

*The*

25p

# SHORT WAVE

*Magazine*

VOL. XXXI

MAY 1973

NUMBER 3



WORLD WIDE COMMUNICATION



**OUR  
AESU MUSEN MAIN DISTRIBUTOR**

**WESTERN**

**"ALL RECEIVERS 'FALL OFF' AT 30MHz!"**

THIS HAS BEEN THE GENERAL OPINION OF RECEIVER SENSITIVITY PERFORMANCE FOR YEARS AND STILL APPLIES TO SOME MODERN EQUIPMENT! HOWEVER,

It does not apply to Yaesu Equipment !

"You don't believe us? Then here are the facts !"

TAKE YOUR PICK! EITHER REFER TO THE R.S.G.B. REVIEW OR OUR TEST ON AN OFF-THE-SHELF

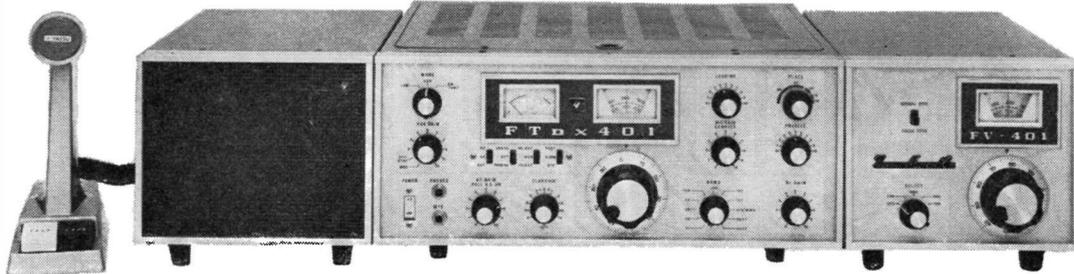
**YAESU FT-401**

YD-844

SP-400

FT-401

FV-401



**RECEIVER MEASURED PERFORMANCE**

In order to compare receiver performance figures one must determine the following :

1. 'Voltage': is it emf or pd across, say 50 ohm input ? There is a 6dB difference!
2. The signal + noise to noise ratio (S + N : N) in dB's.
3. The frequency at which the measurements have been made.
4. The bandwidth used.

Just in the same way as one can't compare apples with oranges, nor can one compare sensitivity figures unless the same standards are used. To use a narrower bandwidth would seem to give a receiver a better noise performance. Equipment used for tests: Marconi signal generator TF2002AS, Digital Synchroniser (Marconi) TF2170AF, Power Meter TF2500.

**SENSITIVITY**

Input Freq. MHz	S+N : N for 0.5µv emf dB	S+S : N for 1.0µv emf dB
3.6	16	22
7.1	19	25
14.2	19	25
21.2	19	25
28.7	20	26
29.7	20	26

**AGC CHARACTERISTIC**

Input emf 14.2MHz	AF output dB	Comparative figures with a £1,200 receiver ! dB
1 microvolt	0	0
3.2 microvolt	+6.5	+6.5
10 microvolt	+8.1	+8.1
32 microvolt	+8.6	+8.6
100 microvolt	+8.8	+8.8
320 microvolt	+8.8	+8.8
1 millivolt	+8.8	+8.8
3.2 millivolt	+8.9	+8.9
10 millivolt	+8.9	+8.9
32 millivolt	+9.0	+9.0
100 millivolt	+9.0	+9.0
320 millivolt	+9.0	+9.0
1 volt	+9.0	+9.0

**INTERMODULATION. In-band 3.7MHz.**  
Measurements made with two Marconi Signal generators TF2002SA, two Digital Synchronisers, Marconi TF2170, Hewlett Packard 302A Wave analyser and resistive combining pad.

Input emf of each generator	2nd order 600MHz dB	3rd order 800MHz dB	3rd order 2600Hz dB
100 microvolts	-37	-24	-38
1 millivolt	-30	-20	-33
10 millivolt	-28	-17	-31
100 millivolt	-26	-16	-30

**INTERMODULATION. Out of Band. Second Order.**  
Inputs at 6.7MHz and 7.5MHz Tuned to 14.2MHz

Input emf of each generator millivolts	Equivalent emf of IM products	dB relative to one input
3.2	Inaudible	Inaudible
10	Inaudible	Inaudible
32	Inaudible	Inaudible
100	0.25 V	-112 dB

**DESENSITISATION**

Wanted signal at 14.210MHz at 1.0µV				
QRM level emf	QRM Freq. MHz	Freq. spacing kHz	QRM Freq. MHz	QRM level emf
mV				mV
4.5	14.20	10	14.22	4.5
6.3	14.19	20	14.23	6.3
12	14.16	50	14.26	12
14	14.11	100	14.31	14
14	13.71	500	14.71	14

Measurements. Receiver tuned to 14.21MHz, RF Gain at max. Mode USB, 1.0V input. Interfering signal at given spacing from wanted signal. Level of QRM signal raised until S + N : N ratio is reduced by 3dB.

**INTERMODULATION : Out of Band. Second Order.**  
Inputs at 21MHz and 6.8MHz Tuned to 14.2MHz

Input emf of each generator millivolts	Equivalent emf of IM product	dB relative to one input
3.2	Inaudible	Inaudible
10	Inaudible	Inaudible
32	0.18 V	-105 dB
100	0.5 V	-105 dB

**INTERMODULATION : Out of Band. Third Order.**  
Inputs at 14.0 and 14.1MHz. Tuned to 14.2MHz

Input emf of each generator millivolts	Equivalent emf of IM product V	dB relative to one input dB
3.2	0.1V	=90
10	0.4V	=88
32	9.0V	=71
100	320.0V	=50

# ELECTRONICS (UK) LTD

So when you hear people say that receivers "fall-off" at 30 MHz or that you sacrifice receiver performance if you buy a transceiver, don't forget to reply, "Not with Yaesu Musen you don't."  
As regards transmitter performance we respectfully draw your attention to the power output figures at 30 MHz and 3.5 MHz. You'll notice they're the same! Now try your own equipment and see how it compares; on second thoughts don't bother as we don't want you to have any sleepless nights! Yes we have a very large stock of OSKER POWER METERS at the old pre-yen re-valuation price of **£18.5 + VAT** so get yours now.

## YAESU PRICES—Carriage paid by Securicor

HF TRANSCEIVERS	PRICE	VAT	HF RECEIVERS	PRICE	VAT
FT-75, 50W p.e.p. 10-80m. 3 Ch. vxo ...	£99.00	£9.90	FR50, Double conversion 10-80m. ...	£65.00	£6.50
FP-75 AC PSU and Speaker for above ...	£22.50	£2.25	FR50 fitted WWV and xtal. Calibrator ...	£69.00	£6.90
DC-75 DC PSU, SPEAKER and MOBILE MOUNT ...	£22.50	£2.25	FR400DX, 160m. 80-10m. (28-29 MHz) ...	£135.00	£13.50
FT-200 240W p.e.p. 10-80m. ...	£145.00	£14.50	FR400SDX, 160-2m. 4 Mech. Filters, 28-30 MHz ...	£175.00	£17.50
FP-200 AC PSU and SPEAKER for FT-200 ...	£45.00	£4.50			
DC-200 DC PSU for FT-200 ...	£51.00	£5.10	<b>MATCHING SPEAKERS</b>		
FT-101 as above + 160m. NEW MODEL ...	£280.00	£28.00	SP101, SP400, SP401 ...	£11.00	£1.00
FT-401, 560W, p.e.p. 10-80m. ...	£265.00	£26.50			
FT-501, Digital Tcvr. ...	£335.00	£33.50	<b>REMOTE VFO's</b>		
			FV-101 for FT-101, FV-200 for FT-200 ...	£42.00	£4.20
<b>VHF TRANSCEIVERS</b>			FV-401 for FT-401 ...	£42.00	£4.20
FT-2FB 2m. 12 Channel, 10W. O/P FM. ...	£98.00	£9.80	FV-50 for FT-75 and FL50 ...	£28.00	£2.80
FT-2AC AC PSU and SPEAKER ...	£27.00	£2.70			
FP-2 ACB, AC PSU/Spkr. and Ni. cad batteries ...	£39.00	£3.90	<b>FREQUENCY COUNTERS</b>		
FT-2 AUTO, 2m. 8 Ch. Scanning ...	£157.00	£15.70	YC-355, 35 MHz, AC or 12v. DC ...	£97.00	£9.70
SIGMAISIZER 200 ...	£180.00	£18.00	YC-355D, 220 MHz, Built-in pre-scaler ...	£120.00	£12.00
<b>HF TRANSMITTERS</b>			<b>LINEAR AMPLIFIERS</b>		
FL 50, 50W, p.e.p. 10-80m. VXO control ...	£75.00	£7.50	FL-2100, 1200W p.e.p. 10-80m. (Matches FT-101) ...	£165.00	£16.50
FL 400 fitted VOX ...	£79.00	£7.90	FL-2000B, As above, Matches FL400 ...	£165.00	£16.50
FL 500, 240W, 10-80m. Transceivers with matching ...			FL-2500 2kW p.e.p. 160-10m. ...	£130.00	£13.00
FR400 receiver ...	£165.00	£16.50			

## NOTE—ADD 10% VAT TO ALL ADVERTISED PRICES BELOW

### NEW/USED EQUIPMENT : 3 months guarantee. Add £1 Securicor delivery.

Collins 7551, very good ...	£175.00	Heath HW32 + HP23 ...	£59.00	Lafayette HA500, 3.5-54 MHz ...	£30.00	Sommerkamp FL-500 Tx ...	£105.00
Codar Pre-selector ...	£5.00	Heath SB101 + HP23 ...	£150.00	National NCX5 ...	£170.00	Tristao, 105ft. Telescopic Tower ...	£225.00
Eddystone EC10 Mk. 2 ...	£60.00	Heath SB303 + CWF ...	£238.00	National NCX500 ...	£165.00	Trio 9R59DS ...	£39.00
Hallcrafters HT32B, 10-80m. Tx. ...	£80.00	New, No VAT ...	£199.00	Pyramid Linear ...	£37.00	Trio JR500SE ...	£35.50
Hallcrafters SX133, Mint ...	£90.00	KW Atlanta, New ...	£149.00	Racal MA79G Drive Unit, Mint ...	£485.00	Trio TS510, Mint ...	£140.00
Hammarlund HX50 Tx. ...	£79.00	KW Atlanta, Used ...	£149.00	Sommerkamp FT-100, 10-160m. ...	£150.00	Trio, Remote VFO ...	£20.00
Hammarlund HQ170A Rx. ...	£70.00	KW 2000A + AC PSU ...	£25.00	Sommerkamp FT-100, 10-160m. ...	£150.00	Yaesu FR50B, Mint ...	£35.00
Heath GR78 Rx. ...	£59.00	KW 2000B + AC PSU ...	£175.00	Sommerkamp FL 200B Tx. ...	£80.00	Yaesu FR400SDX, Mint ...	£149.00
Heath HM102 ...	£18.00	KW Viceroy 1 Tx. ...	£45.00	Sommerkamp FT-250, Tcvr. ...	£135.00	Yaesu FV400S, VFO ...	£30.00
Heath SB610 Monitorscope ...	£39.00	KW Vespa 2 Tx. ...	£90.00	Sommerkamp FT-500 Tcvr. ...	£160.00	Yaesu FT-101, Mint ...	£199.00
Heath HW12 and HP23 ...	£59.00	KW 600 Linear ...	£70.00			Yaesu DC-200, Unused ...	£40.00

## ANTENNA ROTATORS

AR20 (p & p 40p) ...	£20.00	AR22R (p & p 65p) ...	£25.00	TR44 (p & p 75p) ...	£45.00	HY-GAIN, 400 (p & p £1) ...	£115.00
				HAM-M (p & p 80p) ...	£70.00		

## BANTEX FIBREGLASS MOBILE ANTENNAS (Carr. 50p) including Base

70/1/2, 70 MHz, 1/2 wave ...	£3.00	BGA, 144 MHz, 1/2 wave ...	£6.15	Magnetic mount ...	£6.15	Note, Deduct 50p from price of aerial if base is not required.
144/1/2, 144 MHz, 1/2 wave ...	£2.75	B5, 144 MHz, 3/4 wave ...	£4.35	All aerials complete with base.		

## G WHIPS (Carriage 50p, coils 20p)

Tribander 10, 15, 20m. ...	£9.45	LF160 160m. coil ...	£4.00	160 Ranger ...	£7.50	MM80 80m. coil ...	£4.00
LF40 40m. coil ...	£4.00	Whip for LF and MM coils ...	£1.00	Multimobile '71' 10, 15, 20m. 40m. coil ...	£12.50	MM160 160m. coil ...	£4.00
LF80, 80m. coil ...	£4.00	160/180m. Duobander ...	£9.00			Basemounts ...	£1.45

## GEM-QUAD. The best FIBREGLASS 10-15-20m. QUAD

2 ele. ...	£74.50	3 ele. ...	£109.80	4 ele. ...	£144.00	Conversion kits ex-stock.
------------	--------	------------	---------	------------	---------	---------------------------

## HY-GAIN (Carriage paid)

Hy tower, 10-80m. (self-sup) ...	£110.00	LC800, 8mm. coil for 14AVQ ...	£7.75	TH3 Jnr., 10-20m. 3 ele. 600W. ...	£51.50	203BA, 20m. 3 ele. beam ...	£72.00
18V, 10-80m. vertical ...	£12.85	TH6DXX, 10-20m. 6 ele. beam ...	£97.00	Hy-Quad, 10-20m. 2 ele. ...	£74.50	153BA, 15m. 3 ele. beam ...	£36.50
12AVQ, 10-20m. vert. ...	£16.50	TH3MK3, 10-20m. 3 ele. 2 kW ...	£75.00	DB10-15 10-15m. 3 ele. ...	£57.50	103BA, 10m. 3 ele. beam ...	£28.50
14AVQ, 10-40m. vert. ...	£24.50			204BA, 20m. 4 ele. beam ...	£80.00	LA1 Lightning arrester ...	£14.50
18AVT, 10-80m. vert. ...	£35.50					LA2 Lightning arrester ...	£2.50

## J BEAM. Full range in stock

## MOSLEY (Carriage paid) (Ex-Stock) from us for fast delivery

Mustang 10-20m. 3 ele. 2kW ...	£45.00	TA33 Jnr., 10-20m. 3 ele. ...	£36.50	TA32 Jnr., 'E' or 2" mast ...	£26.50	TA31 Jnr. Rotary dipole ...	£17.00
TA33 Jnr. 'E' for 2" mast ...	£37.00	TA32 Jnr. 1-20m. 2 ele. ...	£29.00				

CATALOGUE — Communications equipment, antennas, towers, rotors, 20p.

Hours of Business : 9-5.30 p.m. Monday-Friday, 9-12.30 p.m. Saturday.

AGENTS : MIDLANDS—Andy Martin, G3UDR. Tel. 0608 61839. BUCKS.—Ian Partridge, G3PRR. Tel. Chesham 024-054143.

**WESTERN ELECTRONICS (UK) LTD.**  
OSBORNE ROAD . TOTTON . SOUTHAMPTON SO4 4DN

**TEL. TOTTON (04216) 4930 or 2785**  
Cable : 'AERIAL' SOUTHAMPTON

# LOWE ELECTRONICS

119 Cavendish Road, Matlock, Derbyshire, DE4 3HE

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

John: G3PCY

Bill: G3UBO

Alan: G3MME

## MAIN DISTRIBUTOR FOR YAESU MUSEN EQUIPMENT

Hours: Tuesday to Saturday 9-5.30 (closed 1-2 and all day Monday)

**SERVICE AND SALES** (evenings and weekends only): John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel: Ringmer 812071. Sim GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel. 041-771 0364. Alan GW3YSA, 35 Pen y Waun, Efail Isaf, Nr. Pontypridd, Glam. Tel. Newton Llantwit 3809. Peter Ward, G3XWX, 47 Radstock Avenue, Ward End, Birmingham B36 8HD.

**SERVICE ONLY** (evenings and weekends): Dave Dryden, G3BKQ, 205 Main Street, Thornton, Leics. Sim, John, Alan and Peter will be happy to demonstrate New Yaesu Gear by appointment. They also have a pretty good selection of second-hand trade-ins at the right price.

### Price List

Please note that V.A.T. must be added to the prices below, but carriage is included.

### YAESU MUSEN

#### Receivers

FRdx400 SDL £175.00 FR50B £65.00

#### FR50B Mods:

We can now modify this receiver for 160m. in place of the "AUX" switch position for WWV, and it is a modification we can thoroughly recommend.

We can also extend the 10m. band so that instead of covering 28 to 29.2 MHz it covers the full 28 to 30 MHz for converter use. Note however that the dial remains calibrated from 28 to 29.2. However, it doesn't take long to sort out where everything is.

Finally, for the man who wants everything, we can actually fit a 2m. converter which is switched from the front panel. This is the Weir Mosfet Converter which we think is excellent value for money.

#### PRICES OF OPTIONAL EXTRAS

100 kHz marker crystal ... ..	£2.50
1.5 to 2.0 MHz coverage for top band ...	£5.00
Extended (28-30 MHz) coverage of 10m. for converter use ... ..	£2.50
Both the top band and 10m. mods. done at the same time ... ..	£6.50
Installation of front panel switched 2m. converter to include extended coverage of 10m. ... ..	£20.00

If you require any of the above modifications carried out to your FR50B, please advise us and we will arrange Securicor collection and re-delivery for £4.00.

#### Transmitters

FLdx400 £165.00 FL50B £75.00

#### Transceivers

FT101 ... ..	£280.00	FT200 ... ..	£145.00
FP200 ... ..	£45.00	FTdx401 ... ..	£265.00
FT501 ... ..	£290.00	FP501 ... ..	£45.00
FT75 ... ..	£115.00	FP75 ... ..	£25.00
DC75 ... ..	£25.00	FT2FB ... ..	£98.00

Sigmasizer	£180.00	FT2AUTO ... ..	£157.00
		(fitted 3 channels)	
		(fitted 5 channels)	

### Linears

FL2100 ... £165.00 FL2000B ... £165.00

### Accessories

Remote VFO's (FV101, FV401, FV200) ... ..	£42.00
Remote VFO's (FV50B, FV50C) ... ..	£28.00
Speakers (SPI01, SP401, SP400) ... ..	£11.00
Microphones YD844 (table) ... ..	£13.00
YD846 (hand) ... ..	£5.00
FT101 fans ... ..	£9.00
CW Filters ... ..	£16.00
FT101 AM Filters ... ..	£18.00
Tune-up device: Kit ... ..	£1.50
Assembled ... ..	£3.00

### 2m. Equipment

In addition to the popular Yaesu 2m. FM equipment, FT2FB fitted 3 channels at £98.00, FT2AUTO fitted 5 channels at £157 (extra channels £3.20 each) and the Sigmasizer (200 channels!) at £180, we stock the Liner 2 at £138. This rig is becoming extremely popular and has revolutionized 2m. SSB. It puts out a solid 10 watts of SSB, equally at home, mobile or fixed station, and covers the present SSB portion of 2m. 145.25 to 145.49 (fully tunable on both Rx and Tx). In the event of a change in the Band Plan, the Liner 2 can be made to cover any 240 kHz segment of 2m. by simply changing one crystal.

We also stock the range of Braun equipment which has a reputation for top performance and quality.

SE600 DIG. No compromise AM/FM/SSB/CW with digital readout. Probably the finest piece of 2m. equipment ever to appear on the market. £570.00.

SE280. Top quality 80 channel FM rig featuring a crystal synthesizer and separate Rx and Tx channels for repeater working. £220.00.

DGTC 22. 2m. Converter ... ..	£22.00
DGTC 1702. 70 cms. Converter ... ..	£40.00

Finally, we must mention the 2m. Converter we fit to the FR50B—this is the Weir Mosfet Converter and very attractively priced at £13.65.

**Station Accessories****SWR Meters :**

Asahi twin meter ... ..	£8.00
Hanson single meter ... ..	£5.00
PL259 plugs to suit SWR meters ... ..	30p
Reducers ... ..	10p
Kuranishi Wattmeters ... ..	£35.00
Headphones, low impedance, padded ... ..	£3.00
<b>Microphones</b>	
Yaesu YD844 desk type ... ..	£13.00
YD846 hand type ... ..	£5.00
Katsumi EK9X Keyers ... ..	£9.00
CW practice oscillators ... ..	£2.20
<b>Rotators</b>	
AR22R ... ..	£25.00
TR44 ... ..	£45.00
Ham-M ... ..	£75.00

**Antennas**

Big beams etc.—we can usually supply a top quality beam at a reasonable price—give us a yell.

**Quads**

The Polygon glass fibre quad, excellent value at **£35**

**Verticals**

Asahi Echo 8G 40, 20, 15, and 10m. ... ..	£20.00
Diamond DPI04 20, 15 and 10m. ... ..	£19.00
Diamond DPI03 80, 40m. ... ..	£25.00
Diamond DPI05 80, 40, 20, 15 and 10m. ... ..	£35.00

Note: ALL ITEMS UP TO NOW INCLUDE CARRIAGE BY SECURICOR OR POST BUT FROM NOW ON, CARRIAGE IS EXTRA—PLEASE ENCLOSE SUFFICIENT, WE'LL REFUND ANY EXCESS.

Antennas—Carriage extra, see below.

**Mobile**

G-Whips	Tribander (20, 15 and 10m.)	£10.50
	Multimobile (20, 15 and 10m.)	£12.50
	160, 80 and 40m. loading coils ea.	£4.00
	Top whip sections ... ..	£1.00
	Base section ... ..	£1.45
	Ranger 160m. ... ..	£8.00
	Duobander 160 and 80m. ... ..	£9.00
	Flexiwhips ... ..	£15.00

2m. Whips The elegant Diamond  $\frac{5}{8}$  vertical gutter mounting whip requires no holes in your car. Mounted in seconds ... ..

“J” Beams	2/4y 4 element ... ..	£2.90
	2/6y 6 element ... ..	£3.50
	2/8y 8 element ... ..	£4.20
	2/10y 10 element ... ..	£9.00
	2/14P Parabeam ... ..	£14.30
	2/12 double 6 slot fed ... ..	£6.80
	2/16 double 8 slot fed ... ..	£8.40
	2/10XY crossed 10 ... ..	£12.20

Please specify 50 or 75 ohms

Carriage—The above can be sent British Rail at 50p extra, or can be sent Securicor 24 hour service at £2.00 extra.

**Cable—Postage Extra**

UR43, 8p/m.; UR70, 10p/m.; UR67, 22p/m.  
75 ohm twin feeder, 5p/m.; 300 ohm twin feeder, 5p/m.  
4 core rotator cable for AR22R, 15p/m.  
12 core rotator cable for TR44 and Ham M, 30p/m.

**Baluns—Postage Extra**

Popular HZP 1 : 1 £4.80 HZP 4 : 1 £4.80.  
Rugged Kirk 5075B 1 : 1 2kW broad band, £7.50.  
5075D LF 1 : 1 2kW specially optimised  
for 160, 80 and 40m. dipoles, £6.50.

**Valves**

For common valves like 6BA6's, 6BE6's, 6AU6, etc., we recommend you go to one of the large London dealers in valves—we simply cannot compete with their prices. Quite honestly if we want a common valve, we get it from RST or Z & I rather than go to our Wholesaler—it's cheaper. We recommend you do the same.

Where we can be of service to the Amateur is to stock some of the valves he can't get easily, particularly those used in Yaesu equipment as under :

6AH6, 6BZ6, 6CB6A, 6CL6, 6U8A, 6EW6, 6EH7, 6BM8, 12BY7A. All at **60p** each + VAT, post paid.  
6GK6, **£1.20** + VAT, post paid.  
PA Valves 6JM6A, **£1.50** each + VAT, post paid.  
6JS6C, 6KD6, **£2.00** each + VAT, post paid.

These are supplied in matched pairs at no extra cost. Finally we must mention that we still have some 4CX250 valve bases in stock complete with chimneys. Brand new **£3.00** plus VAT, post paid.

**Service**

Ask anyone who has dealt with us—he is our best advertisement.

**Second Hand Equipment**

We always have the best selection in the best condition, fully checked, serviced and guaranteed. If it is not to your liking, you simply pick up the 'phone and tell us. We collect and you get your money back less the cost of carriage. This takes all the risk out of buying second hand. A SAE will get you our latest second hand list and a large envelope with a 6p stamp on will get you our complete catalogue which runs to over 50 pages, and includes circuit diagrams of all new gear.

**Trade-Ins**

We are always happy to trade in used equipment if it is something we can recommend to another customer. We don't mind if it's faulty because we service all the second hand gear before resale anyway.

**Hire Purchase**

We can arrange Hire Purchase terms on both new and second hand gear. The deposit is a mere 10% and repayment may be spread over 12, 18, 24 or 36 months. Your trade-in gear is perfectly acceptable as a deposit.

**Agents**

Don't forget that our Agents, Sim, in Glasgow, John in Sussex, Alan in S. Wales, and Peter in Birmingham can demonstrate and supply Yaesu gear, have second hand gear for sale, have a wide range of accessories and are available evenings and weekends to help you, advise you or just chat to you. Why not 'phone them if you have any problems?

In the case of Peter in Birmingham, he is operating full time from his home and although not yet on the 'phone is available pretty well any time. Five minutes from the Gravelly Hill interchange (Spaghetti Junction) puts him pretty close to you.

# LOWE ELECTRONICS

**119 CAVENDISH ROAD, MATLOCK, DERBYSHIRE, DE4 3HE**

**Tel. MATLOCK 2817/2430**

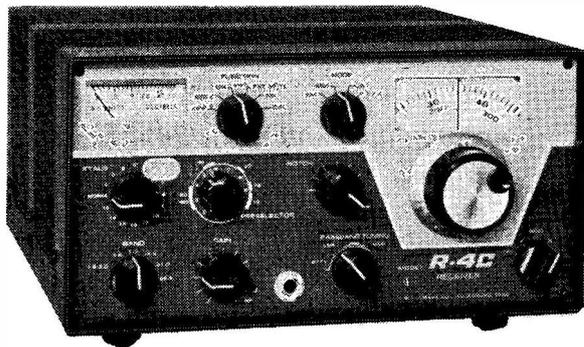
MEMBERS OF THE AMATEUR RADIO RETAILERS ASSOCIATION

# Radio Shack Ltd ★

## London's Amateur Radio Stockists

*Just around the corner from West Hampstead Underground Station*

### *Drake has made The Best better!*



## The New DRAKE R-4C Receiver

#### FEATURES

- Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.
- Covers amateur bands with crystals furnished. Covers all of 8,040, 20 and 15 metres, and 28.5–29.0 MHz of 10 metres.
- Covers 160 metres with accessory crystal. In addition to the amateur bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz. 5.0–6.0 MHz not recommended. Can be used for MARS, WWV, CB Marine and Shortwave Broadcasts.
- Superior selectivity : 2.4 kHz 8-pole filter provided in SSB positions. 8.0 kHz, 6-pole selectivity for AM. Optional filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.
- Smooth and precise passband tuning.
- Tunable notch filter attenuates carriers within passband.
- Transceive capability. May be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.
- USB, LSB, AM and CW on all bands.
- AGC with fast attack and two release times for SSB and AM, or fast release for break-in CW. AGC also may be switched off.
- New high efficiency accessory noise blanker that operates in all modes.
- Crystal lattice filter in first IF prevents cross-modulation and desensitisation due to strong adjacent channel signals.
- Excellent overload and intermodulation characteristics.
- 25 kHz calibrator permits working closer to band edges and segments.
- Scratch resistant epoxy paint finish.

**DRAKE — SALES — SERVICE**

SECURICOR ★ COURIER EXPRESS ★ B.R.S. ★ ACCESS ★ BARCLAYCARD ★ U.D.T.

## **RADIO SHACK LTD.**

**188 BROADHURST GARDENS  
LONDON, NW6 3AY**

*Just around the corner from West Hampstead Underground Station*

Telephone : 01-624 7174 Cables : Radio Shack, London, N.W.6.  
Giro Account No.: 588 7151

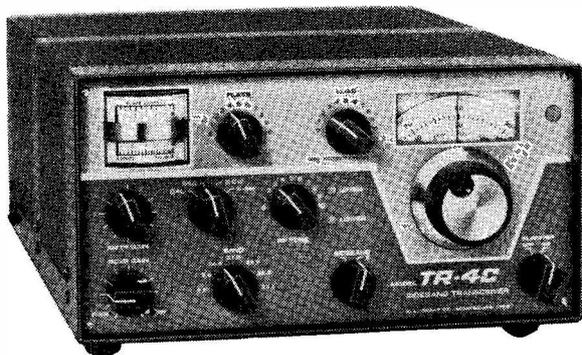
OPEN 6 DAYS 9 —5 CLOSED 1—2 p.m.

# Radio Shack Ltd ★

# London's Amateur Radio Stockists

*Just around the corner from West Hampstead Underground Station*

## *Drake has made The Best better!*



## The New **DRAKE** **TR-4C** Transceiver

The Drake TR-4C is a product of years of transceiver experience and design improvements. The resulting performance makes it one of the finest transceivers available. Its operating handiness is not only evident in circuit design, but also in packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. USB, LSB, CW or AM operation is at your finger tips with 300 watts P.E.P. of communications power.

### INCLUDED FEATURES ;

- **300 Watts PEP** input on SSB, 260 watts input on CW.
- **Complete Amateur Band Coverage**; 80 through 15 metre bands complete and 28.5-29.1 MHz of 10 metres. Rest of 10 metre band obtained with accessory crystals.
- **Separate Sideband Filters**; separate USB and LSB filters eliminate oscillator shifting and insure long term carrier vs filter alignment.
- **Nominal 1.7 ; 1 Filter Shape Factor**; These filters stand among the industry's finest with 6 dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection.
- **Provision For Highly Effective Accessory Noise Blanker.**
- **Heavy Irridited Cadmium Plated Chassis.**
- **CW Side Tone Oscillator** for monitoring your CW transmission.
- **Finish**; scratch resistant epoxy paint.
- **Crystal Calibrator** built-in.
- **VFO Indicator Light** eliminates confusion of which main tuning knob controls the frequency when using an RV-4C remote VFO.
- **Automatic CW Transmit Receive Switching** sometimes called "semi" break-in.
- **Full AGC** with Drake dual time constant system confines a 60 dB signal change to a 3 dB audio change.
- **Effective Transmitting AGC** insures clean SSB output.
- **Solid State Permeability Tuned VFO** for low drift and accurate 1 kHz divisions on all bands. New easy to read dual concentric dials.
- **VOX or PTT** for use on AM or SSB.
- **Receiver S-Meter** automatically switches to indicate transmitting AGC on transit.
- **Transmitter Plate Ammeter** indicates **Relative RF Output** by depressing load control shaft.
- **Adjustable Pi-Network** output circuit.

DRAKE — SALES — SERVICE

SECURICOR ★ COURIER EXPRESS ★ B.R.S. ★ ACCESS ★ BARCLAYCARD ★ UDT

## **RADIO SHACK LTD.**

**188 BROADHURST GARDENS  
LONDON, NW6 3AY**

*Just around the corner from West Hampstead Underground Station*

OPEN 6 DAYS 9-5. CLOSED 1-2 p.m.

Telephone : 01-624 7174 Cables : Radio Shack, London, N.W.6  
Giro Account No.: 588 7151

# THE SENATOR CRYSTAL BANK

G3UGY

Phone 01-769 1639

CRYSTALS FROM STOCK AT KEEN PRICES

**SENATOR CRYSTALS: the first place to contact when you need good crystals quickly.**

29-780 MHz in HC6/U for RX x 2 + 10-7 MHz = 70-260 MHz 4M Mobile £1-65  
 6-74666 MHz in HC6/U for RX x 12 = 10-7 MHz = 70-260 MHz 4M Mobile £1-60  
 11-710 MHz in HC6/U for TX x 6 = 70-260 MHz 4M Mobile £1-60

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

kHz	MHz	MHz
100 in HC13/U ...	£2-50	28-045 in HC25/U ... £1-60
454 in HC6/U ...	£1-75	28-500 in HC25/U ... £1-60
455 in HC6/U ...	£1-75	30-000 in HC6/U ... £1-60
456 in HC6/U ...	£1-75	32-500 in HC18/U ... £1-60
500 in HC6/U ...	£1-75	34-000 in HC18/U ... £1-60
		34-500 in HC18/U ... £1-60
		35-000 in HC18/U ... £1-75
1-000 in HC6/U ...	£1-75	35-500 in HC18/U ... £1-75
2-000 in HC6/U ...	£1-60	38-666 in HC18/U* ... £1-35
3-500 in HC6/U ...	£1-75	40-000 in HC18/U ... £1-60
5-000 in HC25/U* ...	£1-60	42-000 in HC18/U ... £1-60
7-000 in HC6/U ...	£1-50	70-000 in HC18/U* ... £2-00
9-000 in HC6/U ...	£1-50	71-000 in HC18/U ... £2-00
10-000 in HC6/U ...	£1-50	72-425 in HC18/U ... £1-75
10-245 in HC25/U ...	£1-60	72-500 in HC25/U ... £1-75
11-000 in HC6/U ...	£1-50	72-525 in HC18/U ... £1-75
24-500 in HC18/U ...	£1-60	96-000 in HC18/U ... £2-00
26-500 in HC18/U* ...	£1-60	116-000 in HC18/U ... £2-80

\* = Also in HC6/U

NEW FREQUENCIES FOR POPULAR CHANNELS :

44-593333 MHz in HC6/U for RX x 3 + 10-7 MHz = 144-480MHz F.M. Channel £1-80  
 45-016667 MHz in HC6/U for RX x 3 + 10-7 MHz = 145-750MHz Repeater Out £1-80  
 8-063888 MHz in HC6/U for TX x 18 = 145-150MHz Repeater In £1-65  
 4-031944 MHz in HC6/U for TX x 36 = 145-150MHz Repeater In £1-65  
 4-027777 MHz in HC6/U for TX x 36 = 145-000 Mobile £1-65  
 4-013333 MHz in HC6/U for TX x 36 = 144-480MHz F.M. Channel £1-65

NEW FREQUENCIES now available :

1-6202 MHz and 1-6184 MHz in HC6/U (spacing 1-8 kHz) at £1-80 each  
 33-6666 MHz in HC6/U ... £1-60  
 43-333 MHz in HC18/U ... £1-70  
 46-666 MHz in HC18/U ... £1-70  
 47-3333 MHz in HC18/U ... £1-70  
 48-3333 MHz in HC18/U ... £1-70  
 58-000 MHz in HC18/U ... £1-70  
 10-866667 MHz in HC6/U ... £1-70  
 9-975 MHz in HC6/U ... £1-70

And here's our STOCK range of BRAND NEW HC6/U 8 MHz for 2M :  
 8-002 8-007 8-012 8-018 8-021 8-0266 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.

8-0555 MHz in HC6/U for TX x 18 = 145-000 MHz 2M Mobile £1-25  
 44-7666 MHz in HC6/U for RX x 3 + 10-7 MHz = 145-000 MHz 2M Mobile £1-80  
 8-100 MHz in HC6/U for TX x 18 = 145-800 MHz for RAEN £1-25  
 45-0333 MHz in HC6/U for RX x 3 + 10-7 MHz = 145-800 MHz for RAEN £1-80  
 12-975 MHz in HC6/U for RX x 12 = 10-7 MHz = 145-000 MHz 2M Mobile £1-60  
 11-1916 MHz in HC6/U for RX x 12 + 10-7 MHz = 145-000 MHz 2M Mobile £1-60  
 12-0833 MHz in HC6/U for TX x 12 = 145-000 MHz 2M Mobile £1-60  
 8-7825 MHz in HC6/U for TX x 8 = 70-260 MHz 4M Mobile £1-60

Prices for specially manufactured SENATOR Crystals are as follows (made to Ministry of Defence Standards) :

50-149-9 kHz in HC13/U ... £4-60  
 150-499 kHz in HC6/U ... £3-85  
 450-500 kHz in HC6/U ... £3-50  
 501-999 kHz in HC1/U ... £4-50  
 1-000- 1-39 MHz in HC6/U ... £3-20  
 1-40 - 20-00 MHz in HC6/U (18/U & 25/U over 5 MHz) ... £2-00  
 20-00 - 59-99 MHz in HC6/U ; HC18/U ; HC25/U ... £2-25  
 60-00 - 79-99 MHz in HC6/U ; HC18/U ; HC25/U ... £2-50  
 80-00 - 114-00 MHz in HC6/U ; HC18/U ; HC25/U ... £3-00  
 114-00 - 140-99 MHz in HC6/U ; HC18/U ; HC25/U ... £7-00  
 141-00 - 175-99 MHz in HC6/U ; HC18/U ; HC25/U ... £8-75  
 176-00 - 200-00 MHz in HC6/U ; HC18/U ; HC25/U ... £12-00

ANNUAL VACATION CLOSURE: JUNE 30 THRU JULY 30. NO DESPATCHES.

**V.A.T. ADD 10% TO ALL PRICES.**

Mail Order SENATOR CRYSTALS Dept. S.W., 36 Valleyfield Road, SW16 2HR

Latest FT-101 Transceivers, and full range of equipment from Stock. Checked (and adjusted where necessary) by experienced KW Engineers, before despatch. Your purchase of imported equipment is given professional care and attention. The most modern (and expensive) Test equipment in the Amateur Radio Trade, in this country, is available to our Engineers.

Usual KW courtesy and service. Easy terms available.

**K.W. Developments Ltd.**  
 1 HEATH STREET, DARTFORD, KENT  
 Telephone : Dartford 25574

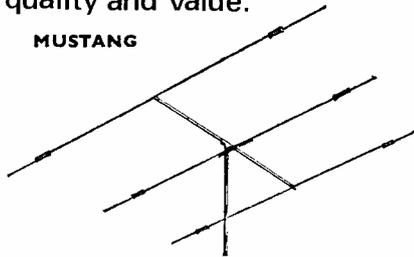
G3ACQ offers : CRYSTALS, 72p each post paid ; AERIALS : trapped dipoles, HY-GAIN verticals, TH3 ; J BEAMS and rotators, bantex whips ; telomast ; YAESU MUSEN : FR50 ; FT75 ; TRIO : 9R59DS ; JR310 ; TSS15 ; SOLID STATE MODULES : 2 metre, 4 metre, 70 CM converters ; KATSUM : electronic keyer ; JUNKERS : straight key ; DIGITAL CLOCKS : coax ribbon feeders—TRIO sig generator and valve voltmeters.

**S. MAY (Leicester) LTD.**  
 12/14 CHURCHGATE, CITY CENTRE,  
 LEICESTER LE1 4AJ  
 Telephone 58662

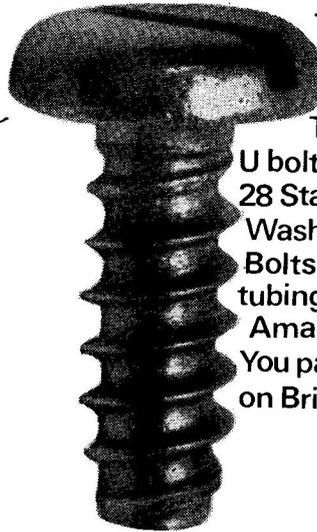


Our antennas are built around Stainless Steel hardware and heat treated alloy tubing for highest quality and value.

# its a steal!



MUSTANG



Take the 2KW Mustang you get  
 48 Stainless Steel Self Tappers, 8 Stainless Steel U bolts, 16 Stainless Steel Nuts 28 Stainless Steel Spring-Washers, 12 Stainless Steel Bolts together with traps tubing etc.  
**Amazing! all for £48.40p** (includes VAT)  
 You pay no extraneous costs on British Mosley Antennas

FOR ALL ANTENNA DETAILS:  
 Send for complete Handbook, containing full details and prices of Antennas and other technical information. 25 pages, 15p  
 Refundable upon purchase of an Antenna.

ROTATORS, TOWERS  
 CABLES, INSULATORS ETC.

## MOSLEY Electronics Ltd

Administrative Address only  
 40 Valley Road, New Costessey, Norwich, Norfolk, NOR 26K



### R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

KW VESPA 2 and p.s.u.	£105.00 (£3.00)
HEATHKIT GR 64	£25.00 (£1.00)
KW/GELOS CONVERTER (into 4.5 MHz)	£16.00 (50p)
LAFAYETTE HA350	£60.00 (£1.50)
LAFAYETTE HA800	£48.00 (£1.00)
HEATHKIT RA1	£35.00 (£1.00)
LAFAYETTE HE 80	£50.00 (£1.50)
HARMARLUND SP-600-JX6	£135.00 (£2.00)
EDDYSTONE 960 Receiver	£45.00 (£3.00)
HEATHKIT DX 100 Transmitter	£60.00 (£1.00)
EDDYSTONE EC10 Mk. 2	£35.00 (£1.00)
KW 2000A with A.C. p.s.u.	£180.00 (£3.00)
NATIONAL NCX-5 with A.C. p.s.u.	£220.00 (£3.00)
TRIO TS 510 with A.C. p.s.u.	£150.00 (£3.00)
EDDYSTONE 960 Receiver	£45.00 (£3.00)
KW 201 Receiver	£58.00 (£1.00)
HEATHKIT RGI Receiver	£90.00 (£2.00)
TRIO JR-500-SE Receiver	£33.00 (£1.00)
RCA AR88D Receiver	£75.00 (£2.00)
TW 160 Communicator 12v. D.C.	£48.00 (£1.50)

WE CAN ALSO SUPPLY ANY MAKE OF NEW EQUIPMENT—and have pleasure in giving a few examples which are normally in stock—

#### STOCKISTS OF YAESU MUSEN EQUIPMENT.

AVOMETERS, Model 7, Mk. 2, £37.60; Model 8, Mk. 5, £40.90; Model 9, Mk. 4, £40.90; Model 40, Mk. 2, £37.60; Model 72, £18.20; Multimeter, Mk. 4, £13.50; Standard leather carrying case (Models 7, 8, 9, 40), £6.50; Every-Ready ditto, £7.40; Multimeter leather case, £3.30; 10KV D.C. Multiplier for Model 8 or 9, £6.10; 30KV D.C. ditto, £9.90; Pair of Long Reach Safety Clips, £1.50; Models EA113 Electronic Avo, £82.00. All above post free in U.K. Trade and Educational enquiries invited.

S. G. BROWN'S HEADPHONES, Type "F" 120 ohms, high quality, electro dynamic, £7.55 (25p); Rubber earpads for same, 45p per pair (5p); Type 3C/1100 Noise excluding (with superb fitting), high quality, electro dynamic, £7.55 (25p); Standard Jack Plugs, 24p (4p).

EDDYSTONE EQUIPMENT, Receivers, 830/7, £389.00; EC10/2, £86.00; 1000, £210; 1001, £230; 1002, £293; 1004, £280; 924 A.C. mains p.s.u., £7.75 (50p); Doublet Aerial, 731/1, £7.50 (50p); Plinth Speaker, 906, £6.20 (50p); General Purpose Speaker, 935, £3.55 (40p); Edometer, 902 Mk. 2, £29.50 (50p); Telescopic Aerial, LP, 3126, £2.50 (25p); Die-cast Boxes from 45p (10p). Brochure on request.

CODAR EQUIPMENT, CR70A, £27.50 (65p); PR30X, £9.50 (30p); PR40, £8.90 (30p); Leaflets on request.

LAFAYETTE HA600 Receiver £50.00 (50p); LAFAYETTE HA800, £57.50 (50p).

NOTE: We request that from April 1st 10% VAT must be added to all prices, new & secondhand, inc. carr. & packing. Carriage for England, Scotland and Wales shown in brackets. Terms: C.W.O., Approved Monthly Accounts, Hire Purchase and Part Exchange. Special facilities for export.

At R.T. & I.

- ★ We have full H.P. facilities.
- ★ Part exchanges are a pleasure.
- ★ We purchase for cash.
- ★ We offer a first-class overhaul service for your electronic equipment, whether you are an amateur or professional user.
- ★ We have EASY Packing facilities.
- ★ We welcome your enquiries for specific items which although not advertised, may very well be in stock.

FREE SHURE MIC. WITH EVERY KW TRANSMITTER or TRANSCEIVER purchased

PARTRIDGE "JOYSTICKS," "New Lightweight VFA" £11.00 (40p). "JOYMATCH" III, Aerial Unit, £11.00 (40p). LO-Z500, £16.00 (40p); ATU kit, £4.50 (30p); ATU assembled, £5.50 (30p); Artificial earth £4.50 (30p); Aerial Bandswitch, £4.50 (30p). Literature on request.

TRIO EQUIPMENT, Receivers: 5R59DS, £49.50 (£1.00); JR 310, £75.00 (£1.00); JR 599, £185.00 (£1.50); Transmitter TX-599, £185.00 (£3.00); Transceiver TS 515 and PS 515, £210.00 (£3.00); Loudspeaker SP5D, £4.50 (50p); Headphones HS4 (equivalent), £6.00 (20p); Stabiliser, 60p (5p). Leaflets available.

SHURE MICROPHONES, 444T, £15.00 (40p); 444, £13.00 (40p); 401A, £6.50 (30p); 201, £5.40 (30p); 202, £6.00 (30p). Full details on request.

KEYNECTORS, piano key mains connector units, £2.95 (25p).

VALVES, Please state your requirements.

ADVANCE DMM2 DIGITAL MULTIMETER, £99.00 (50p), etc., etc. TMK METERS: TMK500, £9.00 (25p); TW20CB, £11.25 (25p); TP5SN £6.25 (25p); 700, £18.00 (25p); also leather cases.

PHILIPS PM2403 ELECTRONIC MULTIMETER, £49.00 (25p), etc., etc. We also supply PHILIPS and KORTING COLOUR TV TEST EQUIPMENT, including Colour Bar Generators, Convertors, etc.

KW EQUIPMENT (Don't forget your FREE mic. with every Tx. and Txcr.!) KW2000B + A.C. p.s.u., £240.00 (£2.00); D.C. p.s.u. for KW2000B, £44.00 (50p); KW 2000B only, £200.00 (£1.50); KW2000E plus A.C. p.s.u., £265.00 (£3.00); KW ATLANTA + A.C. p.s.u., £190.00 (£2.00); Remote V.F.O. for Atlanta, £34.00 (50p); VOX unit for Atlanta, £7.50 (25p); Remote V.F.O. for 2000B, £36.00 (50p); KWI1000 Linear amplifier, £135.00 (£1.50); KW202 Receiver with calibrator, £140.00 (£1.50); KW 202 Matching speaker, £8.00 (80p); KW204 Transmitter, £160.00 (£2.00); KW107 combined E-Z Match; VSWR indicator, dummy load, and ant. switch (4 outlets) 52 or 75 ohms, £46.00 (50p); KW103 VSWR and power meter, 52 ohms, £12.50 (45p); KW101, VSWR meter, 52 and 75 ohms, £8.25 (30p); also E-Z match, dummy load, trap dipoles etc., etc. Details on request.

### R. T. & I. ELECTRONICS LTD.

Ashville Old Hall, Ashville Road, London, E11 4DX Tel: 01-539 4986

# AMATEUR ELECTRONICS G3FIK

BIRMINGHAM 021-327 1497 021-327 6313

MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION



## SOMMERKAMP FT-501 E

We are now pleased to announce the arrival of the new SOMMERKAMP FT-501E DIGITAL READ-OUT TRANSCEIVER. Since this was first announced at the end of last year there has been tremendous interest in this new top specification Transceiver and now at long last the first stocks of this exciting new unit have arrived. Quite apart from the Digital Read-out feature this new model has a specification exceeding that of anything comparable on the U.K. market today and incorporates three separate filters, high stability and sensitivity plus a high power capability of 560 watts p.e.p. To date this is the ultimate that we have seen in Transceivers.

We have a continuing and ever-growing turnover in used equipment, some items of which we show below but which, alas, is also subject to 10% VAT, as with new gear. Many people wonder if this, in fact, is the true situation and we have a feeling that some customers may think that the extra 10% levied is merely a device to maintain second-hand prices at around the same level, pro-rata, as new. This is not so and without exception this 10% figure is passed on in full to Customs and Excise. PLEASE NOTE: All prices shown include carriage but not VAT.

- TRIO TS-500/PS-500 TRANSCEIVER. Good condition ... £117.50
- EDDYSTONE 940 RECEIVER with speaker/plinth. Mint ... £117.50
- EDDYSTONE EA12 RECEIVER. Excellent condition ... £145.00
- EDDYSTONE EA12 RECEIVER. Immaculate, with speaker/plinth ... £150.00
- KW2000 TRANSMITTER. Good condition ... £115.00
- KW2000 TRANSMITTER. Above average ... £120.00
- HEATH HW-32 TRANSCEIVER with matching PSU, excellent ... £66.50
- HEATH HA-14 LINEAR with matching PSU, excellent ... £60.00
- HEATH HA-100 TRANSCEIVER with matching A.C. and D.C. p.s.u. ... £135.00
- TRIO 9R59DE RECEIVER. Very nice condition ... £36.50
- TRIO JR-310 RECEIVER. Could be sold as brand new ... £65.00
- YAESU FR50B RECEIVER. Absolutely mint ... £55.00
- EDDYSTONE EC10 MARK II RECEIVER. Very slight marks on edge ... £65.00
- HEATH GR78 RECEIVER. Absolutely as new ... £65.00
- LAFAYETTE HA-350 RECEIVER. Good general condition ... £32.50
- TRIO 9R59DE RECEIVER, not original but OK and a good buy at ... £30.00
- EDDYSTONE 840A RECEIVER. Fair externally ... £35.00
- CODAR CR70A RECEIVER. Very good ... £18.00
- LAFAYETTE HA63 RECEIVER. Good general condition ... £25.00
- HAMMARLUND HQ100 RECEIVER. Good performance, soiled front panel ... £35.00
- KW VESPA MARK I TRANSMITTER. Very clean condition ... £81.50

AN S.A.E. WILL BRING YOU OUR LATEST USED EQUIPMENT LIST

- Osker Block SWR200 Power Meters. The ultimate in SWR/Power Bridges ... £19.25
- TCC SWR Bridges C3042. Single meter model ... £5.00
- TCC SWR/Power Bridges C3005. Twin meter model ... £7.85
- Sansei Miniature SWR/Power Meter SE406 ... £3.80
- Medco Filters. The best on the market, FL50A and FL75A 50 ohm Belling Connectors ... £6.00
- FL50B and FL75B 75 ohm PL259 connectors ... £6.50
- FH40 High Pass ... £2.35
- Copal Clocks. Now down in price. All types ex stock. Illustrated list by return.
- Amphenol PL259 Connectors ... ea. 30p
- Belling Coaxial Connectors ... ea. 10p
- 50 ohm Heavy Duty Coax ... yd. 22p (Carriage extra)

- J. Beam Antennas. Illustrated catalogue on receipt of S.A.E. Full range in stock.
- G-Whip Antennas all ex stock. Catalogue by return.
- Shure Microphones Model 201 Hand ... £5.75
- Model 444 Desk ... £13.25 (S.A.E. with enquiries please)
- Mosley Antennas TA31 Jnr. ... £15.50
- TA32 Jnr. E. ... £25.00
- TA33 Jnr. E. ... £35.50
- Hy-Gain Antennas I2-AVQ Vertical ... £16.50
- I4-AVQ Vertical ... £24.50
- I8-AVT/WB Vertical ... £35.50
- LC-80Q Loading coil ... £7.50
- TH3 Jnr. 3 ele. beam ... £51.50
- TH3 Mk. III 3 ele. beam ... £75.00
- TH6 Mk. III 3 ele. beam ... £75.00
- TH6 DX 6 ele. beam ... £97.00
- BN-86 Balun ... £8.00 (Carriage extra on Mosley/Hy-Gain)
- Rotators. All post paid. Stolle Memomatic 3001 ... £22.40
- Stolle Automatic 2010 ... £28.00
- CDE AR20 ... £20.40
- CDE AR22 ... £25.65
- CDE TR44 ... £45.75
- CDE Ham-M ... £70.80
- Wightraps Standard pairs ... £2.90
- High Power ... £3.90

Please don't forget to add 10% VAT on all prices shown.

HOME DEMONSTRATION SERVICE! As previously announced this is available on all new gear through our Northern and Southern representatives:—

Northern: JOHN ROWLEY, G3KAE, Castle Rise, West Ayton, Scarborough. Tel: West Ayton 3039.

Southern: JEFF HARRIS, G3LWM, Cricketfield Lane, Bishops Stortford, Herts. Tel.: 0279-56347.

**ELECTRON HOUSE, 508-514 ALUM ROCK ROAD, BIRMINGHAM, 8.**

# SOLID STATE MODULES

Telephone : 0484 - 23991

**63 WOODHEAD ROAD,  
SOLID, LOCKWOOD,  
HUDDERSFIELD, HD4 6ER**

MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION



SENTINEL MF

**SPECIFICATION COVERING ALL OUR V.H.F. CONVERTERS**

- ★ Noise figure 2 dB. Gain 30 dB.
- ★ Protected dual gate MOSFETs in RF and mixers for excellent overload and cross modulation characteristics.
- ★ All housed in aluminium cases, stove enamelled silver hammer with black trim.
- ★ Every one carefully adjusted for bandwidth and noise figure on our spectrum analyser

**THE SENTINEL M.F. Becoming a very popular unit.**

Receives 2 metres on a conventional M.W. B.C. receiver, particularly useful for use with a car radio. IF output 0.5 to 1.5 MHz for 144-145 and 145-146 MHz in two switched bands. "OFF" position switches M.W. aerial straight through to receiver. Double conversion design with two switched crystal oscillators. No frequency multiplication. Size: 5" x 1 1/2" front panel 4" deep. Price: £20.62.

**THE SENTINEL 2 METRE OR 4 METRE DUAL GATE MOSFET CONVERTER**

By far the most popular converters. Stock IFs for 2 metres: 2-4 MHz, 4-6 MHz, 9-11 MHz, 14-16 MHz, 18-20 MHz, 23-25 MHz, 24-26 MHz, 27-29.7 MHz, 28-30 MHz; 4 metre IF: 28-28.7 MHz. Size: 2 1/2" x 3 x 1 1/2" except the 2-4 MHz and 4-6 MHz which being double conversion are 2 1/2" x 4" x 1 1/2". Price: £15.12.

**THE SENTINEL X DUAL GATE MOSFET 2 METRE CONVERTER**

This 2 metre converter is a de luxe version of our well established Sentinel converter. Contains internal mains power supply but can be used with external batteries. It features an RF gain control to reduce cross modulation and overload of the main receiver and may be switched between mains and battery. Size: 5" x 1 1/2" front panel 4" deep. It uses fundamental crystals on the required frequency i.e. no multiplication. IFs from stock: 27.7-29.7 MHz, 28-30 MHz. Price including P.S.U., £21.45

**THE SENTINEL LOW NOISE FET 2 METRE PRE-AMPLIFIER**

- ★ Low noise figure 1 dB. Transistors selected for low noise figure.
- ★ Gain 18 dB. 12v. D.C. at 5 mA. Isolated supply lines.
- ★ If you are in doubt about the performance of your receiving set up, one of these pre-amps will remove the doubt. Price: £7.15.

Want to receive 70 cms. cheaply but well?

**SM70 70 cms. Converter**

- ★ Low noise figure 4.5 dB.
- ★ IF output 144-146 MHz. By using the 70 cm. converter with a 2 metre converter you can have a high performance 70 cm. unit at a low price, £15.12.

**NEW! SSN EUROPA 10 TO 2 METRE SSB TRANSVERTER**

This unit plugs straight into Yaesu SSB equipment. Although it is compatible with all 28-30 MHz transceiver or separate transmitter/receiver arrangements. Receiver converter specification is the same as our Sentinels.

Transmit converter uses two QV03/10 and one QV06/40 P.A. Overall size: 9" x 4 1/2" front panel 4" deep. Price: £64.35 less valves. QV03/10 £1.37; QV06/40, £11.00. You can, of course, obtain used valves much cheaper than this.

T.B.C. 1. Top Band to Medium Wave converters. Price: £8.25.

3CG Crystal controlled calibration Generator. Price: £17.60.

Magnetic Devices 951, 12 volt change-over relay, £4.12.

Europa deliveries may be ex-stock during May—all the other units advertised should be ex-stock, you can always ring for confirmation. Call in any time to have a look at the stuff. G3MXG.

# YOUR MIDLAND STOCKISTS

Stabilised P.S.U. 240v. A.C. input, 3-6-7.5-9v. D.C. output -4A., £3.75, 16p Carr.

Packs of connecting wire, 5 x 5 yds., flexible or solid, 20p, 10p Carr.

Packs of resistors, assorted values, 75p, 16p Carr.

Packs of capacitors, assorted values, 75p, 16p Carr.

Packs of Transistors (unmarked), 76p, 16p Carr.

Recording tape by well known manufacturer, (not boxed), 5in. STD, 38p, 16p Carr.; 5in. LP and 5 1/2in. STD, 45p, 16p Carr.; 5 1/2in. LP and 7in. STD, 60p, 16p Carr.; 7in. LP, 80p, 16p Carr.

C1134 valves (equiv. to QVO 3-20A.), £5.00 16p Carr.

Ferric chloride liquid, 500 ML, 52p, 16p Carr. Super servisol switch cleaner aerosol, 40p, 16p Carr.

Inverter transformer with circuit, 12v. D.C. to 230v. A.C. 40w. approx. 50 Hz, £3.25 16p Carr.

Cassette tapes by Scotch, Philips, EMI, BASF, Agfa, C60, 52p, 8p Carr.; C90, 74p 8p Carr.; C120, £1.09, 8p Carr.

Finnigans Hammerite paint, 250 ML, 40p, 16p Carr.; 500 ML, 80p, 16p Carr.; 1 gal., £2.45, Carr. at cost; 1 gal., £3.30, carr. at cost. Colours: black, silver, red, deep green, deep blue, blue, bronze, green.

**WE STOCK A COMPREHENSIVE RANGE OF R.S. COMPONENTS, J. BEAM AERIALS AND FITTINGS**

**YAESU MUSEN**

FT101 Transceiver 160-10M. £280.00

FR50B receiver, 80-10M with cal. £69.00

FT2FB 2M transceiver with tone burst £98.00

**TEST EQUIPMENT**

Osker power meter Carr. £18.50, 25p

SWR 200 52/75 Ω £13.50, 25p

Tech TE-15 GDO 44 280 MHz £46.00, 25p

KW 107 ATU/SWR meter £8.25, 25p

KW 101 SWR meter £12.50, 25p

Raymart Bandchecker £5.25, 25p

**TRIO**

9R-59 DS receiver 5-30 MHz £49.50

JR310 receiver, 80-10M £75.00

SP5D speaker £4.50

TR72002M transceiver £129.00

**KW**

2000E transceiver, 160-10M £265.00

with A.C. P.S.U.

202 receiver, 160-10M £140.00

speaker for above £8.00

204 transmitter, 160-10M £160.00

**EDDYSTONE**

EC10TMk. II receiver, 5-30 MHz £86.00

**TEST METERS**

			Carr.
TMK	TP10S	2K/V	£6.77, 21p
	TP5S	20K/V	£8.91, 21p
	500	30K/V	£13.00, 21p
	700B	50K/V	£29.96, 25p
Sanwa	P2B	2K/V	£5.77, 21p
	JP5D	2K/V	£6.93, 21p
	U50DX	20K/V	£9.90, 21p
	A303TRD	20K/V	£13.00, 21p
Tech.	380CE	33-3K/V	£18.90 21p
	ITI	20K/V	£5.25, 21p
Reace	T-1K	1K/V	£2.40, 16p

**BOOKS**

"Making a Radio"	15p, 8p
"How to make Walkie Talkies for Licensed Operation"	40p, 16p
"Radio Teach Yourself"	75p, 21p
"Surplus Equipment Manual"	£3.25, 25p
"Pre Fix Maps"	65p, 6p

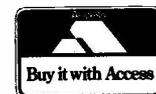
**NO V.A.T. ON BOOKS**

**AERIALS**

Bantex fibreglass 2M 1/2 wave	£4.35	} Carriage at cost approx. £1.00
Bantex fibreglass 2M 1/4 wave	£2.85	
Halsol 160M whip	£7.40	
G whip 160M Ranger	£7.50	
G whip 160/80M	£9.00	

**PLEASE ADD 10% VAT TO ALL PRICES**

NO C.O.D. PLEASE PRINT YOUR ADDRESS. YOU MAY ORDER GOODS BY PHONE AND PAY BY ACCESS OR BARCLAYCARD. SIMPLY QUOTE YOUR CARD NO. TEL: 021-236-1635



**AMATEUR RADIO**  
**CHAS. H. YOUNG LTD.**  
170-172 CORPORATION ST. BIRMINGHAM B4 6UD

# NORTH WEST ELECTRICS, G3MAX

769, STOCKPORT ROAD,  
MANCHESTER, 19.

LEVENSHULME,

Phone: 061-224 4911

**EDDYSTONE RECEIVERS & DIECAST BOXES.  
TRIO RECEIVERS. JACKSON CAPACITORS &  
DRIVES. DENCO COILS.**

**PLUS 10% V.A.T.**

**TRANSFORMER.** Specially wound for Digital instruments. 200 volt 40 mA HT. 6 volt IA. Two windings LT. Will supply 6v. 2A. or 12v. IA. CT  $2\frac{3}{8}'' \times 2'' \times 2\frac{1}{2}''$ , £1.50, post 25p.

**TRANSFORMER** for clock, £1.25, post 25p.

**TRANSFORMER.** Ex. Equip. potted. 4 x 6.4v. at 2A. each winding tapped at 5v. and 2.5v. size  $4\frac{1}{2}'' \times 3'' \times 3''$ , £1.75, post 50p.

**INSTRUMENT CONTROL KNOBS.** Black and bright Ali. centre,  $\frac{1}{4}''$  brass insert with grub screw. 1",  $1\frac{1}{2}''$  and  $1\frac{1}{2}''$  dia., 15p each, post 5p each. Any excess refunded.

**DIECAST BOXES.** With fitted lid. Post 10p per box.

Cat. No. 7969P $3\frac{3}{8}'' \times 1\frac{1}{2}'' \times 1\frac{7}{32}''$ ,	39p
Cat. No. 7134P $4\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1''$ ,	46p
Cat. No. 6908P $4\frac{1}{2}'' \times 3\frac{1}{2}'' \times 2''$ ,	65p
Cat. No. 6827P $7\frac{1}{2}'' \times 4\frac{1}{2}'' \times 2''$ ,	£1.04
Cat. No. 6357P $7\frac{1}{2}'' \times 4\frac{1}{2}'' \times 3''$ ,	£1.13

Sizes shown are approx. internal dia.

**ALI. MINI BOXES.** With fitted lid. Post 5p per box.

$3'' \times 2'' \times 1''$ , 33p	$5\frac{1}{2}'' \times 4'' \times 1\frac{1}{2}''$ , 43p
$4'' \times 2\frac{1}{2}'' \times 1\frac{1}{2}''$ , 38p	$4'' \times 2\frac{1}{2}'' \times 2\frac{1}{2}''$ , 38p
$4'' \times 4'' \times 1\frac{1}{2}''$ , 38p	$5'' \times 2\frac{3}{4}'' \times 1\frac{1}{2}''$ , 38p

**FINNED ALUMINIUM HEAT SINKS.** 5" x 2" ready drilled for TO3, 25p. 5" x 4" undrilled, 37½p. 5" x 8", undrilled, 65p, post 10p.

**POLYPROPYLENE ROPE.** 500 lb. Strain. 100 yd. reel, £1, post 15p. (This item is now in stock).

**CONSTANT VOLTAGE TRANSFORMER.** Brand new. Advance. 60 watts 230v., £7, carr. £1.

**DENCO COILS.** Most ranges in stock, 40p ea., post paid.

**CONTROL UNIT, TYPE 384.** This unit contains:  $3\frac{1}{2}''$  desyn indicator. 5 mA right hand zero meter  $1\frac{1}{2}''$  dia. 6 var. res. with gear drive on 2:2 DP push buttons. 2-1 pole 12 way. 1-8 pole 5 way, 2 bank switches. 3-62, 2-42 ohm 5W res. Excellent value, 87½p, post 27½p.

**IF STRIP.** Ex R3673 Rx. 7.5 MHz with circuit. Less valves. 8 B7G PTFE holders. Sealed relay twin 500 ohm coil. 12 pin plug and socket, 50p, post 20p.

**CONVERTER 20 to 90 MHz.** 7.5 MHz IF. Ex 3673 Rx. 2/EF91's. 1-6J6 Osc., £1.25, post 20p. Some less valves, 75p, post 20p. Supplied with circuit.

**Business Hours:** Tuesday-Friday, 9.30 a.m. to 6.00 p.m.

SATURDAY: 9 a.m.-5 p.m. OPEN ALL DAY

CLOSED ALL DAY MONDAY

## COMPONENTS

FOR

### FREQUENCY COUNTERS & CLOCKS

**NEW BOARDS MANUFACTURED TO OUR SPECIFICATION, COMPONENTS NOT INCLUDED IN PRICE OF BOARD.**

**8 DIGIT READOUT BOARD ASSEMBLY, £4.50, post 10p.** Printed to use ZM1020 1" dia. end readout tubes. Front board takes holders for ZM1020s and 74141N Nixie drivers. Back board takes 7490 and 7475 Quad latch. Boards mount back to back to make an ideal assembly for frequency counter, etc. Board size:  $10'' \times 2\frac{1}{2}''$ . Front or back board available, £2.25 ea.

**READOUT BOARD.** 4 Digit, uses GNP7 wire ended, side viewing tubes. 7490 dividers, 7475 latch and 74141 Nixie driver. Printed for reset 0, can be wired to reset 9. Size:  $4\frac{1}{2}'' \times 3''$ . £1.50, post 5p.

**GNP7.** Wire ended side viewing. A7001 Wire-ended side viewing, £1.50 ea. Post Paid.

**TIME BASE BOARD.** Gives all pulses needed to control readout for counter. Uses 7400 Osc. 1 MHz. 6 off 7490 Divider chain to 1 cycle. 7474 clocked dual D, 7413 Schmitt trigger. 7400 pulse outputs. 2N3708 latch output. Size:  $4\frac{3}{8}'' \times 2\frac{1}{2}''$ . Use BC107 to drive 8 latches, £1.50, post 5p.

**PRINTED BOARD FOR 72710N** op amp. Counter front end.  $2\frac{1}{2}'' \times 1\frac{1}{2}''$ , 45p, post paid.

**PRINTED CIRCUIT HOLDERS FOR ZM1020, 28p** each, post 5p. 8 way ribbon cable for connecting boards, 20p yd., post 5p. yd. (8 x 4" sections required for linking boards.)

**READOUT TUBES.** ZM1020 1" dia. end viewing, £1.50 each with holder, 4 for £5, post paid. Supplied with Chassis or printed circuit holders.

**DIGITAL CLOCK BOARD.** 4 digit 12 hour. Uses 7 off SN7490's. 1-SN7413, 3-SN7414, 1-C407. Printed to use A7001 midget side viewing tubes, £1.50, post 5p.  $4\frac{1}{2}''$  square.

**A7001 TUBES.** Full set of parts for 12 hour clock, £20, post paid.

**NEW TEXAS I.C.'s.** 7400, 22½p; 7413, 40p; 7490, 86p; 7474, 45p; 7414, £1.12; 7475, 55p; 72710, 46p; 72741, 75p. Post 5p each.

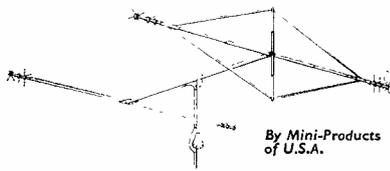
**ALL BOARDS ARE HIGH QUALITY PRINT ON FIBRE GLASS. HOLDERS FOR I.C.'s.** Low profile 14 or 16 pin, 15p each, postage 5p each and including up to 5 off.

WE WELCOME ALL ENQUIRIES HOWEVER SMALL

Stamped address envelope please for special offer list.

MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION

**SOLE UK DISTRIBUTORS FOR  
MINI-BEAMS  
NO GARDEN IS TOO SMALL!**



- \* 10-15-20 metres
- \* 1500 watts rating
- \* 6ft. turning radius
- \* No traps to burn out
- \* High efficiency
- \* Good band-width
- \* 50 ohm coax feed

By Mini-Products of U.S.A.

TYPE HQ-1 ABOVE ... .. £46.75 (1.50) Send large  
ALSO B24 MODEL ... .. £35.75 (1.50) S.A.E. for  
C4 3 BAND VERTICAL ... .. £20.70 (1.00) details

TVI? Try the new HPIA filter designed for UHF TV receivers. This unique filter provides high rejection of hf band signals and worthwhile immunity on 4 and 2 metres. Both inner and outer conductors of the coax are effectively filtered by the HPIA ... £1.32 (10p)

5 BAND DIPOLE—Spring is here! Make yourself an all band dipole using High Power Wightraps. Full instructions are provided with each pair of traps at the low price of ... £3.68 (20p)

FERRITE RINGS—As advocated in Radio Communication, April 1973, for curing audio interference ... .. 20p (post free)

CQ 2 METRE MOBILES—We are now stocking the super 3/4th wave mobile antenna direct from the U.S.A. by Antenna Specialists. This is a professional antenna designed for commercial communication links. It has a smart spring base and built-in matching transformer for true 3db gain. Why pay out for expensive solid state amplifiers that tax your battery when you can double your effective power simply by installing our whip ... .. £12.00 (50p)

S.A.E. for further details

IMPORTERS DISTRIBUTORS EXPORTERS  
**WATERS ELECTRONICS**  
8, GAY BOWERS, HOCKLEY, ESSEX.

CALLERS BY APPOINTMENT.

EVENINGS 03704 4930

**NEW!** BEAMS — QUADS — VERTICALS  
HIGH PERFORMANCE LOW COST!  
10-160 METRES

We are now the sole distributors in the United Kingdom for the GOTHAM range of antennas. Famous in the U.S.A. for over 20 years. GOTHAM produce a wide range of quads, beams, and verticals that will put you in the DX front line.

**GOTHAM TRIBAND QUAD**—less cumbersome than most full size quads and easily erected by one man (which is more than can be said for most quads).

- ★ FULL SIZE ELEMENTS
- ★ ALL METAL FRAMEWORK
- ★ NO BAMBOO TO ROT
- ★ 10-15-20 METRES
- ★ 5 kW RATING
- ★ SINGLE 52 OHM FEED

— THE LOWEST PRICED TRIBAND QUAD AVAILABLE —

**GOTHAM 20 METRE 3 ELEMENT DX BEAM**—This really is a no compromise antenna for the amateur who demands top performance at a realistic price. The 20 metre performance of most trapped triband beams leaves much to be desired in respect of both gain and front to back ratio. With the rapid decline in 10 and 15 metres most of the DX will be carried on 20 metres for the next few years. Why not take down your tribander and join the top DXers with a full size wide spaced beam for 20 metres.

**GOTHAM—10-160 METRE VERTICAL**—Well known for many years in the U.S.A. this 23ft. high antenna will surely find its way into many back gardens in the U.K. where space is a problem. Ideal for fixed or portable work it is the only 6 band antenna available and is fed with 52 ohm coax.

**GOTHAM PRICES**—At the time of going to press final U.K. prices were not known. However as usual our prices will be the lowest possible. We anticipate prices 50% below some makes of antennas and this is one of the reasons why GOTHAM antennas are so popular in the U.S.A. After all, one full size antenna is much the same as another so far as performance is concerned. It's the price that counts!

**Ever had Component Problems?**

1. Problems of choosing your components?
2. Problems of getting them quickly?
3. Problems of locating a supplier?

**CHEER UP!** **HOME RADIO** (COMPONENTS) LTD  
have created a catalogue and an organisation that between them solve your problems simply & economically

**PUT US TO THE TEST**  
FIRST YOU'LL NEED THE CATALOGUE.  
SEND COUPON with 75p CHEQUE or P.O.  
YOU'LL NEVER SPEND 15 BOB BETTER!

Please use block capitals

Name .....

Address .....

**HOME RADIO (Components) LTD.** 712966 London  
Dept. SW, 234-240 London Rd, Mitcham, CR4 3HD

# When did your car last save you money?

Why not do the repairs and maintenance on your car using the world famous Heathkit automotive aids? It will make a marked change in the QRM level!

For instance, the CM-1050 portable engine analyser (A) is the most versatile automotive testing and trouble-shooting instrument we've ever offered—and at its low kit price gives unbeatable value. Whether you are a professional mechanic or a Saturday do-it-yourselfer, the Heathkit engine analyser is just the tool for you.

Any ignition problems can be easily solved using the ignition analyser, model CO-1015, (B). It detects shorted spark plugs, bad points, defective wiring, etc.

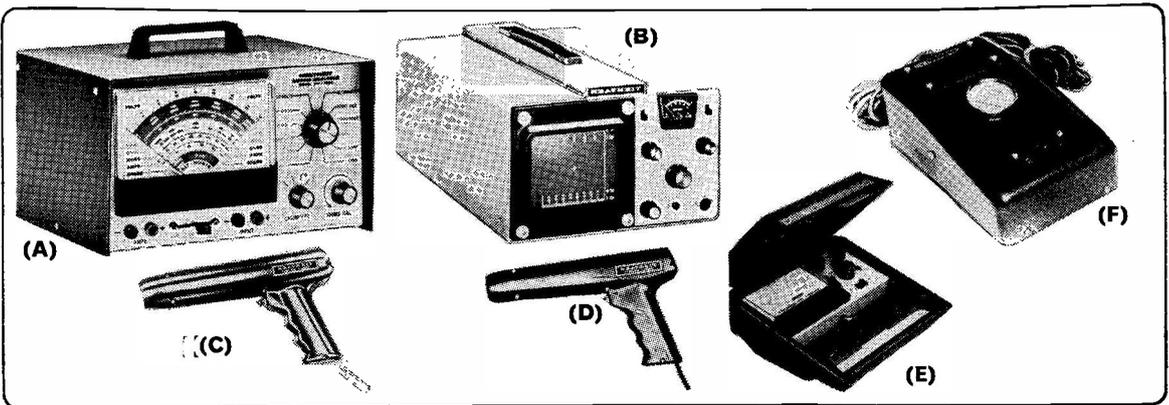
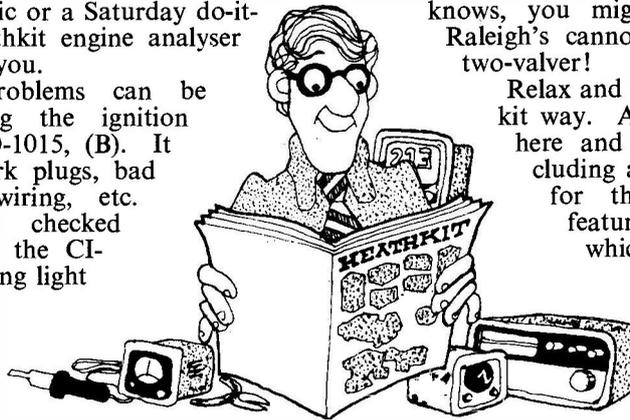
Timing can be checked quickly with either the CI-1020 solid-state timing light

(C) or the CI-1050 inductive pick-up timing light (D).

Our handy portable 3 in 1 tune-up meter, the IT-18, (E), is also making new friends throughout Europe. Battery feeling a little sick? Use our robust battery charger, kit model UBC-4, (F), for a healthy start.

Fancy a little different fun on the beach? Take along a Heathkit metal detector—who knows, you might discover Sir Walter Raleigh's cannon or an ancient British two-valver!

Relax and enjoy yourself the Heathkit way. All the models mentioned here and many, many more, including a wide range of products for the radio amateur, are featured in our latest catalogue which is yours—FREE! Just post the coupon.



Send for details of our Continuous Credit Terms!

Please send me the FREE Heathkit catalogue

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**HEATH**

**Schlumberger**

Heath (Gloucester) Limited  
Dept. SW/05/73  
Bristol Road, Gloucester GL2 6EE

## Heathkit Showrooms

**LONDON**  
233 Tottenham Court Road.  
Tel: 636 7349

**GLOUCESTER**  
(Factory and Head Office),  
Bristol Road, Gloucester, GL2 6EE.  
Tel: (0452) 29451

... another  
winner from

**KW**

## The KW 2000E

A KW 2000E with 500 kHz  
VFO COVERAGE 10-160  
metres

Complete with  
AC PSU **£265-00**  
+ VAT (carriage extra)

Includes the following features :  
TOP BAND with switch to legal U.K.  
limit.  
Reliable 6146's in PA.  
Built in Calibrator 100 Hz + WWV.  
IRT/JTT & VOX.  
"Break in" CV. All crystals supplied.  
10 metres coverage 28.0-30.0 MHz.  
KW after sales service and spares for 5  
years (possible 10 years).  
New R.F. Stage.  
Smooth 2 speed Slow-motion drive.

### K. W. ELECTRONICS LTD.

1 Heath Street, Dartford, Kent.  
Tel. Dartford 25574/21919



ALSO—KW 202 Receiver 10-160m. KW204 SSB/CW/AM  
Transmitter. KW 107 SUPERMatch. KW 103 SWR/RF  
Power Meter. KW 101 SWR Meter (52 and 75 ohm).  
KW E-Z Match. Low Pass Filters.

Antennas—Beams—Dummy Load—Antenna Switch—Baluns,  
etc.

NOW AVAILABLE—KW MONITORSCOPE in matching  
'G' Line Cabinet—KW 2000B/202/204/107/ etc.

Write or 'phone for latest catalogue.

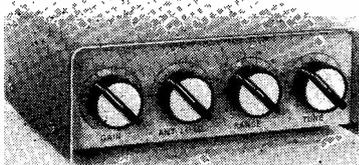
**KW**  
ELECTRONICS  
LIMITED

All Equipment Available  
through accredited agents

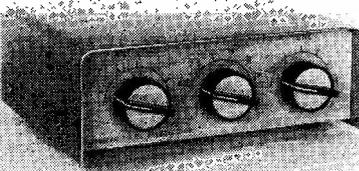
**EASY TERMS ON EQUIPMENT AVAILABLE OVER 12, 18 OR 24 MONTHS**



**P.M.IIA**



**P.M.IIB**



**P.M.IIC**

#### PRESELECTORS

**P.M.IIA.** This is a preselector covering from 1-8 to 32 MHz in six overlapping ranges, having an antenna coupler to make the most of your aerial, followed by an EF80 to amplify the signal up to some 20/25 dB before it reaches the receiver. Complete with silicon/transformer fused supply and indicator. **£9-20** plus 25p postage. Can also be supplied with a built-in 1 MHz crystal calibrator. **£13-20** plus 25p postage.

**P.M.IIB.** All solid state covering the same ranges as the P.M.IIA 1-8/32 MHz with an antenna tuner. Utilizing an F.E.T. with Bipolar. Having a gain of some 20/25 db. Controls as the P.M.IIA having "Antenna Load," Bandswitch, "Tune" and Gain control. Battery powered. **£8-50** plus 25p postage.

**P.M.IIBX.** Specification as the P.M.IIB with the addition of an internal mains power supply with indicator and fuse. **£10-80** plus 25p postage.

**P.M.IIC.** Our latest and lowest priced solid state unit covering 3-5 MHz to 32 MHz in five overlapping ranges with an antenna tuner. Having the same R.F. section, F.E.T. with Bipolar and gain as the P.M.IIB. This unit features a "Listen Thru" facility; when it is switched off the antenna automatically passes the unit and goes direct to the receiver. Having three easy to use controls, Antenna Load, Tune and Bandswitch. Battery powered and priced **£6-85** plus 25p postage.

#### CALIBRATORS

**P.M.V.** Extremely small unit having a 1 MHz oscillator and 100 kHz I/C divider. Modulation applied at 1 kHz. **£7-75** plus 25p postage.

**P.M.VIII.** Battery driven with outputs at 1 MHz, 100 kHz, 10 kHz and modulation at 1 kHz. Oscillator adjustable to a frequency standard transmission, again using I/C dividers. **£11-75** plus 25p postage.

**P.M.IX.** Mains powered de luxe version of the above, having outputs at 1 MHz, 500 kHz, 100 kHz, 50 kHz, 10 kHz and again modulation at 1 kHz when required. It has a silicon/transformer fused supply, with indicator and gain control. **£19-50** plus 25p postage.

All these calibrators give harmonics up to at least 144 MHz.

Send for illustrated leaflets on this equipment.

**HAMGEAR ELECTRONICS**  
**29 CARLYLE ROAD, NORWICH, NOR 66C**

ADVERTISERS INDEX

	Page
Aero and General Supplies	144
Amateur Electronics (G3FIK)	137
B.I.E.T. ... ..	135
J. Birkett ... ..	185
British National Radio School	189
I. N. Cline ... ..	186
Colomor Electronics ...	183
Derwent Radio <i>inside front cover</i>	
E. & E. Services ... ..	188
Eddystone Agents ... ..	188
Eley Electronics <i>inside back cover</i>	
Ensign Electronics ... ..	188
G3HSC ... ..	184
G.W.M. Radio ... ..	186
Hamgear Electronics ...	142
Heath (Gloucester) Ltd. ...	141
Holdings Photo Audio Centre (Trio) ... ..	188
Home Radio (Comp.) Ltd.	140
Imhofs ... ..	186
Johns Radio ... ..	182
K.W. Electronics ... ..	142
K.W. Developments, Ltd.	134
Lowe Electronics ... ..	130, 131
S. May (Leicester) Ltd. ...	134
Mosley Electronics ... ..	136
Gerald Myers ... ..	135
North West Electrics ...	139
P. & P. Developments <i>back cover</i>	
Partridge Electronics Ltd.	144
Practical Electronics ... ..	187
Radio Shack Ltd. ... ..	132, 133
R. T. & I. Electronics Ltd.	136
Scottish & Home Department	189
SCS Components ... ..	185
Senator Crystals ... ..	134
Semicon Indexes ... ..	184
Small Advertisements ...	180-184
Solid State Modules ... ..	138
Spacemark ... ..	189
SSB Products ... ..	181
Stephens-James ... ..	135
Strumech Engineering ...	186
Studio Electronics ... ..	181
S.W.M. Publications <i>inside back cover, back cover, 184, 190, 191,</i>	<i>192</i>
Taurus Electrical Services	188
J. & A. Tweedy (Electronic Supplies) Ltd. ... ..	183
Reg Ward & Co. Ltd. ... ..	185
Waters Electronics ... ..	140
Western Electronics Ltd. <i>inside front cover,</i>	<i>129</i>
Chas. H. Young Ltd. ... ..	138

# SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXXI

MAY, 1973

No. 355

## CONTENTS

	Page
Editorial— <i>Praiseworthy!</i> ... ..	145
Communication and DX News, <i>by E. P. Essery, G3KFE</i> ... ..	146
Knowing About SS/TV, <i>by D. J. Standen, G4BSU</i> ... ..	152
Book Review— <i>Wire Antennas</i> ... ..	154
Antenna Noise Bridge, <i>by G. Denby, G3FCW</i> ... ..	155
Absorption and Indicating Wavemeters, <i>by F. G. Rayer, A.I.E.R.E., G3OGR</i> ... ..	158
“SWL”— <i>Listener Feature</i> ... ..	162
The Month with The Clubs— <i>From Reports</i> ... ..	167
The Mobile Scene ... ..	172
Specially on The Air ... ..	173
VHF Bands, <i>by A. H. Dormer, G3DAH</i> ... ..	174
New QTH's... ..	179

*Managing Editor:* AUSTIN FORSYTH, O.B.E. (G6FO/G3SWM)

*Advertising:* Maria Greenwood

*Published at 55 Victoria Street, London, SW1H-0HF, on the last Friday of the month, dated the month following. Telephone: 01-222 5341 & 5342*

**Annual Subscription:** *Home: £2.75 (£3.00 first class) post paid  
Overseas: £2.75 (\$7.00 U.S.), post free surface mail*

**Editorial Address:** Short Wave Magazine, BUCKINGHAM, MK18 1RQ, England

### AUTHORS' MSS

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

© Short Wave Magazine Ltd.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★  
**★ NEVER AGAIN ★**

★ after Mr. Rising Price emerges ★  
 ★ from the 'fridge, will an oppor- ★  
 ★ tunity like this recur !!! ★

★ Partridge Package prices are ★  
 ★ actually LOWER than the Pre- ★  
 ★ VAT prices of the items pur- ★  
 ★ chased separately. ★

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

The Space Age WORLD RECORD award winning 7'6" long All Band JOYSTICK VFA Antenna—JOYMATCH A.T.U.—TRIO RECEIVER or TRANSCIEVER—Matching HEADPHONES—A COMPLETE STATION IN ONE COMPACT PACKAGE—THE FLAT DWELLER'S DREAM!

★ JOYSTICK VFA £12.54 (A) ; JOYMATCH ATU III or IIIA £12.54 (B) ; JOYMATCH ATU LO-Z500 £18.10 (C).

**COMMUNICATIONS HEADPHONES £2-86 (D)**

(All including carriage, packing, accessories and insurance)

**PARTRIDGE PACKAGE No. 1**  
 9R59DS receiver ... £54.45  
 \*Items (A) ; (B) ; (D) above £12.10  
 Complete Gen. Coverage  
 Station ... £66.55

**PARTRIDGE PACKAGE No. 2**  
 JR310 receiver... £82.50  
 \*Items (A) ; (B) ; (D) above £7.70  
 Complete Amateur  
 RX Station ... £90.20

**PARTRIDGE PACKAGE No. 3**  
 JR599 receiver... £203.50  
 \*Items (A) ; (B) ; (D) above FREE  
 Complete Amateur  
 RX Station ... £203.50

**PARTRIDGE PACKAGE No. 4**  
 TS/PS515 Transceiver  
 180W ... £231.00  
 \*Items (A) ; (C) ; (D) above FREE  
 Complete TX-RX  
 Station ... £231.00

**BARCLAYCARD — ACCESS — PERSONAL LOANS !!**

ALSO: SP5D SPKR. £4.95 ; OA2 MAINS STABILISER 74p

**NEW:** World-wide reception on the amazing "DX—CRYSTAL SET" £2.20 including unique aerial.

**PARTRIDGE BUDGET LINE—**

**ARTIFICIAL EARTH—SOLVES YOUR EARTH PROBLEMS £5.28 ; AERIAL BANDSWITCH—TUNED AERIAL £5.28 ; A.T.U. KIT—FULL COVERAGE TX/RECEIVER £5.28 ; ASSEMBLED £6.38.**

(All including carriage, packing, accessories and insurance)  
 Send 3p stamp for full illustrated details of Partridge Products.

TRIO brochures (state which) 3p stamp extra.

**ALL PRICES INCLUDE V.A.T. AT 10%**

**NO V.A.T. ON OVERSEAS ORDERS**

**CARRIAGE AND INSURANCE EXTRA OVERSEAS**

**BOX 4,**



Phone : 0843 62535 or 62839 cheap periods

**IMPORTANT**

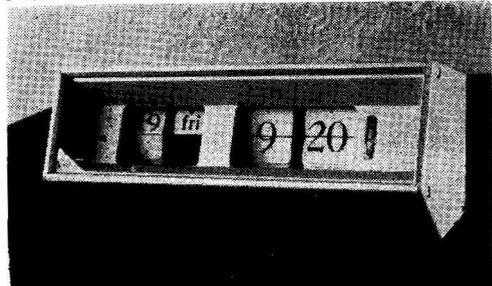
**READ THIS — OR YOU WILL REGRET IT**

The replacement of Purchase Tax with V.A.T. has reduced the price of Digital Clocks, BUT regrettably the upward floating Yen means that all Copal/Coston clocks now being imported are subject to a "Currency Revaluation Surcharge" which just about completely wipes out any saving. In many cases the clocks will actually cost more.

As your Digital Clock specialists we anticipated this and stocked up just before the surcharge came into effect.

Thanks to the above, and a further reduction in prices by us, we are delighted to offer you the following clocks at the lowest prices ever.

**HURRY, WE DON'T WANT TO DISAPPOINT ANYONE, BUT WHEN PRESENT STOCKS ARE EXHAUSTED, PRICES ARE BOUND TO RISE. DO YOURSELF A FAVOUR, ORDER RIGHT NOW.**



The "601" (24 hour). A superb clock with day, date, hour, minute and twelfth of a minute. Every day is shown in a different colour. Mains powered with diffused lighting in a beautiful case of satinised aluminium. Size : 8 1/2" x 3 1/2" x 4 1/2"

WHILST STOCKS LAST, ONLY £11.50 + VAT, post paid



The "222" (24 hour). The ideal Radio Amateurs or S.W. Listeners clock at an economy price. Mains powered with built-in diffused lighting. Absolutely reliable and accurate. Available in Charcoal, White and Red. Size : 5" x 2 1/2" x 2 1/2"

WHILST STOCKS LAST, ONLY £5.60 + VAT, post paid



The "227" (24 hour). A very fine alarm clock in Black, White, Red and Yellow. Mains powered with built-in diffused lighting, these clocks are incredible value. Size : 5 1/2" x 3 1/2" x 2 1/2"

WHILST STOCKS LAST, ONLY £7.00 + VAT, post paid

NOT ILLUSTRATED, BUT ALSO AVAILABLE AT THE LOWEST PRICE EVER:—

"701" (24 hour). Alarm with intermittent operation. £8.60 + VAT, post paid  
 "T-11" (24 hour). Battery powered, tuning fork controlled alarm. £17.00 + VAT, post paid

PLEASE REMEMBER, THAT ONLY WHEN YOU BUY FROM US, your clock comes by return of post, carefully checked and tested specially wrapped and fully guaranteed for 1 year. Furthermore if you are not satisfied you have only to return it for a full refund without question.

**AERO & GENERAL SUPPLIES**

**NANAIMO HOUSE, 2 RINGWOOD AVENUE, LEEDS LS14 1AJ. Tel: LEEDS 658568**

FOR THE RADIO AMATEUR AND AMATEUR RADIO

# *The* SHORT-WAVE *Magazine*

E D I T O R I A L

## ***Praiseworthy!***

On April 10, the BBC put out, on its "World Service" for listeners overseas, an altogether creditable half-hour programme on the theme of Amateur Radio.

In the Amateur Radio context, the programme proved to have been very well put together, with all aspects of current amateur activity covered—AM Phone, SSB, CW, SS/TV, VHF, mobile, Oscar VI working, the mystique of the QSL card and what it represents, the international aspect of Amateur Radio, RTTY operation, radio astronomy in the amateur field, also a brief description of the early amateur work on transistory, using home-made transistors powered by solar cells.

The speakers actually identified were G2BVN, G2DX, G3HMO, G5CS and G6DW—there were others, call signs not mentioned, including three enthusiastic VI Form boys from Harrow School, who had evidently done their home-work and between them knew a good deal about Amateur Radio as it is practised today.

Mercifully, from the producing side we were spared the usual idiot-talk about "hams" and fatuous comments on our jargon, nor was there any propaganda guff.

This half-hour BBC programme was in every way a most excellent treatment of the subject of Amateur Radio—it caught exactly the interest and feeling of the average intelligent radio amateur and where his interests lie over the very wide field of radio activity.

The production was of such quality that this is the sort of BBC programme that ought to go out on one of the Home Service channels, with a listing in the "Radio Times". As it is, it could have been heard by very few in the U.K. because it was transmitted on the Overseas Service at an awkward hour.

This is a pity. It is the first time in 25 years that we have been able to congratulate the BBC on their treatment of the Amateur Radio theme.

*Austin Forsyth  
G6FO*

WORLD-WIDE COMMUNICATION

# COMMUNICATION and DX NEWS

*F. P. Essery, G3KFE*

LAST month the piece was abbreviated by reason of the rail chaos; this time it is being put together at breakneck pace to beat the production hold caused by the Easter Holiday break—always a menace to those who have deadlines to meet. However, the meantime has been quite eventful, one way and another. Your conductor has had the pleasure of getting the rig fired up on, say, Twenty, after an evening meal, and *not* having the band go out while the rig was warming-up. Earlier this week, a trip to the New Forest was almost like being in high summer, albeit as this is being written snow lies thick on the apple-blossom buds. Eventful, indeed!

### Interesting

Those who have seen the January issue of the American *QST* will have no doubt read the page of

IARU news therein. A letter from no less than 46 Russian signatories, endorsed by their national organisation, comes out in protest against the divisive tactics adopted by K6BX of the CHC, against IARU. It is of interest to notice that these 46 Russian operators are almost all well-known and respected DX amateurs, and that they were all members of CHC themselves. They realise that IARU exists for the benefit of radio amateurs of all countries, whatever K6BX and his organisation may think; and what is more they raised their protest in the only civilised way, by writing a letter for publication in the IARU page of *QST* (the ARRL magazine), and by withdrawing *en bloc* from CHC. Good for them! We might comment, that this could well serve as a lesson in the mechanics of protest for some of our long-haired youth of today in the West.

Perhaps we should add that as far as your conductor knows, nobody in the U.K. has done more than hear K6BX; the G's in general are far too sensible to regard CHC as other than a group of chaps interested in collecting certificates. (We withdrew support from K6BX and his concept of CHC about 12 years ago.—*Editor.*)

### Top Band

Let us continue by looking first at One-Sixty. Just in time for this, we have a report covering the Trans-Equatorial summer tests. This year, stations in CP, LU, YV, ZS, 9J2, ZP, VP8, CX and PY are known to be intending to be active, and there is always the odd new one liable to pop up. The Tests this year will be timed for 0001-0030 GMT—Europeans and Asians to be on 1825-1830 kHz, the rest, including W/VE, on 1800-1807 kHz, saving only the ZS1MH station which is to use 1935 kHz. It is suggested that with the likelihood of Asians, for instance, appearing, U.K. operators should check their own frequencies plus-or-minus 2 kHz, as well as the LF end of the band. Procedure: Stations North of the Equator take the calling period for the first 2½ minutes, listen for the second 2½ minutes, *et seq*; stations South of the Equator go in reverse order, of course. As there are usually one or two very good nights, with signals a couple of S-points better than normal, it is more than ever important that an operator regarding himself as in the "tiddler category" should at least check the band every night during the month of June, and maybe even the first week of July, to be sure of hitting the good nights when they could have a chance of working some real DX.

ZS6ZE (Pretoria) who used to write in as G3LZQ, has come back to life; John found the Top Band listening a bit of a chore—as he puts it "DHJ 589 at times, but sustained listening is not on when noise can hit S9 plus 40 on the



G4AVT, Vincent Evans, of Beacon View, Parbold Hill, Wigan, Lancs. is one of those who first came to Amateur Radio in his middle 50's, never having had any professional connection with radio or electronics—he studied for the R.A.E. and Morse Test from the ground up, becoming licensed in January last year, on his second attempt at the Morse. Moreover, he worked largely on his own, from the books that we recommend for all beginners. These details are mentioned by G4AVT because he thinks they might encourage others of his sort of age to become licensed.

75A2 S-meter!" However, they are now in their autumn when conditions should improve, which means that both ZS1MH and ZS6ZE will be in there slogging on 1930-1935 kHz, monitoring 1805 and 1825-1830 kHz. John proposes Friday and Saturday evenings, 2000-2200z.

W4WFL/1 (Farmington, Conn.) adds some more to the known WAC holders on Top Band—the latest issues are to OL1AOH, W4BRB, K4BHG, WB4JFK and W4QCW. Incidentally, if you hear G5AYL belting away in the next few days, give him a shout—it'll be W4WFL on his European holiday.

G3DCS (Ipswich) in the course of a report covering all bands, has a succinct comment on 160 metres—*nil!* And, we might add, that goes for your conductor as well, saving that he managed a contact with G4BMO (Mouldsworth) after trying it previously on Forty with no joy—David's CW came through nice and steadily over the QRM and sounded as though with a few years of practice he'll be as good as any, even though his phone was just buried under the crud.

### Eighty Metres

Since G2HLU (Reading) last wrote in he has abandoned his ideas about a beam, after considering how to get it up—and down!—in his restricted space. Instead, he has replaced the traps in his old W3DZZ inverted-Vee aerial by a brace of loading coils and used the rest of the savings from not having a beam by lashing out on a K.W. Vespa and E-Zee Match. It is, he remarks, very nice to go on CW and not have a "drifty" signal. He hasn't tried the Tx on SSB as yet. During the CW leg of the ARRL Contest, G2HLU found it easier to work W's on Eighty than on Forty, with strings of them booked in for no more than a QRZ? after each contact.

G3ZPW (Wombourne) does have a beam on Eighty. Mike worked lots of States and Caribbean stuff, including KP4AN, VP2EQ, HR1RF (who was booming in like a local). Off the *back* of the beam, he raised such as ZB2, OD5, YA1's, CN8's, 3A0FY/M and JY9GR. VP2EQ, FG7XL, FM7WN and HR1RF have all indicated that they intend to use 80m. more than they have done in the past. If we look at the

period between 2200 and 0200z, we find among many in the G3ZPW log, such calls as FG7XL, FM7WN, HK0BKX, HK3AVK, PJ2CW, PJ8GQN, PJ7LAR, PZ1CU, assorted VP2's, VP1JB, VP1BH, VP2ND, VP9's, KP4AN, KV4FC, KG4's, KZ5JF, 6Y5's, 8P6's, 8R1G, 9Y4AR, 3E1XIS, DL1DH/MM (in the Panama Canal), KP4ARW/HI8, WA2COJ/HH4, ZF1GC, YV's. PY's, and all W call areas saving W7—W6/s being heard between 0100 and 0200. Quite a collection for one log on Eighty!

An interesting story from G3YRR (Grimby) who relates how he gave a talk on Amateur Radio to a local Association. One chap was inspired to have a go, and is now G4BTL, a retired engineer who just got stuck into the swotting; he is nearing 70 years of age, and now is on Top Band and Eighty, at least till he solves his aerial problems. To G4BTL go congratulations, and the hope that others who have felt themselves too old to get a call will likewise be sensible enough to have a go—nothing venture, nothing gain!

Conditions, reckons G3RFG (Henlow) where rather interesting last month, with much QSB and QRN, but unexpected QSO's nonetheless. For Eighty, Stan used CW, as always, to connect with K3NPV, KV4HW, OY7BD, VE3UEM, W3EPR, W4MOX, W8JW and YV5CKR, on his multi-band, home-built vertical aerial.

This is perhaps the first time we have had a multi-band report covering mainly RTTY—G3DCS offers RTTY contacts with G's, F5XM, I5MPK, ON4CY, ON4WG, OK2BJT, DL8VX and OZ4FF. Enver uses 640 and 820 Hz tones for narrow shift, and 650/1500 Hz for the standard shift, frequencies which fall nicely into the pass-band of his Yaesu, the 650 Hz one coming bang in the centre of the "600 Hz" CW filter—it assists reception considerably, but does complicate transmission a wee bit.

### Forty Metres

Weather conditions which failed to affect your scribe's 28g. "invisible aerial" managed to fell two of the four aerials at G3VLX (Chislehurst)



G2HR, Eric Johnson, 35A Woodland Road, North Chingford, London, E.4, was first licensed in 1929. His station description (as it was at that time) appeared in our "Other Man's Station" series during 1957. Sixteen years later he is still at it, though now with commercial gear of the K.W. marque. Having retired, G2HR is very much involved with his local group, the Silverthorn Radio Club (G3SRA) with which he has been actively associated for many years.

although, luckily, the TA-33 was not one of the casualties. Deryck, in addition to his TA33, has an inverted-Vee on 7 MHz, a trap dipole and a long-wire for Top Band—or, rather, did have! However, as far as Forty was concerned, VK3MR's rhombics were eclipsed by the contact with VK7GK, who has a Cubical Quad for 40 metres!

Forty CW yielded plenty of contacts to ZS6ZE, with G3KKP, G3KDB, G2HDU, DL1RK, DL8MM, DK4TP, I1DSR, OH2LA, SM6CTQ—but *not* G3KFE, despite repeated calls! On SSB one notices such as DJ2YA, G4ANT, HA4KYB and OZ5KF, so obviously John out there is getting through to Europe pretty consistently. On a different tack he relates the travellings of his log for the 1972 "CQ WW Phone Contest"—from ZS to U.K., then U.K. to JA and return, U.K. to ZS, and finally being posted off to the States! A total of nearly 40,000 miles, and 96 hours of concentrated paperwork to get the entry off in time, for a claimed score of 1.68 million points from 1869 QSO's in 30 hours of operating. No wonder John needed six weeks rest back home after that little lot!

G2NJ (Peterborough) has quite a packet of assorted news, much of it germane to Forty. G3ZXH, who has been worked by many as /MM, writes to say he has now obtained permission to use GM3ZXH/MM—he of course comes from Inverness. His late buddy, G3TZL/MM told G2NJ that he would be flying to Japan to join a brand-new ship. G3RSP/MM was heard back in February, in the English Channel and bound for Rotterdam. Another interesting call Nick has worked recently was GI3WWM/OE on CW, near Vienna, while G3MCA was running two watts CC, with a *one-tube regen receiver!* What's maybe more to the point, it was a good solid contact both ways. More contacts with ON4TA are noted, one of them lasting a full half-hour with no more than 700 milliwatts at ON4TA; André is very busy at the moment modifying his gear for Seventycems and two metres.

Four 40m. CW contacts are noted in W6AM's transcript of the log for the period under review, namely with CT1LN and KX6BB (both around 0700z) JD1AHC at 0849 and

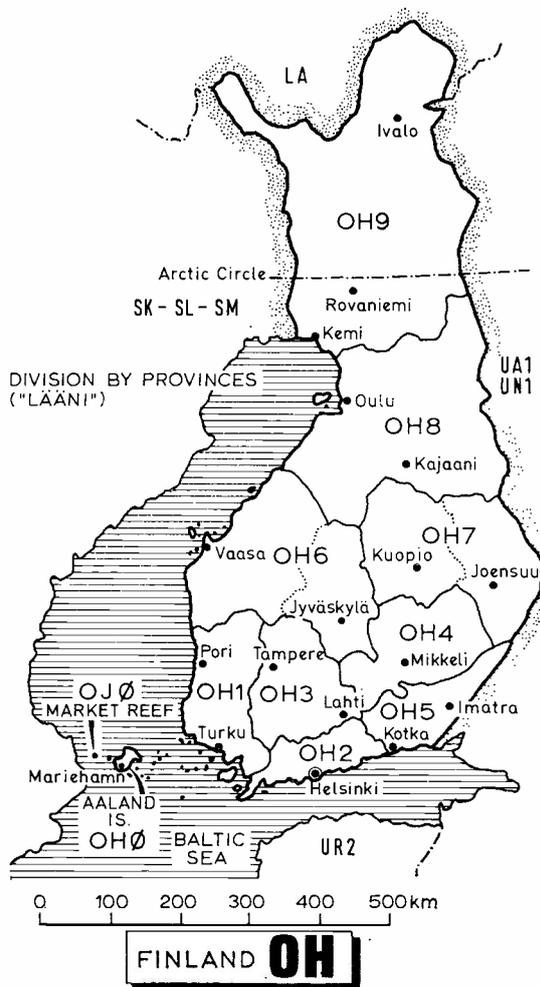
C21DR at 0900. As usual, the report Don got from those rhombics of his was 599—he hardly ever gets any other report, saving on Eighty, where the rhombics are probably not so gainy.

G2HLU found particular pleasure in some contacts he made, with ZL4BO, VK3MR and VK3XB for his first-ever QSO's with Oceania on that band.

On to G3RFG, who seems to have put in a fair amount of time on Forty, to work CW with KV4CI, PY1DUB, PY2FQP, PY2CJW, VE8DJ, VK3MR, VK7GK, WA3HPS/2, W9LVH, YV5DMM

and ZL1BHQ.

To bring his record a bit more up-to-date, G8HX (Mansfield) sends in one of his interesting "specials," Frank has taken down the 7 MHz dipole, and replaced it with a 136-foot wire, with the help of a certain amount of bending; it is cut for two half-waves on Forty, and works as well as the dipole—but by the fact of end-feeding it, Frank can now operate other bands as well if the mood takes him. On the station side, the SB-301 has replaced the AR-88, and is found to be very satisfactory, particularly since a 30 pF capacitor was floated



The provincial callsign areas for OH, Finland—from the "IARU Region I News", by G2BVN. Now you know where Market Reef and those blessed Aaland Islands are!

across the BFO crystal to bring the beat note down in frequency to 400 Hz. With all this, Frank doesn't mention much in the way of stations worked, apart from OD5EJ and 4W1AE, but doubtless more are booked in by now.

### Ten Metres

Yes, despite dire predictions there is still the odd happening on the band. The CW of G3DCS was tried out on Ten, and managed a couple of East-West contacts with W4KFC and W4OZF. During five months of operating, ZS6ZE has managed a total of 1400 QSL's on Ten, working 280 different prefixes, in 86 countries. He adds: "It's a patchy band, but I do wish more people would come on and *use* it rather than just listen."

Another one who echoes these sentiments is G3USF (Keele) who found it an undistinguished month, yet with few blank days. Martin bends his conscience a bit, by having a set running on his office desk, but not *operating* in "firm's time!" Openings have occurred to West Africa, Eastern South America and the U.S., and there also have been Auroral goings-on, notably on April 1 when during the evening, between 1600 and 1815, most of Europe was there with the characteristic buzz-saw note and again between 2158 and 2356z—but, and here is the interesting propagation problem, in the middle of all the EU's, came W9DLZ at 2159z and W3BQP at 2240, both with weak but *non-auroral* signals. For G3USF, regulars on the 10-metre band are still CR6, ZS, 9J, 4X4, LU and PY, but in addition the following are noted—A4FD, A2CCY, A2CEW, CX6AM, CX8BZ, EP2MD, MP4TEE, ST2SA, VP2VAM, VP8KF, VQ9R, TT8AC, OD5CS, TJ1BB, 3B8CV, 4W1AF, 7Q7RM, 9L1MF and 9Y4EH.

G3VLX had one 10-metre contact, with 9J2RC. G3KFE managed to look at all the times when the band was *not* open!

### Comments

G3UZ (Goring-by Sea) has a light-hearted description of what he describes as "local QRM," when his wife discovers he is no longer wielding the paint-brush but has crept off to work some DX! On a different tack, George wonders what would



JA4FWM, Akio Takahashi, is at 885 Kojima, Kurashiki, Okayama, in the southern part of Japan. He is a keen DX man and his layout is a good example of a modern Amateur Radio station. Outside, he has a 5-element beam for 20 metres.

happen if, say, a UA1 crept into a list of DX from the U.K. It all depends on what you mean by DX (frequency, power and time) and that, when all's said and done is an individual thing which varies with time. For a new chap who had never been on before UA1 may well represent DX—a couple of weeks later it is nothing to mention and three months later still it has fallen to the level of QRM to the same operator who first thought it DX! Your conductor tends to try and stabilise his own definition in terms of "anything not worked before, or worked but no card inwards" but for the purposes of CDXN, defines it as "anything about which the writer of the particular letter feels at all cock-a-hoop."

G6XJ, on his trip to New Zealand, struck the lucky dip when he discovered the R/O on board was G3UOF/ALØN, so between them they had fun on Fifteen until Arthur landed.

By way of W6AM comes a copy of the South Western Division *Bulletin*, with some interesting facts on licensing over there; looking at the list one notes a *downward* trend in the numbers of Novice, Technician, Conditional, and General licensees, with an upswing in the Advanced

and Extra classes, albeit not enough to cancel the overall picture of a fall in numbers.

Piracy next: G3HQU has a pest using his call on Eighty AM—the real one is only to be heard using SSB. Anyone involved with this AM pirate, kindly expose him.

G3ZZR is also being pirated—his shadow signs GM3ZZR/A or GM3ZZR/M, and cards have been received which indicates he has been active on Eighty and Twenty, giving location as Dundee, and names Allan, Archie, or Bob. Anyone who worked this one and sent a card obviously wasted his time; but if heard, please nail him for a pirate.

A letter from G3CNA says he has been asked by F3RW in Nimes to advise that cards to F3RW from U.K. should be sent *direct*, the address being Jean Bessone, 4 Rue Ecole-Vieille, Nimes, France.

Talking of QSL addresses, we have the odd one or two to offer. G3NOF first: He gives VQ9D, Box 191, Mahé; A6XF (was MP4TEE) via G3LQP; ZD9GC, to ZS6XO; and YJ8XX, to ZL1AMO. To this W4WFL/1 adds that VS5RL cards should go to his home call, WB5HJZ, QTHR. A new Persian station is on the air, EP2EJ, whose address for QSL's

is M. Sgt. Eber F Diehl, EP2EJ /W7AMM, Box R-136, Page, Communications Engineers, APO New York 09205.

G3UOF/MM writes from the Liberian registered cruise ship *Fairstar* (5MXH is her own callsign) at Fremantle, Australia, and mentions his passenger G6XJ, who landed OK at Wellington, New Zealand. Their contacts were all made using Mike's "at sea" call of ELØN/MM. G3VCH, says Mike, is one of the four R/O's on board *Northern Star* (GHZB) at present cruising between VK/ZL and the Pacific islands, but although he has an FT-101, he has no /MM licence; it is understood G3VCH is looking into the possibility of an HBØ maritime mobile ticket to get round this problem. As far as G3UOF is concerned, he arrives back in U.K. at about the time this is being written, for five days docking, and then is off again for ten weeks at 18 knots round the world via ZS / VK6 / VK5 / VK3 / VK2-ZL / FO8 / KZ5 / PJ / CT2 / CT1 / PA/G! Lucky chap!

#### BRIEF DX DATA

- 9M8OEA } If needing a card from  
9M8SPD } either of these, re-apply to  
C. E. Schaub, Regional  
Relay Facility, PSC No. 2,  
Box 19047, A.P.O. San  
Francisco, California,  
96274.
- TY1AAA Try 21265 or 21172 kHz;  
has been heard around  
1130 and 1545z.
- Zone 23 UAØYAE and UAØYT,  
the former seems to stick to  
CW but Vlad has been  
worked 21031 kHz, 0915,  
14199 SSB at 1355z.
- XF4 XF4FFC said conditions  
were very poor and no  
EU stations were worked.  
However, they did work  
*another* Revillagigedo  
Island, this one in Alaska!
- 3B6CF 14232 kHz, and other  
frequencies. Works to a  
list taken the previous  
day by A6XF, *ex-*  
MP4TEE, on 14180 kHz  
at 1300z. Agalega Is.
- 419, 4L3 4J9B was on from Lenin-  
grad, 4L3Z from UF6-  
land. QSL both *via* Box  
88, Moscow.

## Reporting the HF Bands

Reference that comment about VE1LG last time—we now have it that Fred is in fact 98 in September, is in good health, walking a mile a day or more for the exercise, and operating actively on 80 and 40 metres. Fred would like to hear from any oldster in the U.K. who would care to write—he obviously likes plenty to keep him occupied. He is *QTHR*.

#### Now Twenty

Let G3RFG kick off with his CW list: HS3AHL, JA2YC, K3ORS, VK2BET, VK2OO, VP9DR, W1VJ, W2ZT, WA3EFH, W4IJ, W7AUS, W8LY and WAØGVO/5.

As always, quite a lot of W6AM's DX is on Twenty, SSB giving him KA1DX (Marcus), ZVØWH, 4X25NJ, plus CW to 4X25NJ also.

Now ZS6ZE, who managed CW with KH6CA and C29ED, while SSB came up with A51PN, DU1JMG, no less than 66 JA's, JD1YAA (Marcus), KA1CQ (Iwojima), KA1DX, UDS, UG6, ZD7SD, 3B6CF and 4S7AB.

G3VLX complains his list is too long—never mind, we sort 'em out! Deryck's extra bit of power and the TA-33 have made quite a bit of difference to his average report, one notices. There were JX3P, OD5HM, 9Y4EA, 4J9B, HS4AGZ, VQ9R, 9H5D, VP9GO, EP2DO, HR3AC, VP2KH, VP2VI/MM and XE1AAK, all found on SSB.

G3UZ heard much DX popping up from the murk but failing to respond to his calls—'twas ever thus! However, the Swan 350 and dipole, plus key, accounted for UD6's, UL7's, UK7, UI8BL, UV9PS, UW9TK, UA9WU, UA9XAI, UA9FER, UW9TH, other UA9's, VO1JR, VK2MT, VP7BA, JH2FSC, OD5LX, PY2BAJ, FM7AD, KP4DPN, PY7ASV, YV5BPI, FY7AI, SVØWTT and UWØAY for the month under review (plus another crop of equal excellence for the previous month, which was caught in the mail chaos).

G3ZPF (Dudley) offers the cure

for G3KFE's gremlin of changing the low-pass filter. Possible, but we did more good by disentangling the 14-AVQ radials from the Top-Band end-fed after some kind soul had dropped a box of rubbish on the lower end of a halyard and *didn't* mention it. As to David's DX: He worked (all SSB), including W1, W2, W3, W4, W8, EA8IT, VU2AAA, UØ5OAK, 4L3Z, 4J9B, UA9BB, FL8OM, VK6DR, VS6GA (who is G8ATV in disguise), OHØNJ, VP9DL, UK9FFE, VE8ML, MP4TEE and, for comic relief, a "ZA4SMN" who wanted a QSL via I4SMN. Makes a change from "via the Albanian Bureau!"

Twenty for G3DCS was split between CW and RTTY. In the former mode, lots of W's were tackled, and on RTTY there were I6VGA, I5WT, HA25KDQ, IT9ZWS, W3DJZ and W4CQI, which sounds like a good start using radio-teleprinter.

G3NOF (Yeovil) returns to the scene after an absence caused by troubles in the aerial and linear-amplifier departments. The only band this time on which he feels able to comment is Twenty, for which his string of gotaways is as long as the list of worked-ones. The latter included A6XF, VQ9D, VS6GA, XW8EO, 9V1QG and some VK's.

#### Now Fifteen

Like Twenty, this band has felt the benefit of the Spring with longer "opening hours" enabling some of us to get in a bit of DX after tea-time

G3DCS kept his RTTY out of use on Fifteen, and stuck to the key, with which, in his limited time on the air, he managed a shoal of W's and PJ9JT.

G3ZPF was rather disappointed to find, having soldiered through his exams on the promise of DX to come, that when he did get back, everything was in the grip of an SID—but David offers W1, W2, W3, W4, W8, W9, HR3AC, EA8IS, 8R1UGF,

EP2RB, EP2SP, EF2GW, VQ9HCS, XX7IK and VP2MYA.

ZS6ZE has quite a list, including SSB with DU1AMA, EA8CN, EP's, 47 G's, 54 JA's, VP2MYA, VS6EN, YA1AH, ZD8RW, 4W1AF, 9M2IR, 9Y4T and KA1CQ.

For G3VLX, activity seems to have been about equally divided between 14 and 21 MHz, with the latter showing SSB contacts with VQ9W, ZF1JA, VS6CY, CN8BF, KP4BCL, HC1RJ, CQ6LF, VP2MYA, CP1JV, OD5BA, 5N2ESH, 5N2ABG, ZE1CE and CP5BP.

Quite the longest column in the G3RFG offering is devoted to Fifteen, Stan apparently having

quite deserted Ten of late. CW is the mode, and the result CX5CB, K2JKJ, LU1HAC, LU6EF, PY1BTC, PY2EWL, PY4AHH, PY7AES, PY7BFD, VE3EZH, VE3GGO, VE7CE, VK4YP and all W call areas save W5 and W6.

On the QRP front, G2NJ reports G3KPT's couple of watts as having rung the bell at UA9MEW, Omsk, and also working over the Pond to U.S.A. no less than ten times. G2NJ himself struck an odd one when he raised "SQ5Z," on CW, and was told the station was in connection with the reconstruction of the old Royal Castle in Warsaw.

A couple of new ones came the

way of G2HLU, in the form of EP2BQ and ZD8RR, the former sending his card through so fast that it arrived before Harold has sent off his'n!

#### Terminus

Reached once again, with assistance from all sources of news, to whom our thanks are due. For the next time the deadline is **May 8** latest, addressed as always, "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

Deadline dates for months following are *June 12*, *July 10* and *August 14*. Please post (in the U.K.) at least a couple of days ahead of time.

#### ISRAELI LICENSING AUTHORITY

Holders of U.K. amateur licences wishing to operate from Israel, 4X4/4Z4, whether on holiday or a working visit, can get full details of the requirements on application to: Ministry of Communications, Engineering Services, P.O. Box 29107, Tel-Aviv, Israel. We understand that licences are granted quite freely, subject to certain conditions.

#### CHINESE AMATEUR CALLSIGNS

From G2BVN's *Region I News* for April we get it that if and when amateur licences are in general issue to Chinese nationals, the form of the callsign will be B followed by a letter denoting a geographical area, then a single digit and after that an A, or A with one or two suffix letters, e.g., a Chinese amateur station in the Shanghai area could be signing BH2A, or if from Hankow BJ1AB, while a Sinkiang AT-station might come up as, say, BU3ABC. There are 17 prefix letters

allotted. So, when the bamboo curtain does go up (the chinks are already beginning to show) and amateur licences become freely available, the Chinese call book will be quite a thing. Though at the moment of writing we have no further positive information, callsigns heard or worked in the form shown here could well be genuine.

#### U.K. J-O-T-A REPORT

The final report on the last Jamboree-on-The-Air, the Scout international Amateur Radio event which took place during October 21-22, 1972, shows that about 300 U.K. stations took an active part, working between them nearly 500 overseas Scout stations in 64 countries—figures well up on the 1971 J-O-T-A. The total Scout participation in the U.K. (meaning operators and visitors to their stations) is estimated at 12,000-15,000 Scouts and Guides. Leslie Mitchell, G3BHK, the organiser for the British Isles, has circulated a most interesting and well-written report on the event.



Scene in the main hall during the White Rose Rally on April 1. The attendance and the trade support were such that the overflow of dealers had to go into separate rooms.

## KNOWING ABOUT SS/TV

### DISCUSSING THE FUNDAMENTALS AND EQUIPMENT REQUIRED

D. J. STANDEN (G4BSU)

ANYONE who has tuned across 20m. will have heard a strange warbling sound around 14.230 MHz. Many will have passed this off as RTTY, or some kind of QRM, but what has been heard is the transmission of pictures across the world, by amateurs equipped for slow scan television.

SS/TV is rapidly gaining in popularity on our HF bands, but not yet on VHF. The main increase in stations seems to be from Italy and the U.S., with very few G's to be heard being worked. Why there should be such little interest on the part of British amateurs and SWL's may be partly explained by the lack of much information on the subject, and the popular misconception that because it is "television" it must be complicated and very expensive—considering the high cost of commercial equipment for SS/TV (over £500) advertised in amateur magazines, this can easily be understood.

This article aims to show that SS/TV need be neither difficult nor expensive.

#### Principles

The basic principle of SS/TV is the conversion of black-to-white picture information into audio which, with its sync. pulses, are fed into the microphone socket of an SSB transmitter, resulting in Single Sideband Frequency Modulated Video, or F5j. A frequency of 1500 Hz represents black and 2300 Hz white, intermediate shades of grey being obtained by intermediate frequencies. Tones of 1200 Hz (ultra-black) are used to transmit the line and frame sync. pulses. See Fig. 1. The bandwidth occupied by a signal is 1.2-5 kHz.

Sweep rates are line  $16\frac{1}{2} \pm 1$  Hz and frame between 6.79 and 8.68 secs., which results in a  $128 \pm 8$  line frame. It will be seen that at approximately  $7\frac{1}{2}$  secs. per picture, a long-persistence cathode ray tube is required, and that only static shots can be transmitted, for example slides of oneself, XYL, or QTH, also captions made up by *Letterset*, and drawings in Indian ink.

#### The Monitor

The monitor can be a specially constructed unit or an oscilloscope modified. Fig. 2 shows the monitor in block diagram. The limiter smooths out variations in the amplitude of the signal which is then passed to the discriminator, which is a simple audio filter consisting of three toroids and associated capacitors to separate the sync. pulses (1200 Hz) from video information (1500 Hz-2300 Hz); these are detected and amplified in a two-transistor circuit, and applied to the grid of the CRT.

The sync. pulses from the discriminator are passed to a sync. detector and separator, which sorts out the

line sync. pulse of 5 milliseconds from the frame pulse of 30 milliseconds, these then being applied to a trigger circuit and sawtooth generator and thence to the scan coils.

EHT is derived from a standard television line output transformer with associated oscillator and output valve. Line, frame, contrast and brightness controls are brought out to the front panel. (A simple but excellent monitor circuit is published in a booklet entitled *Slow Scan Television*, by G3RHI, and obtainable from BATC at 25p.).

The writer has built this equipment in the course of two evenings, and would consider it suitable for a beginner to complete. The circuits lend themselves well to be copied on to printed circuit board, and end connectors were used to enable the boards to be removed quickly for modifications.

Apart from a set of scan coils and a line output transformer, both salvaged from an old television receiver, all components were purchased new and the total cost of the monitor just reached £10. This cost could be reduced by going through the junk box or stripping an old TV Rx, as all the components are the more common of the preferred values, while the transistors, mainly BC109 and BC113's, can be obtained at about 10p each, and some cheap bulk unmarked manufacturer's surplus were also found to work. The tube, which must have a P7 phosphor (long-persistence) was £2 new; this was a 5in. tube, the 5FP7.

Anyone wishing to carry out an oscilloscope modification will find a circuit in the 1972 ARRL *Radio Amateur's Handbook*, which consists of 9 transistors. The main problem with this project is to find an equivalent electrostatic cathode ray tube with a P7 phosphor—such a tube could be more expensive than the total cost of the previously mentioned monitor.

#### Tape Recorder

Having built the monitor and received pictures it will soon be found useful to retain some off-the-air recordings of interesting video QSO's. All that is required is an audio tape recorder as we are dealing with audio frequencies. The faster tape speeds will result in better reproduction. The tape recorder in use at G4BSU is a cheap cassette type with professional tape of the extended frequency cobalt energized type (EFR90). Many of the recordings made are of very good quality, and apart from interest value, are of great use in making adjustments or modifications to the monitor in the absence of live signals. The tape recorder also becomes of use when we come to transmission. The audio frequencies from the camera modulator can be recorded, and a pre-recorded programme for transmission built up from various slides, captions and drawings.

Once the monitor is built then it is possible to enlist the help of an SS/TV station who has a camera unit, and who might put on tape a programme and CQ call, etc., which can be used live in SS/TV QSO until such time as a camera unit can be made.

#### The Camera

There are three methods of camera construction. The most expensive would be to use a slow-scan Vidicon tube; this is a special vidicon containing a shutter,

which exposes the scene briefly and so freezes all motion and then scans the latent image. Slow-scan vidicons have uses in satellites, and are both rare and very expensive to obtain.

Another system involves the use of fast-scan 625-line equipment, and involves altering the plane of the camera and fast-scan monitor scan coils, sampling for example every 5th line; circuits for sampling units are available, and references are given at the end of the article.

However, the simplest and cheapest system, costing less than £10, is the flying spot scanner. With reference to Fig. 3, a sync. pulse generator involving five IC's and locked to 50 Hz mains will produce the sync. pulses which are applied to the monitor time bases to make a raster; they also trigger a multi-vibrator to produce 1200 Hz audio.

The raster on the monitor is then covered with transparent material on which simple captions have been drawn. As the spot scans the tube its light passes through the transparency, and light output varies according to the density of the transparency—black passes no light, then goes through grey to clear (white) when all the light is passed. A photomultiplier tube is placed about 12 inches from the monitor tube and this converts the variations in light intensity into voltage variations, which are also applied to the multi-vibrator, set up to produce between 1500 Hz and 2300 Hz, depending on the voltage swing.

The transparency is scanned every  $7\frac{1}{2}$  seconds approximately (1 frame) the spot being returned to the start of the scan with each frame pulse, also transmitted as are the lines pulses, thus the distant monitor is kept in step with the transmitter.

If suitable optics are available, the raster can be made to scan through a 35 mm. transparency and reduced to a focal point, where a photo-transistor can be placed with its output applied to the multi-vibrator, thus dispensing with a photomultiplier tube and its HT supply. This is where there is plenty of scope for experiment, and readers could no doubt devise systems of their own.

**General**

With the simple equipment outlined here remarkable results have been obtained, quality of pictures in many cases being excellent, with sharp-contrast callsigns and equipment details; still photographs of a foreign amateur's QTH on which could be seen his antenna on the roof and its elements counted; and similar high detail pictures have been received. Not all pictures are good—quite a few are very poor, the quality depending on the signal strength and the level of QRM at a vulnerable frequency in the 20-metre band.

Pictures have been received *via* Oscar, colour has been transmitted and received (by the use of colour filters at each end) each of the three colour frames being photographed separately, the end result being a colour photograph.

Those are some of the possibilities. There are many others with regard to equipment—for example, AGC, continuous running timebases, better filter response, all enabling weaker signals to be received in more QRM, also the use of more IC's to reduce equipment size.

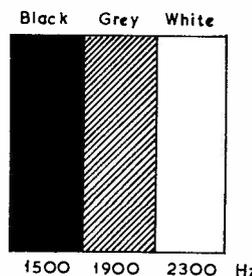


Fig. 1

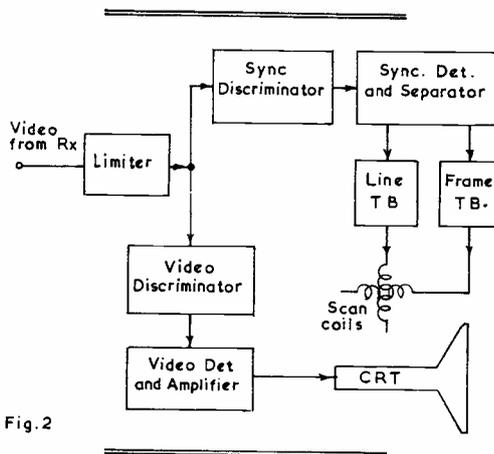


Fig. 2

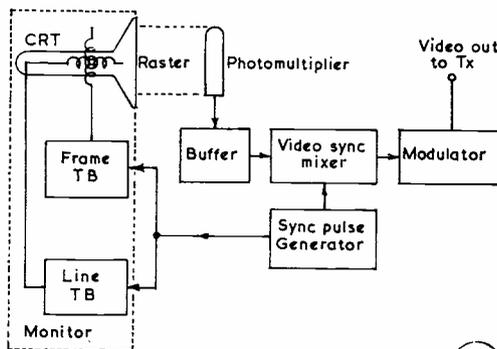


Fig. 3

S  
94

**Licence Requirements**

To transmit SS/TV application must be made to the MPT detailing the standards to be used, and the frequencies; the applicant must also hold a valid U.K. amateur Licence A (for HF) or B (for VHF).

Permission to operate is free. A Class-A holder is allowed to operate on the 7, 14, 21, 28, and 144 MHz bands, a Class-B licensee is allowed 144-146 MHz, and although no particular mode is specified, sideband transmission is normally used on the HF bands. In the writer's case no objection came from the MPT

when application was made also to use an AM transmitter on two metres.

#### Standards

The frequencies used for SS/TV are around 14.230, 21.340 and 28.680 MHz.

The U.K. standards are: Number of lines per frame,  $128 \pm 8$ ; Aspect ratio, 1 : 1; Horizontal frequency,  $16\frac{2}{3} \pm 1$  Hz; Vertical frequency, 7.68 secs. (limits 6.79—8.68 secs.) Horizontal sync. pulse, 5 milliseconds; Vertical sync. pulse, 30 milliseconds; FM subcarrier sync. = 1200 Hz; Black = 1500 Hz; White = 2300 Hz. Sync. must be locked to 50-cycle mains.

#### Future

The SS/TV movement is gaining some impetus, with plenty of pioneering still to be done, and so giving a new field of experiment in our HF bands. Where Sideband was in the fifties, SS/TV is today—it is quite legal now

to transmit video on one sideband and speech on the other.

In not too long we may see the transceiver with a video input/output/upper/lower sideband facility and an additional unit for a camera monitor about the size of a loudspeaker unit, with the exchange of pictures as commonplace as is the discussion about weather today. Two metres is wide open for G8/3's to experiment with SS/TV—the writer knows of none who have accepted the challenge.

*Editorial Note:* For more information about SS/TV and references to available material, the reader is advised to consult the BATC booklet *Slow Scan Television*, by B. J. Arnold, G3RHI, obtainable at 28p post free from BATC Sales, Kyrles Cross, Peterstow, Ross-on-Wye, Herefordshire. Though not in itself a complete treatise, it does open up the subject for those who might like to try SS/TV on the HF bands.

## BOOK REVIEW — WIRE ANTENNAS

TEACHERS of R.A.E. classes will all tell you of the glazed look in the eyes of their students after ten minutes of the lecture on Aerials. If you are one of those glassy-eyed ones, this book, *Wire Antennas* is for you. There is a whole lot of material in the earlier chapters, to explain simply what the R.A.E. lecturer had to cover in a few minutes; these chapters put it all in a beautifully easy manner. Orr, W6SAI, the author of this volume—who is a well-known writer who has specialised in the Amateur Radio field—then goes on to discuss the nature of the earth system, and how it can be improved, to dipoles, and how they should be made, to the ground-plane aerial, G3RFG's multi-band version of the vertical, and then on to several versions of the "invisible aerial" for the chap who isn't allowed any form of aerial. Oddly enough, your reviewer has used the "invisible aerial" concept for years now, to get a better skywire up than the size of his own plot allows, and he is well able to say that this chap Orr talks sense; and what is maybe even more important, if you have aerial problems, he shows possible ways out, and encourages the reader to come up with his own ideas, along sensible lines.

Some amateurs will object to all this that they "just aren't practical enough" to do the things the book suggests by way of home-built aerials. Not so! The author obviously has met people who just don't know, for example how to put a coax plug on a cable properly, or how to strip a cable ready for terminating at the centre of a dipole, or whether there might be some "gunge" which will stop the weather from ruining one's nice new aerial in a few weeks—even whether to use surplus coax cable or buy new, and exactly why.

This reviewer has a whole shelf of books on aerials, and he will say that, for the price of £1.72, he only wishes he had had it earlier, to show him the way—now he knows a bit about aerials, he still regards this book as a good buy for himself, with a very strong recommendation to anyone who is interested in the vital part

of his station but who doubts his own knowledge and ability not only to buy it but also to sit down and read it carefully. In terms of station operation, in the long term, it will surely improve results.

*Wire Antennas*, price £1.72, from Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

E.P.E.

## 1973 ARRL HANDBOOK

The latest (50th) edition of this indispensable radio amateur manual—for so many years recognised as the "bible" in the Amateur Radio field—should be available from us shortly after this appears in print. We already hold many orders and it is much to be regretted that for the first time in the 16 years we have been handling the ARRL's famous *Radio Amateur's Handbook* it has not been in stock by early March. Apparently, there has been some sort of production hold-up at the American end. The price of the 1973 *Radio Amateur's Handbook* is £2.85 in limp cover, or £3.65 in hard-back ("library edition"), prices post free. Orders to Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

## MATERIAL FOR PUBLICATION

We are always glad to see material—in the way of technical articles and similar matter—for possible publication, for which we pay at good rates on appearance. Articles should be set out in the form outlined under "Authors' Mss.", to be found on the Contents page of any issue.

Photographs of Amateur Radio interest are constantly required. They should be good quality black-and-white prints, about post-card size, with details on a separate sheet.

All such material should be addressed: Editor, SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

## ANTENNA NOISE BRIDGE

CONSTRUCTED FROM A  
COMMERCIAL KIT

G. DENBY (G3FCW)

A SMALL box with an impressive sounding name. But what can it do? This question has been put to the writer on several occasions, and the answer is that this bridge takes over where the grid-dip oscillator and SWR bridge leave off.

### Applications

Aerial theory (for instance) is not everyone's cup of tea, but a certain amount of aerial practice *should* be. After all, many constructional hours are spent building

a transmitter, say (or a considerable amount of money buying one) to produce a number of watts of RF—the intention being to radiate this RF off the antenna. How well we do this depends on the aerial *and* its feed. Any inefficiency results in power being lost as heat. Power produced at great cost.

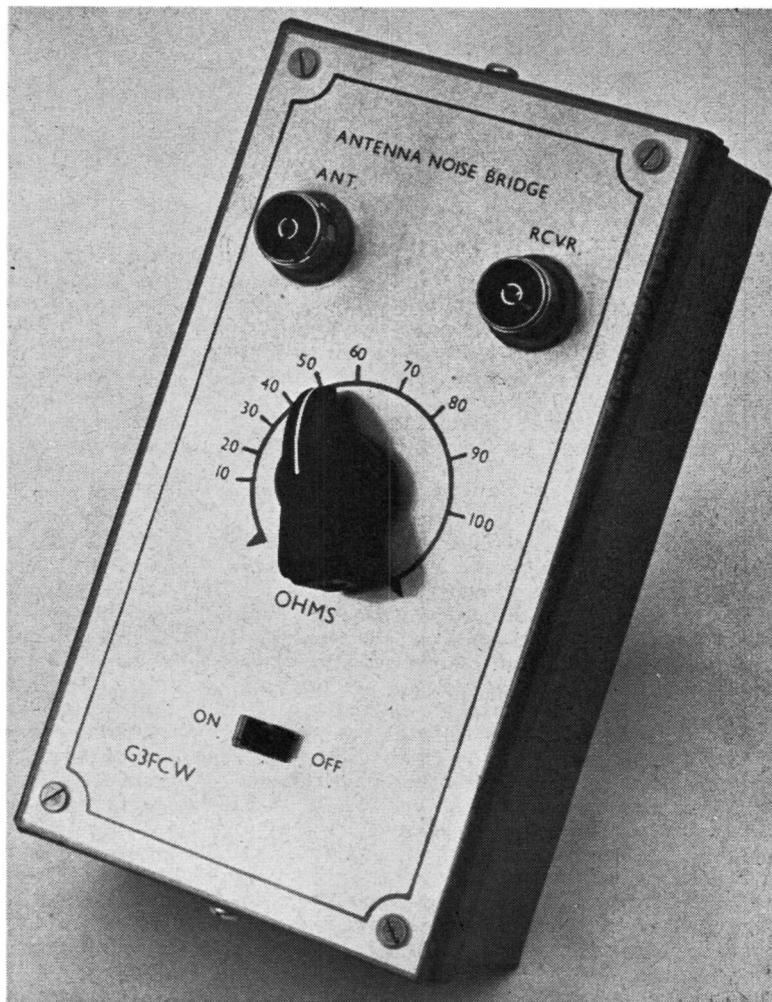
First, then, the antenna must be made resonant at the operating frequency. Many people cut to the “book-length” and leave it at that, ignoring perhaps, that their own local site conditions can modify this. (What they do not know, they don't worry about). Others, after reading the manuals, will say the GDO is the answer. After all, it is an instrument designed to measure the resonant frequencies of tuned circuits, antennae etc. So it is, but it gets a bit difficult when the aerial is *in situ* tens of feet up in the air.

Then there is the impedance at the feed point. To assume, for example, that the impedance at the centre of a half-wave dipole is 75 ohms is to ignore local conditions, height above ground and so forth which can

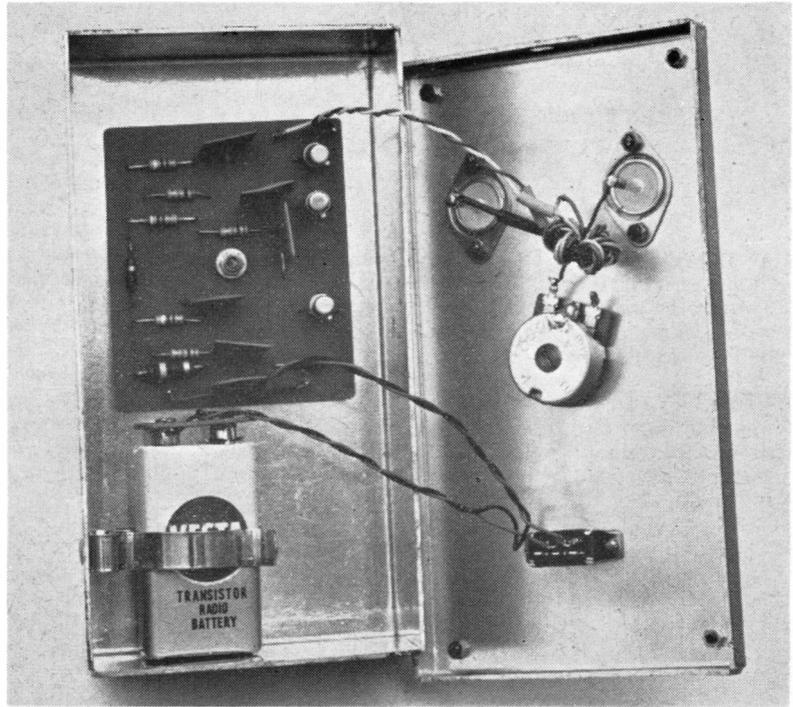
---

The completed Ae. Noise Bridge as described in the text by G3FCW. The coax sockets and switch can be fitted using countersunk bolts which are hidden when the front panel is in place.

---



Interior lay-out of the Noise Bridge as built from the "Cambridge" kit —see text. The toroid is suspended in the wiring between the coax sockets and the reference potentiometer.



alter this figure, either way.

Oh, yes, your SWR bridge in your 75-ohm line may show a low reading, but have you wondered why it was never *quite* 1 : 1? You will have found that any adjustments made at the transmitter end of the line made no difference. Perhaps the antenna impedance is not 75 ohms after all?

You may say it does not matter. The reply is that it does. Remember those hard-earned watts of RF, and where they are going?

#### Methods

Enter the antenna noise bridge. An instrument from which you can read your antenna impedance directly, and the resonant frequency from your receiver.

The unit comprises an RF source of very wide bandwidth ("white noise") as a signal, which drives the bridge. The bridge compares the unknown (antenna) impedance against a calibrated potentiometer, and the receiver is used as a (tuned) null indicator.

For example, the bridge is connected to the aerial feed point, and the receiver to the bridge. With receiver RF gain reduced (the bridge puts out a hefty signal) and AGC off, the tuning is adjusted for a null. This occurs at the resonant frequency of the antenna. Then adjust the noise bridge control for a deeper null, and read off the antenna impedance. Just like that!

Remember trying to tune your mobile whip to frequency? Or adjusting your receiver input circuit coupling for an optimum match? Cutting baluns, or stubs to correct length?

All become easy and routine with the help of a noise

bridge. For a full treatment in the use of the bridge the excellent article by G6LX in *SHORT WAVE MAGAZINE* for July, 1971 is to be recommended.

#### Construction

Having decided to acquire a noise bridge, then three approaches are open. We can go out and buy one of the commercial models which are available, and which are no doubt excellent, but the prices of which were a deterrent to the author for an instrument which is not in constant use.

The second way is to build one, and certainly the circuit is uncomplicated. Several designs have been published, and usually consist of a zener diode used as a noise generator, followed by two or three stages of amplification. The noise signal is coupled *via* a wide-band transformer to the bridge circuit, which essentially is a calibrated potentiometer.

No problems arise until one reaches the wide-band transformer. This literally is the heart of the unit, and success or failure depends upon it. Its form is a multi-wound toroid, and the choice (and availability) of a suitable ferrite ring, and the correct winding to put on it, determines the upper frequency limit. No problem in reaching 14 MHz say, but what about 144 MHz? This proved another deterrent to the writer.

The third approach opened when it was found that a noise-bridge kit is being marketed by *Cambridge Kits*, 45 Old School Lane, Milton, Cambridge, for £4.00. This included all parts, with the all-important toroid, ready wound.

Now there are kits, and kits. One thinks of Heathkit,

with their attention to complete detail, and a step-by-step construction system. By comparison, the *Cambridge* kit is more a collection of parts. This is not criticism, as the kit is complete with components of first-class quality, even including the box and battery. A 100-ohm carbon potentiometer is supplied, an item you would normally have to search the shops for.

A piece of perforated board is included, together with a practical layout as well as the circuit, on which to build the noise-generator and amplifier. Although this is perfectly adequate, the writer decided to etch a printed circuit board as it looks better. The recommended layout was followed and the circuit marked out using some cellulose paint as a resist. A few minutes etch in acidified ferric chloride solution was followed by cleaning, drilling and the soldering in of the components. In all, not more than an hour or so's work.

The mini-box lid was drilled for the potentiometer, and the switch and coax sockets were fitted using countersunk bolts which did not show when the panel was completed. All non-critical, but remember to keep connections short between toroid, potentiometer, and the coax sockets. A Terry clip was pop-riveted to the box side to hold the battery and the box then finished in silver hammer enamel. The circuit board was bolted on a spacer to the base of the box, and the inter-connections completed.

#### Calibration

It is recommended that the potentiometer be cali-

brated at low frequency (2 MHz, say) by using non-inductive carbon resistors as the load. This was done, and on checking with a Model 8 Avo, the potentiometer resistance was found to agree precisely with that of the calibration resistors. This is as one would expect, but it did suggest that calibration could be done at DC, by merely calibrating the potentiometer itself—angular position against track resistance—and calibration was completed this way. Although a potentiometer with a linear law is supplied, the calibration shows this to be not quite so. Checking various resistors at 144 MHz showed the DC calibration to hold true.

#### Finish

The difference between amateur and commercial equipment often shows in the finish of the panel. The layout as shown was drawn full size on paper and the letters and numbers applied with dry print lettering. This could have been used as the panel but the writer photographed this using line film, which accentuates black and white, and subdues any intermediate grey shades. The resulting negative, of high contrast, was then printed on to *Kentmere Kentint*, a photographic bromide paper having a metallic silver base. This gives a silver panel with jet black lettering. It is only paper of course and so a covering of 2.5 mm. clear Perspex was fitted as a protection. It is held in place by the potentiometer, and four countersunk bolts at the corners.

The result is a neat portable unit, with a performance to 144 MHz, and at a very reasonable price.

#### SMALL ADVERTISEMENT FACTS

In the spread of Reader Small Advertising in the April issue of *SHORT WAVE MAGAZINE* the total value of the priced "For Sale" items alone was about £5,700. The cost to the readers concerned for placing this advertising was about 1½% of the sales value—surely there could hardly be a better bargain! (This computation takes no account of the "wanted," or "what offers" or "exchange" notices).

For years now—and, remember, we've been in this business since before Hitler's War—our Reader Small Advertising (through which all manner of radio amateur apparatus is bought, sold or exchanged) has established the second-hand market value of a wide range of equipment. And not everything has gone down in price over the years—there are at least a few that have increased and others that have held their value.

The cost of reader advertising in *SHORT WAVE MAGAZINE* is 3p a word (to include QTH but not callsign, which is not charged and should always be quoted where applicable) which a *minimum* of 50p even if fewer than 17 words. Bold face, like this, is 25% extra. (These rates are, of course, as they were when the freeze was imposed last November, the issue for that month appearing on October 27).

As we cannot run ledger accounts for small advertising (with all the book-word and postal charges entailed) remittance must accompany the notice. Where there is doubt about the cost, we can accept a signed blank cheque for filling in (yes, many readers do it this way!)

protected by an endorsement "not over £3," or some such reasonable amount depending on the reader's own rough calculation as to what the cost might be. The charge entered on the cheque is notified on acceptance of the advertisement. Remit, with instructions, to: Advertising Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

#### HELP, PLEASE!

Readers who are direct subscribers (meaning those who obtain the *Magazine* by post on subscription paid to us in advance) are asked to let us have back their wrapper or envelope when notifying a change of address. It is also a great help if, when sending in a new QTH or C/A for the "New QTH" page, mention is made of whether the reader is or is not a direct subscriber. This can save hours of office time when the Subscriber Index is being checked for any necessary alterations to be made to address-plates. *Thank you!*

#### REDIFON EXHIBITION

The well-known manufacturers of commercial radio equipment, Redifon Telecommunications, Ltd., of London, will be putting on a display of their products, with lecture-demonstrations covering trends and developments in civil, naval, military and merchant-ship radio communication and navigational aids. This will be at the new West Centre Hotel, Earl's Court, London, during the period June 5-8.

## ABSORPTION AND INDICATING WAVEMETERS

### PRACTICAL NOTES ON CONSTRUCTION, CALIBRATION AND USE

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

**T**HOUGH an absorption wavemeter can be an exceedingly simple device, it is most useful in checking the order of harmonics, and can help with the tuning up of oscillators and circuitry of all sorts. It is an essential basic tool because it tells you things. In addition to its simplicity, the wavemeter has the advantage that its indications are unambiguous. Though its uses are mainly with transmitting equipment, it can also have other purposes.

Probably its greatest limitation is its lack of close accuracy over a narrow band of frequencies, but if correctly used its accuracy can be adequate for many applications.

Suitable wavemeter circuits for amateur work are given here, followed by constructional information, then more detailed notes on the manner in which such wavemeters are employed.

#### Absorption Wavemeters

The simplest wavemeter is shown at A in Fig. 1. The variable capacitor C is in parallel with the inductor L, and rotation of C allows the combination to cover a band of frequencies. As only one coil and one capacitor are required, it is practicable to have such a wavemeter for each frequency range wanted. This avoids any need for coil changing, and has the advantage that C can be smaller for the VHF ranges.

The alternative, where more than one range is necessary, is to employ plug-in coils as at B, Fig. 1. The inductors L are then wound on some of the plug-in coil formers which are available, or on suitable alternatives devised from items to hand—such as old octal valve bases, or paxolin tubes fitted with plugs.

These absorption wavemeters work by taking a little RF from the circuit investigated, and resonance is indicated by a meter already fitted in the equipment—such as that showing PA grid or anode current. The wavemeter coil is located so that it is coupled to the tuned circuit to be checked, and the wavemeter tuning is then adjusted to resonance, which will be shown by a small dip in the PA grid current reading, when as example investigating the grid or earlier circuits.

Coupling is maximum when the coils are in line and close together, falling off as the distance is increased, or when the wavemeter coil is at an angle to the coil in the transmitter or other equipment.

For accuracy of reading, the loosest possible coupling which will give an indication should be used. This will usually mean that the wavemeter is held with its coil some inches away from a circuit where there is appreciable power. But with a circuit such as a low-level oscillator, the coils may need to be much closer

#### Indicating Wavemeters

A wavemeter often has its own indicating device, such as a 100-microampere moving coil meter. This gives a sensitive indication of resonance. A 250  $\mu$ A or 500  $\mu$ A instrument is also quite suitable, though less sensitive.

A semi-conductor diode is also added, as in Fig. 2. Resonance is shown by tuning for maximum meter reading. However, coupling from the wavemeter to the circuit being checked should be loose until it is seen what kind of reading is likely to be obtained, or the meter may be damaged. Loose coupling also gives more accurate results, as it reduces pulling of one circuit by the other.

To obtain sharper tuning, wavemeters sometimes have a tapped coil, or a coupling winding for the diode, as in Fig. 3. Coupling between the tuned winding L1 and second winding L2 can be relatively small, to reduce damping which causes flat tuning. L2 may have about one-eighth the number of turns used on L1 (or 1 turn for small coils), while the tapping T can place the diode and meter across about one-tenth of the total winding.

To avoid the meter, a 6 volt 0.04 ampere or other low consumption bulb is sometimes used, as in Fig. 4. L2 can have about one-third to one-quarter the number of turns on L1. Closer coupling of L1 with the RF circuit is necessary than for Fig. 3, and Fig 4 is unsuitable for circuits where the level of RF is very low.

An output jack can be provided in series with the indicator in Fig. 2 or Fig. 3. Its main use is to take a plug for headphones or other equipment (such as a tape recorder) so that when the wavemeter is lightly coupled to the PA tank of an AM transmitter, the modulation may be heard, recorded for playback, or observed with a 'scope.



Fig.1 Absorption Wavemeters for one or several ranges

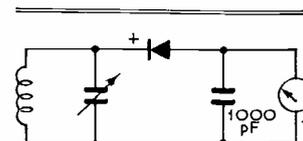


Fig.2 Circuit of Indicating Wavemeter

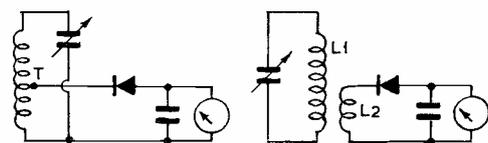


Fig.3 Modifications to reduce damping of tuned circuit

**Coupling Link**

With compact equipment or a bulky wavemeter it may be impossible to couple the wavemeter to the RF circuit directly. This can be overcome by providing a twin or co-axial lead with links L2 and L3, Fig. 5. A 15in. lead can be used up to 144 MHz, or a 3ft. lead up to 30 MHz. The main point is that the accessory should not be self-resonant in the working range.

For VHF, L2 and L3 can be one turn each, about 3/4in in diameter, or as required to suit the wavemeter coils. For lower frequencies, 2 or 3 turns can be used. The whole is made from insulated wire or has joints insulated to avoid possible contact with HT or other circuits. Coupling at each end of the circuit should not be made tighter than necessary to give a reasonable indication on resonance.

**Other Circuits**

A switched inductor such as that at A in Fig. 6 is sometimes used. Here, the single coil provides four ranges. It may be found that the tapped coil results in absorption effects on some ranges, or other effects which are absent with circuits such as those in Fig. 1. For this reason, a tapped coil is not much recommended.

Some commercial instruments have a fixed capacitance C in parallel with the tuning capacitor VC, B in Fig. 6. This is a good plan if a reliable capacitor is used at C, and it allows VC to cover a relatively narrow band of frequencies.

**Construction**

A circuit such as at A, Fig 1, is most easily assembled as in Fig 7, (p.161) with a pointer reading on a calibrated scale, or with a numbered dial for use in conjunction with a graph. For VHF purposes this form of construction can be duplicated with sufficient accuracy to give a wavemeter which should be found to cover a particular band quite accurately. (It will be realised that *exact* duplication of frequency coverage cannot be expected with a home-constructed item, but coverage should be sufficiently near that expected for easy calibration.)

L is 4in. of 20g. wire, insulated or in sleeving to avoid HT shorts. VC is a Jackson C.804 capacitor of 4.5 μμF, or similar. The wire is bent into a staple having 1in. between sides, ends being adjusted to overlap the soldering points 1/8in. each. A parallel capacitor (C, Fig. 6) of 10 μμF (2% or ± 1 μμF) is used. The range

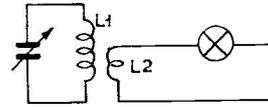


Fig. 4 Use of lamp as resonance indicator



Fig.5 Coupling a Wavemeter with a link line

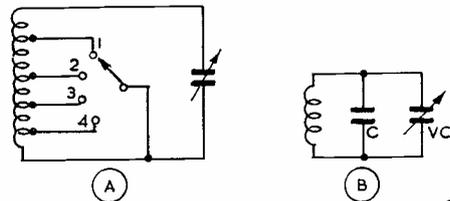


Fig. 6 Other Wavemeter circuits

F 145

is then 138-148 MHz.

Similar construction, but using a C.804 100 μμF variable, and omitting the fixed capacitor, can give a range of 42-160 MHz, which is useful for many stages of a 2m. Tx. L is then made of 6in. of wire, having 1 1/2 turns 3/4in. in diameter, with ends as for L1 in Fig. 7. (See Table II p.160 for calibration of 0-100° dial.)

For a larger single range wavemeter, a 100 μμF miniature variable capacitor can be fitted in one end of a paxolin tube, with the winding at its other end. To keep accuracy of calibration windings should be cemented. Semi-calibrated wavemeters such as those in Fig. 7 should be stored in a box or safe place when not in use.

For plug-in coils, sockets or a holder can be mounted on a piece of metal which also carries the variable capacitor, as illustrated. Constructional details are not too important, but a compact assembly allows the wavemeter to reach confined spaces. Rigid construction and wiring will help maintain accuracy.

Table I gives details for *Denco* plug-in miniature formers which are 3/4in. in diameter. These formers should be fitted in a holder while soldering to their pins. The capacitor is a Jackson C.804, 75 μμF.

For continuous coverage from about 1.8-150 MHz without too much crowding, five ranges will suffice. Due to the absence of other stray parallel capacitances, the ranges obtained are very wide. Frequencies tend to become crowded near the fully open position of the tuning capacitor, so it is as well to ignore part of the scale here.

The table will aid in selecting suitable windings. All coils are air cored. Where typical frequency calibration

**Table I**

- Plug-In Coil A. 1 1/3 turns. Ends 1in. and 0.9in. to pins.
- Plug-In Coil B. 7 1/2 turns. Ends 1in. and 0.8in. to pins.
- Plug-In Coil C. 25 turns.

All above use 26g. wire, with turns side-by-side.

- Plug-In Coil D. 60 turns 34g. enam. wire side-by-side.
- Plug-In Coil E. 100 turns 34g. enam. wire in pile occupying 0.3in.

C.804 75 μμF with 0-100° dial. Lead from holder to fixed plates tag = 0.8in. Lead from holder to moving plates tag = 1in.

Table II

Approximate dial readings against frequency with coils as specified.

42-160 MHz Wavemeter		Plug-In Coil C	
160 MHz	6°	30 MHz	8°
150	8°	28	10°
140	9°	26	13°
120	12°	24	15°
100	17°	22	18°
90	21°	20	23°
80	27°	18	30°
70	34°	16	38°
60	46°	15	43°
50	65°	14	48°
45	80°	13	56°
42	95°	12	65°
		11	76°
		10.5	85°
		10	95°
Plug-In Coil A.		Plug-In Coil D	
150 MHz	10°	12 MHz	12°
140	12°	11	15°
130	14°	10	19°
120	16°	9	23°
110	19°	8	29°
100	23°	7	37°
90	29°	6	52°
80	37°	5	80°
70	47°		
60	66°		
55	81°		
Plug-In Coil B		Plug-In Coil E	
75 MHz	4°	4 MHz	4°
70	7°	3.5	12°
60	11°	3	21°
50	18°	2.5	39°
40	29°	1	71°
35	38°	1.8	94°
30	51°		
28	60°		
25	74°		
24	81°		
23	90°		

points for ranges are given, these can apply only when the specified variable capacitor is fitted, and they are intended only as a basis for more accurate calibration.

#### Means of Calibration

As there are only two components in an absorption wavemeter, calibration may prove to be quite near that given. This will in any case simplify checking, which should be done to verify the coverage actually obtained.

A good means of calibration is to draw a graph of dial readings against frequencies, ignoring the extreme positions of the variable capacitor. Four or five calibration points will then allow the graph to be completed, to show all frequencies in the range.

An indicating wavemeter, such as Figs. 2 and 3, can be calibrated directly from a signal generator by taking the generator output to a 1 or 2 turn loop, which is situated an inch or so from L1. Use the loosest possible coupling, this depending on the generator output and meter sensitivity. Do not use generator ranges where the dial is calibrated for harmonics.

An absorption or other wavemeter can be calibrated from a receiver by holding L1 near enough the receiver oscillator coil to produce a slight chirp or change in

frequency (with BFO on) when the wavemeter is tuned through resonance. When the oscillator is HF of the signal frequency (check this if in doubt) the wavemeter frequency will be receiver signal frequency *plus* 1F, and the graph can be marked accordingly.

Incidentally, should a regenerative or super-regenerative receiver be used on VHF or be among old gear, wavemeter resonance will be shown by pulling the receiver out of oscillation. (Regeneration should not be advanced too far.)

Probably the best method of calibration is to use a transmitter already correctly set up. This will give calibration points at that of the VFO or crystal, plus multiples which are available in later stages.

#### Uses

An absorption or indicating wavemeter will show that a stage is operating in the band of frequencies expected. An indicating wavemeter can also be used to show relative strength of the RF present, and thus improvements resulting from adjustments or circuit modifications.

Fig. 8 is a typical crystal oscillator for VHF equipment where output may be taken at 2x, 3x, or some other multiple of the crystal frequency. As example, assume a crystal around 8.8 MHz, with the anode circuit tuned to 35.2 MHz, to be followed by a doubler for about 70.4 MHz. If the wavemeter is used to check that VC/L Fig. 8 are tuned to 35.2 MHz, correct operation of the



An indicating absorption wavemeter, using a plastic box as container to minimise hand-capacity effects, and an 0-100 microamp. m/c meter as the resonance indicator.

doubler is virtually certain, and output from this stage can be checked to assure it is on 70.4 MHz. With home-built equipment, VC/L could possibly be tuned to 3x, or around 26.4 MHz, in error. This could be followed by mistakenly tuning the doubler for 3x, resulting in 79.2 MHz drive to the PA—which is of course outside the band, but could probably be reached by the 70 MHz PA tank coil.

Similar considerations arise with two-metre or other VHF equipment. With LF band apparatus, the multiplication of stages following the LF VFO to bring it to higher frequency bands can be checked in the same way.

With some overtone circuits, a check is necessary that the oscillator is crystal controlled, and that output is on the wanted overtone. Fig. 9 is a simple circuit of this kind. Output increases as the tap is moved along L1 away from the crystal, but a point is reached where the oscillator is no longer controlled by the crystal, instead oscillating at any frequency to which L1 is tuned. If adjustment to L1 tuning moves the wavemeter tuning up and down, the circuit is not crystal controlled. After checking that L1 is on the right frequency (often 3x or

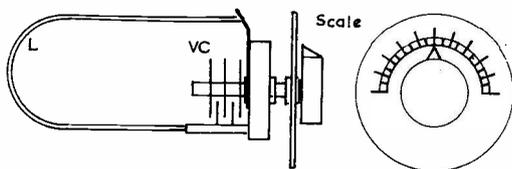


Fig. 7 Construction of VHF Wavemeter

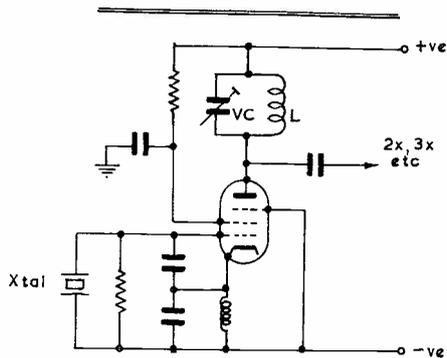


Fig. 8 Typical oscillator with harmonic output

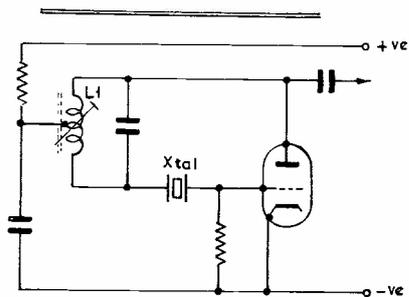
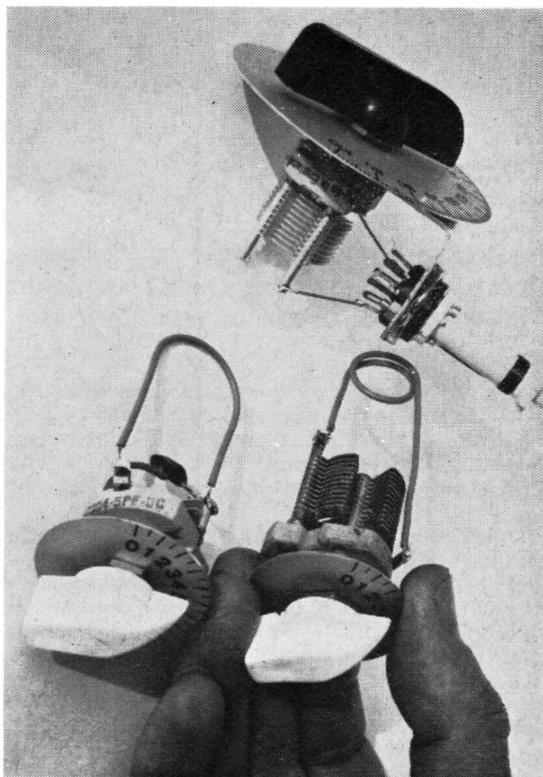


Fig. 9 Triode Overtone oscillator

F 146



Single range absorption wavemeters of the type discussed in the text for 138-148 MHz and 42-160 MHz, also (at top) a five-range wavemeter with plug-in coils for 1.8 to 150 MHz.

5x) this fault must be corrected, and frequency stability confirmed with a receiver.

**RF Indication**

If the indicating wavemeter is positioned so that its coil picks up a little RF from an appropriate anode or grid circuit, tuning or other adjustments to earlier stages can be directed to securing the best meter indication. (But a crystal oscillator may have to be slightly off-peak for reliable starting.)

Some VHF transmitters have some kind of RF tune-up indicator, as the PA anode current meter dip is not a reliable indication of best tuning. Where no such indicator is provided, the indicating wavemeter can be positioned to pick up a little RF from the PA tank, and adjustments are then for maximum RF here, which correspond to maximum RF output of the PA.

The presence of strong harmonics, or parasitics, will show up as unexpected and unwanted indications on the wavemeter, if it is coupled to the PA tank and tuned upwards in frequency. Breakthrough on what is sometimes termed a sub-harmonic (as when a simple 160m. Tx doubles to 80m. but does not sufficiently suppress the original frequency) will also show on a sensitive indicating wavemeter. All such defects should be eliminated before putting the equipment on the air.

• • • SWL • • •

SHORT WAVE LISTENER  
FEATURE

By Justin Cooper

INTERESTING TECHNICAL POINTS — ANOTHER  
HEAVY MAIL — SOME QUERIES ANSWERED  
— NEWS AND GOSSIP — THE HPX SIDE

PERHAPS the most consistent theme running through the letters, if one discounts HPX matters, is the QRM caused to SWL's by "lessons," whether professional studies, O or A Levels at school, R.A.E., or whatever. And yet—it is quite strange—we live in a most untutored age.

The reason is not far to seek. This is the first generation to pursue education solely as a means to an end, and not for its own virtue alone. Thus, we have the distressing spectacle of the person who, for example, takes and passes an HNC in, say, Electrical Engineering, which gives him a responsible job and a good salary; and yet, once the coveted certificate has been obtained, its owner quite firmly and unequivocally sets his face against any sort of activity involving formal learning for the rest of his life.

This attitude appears in Amateur Radio, too—the SWL who boasts that he knows nothing of the technicalities, or the licensed type who buys his first receiver after passing the R.A.E.; or, less directly, the chap who thinks he should have a Novice or Citizen's-band licence (not available in the U.K.) because he doesn't want the bother of learning any more.

The Mail

Persistence pays, is the theme of the letter from *K. Plumridge (Southampton)* who reports happily that he has passed the R.A.E. after four tries, and the Morse at the first attempt, so that he now is the proud possessor of G4BYY—and as he has his ticket, Dad has caught the SWL bug again and purposes a re-entry to the All-Time Post War HPX Ladder.

Another happy chap is *C. Lancaster (North Ferriby)* who is now G8HDR, and welcomes reports from other SWL's, always providing they are "proper ones", of course. Chris intends to go on for his Morse in the shortest possible time, but the G8 call is a staging-post in Amateur Radio, at least until the dreaded A-Level exams are out of the way.

The *Singletons*, John and Shelagh, of *Hull*, have written to say they are, regretfully, retiring from the HPX ladder, thanks to a spread of other commitments, and overtime for John, not to mention two young children. We wish them well, and hope we shall in due course hear from them again.

A long and interesting letter from *B. Heppenstall (Holyhead)* details how he came to make the acquaintance of an unmodified R.1155A, and then to bring it up to par with his own modifications. Of course, there was

a certain incentive, with Dad operating 400 watts p.e.p. of VHF, to improve the cross-modulation performance, and to go for the R.A.E. Then there are A-Levels to go through, with a degree in electronic engineering to come later—but for the moment the old 1155 is doing fine at raking in the prefixes on CW, as his first list shows.

Also from *Holyhead*, also a first entry, is *M. Wright*, who is in for R.A.E. this December, all being well. Martin has a Yaesu FR-50B, with an R.1155 used as the Top Band receiver only, as reserve. The aerial is in a small—very small—garden, and so its 132 feet are spread out by the kindness of a couple of good neighbours.

In *Beckenham* lives *C. Henderson*, who has a B.40 receiver as the mainstay, plus two-metre converter. Since he kicked off in October 1970, Crispin has booked in 277 countries, mainly on Eighty and Ten although all bands are watched. On the aerial side there are a 200-foot wire, an inverted-Vee, and an endfed full-wave for Twenty.

*M. J. Marsh (Sudbury)* is working for his R.A.E. at Colchester Tech., and on the Rx side uses a Yaesu FR-50B into a Mosley RD-5 aerial running approximately N-S. With this set-up he puts in a list of DX which covers all bands and all continents, with perhaps the prize catch as VK4AVA on Forty.

After a lapse of about six years, *P. Barrett (Welwyn)* has made a come-back to the bands, with the help of a FR-50B receiver and dipoles for 14-21-28 MHz, running E-W. One of his more interesting observations was on Ten, where once or twice he heard W's working Europeans when both ends of the QSO were beaming towards South America—which only goes to show how large are the side lobes on most practical beam aerials.

*C. B. Russell (Runcorn)* has, since last he wrote, managed to elevate his aerial to twenty feet, to the improvement of his DX results. On a different theme, Brian waxes philosophical about the fact that he can get QSL's by return post from MP4, a PY8 1200 miles up the Amazon, and sundry other rare spots, but not at all from such as GD, GC, and EI!

Although he still listens for the same time, the results in terms of new prefixes have been disappointing for *C. Verstage (Old Basing)*; but on the other hand some of the few prefixes heard have been quite rare ones, which is some compensation!

The help of a new FR-50B receiver, and the raising of the aerial have both helped *D. Churchill (Bexleyheath)* to make a far better start on the Tables than he did in the same period for the 1972 Table—but we could add that a year's extra listening expertise has some bearing on this year's score.

\* \* \*

*A. West (Herne Hill)* raises the interesting point that

one can go for years without hearing, say, 5N2—and then, having heard the first one, several more are manifest in the next few days! Incidentally, he has built up the omni-directional aerial described in the *March Magazine* for use with the Oscar downlink on Ten. It seems to be fulfilling expectations, judging by the 10-metre prefixes recorded in his letter.

Oh' dear! We got it all wrong about *H. M. Graham's* (*Harefield*) set-up. For a start he has Eddystone 840C and FR-50B, not an EC-10—and the shack is exclusively radio, although it has in the past served, at separate times for darkroom, store, and so on. Interestingly enough, since Maurice moved into his den, the colour TV timebase noises, which plagued him downstairs, have ceased.

*L. A. S. Poole* (*Winchmore Hill*) has set your scribe a bit of a problem—he mentions a station which in the query looks like YY4CUE but in the list reads as YV4CVE—despite reader Poole being blessed with a handwriting which is easier than most to decipher! If it is YV, then it could be quite OK; but if YY4, Heaven only knows!

We have, in answer to *A. Williams* (*Stockport*) to be quite firm; stations claimed as /AM, must be signing with an amateur radio call proper to their country of origin. We cannot accept claims involving alleged amateurs, operating within our bands, using the aircraft's own call.

On to *B. Londesborough* (*Swanland*) who has some HPX points, as follows: JY5, quite possible; 5V7GE in Togoland; and a mystery "ZD5KKK". ZD5 is in fact down for Swaziland, superseded by the 3D6 prefix—your scribe has his doubts about this one, but would hesitate to put the red pencil through him in the absence of some other evidence. Perhaps someone else has some ideas?

*K. C. Webb* (*Reading*) has been preparing for his final examinations in accountancy, and so has been a bit out of touch; and on top of that his 840C receiver seems to have a fault somewhere aft of the detector—possibly an open-circuit capacitor coupling the audio stages? On the prefix front, Keith has AJ3VI, and a CI1ADV. The former is U.S. MARS (military) and therefore not amateur within our definition for HPX purposes, while the latter is a "special" from Canada.

One or two people have mentioned ZVØWH, who was a DX-pedition to Fernando de Noronha Is., by PYØWH. It is quite a good prefix, and understood to have been cleared by ARRL before departure.

### Technical Matters

*A. R. Holland* (*Malvern*) has a Trio JR-500SE which occasionally blows a fuse. One would guess that this is usually an event which occurs at switch-on, and the right answer is to use a "slow-blow" fuse which takes just that bit longer to blow than the normal one. If anti-surge fuses are not easily come by, it would be safe to raise the fuse rating a little; it must always be borne in mind that a fuse is basically a short-circuit protection, and over-currents of less than 100% do not necessarily result in the fuse blowing instantly—it may indeed hang on for hours till the heat melts the solder and so solders the fuse inside its holder!

Matching impedances is the problem raised by

### HPX RULES

(1) The object is to hear and log as many *prefixes* as possible; a prefix can only count once for any list, whatever band it is heard on.

(2) The /M and /MM suffixes create a new series; thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.

(3) Where a suffix determines a *location* the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE2BUJ/P/SU, they are arbitrarily counted as SU1 and SU2 respectively, and the same holds good for similar callsigns.

(4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 both count.

(5) The object is to hear *prefixes*, not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.

(6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate callsigns will not be credited, nor may any MARS stations be claimed.

(7) G2, G3, G4, etc., all count separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, WB2, WC2, WN2, all count separately, even though they may be in the same street.

(8) Send your HPX list, in alphabetical and numerical order showing the total claimed score. With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, if possible to arrive before the SWL deadline for that particular month.

(9) Failure to report for two consecutive listings, i.e. four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.

(10) Starting score 200. Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.

(11) Lists will be based on those shown in the current SHORT WAVE MAGAZINE list of Countries and Prefixes, dated January 1972, and with the current edition of the *DX Zone Map*.

*M. Stringer* (*Southend*) who is trying to couple a five-element Quad for 144 MHz to the feeder. One would expect the extra elements, over and above the first two, would pull the feed-point impedance down considerably, and possibly make direct co-axial feed possible, provided the directors and reflectors are pre-cut and do not have tuning stubs—tuning four stubs on the parasitic elements, *plus* another on the driven element would seem darn near impossible!

Not so far from Southend is *Rochford*, where lives *J. Cowan*. John has a problem in that he always believed

increase of RF gain would both improve sensitivity and selectivity, thus upsetting your conductor's statement last time about effective tuning of SSB. Now, look at it this way: For AM reception it is normal to have full RF gain and to let AGC control the overall gain, with AF set to a comfortable level. However, excess of RF gain, and to a lesser extent IF gain too, will result in an apparent loss of selectivity, due to signals on the skirts of the IF selectivity curve being strong enough to be detected and appear as QRM. In addition, all the strong nearby signals will probably cross-modulate at the mixer, and so generate a high noise level within the receiver IF which can well mask a weak wanted signal. The reduction of RF gain will not essentially reduce the sensitivity, until it has so far reduced that a given signal is no longer able to penetrate the detector diode and so become AF out of the speaker. Thus, the best method of taking SSB is to run maximum audio gain, and control the receiver, first with RF gain, and in the case of a really big signal, IF gain, or to run the receiver at nearer full gain and use an attenuator between the receiver and the ATU, balancing RF gain and attenuator settings for best signal-to-noise ratio. On a different line, John wants to know about the Cubical Quad aerial—a tall order since there is a book which deals exclusively with the Quad. Basically, it is a diamond shape, made by putting a pair of half-wave dipoles one above the other with the ends joined at each side. If you now short the feedpoint of the upper dipole, and feed the bottom one more or less normally, you have a single Quad element, the lower dipole feeding the upper one through the joined ends. The reflector or director element is just the same except that where the feeder would have gone is placed a shorted stub which is adjusted to resonate the element.

D. Rodgers (Harwood) did his 144 MHz converter an injury during the final tweaking after he had got it working and fitted it inside its box—oh, well ZTX-108's are not too hard to come by! Dennis's filing system may be of interest; he buys the 3-by-5 index cards which are sold at most good stationers, and uses them in conjunction with the metal tags also obtainable from office supply stores. When a new prefix is heard it is entered on a card, and the card tagged. All prefix cards are kept in strict order in a filing box. When the prefix is entered in the list to be sent to the Editorial Dept., the tag is removed and the card re-filed. Thus, any card with a tag awaits entering into the HPX list for next time. Neat and simple! There is also room on the card for any other data required, such as hearing on each band, without any further confusion.

W. McFaul (Londonderry) is swotting up for both R.A.E. and Morse, which has reduced his air-time somewhat. To make matters worse, he is now noticing drift on his receiver, which so far has not yielded to treatment. A quick check could be to replace the local oscillator valve with another one, and if that fails and no other misoperation is observable, to try the effects of improving the ventilation—for a first try take the case off and see if it improves matters, or if possible just lift the lid, which by itself could have a considerable effect. Free circulation of air under the receiver helps, and a pile of magazines and call-books atop will hinder—J.C. found that out the hard way!

An interesting suggestion that some receivers are

more prone to TV timebase QRM than others is put forward by A. Glass (Plymouth), who has changed his FR-DX400 for a FR-50B for this reason, and so far is very pleased with his new box-of-tricks, both on CW and Sideband.

Another one with line-timebase troubles is B. Thomas (Pontefract). Perhaps the greater part of the noise is mains-borne, picked up by induction on to the earth connection, whence it gets into the receiver through common-impedance coupling. A first move, therefore, is to attack the SWL receiver earth connection—take a separate feed from the safety earth, straight down to the water-pipe where it emerges from the ground—that is, lower than the mains earth. If that is not enough, you could try adding a counterpoise earth, cutting one to resonate on each band of interest and either, preferably, "losing them" in the garden hedges or similar places, or even at a pinch around the room or under the carpet. The correct length is half that of a dipole for the same band.

### Rest of The Mail

On which clip come all sorts of interesting letters. G. Ridgeway (Darlington) has an HRO and a 52 Set, coupled through an ATU to a long-wire round the loft, which in its turn finally arrived at a Joystick, which between them have netted enough prefixes to make a start.

C. L. Lee (Ilford) has an untuned 150-foot wire out, the home end of which is hooked to a Drake R4A used on all bands from 160 to 15 metres. VK, ZL appear with W's on 80 and 40, a list covering all continents on Twenty, and almost as good a list on 15, with the latter covering all the W call areas.

The penalty of sticking to Eighty for L. Tarassenko (Dorchester) was that he just missed making the 200 for an entry in the 1973 table. However, in addition he likes them to be at least R5S7, from his W3DZZ trap aerial, although for the Ladder we make no band rules, save that a prefix must be heard with certainty.

P. Barker (Sunderland) had his revenge on the germs during a recent malaise, by hearing JY1 and much other DX.

---

## ANNUAL HPX LADDER

(Started January 1, 1973)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
P. L. Barrett (Welwyn)	452	C. L. Lee (Ilford)	298
M. J. Stringer (Southend)	408	W. J. Smith (Benfleet)	288
R. H. McVey		J. Gravell (Burry Port)	286
(Weston-super-Mare)	390	M. J. Wright (Holyhead)	261
M. A. Londesborough		M. Hartley (Preston)	221
(Swanland)	381	G. Ridgeway (Darlington)	210
K. Williams (Swinton)	346	W. McFaul (Londonderry)	208
D. Churchill (Bexleyheath)	336	C. B. Russell (Runcorn)	202
S. Scott (Stockport)	309		

Starting score 200, in accordance with the HPX Rules.  
All prefixes to be heard on or after January 1, 1973.

---

SWL station of 15-year old Mike Allisette, Springbank, Les Ozouets Road, St. Peter Port, Guernsey, C.I.—whose father is GC3NDX and elder brother GC8DCO (quelle ORM!). Mike is, of course, going for his own ticket. The rig shown here includes a Heathkit RA-1 Rx with home built ATU and a B2 receiver as stand-by. He has a long-wire aerial, favourite bands are 1.8 and 21 MHz and he can hear the mainland Top Band nets on a Sunday morning.



R. H. McVey (*Weston-super-Mare*) notices the large number of non-English-speaking stations in the DX Phone portions of both Twenty and Fifteen. This has for long been the case, as there are bits of the band where the W's don't penetrate, and a chap can have a QSO in his own language in peace if he wants to. But there is some resistance building up to using "American-English" as the *lingua franca* of the bands.

Two letters from J. H. Sparkes (*Trowbridge*) show that he has been down with 'flu—and since then he has had to send away the receiver, as its BFO decided to go on the blink and eliminate reception of SSB and CW signals.

P. L. King (*Emsworth*) wonders just what sort of prefixes the leaders offer each time—answer is much the same as his own, except that they have more of them, gained by intensive and selective listening!

Oddly enough, the list from S. Foster (*Lincoln*) is right after reading King's comment—Stew this time has six new ones to offer, namely A4, C11, GD2, OH4/MM, 4X25 and 4Z25, to take up to 1307.

Another high scorer, J. Fitzgerald (*Gt. Missenden*) has, by the sound of it, rather given up his 3.5 MHz searching in the small hours in favour of more R.A.E. revision; we hope so, for his own sake! John is much pre-occupied with the question of what aerial should grace his transmitting set-up, space being somewhat hard to come by. A Good Question, indeed! Present thoughts are running on a 14-AVQ.

P. G. Jerromes (*Newton Abbot*) contrasts the activity on Eighty at lunch-times with the late-evening situation, to the detriment of the latter. His activity has had one interesting result in that his father, in Birmingham, has once again been bitten by the bug, and is very active with a Yaesu FR-400SDX himself. After the R.A.E. and Morse have been overcome, P.C.J. wonders about a transmitter, and fancies a K.W. *Vespa*—why not, indeed!

S. Scott (*Stockport*) is busy constructing at the time of writing, the project being a converter for Ten and

### HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
R. Shilcock (Lye)	1353	M. Williams (Sleaford)	727
S. Foster (Lincoln)	1307	E. W. Robinson	
A. W. Nielson (Glasgow)	1131	(Bury St. Edmunds)	724
J. Fitzgerald		C. Henderson (Beckenham)	711
(Gt. Missenden)	1119	W. B. Taunton (Meopham)	703
W. Bingham		A. West (Herne Hill)	688
(Carrickfergus)	1092	C. K. Verstage (Old Basing)	685
K. Kyezor (Perivale)	1082	B. Thomas (Pontefract)	681
T. Rootsey (Ilford)	1058	C. A. Lancaster (N. Ferriby)	671
R. Carter (Blackburn)	977	S. Wessely (Sheffield)	669
W. Edwards (Tadworth)	976	A. Judge (Bishops Stortford)	659
Irwin Brown (Newtonabbey)	972	O. L. Cross (Bexleyheath)	652
A. Mercer (Wigan)	922	D. A. Shepherd	
M. J. Quintin		(Brierley Hill)	651
(Wotton-u-Edge)	922	L. Thomas (Castleford)	632
H. Alford (Burnham-on-Sea)	920	J. Woods (Chillesford)	609
B. Hughes (Worcester)	905	M. Cuckoo (Herne Bay)	603
D. Rodgers (Bolton)	890	J. R. Cowan (Rochford)	579
R. Pullen (Crawley)	885	B. Cushing (Hove)	573
J. H. Sparkes (Trowbridge)	853	K. C. Webb (Reading)	571
L. A. S. Poole		A. I. Williams (Stockport)	534
(London, N.21)	842	M. North (Bath)	530
N. Askew (Coventry)	840	M. Kitchener (Hitchin)	523
N. Hembrey (Northiam)	832		
K. Plumridge		CW ONLY	
(Southampton)	822	A. Glass (Plymouth)	914
S. Proud (Letterston)	820	G. Proud (Letterston)	673
G. W. Raven		T. Rootsey (Ilford)	668
(London, S.E.13)	805	W. B. Taunton (Meopham)	600
P. L. King (Emsworth)	791	C. Henderson (Beckenham)	464
M. Fisher (Bradford)	779	D. Rodgers (Harwood)	411
H. M. Graham (Harefield)	742	J. Whittington (Worthing)	316
E. Parker (Hove)	735	J. Dunnett (Liege)	311
A. R. Holland (Malvern)	731	B. Heppenstall (Holyhead)	228

Starting Score 500 for Phone, 200 for CW. Listings include only recent claims. Rules for HPX—see Panel, p. 163. DX Zone Map with latest Prefix List 85p post free (Prefix list alone 23p post free) from Publications Dept., SHORT WAVE MAGAZINE, 55 Victoria Street, London, SW1H-OHF.

Fifteen, to extend the range of the BC-348.

The contrast in behaviour, as between his old SX-24 and the new FR-50B—fitted with Top Band, calibrator and full ten-metre coverage—which now replaces the

earlier box, is outlined by *A. Judge (Bishops Stortford)*, who finds it has done quite a lot even for his Top Band score.

*E. Parker (Hove)* feels rather like a cat on hot bricks just now, the reason being that he awaits the arrival of the last few cards to complete the Hundred Countries confirmed. Ernie admits that once this hurdle is passed he will be able to log many prefixes which have so far not been logged while the hunt for countries was at its height.

Although it has not generated any problem in most people's minds in the prefix context, the question of the calls recently appearing with 25 or 100 as the numeral have worried several correspondents, *M. Hartley (Preston)* among them. To clear the situation up, a 4X25 counts as just that, not as 4X2. (Actually, such numerical aberrations are contrary to I.T.U. call sign stipulations).

Pushing his luck was *N. Henbrey (Northiam)* just lately, trying to lift a 40ft. Telomast with, on top, a TA-33, a rotator and a two-metre eight-over-eight! No wonder he had to cut the height down to only 30ft.—but even then his aerial set-up must be one of the best SWL installations in the country—and any sign of that lot toppling could spell money! On a different line from prefix chasing, Norman has changed his receiver, from the FR-500 to the FR-400, for listening to VHF signals, both in the contests and over *Oscar VI*, through SSB signals have been heard from both sides of the Atlantic.

Though he submits a *nil* return, *K. Kyezor (Perivale)* mentions that his wife, going through his HPX records while he was away, found several unclaimed prefixes in the log—so it looks as though we should, ere long, have a large list from this quarter!

His list of prefixes is the shortest ever, says *H. Alford of Burnham-on-Sea* (not one of our youngest readers) the reason being that he is well occupied with the building of his "Mark II" version of the home-built effort of last year, a receiver to end 'em all. As he says, this sort of thing makes an interesting occupation for the long evenings.

*P. L. Newman (Thame)* has been really making progress, with most of the shack problems ironed out, several constructional projects completed, and a fault in the receiver cured with an assist from G8FMK. As if all that were not enough, Paul is in for the May R.A.E.

\* \* \*

*M. Smith (Matamata, New Zealand)* uses a Gulbransen general-coverage receiver and a Sanyo (types we've never heard of before!) coupled to dipoles for Twenty, Forty and Eighty coupled through a common feeder. Mike queries 9M1MM, but we would think it most likely is a misreading of 9N1MM, who is pretty active.

*W. J. Wellington (Whitley Bay)* has been, he says, chased from one room to another with a paint-pot—but he found the time to build a transistor RF amplifier and to tame it. Since his XYL went over to colour TV, he has been plagued with that time-base noise which makes Top Band all but unusable—the cure, as far as we can suggest anything, has been mentioned earlier in this piece.

A good—and novel—reason for an improvement in

scoring emanates from *R. Carter (Blackburn)*. Seems his dog has been waking earlier, at 0500, and getting Ben up as well, so early-morning stints on Eight are showing profit. It is always a good thing when the rate of scoring lags to change the listening hours, and so to open up new areas of the world for the logbook.

*T. Vale (Abingdon)* takes your scribe up on the question of *buying* versus *building*. He makes a valid point when he says that for five of the eight years he has been an SWL he has had to study for professional examinations, which, with such distractions, as YL's, clubs, discos, and so on, take up too much time to leave much for construction—and anyway few amateurs have adequate test-gear to set up a project once it is all wired up. When your Editor was a youngster, the current YL had to sit in on DX sessions, do the logging, tolerate the heat of a carbon-lamp battery charger and the shriek of a DC/DC 500-volt motor generator—all without asking silly questions! Changing the subject, OM Vale has a few things to say about known pirates, and those characters who blow into microphones, swear, and make a nuisance of themselves generally. He takes bearings of them over several sessions, makes as many notes as he can, call signs if these are "inadvertently" given, and any other useful data for a QSL—and then sends the lot to the Ministry! A nice idea and if several hundred more people would do so, the various bearings so taken would probably give enough information for MPT to take action.

### The May R.A.E.

This is dated for May 10, and by now all candidates will know where they have to go and will have been well briefed on the procedure. All we can do is to wish them luck and offer a few words of advice for what is basically a simple test (if they have done their homework).

Arrive in good time, take it easy, read carefully through the Paper, pick out the questions you can answer right away, and then tackle Part I, in which you have to deal with both questions. Long and complicated answers are not required. Remember that the Examiner expects to be able to read your writing—an illegible scribble annoys him and does not help you. Circuits where required should be drawn tidily, and that's all—there is no need to spend time on copper-plate presentation. Give yourself about ten minutes or so to read through your offering and mark clearly any amendments or second thoughts. Take no notice of what anyone else is doing.

If you tackle it this way, and you go in knowing the stuff, you should pass, no trouble at all.

### Conclusion

As usual, the space runs out before the while pile could be covered. Therefore, all those who sent in just a list for the Tables and maybe a brief note, have had their entries taken in—if their letter arrived by deadline-time.

So that's it once again. Keep those letters rolling, and tell us the news of your doings, addressed as ever to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ, and post it to arrive before May 24.

# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for June issue: May 3)

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

AS this comes to be read, outdoor activities, visits, and such-like goings-on add to the attractions of Club life, while the bands are all but through their spring peak, all of which is reflected in the reports, one way or another. Perhaps a Club session could be profitably filled by having a working party look over the gear; aerials, masts, tents, generators, all need some care and maintenance after their winter hibernation—and provide a means of filling, maybe, an awkward gap in the programme.

## The Reports

First, the clubs with no "local" affiliations. The first of these is **British Rail**, who have a very interesting, even if slightly late, Newsletter, once again with comments from Stateside.

**B.A.R.T.G.** caters for the radio teleprinter section of Amateur Radio activity—the boys with RTTY gear, both transmitting and SWL. Perhaps the main items to be noted is the convention, which once again will be held at Meopham Village Hall, in Kent. June 30 is the date for this, with visitors being met, if needed from the railway station. All the details from G3VZV—see Panel, p.168.

For **R.A.I.B.C.** this is the time for the Statement of Accounts, which shows, despite rising costs, an offset in terms of increased subscription income, and a most satisfying situation revealed of practical help by way of the provision of radio gear, receivers, transmitters, etc., to members who are invalid or blind. And, for the first time, those same members are going to have their own "do" by way of the Picnic at the Fairground, Broadlands Estate, Romsey, on May 20. Trains from Town will be met on prior request; for those coming by road, the

A.27, Romsey by-pass, is the route to take.

**Nigerian** next, where there still seems to be the scent of new licences in the air—one sincerely hopes the negotiations bear fruit, which must mean an influx of new members into the society.

**A.R.M.S.** are running a membership campaign, to garner in as members all the chaps with a /M ticket. One thing is certain that, for the lads who join, one of the benefits, aside from the *Mobile News*, is the advice service on such things as vehicle suppression. Details of membership can be obtained by dropping a line to G3FPK (see Panel).

The **Royal Signals** group has well over 900 members, of whom some 700 are licensed. Membership is open in full to serving or ex-Royal Signals chaps, or as associate to past and present members of the British Army, T.A.V.R. and Commonwealth Signals Corps—all these despite the title limitation. Details from the Secretary, as in Panel, p.168.

## South & East

**Harrow** start the ball rolling in this part of the world; they have a weekly session on Friday evenings, at the Harrow Sea Cadets Association Hq., Woodlands Road. May 4 sees a Junk Sale, and on the 11th Commander Marshall Turner of the Sea Cadets will talk on a topic of his own choice. May 18 is a Practical, and a week later the results will, hopefully, be entered in the Construction Contest.

At **Reigate** they have a monthly formal get-together and another informal. The latter comes up on May 1, at the "Marquis of Granby," Redhill, while the formal session, on Direction-Finding, is down for May 15, at

---

Group of Spalding & District Amateur Radio Society members taken during their visit to the Post Office Coast Station Humber Radio (GKZ, near Mablethorpe, Lincs.) which covers a wide range of maritime frequencies and Services.

---



St. Marks Church Hall, Alma Road, Reigate.

The lads at **Bedford** turn up once each week at the Dolphin, Broadway, Bedford, on Thursdays. May 3 is a Junk Sale, and on May 10 they have an Inventors' Club. May 17 sees G8HGW talking about Digital Techniques in Communications, and on May 24, G5AGU and G4AHE get together on the dais to present equipment for D/F on 144 MHz.

G3GEH is ever-present in this clip, with news of the **Acton, Brentford and Chiswick** events; this time, on May 15, G3CCD is to open a discussion on Speech Processing Techniques for SSB. As usually, the meeting is at the Trades and Social Club, 66 High Road, Chiswick.

A new Hq. is to be noted for **Kingston** who now have a billet at the 5th Tolworth Scout Group Hq., Stirling Walk, Raeburn Avenue, Surbiton, near Surbiton Lagoon. We understand the new place has "distinct possibilities," for a future permanent Club station and aeriels. The date for you to go and see is May 9, when there will be a Junk Sale, with the usual 10% cut for the funds.

Saturday May 19 is the date, Emmanuel Church Hall, Barry Road, London S.E.23 the venue, and G3OOU the speaker, for the **Crystal Palace** group meeting. Sad to say their last month's "special" a repeat of G5CS's

lecture at the IEE, on the "First Five Years of Wireless" was not noted in time for our deadline; a combination of their bringing their date forward a week, plus the rail chaos, meant that G3FZL's letter just missed this piece.

**Chiltern's** chaps are taking an interest in the art of Slow-Scan TV, according to their current programme. There is a talk on the subject down for May 23, as well as the informal on May 8. Both these are at the Ernest Turner works canteen, Totteridge Avenue, High Wycombe.

Well organised are the folk at **Dunstable Downs**, with every Friday from March to June accounted for in a newsletter printed around New Year time. For May we note a couple of "between weeks" on the 4th and 18th. May 11 is for G6JP to talk about 430 MHz PA stages; there is a two-metre D/F Hunt on May 13; and on May 25 G8FAL will be showing his 6-amp PSU for a Pye Cambridge, and also talking on RF Power measurement.

Another Club has to record a change of venue, namely **Stowmarket**, who now have a booking for the *first Monday* in each month at the Adult Centre, Stowmarket High School, Onehouse Road, Stowmarket. At the time of writing, they are in the middle of a series of lectures on the mechanics of getting on the air.

#### Names and Addresses of Club Secretaries reporting in this Issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.  
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.  
 BEDFORD: J. Bennett, G3FWA, 47 Ibbett Close, Kempston (2427), Bedford.  
 BISHOPS STORTFORD: E. P. Essery, G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford (52501), CM23-5BP.  
 BRADFORD: R. Harker, 65 Whitby Road, Bradford (43971), BD8-9JN.  
 B.A.R.T.G.: G. P. Shirville, G3VZV, 2 Bradford Way, Toddington (2470), Dunstable, Beds.  
 BRITISH RAIL: L. C. Carter, G3ILC, 35 Barnfield Gardens, Kingston-upon-Thames, KT2-5RH.  
 BURY & ROSSENDALE: J. D. Clifford, G4BVE, 10 Arley Avenue, Bury, BL9-5HD, Lancs. (061-764 3466.)  
 CHELTENHAM (RSGB): E. Janes, G2FWA, Hillside, Bushcombe Lane, Woodmanocote, Cheltenham. (Bishops Cleeve 2229.)  
 CHILTERN: F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks. (Penn 4240.)  
 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.  
 COVENTRY: G. Whenham G3TFA, 33 Chapel Street, Bishops Itchington, Warwickshire.  
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London S.E.23. (01-699 6940.)  
 DENBY DALE: J. Clegg, G3FQH, 8 Hillside, Leak Hall Lane, Denby Dale, HD8-8QZ. (Skelmanthorpe 2390.)  
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (2193), DE3-7GE.  
 DUNSTABLE DOWNS: C. G. Powell, G8BPK, 1 Wenwell Close, Buckland Wharf, Aston Clinton, Aylesbury (630600).  
 ECHELFORD: V. W. Higgs, G3VWJ, 205 Commercial Road, Staines (57021), Middx., TW 18-2QT.  
 EDGWARE: A. J. Masson, G3PSP, 62 Coldharbour Lane, Bushey, Herts., WD2-3NY. (01-950 6827.)  
 HARROW: L. Light, G3KDL, 22 Chippenham Avenue, Wembley.  
 HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford (3237).  
 HULL F. Moss, G8GDD, 334 Ings Road, Kingston-on-Hull, HU8-ONA.  
 KINGSTON: R. S. Babbs, G3GVU, 28 Grove Lane, Kingston-on-Thames. (01-546 2801.)  
 LINCOLN: F. Day, G4BXL, 5 St. Marks Avenue, Cherry Willingham, Lincoln (51058), LN3-4LX.

MEDWAY: H. E. Willis, 111 Laburnum Road, Strood, Kent. (Medway 76953.)  
 MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham 32. (021-422 9787.)  
 MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (3552), Sussex.  
 NIGERIAN: The Hon. Sec., Nigerian ARS, P.O. Box 2337, Lagos, Nigeria.  
 NORTH BUCKS: R. J. Pye, G8AAT, 7 Meadow View, Potterspury, Towcester. (Yardley Gobion 640.)  
 NOTTINGHAM: S. Claringburn, 49 Fernleigh Avenue, Westdale Lane, Nottingham, NG3-6FN.  
 R.A.I.B.C.: Mrs. F. Woolley, G3LWY, Woodclose, Penselwood, Wincanton, Somerset.  
 READING: D. King, 34 Crawshay Drive, Emmer Green, Reading RG4-8SY.  
 REIGATE: F. H. Mundy, G3XSZ, 2 Conifer Close, Reigate (43130), Surrey.  
 ROYAL SIGNALS: Captain (TOT) J. Cooper, Royal Signals, Blandford Camp, Blandford Forum, Dorset.  
 SALTASH: J. A. Ennis, G3XWA, 14 Station Road, Saltash.  
 SLADE: J. E. Drakeley, G8GRC, 186 Conway Road, Chelmsley Wood, Birmingham 37.  
 SOUTHGATE: J. Batchelor, G3XMV, 22 Faversham Avenue, Bush Hill Park, Enfield. (01-360 6537.)  
 SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, Cheshire.  
 SPALDING: R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs., PE11-1QX.  
 STAR: T. Leeman, G4BUU, 115 Asket Drive, Seacroft, Leeds, LS14-1HX.  
 STOWMARKET: A. P. Ashton, G3XAP, 30 Ford View Road, Stowmarket, IP14-2BL.  
 SUTTON & CHEAM: J. Korndorffer, G2DMR, 19 Park Road, Banstead, Surrey.  
 TORBAY: Mrs. G. Western, G3NQD, 10 Truro Avenue, Hele, Torquay.  
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, Herts., WD2-5JQ.  
 WIRRAL: A. Fisher, G3WSD, 34 Glenmore Road, Oxtou, Birkenhead.  
 WOLVERHAMPTON: J. P. H. Burden, G3UBX, 28 Coalway Road, Wolverhampton, WV3-7LX.  
 WORCESTER: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester (29208), WR5-2EG.  
 WORTHING: G. Hooper, G8ETL, 12 Bramble Crescent, Durrington, Worthing (62013), Sussex.  
 YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

---

The Guernsey Radio & Electronics Society have Hq. at The Lodge, La Corbinerie, Oberlands, St. Martin's, this being taken on the occasion of their annual construction contest, when GC3YIZ (right) received the cup from GC8BMO. There was a good entry, the winning one being an SS/TV monitor.

---



**North Bucks.** have an interesting one down for May 14, namely a lecture on British Rail Telecomms. The Hq. for this is at Wolverton Youth Club.

"To be announced," says the Secretary regarding the **Edgware** date on May 10; and of course there will be an Informal on May 24, as usual. Hq. is at the Watling Community Association, 145 Orange Hill Road, Edgware.

Before the weekly meetings of the *Worthing* group get going at 8.0 p.m. the room is occupied for thirty minutes with Morse practice for the keen types. As for the rest of the evening, we see a lecture on May 1, and

a Junk Sale on the 8th. G3JHM has a talk to give on May 15, on VHF topics, and both May 22 and 29 will be occupied with NFD preparations.

Good stuff at **Cray Valley**, where on May 3, G3VUU will give a talk on "TVI, Causes and Cures," The Natter evening is on May 17; both dates are booked at the United Reformed Church Hall, Court Road, Eltham, London S.E.9.

The second Thursday in each month is the date for the **Southgate** meeting. However, should you feel like attending, it would be as well to contact G3XMV,




---

**Amateur Radio** at the Shelburne Youth Club, Hornsey Road, London, N.7, where they get together on Monday evenings, 7.0 to 9.0 p.m. They have their own call G4BXW and the instructor is G3SLF (right).

---

at the address in the Panel, p.168, as there are indications that a change of Hq. address is very much on the cards.

### Up North

The cannibals must have been raiding in force in these parts, for hardly a letter is to be seen in the clip!

One of the survivors is at **Lincoln**, where there is to be a talk on May 2; an Open Night on the 16th; films on the 23rd; and a treasure hunt on the 30th. However, G4BXL forgot to mention the Hq. address this time, so for that detail we must refer you to him, as Secretaries' Panel, p.168.

However one may feel about a scribe forgetting to mention the Hq. address, how about a chap who forgets the *name of the Club* he writes for? Luckily, we know that handwriting of old—it comes from **Nottingham**, and tells us to look for them on Thursday evenings at the Sherwood Community Centre; as they have just had the AGM, it was not possible at the date of his letter to give much more detail than that.

No less than 151 members fully paid up is the proud record at **Derby**, making them one of the strongest Clubs in the country—and maybe the G2CVV stint of nearly 25 years as hon. secretary has something to do with that! Wednesdays are the main meeting-nights,

at 119 Green Lane, Derby. May 2 is a Surplus Sale; May 9 a Surprise Night; and May 16 a D/F Practice Night. Then comes a tape-and-slide talk on their trip to Andorra by the Nottingham lads, which is also a Ladies' Evening. Finally on the 30th, there is a film show.

### Midlands

First we visit **Wolverhampton** where the venue is at Neachells Cottage, Stockwell End, Tettenhall on Monday evenings, May 7 being a home-construction contest, and May 14 a Natter. May 21 is for the two-metre Project under G8ENP and the 30th is the committee evening. In addition, there is a Morse class, which runs on Fridays at Hq.

**Midland** have their place at the Midland Institute in Margaret Street, Birmingham, where, on May 15, they have a talk on RTTY by G3MNV.

Alternate Fridays is the routine at **Slade** in their Hq. at the Committee Room, Church House, High Street, Erdington, Birmingham; this gives us May 4 for a talk on "How to Make a Portable Receiver in an Evening," by G3JZF, and May 18 for a session topic for which has yet to be settled.

**Coventry** get together on May 4 and 18 for a Night-on-the-Air, between which falls the 11th, which is a Two-metre session, and then the 25th, on which date there is a possible visit to Elmdon Airport.

Now to **Bury and Rossendale** who have their monthly meeting on May 8, when there will be a Quiz at home, against the Blackburn crowd. The address to look for is the George Hotel, Market Street, Bury.

The lads at **Worcester** are on the move again, this time to a room at the Old Pheasant, a black-and-white building in New Street, Worcester. On May 7, there is to be a talk on the Navigation and Docking of the Mammoth Tankers, while on May 19, the plot for NFD will be unrolled.

May 3 is the date for the regular monthly sessions of the **Cheltenham RSGB** group, at the Royal Crescent Hotel, Cheltenham, when Freddy Butler will be, mainly, talking about Power Control, with, doubtless, asides on other subjects. On May 17 comes a limited-number party to the Police Headquarters in Lansdown Road; please notify G8ML if you wish to be in on this one.

Unfortunately we are not quite up to date on the doings of the **Wirral** group—but we can say that they are to be found on the first and third Wednesdays in each month in their temporary Hq. at the Community Centre, Carr Bridge Road, Woodchurch, where the entrance is through the large doors on the left side of the building.

### Western Parts

Perhaps the entrance to the West is through **Reading**, who write to advise us they get together on Tuesdays May 8 and 22, between 7.30 and 9.30 at their Hq. the Clubroom, the White Horse, Kidmore End Road, Emmer Green, and add that all visitors will be welcome.

A new venture for the **Torbay** gang is a news letter, first edition of which seems to be a winner. A sad event for this club recently was the death of G5IP at 85 years of age; members of the group were in attendance at the funeral to pay their last respects. For May, they have May 26, and they split the time between getting

### SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING MONTHLY
Bishops Stortford	British Legion Club, Windhill	May 21
Bradford	Bradford Liberal Federation, 10 Southbrook Terrace, Bradford 7.	May 1, 15, 29
Cornish	SWEB Clubroom, Pool, Camborne	May 3
Denby Dale	Denby Dale Parish Hall	May 30
Echelford	St. Martins Court, Kingston Crescent, Ashford	May 14, 31
Hereford	Civil Defence Hq., Goal Street	May 4, 18
Hull	592 Hessle Road, Hull	May 4, 11, 18, 25
Medway	Aurora Hotel, Gillingham	May 4, 11, 18, 25
Mid-Sussex	Marle Place, Leylands Road, Burgess Hill	May 3, 17
South Manchester	Sale Moor Community Centre, Norris Road, Sale	May 4, 11, 18, 25
Spalding	Ship Albion, Spalding	May 18
Star	New Inn, Bramley Town Street, Leeds 13	May 2, 9, 16, 23, 30
Sutton & Cheam	The Harrow, Cheam	May 15
Verulam	Market Hall, St. Albans	May 16
Yeovil	Youth Centre, Park Lodge, Yeovil	May 3, 10, 17, 24, 31

N.B.—In each case, the Secretary's name and address appears in the Panel, p.168.

---

At the recent annual dinner of the Scarborough Amateur Radio Society, G3TKX (right) received a memento in appreciation of his long service to the Society as hon. treasurer. The presentation was made by G3JBR, their president.

---



ready for NFD and having a Junk Sale, at the Hq., rear of 94 Belgrave Road, Torquay.

Saltash revive their *Tamar Pegasus* in newsletter form; and they have also taken the trouble to write as well, to remind us that Burraton Toc H is still "home," on alternate Fridays, but, sad to state, they gave us the dates for April! Not to worry, just look up the secretary's address in the Panel, and drop him a line.

#### Finale

And that's the lot for this month. For next time, your news and views for June, addressed as ever to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ, to arrive on (or before if possible) May 3. Sorry it's so tight, but that's the way the Calendar runs! Closing dates following are June 7 and July 5—and don't be late.

#### R.A.I.B.C. FINANCES

The latest statement covering the activities of the Radio Amateur Invalid & Bedfast Club shows that, during the last year, £645 was spent on the purchase of equipment for members. Donations totalled £816 and the printing and distribution of *Radial* (their monthly newsletter) cost £321, of which postage alone accounted for £193. Interest-bearing investments at year's end totalled £624, showing that R.A.I.B.C. is in a sound financial position. This is, of course, mainly due to the fact that no administrative expenses are incurred, all that necessary work being done *gratis* by the Woolleys, G3LWY and her husband G3ESR.

#### DAILY SLOW MORSE

The Royal Air Force Amateur Radio Society now has a regular schedule of Slow Morse transmissions at 5-15 w.p.m. going out on Monday-Friday evenings, starting at 7.30 p.m. clock time, for about half-an-hour. Frequencies are 1910, 3590 kHz and 144-024 MHz in the two-metre band. The callsign used is G3RAF, emanating from the R.A.F. Station at Locking, Weston-

super-Mare, Somerset, Hq. of the Society. Eight operators are available for the duty and transmission is by auto-Morse tape—so you get as nearly as possible "perfect" Morse. Those using the service are invited to drop a line to the Asst. Hon. Secretary, RAFARS, G3GNS, *QTHR*, or to Locking, with a comment on results at the listening-frequency used. It should be noted that all these Slow Morse transmissions are provided quite voluntarily in the interests of Amateur Radio.

#### INTERNATIONAL SCOUT FREQUENCIES

For regular communication on the amateur bands and for Scout net operating purposes, the following frequencies are in use: CW 3590, 7030, 14070, 21140 and 28190 kHz, and for Phone 3740 (3940 in U.S.) 7090, 14290, 21360 and 28990 kHz.

The regular Scout Nets are: For the U.K., Saturdays on 3740 kHz at 9.0 a.m. clock time; *European* Net, Saturdays at 0930z on 14290 kHz; *Australian* Net, fourth Sunday evening every month on 14120 kHz at 2300z. There is also a Scout World Net each Saturday evening at 1800z on 21360 kHz.

\* \* \* **THE MOBILE SCENE** \* \* \*

## FURTHER FIXTURE DETAILS

The Mobile Rally Calendar now looks to be about full up, there being no less than 19 events scheduled (of which two will have taken place by the time this appears).

That on April 1, the annual White Rose Rally at Leeds, is reported as having been a great success, attracting all of 2,000 visitors, with brisk business round the trade stands and 56 /M's worked by the Top Band (25) and two-metre (31) talk-in stations, respectively signing G3XEP/A and G4BAO/A.

As in previous years, we shall be very glad to have reports (and good pictures, please) as quickly as possible after an event, for coverage in these pages. Send to: "Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

## THE RALLY CALENDAR

- May 6:** Tulip-Time Rally, at Sunfleet on the A.16, four miles north of Spalding, Lincs.—Information from R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs.
- May 13:** South Leicestershire Mobile Rally at Westfield Activity Centre, Rosemary Way, Hinckley, opening at 11.0 a.m. Talk-in by G3ZOP/A on Top Band, G8CGW/A on two-metre AM/FM, and G3WPB/A on 2m. SSB. There will also be a bring-and-buy stall. Trade stands are to be organised and applications are invited. Details from J. Elliott, G8CGW, 92 Hinckley Road, Barwell, Leicester.
- May 20:** RAIBC gathering at the Fairground, Broadlands Estate, Romsey, Hants., in conjunction with the Southampton Group—Mrs. Frances Woolley, G3LWY, Woodclose, Penselwood, Wincanton, Somerset.
- May 20:** Otley Radio Society's Northern Mobile Rally at Moor Grange School, Ring Road, Leeds, offering all the usual attractions.—D. G. Mott, 17 Newall Carr Road, Otley, Yorkshire.
- May 27:** Maidstone Mobile Rally at YMCA Sports Centre, Melrose Close, opening at 11.0 a.m. All main events under cover, talk-in by GB3YSC on 2-4-80-160m. Contact A. S. Walter, G3WXL, 4 Oak Farm Gardens, Headcorn, Kent.
- May 27:** Hull & District Mobile Rally at Bishop Burton, East Riding College of Agriculture, on the A.1079, York-Beverley, with entertainment and attractions for the whole family, trade stands and a raffle. College grounds will be open from 12 noon, and the talk-in stations, G3AMW/A on 1981 kHz and G8GBY/A on 145.5 MHz come on the air at 11.0 a.m. Rally organiser is L. D. Colley, G3AGX, 13 Ferry Road, Wawme, near Hull, East Yorks., HU7 5XU.
- May 30-June 2:** Rally to be held in conjunction with the Bath & West and Southern Counties Show at Shepton Mallet, a well known and very popular event in the West Country. GB2BWS will be on 3710 kHz or near, depending on QRM, and it is hoped to have talk-in on two metres as well for the period of the Show. Operator assistance is invited, with free car/caravan entrance and parking for helpers. It is proposed to have a dinner for radio amateur visitors on Friday, June 1. Contact: R. B. Holman, G2DYM, The Old Saw Mills, White Ball, Wellington, Somerset.
- June 10:** The fourth Elvaston Castle Mobile Rally in the grounds of the Castle Country Park, off the B.5010 south-east of Derby. Talk-in on 2-4-160m. by G3EEO and G3ZBI. A bring-and-buy sale and various other attractions.—I. Cage, G8GBV, 25 Petersham Drive, Alvaston, Derby, DE2 0JU.
- June 17:** The Amateur Radio Mobile Society's Rally will be held at R.A.F. Station, Cosford, on the A.41 about eight miles north-west of Wolverhampton, with talk-in on Top Band and two metres. Of particular interest is that the R.A.F.'s own Historic Aircraft Museum is at Cosford, and will be open to Rally visitors. A large trade show is being organised and will be accommodated in a big hangar—business men interested in the Amateur Radio trade are invited to get in touch immediately with the A.R.M.S. exhibition manager, S. Barwick, 34 Malvern Road, London, N8 OLA. For further details: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2 1EZ.
- June 24:** West of England Mobile Rally at Longleat House, near Warminster, Wilts. This will be the usual good show, put on for many years now in a particularly attractive setting—the house and park alone are well worth a visit.—Rally details from A. H. Williams, G8CKJ, 58 Britannia Road, Kingswood, Bristol.
- July 8:** Upton-on-Severn Mobile Rally, organised by the Worcester & District Amateur Radio Club. Details: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester, WR5 2EG.
- July 15:** Annual Mobile Rally organised by the Scarborough Amateur Radio Society at Burniston Road Barracks, Scarboro', as in previous years. Details: P. B. Briscoombe, G8KU, Roseacre, Irton, Scarborough, Yorkshire, YO12 4RL.
- August 12:** Torbay annual Mobile Rally at Newton Abbot Rugby Club ground, with talk-in, the usual stands and competitions.—L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.
- August 12:** The 1973 Mobile Rally at Derby, organised by the Derby & District Amateur Radio Society, to be held at the Rykneld School in Bedford Street, as in previous years. Ample accommodation if wet, free entrance and plenty of parking space, many attractions for all comers. This is a well-established annual event, which regularly attracts a large attendance.—F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby, DE3 7GE.
- August 19:** Preston (North Lancs.) Annual Mobile Rally at Kimberley Barracks, Deepdale Road, Preston, Lancs., with free car park, trade stalls, refreshments and a bring-and-buy offering. Talk-in will be given on Top Band and two metres.—Contact man G. W. Earnshaw, G3ZXC, 12 Withy Parade, Fulwood, Preston, Lancs., PR2 4JN.

A firm well known in the Amateur Radio trade is J. & A. Tweedy, Ltd., of Chesterfield, Derby. They were at the White Rose Rally, Leeds, on April 1, with a well-stocked and attractively laid out stand.



**August 26:** Town & Country Festival Rally, National Agricultural Centre, Kenilworth, Warwickshire.

**September 23:** Harlow & District Mobile Rally, this year at Netteswell School, Harlow, to give more space and scope for their activities.—V. Heard, 106 Vicarage Road, Harlow, Essex.

#### SPECIALLY ON THE AIR

The Ministry will grant "for duration only" licences for AT-stations to be mounted for some special public occasion—such as shows, fêtes and similar events of immediate local interest. The callsign is issued to a licensed amateur who takes responsibility for the operation of the station under the usual radio amateur regulations.

Applications should be made to MinPosTel, Radio Regulatory Division, Amateur Licensing Dept., Waterloo Bridge House, Waterloo Road, London, SE1 8UA.

Where these licences are granted and publicity is desired in this space, please set out notices in the form shown here—noting that we also want the name/QTH of the contact man responsible for the operation of the station and the handling of QSL's. Address to: "Specially on The Air", SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

**GB3STF, May 12-13:** From the Grammar School, Priory Road, Spalding, Lincs., by the Spalding & District Amateur Radio Society, running CW/SSB on all bands 10-160m. (and AM on two metres), all contacts to be confirmed by special QSL card—Details from R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs.

**GB2OCC, May 16-June 15:** To be operated by Keele University Amateur Radio Society, in co-operation with other North Staffs. groups, for the Newcastle-Under-Lyme Octocentenary Charter Celebrations. Operator and SWL assistance is requested for station manning. Contact G3COY or G3UOK, QTHR, telephone *Stoke-on-Trent* 44875 or *Keele Park* 371, exten. 128.

**GB3LEC, May 19:** For the Long Eaton Carnival, to be held at West Park, Long Eaton, Nottingham, organised by the Radio Club of Nottingham, running SSB on 10-80m., and possibly two-metre A.M. All contacts confirmed by special QSL card.—A. Veitch, G8FRB, QTHR.

**EI0DMF, May 18-27:** Operating evenings from 5.0 p.m. clock till midnight, on all bands Ten to Eighty, for the Dundalk Festival.—W. Scully, 48 Woodland Drive, Ard Easmuinn, Dundalk, Co. Lough, Eire.

**GB3HCF, May 25-June 3:** For the Hereford Cider Festival, mounted by the Hereford Amateur Radio Society, running all HF bands (but mainly 20m. and 80m.) also RTTY. Enquiries: S. Jesson, 181 Kings Acre, Hereford, HR4 OSP.

**GB2FJE, June 13-14:** From the Shefford Community Centre, put on by the Shefford & District Amateur Radio Society, operating 2m. and 160m. AM, 10-15-20m. SSB. Contacts to be QSL's by special card.—D. Pike, G3VMI, 11 Hazel Grove, Stotfold, Hitchin, Herts.

**GB3HCW, June 30-July 7:** Operating all bands Top to two metres, with three stations on the air. This event is in conjunction with the Hanworth Carnival Week.—V. W. Higgs, G3VWJ, 205 Commercial Road, Staines, Middlesex, TW18 2QT.

# VHF BANDS

A. H. DORMER, G3DAH

THE event of the month must be the Auroral opening affecting Two and Four Metres on Sunday, April 1. This would appear to have been the best experienced for some years, with DX at 59A from as far afield as UR2. The first characteristic T5 signals appeared shortly after lunch time in the North and around tea time in the South, and the second phase started mid-evening and continued until well after midnight. Due to a move of QTH at this time (Murphy and his Law) your scribe missed it all, but prolific reader reports fill in the gap, and extracts are quoted below which give a synoptic picture.

**GM3KJF** in Ayr had 68 contacts, on SSB. **GM3ZVL** (Edinburgh) had 35 QSO's with five countries and 22 counties, many with 59A reports. **GM3ZVB** had 50 contacts, including 35 G's, and describes the opening as "fantastic." **GM3ZBE** (Aberdeen) observed the two phases of the aurora, the first lasting from 1636z to 1750z, and the second from 2130z to 0019z. He had a total of 39 contacts of which nine were on phone and the remainder on CW, and was pleased to hear the number of GM4's and G4's up on their keys. He was getting *Ar* signals from DLØPR the following evening with the beam heading much further to

the North than on the previous day, but no amateur signals were heard. **GM8FFX**, also from Aberdeen, reports the first phase as lasting from 1345z to 1830z and the second from 2200z to 0030z on the Monday morning. Between them, he and **GM3ZBE** worked 80 stations in eight countries and during the first phase Graham had 14 contacts while mobile with a *Liner 2!*

From up in Forfar, **GM2DRD** sends in a comprehensive list of stations worked which seems to include most of the DX reported from other parts of the country; he also noted an impressive visual display for much of the time. On April 1 he made 61 contacts before midnight but then had seven more *Ar* contacts early the following evening. Jim also draws attention to a brief spell of *Ar* activity on the evening of March 19 and again on the afternoon of March 25, when **G3LTF** was 58A at times. According to **GM3DIJ**, 70 MHz was alive with *Ar* signals, many of them from aircraft beacons.

**GW8FOL** (Anglesey) had his first-ever contact *via* Aurora on March 19, and was also up for the April 1 event. First *Ar* signals were logged during 1600-1800z and later over 2000-0010z. Best DX was **GC8AAZ**, (most unusual for the effect to be observed so far South) and the total worked amounted to 52. **GW3ZTH** (Glamorgan) reports *Ar* activity over 2040-0010z, with best DX as **GM3ZVL** (59A both ways just before midnight)—but it may be that his QSO with **GM3OXX** just prior to that may prove to have been better since 'OXX runs very low power. Joe also recorded the Auroras of March 19/20, but was unable to raise anybody.

**GW3WRE** (Glamorgan) worked two SM, five GM and a string of G's during the afternoon phase. **GW8DUP** in Swansea made it with four GM's and **G13RNO** on SSB, including **GM8FFX/M!** **GW8EHK** (Port Talbot) on SSB had his first contact at 1615z and the last at 1825z. He notes that there was much CW activity at times when the higher frequency SSB channel appeared dead. For him, the second phase started at 2100z and lasted through to 2330z, signals being much weaker than during the afternoon. (For

example, **GM8BKE** was 58A at 1620z and 53A at 2130z).

**GD2HDZ** found that *Ar* conditions had developed by 1615z and continued for about two hours. The evening phase appeared at 2040z and lasted until 0015z. GM, GI, PA and DC were all worked, with OZ and F heard but got away. All his contacts were on SSB.

**G8FUI** (Dudley) raised GI, GM, G and GW and remarks that **GW8FOL** was audible for some time before other stations appeared. LA and SM are still get-aways for **G3BW** (Cumberland), although he made it with PA and DL and a whole host of G, GW and GM.

For **G3COJ** (High Wycombe) this was the best auroral opening he had ever encountered. He missed the start of the first phase but logged the close at 1825z and at 1855z on 4m. Phase 2 started at 2045z and yielded a contact with **G13RXV** on 4m. QSY to Two produced contacts with **GM3ZVB**, **GM3ZVL**, **GM2DRD** on CW and **G13RNO** on SSB. A string of G's preceded a contact with **GM3UAG** on both 2m. and 4m. Around 2330z the real DX was coming in and Brian worked **LA5UG**, **UR2HD** and **SM5ALL**, among others. He also heard **UR2CO** working **G3BHW** ('BHW also worked **UR2CQ**). By midnight the EU/DX had disappeared, but GM was still very strong. On April 2, **GM2DRD** was heard auroral at 1820z, but, as elsewhere, the effect was short-lived. '3COJ also reports that **DK1KO** was heard with a auroral note on 70 cm.—one of the very few occasions on which this band has been subject to *Ar* effects, although reports of contacts on that band have come from the States.

Both first and second phases brought some good DX for **G8DNK** (Bradford) who comments further that optimum beam headings appeared to be due East for the EU and North-East for the G and GI stations! (An unusual contact was that at 59A with **G8BCL** five miles away!)

Still in Yorkshire, **G3NHE** (Sheffield) first cottoned on to the fact that a two-metre auroral opening was in progress when he heard some very peculiar notes *via* Oscar, and a QSY to 144 MHz after the orbit quickly revealed the cause. He stuck

to CW and worked DJ, G, GW, GM, PA, SM, OZ and LA—24 contacts in all—and heard a further 30 stations including ON, DM and, unusually, OK. He also logged OH, SP and UR being worked.

G3XDY (Cleethorpes) raised the usual DX stations but reports an interesting two-way SSB QSO at 1620z with GW8FOL via Aurora while he, '3XDY, was mobile in Goole, Yorks, on his way back from Leeds Rally. A noticeable feature of this QSO was the complete absence of the usual flutter, indicating, possibly, that the signals were coming down at a fairly steep angle. Incidentally, the gear in the G3XDY car is pretty ambitious—an FT-101 into a transverter running 150 watts p.e.p. input with a halo on the roof. G3OHH (Mow Cop) caught the first phase at 1725z and lost it at 1915z, but during that time logged some very good DX and comments on the level of SSB activity. He noted GB3SU and Gdansk as both auroral on 4m. at the time. Beam headings was NE veering to NNE. G3OSS (London) worked G, GM, GI and GW and found the most consistent signal to be that from GM3BKE near Glasgow who was 59A for much of the time.

Finally, a most interesting and comprehensive report from G3USF at Keele University. His first comment concerns the exceptional number of low power contacts which were being made. He quotes as examples that between G8CFQ/M using a Liner-2 near Barton Airport and G8CFY in Nantwich, 58A at 1635z, and that between G8AMD (Sutton Coldfield) and a GM/M in Fort William. G8FCQ also reported that there appeared to be a Doppler shift of about 1 kHz on the G8CFY auroral signal compared with his tropo. signal a few minutes earlier. One marked feature was the fact that nearby stations were auroral at such strength as to constitute a major factor in the reception of what would normally be considered a local signal. First auroral indications on 2m. came as early as 1410z, although fewer EU contacts were made during the afternoon than during the second, evening phase. In text book manner, there was a lull until about 2050z, signals peaked at around 2130z and disappeared at 0015z. It was characteristic of this

opening that most SSB signals were much less distorted than is usually the case (suggesting a much higher than usual reflecting efficiency off the auroral curtain. *Editor*). G3USF took the opportunity to check on 10 metres during all this activity and noticed "burbles" on G3NSA and G3BKS, both in the Manchester area. The afternoon 10-metre session also produced auroral tone on signals from UA1, SM2, DK, SM3, OH4, SM6, SMØ and LA. At 2234z and 2241z, non-auroral signals were received from W3 and at 2159z from W9. SM2 signals, which may have been at F2 rather than E's range, were also non-auroral. Altogether a very puzzling and complex propagation event. For the record, G3USF notes the following as providing the most consistent signals during the evening phase: GM2DRD, GM8BKE, GW8FOL, GD2HDZ, GI3RNO, GM3ZVL, G4BEL, G4BKP, GM3AUG, GM3OVB and GM3OXX.

Well, there it is—or was! Just when we shall get another opening like this is anyone's guess. It will, perhaps, be worth having a look at the band(s) with the beam NE on April 27/28 (just as this comes out). Though on the occasions when a repeat had occurred it was just a shadow of its former self, and

more often than not, there has been no repeat at all. Still, there had been considerable sunspot activity just before April 1, and one can only hope that the 27-day cycle will yield some results.

### Oscar VI

Interest is waning somewhat and there seems to be little point in giving more than general comment this month. Most devotees are finding it difficult to work anything new and the repetitious exchange of quick-fire reports is becoming a bit of a bind. Operation is still intermittent, the 70 cm. beacon is off and reception of the 10m. marker rare. For those whose interest has not flagged, the predictions for May are given in our usual Table. It is not proposed to publish the Results Table this month (shortage of space is one factor) but please send in your up-to-date reports of *prefixes* worked for next month as usual.

Just to wind it up, GW3FSP has now had over 800 Oscar contacts, of which more than 300 are Trans-Atlantic. EI6AS has added UA9 to his total, giving him 32 countries and 437 QSO's. G3NHE has 500+ worked and 33 prefixes to his credit. G4AJC has now made it with TF to give him 28 countries, and also noted the effect of the April 1 Aurora on

### OSCAR VI — Prediction Data

Orbit	Date	Time	Position	Direction
2525	May 5	0831	20°E	N/S
2526		1026	09°W	N/S
2527		1221	38°W	N/S
2530		1742	32°E	N/S
2531		1937	03°E	S/N
2532		2132	25°W	S/N
2537	May 6	0731	35°E	N/S
2538		0926	06°E	N/S
2539		1121	23°W	N/S
2543		1837	18°E	S/N
2544		2032	10°W	S/N
2545		2227	39°W	S/N
2700	May 19	0755	29°E	N/S
2701		0950	00°E	N/S
2702		1145	29°W	N/S
2705		1706	41°E	S/N
2706		1901	12°E	S/N
2707		2056	16°W	S/N
2708		2251	45°W	S/N
2712	May 20	0655	44°E	N/S
2713		0850	15°E	N/S
2714		1045	14°W	N/S
2715		1240	42°W	N/S
2718		1801	27°E	S/N
2719		1956	01°W	S/N
2720		2151	30°W	S/N

Times shown are for crossings at 52°N. Orbits beyond 45° E or W are not included. To calculate later orbits, deduct 5-15 minutes and add 1-29°E each 25 orbits. Orbits shown are for weekend operations only in view of the revised AMSAT procedure. Times in GMT. Easterly-Westerly positions in degrees relative Greenwich, 0°.

several orbits on that day. G6RH has added the following prefixes to his total: UK1, UT5, UQ6, UA0 and SM0.

On the subject of prefixes, since the Russian prefixes can now be claimed, the German ones may be treated similarly.

We will re-start the Oscar Results Table in forthcoming issues.

#### DX-Peditions

The Heriot-Watt A.R.S. plan an expedition to Lowther Hill in Lanarkshire for July 6-9. They will have gear for 4m., 2m. and 70 cm. and operating times and modes will be kept flexible to suit propagation conditions, with a bias in favour of CW. Skeds may be arranged through GM3ZVL, QTHR.

G8AGU and GM3JFG will again be portable in GM during June 18-29. This time they will have 2m. and 70 cm. and would welcome skeds on the higher frequency band, in particular. They will be starting in the Border counties and gradually working their way North. Frequencies are: 432.15 MHz and 145.4 MHz (SSB) and 144.05 MHz CW. Operation will be over 0715-0745 BST on SSB and CW—1900-1930 and 2000-2030 BST for 2m. SSB—and 1930-2000 and 2030-2100 BST for 2m. CW. From 2100 BST onwards, operation will be *ad hoc* with QSY to 70 cm. on demand on Two, or by previous arrangement. They will have 100 watts to a '640A on Two and 200 watts p.e.p. from a 4CX250B on Seventy. Skeds G8AGU, QTHR, and last-minute panics via G3BA, QTHR, who is the anchor man for this trip.

GM3YCQ/P will be operating from Kirkcudbrightshire on May 27 during the 2m. SSB contest.

*Advance Notices:* G8GGP and others are planning to be in Cardigan, Merioneth and Montgomery in August, on two metres.

GW4BLE and others intend to visit six of the rarer Welsh counties during the second week of August. Their two-metre gear, in a Ford Transit van, will be tested during Easter from Brecon.

#### VHFCC Awards

G8ECT (Coulsdon, Surrey) heads the list this month with a claim for Two-metre Award No. 182. He runs a Pye base station with a '640A at 30 watts input to a 6-ele.

## About The VHF Spectra

beam at 30ft. and although the QTH is at 320ft. a.s.l., he is still at the bottom of a valley! Licensed as G8ECT in September, 1970, though he was, he held an "experimental receiving and portable licence" in 1923!

Roger Manners, GM3ZVL (Edinburgh) gains Award No. 183 for 2m. operations. He runs 40 watts into a 320A from a VFO controlled driver and receives on a 2N4416 converter into a HA-600A. The antenna is an 8/8 at 40ft. and the QTH at 250ft. a.s.l. is far enough away from the Pentland Hills to enable him to get out well to the East and South, although West and South-West are difficult.

Bryn Llewellyn G8DOT, gets two-metre Award No. 184. From Tiptree, Essex, he used a Pye Ranger with a home-built, VFO controlled, FM rig with a '320A PA. Currently, he has 50 watts input to a '640A feeding a 10/10 slot-fed Yagi at 40ft. The Sentinel dual-gate Mosfet converter feeds a Star SR-200 Rx.

It was a pleasant surprise to get a claim from Old Timer G2DRA of Harrogate, who gains Award No. 185. Ted has been on 2m. since 1952, but with a break of several years. He runs 20 watts input to a '320A with a 4/4 slot at 28ft. The converter is a Mosfet front-end job, and feeds into an Eddystone S.640—aged, but still efficient! Modulator is a pair of KT66's. The QTH is up at 560ft. a.s.l. with a good take-off to all points except due West. Operation is on two metres only at present, but plans are afoot to come up on Four also.

#### The Scottish Scene

The GM6XI QTH in Edinburgh was recently invaded by willing helpers to get up the two-metre 8-ele. and 70 cm. 46-ele. beams for Jack, who is active on both bands, and will shortly be running higher power.

SSB activity is on the increase in GM with GM5VG, GM6ZV and GM3BKE from the Glasgow area, and GM4AOR in Edinburgh all putting out fine signals, as is Harry

Mackie, GM3FYB in Dunfermline.

With the advent of Spring and (sometimes) better weather, mobile activity is also on the up-and-up, helped, one may guess, by the arrival in the area of a number of "Cambridges" suitably modified to give a tunable Rx and increased modulation. GM8GEC and GM3BQA in particular, seem to be much occupied with this aspect of Amateur Radio.

GM3OXX is back on 2m. and 70 cm. and has started his mountaineering feats again (he will be /P in Bute at the end of the month). GM8EKF, lately returned from Jersey, and much impressed by the hospitality of the GC local amateurs, is back on 2m. and reminding the locals that they are not the only ones who must patiently wait for contacts on the band.

Still waiting to get into a new QTH is GM3ZBE of Aberdeen. The site has already been tried out with very favourable results, as many contacts with GDY stations testify, and with the pair of 4CX250B's now available as a linear on 2m., Alec should get his share of the DX. He is also on 70 cm. SSB with a transverter and a '320A PA.

GM3ZVB has been climbing in the Lake District and took his 100 mW rig with him. With this gear, and a 19in. whip, he was managing QSO's at around the 50-mile mark! He and GM3ZVL, both of Edinburgh, would welcome CW skeds on two metres any evening after 10.30 p.m.

#### International VHF/UHF Convention

The 19th International VHF/UHF Convention was held at the Winning Post Hotel, Whitton again this year and the attendance was such that serious consideration is being given to finding a larger venue for this event. The lectures were particularly well supported, and it was standing-room-only for most of the time. Rather fewer visitors stayed for the dinner than was the case last year, and enquiries showed that rather

less business was done at Trade stands—but, once again, this was a very popular occasion providing, as these affairs always do, the opportunity of meeting old friends and making new ones in a congenial atmosphere.

### News Items

**Four Metres:** EI6AS reports that the 4m. band in Eire has now been extended to cover 70-125 MHz—70-450 MHz. G3NHE (Sheffield) is now QRV on this band, as are EI4AL and EI7AF, the two latter both on SSB.

**Two Metres:** EI4AL and EI7AF will both be portable on 2m. SSB during the major VHF contests this year. EI5BH has SSB and RTTY on this band. EI4CF will be active on 2m. CW shortly. EI9Q is also on SSB and available most weekends. EI4AL was the first Eire operator to make a contact *via* Oscar 6.

G8DGR has a solid-state FM Rx under construction which will incorporate channel scanning and reckons that it is still cheaper to build one's own, even to this degree of sophistication, and certainly is more fun. G3KCR is now in a new QTH at 700ft. a.s.l. near Crowborough, Sussex. Although only running 10 watts of NBFM to an 8-ele. Yagi, he reckons on putting out a good signal and would welcome all or any contacts on this, his first experience of VHF.

G3XDY raises an important point in connection with 2m. talk-in stations at Rallies and on similar occasions: Now that large numbers of "Liner-2" equipments are in use, it behoves organisers of these events to cater for this sort of working as well as for the more usual modes.

**70 Centimetres:** A national amateur contest, organised by the British Amateur Television Group, will take place on June 30, 1700-2300z and 0800-1200z, on July 1. The contest is open to all amateurs licensed to transmit or receive A/TV. Full details from Brian Kennedy, G3ZUL, *QTHR*.

### Tailpiece

An astonishing story, printed in the French magazine *L'Express*, has been sent in by a regular reader M. Bernard Stroh, and is summarised

### THREE BAND ANNUAL VHF TABLE

January to December, 1973

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G4BEL	8	2	47	11	29	4	101
GD2HDZ	12	2	48	6	13	4	85
G3NHE	—	—	48	11	23	3	85
G8FUI	—	—	50	9	16	2	77
G8EOP	—	—	41	6	27	2	76
G3OHH	23	2	31	5	8	2	71
G3DAH	14	2	40	8	5	1	70
G2AXI	20	2	33	3	6	1	65
G3FIJ	15	2	27	5	14	1	64
G8DNK	—	—	53	10	—	—	63
GW8FOL	—	—	50	8	—	—	58
GW3ZTH	—	—	48	9	—	—	57
G8GNE	—	—	35	4	12	1	52
G3BW	—	—	43	8	—	—	51
G8FMK	—	—	30	2	16	1	49
GM3ZVB	—	—	39	8	—	—	47
G8BXX	—	—	28	2	15	1	46
G4AEQ	—	—	25	2	13	3	43
G3XDY	—	—	35	8	—	—	43
GM3ZVL	—	—	33	7	1	1	42
G4AJE	—	—	32	6	2	1	41
G3SMU	10	3	5	2	16	3	39
GW8DUP	—	—	31	7	—	—	38
G8DGR	—	—	28	2	6	1	37
GW8FKB	—	—	27	7	—	—	34
G8BKR	—	—	24	2	6	2	34
G4BKG	—	—	28	4	—	—	32
G8CBU	—	—	23	2	5	1	31
G8GNC	—	—	28	2	—	—	30
G8FQE	—	—	25	5	—	—	30
G8DOT	—	—	25	5	—	—	30
G8GPR	—	—	26	4	—	—	30
GW8EHK	—	—	20	7	—	—	27
G8COG	—	—	23	3	—	—	26
G8EMS	—	—	20	2	2	1	25
G4AEZ	—	—	21	1	—	—	22
G8GBV	—	—	14	2	3	1	20
G3WHK	—	—	17	3	—	—	20
G8GJB	—	—	17	3	—	—	20
GW3CBY	—	—	11	5	—	—	16
G8FUL	—	—	13	2	—	—	15
GW8CMA	—	—	11	3	—	—	14
G8GXE	—	—	12	1	—	—	13
G3EKP	4	2	2	1	2	2	13
GW8CGH	—	—	7	2	—	—	9

The Table shows claims to date from January 1, 1973 and runs through to December 31, 1973. Your claims should be sent to:—"VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ, each month as they accrue.

here without further comment. It appears that Duncan Lunan, a graduate of the University of Glasgow and a member of the British Interplanetary Society, has been examining the findings of two eminent scientists, Dr. Van der Pol and Professor Carl Stormer, who some years ago investigated the phenomenon of long-delay radio echoes. He has come to the conclusion that these may be attributed to the presence of an extra-terrestrial object circling Earth. Now, this

solution for LDE's has been postulated before—but E.M.I., at least, are treating the matter seriously enough to provide equipment to maintain daily transmissions for one year with the object of testing this theory. (A good deal of discussion on this topic is going on in the scientific press. It is not new—it is just strange. *Editor*)

#### Deadline

Deadline for the next issue is **May 5**, addressed: "VHF Bands,"

SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Cheers for now and *73 de G3DAH*.

**Stop Press:** The French authorities are to launch a transponder on the morning of May 20. Up frequency: 432.1 MHz-432.4 MHz. Down frequency: 145.6 MHz-145.9 MHz. Power is 8 watts into horizontal dipole. Beacon on 145.2 MHz. Expected life is 8 days. Please listen and report.

### NEW TROPO-SCATTER LINK

It is interesting to hear that the Marconi Company will be installing another radio communication path using the tropospheric-scatter mode of propagation—in effect, meaning as much power as possible on the highest attainable frequency. This one will be in the Persian Gulf, to link Abu Dhabi and the island of Das, 104 miles out in the Gulf. The frequency to be used for the punch-through will be 2,500 MHz and the transmitter power one kilowatt (not easy to achieve at that frequency). However, high-gain dish aerials will be placed at both ends, sufficiently elevated to clear the superstructures of the great 200,000-ton tankers operating in that area.

It just shows what engineering problems are involved in setting up reliable radio links of this sort.

### OBITUARY

Having only recently had to announce the passing of Jack Drudge-Coates, G2DC, we now have to record, with the deepest regret, the deaths of three more old timers. Norman Spooner, G2NS, died at Southborne, Bournemouth, at the age of 75—he was one of the earliest regular contributors to SHORT WAVE MAGAZINE, starting in the pre-War days. Out in Australia, Alfred Perkins, VK2ZW (ex-G6KP, formerly of Morden, Surrey), died in March, and more recently Harry Marshall, G5IP (Dawlish, Devon), aged 85.



The new Racal-Mobilcal TRA.1338 is a commercial 25-watt SSB transceiver to cover a frequency range of 2.0 to 8.0 MHz, there being ten crystal channels which can be pre-set in that range. The design is solid-state, with output matching possible into virtually any type of aerial. Modes of operation are AM/CW/SSB and, being intended for mobile working, it is light and compact and runs off a 12v. negative-earth supply.

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

# NEW QTH's

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

- EI2CH**, G. P. Morgan, Porleek, Ravensdale, Dundalk, Co. Louth.
- G4BQT**, Radio and Electronics Society, Sorby Hall, Endcliffe Vale Road, Sheffield, S10 3ES.
- G4BTK**, A. G. Whitehouse, 24 Longfield Close, Amington, Tamworth, Staffs., B77 3BJ. (Tel. Tamworth 4636.)
- GM4BUI**, J. M. Simpson, 18 Binny Park, Ecclesmachan, Broxburn, West Lothian, EH52 6NP. (Tel. Broxburn 4100.)
- G4BUN**, H. Bunting, C.Eng., M.I.E.E., 34 Bowerfield Avenue, Hazel Grove, Stockport, Cheshire, SK7 6JA. (Tel. 061-709 3956.)
- G4BUX**, K. Bucey, Cold Wall Farm, Mellor, Stockport, Cheshire, SK6 5NH.
- G4BUY**, P. C. Hufton, 16 Patricia Drive, Arnold, Nottingham.
- G4BVA**, J. A. Edwards, 81 Hunter Avenue, Shenfield, Brentwood, Essex. (Tel. Brentwood 180.)
- GM4BVC**, G. R. Kelman, 2 Baillieswells Crescent, Bieldside, Aberdeen. (Tel. Aberdeen 48202.)
- GM4BVO**, C. M. Smith, 15 Strathmore Avenue, Kirriemuir, Angus, DD8 4DJ.
- G4BVR**, C. H. Pye, 54 Chester Road, Edmonton, London, N.9 8JG. (Tel. 01-807 4610.)
- G4BWB**, R. W. Andrews, 82 Wellington Hill West, Westbury-on-Trym, Bristol, BS9 4SN. (Tel. Bristol 49074.)
- G4BWN**, P. J. Funnell, 51 Bramhall Road, Bilborough Estate, Nottingham, NG8 4HU.
- G4BWQ**, P. T. Russell, 13 New Road, Bolter End, High Wycombe, Bucks., HP14 3NA.
- G4BWQ/A**, P. T. Russell, Church Farm, Boughton, Kings Lynn, Norfolk.
- G4BXD**, B. Nock (*ex-G8ESY*), 4 Park Crescent, West Bromwich, Staffs., B71 4AJ.
- GW4BXE**, P. Edwards (*ex-GW8FJK*), 1 Matthew Terrace, Pentrepiod, Pontypool, Mon. NP4 6PU.
- G4BXL**, F. Day, 5 St. Marks Avenue, Cherry Willingham, Lincoln, LN3 4LX. (Tel. Lincoln 51058.)
- G4BXQ**, A. Pressley, 22 Springbank Avenue, Farsley, Pudsey, Yorkshire, LS28 5LW.
- G4BXT**, P. Homer, 79 Gordon Road, Dartford, Kent, DA1 2LG
- G4BXY**, H. F. Barker, 372 Gosbrook Road, Caversham, Reading, Berks., RG4 8EG.
- G4BYP**, A. G. Scott, 74 Vale Road, Woolton, Liverpool, L25 7RN.
- G4BYY**, K. J. Plumridge, 219-A Priory Road, St. Denys, Southampton, SO2 1LR.
- G4BZW**, T. C. Clark, 78 Lansdowne Drive, Hackney, London, E8 3ER.
- G8GLQ**, C. A. Short, 175 Wellington Hill West, Westbury-on-Trym, Bristol, BS9 4QW. (Tel. Bristol 625502.)
- G8GND**, D. Crowe, 2 Cheriton Cottages, Ivy Dene Lane, Ashurst Wood, East Grinstead, Sussex.
- G8GOJ**, A. G. Hobbs, 83 St. Peter's Street, South Croydon, Surrey, CR2 7DG. (Tel. 01-688 2564.)
- G8GOZ**, 72 Catherine Road, Newton Hall, Durham, Co. Durham.
- G8GUP**, J. McGee, 6 Ripon Road, Newton Hall, Durham, Co. Durham.
- GM8GVQ**, A. H. Pardoe, 14 Kinkell Terrace, St. Andrews, Fife.
- GM8GVQ/A**, A. H. Pardoe, Madras College, St. Andrews, Fife.
- G8GXR**, Radio and Electronics Society, Sorby Hall, Endcliffe Vale Road, Sheffield, S10 3ES.
- G8HAA**, J. R. Wood, 28 Greenleaf Drive, Barkingside, Ilford, Essex.
- G8HAC**, J. J. Males, 12 Wantage Close, Moulton, Northampton.
- GM8HBU**, M. Parks, 6 Stamperland Hill, Clarkston, Glasgow, G76 8AE.
- G8HDR**, C. A. Lancaster, 16 Mill Road, Swanland, North Ferriby, E. Yorkshire, HU14 3PL. (Tel. Hull 633109.)
- G8HDZ**, P. Torrance, 4 Penpool Lane, Welling, Kent.
- G8HED**, I. S. Camm, 25 Sunnyhurst Lane, Darwen, Lancs.
- G8HEP**, B. P. Hughes, 46 Leinster Gardens, London, W2 3AT.
- G8HFP**, D. C. J. Matthews, 7 Foxgrove Gardens, Felixstowe, Suffolk, IP11 7JX.

## CHANGE OF ADDRESS

- G2ABC**, R. A. Ledgerton, West Lea, Hugus Road, Three Milestone, Truro, Cornwall.
- GM3IBU**, A. W. Wright, c/o Procurator Fiscal's Office, Sheriff Court House, Kirkwall, Orkney Islands.
- G3KCR**, D. Payne, Bramley, Eridge Road, Crowborough, Sussex.
- G3KWW**, Dr. R. W. Wilkinson, Lower Stonehams, Pangbourne Hill, Reading, Berks.
- G3PBQ**, M. Keen, 71 Deakin Road, Erdington, Birmingham 24.
- G3RHU**, M. F. Stanbridge, 12 Hancock's Close, Leiston, Suffolk.
- G3TMQ**, R. J. Harrison, 30 High View Road, Farnborough, Hants.
- G3UGO**, Mrs. Edna Cooper, The Firs, Treskerby, Scorrier, Redruth, Cornwall.
- G3URA**, R. G. Whittering, Arnocks, High Street, Herstmonceux, Hailsham, Sussex. (Tel. Herstmonceux 3273.)
- GM3VEY**, F. Baxter, Carnegie Lodge, Sunnyside Royal Hospital, Montrose, Angus. (Tel. Hillside 217—Ext. 278.)
- G3XDS**, P. J. Wilde, 151 Avondale Drive, Hough Green, Widnes, Lancs., WA8 7XB.
- G3ZDR**, W. C. Stampton, 88 Wilberforce Way, Gravesend, Kent.
- G3ZJZ**, J. P. Mason, 35 Broadway, Hockley, Essex, SS5 5EL.
- G4AHJ**, M. E. Downey, 11 Woodlands Drive, Lepton, Huddersfield, Yorkshire, HD8 0JB. (Tel. Kirkburton 4789.)
- G4AKC**, D. S. Starkie, 31 Endsleigh Gardens, Blackpool, Lancs.
- GW8FVY**, R. T. Pill (*ex-G8FVY*), 73 Park Avenue, Mynydd Isa, Flintshire.

## SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

6p per word, minimum charge £1.00. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50% for Bold Face (Heavy Type). Box Numbers 15p extra. No responsibility accepted for transcription errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, SW1H 0HF.

### TRADE

**IRISH Readers!** Join the Amateur Radio Society of Ireland. Magazine and QSL Bureau free to members. Details from **A.R.S.I., P.O. Box 73, Athlone, Co. Westmeath, Eire.**

**QSL Cards:** For Tx, G8/3 and SWL, one to 4-colour designs; good selection; large s.a.e. for samples.—**Printon Printers (R/Rose), 105 Fleetwood Street, Preston, Lancs.**

**QSL Cards for Tx and SWL.** Send s.a.e. for samples stating which type required.—**Beaumont, G5YV, 8 Ashfield Avenue, Morley, Leeds, LS27-0QD.**

**QSL CARDS** and G.P.O. approved Logs (hard back), prompt delivery. Send 4p stamp for samples.—**Atkinson Bros., Printers, Looe, Cornwall, PL13-1JT.**

**UHF High-Pass Filters:** Suitable for fitting in UHF/TV antenna lead. In many cases these have proved successful in eliminating TVI. Price £1-92 each. **E. & E. Services, 72 Elmstone Road, Rainham, Kent.**

**JUNE Issue:** Due out May 25. Single-copy orders 30p, post free, to reach us by Wednesday, May 23, for posting on May 24.—**Circulation Dept., Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.**

**WALKIE-TALKIE:** No. 88 ex-W.D. 14-valve four channel transmitter/receiver unit, £5-50 plus post/packing 68p. No. 19 ex-W.D. used transceiver, valved unit only, £5-50, carriage £1-10. No. 17 Sets, used valved transceiver, 2v./120v., £3-10, post 60p. No. 38 Sets, 12v., dirty cases but new inside, ex-W.D., £5-50, post/packing 75p. Salvage telemeter unit, multi-valve receiver, speaker and tape unit, in sealed cartons, cost vast amount, £4-15, carriage 88p. **Speech** recorders, salvage Remington AC mains valved unit, cost vast money, £5-50, carriage 88p. **Chart Boards,** ex-W.D. A.M. type, for air speed, wind speed, distance, vernier calibrations, cost vast amount, £5-50, post/packing 68p. Ex-W.D. tank aerials, three 4-ft. top sections, 85p, post 28p. **American** ex-W.D. feather-weight low-resistance headphones, new, £1-65, post 15p. **New No. 19** microphone and headphone sets, boxed, £2-75, postage 25p. Callers welcome, **Southern Surplus Merchants, Ltd., 66 London Road, Kingston-upon-Thames, Surrey. (Tel: 01-546 9263).**

### READERS ADVERTISEMENTS

3p per word, minimum charge 50p payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 15p extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, SW1H 0HF.

### READERS

**WANTED:** Heath HW-17A transceiver with AC/DC PSU.—**Davis, 20 Erw Goch, Waun Fawr, Aberystwyth (3591), Cardiganshire.**

**SALE:** AR88 receiver and manual (all new valves, cost £26), fine condition, £32. Buyer collects.—**Ring Major, 01-845 0920.**

**SELLING:** KW-2000 with K.W. AC/DC PSU, mobile aerial, spare 6146's, excellent condition, £110 or near offer; "G2DAF" type linear, internal PSU (table top), with spare valves, £18 or near offer.—**Griffiths, G3NPZ, 35 Ironmill Close, Fareham, Hants. (Tel: Titchfield 43894).**

**WANTED:** Panda ATU 150; Eddystone coils 706/LB and 706/W; battery eliminator, 120v./2v.—**Kyle, 74 Rubislaw Den North, Aberdeen, AB2 4AN, Scotland.**

**SALE:** IC xtal calibrator, 1750/1000/100 kHz and harmonics to above 200 MHz, £12 or near offer; 2m. FET Rx, £4 or near offer; 2m. valve Tx, kit construction, £6 or near offer; s.a.e. please for further details.—**Cole, Zodiac House, Porthcurno, Nr. Penzance, Cornwall.**

**SELL OR EXCHANGE:** Hammarlund SP-600JX professional receiver, coverage 540 kHz to 54 MHz, complete with cabinet and speaker, excellent condition (cost £520 new), £85; PART-EXCHANGE receiver welcome. Joystick and SM tuner, £9-50; Rogers FM tuner, £7-50. Trio JR-310, mint, £60.—**Snowden, Swainsea Lane, Pickering, Yorkshire.**

**SELLING:** R.1155, rough, £2; K.W. Dipole, £5; HRO-MX receiver, with 9 coil packs, £18; 20-watt amp., £2; 7 MHz home-built Tx, with PSU, £3; BC-625 AM Tx, £3; 600v. PSU, £2; P.M.I. preselector, £3; LW/MW/SW chassis, £3.—**Ring Goatley, 0703-47840 (Southampton).**

**SELLING:** Complete two-metre station, suitable for beginner; 20-watt AM/FM transmitter, convertor, receiver, 30-ft. mast with rotator and 4-element beam, co-ax. feeder, various odds and ends, £70. Buyer collects.—**Legear, G8FCP, 18 Bladindon Drive, Bexley, Kent.**

**SALE:** Home-built K.W. Vanguard, new 807 PA and 160m. mod., perfect order, must sell. Offers?—**5 Pinewood Close, Rubery, Birmingham B45 9HE.**

**FOR SALE:** KW-2000A, recent maker's overhaul, with many K.W. items, all excellent condition; going QRT, s.a.e. please for full details, then view by appointment.—**Pryse, G3WXT, 36 Hart Road, Byfleet, Weybridge, Surrey.**

**SALE:** Ranger 2107 (Tx only) working on 144-38 MHz, built-in mains HT PSU, needs 12v. LT, £10; EX-9X keyer, £5; BH-4 Mk. III working on 70-6 MHz, Rx tunable, £7; No. 10 calibrator, £1-50; Trio SP-5DS speaker, £2. All above items in working order. **WANTED:** Mohican or similar portable Rx.—**Thomas, GW4BCD, 13 Northways, Porthcawl, Glamorgan, S. Wales.**

**SELLING:** Ten-Tec PM.2 transistorised transceiver for 80m. and 40m., stable, 1 micro-volt sensitivity, 2-watts CW input, mint condition, original packing, with manual, £20; Ten-Tec KR-40 integrated circuit squeeze keyer, new and boxed, with manual, £25; Webster Bandspanner all-band mobile aerial, unused, £12; Pair of Pye 2207 low-band transceivers, complete.—**Henderson, G3LYD, QTHR. (Tel: Bedford 781-306 weekends, Birmingham 454-4828 daytime).**

**WANTED:** K.W. Geloso or Minimitter amateur band converter in good working order. Details and price, please. Buyer will collect reasonable distance (London).—**Box No. 5139, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.**

**SALE:** KW-201 receiver, as-new condition, £70.—**Shepherd, Woodfield, Priory Close, Chislehurst, Kent BR7 5LB. (Tel: 01-467 2023).**

**FOR SALE:** FT-DX401 transceiver with speaker, little used, £170; **WANTED:** Top Band transistor phone Tx and Top Band Communicator, (Berks).—**Box No. 5135, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.**

**FOR SALE:** The following AM low-band equipment offered in good condition and working order, suitable for 4 metres, or convertible for 2 metres, each complete with microphone, cables etc., less crystals: Marconi HP-12, with 12v. and AC mains power units, handbook, £20-50; Marconi L.67C, with 12v. and AC mains power units, handbook, £20; Murphy Rover, Tx 10-watt, 12v., £12; Murphy MR-820, Tx 5-watt 12v., BCC68, 12v. or 24v. (state which), £10; BCC69, 12v. transistorised power unit, £15-50; BCC81, 12v. transistor Rx/Tx, 5-watt, with quick-heat valves, ideal mobile rig, £30; BCC715, Tx 12v., 15-watt, with extension control unit and handbook, £27-50; BCC46 walkie-talkie, with handbook, £6-50; new, sealed QV06-40A, £7-50; Meters: 2½-in. square, 1 mA, 150 mA, 300 mA, 75p; 20v., 40v., 65p; RF, 0-5A, 1A, 1-5A, 2A, 2-5A, 3A, £1 each; 3¼-in. round, 1 mA, 100 mA, £1; RF, 0-5A, 1A, 1-5A, £1-25; Small weatherproof PA loudspeaker, £2-50; BCC68, aeronautical-band, 12v. or 24v. power unit (state which) with extended control unit, test unit and easy modification details for 2 metres, £18-50; Pye Cambridge, High-Band, boot mounting, £25; Pye Vanguard, High-Band, Tx/Rx unit only, £17-50. New vibrator packs 6v., £1, and 12v., £1-25; Marconi H-16 Rx, Low-Band, mains, £3; BCC46 walkie-talkie, High-Band, with handbook, £6-50; BCC46 walkie-talkie, Tx/Rx units only, £3-50. Many valves, brand new at reasonable prices. Carriage at cost; s.a.e. with all enquiries, please.—McVicar, GM8GEC, 31 Lochend Road North, Musselburgh, Midlothian EH21 6BE, Scotland.

**SELLING:** Joystick Standard VFA with 3A Rx ATU, £7. Carriage paid.—Denman, G3MEW, 24 Ascot Road, Copnor, Portsmouth, Hants.

**WANTED:** North Kent G8 wishes personal tuition to pass Morse Test, fee/reward by arrangement.—Ring Shepherd, 01-467 2023.

**WANTED:** Eddystone EC-10 Mk. II receiver. Please state price and condition.—Waters, G3OJV, 8 Gay Bowers, Hockley, Essex. (Tel: 03-704 4930).

**SELLING:** For RTTY, Creed 7TR reperforator, 6S tape transmitter, 7B teleprinter, table and silence covers, with DX-100U transmitter, all at £50 or near offer. For VHF, Storno Viscount high-band FM complete, £12, also Pye 4-metre base station at £10 or near offer.—Smith, G3UGJ, 33 Rippington Drive, Old Marston, Oxford. (Tel: Evenlode 229).

**WANTED:** Good BC-348 receiver, complete with power supply.—Ring Handy, Coventry 22201.

**BARGAINS!** Marconi CR-150/4 receiver, coverage 1-5 to 30 MHz, with xtal filter, matching PSU and handbook, £28. Marconi HR-22 SSB receiver, tuning 2 to 20 MHz, AFC locks on signal, with manual and in immaculate condition, £60. Racial mobile SSB transceiver, with remote ATU, 12v. solid-state PSU and control unit, £20. Racial Synthesiser, 3-6 to 4-6 MHz in 1 kHz steps, £25. Solatron CD.711 D-B 'scope, £28. E.M.I. 'scope, 5 MHz, £10. R.C.A. frequency meter, 1-4 to 6-7 MHz, high stability, in oven, calibration to 1 kHz, £10. Rhode & Schwartz C-bridge, £7. AVO L/C/R Bridge, £10. S.T.C. FSK unit, 2-5-6-5 MHz basic coverage, with deviation monitor 'scope, £25. Admiralty D/F receiver, coverage 2 to 24 MHz, showing bearing on calibrated CRT, £12. Twin tape-deck and amplifier in rack, £10. Marconi VTM, £2. Vintage signal generator, £7. Tx units ex-ART13, £2 each. Collins permeability VFO, 200 kHz to 1-5 MHz, £2. Xtal filter, 100 kHz, £3. Panadaptor, 30 MHz, £10. Large silvered cavity for 144 MHz, £3. No. 29 Set, 2 to 8 MHz, £12. ATU rated 1 kW, £10. Xtal Test Set, £5. Signal Generator Type TS-155C, £30. UHF Signal Generator, 710A, £12; TE-421, £7; TF-791, £5. Transformer, 250v. 4A isolating and 350-0-350v. 250 mA, £3-50. R.C.A. plate, £7; 1450-0-1450v. 250 mA, £3. CR-300 PSU, £2-50; 500/250v. PSU, rack, £3. Oscillator for 10 cm., W/M and Att., £7. Buyer collects.—Price, G8CNN, Underwood House, 110 Harestone Valley Road, Caterham, Surrey. (CA 45085).

## G3EKX S.S.B. PRODUCTS G3EKX

EDDYSTONE EC10. Mk. II ... ..	£86-00
EDDYSTONE 924. Power packs ... ..	£7-75
TRIO TRANSCEIVER. TSS10/PS510. New ...	£180-00
TRIO VFO 5 (TS500) ... ..	£21-00
LAFAYETTE HA230 RX. ... ..	£28-00
EDDYSTONE 770R V.H.F. RX. ... ..	£95-00
COLLINS TCS12 TX. Less P.S. ... ..	£8-00
VICEROY Mk. 3A TX. ... ..	£55-00

(Carriage extra please)

**MORSE KEYS.** Heavy brass. On wood base. Type C/1056A, back contacts. Large terminals. Unused, boxed ... .. (30p) ea. £1-20

**SUPERB R.C.A. ROTARY RELAYS.** 12v. D.C. input (hold in coil). Ideal for aerial switching 160m. to 2m. Changeover contacts. (3 sets). Only ... .. (24p) ea. 60p

**CRYSTALS.** New metal cased types. Mixed freq's from 201 kHz to 110 MHz. Please clearly state requirements and alternatives. Essential an s.a.e. is enclosed for reply. From... .. (5p) ea. 60p  
10-230, 11-155, 1-450, 2-5, 10-245, 24 MHz.  
Spon On ... .. (5p) ea. 75p

**SCARAB.** S.S.B. Tx ½ lattice Filters. Plus matching carrier xtal. (HC6/U xtal) all parts, instructions + 3 band Tx.—Circuit Hundreds in use ... .. ea £8-99

### SPECIALY MATCHED VALVES FOR LONGER LIFE

PAIR MATCHED 6HF5's R.C.A. ... .. (20p)	£5-50
PAIR MATCHED 6146 R.C.A. ... .. (20p)	£5-00
PAIR MATCHED 6146B R.C.A. ... .. (20p)	£6-20

1 FRANCES STREET, TRURO  
Tel. DEVORAN 862575 CORNWALL

## SPECIAL HRO RECEIVERS!

**HRO.** Tested and working, including a coil unit of our choice, £18.

**HRO-ST.** Tested and working, including a coil unit of our choice, £25.

LG coils, £1-50 each, 4 for £5.

HF coils £2 each, 5 for £9.

Set of 9 coils for £13, if with receiver.

Power units £5.

Complete HRO set, £32.

Complete HRO-ST set, £38-50.

**RI475.** 2-20 MHz. Ideal tuneable IF, Serviced and Tested, £19 : Complete and Untested, £11 : Rough sets for spares, £6. As new power units to match, 240v. A.C. and 12v. D.C. inputs, £5-50 with receiver, otherwise, £7.

### Specialist Services

Distributors of all Sonax and Teleradio kits.

Kits supplied for any published article ; send for details. If it is electronic, we will try to supply it. Try us first because we try harder, no enquiry too small.

Send large s.a.e. for full lists.

All communications acknowledged by return.

Carriage on receivers 75p, otherwise post free.

PLEASE ADD 10% VAT TO ALL ORDERS

## STUDIO ELECTRONICS (G8AIP)

P.O. BOX No. 18, HARLOW, ESSEX, CM18-6SH

Tel. Harlow 25457. Callers welcome by appointment

Due to Warehouse Clearance we have a few low powered F.M. VHF Wireless Station Type A, A.F.V. No. 88. Contained in two units (1) Transmitter/Receiver, (2) 12 volt Power Unit and L.F. Amplifier. The Tx and Rx are contained in a waterproof diecast alloy case, using a total of 14 valves, operates on four switched channels which are Crystal controlled.

All 8 Crystals are supplied, and are the same in each set. Therefore all sets will transmit and receive to each other, provided each are switched to the same channel out of the four.

The Stations are supplied with mounting carriers, 2 vertical whip aerials, plus aerial base, spare valves, bulbs, mounting screws, connectors, etc. Including the operating manual giving all details, plus circuits of the wireless set.

All above items are individually boxed and wrapped, placed in original transit case.

**ABSOLUTELY BRAND NEW**—Made by Echo for the Government no expense spared, few only available at £9.50, carr. £2.

#### RADIO TELETYPE TERMINAL SET

A. type AN/SGGIA latest Government release of these sought after units, housed in metal case, approx. size : 8" x 19" x 16" deep. Using a total of 11 valves, supply voltage : 115 volts 50 c/s. Containing Meter switched for checking, send and receive bias, send and receive level loop and plate current, in fair used ex-Government condition. Few only available at £7.50, carr. £1.50.

**TRANSCEIVERS.** Due to warehouse clearance we have for disposal, few only Transceivers No. 62 Mk. 2, made by Pye for the Navy and Army. Using a total of 11 valves, 1 RF and 2 I.F. stages, A.V.C., BFO, covering 1.5 Mc/s. to 10 Mc/s.



(approx. 200 to 30 metres) in two switched bands. Can be used on RT or CW M.O. or Crystal. A very good internal ATU made of a rotating silver wire coil, tunable over the complete range, suitable for aerials 4ft. to 100ft., internal P.U. for 12 volt D.C. A meter is fitted for checking voltages A.V.C., etc. Housed in a metal waterproof case, approx. size 18" x 10½" x 12½". Supplied in as new condition, being either re-built by Army Signals or store-soiled new set. In cartons two spare valves, circuit, price £17.50, carriage £2. Suitable hand telephone with spring coil plus transmitter switch in handle. Modern, £1.50.

**CRYSTAL CALIBRATOR No. 10.** Range 500 kc/s. to 10 Mc/s., up to 30 Mc/s. on Harmonics. Size : 7" x 7½" x 4". Power 300 volts HT, 12 volts LT. The Calibrator can plug into a Power Socket on the 62 Trans-Receiver which it was normally used with. Supplied in good used condition with circuit, £2.50, Post 50p or **BRAND NEW IN CARTON, £5.00, 50p post.**

**LARGE QUANTITY OF TELEPRINTER PAPER** Available, sprocket fed, contained in sealed packs, each pack containing 4 separate wads, price 60p per pack of four pads, post 25p, or wooden crate containing 5 packs equals 20 wads, £2, carr. 50p.

## JOHNS RADIO

424 BRADFORD ROAD, BATLEY, YORKS.

Phone: BATLEY 7732

**MANUALS:** Mercury, Electra, B.40, Hartley, 13A, RA-17, £1.75; R.216, R.210, SP-600, PTC-2107, CR-150, AR8516L, £2; R.1155, T.1154, HRO-50, R.1294, BC-348, R.1355, GR-64, £1.50; CR-100, CR-300, S.27, S.36, AR88LF, £1.25. Please add postage. 120 others.—Brooks, 5 Farrant House, Winstanley Road, London S.W.11.

**EXCHANGE:** AR88D, Trio 9R-59DS receivers and BC-221 frequency meter, all in good condition, FOR Eddystone 770R or W-H-Y VHF-wise?—Ring Bedford, Merthyr Tydfil 2786 (Glam., South Wales).

**SELLING: RECEIVERS:** Collins 51-J, coverage 0.5-30.5 MHz; Eddystone 770R, coverage 19-165 MHz; Converter, 36-1000 MHz. Silicon rectifiers, 1250v./1½ amp., 10p each; s.a.e. please.—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

**FOR SALE: Eddystone 840C receiver, in mint condition, coverage 480 kHz to 30 MHz, with Z-unit. Also Furzehill 'scope Type 0.120. All-in price £50, buyer to collect.—Barlow, 86 Green Lane, Heywood, Lancs.**

**SALE:** UHF receiver, tunable front-end, with IF unit 1000 to 2600 MHz, and 2300 to 4450 MHz, £15, Avometer Model 7 test meter, £16.50.—Box No. 5128, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**SELLING:** Heath SB-610 monitor 'scope, mint condition, £35; Home-built mobile PSU, suit HW-12, £10; home-built Codar A.T.5 with mobile PSU, £10.—Linney, G3VQL, QTHR. (Tel: Shrewsbury 51733).

**FOR SALE:** Complete two-metre transceiver, for mains or mobile operation, with two halo's and Yagi beam, HW-17A with pre-amplifier and PSU's, in excellent working condition, £50. **WANTED:** Complete SSB mobile transceiver.—Curry, G3DMQ, QTHR, or ring Reading 581481.

**SELLING:** Barlow-Wadley XCR-30 receiver, coverage 500 kHz to 31 MHz, excellent condition and little used. This fantastic set is offered at the reasonable price of £65.—Jesson, 181 Kings Acre Road, Hereford. (Tel: 0432 3237, evenings).

**SALE:** No. 19 Set, Tx/Rx (but Rx PSU only), with connectors, £8. Delco rotary transformer, £1.50. Metal cabinet, 15½ x 11 x 9-in., £1.50. Buyers to collect.—Walker, 63 Harbridge Avenue, Roehampton, London, SW15 4HA.

**SELLING:** KW-202 receiver with calibrator, matching speaker, headphones and aerial matching unit PM-11A, purchased new last January, accept £120 all in. Buyer to arrange carriage. (Giving up).—Newby, 19 Guildford Road, Green Lanes, Ilford, Essex.

**FOR SALE:** In mint condition, Collins 32S-3 with manual, also 62S-1 with cabling and manual, mint condition, very little used. Sensible cash offers, please.—Box No. 5138, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

**SELLING:** R.C.A. AR88D receiver, with S-meter, very good condition, £45. AF239 two-metre converter, IF 24 to 26 MHz, £5. Pye 40-watt mains Tx, QQVO3-20A in PA, pair 6L6 modulating, working on two metres, £11. Pye Vanguard, excellent condition, working two metres, tunable receiver and pre-amp., £28.—Bleaney, GW3VPL, 102 Commercial Road, Taibach, Port Talbot (5459), Glam., South Wales.

**SALE:** Yaesu FR-50B amateur bands receiver, with crystal calibrator, WWV check point, speaker and in mint condition, only five months old, £55 or near offer (bought new Rx). **WANTED:** SP-400 speaker.—House, 10 Leagh Close, Kenilworth (54556), Warwickshire.

**SELLING:** Heath GR-78 Rx, factory built (cost £90), in excellent condition, complete with manual, will accept £70. (Midlands).—Box No. 5140, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

**WANTED:** Collins 516F-2 mains PSU and 312B-4 station control unit, any condition.—Wilson, GM4BIT, 22 Caerlaverock Road, Prestwick, Ayrshire, Scotland.

**FOR SALE:** APR-4 receiver with TU-16, coverage 38 to 95 MHz, £25; APR-4 with TU-18, tuning 300 to 1000 MHz, £25, or £40 the pair. Transmitter, T.1154, £5. Transmitter unit, AP No. 5AH, 1.5 to 13 MHz, requires modulator, £4. PSU's, mains input, Type 234, gives 250/350v. DC, 6.3v., £3; Type 66863, for FS converters, £3; G.P.O. type 26B, 80.0-80v., £3. Cscilloscopes: Cossor 339 twin-beam, £12; Cintel demonstration Type 15, 14-in. screen, £30; Solatron CT.316 £18. Wavemeter Type W.1310, coverage 155 to 230 MHz, £2.50. R.C.A. Volt-Ohm-ist VTVM, £8. Crystal oscillator, 1 kHz, mains operated, £1.50. RF Units Type 27, £1. Teletype console, Type 28, with keyboard and service unit, £10. AVO electronic multimeter CT.38, £18. Signal Generator Type CT.53, 9 to 96 MHz, £18. Buyers to collect.—Barry-Peters, 30 Tullimore Road, Mossley Hill, Liverpool, L18 4PR. (Tel: 051-724 4446).

**SELLING:** Pye transistor Ranger on two metres, with tunable Rx, built-in FET pre-amp., needs Tx crystal, £20. Also a Ranger on Two, as foregoing but vibrator PSU, £15.—Smith, 19 Hyde Road, Kenilworth (54609), Warwickshire.

**SALE:** Trio 9R-59 receiver, very good condition, £29 plus carriage charge.—Box No. 5141, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

**SELLING:** TA-33Jr. beam, £25. DX-100U Tx (needs new mains transformer) with manual, £20. Parmeko 15-watt AM amplifier (Type AP.3202), £1. Two 6v. 140AH lead-acid accumulators, £10.—Rogers, G3VOG, QTHR, or ring Brighton 593777.

**OFFERING:** Collins KWM-2, very little used, as new and in mint condition, with AC/PSU 516F-2, PM-2 portable PSU, mobile PSU MP-1 and mobile mount, with noise blanker, antenna and manuals, today's price over £1,500. Also mint Collins 51S-1 with 55G-1 tuner and manuals. For those who want only the best equipment. Sensible offers, and letter first, please.—Box No. 5137, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

**SALE:** Eddystone S.640 receiver, good condition and above average performance, £22 or near offer. Prefer buyer collects if possible.—Newey, 23 Lea-house Road, Oldbury, Warley, Worcs.

**WANTED:** Up to £200 available for best commercial transceiver/matched-separates offered. All letters answered.—Taylor, G3RDT, Derwent, Chapel Lane, Bagshot (73577), Surrey.

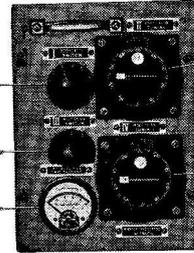
**WANTED:** Early Morse keys, to purchase for exhibition station at the Northern Horse Show. Details please, call or write. Club meetings every Wednesday at 8 p.m.—Star Radio Club, New Inn Hotel, Bramley Town Street, Bramley, Leeds 13.

**FOR SALE:** Evershead and Vignoles 250v. Megger with case, little used, £20.—Cleaver, 86 Main Road, Harwich, Essex CO12 3LH.

**SELLING:** A few High-Band Rangers, dash-mounted, modified for two metres, cases re-sprayed as new, less Tx and first oscillator crystals, complete, £7 each.—Burgess, G3VPT, QTHR. (Tel: Norwich 898715).

## MI-19467-A MASTER OSCILLATORS

These R.C.A. units which are used in the ET 4336 transmitter and which were supplied as a separate item, each in its own slide-in metal case, are ideal as the heart of any high-power transmitter, unmodified as a low-power (approx. 20w.) transmitter, or as a basis for modification to suit individual requirements. They incorporate a 6-position oscillator switch (covering 1 to 5 MHz); a 3-position Multiplier switch (covering 2 to 10 MHz); a D.C. current meter, and oscillator and multiplier coils with "turns counting" mechanisms for precise tuning. Power requirements are H.T. and L.T. for the 807 valve used in the unit, and are brought in by an 8-pin Jones plug on the rear of the chassis. The basic frequency coverage of the oscillator is 1 to 10 MHz, which can be extended to 20 MHz when used as the oscillator section of a higher power transmitter or when used on its own. All these and many more details are covered in full in the extremely comprehensive instruction/service manual (supplied with each unit) containing wiring and circuit diagrams, adjustments, photographs, etc. BRAND NEW. Price per unit is £8.50 including 2, 807 valves. Carriage £1.50.



## COLOMOR ELECTRONICS LTD.

01-743 0899

01-748 8006

170 GOLDHAWK ROAD,  
LONDON, W.12

G2CTV

G3ZY

## J. & A. TWEEDY (ELECTRONIC SUPPLIES) LTD.

Member Amateur Radio Retailers Association

We keep accessories and equipment by the following manufacturers in stock. Prices to be announced.

Asahi (SVR Bridges) Mosley (Verticals, Beams)  
Caslon Clocks Osker (SVR Bridges)  
Cornell Dubilier Rotators Spacemark (Keys)  
"G" Whips (Mobile aerials) Telomasts  
Hamgear (Preselectors, etc.) Tavasu (Mobile Whips)  
J Beam (VHF Aerials) Trio (Equipment)  
Hy-Gain (Verticals, Beams) Tronilux (70 cm. Triplers)  
KW Electronics (Equipment) Sentinel (VHF converters)

### Used Equipment :

Prices do not include V.A.T. (add 10%)  
Heathkit DX100 £25 ; Heathkit SB10 SSB adaptor £35 ;  
Heathkit DX40U £15 ; Heathkit HW32A £48 ;  
KW Viceroy £55 ; KW Vespa Mk. I £75 ; KW2000  
"G" Line £105 ; Trio JR500SE £48 ; Drake 2C £68 ;  
Sommerkamp FL200 £75 ; Yaesu FLDX400 £115 ;  
Yaesu FT400 incl. top band £150 ; Garex 2 metre  
mobile £28.

Open Tuesdays to Saturday 9 a.m. to 5.30 p.m.

HP terms available

Part exchanges

79, CHATSWORTH ROAD,  
CHESTERFIELD S40 2AP

Tel. 4982 (68005 evenings until 8 p.m.)

**SELLING:** TA-33Jr. aerial and TR-44 rotator with 60-ft. control cable, £45. Heath GR-78 receiver, £55.—Blakeley, G3KZN, 338 Thong Lane, Gravesend, Kent.

**WANTED:** Pye Bantam Low-Band, AM, in good condition. Details and price, please.—Doherty, G14AXV, 106 Somerton Road, Belfast (0232-76467), N. Ireland.

**FOR SALE:** CR-100 receiver, coverage 60 kHz to 30 MHz, noise limiter, in very good condition, £12. (Bristol).—Box No. 5137, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**QRT SALE:** KW-2000B with AC/PSU, Shure mic. and handbook, one year old and in mint condition, £160. Will deliver reasonable distance.—Jones, G3JUT, QTHR. (Tel: Weston-Super-Mare 32268).

**OFFERING:** RTTY audio converter Type CV-89A, and CM-22A comparator with manual; AN/PRM-10 GDO, 2-400 MHz; I-177B valve tester and MX-949/U adaptor; AVO Multimeter; AN/URR-35C receiver. **WANTED:** APR-9A manual. (Enclose s.a.e. please).—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

**WANTED:** No. 62 Set transceiver and 12v. rotary PSU, no mods. and must have good front panel. Required for CW work. £12 offered, will pay carriage.—Box No. 5136, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

## RADIO COMMUNICATION HANDBOOK

Fourth Edition of the  
Original RSGB "Amateur Radio Handbook"

**Price £4-10**

(inclusive of post and packing)  
Available from stock

Order from

**PUBLICATIONS DEPT.  
SHORT WAVE MAGAZINE LTD.  
55 VICTORIA STREET, LONDON, SW1H 0HF**

## TRANSISTOR DATA The INTERNATIONAL TRANSISTOR DATA MANUAL

1973 Edition is now ready. Data on upwards of 18,000 transistors of International origin and other valuable information. £5.25 + 35p post and packing in U.K. £6.10 + 95p overseas.

Brochure available. Order direct from

**SEMICON INDEXES LTD.,  
Freepost, Wokingham, Berks., RG11 1BR**

## MORSE MADE !!! EASY

**FACT NOT FICTION.** If you start RIGHT you will be reading amateur and commercial Morse within a month. (Normal progress to be expected.)

Using scientifically prepared 3-speed records you automatically learn to recognise the code RHYTHM without translating. You can't help it, it's as easy as learning a tune. 18-W.P.M. in 4 weeks guaranteed. For Complete Course 3 Records & Books send £4.50 (overseas £1 Extra).

For Further details of course Ring 01-660 2896/01-668 3255 or send 4p stamp for explanatory booklet to:—

**G3HSC (Box 14) 45 GREEN LANE, PURLEY, SURREY**

**OFFERING:** Eddystone EC-10 Mk. I receiver with mains/battery conversions, as new and in manufacturers' packing, in storage except for few months use only. Sensible offers?—Ring Rhodes, Horley 3400. (Surrey).

**SALE:** AR-22R rotator, £19; J-Beam four-metre 4-element aerial, £3; Skybeam 2m. 10-element aerial, £6; Sentinel Mosfet converters, 2m. and 4m., IF 28-30 MHz, £10 each; BC-221 charts and power supply, £15.—Allerton-Austin, G3ZCJ, QTHR. (Tel: Sturton-le-Steeple 327, Notts.).

**FOR SALE:** Codar AT-5, T.28, DC/PSU and S/W control unit, £25; K.W. Vanguard Tx, coverage 160-10m., £25 or near offer.—Beynon, GW3WSU, QTHR.

**SELLING:** Yaesu FT-100 transceiver, coverage 160-10m., complete fixed/mobile station, £100.—Boucher, G3OLB, 5 Derwent Court, Thornbury, Bristol. (Tel: Oldbury 4559).

**SALE:** Heath DX-60B transmitter with HG-10B VFO; HR-10B receiver and Trio speaker. Complete station, new and unused, £80.—Ring Tinsley, Wakefield 50753.

**SELLING:** (Going Mobile): "G2DAF"-type Mk. II Tx, very FB rig, £45 or near offer. Trio JR-310 Rx, with filter and two-metre FET converter, £65. Parts for 10 to 80m. linear, pair 4X150A's with PSU, £15. Two-metre Tx, AM modr., with PSU, £6. Ten various 2m. xtals, £6 the lot. Class-D Mk. II wavemeter, £5. Wilcox-Gay VFO, £3. Two Woden transformers, 450-0-450v. at 500 mA plus many LT windings, £3 each. Offers invited for Solatron oscilloscope, CD.1400 series. Also various other parts, VHF items, valves, etc.—Eames, G3SBF, QTHR, or ring Markfield (Leicester) 2585.

**SALE:** Beam aerial rotator, 230/250v. mains, reversible, 5 r.p.m. final speed, mounted on 8-in. steel tripod driving 3-in. steel rod in ball race; will turn 70lb. load, rated 50lb./in. continuous, £11.50 including carriage.—Barnes, 14 Laurel Drive, Eccleston, St. Helens, Lancs., WA10 5JD. (Tel: 051-966 2393, day-time).

**JUNE Issue Short Wave Magazine due out on Friday, May 25. Single copies at 30p post free can be supplied to orders reaching us by Wednesday 23rd, for despatch on Thursday 24th, the day before publication. These copies go out flat in an envelope, first-class posting. Limited supply. Orders with remittance to:—Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.**

**SELLING:** B2 rig, with PSU and crystals, etc., offers please? Books: ARRL "Handbook," 1972 Edn., £2.50; "World Radio & TV Handbook," 1972, £1.50; "DX Handbook," £1. "Understanding Amateur Radio" (ARRL), 75p; 1972 "DX Callbook," £1.50—or all books together for £7.50. Also Morse key, 75p. All in mint condition, carriage extra.—Lane, 30 Newton Close, Elburton, Plymouth (44802), Devon, PL9 8UL.

**FOR SALE:** KW-2000 with KW-500 linear, £105 carriage paid.—Gray, GM3PLO, Norland, Stromness, Orkney, Scotland.

**WANTED:** Star 600A receiver, details and price please, soon.—Patel, 22 Balmoral Road, Willesden, London, N.W.2. (Tel: 01-459 4824).

**STOP PRESS!** "Radio Handbook," 19th Edn., just arrived. New, and the big one, by Orr, W6SAI. Price £7.50 at counter, or £7.75 by post.—Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

**REG. WARD & CO. LTD. (G2BSW)**

**WE ARE OFFICIALLY APPOINTED K.W. AGENTS FOR THE SOUTH WEST (Somerset, Dorset, Devon, Cornwall)**

KW Atlanta with p.s.u. ....	£231.00
KW 2000B with p.s.u. ....	£264.00
KW 2000E TCVR ; & A.C. p.s.u. ....	£291.50
KW 202 Receiver ....	£154.00
Matching Speaker ....	£8.80
KW 204 Transmitter ....	£176.00
KW 1000 Linear ....	£148.50
KW 101 VSWR Meter (52 or 75 ohm) ....	£9.07
KW 103 VSWR Meter and Combined Power Meter ....	£13.75
KW E-Z Match, 10-80m. ATU ....	£18.15
KW 107 Combined E-Z Match, VSWR and R.F. Power Indicator, Dummy Load and Antenna Switch for 4 Outlets ....	£50.60
KW Trap Dipole 70' 75 ohm Twin Feeder ....	£16.50
KW Trap Dipole 97' Coaxial Feeder ....	£18.15
KW Trap Dipole with Balun ....	£20.35
KW 3 way Antenna Switches (for coax) ....	£4.67

**YAESU**

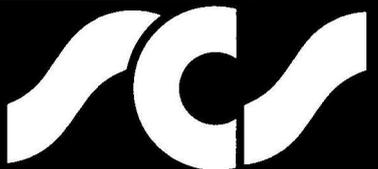
FR50B Amateur Bands Receiver ....	£71.50
FT101 260w. Transceiver, with mic.; spkr. and built-in A.C./D.C. p.s.u.'s. ....	£273.90
FR50 + Cal. WWV ....	£75.90
FT200 Transceiver ....	£159.50
FR200 A.C. p.s.u. ....	£49.50
FR400SDX Rx. (with 160 and 2m.) ....	£192.50
SP400 Speaker ....	£12.10
Caslon 24 hour Digital Clocks ....	£8.25

**EDDYSTONE RECEIVERS**  
 EC10 Mk. II £94.00 ; New Model 1000, £231.00.  
**WE ARE THE DISTRIBUTORS OF EDDYSTONE PROFESSIONAL RECEIVERS FOR THE SOUTH WEST.**  
**SECOND HAND EQUIPMENT** in stock : Trio JR500, £60.00 ; Atlanta Tcvt. and A.C. p.s.u., £192.00 ; KW2000A Tcvt., £143.00 ; Eddystone 888, £77.00 ; Eddystone 640, £16.50.  
**SHURE MICROPHONES**  
 Model 444, £15.40 ; Model 201, £6.32 ; Model 202, £7.26.  
**ANTENNAE** J-Beam 2 metre Beams in stock. Also Joystick and Joymatch A.T.U.'s, Stolle Ant. Rotators. 140ft. coils 14G. Copper Antenna Wire & Ribbed insulators.  
 R.C.A. VALVES for KW and Heathkit equipment. 6146, 6146B, 6HF5, 6LQ6, 6GE5, 6EA8, 6GW8, 6GK6, 6CM6, 6CL6, 6CB6, 6BN8, 6H56, 6EW6, 12BA6, 12BE6, 12B26, etc. and many other types.  
**TRADE INS WITH PLEASURE. OUR STOCK OF GOOD SECOND HAND EQUIPMENT CHANGES DAILY. - LET US KNOW YOUR REQUIREMENTS.**  
 Due to currency fluctuations prices of imported equipment are liable to alteration. Above prices include V.A.T.  
 WE STOCK R.S.G.B. PUBLICATIONS, LOG BOOKS, Etc.  
 HP TERMS AVAILABLE. CARRIAGE EXTRA ON ALL ITEMS.  
**AXMINSTER - DEVON Telephone: 3163**

1-5 Watt **UNMARKED ZENER DIODES** in the following voltages 3.5 volt, 4.25 volt, 4.75 volt, 5.25 volt, 5.75 volt, 6.25 volt, 7 volt, 9 volt, 10 volt, 11 volt, 12 volt, 20 volt. All at 10p each.  
**HC6U CERAMIC CRYSTAL HOLDERS** at 5p each.  
**SUB-MINIATURE COIL FORMERS 3/16"** with core. 3 for 5p.  
 1000pf 10 K.v.w. **CERAMIC CONDENSERS.** 3 for 10p.  
 220pf 8 K.v.w. **DISC CERAMICS,** 6 for 10p.  
**VHF-UHF TUNING VARACTORS UNTESTED,** 6 for 25p.  
 50 PIV 1 amp **SILICON BRIDGES** at 25p each.  
**LIMITING I.F. AMPLIFIER-F.M. DETECTOR** with Audio Driver stage untested similar to TBA 750. 4 for 60p with data.  
 Packet of 25 **PRINTED CIRCUIT SILICON RECTIFIERS** untested up to 1000 PIV 500mA at 25p.  
**600 MHz MADT unmarked MSD 39 PNP TRANSISTORS,** 5p ea. 40p doz.  
**10.7 MHz CERAMIC FILTERS FOR F.M. I.F. STRIPS** with data at 25p ea.  
**COMMUNICATION SERIES OF I.C.'s** untested consisting of 1 x R.F., 3 x I.F., 2 x VOGAD, 2 x AGC, 1 x Mike amp, 2 x Double Balanced Modulator, 1 x Mixer. The 12 I.C.'s for £2.75.  
**BACK DIODES.** BD2 at £1.25, BD3 at 75p, BD4 at £1.25, BD5 at £2.50, BD6 at £2.50, BD7 at £2.50.  
 100 PIV 10 amp **SILICON BRIDGES** at 75p.  
**TUNING CONDENSERS 380 + 375 + 20 + 20 pf** with S.M. Drive at 25p.  
 400 PIV 10 amp SCR at 50p, 800 PIV 10 amp at 60p.  
**500 mW AUDIO AMPLIFIERS** at £1.25.  
**F.E.T.'s** BFW10 at 25p, BFW11 at 25p, 2N 3819 at 30p, 2N 3824 at 20p.  
**S.C.R.'s Ex-NEW EQUIPMENT 400 PIV 5 amp.,** 3 for 50p, 7 for £1.  
**MULLARD MATCHED SET OF OC81DM, 2x OC81M** at 20p.  
**MULTI TRANSISTOR PACKAGE** containing 1 Matched Pair Plus 3 separate 600 MHz NPN TRANSISTORS similar to RCA CA 3045 at 5 for 50p.  
**TRANSISTOR TUNING CONDENSERS.** 125 + 125pf at 20p, 250 + 250pf at 20p, VHF Type 6pf at 10p.  
**1000pf SOLDER-IN FEED-THRO's,** 15p doz.  
**PLEASE ADD 10% for VAT**

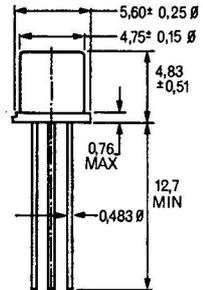
**J. BIRKETT**  
 Radio Component Suppliers  
 25 THE STRAIT, LINCOLN, LN2 1JF.  
 Telephone: 20767

TERMS Retail mail order subject to £1.00 minimum order.  
 Cash with order only. Trade and educational establishments M/AC on application (minimum £5.00).  
 Postage 10p inland. 25p, Europe.  
**GUARANTEE:** All goods carry full manufacturer's warranty. Get in touch today for a complete run-down of devices available from SCS (include SAE).



**SCS COMPONENTS, P.O. Box 26, Wembley, Middlesex HA0 1YY**  
 The 'Professional' Amateur Supplier

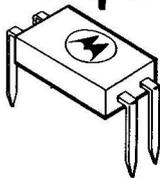
**device of the month ZN414**



The Ferranti ZN414 is a complete a.m. radio circuit which operates from 1.1 to 1.8 volts and requires only battery, earphones and antenna plus a tuning capacitor and two decoupling capacitors. The ZN414 features: medium and long waveband, good stability on assembly, no setting up of IF coils, plus much more.

a complete a.m radio circuit for just **£1.20**

**compatible device MFC4000**



The Motorola 1/4-Watt Audio Amplifier is designed for the output stage of battery powered portable radios.

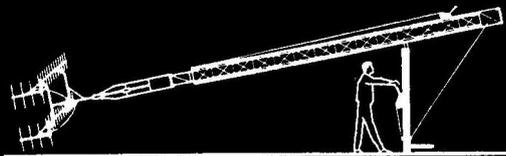
- \* 250 mW of Audio Output Power
- \* Low Standby Current— 3.5 mA typical
- \* Low Harmonic Distortion
- \* Reduces Component Count in Portable Radios by Two Transformers and Two Transistors
- \* Eliminates Costly Component Matching Requirements

**motorola 1/4 watt audio amplifier MFC4000** **50p**

## INSIST ON VERSATOWER

Acclaimed as the World's leading telescopic tiltover tower in the field of radio communication  
Models from 25' to 120'

Enquiries to  
Western Electronics (UK) Ltd  
Osborne Road, Totton, Southampton



Look for the name

**STRUMECH**

Strumech Engineering Co Ltd  
Coppice Side, Brownhills, Walsall, Staffs.

## EMUVERTER 2 METRE CONVERTER

- ★ Plug in dual gate Mosfets, 116 MHz xtal, image rejection circuit, 28-30 MHz I.F. 12v. supply used.  
£16 including postage

## EMUPRESSOR SPEECH PROCESSOR

- ★ Battery powered, placed between mic. and Tx.
- ★ Virtually constant output for a wide input range, enables mod to be kept to an optimum over a wide range of speech levels.
- ★ Accepts input signals from 1mV to 1v.
- ★ Suitable for AM, FM or SSB.  
£7.80 including postage

## EMUMARKER CRYSTAL CALIBRATOR

- ★ Provides separate outputs at 1 MHz, 100 kHz and 10 kHz spacings up to 450 MHz.
- ★ Set up on Droitwich 200 kHz standard before dispatch.
- ★ Requires 9v. supply.  
£8.50 including postage

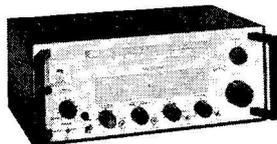
MONEY BACK GUARANTEE ON ALL PRODUCTS

**I. N. CLINE, G3EMU**  
15 KNIGHT AVENUE,  
CANTERBURY, KENT,

## VISIT LONDON'S LIGHTHOUSE

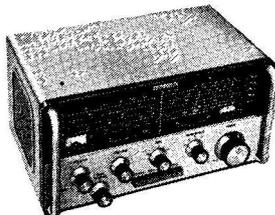
*our lighthouse keeper  
wants to meet you!*

Jim Roche has been Imhofs Eddystone lighthouse keeper for a good few years now - so who better than he to guide you into the right channel, for an Eddystone communications receiver:



Model 1001 - general-purpose receiver with reception facilities for CW, MCW, AM and SSB  
Provision for crystal control on 10 channels

EC10 Mk II still 'Top of the Pops' in the modest price range of communication receivers. Embodies features usually only found in the more expensive designs.



**IMHOFS**

112-116 New Oxford Street  
London WC1A 1HJ  
telephone 01-636 7878 R81

## G. W. M. RADIO LTD.

ALL PRICES INCLUDE 10 PER CENT V.A.T.

**DOUBLE BEAM OSCILLOSCOPES CT436** (Military version of the Solatron CD 1014) D.C. to 6 Mc/s., 10Mv per Cm. sensitivity. Clean and in good order, £54.50, carriage paid.

**RECEIVERS TCS.** 1.5 to 12 Mc/s. Power needed 12v. A.C. or D.C., 220v. D.C. Clean untested condition, £10-35, carriage paid.

A few more of the Miniature CT52 Oscilloscopes. Mains operated and in clean condition, with mains lead, £21 carriage paid. A few Murphy high band TR821/25, £8-75 or low band TR801a, £7-60, post paid.

**TRANSMITTER PA UNITS STC T4188.** Tunes 2-8 to 18 Mc/s. Manual or 28v. motor driven. 13" x 8" x 8". Pair CV518 (4 x 150) 28v. blower cooled. Bases are NOT UHF type. Ideal basis for Linear Amplifier construction, £8-75, post paid.

**PLESSEY PTR161.** 24v. 6 channel remote Transmitter/Receiver 116-132 Mc/s. QV04-7 output. 6" x 8" x 11" weight 16 lbs. Good clean condition and complete with circuit and details of suggested 2 metre conversion and heater modification to 12v., £8-75, post paid.

**REDIFON S.S.B. Generator.** 6315/a. 6 transistor plug in unit 9" x 6" x 13". No details, £1-09, post paid.

**PARMEKO 200-250v.** mains transformers, output 0-4-5-6-3v. 2a, 92p, post paid. Larger potted type 0-10-10-5-11v., 0-75a., 71p, post paid.

**METERS.** 500 microamp calibrated 0-1-4 kilowatts by Ernest Turner—Oblong 1 1/2" x 1 1/2". Also same make and specification but just over 3" square. Either type £1-35, post paid. 500ma 2 1/2" round, 65p, post paid. CRYSTAL CALIBRATORS No. 10 for Army 62 set, £2-70, post paid.

Hygrometers, wet and dry bulb type, Centigrade £1-35, post paid. Moving coil circophones No. 13 with Plessey plug for B44, 65p, post paid. Low impedance headphones with lead and two pole jack, aluminium headband, as new, £1-25, post paid.

**REED RELAYS** for G3FCW keyer. 4 reed normally open 200 ohms coil, 16p each, post for any number, 10p. Reed inserts 1-85" long (body 1-1") dia. 0-14". Gold clad contacts switch up to 500ma at up to 250v. D.C., 69p per doz.; £4-12 per 100; £30-25 per 1000; £275 per 10,000, all post paid.

**BC221** Frequency meters with A.C. pack, £18-60 or less pack, £16-40, carriage paid. Attenuators Marconi 70 ohms 10dB. Pye socket one end other special, 54p, post paid.

All Receivers and Test Equipment are in working order at time of dispatch. Carriage charges quoted are for England and Wales only.

Telephone 34897

Terms: Cash with order. Early closing Wednesday

40-42 PORTLAND ROAD, WORTHING, SUSSEX

# FREE DISPLAY DEVICE IDENTICHART

Electronic clocks, calculators, digital meters and indicators all need some sort of display device to present their information. Whole new technologies have grown up in this field and the identichart gives a summary of data on some of the latest products available.

## **PUSHBUTTON STEREO TUNER**

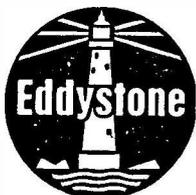
Add another dimension to your radio listening by building this low cost high quality tuner. Built in only a few hours, it is the perfect unit to complete your hi-fi stereo system!



**LOGIC TUTOR.** To many the fundamental principles involved in computing are a foreign language. With the aid of the Tutor and an accompanying series of practical exercises, logic theory can be self taught.

# PRACTICAL ELECTRONICS

MAY ISSUE OUT NOW **20p**



**"LISTEN TO THE WORLD WITH EDDYSTONE"**

Your local Eddystone dealer is:

- CHESHIRE**  
The Transistor Centre (Wimslow) Ltd  
Green Lane  
Wimslow 24766
- CORNWALL**  
R. V. Heming Ltd  
(Peter Heming G3WVB)  
Cliff Road, Newquay  
Newquay 2191
- S.S.B. Products**  
(Norman Birkett G3EKX)  
1 Frances Street  
Truro  
Devoran 862575
- DEVON**  
Reg. Ward & Co. Ltd: G2BSW  
Axminster  
Axminster 3163
- ESSEX**  
F. E. Smith  
184 Moulsham Street  
Chelmsford  
Chelmsford 54594
- IRELAND**  
John F. MacMahon  
10, Church Street, Enniskillen  
Co. Fermanagh, N. Ireland  
Enniskillen 2955
- LANCASHIRE**  
Holdings Photo Audio Centre  
Mincing Lane - Darwen Street,  
Blackburn BB2 2AF  
Tel. 59595

- Stephen-James Ltd  
70 Priory Road, Anfield  
Liverpool L4 2RZ  
051-263 7829
- North West Electrics  
769 Stockport Road  
Levenshulme, Manchester 19  
061-224 4911
- Croffilm Ltd  
46 Friargate Preston PRI-2AT  
Preston 55244
- LEICESTERSHIRE**  
A. K. Davey Ltd  
New Street, Hinckley  
Hinckley 2173 and 4288
- LONDON**  
Imhoofs (Retail) Ltd  
112-116 New Oxford Street  
W.C.1  
01-636 7878
- R. T. & I. Electronics Ltd  
Ashville Old Hall  
Ashville Road Leytonstone, E.11  
01-539 4986
- Radio Shack Ltd  
188 Broadhurst Gardens  
London, N.W.6  
01-624 7174
- NORTHUMBRIA**  
Aitken Bros. & Company  
35 High Bridge  
Newcastle upon Tyne NE1 1EW  
Newcastle upon Tyne 26729
- WALES**  
Holt High Fidelity  
Picton Arcade, Swansea  
Swansea 53254
- Holt High Fidelity  
8 Portland Street, Swansea  
Swansea 41032
- WARWICKSHIRE**  
Chas. H. Young Ltd  
170/172 Corporation Street  
Birmingham 4  
021-236 1635

**TAURUS ELECTRICAL SERVICES**

26-28 NOTTINGHAM ROAD, LOUGHBOROUGH, LEICS.  
Telephone : 05093-5131



We stock all TRIO communication equipment and most of the SOMMERKAMP gear. If we've not got it we do our utmost to get it for you. Now we have ACCESS for purchasers of all Amateur Radio equipment, New and Second-hand.

- THIS MONTHS BARGAINS**
- |  |   |                  |
|--|---|------------------|
| <b>BOXED NEW 4CX250 BASES.</b>   | Complete with chimneys and securing clips | £3-20            |
| <b>NEW MULLARD 1" END-ON NIXIE TUBES</b>                                   |   | £1-30            |
| Bases for same   |   | 12p              |
| <b>807 BASES</b>   | each                                      | 10p              |
| <b>FIELD STRENGTH METERS</b>   |   | £3-10            |
| <b>NEW EDDYSTONE 10-7 Meg. IFs</b>   |   | 12p              |
|  | RF Chokes                                 | 10p              |
|  | Large Knobs                               | 25p              |
| <b>NEW GORLER Dual IF Amplifiers, 10-7 Meg. and 465 kc/s. with circuit</b> |   | £3-20            |
|  | Spare last IF's for above                 | 15p              |
| <b>NEW 8 Ω 3" Loudspeakers</b>   |   | 35p              |
|  | 40 Ω 2" Loudspeaker                       | 40p              |
| <b>SHURE LOW IMPEDANCE MIKES</b>   |   | £1-75            |
| <b>DESK HIGH IMPEDANCE MIKES</b>   |   | £3-25            |
| <b>ACOS MIC 40</b>   |   | £1-50            |
| <b>HAND MIKES</b>  | 80p, 90p and £1                           |                  |
| <b>SLOW MOTION DIALS</b>   |   |                  |
|  | Small 65p Medium 85p Large £1             |                  |
| <b>TELEPRINTER 7B's in stock</b>   |   | £15-00 to £25-00 |

All goods advertised last month still available

- OSCARBLOCK SWR and POWER METERS** ... £18-50
- FX2000 CRYSTAL MARKER GENERATORS 100 kHz/50 mHz with switchable modulator** ... £5-75
- MG 100 AUDIO GENERATORS** sine and square wave, 19 Hz - 220 kHz... £17-50

All prices include carriage

All orders over £2 confirmed by return if any delay

You can order these goods by letter or telephone  
**SIMPLY QUOTE YOUR ACCESS NO.**

**ENSIGN ELECTRONICS**

- Speakers : 8 Ω 2 1/2" 35p, 40 Ω 2" 35p, 75 Ω 2" 35p
  - Headphones with Mic. New and boxed ... £1-00
  - Set of spare valves for 62 Set New ... £1-35
  - New Eagle 0-300 volt D.C. Meters. 3" square ... £1-10
  - AR88 SPARES** - Crystal Load Coils, 25p; Wavetraps ... 40p
  - Mew Marked 2N3055 Transistors ... 35p
  - 100 Mixed High Stability Resistors ... 35p
  - 4" B Section Telescopic aerials ... 35p
  - 67' wire aerials. Marked every foot ... 60p
  - Aircraft Match Meters ... 70p
  - Slide Switches 4 for ... 30p
  - 10 1/2" Revox Tape Spools ... 40p
  - Min. Silicon Bridge Rectifiers. 50 volt 1 amp. ... 25p
  - IN4005's 600 volt P.I.V. 1 amp. ... 12p each, 12 for £1-30
  - Valves - E180CC 20p, Ruggedised E.F.91's ... 20p
  - CAPACITOR OFFER** : 100 mfd 12 volt, 5p ; 33 mfd 16 volt 5p ; 0.05 mfd, 0.02 mfd, 0.002 mfd, 50 volts discs, 12 for 15p; 50 for 50p.
  - 'Min' Battery Level' Meters. 0-600 M.A.F.S.D. ... 50p
  - 25 Mixed Capacitors ... 30p
  - Adjustable Hole Cutters ... 50p
  - Set of 5 ex U.S.A.F. Maps (large, all different) ... 55p
  - Lightweight Headphones—New and Boxed ... £1-00
  - Trimmers : Air Spaced 0-25 pf, 12p 0.5-5 pf screwdrivers type, 8p.
  - Valve Bases, B7G, B9A, Octal ... 6p each
- All Prices include Postage and Packing. Minimum Order 30p

**SPECIAL OFFER.** Ferric Chloride Powder for printed circuit etching. Full instructions. 1 lb. bag, 40p; 3 bags, £1

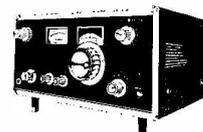
Our shop at the address below is now open on Saturdays from 10.00 a.m. to 5.00 p.m. We have in stock a couple of good as new 7B teleprinters for callers at our usual range. Good used communications equipment required for cash. We shall be attending most mobile rallies this year.

Manufacturers surplus equipment and components required for cash.

**30 HIGH STREET, QUORN, NR. LOUGHBOROUGH, LEICS.**

THE RESULT OF TWO YEARS EXPERIENCE

**TRIO JR.310 SUPER DE LUXE**



We have always thought that JR.310 took some beating and thousands of users have agreed. Now for a little extra, if bought from us, it is even better. Improved 40 metre performance, top band, crystal cal. unit, full 10 metre coverage for 2 metre converter use, alignment and sensitivity checked (\$9 now reads about 30uv) plus 12 months free labour guarantee. Send for R.S.G.B. test report.

- JR.310 Super de luxe ... £93-50
  - Extras : Suitable phones £4-25, 2 metre FET converter £15-00, Narrow Band filter fitted £15-00.
  - Carriage—Rail at your risk £1-10 Securicor—Our risk £3-30
- Prices include VAT.

**HOLDINGS PHOTO-AUDIO CENTRE,**  
39/41 MINCING LANE, BLACKBURN, BB2 2AF  
Telephone : 59595/6. Closed Thursdays

**2 METRE CONVERTERS**

- LOW NOISE R.F. STAGE F.E.T. MIXER.** Xtal controlled multiplier chain. Aluminium case. Size : 4" x 3" x 1 1/2". I.F.'s 4-6, 18-20, 24-26, 28-30 MHz. £11-55 each.
- 2 METRE LOW NOISE CASCODED F.E.T. PRE-AMPS.** Aluminium case. Size : 2 1/2" x 1 1/8" x 1 1/4". £5-50 each.

**E & E SERVICES**

72 ELMSTONE ROAD, RAINHAM, KENT.

## SOLID-STATE RTTY CONVERTER-KEYER SRD-1

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

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

- Advanced circuitry, 6 ICs, 25 semi-conductors. ● Input matches receiver outputs 3-8 or 500-600 ohms. ● 3-pole Butterworth input bandpass filter. ● Switched 850/400/170 Hz Amateur/Commercial shifts but copies shifts 1000 Hz down. ● 2-pole low-pass filter. ● Tuning meter. ● Monitor scope outputs. ● Mark Hold and Normal/Reverse shift switch. ● Built-in loop PSU—Instant switch-selection of single- or double-current printers. ● Narrow-shift CW identification. ● F.S. Keyer output for TX. ● Socket and circuitry already fitted for optional plug-in AFSKeyer module, 850/170 Hz. ● Manual. ● Two-tone pvc-coated case, 9" w x 3 3/4" h x 14" d. Weight : 7 lbs. **SRD-1, £54.45.**

(Optional plug-in AFSK module, SRDI-AK, £6.33. SRD-1 complete with SRDI-AK, £60.50).

**RTTY CONVERTER-KEYER** Model TTU, £132. **ST-5** PCBs and datasheets, £4.57. **TOROIDS** 88 mH, 83p per pair. **ST-6** PCBs and datasheets, £12.93. **ST-6 KIT** complete less case, with datasheets, £68.75. **SAMSON ETM-2b**, £26.18. **ETM-3b**, £28.55. **JUNKER** Precision hand key, £10.73. **BAUER** keying lever, £4.18. **SSB 90° AUDIO PHASE SHIFT NETWORKS**, £3.25. **PRINTSET** Basi-kits.

**ALL PRICES INCLUDE V.A.T.**

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

### SPACEMARK LTD.

**THORNFIELD HOUSE, DELAMER ROAD,  
ALTRINCHAM, CHESHIRE.**

(Tel. 061-928 8458)



## become a RADIO-AMATEUR!

learn how to become a radio-amateur in contact with the whole world. We give skilled preparation for the G.P.O. licence

**free!** Brochure, without obligation to: SWB-53

**BRITISH NATIONAL RADIO & ELECTRONICS  
SCHOOL P.O.BOX 156, JERSEY, CHANNEL ISLANDS**

NAME : \_\_\_\_\_

ADDRESS : \_\_\_\_\_

\_\_\_\_\_ BLOCK CAPS please

## SCOTTISH HOME AND HEALTH DEPARTMENT WIRELESS TECHNICIAN

Applications are invited from men, aged 17 or over, for five posts of Wireless Technician in the Scottish Home and Health Department. The posts are located at Montrose, East Kilbride, Edinburgh, Cambusbarron (Stirlingshire) and at a location still to be decided. The candidate appointed to the Cambusbarron post will be required to serve at Darvel, Ayrshire for an initial period.

**QUALIFICATIONS :** (1) 4 posts—Sound theoretical and practical knowledge of Wireless engineering and wireless communications equipment, including VHF and UHF equipment. Possession of an HN or C & G certificate an advantage but provision may be made for those who wish to continue their studies for one of these qualifications. The work involves installation and maintenance of equipment located a considerable distance from headquarters. Candidates must be able to drive private and commercial vehicles and have a clean driving licence.

(2) 1 post—Wireless Technician with Radiac duties. Post based at Cambusbarron, Stirlingshire, applicants require a sound theoretical and practical knowledge of electronic engineering as applied to radiac instrument techniques. Oversight of testing, repair and calibration of radiac instruments comprising personal dosimeters, charging units, fixed survey meters, contamination meters, training simulators, and portable survey meters. Again some travelling will be involved and a candidate must be able to drive private and commercial vehicles and have a clean driving licence.

**SALARY :** £1155 (age 17) to £1715 (age 25 or over) : scale maximum £2025.

These are unestablished appointments with prospects of establishment after one year's continuous satisfactory service.

*Application forms and further information may be obtained by writing to the*

**SCOTTISH OFFICE ESTABLISHMENT DIVISION,**

**Room 172, St. Andrew's House, Edinburgh EH1 3BX**

quoting reference PM4/3/73. Closing date for receipt of completed application forms is May 15, 1973.

## SOME TITLES FROM FOULSHAM-SAMS

### ABC'S of ANTENNAS

The introductory chapters cover the fundamentals of radio-wave propagation and basic antenna characteristics. The remainder of the book is then devoted to a discussion of the various types of antennas and their uses. Antennas for radio, television and two-way communications are included. Business radio, amateur, both mobile and fixed-station operation, are covered. The final chapter should be particularly appealing to those interested in microwave uses and radio-navigational systems. A perusal of this book will provide any student with an excellent foundation for more advanced study in antenna design.

89p

### AMATEUR RADIO SSB GUIDE

Single-sideband receivers, transmitters, and transceivers are now available which have higher frequency stability and are much easier to tune than the early models. In this book, the author presents a guide to single-sideband and single-sideband equipment, which will be useful to any amateur considering or already operating SSB.

By W6TYH

£1.59

### BEGINNER'S GUIDE TO RADIO

For many years "Beginner's Guide to Radio" has been extremely popular as an introduction to the subject of radio-and-how-it-works. The many advances made in recent times have rendered a new edition necessary.

This seventh edition has been completely rewritten and brought up-to-date to take account of the latest techniques and methods, and covers every aspect of the modern radio scene, while including the important basic information necessary for the newcomer to the subject.

The reader is guided from the first principles of electricity and magnetism, through radio waves, modulation and radio components, including valves and transistors, taking in radio transmitters and stereo broadcasting, and ending with hi-fi reproduction.

The book will be of interest to all who wish to understand the how-and-why of radio, whether it be for a hobby or a profession.

Seventh Edition

£1.12 post free

### RADIO AMATEUR OPERATOR'S HANDBOOK

The opportunity has been taken of bringing this edition—the twelfth—right up-to-date and of incorporating extensive revisions. The book covers in detail the Post Office regulations governing the issue of transmitting licences.

The purpose of this Handbook is to provide all the information which the operator of a radio station may need about such matters as Country Prefixes, Call Sign Areas, Frequency Allocations, Standard Frequency Transmissions, Time Factors, Distance Tables, and so on. For the newcomer, this manual enables him to find the basic answers and to obtain the maximum pleasure from his hobby.

53p post free

### TRANSISTOR FUNDAMENTALS Vol. 1

This book is a carefully planned programmed introduction to semi-conductors and the basic electrical circuits. It begins with a brief description of transistors and later devotes an entire chapter to an explanation of transistor principles. Sandwiched between these chapters are explanations of voltage, current, and resistance; and the all-important Ohm's Law and Kirchhoff's laws. The book also looks at the more complicated nature of inductance, capacitance, and resistance in AC circuits.

£1.92

### TRANSISTOR FUNDAMENTALS Vol. 2

This volume describes transistors and how they are used in semi-conductor circuits. Simple circuits illustrate the basic principles involved, and the more complicated circuits found in amplifiers and oscillators help to show how the basic operations are applied. Later, some recent semi-conductor developments are discussed. Detailed descriptions of four new transistor devices are given and how they are being used.

£1.92

### KNOW YOUR OSCILLOSCOPE

By Paul C. Smith

The oscilloscope provides you with a "third eye" which lets you see what is actually happening in electronic circuits. But you must know something of the nature of this valuable instrument, and how to use it, before it will serve you. This book presents complete information on the circuitry, functions, and applications of the oscilloscope in easy-to-understand language. Worthwhile reading for anyone who uses an oscilloscope . . . a "must" for service technicians and students.

£1.80

### PRACTICAL INTEGRATED CIRCUITS

This is the first British book to be published on micro-electronics for the amateur experimenter. With circuit diagrams, layouts and easy instructions, it shows how to construct ten practical radio and electronic devices using integrated circuits (ICs) which are now available at low cost from many component stores. Micro-electronics—the big development in electronics since the transistor—involve complex circuits in the form of tiny "chips", incorporating several circuit elements, to which it is only necessary to make connections. Various kinds of micro-circuits are already available to amateurs, with new ones regularly coming on to the market. In this book the authors provide, in addition to practical projects, an introduction which shows clearly the present state of the art and a summary of the items available commercially. The advent of the integrated circuit (IC) opens up a fascinating new field for the electronics student, constructor and experimenter. This book shows how to get started and produce some really interesting and worthwhile equipment.

£1.01 post free

### HANDBOOK OF TRANSISTOR CIRCUITS

By Allan Lytel

Here is a collection of more than 200 practical transistorised circuits for use in counters, power controls, timers, indicators, photoelectric devices, power regulators, amplifiers, power supplies, oscillators, power converters, and other applications. Schematic diagrams, parts lists and descriptions of operation are included for each circuit.

Planned as a supplement and companion volume to author Lytel's previous book, *Transistor Circuit Manual*, many of the circuits employ such specialised semi-conductor devices as silicon-controlled rectifiers, photocells, zener diodes, and tunnel diodes, in addition to standard diodes and transistors.

This book is a handy source of information on the design, operation, and application of a wide variety of transistorised circuits. Engineers, technicians, students, and hobbyists will all find the circuits of interest and the material of value in research, development, experiment, and general studies of circuitry.

£2.35 post free

### PRACTICAL WIRELESS CIRCUITS

There are more than 50 different circuits detailed in this book. Transistor receivers, 22 in all, range from an ultra-simple crystal diode circuit to a very sophisticated 10-transistor communications Rx. Valve receivers cover MW, SW and FM. Transistor and valve amplifiers include preamplifier, PA and Stereo.

There is a chapter on transmitters and transceivers, and another on transmitter and receiver circuits for Model Control. Circuits for an extensive range of Test Gear covers everything from a simple Transistor Tester to a Comprehensive Multimeter, including a Pocket Signal Tracer (RF, AF and IF), also FM, Square-Wave and Noise Generators.

Among the special circuits are a recording level meter for tape recorders, an electronic photographic timer and a solar cell receiver.

The first few simple circuits are accompanied by step-by-step instructions to enable the absolute beginner to gain enough experience with circuitry building to tackle the more complicated work.

£1.34 post free

### 49 EASY TRANSISTOR PROJECTS

This book is for the electronic hobbyist who is interested in developing projects that can be fun as well as useful. Most projects can be constructed in one evening using only a few inexpensive parts. Many of the parts can be salvaged from old radio and television chassis.

Each project is presented in an easy-to-understand way, with a parts list and a schematic diagram. Many value substitutions can be made in resistors and capacitors without affecting the end result, providing that the proper transistors, coils, and transformers are used.

Projects in this book, which include an AM radio, an FM receiver, light relay controls, audio amplifiers, code practice oscillators and test equipment—each designed with only two transistor types.

£1.01 post free

### 110 SEMICONDUCTOR PROJECTS

Due to the rapid advances in semiconductor technology, many engineers and certainly most amateurs have found it impossible to keep track of the new devices that become available because of lack of readable information. This book introduces the reader to such outstandingly useful new devices as the field-effect transistor, uni-junction transistors, silicon controlled-rectifiers, silicon planar transistors and integrated circuits, giving their properties and methods of operation, with full constructional details of many exceptionally useful circuits.

Of particular interest to the amateur are simple amplifiers lamp and relay driving circuits, electronic switches—operated by light, sound or contact with water—and delay circuits ranging from a fraction of a second to 35 minutes. Among the many circuits which will be of interest to the practising engineer are amplifiers with input impedance as high as 500 megohms, voltage and current regulators, waveform generators, analogue-to-digital converters and logic circuits. All circuits are designed around internationally available semiconductor.

124 pages, including 110 illustrations

£1.37 post free

Most Books described here are American in origin.

The above prices include postage & packing.

Delivery is from stock.

Available from

Publications Dept., 55 Victoria St., London S.W.1.

01-222 5341

(Counter Service, 9.30-5.15, Mon. to Fri.)

(Nearest Station: St. James's Park)

(GIRO A/C. No. 547 6151)

# Technical Books and Manuals

(ENGLISH AND AMERICAN)

## AERIAL INFORMATION

ABC of Antennas . . . . .	90p
Aerials (By D. Sjobbema) . . . . .	88p
Aerial Handbook (Briggs) . . . . .	87p
Amateur Radio Antennas (Hooton) . . . . .	£1-87
Antenna Handbook, Volume 1 . . . . .	£1-77
Antenna Round-Up, Volume 1 . . . . .	£1-47
Antenna Round-Up, Volume 2 . . . . .	£1-77
Antenna Handbook, 12th Edition (ARRL) . . . . .	£1-40
Beam Antenna Handbook, 4th Edition . . . . .	£2-10
Quad Antennae, 2nd Edition . . . . .	£1-80
Simple Low Cost Wire Antennas . . . . .	£1-72
73 Vertical, Beam and Triangle Antennas (by E. M. Noll) . . . . .	£2-40
73 Dipole and Long-Wire Antennas (by E. M. Noll) . . . . .	£2-20

## BOOKS FOR THE BEGINNER

Amateur Radio (Rayer) . . . . .	£1-60
Beginners Guide to Radio (7th Edition) . . . . .	£1-12
Beginners Guide to Electronics (N.E.) . . . . .	£1-10
Beginners Guide to Transistors . . . . .	£1-12
Beginners Guide to Colour TV . . . . .	O/P
Better Short Wave Reception, 2nd Edition . . . . .	£1-80
Course in Radio Fundamentals (N.E.) . . . . .	£1-15
Foundations of Wireless and Electronics . . . . .	£2-02
Guide to Amateur Radio (N.E.) . . . . .	89p
Ham Radio (A beginner's Guide) by R. H. Warring . . . . .	£1-72
How to Become a Radio Amateur . . . . .	59p
Learning the RT Code . . . . .	27p
Morse Code for the Radio Amateur . . . . .	15p
Radio, by D. Gibson . . . . .	85p
Radio Amateur Examination Manual (N.E.) . . . . .	89p
Simple Short Wave Receivers (Data) . . . . .	89p
Understanding Amateur Radio . . . . .	£1-37

## GENERAL

ABC of Electronics (by Earl J. Waters) . . . . .	£1-20
ABC of FET's . . . . .	£1-35
ARRL Calculator, Type A . . . . .	92p
Easibinder (to hold 12 copies of Short Wave Magazine together) . . . . .	90p
FET Principles, Experiments and Projects . . . . .	£2-15
Guide to Broadcasting Stations (16th Edition) . . . . .	60p
Having Fun with Transistors . . . . .	£1-59
How to Listen to the World—7th Edition . . . . .	£1-90
Know Your Oscilloscope (by Paul C. Smith) . . . . .	£1-80
Microphones . . . . .	£1-65
Practical Integrated Circuits (Newnes-Butterworth) . . . . .	£1-01
Practical Transistor Theory . . . . .	£1-10
Practical Wireless Circuits . . . . .	£1-34
Prefix List of Countries . . . . .	23p
Radio Engineers Pocket Book (Newnes) (N.E.) . . . . .	£1-26
RCA Designer's Handbook (Solid State Power Circuits) . . . . .	£3-50
RCA Receiving Tubes Manual . . . . .	£1-77
RCA Transistor Thyristor and Diode Manual . . . . .	£1-75
RCA Transmitting Tubes . . . . .	£1-35
Shop and Shack Shortcuts . . . . .	£1-75
Single Sideband: Theory & Practice (by H. D. Hooton) . . . . .	£3-47
Telecommunications Pocket Book (T. L. Squires) . . . . .	£1-32

World Radio and TV Handbook 1973 Edition . . . . .	£3-00
110 Integrated Circuit Projects for the Home Constructor . . . . .	£1-30
49 Easy Transistor Projects . . . . .	£1-01
110 Semi-Conductors Projects for the Home Constructor (Iliffe) . . . . .	£1-30

## HANDBOOKS AND MANUALS

Amateur Radio DX Handbook . . . . .	£2-17
Electronic Circuit Handbook, Vol. 1 . . . . .	£1-42
Electronic Circuit Handbook, Vol. 2 . . . . .	£1-42
Mobile Handbook, CQ . . . . .	O/P
Mobile Manual, ARRL . . . . .	O/P
New RTTY Handbook . . . . .	£1-80
Radio Amateur Handbook 1973 (ARRL) . . . . .	£2-85
Radio Amateur Handbook 1973 (ARRL) (Hard Cover) . . . . .	£3-65
Radio & Electronic Handbook . . . . .	£1-32
Radio Amateur Operators Handbook, 12th Edition . . . . .	53p
Radio Communication Handbook (RSGB) . . . . .	£4-10
Rtty A-Z (CQ Tech. Series) . . . . .	£2-25
Radio Handbook (W. I. Orr) 19th Edit. . . . .	£7-75
Surplus Conversion Handbook . . . . .	£1-37
Television Interference Manual (G3JGO) . . . . .	90p
Transistor Substitution Handbook No. 10 . . . . .	£1-12

## USEFUL REFERENCE BOOKS

Amateur Radio SSB Guide . . . . .	£1-59
Amateur Radio Techniques—4th Edition . . . . .	£1-80
Care & Feeding of Power Grid Tubes (Elmac Division of Varian) . . . . .	£1-60
Engineers' Pocket Book—6th Edition . . . . .	£1-48
Guide to Amateur Radio . . . . .	50p
'G' Call Book 1973 . . . . .	70p
Hams' Interpreter . . . . .	63p
Hints and Kinks, Vol. 8 (ARRL) . . . . .	62p
Operating an Amateur Radio Stat. . . . .	O/P
Radio Amateur Examination Manual (N.E.) . . . . .	89p
Radio Data Reference Book (3rd Edition) . . . . .	£1-00
Radio, Valve and Transistor Data (Iliffe), 9th Edition . . . . .	89p
Service Valve and Semiconductors Equivalents . . . . .	35p
Single Sideband for the Radio Amateur (ARRL), 5th Edition . . . . .	£1-67
Single Sideband (Theory & Practice) by H. D. Hooton . . . . .	£3-47
Sun, Earth and Radio by J. A. Ratcliffe . . . . .	91p
Surplus Schematics (CQ) . . . . .	£1-22
Transistor Pocket Book . . . . .	£1-57

## TRANSISTOR MANUALS

ABC of Transistors . . . . .	£1-33
Field Effect Transistors (Mullard) . . . . .	£1-95
Having Fun with Transistors . . . . .	£1-59
Handbook of Transistor Circuits . . . . .	£2-35
Transistor Audio & Radio Circuits (Mullard) . . . . .	£1-96
Transistor Fundamentals: Basic Semi-Conductor and Circuit Principles, Vol. 1 . . . . .	£1-92
Transistor Fundamentals: Basic Transistor Circuits, Vol. 2 . . . . .	£1-92
Transistor Substitution Handbook, No. 12 . . . . .	£1-50

## VHF PUBLICATIONS

VHF Handbook, Wm. I. Orr. . . . .	£1-79
VHF Manual (ARRL) . . . . .	£1-37
VHF/UHF Manual (RSGB) (N.E.) . . . . .	£1-80

O/P (out of print)

The above prices include postage and packing.

Many of these Titles are American in origin.

Available from **SHORT WAVE MAGAZINE**

Publication Dept., 55 Victoria St., London SW1H 0HF . . . . . 01-222 5341

(Counter Service. 9.30-5.15. Mon. to Fri.)

(Nearest Station: St. James's Park)

(GIRO A/C. No. 547 6151)

## MORE BOOKS DESCRIBED

### RADIO AND ELECTRONIC HANDBOOK

by G. R. Wilding

Technicians and service engineers in the Radio and Electronics industry require a considerable amount of data which is spread over many books. It is often difficult and time consuming to locate in a hurry. Students, however, who may have to study a whole series of course-books will find a condensation of such information, which gets down to the essentials, extremely useful. *Radio & Electronic Handbook* has been designed to provide, on the one hand, a reference book and, on the other, a revision guide.

The intention has been to summarise basic electronics into four separate, easily assimilated sections, which will provide rapid reference to important principles, formulae and applications. These four main sections are: Direct current theory; Alternating current theory; Valve theory and applications; and Transistor theory and applications. Practical worked examples and circuits diagrams have also been utilised whenever necessary.

The concise presentation, which covers all the relevant ground, makes for easy learning and the book should prove invaluable for both practical and examination requirements. **£1.28**  
149 pages including 84 diagrams.

### QUESTIONS AND ANSWERS ON RADIO AND TV

3rd Edition

#### PREFACE

Curiosity is the keystone of learning. The man who "wants to know" has a far better chance of digesting and retaining information than he who ploughs through a set subject simply because it has been put before him.

Hence the "Question and Answer" form of this little book. Wherever possible, the questions have been arranged to follow the growth pattern of information. Questions arise from the previous answers. This means that the book differs from a standard textbook in that subjects are not cajoled neatly into place; except that main chapter headings give a guide to the line of questioning, the reader can treat these pages as bedside or benchside reading. Mathematics and unwieldy formulae have been avoided. Circuits and other diagrams give the basic information and confusing frills are omitted.

There are many textbooks to which the reader who wishes to augment the information given here can resort. These chapters will whet his curiosity

**83p**

### PRINCIPLES OF AERIAL DESIGN

by H. Pope

The principles involved in the design of aerials are by no means easy for the student to assimilate because they require a knowledge of field theory, which involves more difficult concepts than the more familiar circuit theory. In an endeavour to be precise and exhaustive it is all too easy to complicate the treatment, and so become involved in a welter of abstruse mathematics. On the other hand, if the subject is over-simplified the treatment can easily become purely descriptive, at the expense of an understanding of the principles involved.

In this book—which is not exclusively of amateur-band interest but more on Aerial Theory for the general reader—the author attempts to steer a middle course between these two extremes. The theory of aerials is developed from first principles, but where approximations are necessary in order to avoid mathematical complication the reasons are given and the significance of the approximations indicated. By this means the reader is given a succinct introduction to the more important aspects of the theory of aerials while the practical forms used in the frequency bands up to 30 MHz are also briefly described.

It opens with an exposition of the laws governing electric and magnetic phenomena upon the basis of field theory, and the fundamental concepts and quantities are introduced and defined. The theory and practical applications of Maxwell's electro-magnetic wave equations are next dealt with (and there is an appendix which gives the derivation of the vector formulae employed). The next chapter is concerned mainly with the two important characteristics of an aerial for transmission or reception—the radiation pattern and the impedance—while the final chapter describes the practical forms which aerials take for particular uses and the various techniques employed to obtain the best effect.

The author has been employed for many years in the Research Department of the British Broadcasting Corporation; he also gives a post-graduate course of lectures on Aerials and Propagation in the Electrical Engineering Department of Imperial College, London. His book is as much for the seriously interested amateur as for the professional. 172 pages, including 96 text diagrams, plus 6 pages of art plates. **£2.60**

### 110 INTEGRATED CIRCUITS PROJECTS FOR THE HOME CONSTRUCTOR

Integrated circuits are the most important new semiconductor devices to have been developed within the past decade. They are compact, easy to use and less expensive than their discrete transistor-resistor equivalents. This volume gives an entirely practical introduction to these devices by describing one hundred and ten constructional projects in which they can be used.

The projects range from simple low-level amplifiers to complex test equipment and include a number of hi-fi circuits and logic circuits. The integrated circuits used are internationally available types and all the projects have been designed, built and fully evaluated. The book should prove to be of practical interest to the professional engineer, the student and the amateur.

**£1.30 post free**

### INTEGRATED CIRCUIT POCKET BOOK

by R. G. Hibberd

This book is a logical companion to the Authors' previous book—The Transistor Pocket Book, and is intended primarily for technicians and students whose courses include semi-conductors devices, but it will also be of interest to all those who are concerned with integrated circuits and their applications.

**£2.60 (post free)**

### DICTIONARY OF TELECOMMUNICATIONS

R. A. Bones, B.Sc., Ph.D., ACIS, CEng., MIEE, AInstP.

Economic growth throughout the world is closely linked with the development and growth of telecommunication systems. Modern industry demands ever-improving facilities for its executives to be able to speak to each other from opposite sides of the globe; to be able to transmit drawings, documents and pictures rapidly over large distances; and now to be able to send data accurately and quickly from computer to computer.

Telecommunications is an industry with a high growth rate and, like all technologically based industries, a new language has developed: a language which grows daily as new materials, techniques and systems are developing. This dictionary is an attempt to document that language.

The wide range of definitions, including many reproduced from, or based on, British Standards recommendations, is supplemented by appendices including units and abbreviations, wavelengths and frequency bands, and signal reporting codes.

The concise explanations of the terms in use should prove valuable to engineers, students, technicians, and to all whose work or interest requires them to understand modern telecommunication terminology.

**£2.35**

### MICROPHONES

by A. E. Robertson

A general treatment, in twelve chapters with appendices.

**£1.40**

### WIRE ANTENNAS FOR RADIO AMATEURS

by W. I. Orr

What this Handbook contains:—How to build tested wire antennae (for two metres to 160m.—Top Band) that really get out—horizontals, verticals, beams, trap antennae, ground planes, etc. "Invisible" aerials for amateurs in flats and other locations where radio and TV antennae are "prohibited."

Exact dimensions in feet and inches—also in metres and centimetres—  
—for every antenna described—no guesswork!

How to build two "all-purpose" aerial tuners with 100 uses!

The truth about baluns. How to build an efficient, inexpensive balun for optimum antenna performance and accurate SWR readings

The construction of 2, 3, 4 and 5-band trap dipoles. How to make your own efficient traps and save real money.

Three-band dipole for 80, 40 and 15 metres—only one feedline!

Ground plane aerials for VHF and 10, 15, 20 and 40 metres.

High-gain beam antennae especially suited for VHF FM.

The efficient "folded Marconi" antenna for 40, 80 or 160 metres.

Clear explanations of resonance, radiation resistance, impedance, standing wave ratio (SWR), balanced and unbalanced aerials.

Plus—radial wire ground systems; lightning protection; wood masts; counterweights; the easy way to use coax connectors—and much more!

This book is an American publication by a well-known author in the field of Amateur Radio.

**£1.72 (temp. out)**

**£1.72 (of stock)**

## Available from

Publication Dept., 55 Victoria St., London SW1H 0HF

(Counter Service. 9.30-5.15. Mon. to Fri.)

## SHORT WAVE MAGAZINE

01-222 5341

(Nearest Station: St. James's Park)

(GIRO A/C. No. 547 6151)

**SURPLUS TEST GEAR**

Over 200 items just arrived.

- Signal Generators by Dawe, Advance and Marconi.
- Inductance Bridges by Cintel and Boonton.
- Oscilloscopes by Solartron and Marconi.
- Wave Analysers, Video Oscillators, Audio Generators.
- Calibrated Amplifiers } both valve and transistor.
- Counters }
- Calibrated Variable Condensers, Wattmeters.
- Stabilised p.s.u.'s, both valve and transistor.
- Q-meters, Megommeters, Low distortion Oscillators.
- Special Offer : Valve Voltmeters, £4.50 + 50p carr.

Visit—

**ELEY ELECTRONICS  
SURPLUS SUPERMARKET**

102, BEATRICE ROAD, LEICESTER,  
CLOSED MONDAY — LATE NIGHT FRIDAY 8 p.m.

**DERWENT RADIO**

5 COLUMBUS RAVINE, SCARBOROUGH. Tel. SCA 65996  
Showroom open Tuesday/Thursday/Friday/Saturday

MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION  
PLEASE ADD VAT TO ALL PRICES EXCEPT PUBLICATIONS

KW103 swr/power ...	£12.50	Trio 9R59DE ...	£49.00
KW2000E and A.C. p.s.u. ...	£265.00	Trio SP 5D speaker ...	£4.50
KW Atlanta and p.s.u. ...	£210.00	Trio TS 515 transceiver ...	£210.00
KW 202 receiver ...	£140.00	Trio TX 599 transmitter ...	£160.00
KW 204 transmitter ...	£160.00	RCA IC manual ...	98p
KW 107 AE match unit ...	£46.00	RCA Hobbies manual ...	76p
KW EZ match ...	£15.00	RCA Valve manual ...	98p
KW 101 swr bridge ...	£8.00	RCA COSMOS ...	98p
KW AE switch ...	£4.25	G Whip tribander ...	£10.50
KW Balun ...	£1.95	G Whip 160/80m. ...	£9.00
KW Atlanta VFO ...	£37.00	G Whip 160 Ranger ...	£7.50
Eddystone EC10 Mk. II ...	£86.00	G Whip base mount ...	£1.45
Eddystone EC10 A.C. p.s.u. ...	£7.75	G Whip LF coils ...	£4.00
Yaesu FT 401 ...	£230.00	Lafayette HA 600 ...	£50.00
Yaesu FT101 ...	£235.00	Lafayette HA 800 ...	£57.00
Yaesu FT200 and p.s.u. ...	£172.00	Codar CR70A receiver ...	£27.00
Yaesu FR400S ...	£160.00	Codar PR30X ...	£9.50
Yaesu FL400 ...	£146.00	Codar 12/RC cti. unit ...	£2.50
Yaesu FR50B ...	£59.00	Codar Multiband 6 ...	£11.50
Yaesu FL50 ...	£68.00	Wight traps standard ...	£2.75
Unica URIA Rx ...	£25.00	Wight traps hi power ...	£3.75
Unica UNR30 Rx ...	£14.75	Shure 201 microphones ...	£5.50
Transistor Rx. with 2M ...	£10.00	Shure 444 ...	£14.00
TE15 GDO ...	£12.50	Acos Mic 45 ...	£1.00
Hanson swr bridge ...	£4.20	Yaesu p.t.c. ...	£3.00
Double meter swr ...	£7.75	"U" Beam Halo ...	£1.35
5 band RF meter ...	£4.00	Boom mic crystal ...	£4.60
Katsumi El bug EK9X ...	£8.50	Boom mic ceramic ...	£4.95
Katsumi monitor ...	£2.20	4 digit impulse counter ...	10p
Type 500 test meter ...	£8.85	10 Crystals our selection ...	65p
Mini test meter ...	£2.20	50 resistors ...	16p
Sentinel 2m. converter ...	£13.75	14 1/4 DIL sockets ...	15p
Sentinel 4m. converter ...	£13.75	20 disc ceramics ...	15p
Sentinel 70cm. converter ...	£13.75	Eagle remote cti. mic. ...	£1.65
Sentinel 2m. pre-amp ...	£6.50	10 ceramic capacitors ...	10p
Soldering irons from ...	£1.45	10 silver mica caps ...	10p
2 way intercom ...	£2.10	Amphenol PL259 PTFE ...	30p
"S" Dec ...	£20.00	Amphenol SO229 PTFE ...	30p
AR22R ...	£25.00	Amphenol SO329 ...	25p
3 1/2 7.5/9v. D.C. p.s.u. ...	£4.00	Amphenol reducer ...	8p
2,000 ohm headset ...	90p	10 0-1 Mfd caps 400v. ...	15p
C60 cassettes ...	30p	Double sided copper clad ...	7p
0-20v. D.C. p.s.u. 1A stab. ...	£10.75	Paxolin 8" x 7" ...	3p
2 1/2" speaker 8 ohm ...	35p	2N3819, BF180 ...	35p
3" speaker 8 ohm ...	40p	BC107, 108, 109 ...	10p
24v. relay ex equipment ...	10p	250 ohm carbon pots ...	25p
12v. relay ex equipment ...	15p	10 QSL strips (120 cards) ...	25p
5 mixed relays ...	50p	RCA 3N 140 Mosfet ...	85p
6 BA bolts pack ...	10p	RCA 3N 141 ...	85p
6 BA nuts ...	10p	6146 IIT ...	£1.80
Pack 20 ICs with data ...	£1.00	All RSGB publications stocked.	
Trio JR310 Rx ...	£75.00	RSGB Callbook, post free ...	65p
Trio JR599 ...	£185.00	Dosemeter ...	10p
		Type 10 Xtal calibrator ...	£2.75

Second-hand equipment :		KW Pepmeter ...	£10.00
KW2000A and p.s.u. ...	£140.00	Trio TS150 and p.s.u. ...	£155.00
KW Viceroy IV ...	£75.00	Trio 9R59DS ...	£42.00
KW 2000A/B D.C. p.s.u. ...	£30.00	Trio JR500SE ...	£45.00
Sommerkamp FL200B ...	£85.00	Trio JR310 ...	£60.00
DF receiver 61044 ...	£40.00	Codar CR70A ...	£22.00
BC221 ...	£18.00	Codar 12/RC ...	£2.00
Heath 5" scope ...	£40.00	Codar PR30 ...	£5.00
Eddystone 659/670 ...	£22.00	Viceroy III ...	£70.00
Heath Mohican ...	£30.00	Unica URIA ...	£20.00
Storno hi band tx/rx ...	£8.00	Pye hiband ranger ...	£8.00
RCA AR88D ...	£30.00	Pye lowband FM ranger ...	£8.00

A good chance to stock up with top grade disc ceramic capacitors. Most values 2-2 pfd to .1 mfd, send 10p stamp for full lists and samples. 50p for stock parcel (post 6p). We are looking for good condition modern transmitters and receivers etc. and will pay cash or give good trade in prices. Please let us have details with s.a.e. for offer. DES WOOD, G3HKO  
PLEASE ADD EXTRA FOR CARRIAGE. S.A.E. FOR LISTS  
MAIL ORDER TO  
28 HILLCREST AVENUE, SCARBOROUGH, YO12 6RG  
(Telephone 63982)

**CALL BOOKS**

- INTERNATIONAL :**  
**RADIO AMATEUR CALL BOOKS (1973)**  
 "DX Listings" . . . . . £2.95  
 "U.S. Listings" . . . . . £3.75  
 "G's" only 1973 . . . . . 70p

**MAPS**

- AMATEUR RADIO MAP OF WORLD**  
 Mercator Projection — Much DX  
 Information — in colour. Second  
 Edition . . . . . 65p
- DX ZONE MAP (GREAT CIRCLE)**  
 In colour with Country/Prefix  
 Supplement Revised to January  
 1972 . . . . . 85p
- RADIO AMATEUR MAP OF THE  
 U.S.A. AND NORTH AMERICA**  
 State boundaries and prefixes, size  
 24" by 30", paper . . . . . 60p
- RADIO AMATEUR'S WORLD  
 ATLAS**  
 In booklet form, Mercator projec-  
 tion, for desk use. Gives Zones  
 and Prefixes (New Edition) . . . . . £1.10

**LOG BOOKS**

- Standard Log (New Glossy Cover) . . . . . 55p**  
**Receiving Station Log . . . . . 45p**  
**Minilog . . . . . 25p**

(The above prices include postage and packing).

**MORSE COURSES**

**G3HSC Rhythm Method of Morse Tuition**

- \*Complete Course with three 3 speed L.P. records with books . . . . . £4.50
- \*Beginner's Course with two 3 speed L.P. records with book . . . . . £3.30
- Single 12" L.P. Beginner's with book . . . . . £2.75
- Single, 12" L.P. Advanced with book . . . . . £2.75
- Three speed simulated GPO test. 7" d.s. E.P. record . . . . . 85p

Prices include postage, packing and insurance in U.K. only \*Overseas orders + £1.00.

Available from

**SHORT WAVE MAGAZINE**

Publications Dept., 55 Victoria Street,  
 London, SW1H 0HF . . . . . 01-222 5341

(Counter Service, 9.30-5.15, Mon. to Fri.)

(Nearest Station: St. James's Park)

(GIRO A/JC No. 547 6151)

# P. & P. DEVELOPMENTS

**Havant 72657**  
Shop Hours

WE SPECIALISE IN VHF EQUIPMENT  
FOR THE PROFESSIONAL AND AMATEUR!

**Cosham 74695**  
Evenings, Weekends

**MURPHY 821.** High band AM TX/RX QQVO3-10 final and driver stages, easily converted to 2m. ... £9, carr. 75p

**MURPHY 820.** Mid-band dash version of the 821, good condition will convert to 2 or 4 with circuit ... £6, carr. 75p

**MURPHY 807.** High power AM mobiles for 2 or 4 less QQVO3-20A but otherwise complete ... £6, carr. £1

**MURPHY BASE STATIONS.** High power AM complete units inc. p.s.u. ... £25, carr. £2

**COSSOR CC15.** Lowband AM Mobiles QQVO3-20A final, complete with all leads, speaker, mic., etc. ... £16-50, carr. £1

**GEC LOW BAND BASE** can be modified to 12½ kHz £27-50, carr. £2

**PYE AM10B.** Highband 12½ kHz (new GPO spec.) complete with all accessories in good condition ... £60, carr. £1

**PYE R470.** UHF Rx. all solid state, mint condition, ideal for 70 cms. receiver ... £45, carr. £1

**PYE.** Highband AM monitor receiver, 4 channels, ideal for converting to a 2m. base Rx., very clean condition... £35, carr. 75p

**HEATHKIT SB300.** Amateur bands receiver, mint condition, fitted noise limiter and speaker ... £80, carr. £1-50

**B44 Mk. III.** Ideal for 4m. ... £8-50, carr. 75p

**PLESSEY PV215.** High quality SSB/DSB/AM/ISB driver units, output frequency 100 kHz. Can be operated independently on USB and LSB at same time. Output level via 0-6 dB atten. LC type filters, superb xtal ovens. The units are completely transistorised and in mint condition. £30, carr. £1

**PLESSEY PYT223A.** This unit will accept the 100 kHz above and mix giving output on 3-1 MHz ... £20, carr. 50p

**RADIO ALARMS.** New Murphy radio alarm units, contains 12v. p.s.u. audio board multi-programme cam unit. Ideal for host of spares, or as radio alarm ... £1-25, carr. 75p

**PYE MARINE TX.** Runs 2 x 5B254M's in final AM/CW/MCW xtal control on 8 channels or VFO in 1-5-16 MHz continuous coverage. In good condition complete only ... £10, carr. £1-50

**PSU's** for above Tx less valves but with control unit, £4, buyer collects

**HF VFO/PA.** Contains 2 x 4X150A's chimney and blower, good condition ... £12, carr. 75p

**VHF FIBREGLASS WHIP AERIALS.** Ideal for cutting to ½ wave on 2m. ... £1, carr. paid

**MULLARD.** Tubular ceramic trimmers 0-6pf 14p, 0-12pf, 19p ea.

**INVERTER PSU's.** 24v. input 425v. and 125 watts output. New. £4-25, carr. 50p

**LOW VOLTAGE RELAYS.** 24v. octal fitting ... 50p ea. or 3 for £1-25, carr. 10p

**MIC INSERTS.** Dynamic and carbon. ... 50p each, carr. 10p  
Lustraphone dynamic ... £1 ea., carr. 15p

**STC 633.** High band AM 12½ kHz mobiles, good condition £65, carr. £1

PLEASE ADD 10% FOR V.A.T. TO ALL PRICES.

G8DBX

19 LONE VALLEY, WIDLEY, COSHAM, PORTSMOUTH, HANTS.

## WORLD RADIO/TV HANDBOOK 1973

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

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

**£3-00**

(The above price includes postage and packing).

from:

**SHORT WAVE MAGAZINE**  
55 Victoria Street, London, SW1H 0HF

## CALLBOOK

(1973)

The "Call Book" proper is now published only once a year, in December, in two parts, "U.S." and "DX Listings."

Supplements to both editions appear at quarterly intervals, obtainable by prior order direct from the publishers.

We supply the "Call Book" as an annual publication, as required at any time during the year. We shall not be handling the quarterly supplements. These will be available only direct from the publishers.

This comprehensive reference lists about 300,000 licensed radio amateurs in the United States Directory and 160,000 or more in the rest of the world (contained in the "DX Section"). In the U.S. Section, licence classifications are shown with revised listings of new licences, names and addresses. The CALLBOOK also includes much incidental DX information. Every amateur operator and SWL needs the CALLBOOK to get the most out of Amateur Radio.

**DX Listings £2-95**

**U.S. Listings £3-75**

The above prices include postage and packing.

Your order to:

Publications Dept.,

**SHORT WAVE MAGAZINE**

55 Victoria Street, London, SW1H 0HF

01-222 5341