly connected with the Army Cadet Force.



The Yugoslavs have about 2,000 licensed AT-stations, distributed as shown here.

Map acknowledgement August "Region I News," G2BVN.



Always mention "Short Wave Magazine" when corresponding with Advertisers — it helps you, helps them and helps us.

### “THE HAM’S INTERPRETER”

This is a radio amateur phrase book in ten languages (including English and Esperanto) which translates the usual phraseology—for instance, *Thank you very much for this QSO or I hope to meet you again in the near future under better conditions*—into any one of the nine other languages, from French or Spanish to Yugo-Slav or Russian. The book also contains sections on correct pronunciation, in phonetic spelling, e.g., the letter *Z* is *tse* in Russian or *tset* in German, also a translation of numbers from 0 (zero) to 1000, which is *hiljada* in Yugo-Slav (you say it just like that). There is an extensive glossary of terms usual in radio parlance, like *kantooalto*, which is “carrier-wave” in Finnish, or “effective height”, which sounds like *evektivnaja visota* when you (try to) say it in Russian.

The cost of this very useful and practical little book—which, apart from its applications to the every-day European contact, makes instructive reading for anyone interested in what radio amateurs talk about over the air—is but 55p, post free ex-stock, from the Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. Over the years, we have sold 1000’s of copies of the *Ham’s Interpreter*, from the time it only covered five languages to the ten interpreted in the current issue.

### OUR BOOK DEPARTMENT

Regular readers will not have failed to notice that each month we offer an extensive range of book titles covering (as far as we know) every aspect of the art and practice of Amateur Radio. We are constantly looking for new books of Amateur Radio interest—like Ratcliffe’s *Sun, Earth and Radio*, now available. We do a considerable business through our Book and Publications Dept.—probably in our field the largest in the U.K.

What matters for our customers is that every title we advertise—and there are nearly 150 of them!—is in stock for immediate delivery. All prices shown are post free and orders are usually despatched on the day of receipt—slight blurb in support of the devoted staff who look after the Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. (If you buy at the counter, we knock off the postage charge.)

### FOR ANYTHING FOR SALE OR WANTED

In the radio amateur field, always use the Small Adv. pages of SHORT WAVE MAGAZINE. For nearly 25 years, our Small Adv. columns have been establishing, by the law of supply and demand, the re-sale value of a very wide range of branded equipment, of whatever origin. (There are today some “surplus” items commanding a higher price than they did many years ago—we would not mention them, for fear of forcing the price even higher!)

Through our Readers’ Small Advertising columns, many £1,000’s-worth of equipment change hands every month—in the September issue alone, nearly £3,000-worth of gear was being offered For Sale, this taking no account of the “Wanted” or “Exchange Offer” Advs.

While we do not suggest that you can sell any old junk by advertising it in SHORT WAVE MAGAZINE, what

we do say is that if you have an interesting piece of gear at a reasonable price, you are pretty certain of being able to get immediate cash for it.

We can check this quite easily for ourselves: In each issue there is a certain proportion of Box No. advertisements. The replies to all these must come through us to be sent on to the addressees. It is therefore easy to evaluate Advs. having the greatest appeal—it is always those items offered at a realistic second-hand price. (Of course, we do not open the envelopes, which are sent on immediately as received.) But if we get 37 for Box No. XYZ and only five for Box No. ABC, it is easy to see what are the attractive items from the point of view of the reader willing to lay out his cash.

We have been in this business of Amateur Radio for more than 25 years and the cost of our Small Advertising is cheap enough—2½p per word, minimum charge to readers 50p, payable with order. Copy to: Advertising Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

### GOING BACK A BIT

Anent the picture on p.275 of the July issue of SHORT WAVE MAGAZINE, one of our well-known SWL correspondents, E. J. Boyle (London, S.E.19), writes that during the Kaiser’s War he was in the old R.F.C. as a W/T opr. and himself operated a Tx of that type in a BE-8 artillery spotter aircraft over the Ypres area. The receiver which went with it was a two-crystal job (you had a switch to select the one with the most sensitive spot) followed by a valve amplifier using the famous R-type bright-emitter valves. Hallowed days—hallowed memories.

### CITIZENS’ BAND—U.S.A.

The American FCC (Federal Communications Commission) has recently published the results of a two-year survey on what is happening over there on what is known as the “Citizens’ Band”, categorised as Class-D Licensing for personal transceiver operation around 27 MHz. The most interesting fact emerging from this survey (according to *Auto-Call*, July) is that 74% of the 900,000 individuals licensed are actually making full use of the facility (talking to one another) though it does mean some over-crowding of the 23 available channels, allocated on a regional basis. Apparently, there is a large body of what are called “hard-core violators”—people who pay no licence fee and buy equipment running far over the CB licensed power of 5 watts. There is also an interesting problem due to skip under anomalous propagation conditions—like when we can hear the 27 MHz CB stations over here.

In the U.S., amateurs have a band, apparently little used (and unknown over here) at 220-225 MHz. The proposal is that 2 MHz of this band be given over to the CB service, making some 80 CC/FM channels available, to be allocated on a regional basis.

The underlying difficulty about the whole situation is the fact that the FCC has totally insufficient funds to enforce the CB rules as they stand—not much could be done anyway about anonymous “hard-core violators”—while against them they have a powerful segment of the electronics industry eager to sell more transceivers to more people.

### SCOUT INTERNATIONAL EVENT

Once again, there will be a large number of U.K. stations on for J-O-T-A, the Scout Radio Jamboree over the weekend October 16-17, 0001-2359, effectively midnight Friday to midnight on Sunday, a 48-hour period. Of course, few stations will be able to keep going for such a long stretch but a little calculation with the 24-hour clock will show how the time can be used under the band conditions that normally can be expected to catch DX from anywhere in the world, e.g., 40 metres early Sat./Sun. morning; 20m. during the late evening and early morning; 80m. mid-morning and early afternoon Sat./Sun. for contacts with other U.K. Scout groups; and Sunday morning for the same on Top Band and the working of locals. The other two bands, 10-15m., may not be of much use at any time, though it is always worth checking 15 metres for DX, especially from the Near East and North Africa.

We shall be glad to have, for a write-up in the December issue, J-O-T-A reports from any stations participating. Details required are: Callsign and location; Scout group entertained or involved; bands worked; total of actual J-O-T-A contacts made; best Scout DX and/or most interesting J-O-T-A station worked; a general comment on conditions and experiences—also, where possible, a good picture of the station and visitors—all to be addressed to: JOTA, SHORT WAVE MAGAZINE, BUCKINGHAM, to arrive on or before October 30. All photographs we can use will be paid for on appearance, in the usual way.

### KEEP TO THE UNOFFICIAL RULES

Though any U.K. amateur station is entitled to use any mode he wishes on any frequency within the bands for which he is licensed, there are certain unofficial rules which have been drawn up for the comfort and convenience of all concerned and they are meant to apply throughout the Region I area—in the common interest, they should be observed. Transgressors do not lay themselves open to any official penalty, because there is none—but they will certainly attract the obloquy of other users of a band, an attitude that can show itself in a number of ways, mainly unpleasant.

The Region I IARU Band Plan—with which we are in full agreement and which we entirely support as being in the general interest—can be summarised as follows:

*For CW-only Operation:* 3500-3600 kHz; 7000-7040 kHz; 14000-14100 kHz; 21.0-21.15 MHz; and 28.00 to 28.20 MHz. What all this comes to is that CW working should be confined to the LF areas of the DX bands.

*For Phone-only Working,* the limits are: 3600-3800 kHz; 7040-7100 kHz; 14100-14350 kHz; 21.15-21.45 MHz; and 28.20-29.70 MHz.

International RTTY (radio teleprinter operation) should be kept around 14090 kHz. Two other narrow frequency bands agreed for inter-Continental DX are 3500-3510 kHz for CW and 3790-3800 kHz for Phone.

There is no difficulty about any of the foregoing. The great majority of amateur stations conform. If you are one of those who do not, you cannot complain if you are trodden on. You will not be breaking any official rules but you will certainly be behaving in an anti-social fashion.

### “SUN, EARTH and RADIO”

It is an odd thought that though the ionosphere and its changes are the key to all radio communication, it is the phenomena least understood by amateurs, and also the most simplified part of the R.A.E., to be covered in the course of a couple of hours of lecture.

This book of Ratcliffe's is a demonstration of just how much over-simplified the ionosphere can be and gives a good idea of the speed at which science is learning, modifying and discarding theories in the light of experimental evidence. It is also very much a proof of the practical value of scientific space satellites.

What are you going to get for your money? Not a book to read in bed, certainly. *Sun, Earth and Radio* is aimed at students seeking the facts on the subject and intelligent general readers who just want to know. Thus, there is an introductory historical discussion, further material covering the area out to about 1000 kilometres, and then some chapters dealing with later advances and consolidation of existing theories which the space era brought into the field.

All this is linked up to a discussion of the practical implications in terms of radio communications. In this final part there are some surprises in store for the average reader who is a practising HF-band radio amateur. Finally there are a couple of appendices, the first one of which gives a brief but adequate coverage of basic physical matters which are relevant, e.g., frequency, phase, magnetic fields, photons, Doppler-effect, temperature-measurement and so on, making it possible for an intelligent reader to come to the book “cold.” The second appendix gives the last-minute developments between completion of the main work and publication, emphasising once more the speed with which the experts are moving ahead. To round-off, there is a very useful bibliography, with a heading to the effect that in all additional reading the date of publication is of the utmost importance—and, of course, an adequate index. There are fifteen photographic plates and 83 two-colour diagrams, all drawn originally by the author.

One is not involved in mathematics beyond the ability to read a graph. The style of writing is very direct and the numerous two-colour graphs and diagrams help in bringing home the various points. The caption-writing associated with the diagrams is particularly good and clear.

Summing-up, one cannot imagine a better treatment on the ionosphere and magnetosphere than this, to be read and referred to again. One feels that it will become the standard text against which all other works on the subject will be compared—and it is certainly a valuable addition to your reviewer's shelves.

Of the author, Dr. J. A. Ratcliffe, FRS, it is enough to say that he was for six years the director of the Govt. Radio & Space Research Station and is recognised as a world authority on radio propagation and the problems of the ionosphere.

His book, of more than 250 pages, copiously illustrated and called *Sun, Earth and Radio* costs 89p post free and is obtainable, from stock, of our Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

E.P.E.

## 813's IN LINEAR

### DESIGN FOR ALL HF BANDS

D. P. NICHOLLS, M.B., Ch.B. (G3ZVZ)

M. W. SMITH, M.B., Ch.B. (G3UAF)

MANY amateurs now own transceivers giving 90-200w. p.e.p. output, but would like to run 400w. output for greater advantage in DX working. However, commercial linear RF amplifiers are still quite expensive. This article describes a cheap and reliable linear, capable of delivering the legal power limit with ease. Full constructional details are not given, as it is assumed that many constructors will keep the price down by using available parts, *i.e.*, their junk-boxes. In this way, it should be possible to build the amplifier for under £20.

The linear uses two 813 valves in parallel grounded-grid mode. This has the advantages of good linearity without neutralisation (except perhaps on 10 metres). No complex test procedures are required, and no bias supplies are used. The output from most modern transceivers is more than ample to drive it to full output. (As used to be said of the 813 "you have only to breathe on its grid to get 400 watts RF output"—a pair of them can be pushed to a kilowatt with about 10 mA of drive—*Editor.*)

#### Power Supply Unit—Fig. 1

For maximum efficiency, a plate voltage of 2.2-5 kV is used. This is supplied from a 1000-0-1000v. transformer, rated at 250 mA. A lower current rating may result in core saturation on peaks and diminished output. This is, of course, a lethal voltage, and appropriate safety precautions must be taken, including a good earth. The "third pin" of the mains should *not* be relied upon. Something like 20 to 40  $\mu$ F of smoothing is recommended, with bleeder resistors across each capacitor. The large value of resistor used results in long discharge time; thus, high voltage can remain in the linear for several minutes after switching off. Therefore, *always* ground the HT line with a large, well insulated screwdriver before touching anything inside! The HT and heater transformers should have separate switches; switching the HT off first will decrease the discharge time.

In this context, we should mention the medical treatment of anyone who has received a severe electric shock. Although the victim may appear to be dead, it is well worth while continuing artificial respiration and heart massage for over an hour in such cases, as they could well come round again.

To those more concerned with the longevity of the valves than of the operator, this may be considerably increased by testing and tuning on reduced plate voltage. A Variac or large choke in the mains primary will reduce the voltage, but grounding the centre-tap of the transformer secondary winding does not work. Blower cooling of the valves is a luxury but not a necessity.

The rectifier is a full-wave bridge arrangement, using four or five silicons per limb, mounted on tagboard.

Types such as RAS-310AF are superior to the BY-100 in current rating, but note that in this case the connections are *opposite* to the BY-100. All the capacitors should be isolated in plastic tubing, and the smoothing choke should be of large dimensions. The power pack is screened, but the anode choke L3 and its decoupler C7 (Fig. 2) are contained in the PA compartment. Anode chokes are notoriously difficult to make, and often burn out due to parasitics. It is best to buy a commercial type intended for high-power operation.

#### RF Amplifier—Fig. 2 (p.474)

Although the design of the power-pack is not critical (if may even be built as a separate unit), much more care should be taken with the layout of the amplifier. Leads should be only of the minimum length necessary, and the unit built strong and rigid. The input and output circuits must be screened. It may be convenient to incorporate a heavy-duty aerial change-over relay on the output side of the linear.

The exciter input is fed through a capacitor, C1 which works well in many cases, but better matching is obtained with a *pi*-network. The bifilar heater choke is made from about twelve double turns of 16g. insulated copper wire close wound on  $\frac{3}{8}$ in. ferrite rod, and bound. The anode parasitic chokes L1, L2 are about three or four turns of 16g. copper,  $\frac{1}{2}$ in. i.d., over a 47-ohm carbon resistor (not wire-wound). This may have to be altered if the standing current is excessive, indicating parasitics; normal standing current is about 80 mA.

The *pi*-tank design will vary considerably according to the components available. The tune capacitor C8, C9 must be wide-spaced and heavy-duty, but the load condenser need not be so bulky. For the tune condenser, try 50 pF, with 100-150 pF to switch in parallel for 80m. and 40m. A large split-stator condenser, such as Eddy-stone used to make, is ideal. Plates may be removed from both sections and the larger portion switched in

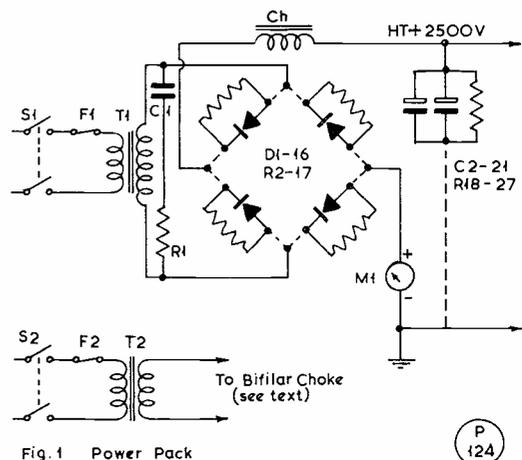


Fig. 1 Power Pack

Fig. 1. Suitable PSU for the 813 Linear discussed in the text. C1, 500  $\mu$ F, 3 kV; C2-C21, 60 + 250  $\mu$ F, electrolytic, 350v. working, ten in series-parallel; R1, 1.5K, 5w.; R2-R17, 470K,  $\frac{1}{4}$ w., 4 in series across each diode; R18-R27, 470K, ten in series; Ch., 5-25 Hy, rated 250 mA +; D1-D16, see text; T1, 1000-0-1000v. at 250 mA; T2, 10v. at 10 amps for 813 heaters.

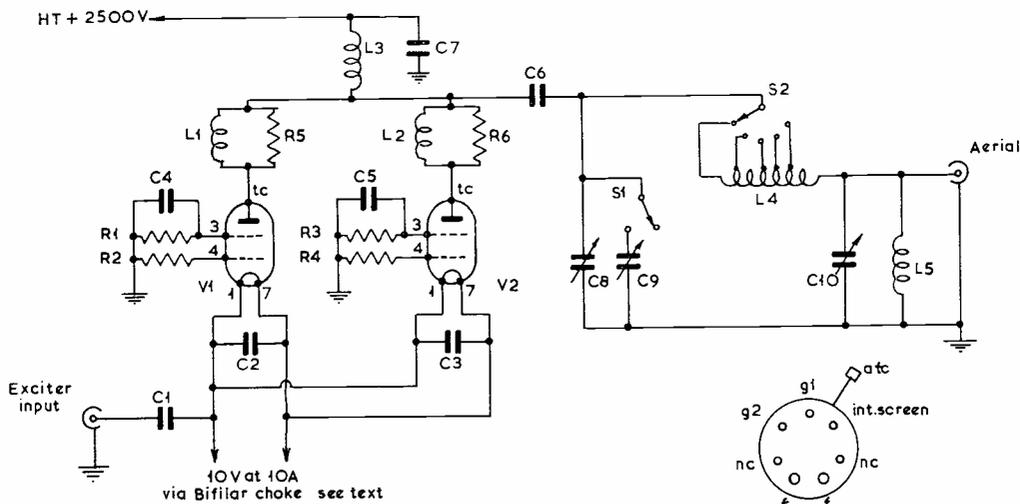


Fig. 2 LINEAR AMPLIFIER

Fig. 2. The parallel-813 Linear Amplifier. Values should be C1, .02  $\mu\text{F}$ ; C2, C3, .005  $\mu\text{F}$ ; C4, C5, .001  $\mu\text{F}$ ; C6, .001-.002  $\mu\text{F}$ , 20 kV working; C7, .01  $\mu\text{F}$ , 5 kV; C8, C9, 50+150  $\mu\text{F}$  wide-spaced variable; C10, .001  $\mu\text{F}$  variable; R1-R4, 15 ohms,  $\frac{1}{2}\text{w}$ .; R5, R6, 47 ohms, carbon, 2w. Valves are 813 and coils are explained in text. The RFC L3 should be designed for the job—see text.

for 80m. and 40m. only.

Two coils are fitted in series at L4 and a heavy-duty ceramic switch used. For 20m., 15m. and 10m. the tapings are on a self-supporting coil of light copper tube, internal dia. 2 $\frac{1}{4}$ in., over 8 turns in 3in. The 80m. and 40m. coils are on a braced winding of 16g. copper wire, 3 $\frac{1}{4}$ in. int. diameter, 2 $\frac{1}{2}$ in. long at 7 t.p.i. The exact tapping points should be found by experiment, aiming for current dip in the mid-range of the plate tune condenser.

It is of course necessary to have an aerial presenting a favourable SWR—otherwise RF may appear in the outer braiding of the coaxial feeder. This can result in TVI, parasitics or even RF burns from contact with the

chassis. (It is also a sure indication that power “up the spout” is being lost).

### Results

This linear has been driven to full output with three different exciters: KW-200, Trio TS-510, and more recently a Sommerkamp FT-101. With a simple ground-plane antenna, it yielded good results on 15m. and 20m., making 2-3 S-points difference in VK. It also works on 10m. with a ZL-Special. Recently, it has been used extensively on 80m. into a modified Windom, with a long-wire of 600 feet. So far, 104 countries have been worked, with good reports from VE, VO, ZL, PY, YV and other South American areas.

## R.A.E. COURSES—FINAL LIST

The following notifications were received too late for the September listings on p.430. In most cases, the Course will already have started, so application to the College or Evening Institute concerned should be made immediately.

**Eastbourne:** At College of Further Education, St. Anne's Road, evenings Tuesday (Theory) and Thursday (Practical), with P. Simmons, G3XUS, in charge.

**Farnborough:** At Cove Further Education Centre, Secondary School, St. John's Road—apply Principal.

**London (Acton):** At the Technical College, opposite Town Hall, on Wednesday evenings. Course lecturer W. G. Dyer, G3GEH. Apply to the College immediately for registration.

**London (Islington):** At De Bevoir Evening Institute, Balls Pond Road, Tottenham Road, N.1, on Tuesday and Thursday evenings—instructor F. Barns, G3AGP, enrolment immediately.

**London (Wembley):** At the Evening Institute, High Road, on Monday evenings, with A. Bayliss, B.Sc., G8PD, in charge. He has a long record of success in R.A.E. tuition.

**Slough:** At College of Technology, William Street, on Thursday evenings, with G3FVC and G3WQC in charge. Apply right away to the College, which also operates its own station G3XPL as part of the course.

**Welwyn Garden City:** At the College of Further Education, apply Principal. or G3IOZ, QTHR.

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## TRANSMITTING ANTENNAE FOR SMALL GARDENS

### INTERESTING HELICAL SYSTEM ON TOP BAND

J. S. CUSHING (G3KHC)

ONE of the problems many amateurs have to solve is how to radiate a reasonable signal from a small garden. The QTH where the aerial systems described here are installed has a garden just over 40 feet long, so elaborate layouts are impossible. A major handicap is the difficulties involved if masts of any height are installed. Obviously, siting and guying even one mast of more than 25 feet is not easy, while if a taller mast is somehow contrived there is always a risk of damage to a neighbour's property. On the principle that good neighbourly relations are more important than an extra S-point with a W2, only one mast about 20 feet high is used. This is near the end of the garden and by using the rear of the house in place of a second mast, a maximum top length of just over 30 feet is possible.

Aerials made by folding about 70 feet of wire into the space available radiate a good enough signal on 160 and 80 metres to allow plenty of contacts, though mostly only local ones result. A very much folded 140 feet has also been tried but this maze of wire gave only slightly better results.

On 20 metres with either of these aerials results were very poor even though all indications suggested they were taking power. But as soon as a simple dipole was put up contacts with European countries became easy. Such an aerial at 20 feet will not open the door to DX working, but on the other hand contacts up to 1500 miles are regularly and easily made with reports up to 5-and-9, and sometimes W's are worked with no great effort—this with an *input* of less than 50 watts p.e.p. The reason for these results is easy to understand if azimuthal radiation pattern diagrams for simple aerials are studied. For a height of about 20 feet—with a 20-metre aerial—radiation will be mostly at high angles, hence the ease in working Continentals.

Practical advice seems to be: Get the aerial up to about 20 feet and plenty of QSO's should result. DX contacts will be very few, but recalling how fierce competition can be, it may be argued very little is being missed.

Having made some progress with 20 metres attention was returned to 160 and 80m. Operation on these bands was possible by the common expedient of strapping inner and outer of the coax feeder to the dipole.

#### Another Approach

At this point it seemed no further progress could easily be made when brief mention of a helically wound aerial suitable for Top Band was noticed in the '69 *ARRL Handbook*. Briefly, the idea is to wind 250 feet of wire on a wooden pole 15 to 20 feet high. This is fed with 70-ohm coax which may be taken straight to the Tx

as no ATU is needed. For a vertical radiator less than 20 feet high, which can be placed in any convenient spot, results are very good and lively interest was shown by some stations contacted. If Fig. 1 is referred to the general idea should easily be visualised. The mast is about 20 feet high and one or two inches in diameter. It must of course be non-metallic so a short wooden scaffold pole, a couple of stout 10 foot bamboos (suitably joined) or thick dowelling are suggested. Uniformly wound over the length of the mast, except for a couple of feet at the bottom, is 250 feet of wire. This should resonate at 2.0 MHz or a little above and to bring the system to resonance in Top Band a tapped inductance is connected between the inner of the coax feeder and the bottom of the helix. The outer of the coax is earthed below the mast.

Turning to constructional aspects the point to keep in mind is there seems to be nothing very critical about dimensions. The *Handbook* does not lay down any rigid data and, as will be seen later, data for this aerial departs a good deal from recommendations in the *Handbook*.

#### Construction

A mast was made by joining two 9-foot lengths of one-inch diameter wooden poles, these being joined as shown in Fig. 2 with a halving joint. This joint is not the strongest possible, but should be no problem to anyone with a modicum of skill in woodwork and needs no special tools other than a small handsaw. Three 2BA screws and nuts secure the joint and the small amount of

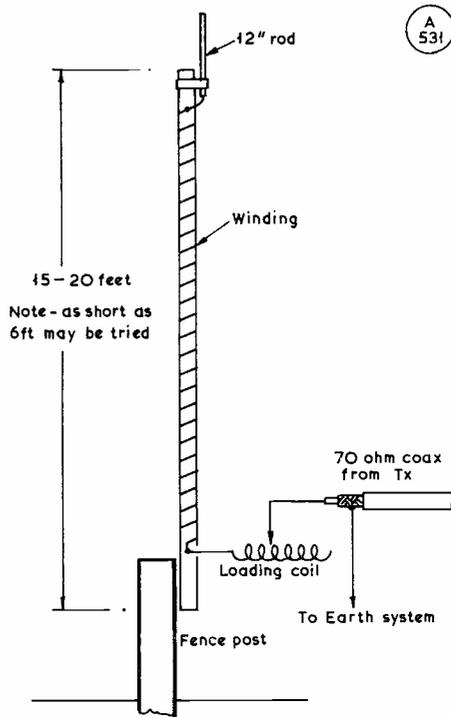


Fig.1

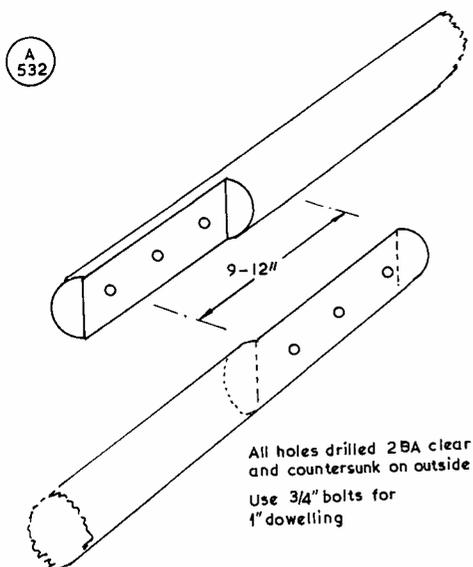


Fig. 2

metal seems to have no ill effect. Having joined the two sections a couple of coats of varnish are applied as weather proofing. Winding 250 feet of wire on to the mast comes next. This should be done carefully so the winding is reasonably regular. Making this winding is rather tedious and takes some time so is best started when time is available to work steadily and get the job done in one go. If a thicker mast or a different length of winding is used, frustration will be avoided if a little figuring is done first mainly to determine the number of turns per inch. Any join in the mast may be covered with a layer of black insulating tape to provide a smooth surface for the winding.

When complete, the winding should be liberally doped with more varnish to fix the turns in place. Once the helix is finished the remainder of the job is easy enough. A fence post or something similar is sunk two or three feet in the ground with the mast fixed to it with home made clamps of thick sheet aluminium. The tapped coil is housed in a plastic box and waterproofed with black *Bostik*.

There remains an earth system. Buried radials are recommended, but several earth rods will do instead. For initial trials one earth rod will suffice.

### Testing

To check resonance of the system, feed "full" output from a signal generator into the coax feeder and place a field-strength meter close to the mast. The meter (which should be of the aperiodic type) will peak as the generator is tuned through the resonant frequency. If different taps are selected optimum taps for various parts of 160m. can be found. (No doubt a GDO could be used instead, though this was not tried.)

When it came to on-the-air testing, a pleasant surprise resulted. It had been assumed in view of the low height and small size that only very local contacts would

be possible—but early contacts proved, it was radiating very well and several stations commented on the strength of the signal, and were much interested when told of the nature of the aerial.

### Results

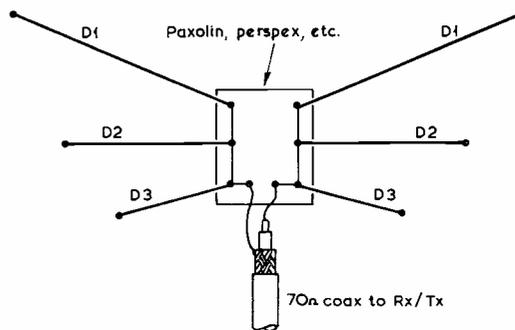
Sufficient QSO's have now been made to establish its performance with some certainty. There seems little doubt that a strong ground-wave goes out with a maximum range of 25 to 30 miles. Nearby contacts are S9+, at 10 miles generally S9 and at 20 miles usually S8. Beyond 20 miles the signal weakens rapidly and ground-wave contacts in excess of 30 miles have not been possible. These figures are across open country. Contacts across heavily built-up areas are not so good—but compared with a folded 70 feet of wire, results are considered very good.

At greater distances performance has been less easily determined, but the following serves as a guide: Up to about 200 miles reports are poor, but beyond this they improve—R5/S5 has been given at 250 miles and R4/S5 at 500 miles. Again, other aerials tried have never produced even these results.

It is, of course, a Top Band-only system and will not work on other bands. If an ATU was placed at the bottom of the helix other bands might perhaps be used. This has not been tried so no comment can be offered.

Reception of Top Band signals is also very satisfactory. In the S.E. of England, GW, GI and GM stations are often heard. Harmonics from TV time-bases, which are so often troublesome, are considerably attenuated—the effect is quite noticeable and this system could be recommended on these grounds alone.

The manner in which this aerial works is not very clear. It does not function as a half-wave (250 feet is approximately a half-wave on 160 metres). It rather acts as a vertical quarter-wave and the *ARRL Handbook* does mention this. This is borne out indirectly by remembering the feed impedance of a vertical quarter-wave is 50 or 60 ohms and that the ordinary 60/70 ohm coax used makes a good feeder. Low readings on a SWR Bridge tend to confirm the above.



- D1 : 20 metre aerial, total length about 33 feet
- D2 : For 15 metres, 22 feet
- D3 : 10 metres 16 1/2 feet approx.

Fig. 3

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These two aerials then, erected in a small garden, have given superior results if compared with a short wire aerial and have produced many enjoyable QSO's. The chance to work DX only occurs rarely but when worked is perhaps more satisfying for that reason. There is, by the way, no need to keep to 160 and 20 metres. The helical can be wound for 80 or 40m. instead and a 15 or 10-metre dipole used in place of a 20-metre one—or perhaps the idea in Fig. 3 could be tried, if all HF bands are to be used. Construction data for the 160 metre aerial is given herewith. If it is checked against that in the *Handbook*, several differences will be noticed, suggesting there is nothing critical about the design. Probably the only important factor is the length of wire used. This was in fact measured fairly carefully and must

have been within a foot or two of the required length of 250 feet.

**Aerial**

Length of mast 17ft. 3in.; diameter of mast one inch; length of wire 250ft.; length of winding 13ft. 6in.; pitch of winding 6 t.p.i.; gauge of wire 28g., or heavier.

**Tapped Inductance**

100 turns close wound, 18g. on 1½in. former, taps every 5-10 turns.

Three or four light guy lines are advised if a one-inch mast is used.

**ADJUSTABLE HT SUPPLY**

**FOR TRANSMITTERS—SIMPLE  
CIRCUIT DEVICE**

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

SOMETIMES, as when running valves at maximum ratings, it is necessary to have some way of varying the HT voltage over a moderate range. To the best of the writer's knowledge the method shown here has never appeared in the literature, and it was suggested to him some years ago by GW3OXE.

In the diagram, T1 is the usual mains transformer, in this case with two semi-conductor rectifiers, with limiting resistors R1 and R2. C1, C2 and the choke are the customary smoothing components.

If C1 is connected in the usual way, a capacitor input circuit is in use. If C1 is disconnected, choke input gives a substantially lower HT output voltage. With VR1 included as shown, a smooth control over HT output from the capacitor input to the choke input conditions is available.

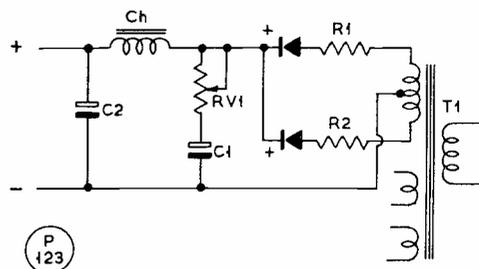
**Voltages Obtained**

The range of adjustment actually secured depends on the choke inductance and resistance, rectifiers, R1 and R2, and effective supply resistance of the windings of T1, as well as upon C1. In such a circuit intended for the supply of early stages of a transmitter, adjustment range was from 225v. to 300v. at 100 mA, using a 300-0-300v. 120 mA transformer.

The maximum voltage output is of course that which would be obtained with the usual capacitor input, VR1 giving a reduction from this level.

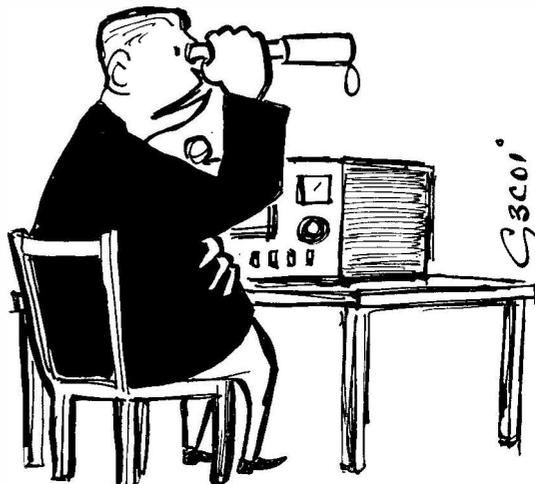
In the case of a 500v. HT secondary, approximately 420v. was obtained at 50 mA to 125 mA, with VR1 at maximum value. With VR1 at minimum, the HT voltage was about 520v. at 50 mA, falling to around 500v. when loaded to 125 mA.

For maximum HT output, R1 and R2 are of the lowest value for making up the total effective supply resistance to the minimum safe value for the rectifiers, for a specified value at C1. The choke also needs to be of low DC resistance. However, placing VR1 in circuit



will allow the voltage to be reduced with any capacitor input circuit. The method is most suitable for equipment imposing a steady HT load.

In using this circuit it becomes apparent that VR1 needs to be quite a large wire-wound component—to carry the watts. A value of 2K was used, but 1.5K to 2.5K should be suitable. After setting operating conditions for the required output voltage, the portion of VR1 in circuit could be measured, and a fixed resistor of similar value permanently substituted for VR1.



“ . . . Using a remote-reading field strength meter here, OM . . . ”

## VEHICLE NOISE SUPPRESSION FOR MOBILE OPERATION

DEALING WITH A MORRIS 1000

D. G. ARIGHO (G3NVM)

*Based on material appearing originally in the July 1971 issue of "Mobile News", the approach and methods suggested by G3NVM would obviously be applicable to almost any make of car requiring rigorous noise suppression treatment.—  
Editor.*

HAVING recently installed 160/80 metre transmitting and receiving equipment in my Morris 1000 for mobile operation, I found various interference problems had to be overcome before satisfactory mobile operation was possible. Whilst I do not claim that the following notes are original, they are an accumulation of various hints and articles which were perused in the effort to find a cure for my own particular interference problem.

### Mobile Installation

The equipment being used consists of a home-built Tx and a Codar T.28 Receiver. The transmitter is located directly over the transmission shaft and below the heater outlet. The receiver is just under the driver's glove compartment. The antenna is a 9-ft. centre-loaded whip with an adjustable capacity hat on the high end of the coil and resonates in the 160-metre band. The aerial mounting is on the rear bumper (driver's side) and a coaxial lead taken through the luggage boot under carpets to the front of the vehicle to the transmitter.

### The Dynamo

The first mobile trials were not very encouraging as the interference whine from the dynamo was equivalent to an S8/9 signal on the receiver so it was virtually impossible for contacts to be made when the vehicle was moving.

This was tackled first; a standard car suppressor (0.1  $\mu$ F) was fitted between the dynamo output and the casing and this improved reception as the dynamo noise level was considerably reduced. The next step was to remove the dynamo and examine the state of the commutator and brushes. The commutator was found to be very dirty and the brush wear was uneven. The commutator was well cleaned up and a new set of brushes bedded in. The possibility of physically mounting the dynamo suppressor capacitors directly on the brushes and inside the dynamo case was investigated and eventually a 0.1  $\mu$ F and a 1,000 pF were wired in parallel across the brush holders.

The first test proved that there was not a trace of dynamo interference at various engine speeds and reception was possible on 160/80 metres. However, now that the dynamo trouble was cleared up, I was permitted to hear interference from the distributor (ignition interference), this was bearable but it was decided to try and eliminate it. The first thing was to fit standard plug

suppressors to all the plugs leads (these can be purchased through most Lucas agents) and a cut lead suppressor to the HT lead to the coil. This modification was tried with a noticeable improvement. The next step was to fit a 0.1  $\mu$ F capacitor to the LT side of the coil (SW)—and again there was an improvement.

### Wheels and Tyres

Then it was discovered that now either wheel or brake static was evident and at S9-plus, making it virtually impossible to copy anything at all. Back to the square one. A quick jab at the brakes confirmed that it was not brake static as it did not disappear when the brake was applied, so it must be a combination of wheel and tyre static.

A rethink and a reread of various manuals dealing with interference disclosed a number of solutions. The first one was to inject anti-static powder into the tyres. Great! But have you ever tried getting any anti-static powder? . . . every tyre distributor I inquired at said "Never heard of it."

The BMC people in Cambridge said there had been a kit of anti-static brushes for a Morris 1000 but they were no longer being manufactured. I had an idea of what would be necessary for these brushes, so I decided to make and fit my own interpretation of them.

Make sure that all the grease is removed from the contact area before refitting the hub cap otherwise you will be wasting effort. The rear wheels not having the removable hub caps required a rethink, and eventually it was decided to drill the rear brake drum and mount a phosphor bronze spring in each rear wheel, so that when the brake drums were refitted they would make contact against the springs and "ground" the wheel to the axle.

### Final Triumph

When the modifications were complete and the mobile equipment tested on the road on 160/80 metres a marked reduction was evident. The ignition interference was well below the noise level and the tyre/wheel static had virtually disappeared. As a last refinement a tin of tyre wall paint (obtainable from Halfords) was bought and a mixture of 25% powdered graphite and the tyre wall paint was made up. This was then painted on to the outside walls of the tyres; a retest was arranged and *presto*, no sign of any tyre or wheel static was evident at all.

### Bonding

It should be mentioned that after this exercise was complete about two days were spent underneath the car taking resistance measurements between various parts of the framework. The results were surprising, as much as 20 ohms appearing between some panels and the overall chassis. Thick, heavy wire was used to bond most of the chassis items to the various panels where these large resistances were encountered. I cannot say that this has at all helped with the *interference* suppression but the signal strength on both transmit and receive has improved remarkably!

One other point worth mentioning which might interest Morris 1000 owners is that the front and rear wheel suspensions are connected to the chassis through rubber bushes, so theoretically the front wheels are insulated from the chassis by these rubber suspension

(cont'd. p.480)

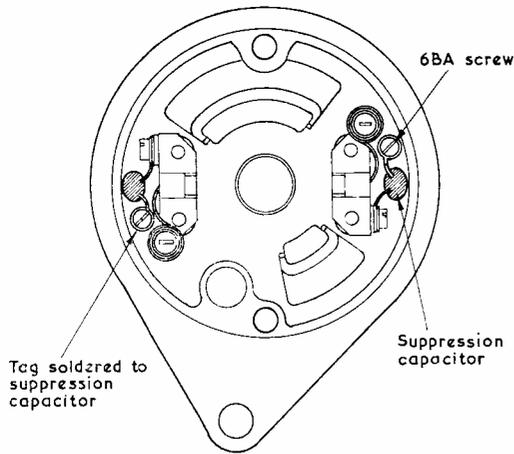


Fig.1 Dynamo End Plate

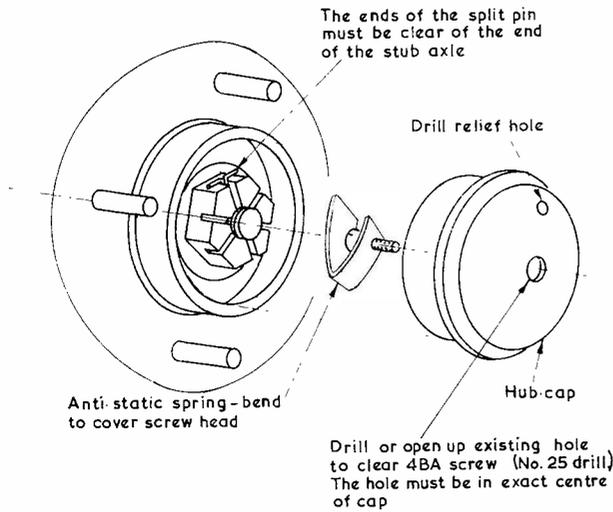


Fig. 2. Fitting Anti-static Spring to Hub cap.

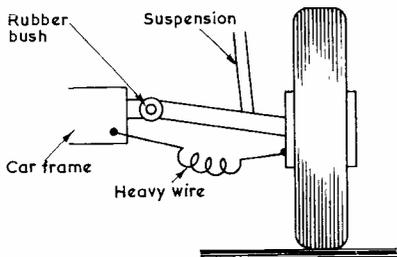
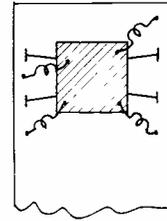


Fig.3 Grounding Front Suspension



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Fig.4 Engine mounting grounding points

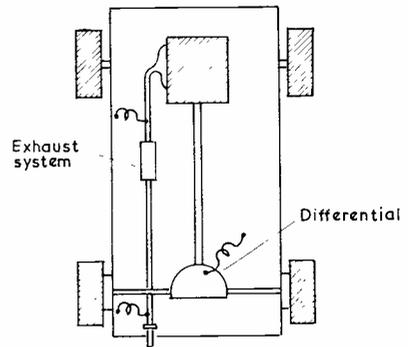


Fig.5 Additional grounding points

Commercial type anti-static spring

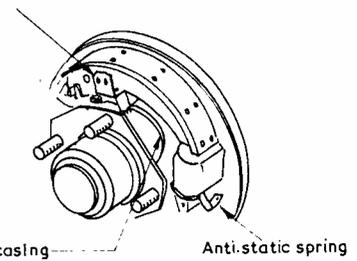


Fig.6 Fitting of Anti-static Bracket to Brake Shoe

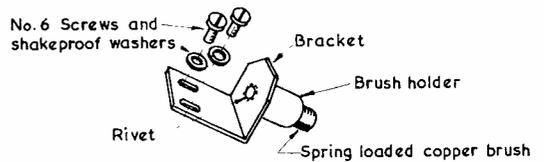


Fig.7 Commercial anti-static spring

bushes. Both front wheels were grounded to the chassis with a short length of heavy flexible cable, the grounding points being from the rear of the front-wheel brake drums direct to the chassis; enough slack grounding cable must be left to allow for the steering linkage, otherwise every time you turn a corner the grounding cable will snap. The rear suspension and exhaust system were grounded from the differential casing to the chassis, also with a short length of heavy lead.

### Conclusion

Perhaps one final comment: During the past few months or so attending various Mobile Rallies and talking with a multitude of Morris 1000 owners everyone had the same comment—in their opinion the Morris 1000 was the worst car they had experienced for ignition and wheel static interference! So, if you're seriously thinking of going mobile, unless you are prepared to do a lot of painstaking work buy another car, one which has a good reputation for interference-free reception from the outset.

## BEAM DIRECTION INDICATOR

### FOR REMOTE READING AT OPERATING POSITION

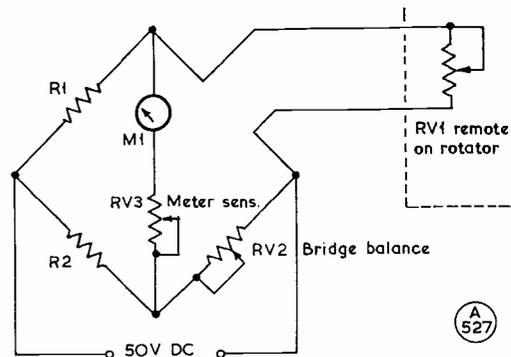
J. M. ORTON (G8CHP)

**A**FTER constructing a rotator for a 2-metre Yagi, the writer had to decide upon a suitable means of determining the direction in which the beam was aimed. Various methods were considered, but the best, it was decided, would be to arrange for one rotation of the aerial to perform about  $\frac{1}{4}$ -turn of a wirewound potentiometer, which would form one leg of a resistance bridge. When the rotator turned, the alteration in resistance so caused, would unbalance the bridge, and cause a deflection on the meter—see diagram.

The writer's rotator was constructed so that when the North heading was reached, a micro-switch broke the motor circuit for that direction (to avoid coax cable tangling) and the potentiometer from being turned past its end stop. Micro-switches were fitted both fully clockwise and fully anticlockwise, although only the actual indicator is dealt with here.

The gearing down of the potentiometer from the rotator drive spindle was achieved quite simply by a 3in. slow motion drive wheel on the potentiometer, friction driving against a one-inch grommet on the rotator spindle; when the slot in the wheel was engaged with same in the grommet, a reliable drive was made, which did not slip, even after continued use.

In the writer's prototype, the meter was set up to read "N" (north) at the zero point on the meter, when the aerial was fully anticlockwise, and "N" at full-scale meter reading, when the aerial was fully clockwise. Thus, the meter read "N-E-S-W-N" left to right. As the rotator motor supply was 50v., it was considered convenient to use this for the bridge supply voltage. Setting up the meter swing was easily done by adjusting



Circuit of the beam direction indicator described by G8CHP, for mounting at the operating position. Values are: R1, R2, 10K; RV2, 470 ohms; RV3, 5K; meter 0-1 mA. RV1 is a 470-ohm potentiometer activated by the rotator, mounted in some convenient manner to obtain drive—see text.

RV2 for bridge balance with the rotator fully anticlockwise, then rotating the aerial fully clockwise, and adjusting RV3 (meter sensitivity) to full scale reading. If a linear wirewound potentiometer is used, it will be found that the compass points are equally spaced across the scale.

### POINTS OF INTEREST

Those concerned about calibration accuracy should remember that Rugby, MSF, transmits standard frequency and time signals on 60 kHz and 2.5, 5.0 and 10.0 MHz—the LW signal is 24-hour and the HF-band transmissions are for 12 hours daily.

It is announced that WWV, Fort Collins, Colorado, U.S.A., no longer uses any Morse in its transmitting sequence. Frequency, time and audio tone signals (440, 500 and 600 Hz) are radiated on 2.5, 5.0, 10.0, 15.0, 20.0 and 25.0 MHz. For the U.K., the 15 MHz transmission is probably the most useful.

A number of South African stations—ZS's 2BZ, 2CC, 2DD, 2GE, 2GZ and 2OW—are working RTTY on the 50 MHz (6-metre) band. There is no allocation for this band in the U.K.—however, previous experience suggests that they could be receivable here when ten metres is open to the States, during which periods the MUF can go high enough for ZS signals on 6 metres to be heard in the U.K. (it has happened) thus making a cross-band RTTY contact G/ZS possible.

For the last R.A.E. in South Africa, basically the same as ours, 55 candidates sat of whom 48 passed, with a best top mark of 89%.

For the forthcoming J-O-T-A during October 16-17, the representative station for South Africa will be ZS6JAM, Mafeking, scene of the famous siege during the Boer War when the late Lord Baden-Powell, founder of the Scout movement, was in command.

**PERSONAL  
PORTABLE FOR  
TWO METRES**

CAPABLE OF  
INTERESTING  
RESULTS — DESIGN  
AND  
CONSTRUCTION



**J. R. HEY, M.S.E.R.T. (G3TDZ)**

General appearance of the completed two-metre personal portable, as designed and constructed by G3TDZ, with a size comparison. The speaker is behind the grille. The Tx runs two watts and more than 100 stations have been worked using simple antennae.

FOR some time policemen have been wandering around with a radio station in their top pockets, so why cannot radio amateurs who have had more experience?

At the risk of someone saying, "Not *another* portable from old "TDZ", a suggested design is offered which will enable our VHF fraternity to take their hobby with them anywhere they wish.

The realisation of the availability of certain useful components prompted this design. A miniature 3-gang capacitor is advertised by two well known dealers at only 25p; a Mullard TAD110, 14 pin dual-in-line IC with a matching ceramic 465 kHz IF filter were bought for £1.19 and 77p respectively. With just a small handful of extra components the second conversion stage or tunable IF could be designed. A fairly conventional converter section or front-end could then be added, so producing a small receiver of adequate performance.

A number of firms offer miniature high-frequency crystals at reasonable prices which means that both the converter oscillator chain and transmitter can be designed economically.

#### Receiver Side

Using Mullards published data on their TAD100 and TAD110 IC's, a basic receiver was lashed up in bird's-nest form and evaluated. It was decided that 12v. operation was going to be the most useful choice and the whole circuit was designed around this voltage, a small stabiliser being included to provide 6v. for the IC. The only remaining transistors necessary were the two output devices, AC188 and AC187, but as a pair of AC128/AC176's were waving from the junk box, these were substituted.

Within the single IC are mixer, oscillator, IF, detector, AGC and audio stages up to output level. It was found, however, that the internal oscillator when tuning 14.5-16.5 MHz was insufficiently stable, the drift experienced being quite unacceptable. A separate Clapp oscillator and emitter-follower was tried, injecting into the mixer base available at pin 13 of the IC; this proved most

satisfactory—in fact the emitter follower was omitted in the final design.

The LP1175 ceramic IF filter overcomes the need for careful IF alignment before anything else can be tested, as in more usual circuits.

In order to avoid conversion birdies, the second-conversion oscillator frequency must be chosen with care. An oscillator covering, for example, 18.4-20.4 MHz would be a good choice in that the nearest the 8th harmonic would come is 1.2 MHz above 146 MHz and the closest the 7th harmonic would be is 1.2 MHz below 144 MHz. It could be argued that it might be better to suffer one odd birdie than sacrifice oscillator stability by operating so high; this is up to the individual and more to the point, what crystal is available. An odd harmonic like an 11th or 13th might not be too drastic.

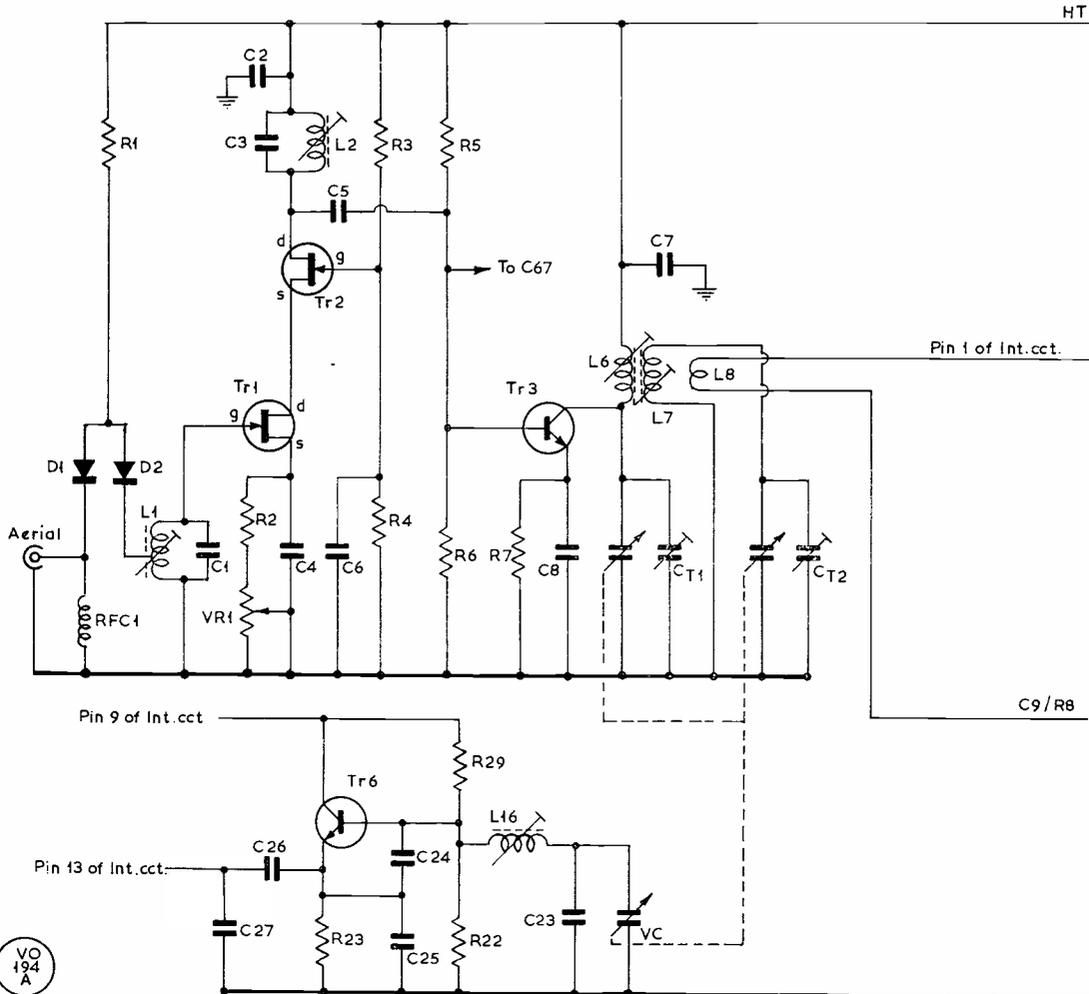
For this unit a 64.5 MHz crystal was obtained at modest cost, thus fixing the injection at 129 MHz which meant an IF of 15-17 MHz. The oscillator must run either 15.465 to 17.465 MHz or 14.535 to 16.535 MHz, and in practice the upper one is used, plonking a nasty

9th in the band, causing a couple of noticeable responses in the lower half. (Oh well, you can't win 'em all.)

A double-tuned critically coupled pair of coils as intermediate IF was considered adequate, and with 35 pF trimmers added to the 14.5 pF swing of the 3-gang, only 19 turns of wire was needed on the standard 3/16in. dust-cored formers. Later, one of these was adjusted to 17 turns and the other increased to 21 turns to make tracking easier.

The two formers are placed 0.4in. apart, which gives the desired coupling, also making it easy to connect to the 3-gang. On top of the secondary winding five turns are wound as a link to feed the mixer in the IC.

Again, the front end or converter design was dictated by component availability. Two Japanese FET's, 2SK19, were to hand and these were to be used in a cascode RF stage. With these had come a planar bipolar transistor 2SC785, recommended for use as mixer in VHF domestic radios and TV's. Perhaps another FET might have been better but beggars should not be so choosy. Whilst this arrangement has proved to be very



good, obviously the S2K19's could be replaced by 2N3819's or UC734's, etc. For those wishing to be more "with it", one of the new dual-gate Mosfets such as 40673 or 40820 should make a lively RF stage.

A straightforward overtone circuit using a BC109 was wired for the crystal followed by a 2N918 doubler; injection is made to the mixer base through a 1.5 pF capacitor.

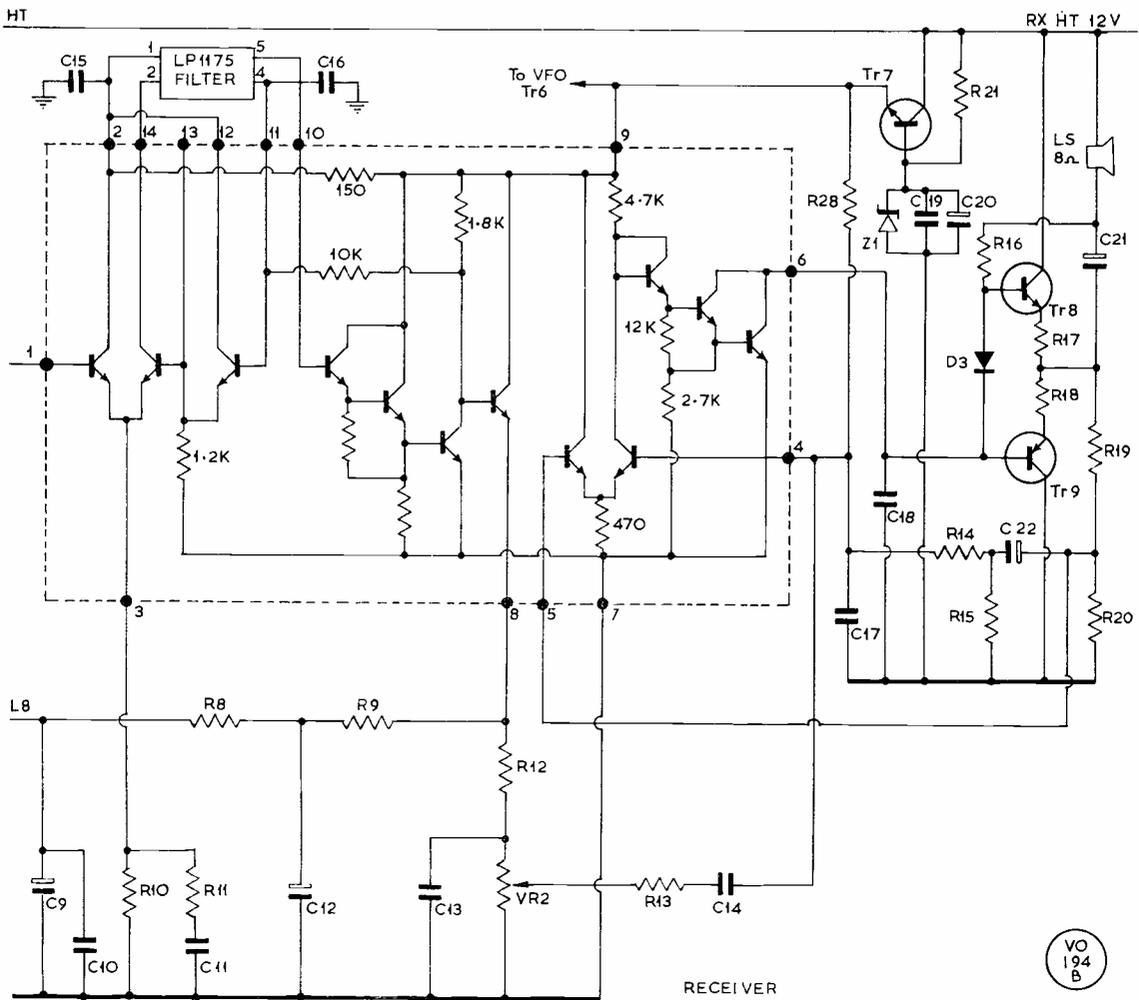
Earlier experiences have indicated the desirability of an RF gain control; a 10K pot. is wired in series with the RF stage source resistor and is a most effective addition. A slight trace of RF instability was cured by simply earthing the brass slug in the drain tuning coil. A gold-plated lead wire from a transistor was heated and pushed through the plastic coil former and soldered to the earth track of the printed board, the slug when re-fitted being earthed.

Now jumping to the other end of the IC: The AF

output transistors were pushed into a double heat clip and the thermistors recommended for biasing the bases of the Class-B outputs replaced by a single NKT279A diode. The reason for this was not particularly because of the argument that a diode provides better regulation against supply variations but that sheer meanness guided the writer towards the junk box rather than the shop.

A slight modification to the driver load resistor values and the biasing resistors of one side of the differential was made to allow the full 12v. to be applied to the audio output and retain equal clipping.

The simple stabilised source consists of a medium power TO5 transistor as series element with a 6.8v. zener in its base. The zener is actually an old planar transistor using only its base-emitter junction connected backwards. This is a handy way of obtaining low power zener diodes around 5-11v. as general-purpose planar transistors are much cheaper than *pukka* diodes. A



Receiver Circuit, G3TDZ Personal Portable — read from left, opposite page. Table of Values overleaf.

001  $\mu\text{F}$  ceramic and an 80  $\mu\text{F}$  electrolytic are placed in parallel across the zener, the latter being amplified by the gain of the transistor provides good decoupling whilst the small capacitor overcomes the noise sometimes generated by zener diodes.

Screening plates were fitted between RF and mixer and between oscillator and doubler. Nothing much can be done about the IC, one must trust providence.

### The Transmitter

A power of two watts was considered the wisest choice between economy and effectiveness. The BLY33 seemed to be the best choice for the PA as many RF power transistors are not at their best at only 12 volts.

A 72 MHz crystal is wired in an overtone circuit, a capacitive tap coupling its output to the doubler. The oscillator uses a BC109 transistor whilst the doubler is happier with a 2N918.

As the input capacity of the RF power devices is as high as 100 pF and outputs in the order of 10-12 pF, simple parallel tuned circuits and *pi*-couplers are not much use. It was decided to use *L-pi* coupling between driver and PA, and again between PA and the 75-ohm aerial outlet.

For the driver, which develops about 40 mW, a 2N3553 or BLY33 is recommended.

In order to tune out the huge input capacity of the driver, a  $1\frac{1}{2}$  turn 0.06  $\mu\text{H}$  coil, L11, is placed in series with the base and resonated by 22 pF to the top of which the resonating capacitor of the doubler is connected. The doubler does in effect use a parallel tuned circuit,

its 4-turn coil L10 connecting to a well-decoupled HT. The DC return path for the driver base is via a small RF choke consisting of two turns wound on an FX1115 ferrite bead.

Emitter leads of both driver and PA must be very short as lengths greater than 2 mm. can cause instability.

The driver collector goes to a diode tap across the modulation transformer through another two-turn RF choke on a ferrite bead. The internal capacity of this transistor, allowing a loaded Q of 10, means the 0.63  $\mu\text{H}$  collector coil L12 requires only 1.8 pF for resonance. Like the driver the PA base is tuned by a  $1\frac{1}{2}$ -turn coil and 22 pF capacitor. In circuits where each resonating capacitor is of similar order in value, these may be lumped together and a suitable trimmer used. However, 1.8 and 22 pF are a bit off and are therefore wired in a series-divider configuration. In the finished unit, these values has to be adjusted a little; the 1.8 pF became 2.2 pF and the 22 pF reduced to 15 pF.

The output stage *L-pi* network is somewhat simpler as input and output impedances are closer. We know we must aim at 75 ohms for the aerial output, the PA transistor looking like 36 ohms with 9-10 pF. The first section has a Q of 10 and the second a Q of 15 which means a loading capacitor of 28.5 pF (a 30 pF trimmer being used) with a centre resonating capacitor lumped into 8.7 pF, or a 10 pF trimmer.

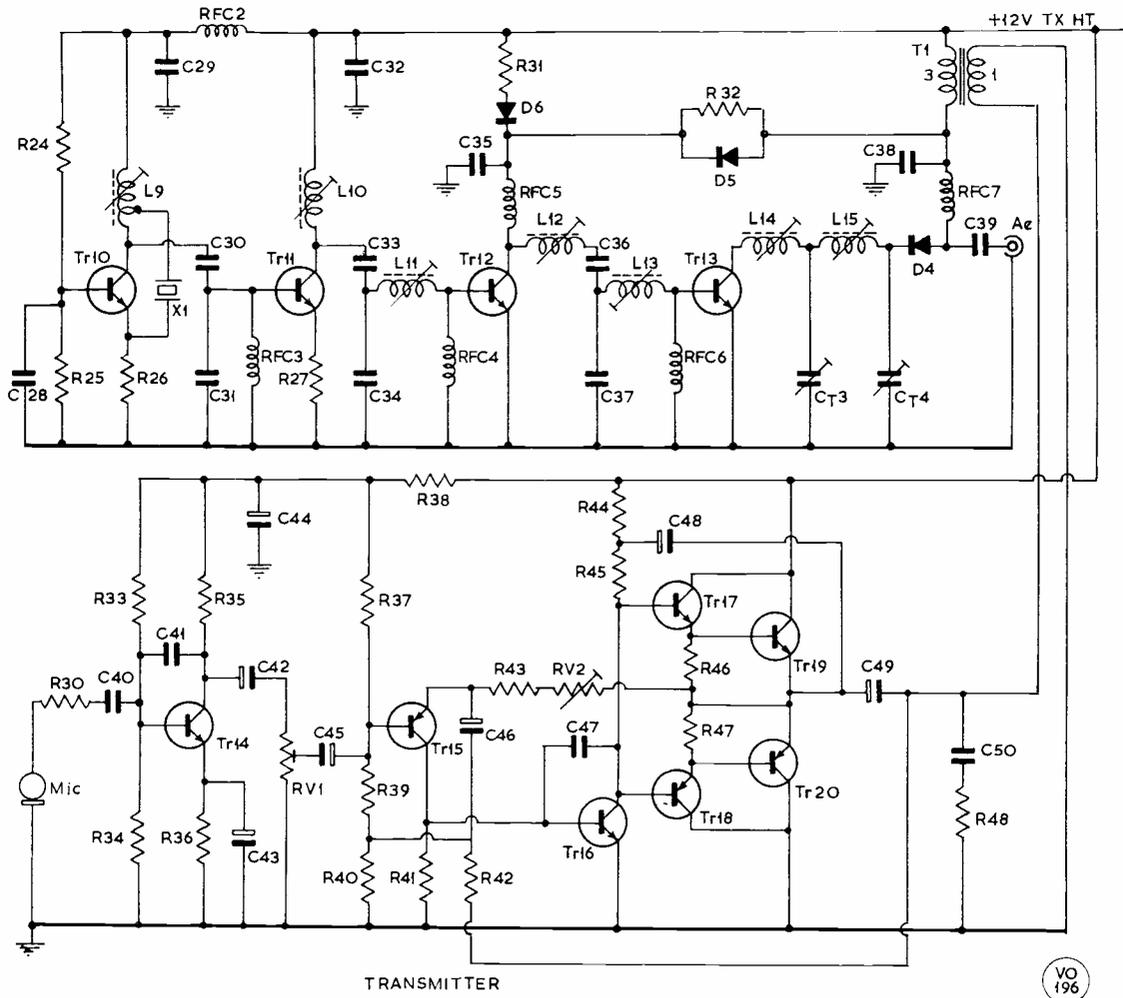
A large diode is inserted in series with the last coil before the HT choke and blocking capacitor. This forms part of the solid-state aerial switching and being in the DC path as well as the RF path, appears as a low

## Table of Values

For the G3TDZ Personal Portable

R1 = 6.8K	R41 = 680 ohms	C24 = 330 pF ceram.	Tr1 = 2SK19, 2N3819,
R2 = 220 ohms	R42 = 4.7K	C25 = 330pF ceram.	UC734, etc.
R3 = 39K	R43 = 560 ohms	C26 = 1000pF ceram.	Tr2 = 2SK19, 2N3819
R4 = 39K	R44 = 1K	C27 = 330 pF ceram.	UC734, etc.
R5 = 12K	R45 = 2.2K	C28 = 0.01 $\mu\text{F}$ foil	Tr3 = 2SC785, BF220
R6 = 5.6K	R46 = 100 ohms	C29 = 0.047 $\mu\text{F}$ foil	Tr4 = BC109
R7 = 2.7K	R47 = 100 ohms	C30 = 33 pF SM	Tr5 = 2N918
R8 = 8.2K	R48 = 22 ohms	C31 = 82 pF SM	Tr6 = 2N918
R9 = 8.2K	R49 = 47K	C32 = 0.022 $\mu\text{F}$ foil	Tr7 = BC441, BFX51,
R10 = 820 ohms	R50 = 15K	C33 = 12 pF SM	NKT0028
R11 = 150 ohms	R51 = 680 ohms	C34 = 22 pF SM	Tr8 = AC176, AC187
R12 = 390 ohms	R52 = 68 ohms	C35 = 2000 pF disc	Tr9 = AC128, AC153,
R13 = 1K	R53 = 560 ohms	C36 = 2.2 PF SM	AC188
R14 = 10K	VR1 = 10K lin.	C37 = 18 pF SM	Tr10 = BC109
R15 = 120 ohms	VR2 = 5K log.	C38 = 2000 pF disc	Tr11 = 2N918
R16 = 680 ohms	TR1 = 10K pre-set	C39 = 2000 pF ceram.	Tr12 = BLY33, 2N3553
R17 = 2.2 ohms	TR2 = 5K pre-set	C40 = 0.1 $\mu\text{F}$ foil	2N3535
R18 = 2.2 ohms	C1 = 12pF SM	C41 = 100 pF ceram.	Tr13 = BLY33
R19 = 22K	C2 = 1000pF disc	C42 = 10 $\mu\text{F}$ 16v.	Tr14 = BC109
R20 = 10K	C3 = 12pF SM	C43 = 10 $\mu\text{F}$ 16v.	Tr15 = BC179
R21 = 4.7K	C4 = 0.01 $\mu\text{F}$ foil	C44 = 80 $\mu\text{F}$ 16v.	Tr16 = BC108
R22 = 12K	C5 = 10pF SM	C45 = 4 $\mu\text{F}$ 10v.	Tr17 = BC108
R23 = 1.2K	C6 = 0.01 $\mu\text{F}$ foil	C46 = 200 $\mu\text{F}$ 10v.	Tr18 = BC178
R24 = 27K	C7 = 0.01 $\mu\text{F}$ foil	C47 = 100 pF ceram.	Tr19 = BD131
R25 = 15K	C8 = 0.01 $\mu\text{F}$ foil	C48 = 25 $\mu\text{F}$ 25v.	Tr20 = BD132
R26 = 680 ohms	C9 = 10 $\mu\text{F}$ 16v.	C49 = 400 $\mu\text{F}$ 10v.	IC = TAD110, TAD100
R27 = 22 ohms	C10 = 0.1 $\mu\text{F}$ foil	C50 = 0.1 $\mu\text{F}$ foil	D1 = BA141, BA101,
R28 = 27K	C11 = 0.047 $\mu\text{F}$ foil	C51 = 0.01 $\mu\text{F}$ foil	BA102
R29 = 12K	C12 = 10 $\mu\text{F}$ 16v.	C52 = 39 pF SM	D2 = BA141, BA101,
R30 = 510K*	C13 = 0.1 $\mu\text{F}$ foil	C53 = 0.01 $\mu\text{F}$ foil	BA102
R31 = 27 ohms	C14 = 0.22 $\mu\text{F}$ foil	C54 = 15 pF SM	D3 = BA114, D914,
R32 = 33 ohms	C15 = 0.22 $\mu\text{F}$ foil	C55 = 470 pF ceram.	1N914, 1N4148,
R33 = 1M	C16 = 0.47 $\mu\text{F}$ foil	C56 = 0.01 $\mu\text{F}$ poly.	etc.
R34 = 330K	C17 = 0.01 $\mu\text{F}$ foil	C57 = 1.5 pF SM	D4 = 10D2, PL4003,
R35 = 27K	C18 = 0.01 $\mu\text{F}$ foil	CT1 = 35 pF trimmer	1N4003, OA202
R36 = 15K	C19 = 1000pF disc	CT2 = 35 pF trimmer	ZD = BZY88/7V or
R37 = 150K	C20 = 80 $\mu\text{F}$ 16v.	CT3 = 10 pF trimmer	transistor*
R38 = 4.7K	C21 = 400 $\mu\text{F}$ 10v.	CT4 = 30 pF trimmer	
R39 = 56K	C22 = 4 $\mu\text{F}$ 10v.	VC = 3 gang 18 pF	
R40 = 47 ohms	C23 = 43 pF 5%SM		





The G3TDZ Two-Watt Transmitter Circuit.

TABLE OF COIL DATA

- L1 = 4 turns, 22g. TC, spaced 3/16 in., tap 1 1/2 turns up, ferrite slug.
  - L2 = 4 turns, 22g. TC, spaced 3/16 in., brass slug.
  - L3 = 5 turns, 22g. TC, spaced 3/16 in., tap 1 turn down from cold end or wind 1 turn PVC link over main winding.
  - L4 = 2 turns, 22g. TC PVC wound on top of L3.
  - L5 = 4 turns, 22g. TC, spaced 3/16 in., ferrite slug.
  - L6 = 21 turns, 26g. enam., close wound, ferrite slug.
  - L7 = 17 turns, 26g. enam., close wound, ferrite slug.
  - L8 = 5 turns, 26g. enam., wound on top of L7, insulated 1 layer paper.
  - L9 = 5 turns, 22g. TC, spaced 3/16 in., tap 1 turn from cold end, ferrite slug.
  - L10 = 4 turns, 22g. TC, spaced 3/16 in., ferrite slug.
  - L11 = 2 turns, 22g. TC, spaced 3/16 in., brass slug.
  - L12 = 12 turns, 24g. enam., close wound, ferrite slug.
  - L13 = 2 turns, 22g. TC, spaced own diam, brass slug.
  - L14 = 9 turns, 24g. enam., close wound, no slug.
  - L15 = 7 turns, 24g. enam., close wound, no slug.
  - L16 = 19 turns, 26g. enam., close wound, ferrite slug.
- Ferrite slugs must be of a material suitable for VHF use.  
 RFC1-7 = 2 turns 26g. enam., ferrite beads FX1115.  
 T1 = 120 turns approx., tetrafillar wound; see text.

Notes: All formers are 3/16 in. diameter. TC indicates tinned copper wire. Ferrite slugs must be of a material suitable for VHF use. Coil values may require adjustment, depending upon layout, and should be regarded as for guidance only.

RF on load. A further BC109 microphone pre-amp is necessary; a small skeleton pre-set pot. is included to regulate the modulation depth.

(To be concluded)

THE EI/GI CONVENTION CANCELLED

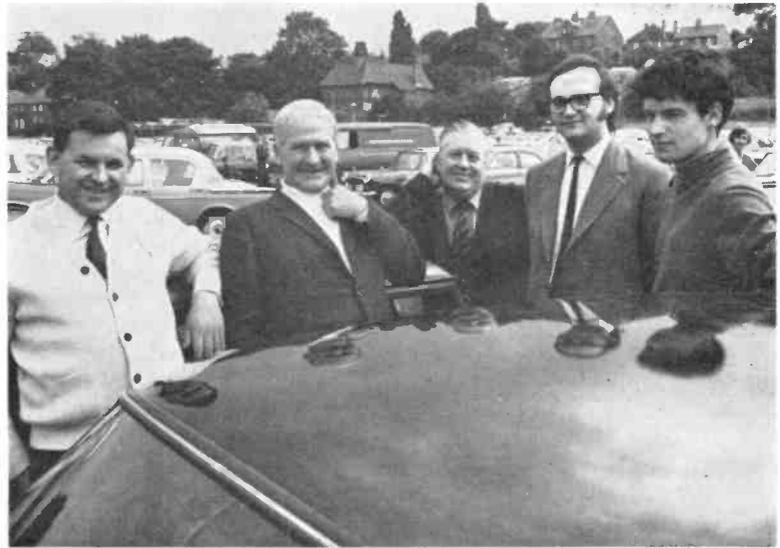
It is with much regret that, consequent upon the present troubled situation in Ireland, we have been asked to announce that the normally very happy and successful EI/GI Convention has had to be cancelled for this year. Our authority for this dolorous announcement is W. McIlwaine, EI9F, secretary, I.R.T.S., who sent us the notice appearing under "Points of Interest" on p.424 of the September issue of SHORT WAVE MAGAZINE. The president of the Irish Radio Transmitters Society is A. D. Patterson, EI4BC/GI3KYP—who at one time served a term as president of the RSGB.

PICTURES FROM THE MOBILE RALLIES

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Having a person-to-person QSO at the Derby event were, left to right: G3XMI, G3XGP, G8CVR (all from Birmingham), G8BFV (Portsmouth) and G8CLY (Chelmsford).

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(Above) At the recent White Rose Rally, left to right, Mr. and Mrs. G6OO, Mr. and Mrs. G3IJC and Mr. and Mrs. G6AU. At right, the two-metre talk-in station, signing G3XEP/A and operated by G3ZTU when this picture was taken.




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Another group caught at the Derby Rally—left to right: G3XOC, VK6KK, G4JW, G5ATB and G3YOA, who came from parts far and near for the occasion.

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## MORE RALLY PICTURES



Those concerned with the mounting and organisation of the recent White Rose Rally in Leeds included, left to right: G3XUD, G3YFP, G3YEE, G8DSW and G3ZKH. They put on a very good and successful show.



The Top Band talk-in station for the Derby Mobile Rally, signing G3ERD/A (one of the Derby Club's own callsigns) operated by G3UQV, with G3ZYD reading the map and doing the logging.



For the Derby & District Amateur Radio Society Mobile Rally, the 14th in their series of these events, once again there was a large attendance with "numerous attractions for all comers"—some of whom are pictured here waiting for the next item to be offered in the monster Junk Sale, always one of the main Rally interests at Derby.

*"Short Wave Magazine" covers the whole field of Amateur Radio and should be obtainable to order through any newsagent.*

A PART from those openings mentioned last month, the remainder of August was fairly quiet on all the VHF bands. Best days were August 16/17 which saw a good 2m. lift to PAØ, and the 18th, when 70 cm. was wide open to PAØ and DL, but little G activity to be heard. Your conductor worked six PAØ and two DL off one CQ (the PAØ beacon was at 5 & 9) and asked each of them if there was other G activity to be heard, but the answer was—none. Odd! The necessary tropo. was there to enable the G3BA/G3BHT/G3URV expedition to LX to make many G contacts before, during and after VHF/NFD at the start of September. Stations well down into France and to the East were also audible at good strength late on the afternoon of September 5. GW to East Coast G was also good on the night of September 3. September 6 produced some reasonable DX on 70 cm, although the other bands were quiet at the time, and GM was worked from Herne Bay on September 6, 7 and 8. During the contact with GM8BRM/P in Aberdeenshire on the 7th, Iain mentioned that he had had 37 Continental contacts that evening, so there was certainly a path from the North to the South East! The Angus beacon was being heard in the South on these two nights at good level, and on the following day DLØPR was at 5 & 9 at 0933z, although signal strengths had dropped appreciably an hour later. G3ZPZ worked GM8CUW/A in Yell in the Shetlands and got 5 & 9 on September 8. The Islander, an ex-Leeds man, runs 10 watts on 145.62 MHz. So September has come in like a lion, and it remains to be seen how it exists. As elaborated below, conditions during VHF/NFD were above par.

#### VHF NFD

Weather conditions were splendid for this event, and were almost matched by propagation conditions, which were showing a welcome lift on all the VHF bands. On 4m., the propagation appeared to be up in pretty well all directions, with GM, EI and GI all workable from the South. The Cornish stations were being worked in the North, and the Welsh portables were heard well in

# VHF BANDS

A. H. DORMER, G3DAH

the South and East. On 2m., the best DX axis was undoubtedly to the South and South-East at the start of the contest, but swung round somewhat towards the end, when DL and PAØ were plentiful. HB, LX, OE2 and EA were all worked from Kent on this band. No reports have been received of reception of SM or OZ, and this year, there was no aurora to help. 70 cm. was not nearly so productive of DX as were the lower-frequency bands, 200 miles or so being considered good, and no Continental contest activity to help swell the totals.

Traffic on all bands seemed to be a bit up on last year, but the slightly less favourable propagation restricted some of the scores heard. Nevertheless, there were some pretty useful totals being passed. On 2m., DL2OM was giving 409S at the end; GW3NUE/P (Brecon) passed 305S at 1630z, and that should mean a fair number of points, since most of these must have been at good range; G2JF has 225 contacts, of which some 80% were Continentals. An early score noted was that of GC3ZXR/P in Alderney who gave 241S at 1145z, so he should be up above the 300 mark, with some good long-haul stuff into the South and West of France from the C.I. To give some idea of the scoring rates on two metres, G3WIR/P near Stokenchurch passed 151S at 1115z and 180S at 1640z—29 stations in 5½ hours. G3SDS/P near Bridport

gave 128S at 1150z and 166S at 1615z making it 38S worked in 4½ hours, so the going was not all that easy.

Scoring rates on 4m. were also slowish, with little CW activity to help the DX along. Several stations were over the 90 mark, but the top score will probably be something around 130. Activity on 70 cm. was apparently higher in the North of the country, where propagation was also better. G8AWS/P near Buxton for example, had got over the 100S by midday on Sunday, including EI, but in the South, apart from the well-sited portables on the Coast, it all seemed a bit of a struggle, and this ties in with the customary picture of activity levels in the two areas.

There was a distinct lull in the proceedings around 1600z, and several stations were heard calling "CQ Contest" after 1800z, presumably because contradictory times had been published. The official times coincided with the IARU Region 1 event, i.e., 1800z September 4 to 1800z September 5.

Inevitably, it seems, there were some pretty dreadful signals around, some on 4m. and 70 cm., but the majority were among the 2m. portables again. Bad quality modulation was the most prevalent fault, followed by generator hash and instability. There was the usual overcrowding at the LF end of the band regardless of the Band Plan, although VFO's were being used more intelligently, and therefore socially, than on some previous occasions, and it was noted that stations operating on fixed frequencies, or using the VFO but rarely, were doing equally as well as the "here, there and everywhere" gentlemen. To quote but one example, in terms of quality, signal strength and generally intelligent operating, newcomers to VHF NFD might well emulate the example of G8APH/P, operating from north of Winchester, who was doing all the right things. Surely, the time has now come to do something more positive about disqualifying persistent offenders. To rely upon other operators writing in to complain, is but to scratch at the problem, and it is suggested that a team of impartial, voluntary adjudicators, located strategically around the

country for the specific purpose of monitoring the bands for poor transmissions, and with the power to recommend immediate disqualification in flagrant cases, would be much more effective. They need not be members of the Contest Committee, and cross-checking their reports would provide a safeguard if anyone wished to question their probity.

So there it is until next year.

### Contests

Conditions were very patchy for the 70 MHz contest on August 15, and appear to have been rather more reliable and productive of DX in the North and Midlands than in the South, although even there, propagation tailed off considerably towards the end. G3OHH and G3RLE, to quote but two stations who normally do pretty well in these events, were passing scores of 35 and 26 respectively at the finish and your scribe could only manage 25, possibly due in part at least to the systemic shock of having to get up in what appeared to be the middle of the night to be in on the start! GC3WMR/P was a good signal in the South and up into the Midlands for the first couple of hours or so, and then was never heard again, although G3TTG/P in Cornwall was there most of the time. G3UVR/P was located in Cardigan, but in spite of his attractive location only worked G3TTG/P and G3ZVK in Kidderminster. Checking around afterwards, it seemed that the choice of the timing was not particularly welcomed by many operators with TVI problems and/or large, local, immigrant populations and University-of-the-Air students, since they were unable to transmit during the time these programmes were being radiated on Sunday morning. There still seems to be a good case for the longer contest, rather than the abbreviated five hours of this event, taking in a large part of the time between midnight and say nine in the morning. It's only two or three times a year, after all. However, as G3DAH knows from personal experience of organising these events, you can't please all the people all of the time, and indeed very few for even part of the time!

Forthcoming events are the UHF/

SHF contests over the weekend of October 2/3, which coincide with a similar IARU Region I event; the first of the 70 MHz Cumulatives on October 13 and 27; and the 432 MHz fixed contest over the weekend October 30/31.

### Meteor Scatter

Many two-metre operators must have heard the 30 w.p.m. CW at the low end of the band recently, and even if they have not been able to hear the other end of the contact, may have deciphered the call as being that of Johnny Stace, G3CCH (Scunthorpe, Lincs.), in contact with

TF3EA, with whom he has been running random meteor skeds on Thursday evenings between 2100z and 2130z. To date, they have had 23 QSO's, and this has encouraged them to have a go at M/S on 432 MHz. At present, only G3CCH transmits, and TF3EA listens. Several "pings" have been heard in Iceland, with occasional, barely perceptible, signals of much longer duration. However, efforts are being made to improve the circuit with bigger and better aerials and higher power. The skeds are on Saturday evenings between 2000z and 2100z at the bottom end of the

### THREE BAND ANNUAL VHF TABLE

January to December, 1971

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3COJ	34	4	63	16	29	7	153
G3OHH	47	7	55	5	24	3	141
G3DAH	31	3	58	12	25	5	134
G5DF	17	2	55	11	29	5	119
G3ZYC	41	4	26	5	33	7	116
GD2HDZ	23	4	48	8	19	4	106
G8ATS	—	—	45	8	39	5	97
G3JXN	27	2	57	9	—	—	95
G3ZPZ	—	—	78	13	—	—	91
G8BCA	—	—	49	6	31	4	90
G2AXI	24	3	39	4	8	2	80
G3EKP	22	6	19	5	6	6	64
G3FIJ	4	1	44	8	5	2	64
G2JF	—	—	51	9	—	—	60
G3IAR	31	3	21	4	—	—	59
EI6AS	15	5	30	6	1	1	58
G8BKR	—	—	41	5	10	2	58
G8ECK	—	—	46	9	—	—	55
G8BWW	—	—	32	5	6	4	47
G8CBU	—	—	36	5	3	1	45
G8DLJ	—	—	32	8	—	—	40
G8AUN	—	—	30	3	3	2	38
G8CVD	—	—	32	5	—	—	37
GM3EOJ	—	—	18	10	3	1	32
PA9LY	—	—	13	6	—	—	19
G8CYN	—	—	13	2	—	—	15

Just a reminder that the Tables go through to December 31st, 1971. The Three Band Annual Tables show claims to date for the year commencing January 1st, 1971. Claims should be sent to SHORT WAVE MAGAZINE, Buckingham, Bucks.

band.

Far from random was Johnny's two-metre QSO with LZ1BW during the *Perseids* shower on August 12/13, a carefully planned and executed operation which resulted in a 2230 km contact to give 'CCH (and probably LZ1BW) his best DX to date.

Fine achievement though this can be seen to be, it is perhaps all the more praise-worthy, since Johnny does not have access to the vast laboratories available to some amateurs, and is not engaged professionally in radio. His gear is home-designed and constructed. One recalls an article of his which appeared in the *Magazine* many years ago, in which he described the construction of a dish for E-M-E working. So, congratulations.

And in another area of Europe, EA4AO of Madrid, well-known to many M/S operators in this country, also got in on the *Perseids* shower. After a phone call from PA0VVH, skeds were arranged for 0900z to 1100z on 144-150 MHz over the period, and on the 13th, a QSO resulted within 60 minutes with good signals both ways and long bursts. At the conclusion of the contact, PA0JMV came on the frequency, and signal strengths of 7 & 8 were exchanged, and this without a previously arranged sked.

To give some idea of the gear required to participate in this particular form of communication, PA0VVH runs 100 watts from a QQV06-40A to a ten-ele Yagi; PA0JMV has 600 watts input to a 4X150A and an 18-ele long-Yagi; EA4AO has 500 watts output from a pair of 4CX250's into a 10-ele Yagi.

### Bacons

GB3SX is still off the air at the time of writing, but it is hoped to have it on again very shortly. The trouble appears to have been that the power increase to 120 watts (to an 829B) and an increase in the ambient temperature, caused it to give up the ghost.

Permission has now been granted for the installation of a new beacon in Lerwick on a frequency of 50.1 MHz with the object of promoting the study of auroral and sporadic-E effects. The Tx will be transistorised and is of the same general form as



On a recent Verulam (St. Albans) Club occasion see see, left to right: G8BJK, G3DAH, PA0LSC, G3COJ and G3POI. G3COJ is well-known on VHF and he and G3POI work PA0LSC regularly, the latter's father being PA0CSL, also very active on the VHF bands.

the TF3EA job, both the brain children of G3JVL. Although not in the amateur frequency allocation, this beacon will provide a useful guide to propagation on 70 MHz.

Happily, the Wrotham 2m. beacon is back in form, although the transmission cycle now omits the long dash, and lining up converters still remains a problem if this transmission is used in lieu of a signal generator. GB3GEC on 70 cm. is still off the air, and likely to remain so for some time, if not indefinitely, which deprives not only the U.K. amateur of a very useful service, but also the many Continental stations who used the beacon as an indicator of propagation in the U.K. direction. So valuable was this beacon to them, that its presence was given as one of the reasons for setting-up the Dutch beacon, PA0VD. True, the new installation at Durham, when it becomes operative, will partly fill this gap, although the proposed antenna headings are not particularly favourable for Continental Europe. Even better would be the installation of a 70 cm. beacon at, say, the site of the projected 23 cm. job at Shooters Hill in Kent, to radiate medium power from an omni-directional antenna. A further beacon in the South-West, beaming North-East, would, with GB3SC, then complete the coverage very satisfactorily. The case has obviously been made for such a system on 2m., and presumably, the arguments are equally

applicable to the higher frequency band, if not more so, in view of the lower levels of activity on 432 MHz.

Further to the information given last month *re* the new French beacon, F7THF, installed at "Ballon d'Alsace" in QRA DH75, the complete cycle is as follows:—

(1) The start signal consisting of a musical tone, (2) The call letters in A2, (3) The temperature in degrees Celsius, defined by one pip for each degree, preceded by a long dash if the figure is below zero, (4) The local pressure in millibars with a pip for each millibar above 950 and up to 1,000. (The low starting point is dictated by the fact that the site is at 1520m. a.s.l.), (5) A 1,000 Hz note for tuning purposes, (6) A 600 Hz note for tuning purposes, but this time on NBFM with a deviation of 1.5 kHz, (7) A report on the reception of "Checkpoint Charlie" just below the band edge, and in QRA DK63j, with nine pips indicating excellent reception, and a lesser number for lower states, (8) A report on the amount of sunshine on site, but this is unlikely to interest us very much!

Plans are in hand to duplicate this beacon information on 70 cm. Reports will be welcomed by Radio Club de Belfort, 7 rue de la Claichiere, 90, Bavilliers, France.

Reception in this country of the German beacon on 70 cm., DL7HGA in Berlin, has yet to be confirmed, although it has been heard out as far as 300 km. in Germany itself.

It appears to be a remarkably stable device, as frequency measurements over last few months have shown it to have varied by as little as 30 Hz about the allotted frequency of 433-485 MHz. This is, unlike the beacons in this country, a "private venture" installation, operated by DL7HG, who has to accede to requests to switch it off when weak DX is around the frequency, in order to keep the peace with his neighbouring amateurs, and in this respect, it operates at a disadvantage compared with remotely and officially controlled beacon transmitters, but nevertheless, it can still be a useful, if not permanent, aid to the determination of propagation conditions on 70 cm. Reception reports would be welcomed by Peter Brumm, 1 Berlin 37, Claszeile 23.

It is reported that a new German beacon has been set up 20 miles NE of Hamburg. Callsign DJ8XOA, and frequency 432.0 mHz.

#### VHFCC Awards

Only one claim has been received this month for the VHFCC Award. This came from Geoff Monks, G8ENL (Horsforth, Leeds) who gains Certificate No. 111 for two metres. Geoff is obviously no slouch, since he was first licensed in January 1971, and has now worked 800+ stations in 38 counties and 8 countries. He runs a QQV06-40A in the PA with 40 watts of NBFM to a 10-ele Yagi at 30ft. a.g.l. on a site 550ft. a.s.l. The converter is a DL6SW and the main receiver an SP600JX.

#### Club and Society Activity

G3ZKH sends some details of the operations of the White Rose Radio Society which has been giving a good account of itself under the callsign G3XEP/P during recent contests. They normally use a site some 950ft. a.s.l. 15 km. north of Leeds, which has a clear take-off in all directions except to the West, where a little affair called the Pennines intervenes. The Tx runs between 25 and 35 watts on two metres to one, or two, 10-ele Skybeams, and on occasions, to a 14-ele Parabeam. Main receivers are either an EC-10 or a Trio JR-500SE, with alternatively a Mosfet converter or a nuvisor job. On 4m., they have

10 watts with a 6-ele beam. One has the feeling that we will hear a lot more of them in the not too distant future.

The Reading Amateur Radio Club held their VHF picnic again in July, with talk-in stations, junk sale and raffle, and it is hoped that this will become an annual event. This sounds a congenial occasion which Club secretaries may wish to investigate further, in which case they should contact G3NBU, *QTHR*, for further details. The South Bucks. Club, whose meetings are regularly reported in this Column, have arranged a talk on UHF equipment by Arnold Mynett, G3HBW, for October 5, and a film on transistors on November 3. Details of these and other meetings may be obtained from the Secretary, G3XPB, *QTHR*.

Another activity which has much to commend it for those who like a day in the country is a foxhunt, and yet this does not seem to have achieved the same popularity in this country as it has on the Continent. The Ovingham & District Amateur Radio Society in Northumberland held theirs on August 1, with the fox at Mootlaw, 832ft. a.s.l. and the winner, G4LA, took just over the hour to find him. The point about these contests is that they can be shared with the family, and XYL QRM is therefore less likely than with a fixed station event. Michael Stott, G8BGU,

organised this one, and Club secretaries might like to contact him, *QTHR*, to get further details of the organisation behind it.

The South East UHF/VHF Group meets at Wye College, University of London, nr. Ashford, Kent, on October 15 at 7.30 p.m., when Arnold Mynett, G3HBW, will be talking about VHF transceivers. Details of this and subsequent meetings may be obtained from the secretary, G3DAH, *QTHR*.

The "Radelec 71" jamboree, (if that is the right word for this particular aspect of Scouting activity) takes place over the weekend of October 1/2 at Gilwell Park near Chingford, Essex, easily reached by train from Liverpool Street station or by road. Talks on ultrasonics, tape recording, RTTY and antennae have been arranged, and all Scouts with an interest in Amateur Radio are welcome. If as many turn up as last year, there should be some 100 there. Further details from G8CBU, *QTHR*.

#### Four-Metre News

Nothing further seems to have been heard from TF3EA or TF3VHF on 4m. since the sporadic-E openings reported last month, except for a brief appearance on M/S on August 11 when the Manchester station, G3VSA, heard quite long bursts, although no contact was made at that time.

G3VPK logged ZB2VHF on 70.26



The legendary Cairn O' Mount site in Aberdeenshire has been used by many VHF/P expeditions. On the Aberdeen-Kincardine border, the elevation is 1,488ft. GM3DAH/M found it a wonderful spot when on a holiday trip up there.

MHz at 2100z on August 7, but as this date coincided with the latest Apollo splashdown TV pictures, perhaps many of us missed the opening! G3OHH reports hearing the station on August 21 between 1938z and 1944z, but signals were very weak. All in all, the openings to ZB2 have been very poor this year—perhaps some of the experts can offer a credible explanation?

G3FDW, one of the star operators on the 4-metre band, is moving QTH within the Nottingham area, and will be QRT until December. G3WOS of Rugby is now to be heard on 4m. on SSB. He runs a FET VFO and QQV06-40A PA; he is planning an all-mode set-up to give him A1, A3, F3 and A3J; the antenna is a 4-ele at 33ft. a.g.l., but a 25-ele (!) with a calculated gain of 13+ dB is planned for contest working. He is also building for 432 MHz. Heard on 4m. recently: An operator with a severe case of the "RF feedbacks" in QSO with another station who reported that the feedback was much worse on 70.36 MHz than it was on 70.26 MHz. Some feedback—the carrier was on 70.47 MHz!

#### Two-Metre and 70 Cm. News

A newish signal from the South-West—and the Lizard is about as far South-West as one can get in this country without going to the Scillies—comes from G3IUD, who is to be heard most evenings on CW around 144.03 MHz. He is a refugee from Wilmslow in Cheshire, from whence he transmitted on all bands from 4m. to 3 cm. He currently has 120 watts to an 8-ele beam. He has a nightly sked with G2JT in Oldham, and they rarely seem to miss. He can also be heard working G3DAH most evenings when conditions are right, at 2320z. He is planning to come back on to four metres again soon.

G8BMI of Keighley, Yorks, is now equipped for teletype reception. Moving QTH has held up further progress in this direction, since it has involved the fabrication of a special console for all the gear. He is to be heard on 2m. AM though. Brian Flynn, GM3BJF, well-known on 70 cm. in Edinburgh, is to be congratulated on his B.Sc., (Hons.) degree; he is staying on at the University to take his Ph.D.



Left to right: G3ZGR, G4LA and G8AGN, winners in a recent fox-hunt on two metres organised by the Ovingham (Northumberland) Amateur Radio Club. The Tx frequency was 145.1 MHz and G4LA got there first.

When GM8BRS was portable in South West Scotland recently, they had a good contact with GD2HDZ, Laxey, I.o.M. to give the latter his first GM on 70 cm. The Tx ran 100 watts, and 30 watts on two metres.

#### News Items

The live A/TV demonstration at Woburn Rally attracted the attention of many visitors, and the following details may be of interest: G6AFK/T and G6AGE/T, with vocal assistance from G8CBU, looked after the transmission side from the car park on Dunstable Downs, while G6AEV/T and G6AGX/T were in the marquee at the rally. The transmitting equipment consisted of a hybrid Tx winding up with ten watts input and a 18-ele Parabeam at 16ft. a.g.l. (the site was 800ft. a.s.l.), the home-built camera equipment having been constructed by G6AFK/T—see p.369, September SHORT WAVE MAGAZINE. At Woburn, a transistor TV tuner, suitably pulled to 70 cm., fed into an ex-rental TV set, with the antenna an 18-ele Parabeam on a Strumech tower up at 60ft. Both sound and vision were transmitted in the 70 cm. band with 3.5 MHz spacing, and very good noise-free pictures were received during the two-hour long programme.

G8BCL, Halifax, Yorks, is looking for contacts on 23 cm. He has a xtal-controlled Tx on 1297 MHz

with a 2C39 tripler/PA giving 5-6 watts out to the 32 ele Yagi. At least, it *should* have been a 32-ele Yagi, but Howard says that an extra director crep' in by mistake, and it is now a 33-ele job! The converter is the K6KXN model. Skeds can be arranged (QTHR, with s.a.e.). Incidentally, many listeners will have heard the early-morning skeds between G8BCL and G5DF in Reading, around 0900 hrs. local time on two metres. These have been running since April 1 this year, and they have never missed due to propagation conditions over this 170-mile path.

Some interesting DX is reported by EA4AO in Madrid. During the recent 2m. contest in Spain, contacts were made with Palma de Mallorca over a distance of 2150 km. The Canary group were up at 2,200 metres and were running a QQV03-12 in the final, so this looks like a spot of *Es*. They were using an abbreviated form of procedure, with just the last letters of the call, and this caused some amateurs, who were copying them at 5 & 9, to think that it was the local police net breaking through. (There must be a lesson to be learned here about using callsigns correctly.) EA4AO makes the point that these sort of conditions are possibly more prevalent than is imagined, and it can only be regretted that there is often insufficient activity to pinpoint them. We could do with a bit of this

propagation at this latitude!

Dave Stockley, G8ELP (Whitstable, Kent) was involved in a nasty car smash recently, but this has not prevented him from coming on the two-metre air from his hospital bed. The local lads have fitted him up with an NBFM Tx/Rx and a halo antenna (of which both the matron and the visiting Padre approve!) and he is thus able to while away the long weeks by keeping in touch with the outside world *via* Amateur Radio.

Alan Wheeler, G3RHF was also laid low in hospital at the end of last month, and was able to get on 2m. with the help of an Echelcom-2 Tx and a Rx designed and built by G8EDL, Derek Holding. Once again, the antenna was a halo, although the best antenna for general listening purposes turned out to be the hospital earth system!

We wish a speedy recovery to them both.

**Ernie Dedman—G2NH**

It is with deep regret that we have

to announce the sudden death, at the age of 57, of Ernie Dedman, G2NH, of New Malden, Surrey. It was immediately after his return from the VHF/NFD site on Sunday, September 5, that this unhappy event occurred, and one cannot help thinking that this might be the way that Ernie himself would have wished it. First licensed in 1927, he has always taken a full and active part in amateur activities on all bands, from HF, through 5 metres, to VHF, and will be remembered by many, who did not have the fortune to know him personally, as the moving spirit behind the Quartz Crystal Company, which in the 1930's must have provided most of the "rocks" for the amateur fraternity. While not neglecting the HF bands, his recent interest had centred on two-metre SSB, and he was to be heard on the air most Monday evenings either working the DX or ready with helpful advice for the newcomer—he was by no means just a "5 & 9—pse QSL" man. The sympathy of so

many of us goes to his family.

### Deadline

Deadline for the next issue is **October 9** and the address for news, views, claims and comment is: "VHF Bands", SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now, and 73 *de* G3DAH.

### Stop Press

The results of the 1969 IARU Region I Contest in September of that year have now been issued officially by the Czech authorities. U.K. placings are as follows:

**144 MHz Fixed:** 3rd G2JF, 360th G8BWF.

**144 MHz Portable:** 23rd GD3VXX/P, 40th GW3BA/P, 63rd GM3TGL/P, 145th G3FZL/P.

**432 MHz Fixed:** No U.K. entry.

**432 MHz Portable:** 1st GW3HAZ/P, 3rd GD3WMS/P.

**1296 MHz Fixed:** No U.K. entry.

**1296 MHz Portable:** 2nd GW3HAZ/P.

### ADDRESSES FOR RECIPROCAL LICENSING

Following is the latest Region I IARU list for applications for reciprocal licences in the countries named, covering also /M permits (where these are allowed to foreigners). Short-term licences are usually free or are issued at nominal cost. In most European countries Top Band is not permitted. In the first instance, make a straightforward typed request with a photostat copy of your licence—and allow ample time for the business to go through.

**Austria:** Generaldirektion der Post und Telegraphenverwaltung, Abt. 15F (Funk), Vienna (or the capital city of the province of residence).

**Belgium:** Monsieur le Directeur-Général des Radiocommunications de la RTT, Place Madou 1, B-1030, Bruxelles.

**Eire:** Dept. of Posts & Telegraphs, Experimental Radio Section, Hamman Buildings, O'Connell Street, Dublin.

**Finland:** Suomen Radioamatooriliitto r.y., P.O. Box 10316, Helsinki 10.

**France:** P.T.T., Direction des Services Radio Electriques, 5 Rue Froidevaux, F-75, Paris XIV. (Also for *Andorra*.)

**Luxembourg:** Administration des P. & T., Hotel des Postes, Luxembourg-Ville.

**Netherlands:** Radio Controledienst P.T.T., Kortenaerkade 12, The Hague.

**Norway:** Teledirektoratet, Universitetsgt. 2, Oslo, 1.

**Portugal:** Administracao General dos C.T.T., Direccao dos Servicos Radioelectricos, 1A Reparticao, Rua General Sinel de Cordes 9-5°, Lisboa 1.

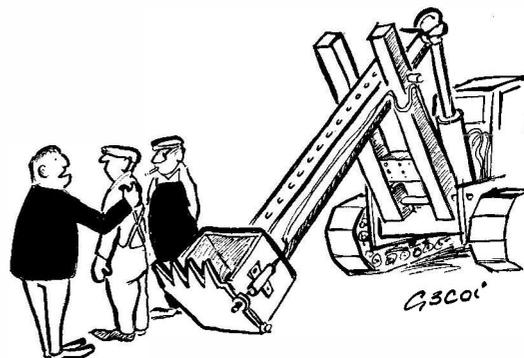
**Sweden:** Central Administration of Swedish Telecommunications, Radio Development Section, S-123 86 Farsta.

**Switzerland:** Generaldirektion P.T.T., Radio und Ferneshabteilung, CH-3000, Berne.

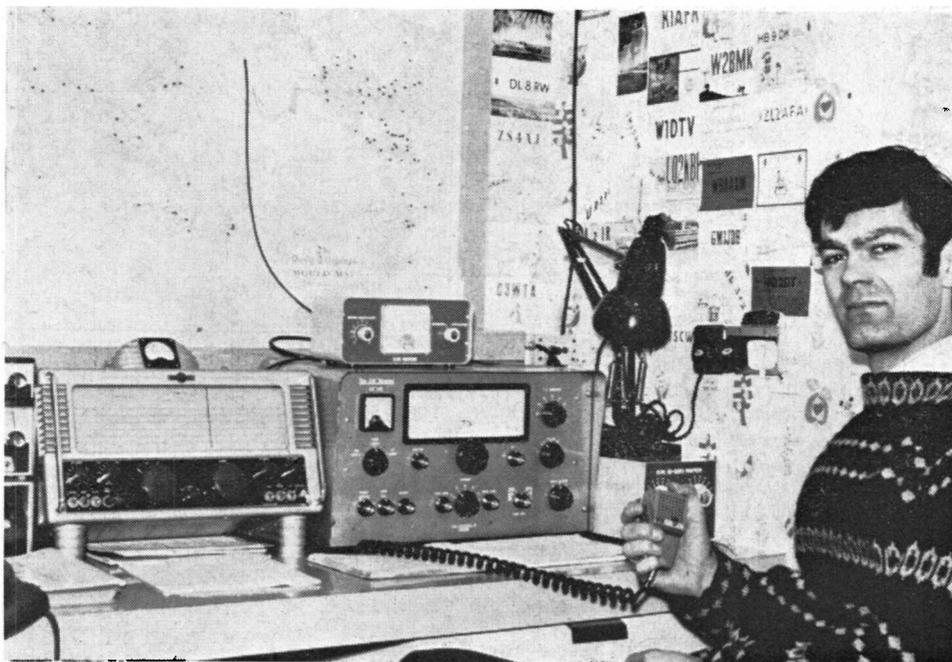
**United Kingdom:** Ministry of Posts & Telecommunications, Amateur Licensing Branch, T & RRD, Waterloo Bridge House, Waterloo Bridge Road, London, S.E.1.

**United States:** Federal Communications Commission, Washington, D.C.

The U.K. address is given for the convenience of overseas amateurs who may wish to operate in this country. The U.S.A. is not in Region I, but is included for completeness.



" . . . Come over here and I'll show you where to dig out for the radials . . . "



## THE OTHER MAN'S STATION

**G3YWS**

**J.** M. SMITH, 16 Woodlands, Winthorpe, Newark, Notts., put G3YWS on the air in November 1969—though in fact he became interested in Amateur Radio fifteen years ago, while still at school. The force of various circumstances—such as working for professional qualifications (he is a lecturer at Newark Technical College), and marriage—held up a serious approach until some years later.

He is now in a house-and-garden carefully chosen with Amateur Radio in view, enabling him to have a good aerial system in a quiet location—antennae consist of a Mosley TA-33Jr., a 132-ft. wire and a 5-ele beam for two metres.

Gear at present in use is, as HF-band Tx, a K.W. Viceroy for CW/SSB operation, an Eddystone 888A as main receiver, a Codar A.T.5 for Top Band and a small two-metre Tx modulated and powered by the A.T.5, with the appropriate 144-146 MHz converter for reception.

Thus, operation from G3YWS is possible on all bands two metres to 160m., with the main interest DX working on 21 MHz. The score at the moment stands at 154C, with 84 countries confirmed.

Activity on two metres was started comparatively recently, in order to join in with the locals who, we are told, use that band extensively—but VHF/DX is also being raised, thanks to an excellent QTH.

Latterly, G3YWS has been busy setting up G3ZWV, the recently-licensed AT-station at the Technical College, with a KW-2000 transceiver and the ancillaries. It is hoped in due time to institute a course for the R.A.E.

Finally, he remarks that he "has a very tolerant XYL and a 2½-year-old junior op. who could say 'CQ' before he could say 'Daddy'"! Well, we don't know . . .!

But we would remark that the operator of G3YWS, now just 31 years of age and with plenty of time in prospect, strikes us as one of those radio amateurs who have made a rational step-by-step approach to Amateur Radio—we wish him and his family well for the years to come.

### APOLOGY FOR ERROR

In that caption on p.275 of the July issue, we inadvertently described the spark Tx as being an "R.A.F.-type of 1916 vintage"—of course, it should have been *R.F.C.*, because the R.A.F. did not exist at that time. Also, it should have been mentioned that the Tx itself is a replica in full working order built by W4ZM to the original Sterling Radio specification, for the Antique Wireless Association, who have a remarkable collection of early radio apparatus.

# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for November issue: October 8)

(Please address all reports for this feature to "Club Secretary," SHORT WAVE MAGAZINE, Buckingham.)

ONCE again the merry-go-round starts to spin, covering reports from Clubs far and wide—and most of them seem to be preparing to do battle in MCC, Rules for which appear herewith. Suffice it to say that while they are basically the same as last year, the formula having met with general approval, the Ident. Codes are different. Thus, if you make a last-minute decision to run a station, it is no good, and can do positive harm, to operate using last year's Ident. Yes, we know it sounds a bit odd—but it has happened!

For more than 25 years now, MCC has been the annual competitive event for Clubs who are really on the air, and have enough CW operators to put in an entry.

This is what makes the interest in MCC—and the fact that your Club is competing primarily with the others in your own Zone. In addition to the main place-list, we also show the first two in each Zone, these being the lead stations in their own area; see p.688, January 1971 SHORT WAVE MAGAZINE for the local Club situation last year.

Also to be remarked here—as has been explained in previous years—the Contest is closely invigilated. This is *not* with the idea of looking for people to disqualify but rather to make sure that all concerned play to the Rules—see, in particular, Rule 8, p.497, which will be strictly enforced. What we do *not* want to hear are loud-and-dirty noises from over-driven transceivers!

All necessary information for making an entry is given herewith. Any Club omitted from the Identification Code list (and there can't be many!) should let us know *forthwith* ("Club Secretary", SHORT WAVE MAGAZINE, BUCKINGHAM) so that if necessary a supplementary Ident. Code list can be published next month—though we are hoping that this year it will not be required and that there will be no last-minute panics about getting a code.

## FULL DETAILS FOR MCC

Appear in this issue. Rules are much as last year but Identification Codes are changed. Any Club not included and wanting a code should write in straight away. Dates for the event are November 6/7, and the report and results will appear in the January issue.

## The Reports

Straight down this time, for a change from the Regional approach of recent months.

Midland appear at the top of the pile; they have their being in the Midland Institute, Margaret Street, Birmingham,

ham, 3. In the calendar for October we notice Tuesdays are the ones—October 1 for an extra Natter session, and the 19th for the Annual General Meeting.

Thames Valley are booked in at the "Three Pigeons," Portsmouth Road, Long Ditton, on the first Wednesday of every month; October's evening will be devoted to modifying for 70 and 144 MHz a certain popular type of business-radio equipment, both from a theoretical and a practical point of view.

Up at North Notts, the lads are having an "odd day" extra this time, visiting Newark Club to meet Fred Ward, G2CVV. Normal sessions are on Thursday, and October 7 is particularly noted for a "Forum," with experts to answer any question you care to throw them. For the venue, and any other details, contact G3OZN, as Panel p.498.

The Richmond Terrace buildings of Brighton Technical College will soon be ringing with radio amateur noises when the lads have their fortnightly sessions, and maybe put G3TCB on the air. Any interested folk who would like to visit or join, should get in touch with G2CMH at the address in the Panel for details and dates.

Sad to say, Bristol will be losing their Secretary, G3RKH at the end of September, which means a special farewell evening in the skittle-alley of the Ship Inn, Redcliffe, on September 30. Then the normal meetings at 41 Ducie Road, Barton Hill, Bristol, must still go on; there is a Film Show on October 14, and the AGM to be dealt with on October 28.

Hq. for the Hereford chaps is at the County Control, Civil Defence Headquarters, Goal Street, Hereford; they are here on October 1 for a talk and demonstration by Geoff Tibbetts, G3NUE, of Worcester, "by radio and land-line." Then on October 15, there is the last trip for this year working /P on 144 MHz, weather, of course, permitting—it it doesn't then it is back to Hq. to operate from there.

A change of venue is afoot for the White Rose lads, who apparently have found themselves an old house to be converted into a permanent home; this probably means that the main interest for the next few months will be in paint-pots and brushes! Because of this, it is suggested that if you want the latest information you contact G3YEE, as Panel.

October 7 is the date for South Birmingham, and a most important date at that, because it is the AGM. This will be dealt with at Hampstead House, Fairfax Road, West Heath, Birmingham, starting at 8.0 p.m. sharp.

Unfortunately, Worcester's calendar, printed in the

copy of the *Newsletter* to hand, stops at the end of September; but from it we learn that the venue is the Crown, Broad Street, and the meeting is set on a Saturday evening. For the rest, we must refer you to the hon. secretary—see Panel overleaf.

For **Bedford**, in their place in the Dolphin, Broadway, October seems a full month; on the 7th, Joe Farley is to give a scientific lecture, and on the 14th G3RFG takes the floor to tell all about his Multi-band vertical aerial. This takes us to October 21, and G4AHE, whose theme will be the development of trends in receiver design using Integrated Circuits. Finally, there is the Annual General Meeting on October 28.

'Tis quite a while since last we heard noises from **Otley**, but they are loud and clear this month, and sound as though they are thriving. They have an Annual Open Night on October 26, with a trade stand, visitors welcome from 7.30 p.m. onwards, and refreshments available, at the Club premises, 14 Back of Court House Street, Otley.

**Spenn Valley** seem to be away more than at home in October! On the 7th, there is to be an evening of music, put on by Richard Allen Radio, Ltd., followed by a visit to Basinghall telephone exchange on the 14th; they also have a look round the Yorkshire Post Newspapers Ltd. set-up, starting at 7.0 p.m. The home meetings are always at the Grammar School, High Street, Heckmondwike.

Thursdays it is for **Redditch**, at the Old People's Centre, Park Road. This month sees the October 14 date filled by a talk by G3HZG, who used to be better-known at VR2FT on Fiji, his topic being life in that DX-otic spot, illustrated by slides. Then there is October 28, when the club's own HW-100 will be in action for a night-on-the-air.

At Marle Place, Leylands Road, Burgess Hill, you can find the **Mid-Sussex** lads twice each month. For October, it rather looks like the second and fourth Thursday by extrapolating from the calendar given for the earlier months in the *Newsletters* to hand; however, it would probably be a good idea to check with the hon. secretary, address as Panel, p.498.

**Wirral** are now safely into their new place at the Drill Hall, Grange Road West, Birkenhead, where on October 6 they have the Annual General Meeting, followed by a film show on the 20th.

\* \* \*

There is a clubroom built on to the back of the "Jack o' Newbury" pub at Binfield, just outside Bracknell, and this is the place to find the **Bracknell** boys on the second and fourth Mondays in each month. From the way he wrote, it is rather gathered the scribe has been hustled into the job at the march of events, so at this stage he could not advise of the programme; but like most groups, they no doubt have something laid on.

**Chippenham** have been assembling every week at the Boys' High School, Hardenhuish Lane, for years now; any Tuesday you can find them there. For October, the particular high spots are the Rowde Hamfest on October 5, with talk-in on Top Band to the George and Dragon, Rowde, near Devizes. Kick-off at 8.0 p.m. and refreshments will be available at modest charges—all, of course, welcome. The other event is the film show,

## MCC—TWENTY-SIXTH ANNUAL TOP BAND CLUB TRANSMITTING CONTEST

### RULES

- Duration:** Saturday, November 6, and Sunday, November 7; on both days between the hours of 1700 and 2100 GMT (eight operating hours in all).
- Frequency and Power:** All contacts to be made in the 1800-2000 kHz band, using CW, with a power input not exceeding ten watts to the final stage.
- Call-Signs:** Where a Club has its own call-sign, that is to be used; if no club call-sign is held, the call of a nominated member may be used.
- Scoring:** Other Club stations may be worked once in each session, the contacts counting three points each time. Non-club stations may be worked once in each session, to count for one point each time.
- Contest Exchanges:** Inter-Club contacts will take the form of an exchange of RST *plus* the allocated Club Ident. Code. (See p.500). Non-club contacts to be an exchange of RST and QTH.
- Logs:** The contest logs are to be legibly set out as follows: One side only of quarto or foolscap sheets should be ruled into nine columns, with the Club name and call-sign on *every sheet*. Col. 1, Date and Time; Col. 2, Call of station worked; Col. 3, Outgoing exchange; Col. 4, Incoming exchange; Col. 5, Outgoing RST (non-club); Col. 6, Incoming RST (non-club). Col. 7, QTH of non-club station. Col. 8, QSO Points, Col. 9, Points claimed after multiplier applied.
- Final Tabulation:** To each Club contact, apply the correct Zone multiplier. To each non-club contact, regardless of distance, apply a multiplier of ten. Total the points claimed after multiplying to obtain final score. This, together with a declaration that the station was operated within the rules and spirit of the Contest, and comments on the Rules, equipment used, experiences, and so on, should be on the front sheet of the entry (Multiplier table on p.501).
- Disqualification:** This is at the discretion of the invigilators, and reasons will be given. Typically, disqualification could result from a consistently rough signal, deliberate interference with other stations, over-driving of a transceiver producing strong key-clicks or a spread of spurious, unnecessarily long CQ calls or abbreviated call signs.
- Contest Call:** Call "CQ MCC" only. Shortened c/s must not be used.
- Entries:** Logs, addressed to "Club Secretary", SHORT WAVE MAGAZINE, BUCKINGHAM, must be posted to arrive not later than **Friday, November 19**. Results will appear in the January 1972 issue of SHORT WAVE MAGAZINE, due out on December 31. The Editor's decision is final on all matters affecting the Contest.

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at Hq., to be presented on October 26 by G8BXG.

A new Hq. is the gist of the **Clacton** report; it seems they have a fine place with the Sea Scouts in Sadds Yard, Skelmersdale Road, which is about 100 yards from the main railway station. It is a year since they re-formed, and members now total 41—which is pretty healthy

progress. All are asked to take particular note of the date for the AGM: October 12, at Hq., starting at 1930 promptly.

**Bristol Shirehampton's** secretary writes in from Polperro to say that the summer break for the Club ends after September, and from then it will be "business as usual." G3SXY should be home by the time you read this, so contact him for all the doings—see Panel.

At **Torbay** we are specially asked to announce that the meeting of October 30 is to be a Junk Sale and Extra-Ordinary Meeting, so please make a special effort to be there.

The **RAIBC Radial** for this month carries a good article on his North American trip by G5CP, and an interesting exposition of the help the Club can give, through the "supporters," to the blind and invalid full members, particularly in relation to the question of how much it *really* means to them.

**Saltash** has to cancel their proposed Mobile Rally of September 5, but are still going—and going strongly, at that—on alternate Fridays at Burraton Toc-H. Details of the talks are not, at the time of writing, firm, but we are assured that there will be something definite fixed up.

\* \* \*

**Derby** can be found on Wednesday evenings at Room 4, 119 Green Lane, as well as at other times for different activities. October, for example, mentions a

UHF/SHF NFD; October 6, for a junk sale, and the 13th for film show. A Natter Night on the 20th is followed by the monthly VHF group meeting; then on the 24th there is a D/F contest with a trophy to be won. All this leads us to October 27, when there will be a Hi-Fi demonstration. *Every* month seems to be as busy as this!

**BEA** have now formed their own Amateur Radio Club, with Hq. at the BEA Training Centre, Heston, on the last Wednesday in each month—but if you want to visit, please contact G3OUF first—his address and phone are in the Panel. Moves are also afoot to set up a permanent Club station at Northolt, at the BEA Trident Club there.

At **Wolverhampton** the lads have Neachells Cottage, Stockwell End, Tettenhall, for an Hq., where they can be found on Mondays. A particular date to be noticed is October 4, when the AGM is taken.

**Yeovil** are pleased to report a couple of their lads have obtained licences; members can be found assembled at the Youth Centre, 31 Park Lodge, any Thursday, we understand.

One always notices the distinctive colour-scheme of the cover of the **Cornish Newsletter**, and there is usually something interesting inside, this month being no exception. The main meeting is at the SWEB Clubroom, Pool, Camborne, on the first Thursday in the month. However, at this time we do not have any details of the

#### *Names and Addresses of Club Secretaries reporting in this issue :*

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W3-8LB.  
 BASINGSTOKE: P. Sterry, G3CBU, Ashley, Orchard Road, Salisbury Gardens, Basingstoke.  
 BEDFORD: J. Bennett, G3FWA, 47 Ibbett Close, Kempston (2427), Bedford.  
 BICESTER: T. Shaw, G8EWS, 5 Langford Gardens, Bicester. BRACKNELL: S. Jewell, G8EMY, 108 Highfield Park, Wargrave (2800), Reading, Berks.  
 BRIGHTON (Technical College): R. J. Henley, G2CMH, 35 Wilmington Way, Brighton, BN1-8TH, Sussex.  
 BRISTOL: R. W. Thompson, G3TKF, Stapledon, Hill Drive, Fairland, Bristol.  
 BRISTOL (Shirehampton): E. J. Davis, G3SXY, 72 North View, Westbury Park, Bristol (33284), BS6-7PZ.  
 BRISTOL (University): C. Elliott, G8ADP, 37 Seymour Road, Bristol (421864), BS7-9HS.  
 CAMBRIDGE (University): D. Field, G3XTT, Selwyn College, Cambridge.  
 CHELTENHAM: E. Janes, G2FWA, Hillside, Bushcombe Lane, Woodmancote, Cheltenham (Bishops Cleeve 2229).  
 CHIPPENHAM: P. J. Tuck, 186 St. Edith's Marsh, Bromham (274), Chippenham, Wilts.  
 CLACTON: T. Mills, G3YAI, 75 Lymington Avenue, Clacton-on-Sea (21664), CO15-4PL, Essex.  
 CORNISH: J. Farrar, G3UCQ, Elm Cottage, Ventonleague, Hayle, Cornwall.  
 COVENTRY: C. Jaynes, 20 Belgrave Road, Wyken, Coventry, Warks.  
 CRAY VALLEY: P. Vella, G3WVP, 78 Hurst Road, Sidcup.  
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BM (01-699 6940).  
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21931), DE3-7GE.  
 ECHELFORD: R. Hewes, G3TDR, 24 Brightside Avenue, Laleham-on-Thames (Staines 56513), Middlesex.  
 HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford.  
 HULL: Mrs. M. Longson, 4 Chester Road, Hull, HU5-5QE.  
 MANSFIELD: F. N. F. Bewley, G8HX, 116 Westfield Lane, Mansfield (25208), Notts.  
 MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham, 32.  
 MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (3532), Sussex.  
 NIGERIAN: E. A. Lomax, 5N2ABG, P.O. Box 68, Kaduna, Nigeria.  
 NORTH KENT: L. Randall, G4ACQ, 118 Brook Street, Erith (40800), Kent.

NORTH NOTTS: E. W. Badger, G3OZN, 20 Tennyson Drive, Worksop, Notts.  
 OTLEY: H. S. Johnstone, 12 Rumble Croft, Newall Carr, Otley, Yorks. LS21-2RE.  
 OXFORD: D. R. Ward, 2 Lincoln Road, Oxford (77471), OX1-4TB.  
 PLYMOUTH: S. E. Martin, 32 East Park Avenue, Mutley, Plymouth, PL4-6PF, Devon.  
 R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 331 Wigan Lane, Wigan.  
 REDDITCH: R. J. Mutton, G3EVT, Summerhayes, Mill Lane, Oversley Green, Alcester (2041).  
 SALTASH: J. A. Ennis, G3XWA, 19 Coombe Road, Saltash, (3531), Cornwall, PL12-4ER.  
 SHEFFORD: A. Sullivan, G2DGF, 12 Glebe Road, Letchworth, Herts.  
 SILVER WING (B.E.A.): D. Evans, G3OUF, 2 Meadow Drive, Amersham (3257), Bucks.  
 SOLIHULL: J. Burnie, G8BYM, 12 Buryfield Road, Solihull (021-705 4565), Warks.  
 SOUTH BIRMINGHAM: R. J. Thompson, 23 Fox Hill, Selly Oak, Birmingham, 29.  
 SOUTHGATE: A. Hydes, G3XSV, 6 Glenbrook North, Cotswold Way, Enfield (01-363 8747).  
 SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, M33-3GW.  
 SPEN VALLEY: J. Milnes, G8DSB, 19 Cliffe Road, Staincliffe, Batley, Yorks. (Heckmondwike 2433).  
 THAMES VALLEY: C. Seaman, G3ATF, 40 Park Road, Ashford, Middx.  
 TORBAY: Mrs. G. L. Western, G3NQD, 110 Truro Avenue, Hele, Torquay.  
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, WD2-5JQ.  
 WEST OF SCOTLAND (Glasgow): V. T. Budas, GM3VTB, 28 Kelvinside Gardens, Glasgow, N.W.  
 WHITE ROSE: R. Short, G3YEE, 10 Tyersal Grove, Bradford 4 (664-220), Yorkshire.  
 WIRRAL: A. Fisher, G3WSD, 34 Glenmore Road, Oxton, Birkenhead, Cheshire (051-652 5078).  
 WOLVERHAMPTON: J. Burden, G3UBX, 28 Coalway Road, Wolverhampton, WV3-7LX.  
 WORCESTER: G. Spink, G3WUI, 1 Belvoir Bank, North Malvern, Worcs. (Malvern 3088).  
 YEovil: D. L. MacLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.  
 YORK: J. A. Rainbow, G8BOK, 14 Temple Road, Bishopthorpe, York, YO2-1QN.

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING DAY MONTHLY
Acton, Brentford and Chiswick	66 High Road, Chiswick	October 19
Bicester	11 Stoneburg Cres., Bicester	Fridays
Bristol University	Dept. of Physics, Royal Fort, Tyndall Park Road	Saturdays, 2.30 p.m.
Cambridge University	King's College	October 12
Coventry	121 St. Nicholas Street, Radford Road	Fridays (AGM October 1)
Cray Valley	Congregational Church Hall, Court Road, S.E.9	October 7, October 21
Crystal Palace	Emmanuel Church Hall, Barry Road, S.E.22	October 16
Echelford	The Hall, St. Martins Court, Ashford, Middx.	October 29 (away)
Hull	592, Hessle Road	Fridays
Mansfield	New Inn, Westgate	1st Friday
North Kent	Not quoted	October 14 October 28
Oxford	Cherwell Hotel, Watereaton Road	2nd and 4th Wednesdays
Plymouth	Virginia House, Bretonside	1st and 3rd Tuesdays
Sheffield	Church Hall, Amphil Road	Thursdays
Southgate	Civil Defence Hut, opp. Arnos Grove Tube	2nd Thursday
South Manchester	Sale Moor Community Centre, Norris Road, Sale	Fridays
York	British Legion, 61 Micklegate	Thursdays

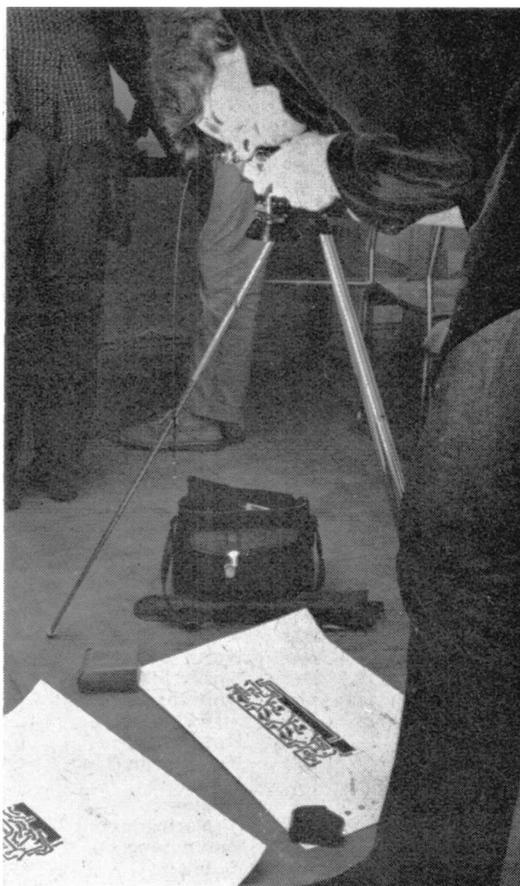
N.B.—In each case, secretary's name and address appears in Panel, p.498.

programme, for which you are referred to G3UCQ, as in Panel opposite.

Chineham House, Shakespeare Road, Popley, is the place where the **Basingstoke** chaps foregather. October 2 is booked for station operation and construction, and on the 16th, they have a constructional competition—an event which nearly always throws up something of interest.

Most months we have something to report from the **Nigerian** group, by way of their *NARS News*—and it is of interest to be told that they have had some enquiries about the Club as a direct result. Of course, they are not just a local group but a full-blown National Society as well—a fact which tends to put a savour into the

(cont'd. p.501)



We might almost call this a Puzzle Picture—but in fact it illustrates part of the Leeds Radio Society project to construct, on a Club basis, a number of small portable two-metre Tx/Rx units which can be easily carried about to meetings (think of the QRM!) and outdoor field events. The printed-circuit layout for each section is photographed and from these, board diagrams are prepared for distribution to members wishing to build up a sophisticated rig involving bi-polars, FET's and the readily obtainable IC's.



“ . . . getting a bit more through the spout here, OM . . . ”

## IDENTIFICATION CODES FOR CLUBS IN "MCC"

<b>Zone A—Scotland</b>		Sheffield (University) <i>B65</i>	Sutton Coldfield <i>C72</i>	Crystal Palace <i>F56</i>
Aberdeen <i>A2</i>		Southport <i>B66</i>	Wirral <i>C73</i>	Culham <i>F57</i>
Ardeer <i>A3</i>		S. Shields <i>B67</i>	Wolverhampton <i>C74</i>	Dartford Heath D/F <i>F58</i>
Border <i>A4</i>		Spenn Valley <i>B68</i>	Worcester <i>C75</i>	Dorking <i>F59</i>
Dundee (Tech. Coll.) <i>A5</i>		Star (Leeds) <i>B69</i>		Dunstable Downs <i>F62</i>
Falkirk Group <i>A6</i>		Sunderland <i>B72</i>		Dursley <i>F63</i>
Glasgow Univ. <i>A7</i>		Thornton Cleveleys (Lancs.) <i>B73</i>	<b>Zone D—Eastern</b>	Ealing <i>F64</i>
Glenrothes <i>A8</i>		Tyneside <i>B74</i>	Bury St. Edmunds <i>D2</i>	East Barnet <i>F65</i>
Greenock <i>A9</i>		Wakefield <i>B75</i>	Cambridge <i>D3</i>	East Kent <i>F66</i>
Heriot-Watt Univ. <i>A22</i>		Westmorland <i>B76</i>	Cambridge (Univ.) <i>D4</i>	Echelford <i>F67</i>
Inverness <i>A23</i>		West Riding Contest <i>B77</i>	Digby R.A.F. <i>D5</i>	Edgware <i>F68</i>
Lothians <i>A24</i>		White Rose <i>B78</i>	Grimsby <i>D6</i>	Fareham <i>F69</i>
Mid-Lanarkshire Group <i>A25</i>		York (Bradford) <i>B79</i>	Grimsby (Wheatsheaf) <i>D7</i>	Fareham (Group) <i>F72</i>
Moray Firth <i>A26</i>			Haverill <i>D8</i>	Fawley <i>F73</i>
Pentlands <i>A27</i>			Ipswich <i>D9</i>	Finchley <i>F74</i>
Radio Club of Scotland <i>A28</i>		<b>Zone C—Midlands</b>	Lincoln <i>D22</i>	G. Kent, Ltd. (Luton) <i>F75</i>
Spey Valley <i>A29</i>		Ashton-u-Lyme <i>C2</i>	Lowestoft <i>D23</i>	Gosport <i>F76</i>
West of Scotland <i>A32</i>		Bromsgrove <i>C3</i>	Norfolk <i>D24</i>	Government Comms. (Cheltenham) <i>F77</i>
<b>Zone B—Northern England</b>		Burslem <i>C4</i>	Pye (Cambridge) <i>D25</i>	Grafton <i>F78</i>
Ainsdale <i>B2</i>		Cannock Chase <i>C5</i>	Scunthorpe <i>D26</i>	Greenford <i>F79</i>
Billingham <i>B3</i>		Chapel Green Country <i>C6</i>	Skegness <i>D27</i>	Guildford <i>F82</i>
Bishops Rawthorne <i>B4</i>		Chester <i>C7</i>	Spalding <i>D28</i>	Harlow <i>F83</i>
Blackpool and Fylde <i>B5</i>		Chesterfield <i>C8</i>	Stowmarket <i>D29</i>	Harrow <i>F84</i>
Bolton <i>B6</i>		Coventry <i>C9</i>	Wattisham R.A.F. <i>D32</i>	Havering <i>F85</i>
Bradford <i>B7</i>		Derby <i>C22</i>	Wymondham <i>D33</i>	Hemel Hempstead <i>F86</i>
Bury and Rossendale <i>B8</i>		Derby (Nunsfield) <i>C23</i>		Henley G.S. <i>F87</i>
Carlisle <i>B9</i>		Dudley <i>C24</i>	<b>Zone F (L)—Southern</b>	High Wycombe <i>F88</i>
Chorley <i>B22</i>		Four Counties <i>C25</i>	Acton, Brentford and Chiswick <i>F2</i>	Hillingdon <i>F89</i>
Cleveland <i>B23</i>		Henley-in-Arden <i>C26</i>	Addiscombe <i>F3</i>	Horsham <i>F92</i>
Culceth, Liverpool <i>B24</i>		Hereford <i>C27</i>	AERE, Harwell <i>F4</i>	Isle of Wight <i>F93</i>
Cumberland <i>B25</i>		Keele (University) <i>C28</i>	Ampfield Contest <i>F5</i>	Kingston <i>F94</i>
Dial House, Salford <i>B26</i>		Kings Norton Contest <i>C29</i>	Ariel (BBC) <i>F6</i>	Leyton and Walthamstow <i>F95</i>
East Lancs. <i>B27</i>		Leicester <i>C32</i>	Axe Vale <i>F7</i>	Loughton <i>F96</i>
Eccles <i>B28</i>		Lichfield <i>C33</i>	Baden-Powell House (London) <i>F8</i>	Luton <i>F97</i>
Fulford <i>B29</i>		Macclesfield <i>C34</i>	Barking <i>F9</i>	Maidenhead <i>F98</i>
Fylingdales <i>B32</i>		Magnus, Newark <i>C35</i>	Basildon <i>F22</i>	Maidstone YMCA <i>F99</i>
Halifax <i>B33</i>		Mansfield <i>C36</i>	Basingstoke <i>F23</i>	Marconi Apprentices (Chelmsford) <i>L2</i>
Hallamshire <i>B34</i>		Melton Mowbray <i>C37</i>	Bedford <i>F24</i>	Medway <i>L3</i>
Hartlepoons <i>B35</i>		Mid-Cheshire <i>C38</i>	Bicester <i>F25</i>	Mid-Herts <i>L4</i>
Hull <i>B36</i>		Midland <i>C39</i>	Bishops Stortford <i>F26</i>	Mid-Sussex <i>L5</i>
Leeds <i>B37</i>		Mid-Warwicks <i>C42</i>	Bracknell <i>F27</i>	Minehead <i>L6</i>
Leyland Hundred <i>B38</i>		Newark <i>C43</i>	Brighton (Technical Coll.) <i>F28</i>	Nailsworth <i>L7</i>
Lindholme R.A.F. <i>B39</i>		Northampton Short Wave <i>C44</i>	Brighton (Coll. of Tech.) <i>F29</i>	Newbury <i>L8</i>
Liverpool <i>B42</i>		North Notts <i>C45</i>	Bristol <i>F32</i>	Newham <i>L9</i>
Liverpool (University) <i>B43</i>		North Staffs. <i>C46</i>	Bristol (Shirehampton) <i>F33</i>	North Bucks. <i>L22</i>
Manchester Group <i>B44</i>		North Staffs. (Polytechnic) <i>C47</i>	Brunel University <i>F35</i>	Northern Poly <i>L23</i>
Manchester (University) <i>B45</i>		Nottingham <i>C48</i>	Burnham Beeches <i>F36</i>	North Kent <i>L24</i>
Manchester Institute of Science and Technology) <i>B46</i>		Nottingham (Univ.) <i>C49</i>	Burnham-on-Sea <i>F37</i>	North Leeds <i>L25</i>
Mexborough <i>B47</i>		Nuneaton <i>C52</i>	Chelmsford <i>F38</i>	Oxford <i>L26</i>
Morpeth <i>B48</i>		Painton (Northampton) <i>C53</i>	Cheltenham G.S. <i>F39</i>	Paddington <i>L27</i>
Newcastle-on-Tyne (University) <i>B49</i>		Peterborough <i>C54</i>	Cheltenham <i>F42</i>	Purley <i>L28</i>
Northern Heights <i>B52</i>		Redditch <i>C55</i>	Cheltenham Group <i>F43</i>	Racal <i>L29</i>
North Liverpool <i>B53</i>		Rugby <i>C56</i>	Chesham <i>F44</i>	Reading <i>L32</i>
Northumbria <i>B54</i>		Salop <i>C57</i>	Cheshunt <i>F45</i>	Redbridge <i>L33</i>
N.W. Durham <i>B55</i>		Sealand R.A.F. <i>C58</i>	Chichester <i>F46</i>	Reigate <i>L34</i>
Ovingham <i>B56</i>		Slade <i>C59</i>	Chiltern <i>F47</i>	Roding Boys <i>L35</i>
Otley <i>B57</i>		Solihull <i>C62</i>	Chippenham <i>F48</i>	Royal Marines, Portsmouth <i>L36</i>
Preston <i>B58</i>		South Birmingham <i>C63</i>	Clifton <i>F49</i>	Royal Navy, Petersfield <i>L37</i>
Rotherham <i>B59</i>		South Manchester <i>C64</i>	Clifton Locking <i>F52</i>	Royal Signals <i>L38</i>
St. Helens <i>B62</i>		Stafford (Coll. of Tech.) <i>C65</i>	Colchester <i>F53</i>	R.A.F. A.R.S., Salisbury <i>L42</i>
Scarborough <i>B63</i>		Stockport <i>C66</i>	Crawley <i>F54</i>	Shefford <i>L43</i>
Sheffield <i>B64</i>		Stoke-on-Trent <i>C67</i>	Cray Valley <i>F55</i>	Silverthorn <i>L44</i>
		Stourbridge <i>C68</i>		
		Stratford-on-Avon <i>C69</i>		

Silver Wing (BEA) L45	Vange, Basildon L72	<b>Zone H—All GW Counties</b>	Univ. College, Cardiff H33
S. Langton School L46	Verulam L74	Bangor H2	Univ. College, Swansea H34
Southampton L47	Veteran Operators L75	Bangor (Univ. College) H3	Welsh H35
Southampton (University) L48	Wanstead and Woodford L76	Barry (Coll. of Further Education) H4	
South Bucks. Contest L49	Wessex L77	Blackwood H5	<b>Zone J—</b>
Southdown L52	West Kent L78	Cardiff H6	<b>Ireland and Isle of Man</b>
Southend-on-Sea L53	Wimbledon L79	Chepstow H7	Ballymena J2
Southgate L54	Winchester L82	Conway Valley H8	Bangor J2
Speedbird (BOAC) L55	Worthing L83	Flint H9	City of Belfast J4
STC, Harlow L56	Yeovil L84	Haverfordwest H22	IRTS Region 1 J5
Stevenage L57		Llanelli G.S. H23	Isle of Man J6
Stroud L58	<b>Zone G—South-Western</b>	Maesteg H24	Limerick J7
Surrey L59	St. Lawrence's, Bodmin G2	Pembroke H25	South-East EI J8
Sussex University L62	Cornish G3	Port Talbot H26	
Sutton and Cheam L63	Exeter G4	Rhyl H27	<b>Zone K—Channel Isles</b>
Swindon L64	North Devon G5	Rhondda H28	Guernsey K2
Taunton L65	Plymouth G6	Sully H29	Jersey K3
Thanet L66	Saltash G7	Swansea Telephone Area H32	
Thames Valley L67	Torbay G8		
Thornbury L68			
University of Essex L69			

**THE MCC ZONES**

The Zone in which a Club is located is indicated by the initial letter of the Ident. Code. The multiplier for a contact with another Club is defined by the Zone letter sent and received, and will be the same for both stations (see Scoring Table). The Zones are as follows:

**Zone A:** All Scottish counties.

**Zone B:** Northern England—Northumberland, Durham, Cumberland, Westmorland, Lancashire and Yorkshire.

**Zone C:** The Midlands—Cheshire, Derby, Shropshire, Stafford, Hereford, Worcester, Warwick, Nottingham, Leicester, Rutland, Northampton, and Huntingdon.

**Zone D:** Eastern—Cambridge, Norfolk, Suffolk and Lincolnshire.

**Zone F (or L):** The South—Somerset, Dorset, Gloucester, Wilts, Berks, Hants, Oxford, Bucks, Herts, Middlesex, Surrey, Sussex, Kent, Essex, London and Bedford.

**Zone G:** South-Western—Devon and Cornwall.

**Zone H:** Wales—All GW counties.

**Zone J:** All EI/GI/GD.

**Zone K:** Channel Isles.

**EXAMPLES FOR OPERATING**

Coventry works Derby and sends 579C9, receives 579C22; Aberdeen works Jersey and sends 559A2, receiving 549K3.

**EXAMPLES FOR SCORING**

Coventry works Derby. Each claims three points x multiplier of ten, equals thirty points.

Aberdeen works Jersey. Each station claims three points x multiplier of twenty, equals sixty points.

Newsletter editorial comment on occasion.

Cheltenham are having a Sale of Surplus Equipment on October 7, at the "Royal Crescent" in Clarence Street, Cheltenham.

There are two get-togethers at Solihull in October. That on October 5 is in the rear bar of the Malt Shovel in High Street. On October 19 things are a little more formal—it is the Annual General Meeting, at the Manor House, High Street, starting at 7.30 p.m.

Now to Verulam, who have the Council Chamber of St. Albans Town Hall for their regular evening sessions. On October 20, G3SBA is coming along to talk about some HF Design and Construction Projects.

Up in Glasgow, West of Scotland (Amateur Radio Society) have got through their AGM, with new elections for 1971-'72— and it is noteworthy that on August 27 they had a record attendance of 96 members. On October 8 they are being hosts to the Ayrshire group. This very active Glasgow group, with more than 100 members after only one year's existence, now have their own callsign, GM4AGG, running K.W. gear on the HF bands and an IC-2F two metres.

**Deadline**

This is one of those blessed (to us, anyway!) months when we have a little more time between issues—the deadline for November is **Friday, October 8**, with all "Clubs" material addressed to: Club Secretary, SHORT WAVE MAGAZINE, BUCKINGHAM. For December issue, it will be *November 5*—but we are not giving you a date for the January, 1972, issue because the Clubs space in that will be devoted to a full report on MCC, the annual Magazine Club Contest on Top Band, taking place during the weekend November 6-7, for which we hope to have a record entry. All gen. herewith!

**Scoring Table**

*Multipliers to be applied to Club Contacts.*

*Contact with own Zone, multiplier 10*

<b>Contact between</b>	<b>Contact between</b>
Zones A and B(V) 11	Zones C(X) and H 11
A " C(X) 13	C(X) " J 13
A " D 14	C(X) " K 15
A " F(L) 15	D " F(L) 11
A " G 17	D " G 15
A " H 13	D " H 12
A " J 15	D " J 15
A " K 20	D " K 15
B(V) " C(X) 11	F(L) " G 11
B(V) " D 13	F(L) " H 11
B(V) " F(L) 13	F(L) " J 15
B(V) " G 15	F(L) " K 15
B(V) " H 13	G " H 11
B(V) " J 13	G " J 15
B(V) " K 20	G " K 12
C(X) " D 11	H " J 11
C(X) " F(L) 11	H " K 12
C(X) " G 12	J " K 12

*Contact with non-Club station, regardless of location, attracts multiplier of 10.*

*N.B. Letters (V) and (X) to accommodate late-entry stations in B and C Zones.*

# 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.

**G3GUE**, A. F. Dowling, Laburnum, Clearway, Addington, Maidstone, Kent. (re-issue). (Tel. West Malling 2557.)

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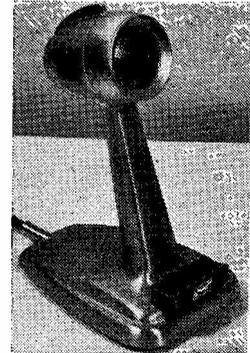
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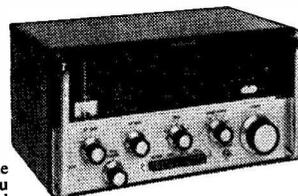
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**EDDYSTONE EC10 Mark II** transistorised communications receiver. A de-luxe version of this famous design now incorporating "S" meter and limited fine tuner. £79.00.

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Due to professional commitments the Eddystone range available to the general public is limited for the time being. However, new models are under development—keep an eye on our advertisements for advanced information. Meantime, the EC10 Mark II continues to prove the most popular medium priced receiver ever introduced by Eddystone.

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## BURNS ELECTRONICS

It is regretted that with effect from November 1, 1971, prices of the Crystal Calibrator, Wavemeter and Frequency Standard will be increased by approximately 10% in order that the present high standard of manufacture can be maintained. However it has been made possible by a continuous programme of development to keep the prices of the Low Pass Filter, FET Converter and FM Detector constant and to reduce that of the Test Oscillator. All orders received before November 1 to be at current prices.

**CRYSTAL CALIBRATOR CC-10.** Battery operated solid state using low power integrated circuits to generate 1 MHz, 500 kHz, 100 kHz, 50 kHz, 10 kHz and 5 kHz and harmonics to above 500 MHz. Stability better than  $\pm 10$ ppm stability. Heterodyne wavemeter and Mod monitor functions. Price: £22-95

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**FREQUENCY STANDARD SD-11.** Provides separate outputs of 1 MHz and 10 MHz phase locked to Droitwich 200 kHz transmission. Battery operated, solid state with self contained aerial. Price: £69-45

**LOW PASS FILTER FL1/FL4.** Reduce BC1/TV1, available 50 or 75 ohms, Passband loss less than  $\frac{1}{2}$  dB, stopband loss 50 dB minimum. Price: £6-20

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**OFFERING:** KW-2000B CW/SSB transceiver; Eddystone 940 receiver; T.C.C. SWR meter.—Dawson, ET5BT, 33 Ardea Road, Dublin, 5, Eire.

**WANTED:** In mint condition, AR-8516L receiver, please state details and price, including carriage in suitable packaging to Holland.—Hendriksen, Lintelostraat 9, Zutphen, Holland.

**FOR SALE:** Trio 9R-59DE receiver, as new, including voltage stabiliser and built-in crystal calibrator, £30. Eagle IP-7 inter-com., complete with two sub-station units, as new, £13 or near offer.—Burrows, 23 Birch Avenue, Ashton-on-Ribble, Preston, PR2-1JU, Lancs.

**SALE:** Brand new Japanese version Lafayette HA-460 10m. transceiver, 20-watt 2E26 final, crystal or VFO control, complete with p-t-t microphone, 12v. DC and 240v. AC PSU's integral, for fixed or mobile working (vehicle mounting brackets supplied), cost £75 but first £45 will secure. Prefer buyer collects.—Beestin, 334 Nine Mile Ride, Wokingham, Berks. (Tel: Eversley 3674, after 6 p.m.).

**WANTED:** Cabinet, front panel and base-plate for Marconi CR-150 receiver; scrap Rx considered if price right. Please give details.—Lang, 4 Lynton Road, Burnham-on-Sea, Somerset.

**FOR SALE:** Eddystone EA-12 receiver, coverage 10 to 160m. bands, with all facilities, including CW and slot filter, as new, £105 or near offer.—Davis, G3VTR, 49 Watersmeet, Harlow (33084), Essex.

**SWL Clearing Shack,** has for disposal cabinets, chassis, mains transformers, speakers, vibrator power supplies and such; also back-number volumes "Short Wave Magazine" and "RSGB Bulletin". Callers welcome at weekends or after 6 p.m. evenings.—Lowson, 4 Julia Place, Old Brechin Road, Forfar, Angus, Scotland.

**WANTED:** Ex-R.A.F. T.1154 transmitter, less PSU, complete and in working order, £5 offered, will pay carriage extra.—Box No. 5037, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**SALE:** Hudson AM-108 Mk.II mobile transceiver, with three channels around 70 MHz, working, unmodified, complete with all crystals, handset, mobile mount and manual, price £12-50.—Michaelson, G3RDG, QTHR, or ring 01-455 8831 (London).

**SALE:** Eddystone S.640 receiver, with S-meter, £20. Codar CR-70A Rx. £15. Codar PR-30 pre-selector, £5. Codar RQ-10 Q-multiplier, £5. Buyers to collect evenings.—Cunningham, 51 Rosemary Lane, Formby (73573), Lancs.

**SELLING:** VHF Tx for two metres, 70 cm. and 23 cm., rack mounted, PA's 3-20A 45w. for two metres, 3-20A 40w. on 70 cm., 2C39A 60w. on 23 cm. Modulation by pair KT88's; all grids and anodes metered, relay controlled, push-to-talk operation, complete with PSU and all cables, £28. Creed 7B page-printer, motor PSU, terminal unit and paper, £20. Local delivery to 50 miles, or carriage extra.—Woodhall, 5 Summerville Avenue, Staining, Nr. Blackpool, Lancs.

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**SALE:** KW-600 linear amplifier, in excellent condition, has just been fitted with a brand new 572B final, price £60, carriage extra.—Box No. 5038, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**OFFERING:** Trio 9R-59DE receiver, with matching SP5D speaker and HS4 headset; all in perfect condition, hardly used and with original packing. Offers invited.—Ring Mathews, 01-876 7868 (London).

**SALE:** National HRO, with miniature valves, all BS coils including 21 MHz and Top Band, stabilised PSU, noise limiter and crystal calibrator, £25. Codar A.T.5 with mains PSU, £18. Carriage extra.—Moser, G3HMR, QTHR.

**OFFERING:** Sommerkamp FT-100 Transceiver, coverage 10 to 80m. bands, mobile PSU fitted, offers around £125.—Hudson, G3BOR, 21 Hallas Lane, Cullingworth, Bradford, BD13-5BX, Yorkshire. (Ring Bradford 23171, 9 a.m. to 5 p.m.).

**SALE:** K.W. Vespa Mk.II, in excellent condition, with mains PSU and crystal microphone, price £87.—Ring Glenn, G3YCU, Wilmslow (Cheshire) 25403.

**SELLING:** Fine example of "G2DAF-type" Rx, with etched front panel and linear VFO; sale at £45 due construction of IC transceiver.—Wiseman, GW3GRY, QTHR, or ring Colwyn Bay 56135.

**SALE:** Hy-Gain 18-AVQ five-band vertical Ae. for £22-50, buyer to collect.—King Spencer, Shenstone (Staffs) 481202.

**EXCHANGE:** Brand-new QQV03-20A for QQV06-40A. E. Boyle, 26 Townview Avenue South, Omagh, C. Tyrone, Northern Ireland. (Tel. Omagh 3785 after 6.0 p.m.)

**SALE:** K.W. Vespa Mk. II with PSU, latest model having 6LQ6 PA, almost new, having had less than 6 hours' use due to business commitments. Cost £135, an absolute gift at £80 in manufacturer's original packing.—Ring Cartwright, G3UCV, Leeds, 643788.

**OFFERING:** Volumes "Short Wave Magazine" 1959-60, 1960-'61, 1961-'62, 1962-'63, 1963-'64, 1964-'65—bound and in perfect condition, at £1-50 each, or near offer (includes postage).—Box No. 5039, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**DISPOSING:** Two-metre gear, including TW2 Tx and PSU, T.W. Twomobile Rx, 10ft. pole, 4-ele J-Beam, frequency meter, etc. (S.W. London).—Box No. X009, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED:** Manual or circuit diagram for Marconi AD.108D, for loan to copy, or purchase. Packing and postage refunded to all correspondents. **SALE:** Heathkit RG-1 receiver, £22.—Day, 38, Woodstock Road, Begbroke, Oxford.

**SALE:** Emsac CN5 Top Band to MW or car radio converter, self-contained, new and as advertised, £5. Home-built solid-state GC superhet, includes Electroniques GC.166T Qoilpax, MW with five SW bands 1-7 to 30 MHz, RF stage, mixer, follower, oscillator, three IF's, product detector, BFO, S-meter, IC-10 AF amplifier, 898 dial, for mains operation, reasonable appearance, price £15 (dial alone worth £7). Postage extra, but prefer buyers inspect and collect.—Ring Hunter, 01-858 1448 (London).

# TRIO

## Communications Accessories

The following accessories are available for use with Trio Communications Equipment...

	Recommended Price
CW Filter for TS510 ... ..	£14-00
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0A2 Mains Voltage Stabiliser ... ..	67p
BI016/L Hand Held Communication Microphone for TS510 ... ..	£3-38
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**WANTED:** To buy or hire, manual for Green Electronics 2M1000 Tx, also circuit for Mullard regulated PSU, Type L.153.—McGregor, G8ENH, 2 Roydstone Road, Bradford 3, Yorkshire. (Tel: Bradford 664404).

**WANTED:** Pye F27AM, Cambridge, Bantams, Westminster, Motaphone. Also wanted, working and unmodified Walkie-Talkies on either 27 or 28.5 MHz.—Kates, G3UHS, QTHR, Caterham (Surrey) 46692.

**SALE:** Codar A.T.5, £15. 250/PSU, £9. Star SR-200 Rx with Codar Q-multiplier, £44. All "or near offer."—Wickham, G3YWB, 25 Westwood Road, Brunton Park Estate, Newcastle-on-Tyne, NE3-5NN. (Tel: 089-4 2473).

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**NOVEMBER issue SHORT WAVE MAGAZINE will appear on Friday, October 29. Single copies at 25p post free can be supplied to orders reaching us by Wednesday 27th for despatch on Thursday 28th, the day before publication. Orders with remittance to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.**

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**SALE:** In very good condition, Eddystone 940, £90. Also Heathkit SB-301, all filters nearly new, price £130. Must clear.—Cliffe, The Willows, Kings Bromley, Burton-on-Trent, Staffs. (Tel: Yoxall 241, evenings).

**WANTED:** Hy-Gain 3DB mobile antenna; Pye AC/10PU power unit; TM-1 test meter; reflectometer Type RLF-1.—Pyatt, 141 The Chantries, Coventry, Warwickshire.

**CONSIDERABLE** Quantity of experimental radio parts left by recently deceased amateur, cheap to clear.—Ring 01-804 892 after 6.00 p.m. for appointment.

**SELLING:** CR-100 receiver, re-valved and realigned, superb, £17.50. R.209, coverage 1.0 to 20 MHz, 12v. DC inverter built in, brand new, £13.—Pugh, G8BSR, 178 Compton Road, Wolverhampton, Staffs.

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**WANTED:** By SWL, good communication receiver and equipment. Details and cash price, please; collection arranged.—Knudsen, 38 Pennington Oval, Lymington, Hants.

**SELLING:** Hallicrafters HT-46 transmitter, as new, coverage 10 to 80m. bands, runs 175w. SSB, 150w. CW. Price £100.—Gibson, 12 Cross Way, Harpenden, Herts.

**WANTED:** Oscilloscope, Hartley Type 13A, also Electroniques front-end Type GC.166. Any condition of either considered.—Hulin, Southview, Station Road, Bramley, near Guildford, Surrey. (Tel: 2279, after 6 p.m.).

**FAILED R.A.E.:** Selling Trio 510 transceiver with PSU, complete and professionally built linear consisting four PL-504's with PSU, all in one cabinet, in excellent condition, price £180 or near offer, or would separate. — Montgomery, 23 Larkham Lane, Plypton, Plymouth (37003) Devon.

**FOR SALE:** Drake TR-4 transceiver, with AC-4 PSU, RV-4 remote VFO, little used and in mint condition, £350.—Barry, 15 Fairlawn Court, London, W4-5EE. (Tel.: 01-994 6931).

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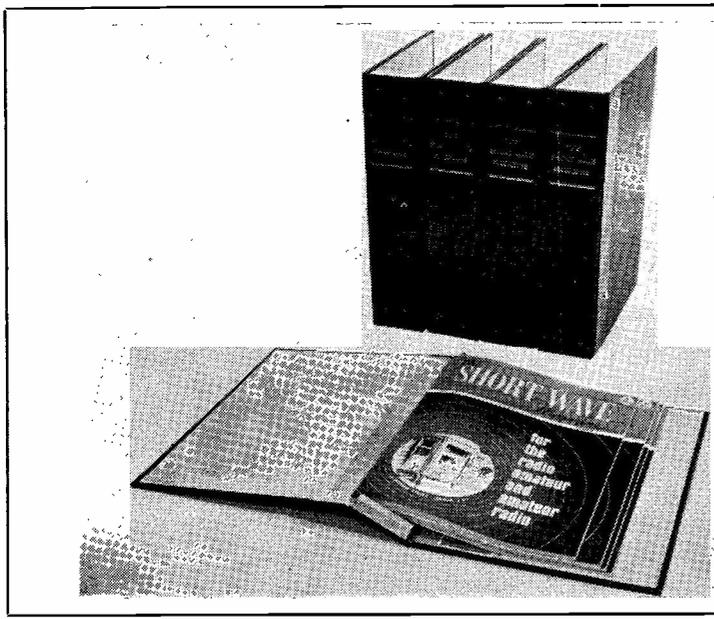
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