

VOL. XXXII
No. 4

THE
**SHORT
WAVE**
MAGAZINE

JUNE, 1974

TWENTY-FIVE PENCE

**WORLD WIDE
COMMUNICATION**

FOR THE RADIO AMATEUR AND AMATEUR RADIO

HURRY — WHILE STOCKS LAST!

A COMPLETE RADIO STATION FOR ANY LOCATION

DELIVERED OUR RISK. FOR **£72.21** SECURICOR £3.00 EXTRA

ASSEMBLED IN SECONDS READY TO USE, COMPRISING

1. **9R59DS** communications receiver
550 kHz to 30 MHz continuous. Electrical bandspread on 10, 15, 20, 40 80 metres. Fine tuning also on 160 metres, SW BC bands. Marine Band : SSB-CW-ANL-BFO ; S Meter ; MECH. FILTER ; IF 445 kHz ; 1½w. OUTPUT ; Built-in quality speaker ; AC Mains.
2. **JOYSTICK V.F.A.** The World Record Award Antenna (7' 6" long).
3. **JOYMATCH IIIA A.T.U.** tunes above frequencies (transmitting amateurs, used with V.F.A. handles 300w. PEP SSB PA input).
4. All necessary accessories incl. 8ft. V.F.A. feeder and insulators for externally locating V.F.A.; terminated leads, etc. In fact all YOU provide is the mains plug !
PLUS—a FREE "DX-CRYSTAL SET" incl. unique aerial (£2.42 separately).

JOYSTICK V.F.A. **£13.75** ; JOYMATCH TX/RX A.T.U. IIIA (see 3 above) **£13.75** ; JOYMATCH LO-Z 500 A.T.U. TX/RX 500w. SSB (PA input) with RF meter, **£19.91** ; Communications Headphones 8 Ω (suitable TRIO, EC10, etc.), **£3.14** ; OA2 mains stabiliser (plugs into 9R59DS), **74p** ; 6 spare 9R59DS valves, **£2.35** ; Full set spare 9R59DS valves incl. OA2, **£4.29** ; Artificial Earth (as used on Oil Rigs), **£5.80** ; Aerial Bandswitch tuned Aerial for domestic receivers, **£5.80** ; A.T.U. kit 1.8-30 MHz receive and transmit (300w. PEP SSB PA input), **£5.80** (assembled, **£7.01**).

Send stamp for details plus extra stamp for 9R59DS brochure.

NO V.A.T. on Overseas Orders (deduct 1/11 from prices quoted) but EXTRA Carriage and insurance necessary.

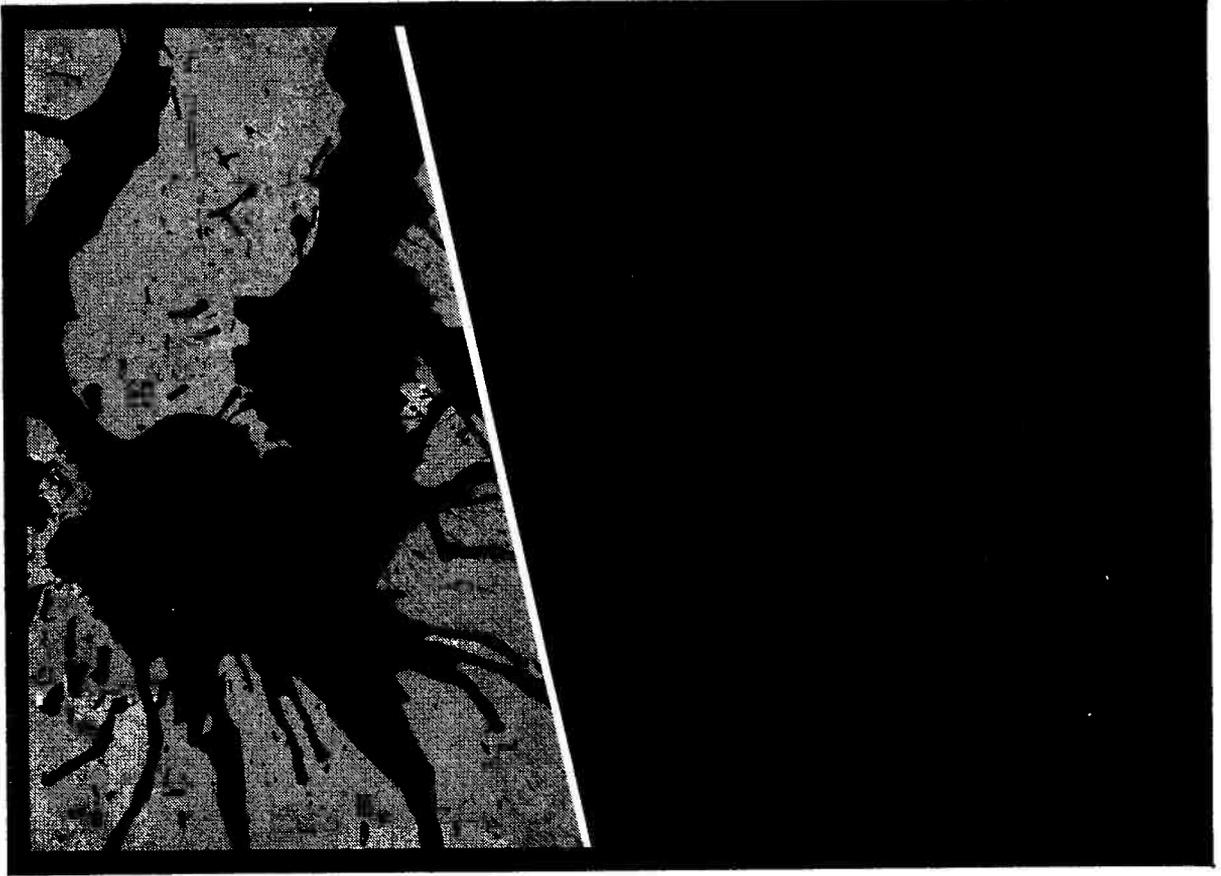


BOX 5

PARTRIDGE
BROADCASTERS WENT ENGLAND
ELECTRONIC LTD

G3CED — G3VFA
FOR EXPERT ADVICE AND INFORMATION
Telephone: 0843 62535 or 62839
evenings and weekends





SSB-ers:

increase talk power, cut "splatter"



Our 444 base station microphone not only gives you increased talk power, but cuts "splatter" (and QRM complaints) to an absolute minimum! It has superbly tailored response, with sharp cutoffs below 300 and above 3,000 Hz and a rising response characteristic for maximum intelligibility. The 444's rugged, reliable Controlled Magnetic element has been proved in safety communications, and other tough professional communications applications. It delivers a clean signal to the transmitter at levels as high as crystal units! (And, unlike crystal and ceramic units, the element is totally immune to the effects of temperature and humidity.) The 444 also features an adjustable height stand that makes for comfortable "ragchewing" sessions, an optional-locking bar for push-to-talk or VOX operation, and a practically indestructible Armo-Dur® case. Write:

Shure Electronics Limited
Eccleston Road, Maidstone ME15 6AU



AMATEUR ELECTRONICS G3FIK

BIRMINGHAM 021-327 1497 021-327 6313



DON'T MOVE AN INCH!

AS MANY SATISFIED CUSTOMERS NOW KNOW OUR NEW EQUIPMENT COLLECTION / SALES SERVICE IS A WINNER AND TAKES ALL THE PROBLEMS OUT OF THE DISPOSAL OF REDUNDANT GEAR WHETHER THIS IS SIMPLY SOLD OUTRIGHT OR PUT IN PART EXCHANGE AGAINST NEW EQUIPMENT.

OUR REPRESENTATIVES ARE GEARED TO COVER PRACTICALLY THE WHOLE OF THE COUNTRY AND WE CAN GUARANTEE SPEEDY ATTENTION TO REQUESTS FOR CALLS AND ALSO ENSURE A FAIR SPOT CASH PAYMENT FOR ALL CURRENT COMMERCIAL EQUIPMENT. THE ONLY STIPULATION WE MAKE IS THAT THE EQUIPMENT OFFERED IS IN TOP GRADE CONDITION BOTH PHYSICALLY AND ELECTRICALLY AND CAN BE RESOLD BY US WITH CONFIDENCE TO OUR FELLOW AMATEURS AND SHORT WAVE LISTENERS.

WRITE OR TELEPHONE TODAY WITH FULL DETAILS OF ANY ITEM YOU HAVE FOR DISPOSAL QUOTING PRICES REQUIRED.

AMATEUR ELECTRONICS FOR NEW GEAR!

- * EQUIPMENT BY EVERY MAJOR MANUFACTURER
- * SECOND-TO-NONE ATTENTION TO ORDERS AND ENQUIRIES
- * CONSCIENTIOUS AFTER-SALES SERVICE
- * FIRST-CLASS DEMONSTRATION FACILITIES
- * ON-THE-SPOT CREDIT TRANSACTIONS
- * FAIR PART EXCHANGE ALLOWANCES ON ALL COMMERCIAL GEAR

JUST TO REMIND YOU! We carry stocks by the following makers—

YAESU	Full range including the new FT101B
TRIO	Large stocks of every model
KW	The most comprehensive stock in the country
SOMMERKAMP	Complete range of 2 metre equipment
BELCOM	Excellent stocks of the famous Liner 2
SPACEMARK	The well-known SSM-1 SLOW SCAN MONITOR from stock
SOLID STATE	Every 2 metre item in the range available off the shelf
FDK	Now in stock! The fabulous Digital Read-out Multi 2000. This is the ultimate in 2 metre rigs—CW/FM/SSB.

SEND TODAY FOR DETAILS OF ANY OF THE ABOVE—A LARGE S.A.E. PLEASE GENTLEMEN

AMATEUR ELECTRONICS for USED EQUIPMENT

WE ARE ACKNOWLEDGED AS THE LARGEST STOCKIST OF QUALITY USED GEAR IN THE COUNTRY. AN S.A.E. WILL BRING YOU OUR LATEST LIST.

Racal Enthusiasts! We have the largest stocks of RACAL Receivers and equipments in the country. Full details on receipt of your s.a.e.

PLEASE NOTE—We wish to buy all RACAL Receivers sub-assemblies and particularly hardware (handles, panels, etc., etc.). No item is too small and your price paid within reason. Cases are of particular interest to us at the moment.

AN ADEQUATE STAMPED ADDRESSED ENVELOPE WITH ALL ENQUIRIES PLEASE

Regional Representatives:

Northern — John Rowley G3KAE Tel: West Ayton 3039
 Scottish — Ron Turner GM8HXQ Tel: Wishaw 72172

AMATEUR ELECTRONICS
ELECTRON HOUSE, 508-514 ALUM ROCK ROAD, BIRMINGHAM 8

R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

EDDYSTONE EC10	£50.00 (£1.00)
TRIO JR160 with 2M cal.	£54.00 (£2.00)
HAMMARLUND HQ170	£160.00 (£2.00)
KW77	£85.00 (£2.00)
TRIO 9R 59DS	£42.00 (£2.00)
SWAN 500C plus A.C. p.s.u.	£240.00 (£3.00)
KW VICEROY	£80.00 (£2.00)
HEATHKIT DX40 plus VFO	£45.00 (£3.00)
KW VESPA 2 and p.s.u.	£105.00 (£3.00)
HEATHKIT GR 64	£25.00 (£1.00)
LAFAYETTE HA350	£60.00 (£1.50)
HAMMARLUND SP-600-JX6	£135.00 (£2.00)
EDDYSTONE 770U	£160.00 (£2.00)
HEATHKIT DX 100 Transmitter	£45.00 (£3.00)
KW 2000A with A.C. p.s.u.	£180.00 (£3.00)
TRIO JR-500-SE Receiver	£58.00 (£1.50)
RCA AR88D Receiver	£75.00 (£2.00)

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

AVOMETERS. Model 7, Mk. 2, £46.50; Model 8, Mk. 5, £49.80; Model 40, Mk. 2, £46.50; Model 72, £19.12; Multiminor Mk. 4, £16.55; Standard Leather Carrying Case (Models 7, 8, 40), £9.32; Ever Ready ditto, £10.80; Multiminor Leather Case, £4.82; 10KV D.C. Multiplier for model 8 or 9, £7.50; 30KV D.C. ditto, £12.50; Pair of Long Reach Safety Clips, £1.75; Model EA113 Electronic Avo, £92.00; Model 272 Electronic Avo, £32.90; Model TT169 Transistor Tester, £19.80. All Above post free in U.K. Trade and Educational enquiries invited. All other AVO and TAYLOR products available, ask for quote.

S. G. BROWN'S HEADPHONES. Type "F" 120 ohm, 2000 ohm, 4000 ohm, £7.00 (30p); Rubber Earpads for same, 50p per pr. (5p); Type 3C/1100 Noise Excluding (with superb fitting) high quality, electro-dynamic £7.55 (30p); Standard jack plugs, 24P (4p).

EDDYSTONE EQUIPMENT. Receivers EC10/2, £102.00; EB37, £99.00; 1000, £220.00; 1001, £230.00; 1002, £245.00; 1004, £280.00; 924 A.C. mains p.s.u., £9.00 (50p); Doublet Aerial 731/1, £8.00 (50p); Plinth Speaker 906, £9.00 (50p); General Purpose Speaker 935, £6.90 (40p); Edometer 902 Mk. 2, £29.50 (50p); Telescopic Aerial Type 991, £2.80 (25p); Active Aerial LP3382, £20.50; Diecast Boxes from 51p (10p). Brochure on request.

CODAR EQUIPMENT, PR40, £8.90 (30p); Leaflets on request.

In present conditions we regret that all prices are subject to alteration without notice.

NOTE: 10% VAT must be added to all prices, new and secondhand, inc. carr. and 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 Parking 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

LAFAYETTE HA800, £57.50 (50p).
PARTRIDGE "JOYSTICKS," "New Lightweight VFA" £12.10 (40p).
"JOYMATCH" III. Aerial Unit, £12.10 (40p). LO-Z500, £17.60 (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: TR7200, £129.50 (£1.00); TR2200, £79.50 (£1.00); 5R59DS £49.50 (£1.00); JR 310, £75.00 (£1.00); JR 599, £160.00 (£1.50); Transmitter TX-599, £160.00 (3.00); Transceiver TS 515 and PS 515, £210.00 (£3.00); Loudspeaker SP5D, £4.50 (50p); Headphones GS4 (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 (30p).

VALVES. Please state your requirements.

ADVANCE DMM2 DIGITAL MULTIMETER, £104.00 (50p); Alpha, £12.00 (50p), etc., etc.

TMK METERS: TMK500, £10.25 (30p); TW20CB, £13.00 (30p); TP55N, £7.25 (30p); 700, £21.50 (30p); also leather case.

PHILIPS PM2403 ELECTRONIC MULTIMETER, £49.50 (40p), etc., etc. We also supply **PHILIPS and KORTING COLOUR TV TEST EQUIPMENT,** including Colour Bar Generators, Converters, etc.

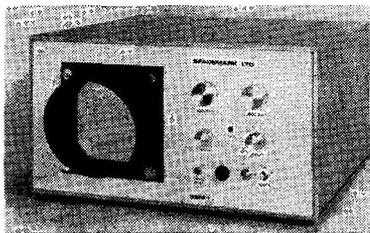
KW EQUIPMENT (Don't forget your FREE mic. with every Tx. and Tecr. I.) D.C. p.s.u., £48.00 (£1.00); KW 2000B only, £200.00 (£1.50); KW200E plus A.C. p.s.u., £25.00 (£3.00); KW ATLANTA + A.C. p.s.u., £200.00 (£2.00); Remote V.F.O. for Atlanta, £34.00 (50p); VOX unit for Atlanta, £8.50 (25p); Remote V.F.O. for 2000B, £36.00 (50p); KW1000 Linear amplifier, £150.00 (£2.50); KW202 Receiver with calibrator, £160.00 (£1.50); KW 202 Matching speaker, £8.00 (80p); KW204 Transmitter, £170.00 (£2.00); KW107 combined E-Z Match; VSWR indicator, dummy load, and ant. switch (4 outlets) 52 or 75 ohms; £60.00 (80p); KW103, VSWR and power meter, 52 ohms, £14.00 (60p); KW109, £75.00 (80p); 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
 NEAREST STATION: LEYTONSTONE (Central Line)

NOW THE NEW SPACEMARK

SLOW SCAN TV MONITOR SSM-I



Plug it into your receiver phones jack and watch SSTV pictures on the Monitor screen from DX stations all over the world. If desired, SSTV pictures can also be recorded on an ordinary tape recorder for viewing again on your Monitor.

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

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

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

JOIN THE FAST-GROWING SSTV CROWD NOW !!

SPACEMARK LTD.

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. ● 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-switch CW identification. ● F.S. Keyer output for TX. ● Socket and circuitry already fitted for optional plug-in AFSK keyer module, 850/170 Hz. ● Manual.
- Two-tone pvc-coated case, 9" w x 3 1/2" x 14" d. Weight: 7 lbs SRD-1, £61.10.

(Optional plug-in AFSK module, SRDI-AK, £6.43. SRD-1 complete with SRDI-AK, £67.54).

RTTY CONVERTER-KEYER Model FSD-I, £143. ST-5 PCBs and datasheets, £4.56. ST-6 PCBs and datasheets, £12.92. ST-6 KIT complete less case, with datasheets, £72.05. 88 MH TOROIDS, 38p each plus 10% VAT. **SAMSON ETM-2b,** £34.79. **ETM-3b,** £38.55. **JUNKER** Precision hand key, £16.59. **BAUER** keying lever, £5.88. **SSB 90-AUDIO PHASE SHIFT NETWORKS,** £3.24.

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

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

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

LOWE ELECTRONICS

MAIN DISTRIBUTOR FOR YAESU MUSEN EQUIPMENT

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

119 Cavendish Road, Matlock, Derbyshire, DE4 3HE

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

Southern Sales (Dave G8FAY)
Goring Road, Steyning, Sussex.
Telephone : Steyning 814466.
Just off the A283 on the Shoreham side of the village.
Halfway down the road on the left—look for the tower.

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

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

NO PROBLEM PARKING AT ANY BRANCH

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

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

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

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

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

NOTE : MIDLAND SALES—Peter can be reached at home outside normal hours at 021-784 1318.

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

H.P. A PLEASURE

PART EXCHANGES WELCOME

Our catalogues are free but we would appreciate postage, etc., so please send 10p in stamps for our VHF catalogue, 10p for our HF catalogue, 5p for second-hand list, or send us 20p in stamps and we will send the lot.

LOWE ELECTRONICS FOR YAESU

Full range of Yaesu equipment ex stock

**LOWE ELECTRONICS FOR 2M SSB**

Liner 2, Multi 2000

**LOWE ELECTRONICS FOR 2M FM**

Yaesu Sigmasizer, FT2FB, FT2AUTO, FDK Multi 7, Multi 8, Multi VFO, Inoue IC210 all ex stock

**LOWE ELECTRONICS FOR ACCESSORIES**

All accessories for the modern station

**LOWE ELECTRONICS FOR ANTENNAS**

Wide selection of antennas both H.F. and V.H.F. along with rotators, cable, baluns, etc., etc.

**LOWE ELECTRONICS FOR SLOW SCAN**

Venus equipment ex stock.

**LOWE ELECTRONICS FOR SECOND-HAND**

Always a good selection of mint, fully checked equipment, carrying a meaningful guarantee

**LOWE ELECTRONICS FOR SERVICE**

This is what puts us that little bit ahead—ask anyone

SOLID STATE MODULES

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

Telephone: 0484-23991

MEMBER OF THE A.R.R.A.

Before you buy equipment you consider some or all of the following :—
PRICE, SERVICE, QUALITY, PERFORMANCE

Different people give these considerations different priority. WE treat them all equally.
When you select our products you get the best of all the above factors.

STILL THE BEST AND THE MOST POPULAR CONVERTERS

SENTINEL DUAL GATE MOSFET 2 METRE OR 4 METRE CONVERTERS

Don't take my word for it. Ask around. We have the letters from people with several makes of converter telling us that ours out performs the others. Nothing I can say is more convincing than what the customer says.

Three models to choose from :—

SENTINEL — Ex Stock

Now with much improved metalwork. 2 metre IF's available from stock : 2-4 MHz, 4-6 MHz, 9-11 MHz, 14-16 MHz, 18-20 MHz, 24-26 MHz, 28-30 MHz.

4 metre IF available from stock : 28-28.7 MHz.

2-4 MHz and 4-6 MHz use double conversion technique with two mixers and no crystal oscillator multiplication.

28-30 MHz IF's use 116 MHz crystals with no crystal multiplication. Noise figure 2 dB. Gain 30 dB.

MOSFETS protected against gate failure.

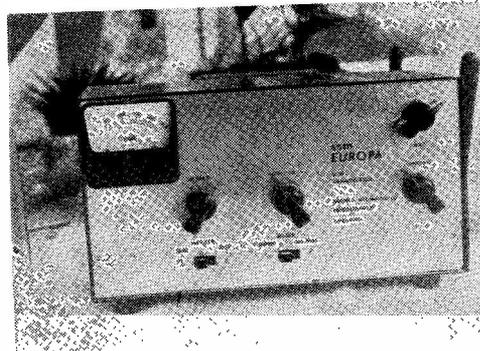
Protected against reverse supply connection and excess voltage 12 months guarantee.

Size : 2½" x 1½" x 3" long except 2-4 MHz and 4-6 MHz which are 4" long. Price : £16.50.

SENTINEL X — Ex Stock

A de luxe version of the above converter containing a mains power supply or external battery operation. It has a front panel R.F. gain control. Technical data is the same as the Sentinel. Stock IF's, 2-4 MHz, 4-6 MHz and 28-30 MHz.

Price £21.45.



THE SENTINEL M.F. DUAL GATE MOSFET 2 METRE TO MEDIUM WAVE CONVERTER — Ex Stock

Receives 2 metres on a conventional M.W.B.C. receiver, very good used with a car radio I.F. output 0.5 to 1.5 MHz for 144.5 and 145.6 MHz in two switched bands. Size : 5" x 1½" front panel, 4" deep Price : £20.62.

SM 70 70 CM CONVERTER — Ex Stock

This one uses an I.F. output of 144-146 MHz. This has enabled us to produce a very high performance converter with a noise figure of 3.5 dB for only £16.50.

2 METRE PRE-AMPLIFIERS (2 MODELS TO CHOOSE FROM) — Ex Stock

THE SENTINEL LOW NOISE FET PRE-AMPLIFIER — Ex Stock

* Built in a box which matches our converters.

* Isolated supply lines make it compatible with any existing supply polarity.

* Low noise figure 1 dB. Gain 18 dB.

* High selectivity tuned circuits. Price : £7.50.

THE PA3 DUAL GATE MOSFET PRE-AMPLIFIER — Ex Stock

* Small (about 1 cubic inch) printed circuit pre-amplifier developed to fit inside transceivers where it can be wired into the receiver aerial lead after the c/o relay.

* Low noise figure 2 dB. Gain 18 dB. Price £5.50.

SSM EUROPA 10 to 2 METRE TRANSMIT AND RECEIVE CONVERTER

We have seen the same customer reaction about the Europa this year as we were getting from our converters 5 years ago. Lots of people coming up to us at the rallies and saying "I've got a Europa. I'm very pleased with it." This is what sells our gear.

Every one we sell produces more customers by recommendation. SSB has revolutionised 2 metre operation. Co-channel working is normal, and distances covered over poor paths, much greater.

The Europa will give you complete 2 metre coverage with 28-30 MHz H.F. equipment with all the facilities provided on your H.F. equipment.

The Europa gives you :

* Well established design with hundreds already in use around the world.

* Direct plug into accessory socket in Yaesu-Sommerkamp equipment (plugs and multicore lead supplied).

* High transmit power—up to 200W input—50% efficiency.

* Excellent receive converter performance 2 dB noise figure.

* Extremely stable operation.

* Clean output.

* Attractive appearance—size 9" x 4½" front panel, 4½" deep.

* Low price : £78.09 complete. £64.35 less valves—valves required are 2 off QQVO3/10, 1 off QQVOa/40A. Additional 12.6v. 2 amps transformer for use with 6.3v. A.C. heater Yaesu equipment (FT401, etc.) £3.30 or in a case to match the Europa, £6.50.

To obtain any of our products. We can dispatch by return of post. We give same day C.O.D. Service. You can call in here any time to look at the gear. Queries ? Write or ring if you have any questions. Normal H.P. terms available. Paul G3MXG.

AMATEUR RADIO CHAS. H. YOUNG LTD. **G3V FV**

170-172 · CORPORATION STREET · BIRMINGHAM B4 6UD

021-236 1635

WE CAN NOW ACCEPT MOST MAKES OF COMMERCIALY MADE COMMUNICATION EQUIPMENT FOR SERVICE

MICROWAVE MODULES

We now stock the entire range of Microwave Modules. These superbly made units are mounted in small diecast boxes finished in durable black matt stove enamel.

70 MHz Converters 28 MHz IF	... £16-72
144 MHz " 2-4 IF	} £16-72
144 MHz " 4-6 IF	
144 MHz " 28-30 IF	
432 MHz " 28-30 IF	£19-91
432 MHz " 144-146 IF	} £26-40
1296 MHz " 28-30 IF	
1296 MHz " 144-146 IF	£26-40
144 MHz Pre-Amp (2 outputs)	£9-90
432 MHz Varactors Triplers	£19-25
1296 MHz Varactors Triplers	£27-30
144 MHz Transmitter (5 watts)	£35-75

All above post free.

SOLID STATE MODULES

2M Converter 4-6 or 28-30 MHz (22p)	£15-12
De Luxe 2M Converter, with built-in A.C. p.s.u. 4-6 IF	£21-45
2M to Med. Wave 2 Switched Bands (30p)	£20-62
70 CM Converter 144/146 MHz (22p)	£15-12
PA3 Pre-Amp for 2M Equipment (10p)	£5-50
2M Pre-Amp in case (22p)	£7-15
Europa 10-2M Transverter with valves	£78-09
<i>(corr. at cost)</i>	
PCB with Instrs. for G3XGP 2M Converter	75p
	(10p)

COMPREHENSIVE RANGE OF DENCO, R.S. COMPONENTS, FINNIGAN'S PAINTS, EDDYSTONE DIECAST BOXES

Midland Agents

for EDDYSTONE, J BEAM, JOSTY KITS, AMTRON KITS, TRIO

RECEIVERS

TRIO 9R59DS	... (Carr. at cost)	£54-45
TRIO JR310	"	£82-50
Eddystone EC10 Mk. II	"	£108-90
Yaesu FR50B	"	£73-70

I only s/hand Eddystone 940. Excellent condition. In stock at time of going to press ... (corr. at cost) £110-00

TRANSMITTER

KW 204	... (corr. at cost)	£187-00
--------	---------------------	---------

TRANSCIVERS

TRIO TR2200 Portable 2M	"	£87-45
TRIO TR7200 Car 2M	"	£142-45
Yaesu FT101 with 160	"	£308-00
Standard SRC 146A	"	£90-00
5 ch 2M FM with tone	"	£90-00
Helical whip to fit SRC 146A	(10p)	£2-75

MICROPHONES

Shure 201	... (30p)	£6-00
Shure 444	... (30p)	£14-40

ATU

KW EZ Match	... (35p)	£22-00
Osker SWR200 SWR/Power Meter 52/75Ω	... (30p)	£21-45

All prices include VAT

NO C.O.D. PLEASE PRINT YOUR ADDRESS. YOU MAY ORDER GOODS BY PHONE AND PAY BY ACCESS OR BARCLAYCARD. SIMPLY QUOTE YOUR CARD NO. Enquiries S.A.E. please TEL.: 021-236 1635. Prices subject to change without notice.

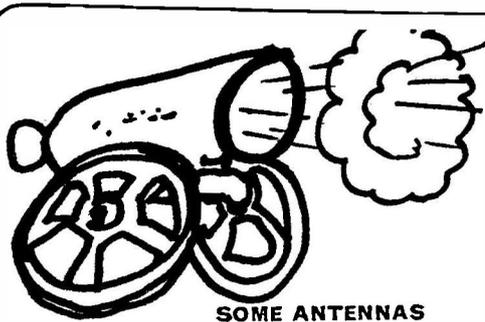
KW107 ATW/SWR	... (40p)	£66-00
KW103 SWR/Power 52 or 75Ω	(30p)	£15-40

Comprehensive range of multimeters in stock

Bantex Fibre Glass 2M 1/2 wave	... (25p)	£3-14
Bantex Fibre Glass 2M 3/4 wave	... (75p)	£4-90
J Beam Fibre Glass 2M 1/2 wave	... (75p)	£7-70
J Beam Halo 2M head only	... (25p)	£1-87
J Beam Halo 2M, with 1/2" pole	... (25p)	£2-20
J Beam 8PM 16ft. Portable Mast	... (corr. at cost)	£5-61

Full range of J Beam Aerials, Rotators and Accessories.

KW Traps with "AT"	... (25p)	£6-60
Low loss coax 75Ω	... yd. (30p)	14p
Low loss coax 52Ω	... yd. (30p)	33p
Hard-drawn 14 SWG Copper Wire 140ft.	... (30p)	£3-05
Hard-drawn 14 SWG Copper Wire 70ft.	... (30p)	£1-55
Soft stranded PVC covered 7/67 mm.	... (30p)	£3-50
3" Ribbed insulators	... (6p)	20p
AT Insulator (Centre T)	... (6p)	15p
ML4 400 lb.	... yd. (25p)	4p
Kwant Switch IP 3W with SO239 Skts.	... (30p)	£5-50



SOME ANTENNAS

MONO-BANDERS

A-310	3 Element, 10 metres	... £27-00
A-315	3 Element, 15 metres	... £30-00
Classic-203-C	3 Element, 20 metres	... £85-00
A-92-S	9 Element, 2 metres	... £14-00
D1-10	Ground Plane, 10 metres	... £22-00
D1-2	Ground Plane, 2 metres	... £8-00
MCQ-10	10 metre Quad	... £53-00
MCQ-15	15 metre Quad	... £53-00
MCQ-20	20 metre Quad	... £53-00

DUAL-BANDERS

Elan	3 Elements, 10 and 15 metres	... £35-00
Elan	2 Elements, 10 and 15 metres	... £26-00
TD-2	Trap Dipole, 40 and 80 metres	... £29-50

Send for HANDBOOK containing full details of Antennas and other technical information. 33 pages 20p. Refundable upon purchase of Antenna.

mosley makes impact

TOWERS
ROTATORS
COAX
ROPES &
LINES

BASIC
PRICES.
ADD VAT
10%

TRI-BANDERS

Mustang Mk. 2	... £55-00	
TA-33 Jr.	High Power Model incl. Balun	
TA-33 Jr.	3 Elements, 10, 15 and 20 metres	... £39-80
TA-32 Jr.	3 Elements, 10, 15 and 20 metres	... £39-80
TA-31 Jr.	2 Elements, 10, 15 and 20 metres	... £28-00
Classic-36	Rotary dipole, 10, 15 and 20 metres	... £18-00
Classic-33	6 elements, 10, 15 and 20 metres	... £15-00
V-3 Jr.	3 Elements, 10, 15 and 20 metres	... £25-00
MCQ-3B	Trap Vertical, 10, 15 and 20 metres	... £13-00
El-Toro	Cubical Quad, 10, 15 and 20 metres	... £85-00
	Vertical, 20, 40 and 80 metres	... £12-00

QUAD-BANDERS

Atlas	Trap Vertical, 10, 15, 20 and 40 metres	... £25-00
-------	---	------------

SWL Antennas

SWL-7	Dipole, 11, 13, 16, 19, 25, 31 and 49 metres	... £12-50
RD-5	Dipole, 10, 15, 20, 40 and 80 metres	... £12-50

Note: All "E" Models (2" mast fitting) ... Plus 50p

All antennas available ex works carriage and insurance extra

Administrative Address only

40 Valley Road, New Costessey, Norwich, Norfolk
NOR 26K, England.

MOSLEY Electronics Ltd



Western



We regret that due to cost increases, Yaesu have increased prices and these are now as follows: (Exc. VAT).

YAESU Prices (inc. free delivery by Securior/Postage):

TRANSCEIVERS

*FT-75	...	£138-00
FT-101	...	£280-00
FT-101B	...	£330-00
*FT-200	...	£170-00
FT-401	...	£310-00
*FT-501	...	£375-00

*Power supply required.

POWER SUPPLIES

FP-75	...	£32-00
DC-75	...	£39-00
FP-200	...	£45-00
FP-501	...	£53-00

TRANSMITTERS

FL-50B	...	£70-00
FL-400	...	£193-00

RECEIVERS

FR-50B	...	£67-00
FR-400DX	...	£155-00
FR-400DX	...	£210-00

LINEAR AMPLIFIERS

FL-2000B	...	£195-00
FL-2100	...	£165-00
FL-2100B	...	£195-00
FL-2500	...	£130-00

until stocks exhausted

REMOTE VFO's

FV-50B for FL-50B	...	£34-00
FV-50C for FT-75	...	£34-00
FV-101 for FT-101	...	£42-00
FV-101B for FT-101B	...	£48-00
FV-200 for FT-200	...	£48-00

SPEAKERS

SP-101	...	£11-00
SP-101B	...	£13-00
SP-101P	...	£26-00
SP-101PB	...	£29-00
SP-400/401	...	£13-00

VHF EQUIPMENT

FT-2 AUTO	...	£157-00
FT-2FB	...	£115-00
FP-2AC	...	£38-00
FP-2AC/B	...	£71-00
SIGMA SIZER 200	...	£196-00
FT-220	...	£264-00
FT-620	...	£170-00

6m. AM-SSB-CW Tcvt.

ACCESSORIES

YD-844 Table Mic.	...	£14-75
YD-846 Hand Mic.	...	£5-75
Fan, FT-101	...	£9-00
FF 50DX L.P. Filter	...	£12-25
Crystals FT2F/B	pr.	£3-50

FREQUENCY COUNTERS

YC-355 AC only	...	£99-00
YC-355 AC/DC	...	£110-00
YC-355D AC/DC	...	£127-00

**NEW-Coming shortly
YO-100 MONITOR SCOPE**

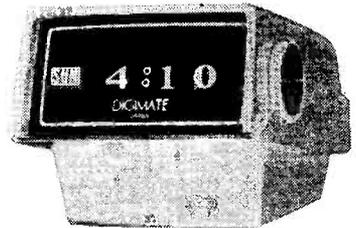
Price **£93.00**

455 KHz or 9 MHz **£2.50 extra**

Keep a watchful eye on your transmitter's output or use it to tune-up for maximum p.e.p.!

Can be connected to your receiver also to monitor incoming signals.

BATTERY CLOCK



(£6.82 inc. VAT)

This operates for about 6 months on one battery (provided). Available in red, blue, orange, ivory and brown; list your choice in order of preference.

**OSKER
POWER METER**

(Ex Stock)

Features: Switchable for 52 or 75 ohm systems. Each instrument is individually calibrated. Four ranges: 0-2, 0-20, 0-200 and 0-2kV, 3-200 MHz. Excellent Styling.

Price: **£19.50 VAT extra**



ATTENTION H.F. MOBILE OPERATORS!

Fed-up with having to disconnect resonators/whips before garaging?

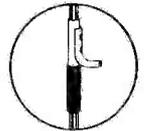
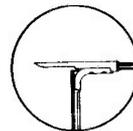
Fed-up with having to go slow due to inadequate mounting?

Then here's the answer... the "HUSTLER."

Hustler and only Hustler gives you 12 years of proven performance, mechanically and electrically superior to all others. You get exceptional reports on every band, lowest SWR and broadest bandwidth. Matching devices are not required. Use any convenient length of 52 ohm feed line. Convenience of fold-over mast for rapid band change or easy garaging, optimized performance on each band and a time proven concept in mobile communications, a concept verified by the overwhelming majority of amateurs, are yours only with the Hustler!

**MO2 MAST
FOLDS OVER**
Rotates 360° in horizontal plane

The original hinge and sleeve clutch mechanism.



NEWTRONICS HUSTLER MOBILE ANTENNAS. Carr. 75p

BM1 Bumper mount	...	£5-05	RM10	...	£5-00	RM20	...	£6-05
MO2 Mast	...	£7-50	RM15	...	£5-55	RM40	...	£7-05
RM75	...	£8-00	Stainless steel spring	...	£5-45	Resonator spring	...	£2-65
Ball Mount	...	£2-00	COMPLETE ANTENNA	BM1, MO2, RM10-75	...	£39-00		
C32 Ball Mount	£2-00	SSM3 Stainless Steel Spring	£5-45	R55Z Resonator Spring	£2-65			

W.E. QUAD 10-20m. "boomless" type. Cast aluminium centre, bamboos, etc. **£30.00 (Carr. paid)**
W.E. Trapped dipoles for 10-80m. All are fitted with resin encapsulated traps and a high quality commercial grade centre assembly with cable strain relief.

Type S.500 watts, **£16**. Type HP for 1 kW p.e.p., **£17-25**. Type P with a special copper/terylene braided element for ease of coiling up. Supplied with winding spools and 70ft. co-ax, **£19.50**. VAT extra.

PRICE LIST. Our latest (March) list is available f.o.c. upon receipt of a foolscap S.A.E.

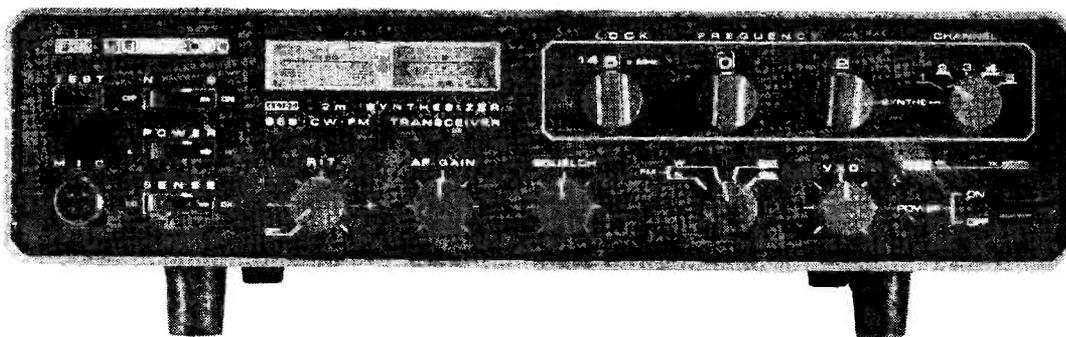
CATALOGUE of Tower, Masts, Antennas, Rotors and Communication Equipment is available at 20. (No S.A.E. required).

All advertised prices exclude VAT and are subject to manufacturers and currency fluctuations.

50p SMALL ORDER SURCHARGE. Due to the increased costs of handling and processing, all orders under £2 will bear this surcharge.

Electronics (UK) Ltd

Sole Authorised U.K. Distributor for the FDK Multi 2000 2m. SSB/FM/CW TRANSCEIVER



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

It has always been this company's policy and it will continue to be not to "run down" our competitors. Indeed, we take it as a compliment that they are so worried that they find it necessary to do so! Let us just say therefore that we are the Sole Authorised Distributor for FDK as those owners of the first batch of Multi 2000's will be aware. We regret that we could not fulfill all the orders which came to us from some prospective purchasers who had ordered elsewhere but we can help from our next batch due this month.

The WESTERN ELECTRONICS MULTI-2000 has the following features—

1. DUPLEX OPERATION ON ALL CHANNELS
2. NARROW and WIDE FM FILTERS FITTED AS STANDARD.

So no matter on what frequency a repeater comes up, the Multi 2000 will tune it because don't forget that it has VXO control; i.e., you are not limited to 10 kHz steps, the VXO allows you to tune any frequency. There is a 9-pin socket on the rear to permit switching an external linear relay. All our models are marked "DUPLEX" instead of "I" on the channel switch shown in the above picture.

SPECIAL OFFER on ROBOT SLOW-SCAN TV

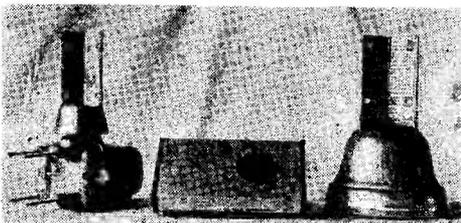
MODEL 70A MONITOR £199.00; MODEL 80 CAMERA £199.00

All you need to add to your SSB Transmitter/Receiver is the model 80 Monitor and model 70 camera in order to send and receive SSTV signals from around the world. Please send s.a.e. for full details (VAT extra).

The NEW SILENT CDE ANTENNA ROTORS are ex-stock.

These supersede the previous "Clunk-click" models.

CDE ROTOR PRICES:
AR20, £23; AR30, £25; AR40, £30;
TR44, £52; HAM-M, £79.



APOLOGIES

We regret that due to a shortage of staff, our service since March has not been that to which our customers have been accustomed. We apologise for any delay in dealing with correspondence and orders but this will be rectified as soon as we can find suitable staff.

WANTED SERVICE ENGINEER! If you're good at servicing we would be very pleased to hear from you stating qualifications, experience and salary required.

VHF - UHF EQUIPMENT

BELCOM.	Linear 2 145.25-48 or 144-1 0.34	...	...	£132.00
BRAUN	SE600 Digital 2M AM/FM/SSB Transceiver	...	...	£780.00
FDK	Multi 2000	...	...	£297.00
TEMPO	6N2WE 2KW 144 MHz SSB/FM amplifier	...	...	£385.00
	12v. DC Amplifiers 502 (50w o/p)	...	...	£62.70
	802 (80w o/p)	...	...	£107.80
	1002-3 (100w o/p)	...	...	£130.90

STANDARD FOR FULL DETAILS OF THIS RANGE OF 2M. AND 70CM. EQUIPMENT—PLEASE SEND S.A.E.

Western Electronics (UK) Ltd

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

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

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



STEPHENS-JAMES

LTD.

70 PRIORY ROAD, LIVERPOOL, L4 2RZ

Telephone: 051-263 7829

G3LRB - G3MCN

THE NORTH WEST'S
LEADING STOCKISTS OF AMATEUR
RADIO EQUIPMENT

YOUR CHOICE OF VHF EQUIPMENT - FM, CW, SSB, AM

FDK MULTI 2000 TRANSCIEVER
Full coverage 144-146 MHz (148 MHz on receive). Separate I.F. strips for SSB/CW and FM. Antenna impedance 50 ohms. AC or DC operation. R.T. noise blanker. Tone call. 10 watts or 1 watt output. Deviation 3.5 kHz but adjustable up to 15 kHz. Carrier suppression better than 45 dB. Sideband suppression better than 50 dB. Complete with microphone. Digital read-out. PRICE **£297.00.**

IC-210 TRANSCIEVER

FM transceiver. Fully tunable both Tx and Rx. Solid state. AC or DC operation. Automatic repeater operation. 10 watt output. Centre reading discriminator meter. Built-in SWR meter. R.I.T. Complete with microphone. PRICE **£286.00.**

LINER 2 TRANSCIEVER

2 metre SSB transceiver. 144.10-144.34 MHz. Electronically protected, P.A. Switched. Combines the advantage with direct frequency read-out, with the ability to tune between channels with the VXO. In addition the provision of R.I.T. which enables the Rx to be tuned to a kHz or two either side of the Tx frequency. DC operated. PRICE **£145.20** AC power unit **£17.60.**

MICROWAVE MODULES

2m. AM Transmitter **£35.75**
2m. Converters (state I.F.) **£16.72**
4m. Converters **£16.72**
432 MHz Converters **£19.81**
432 MHz Varactors **£19.25**
1296 MHz Converters **£26.40**
1296 Varactor Tripler **£27.50**
144 MHz Dual output Preamp **£9.90**

SOLID STATE MODULES

2m. Converter **£15.21**
70 Cm. converter **£15.21**
PA3 Dual Mosfet Preamp **£5.50**
2m. FET Pre-amp **£7.50**
Europa SSB Transverters complete with valves **£78.00**
Transverters. Less valves **£64.35**

J BEAM

2m. 5 Element **£5.29**
2m. 8 Element **£6.61**
2m. 10 Element **£12.00**
2m. 14 Element Parabeam **£17.94**

All prices of beams include carriage. Send S.A.E. for full catalogue of rotators, beams, masts, clamps, etc.

YAESU

FT101B Transceiver **£363.00**
FT401 Transceiver **£341.00**
FT200 Transceiver **£236.50**
FT75 Transceiver **£150.00**
FR400SDX Receiver **£231.00**
FL400 Transmitter **£212.30**
FL2100 Linear **£214.00**
FR50B Receiver **£71.50**
YC355D Frequency Counter **£139.70**
SP400 Loudspeaker **£14.30**

KW ELECTRONICS

KW2000E Transceiver **£302.00**
KW202 Receiver **£176.00**
KW204 Transmitter **£187.00**
KW1000 Linear Amplifier **£165.00**
KW107 Antenna Matching Unit **£72.60**
KW108 Monitorscope **£84.70**
KW E-Z Match **£22.00**
KW 160m. Tuning Unit **£17.60**
KW Balun **£2.75**
KW 3 way Antenna switch **£5.50**

KW103 SWR/Power Meter **£15.40**

HY-GAIN ANTENNA RANGE

I2AVQ 1-15-20m. Vertical **£22.00**
I4AVT/WB 10 to 40m. Vertical **£32.45**
I8AVT/WB 10 to 80m. Vertical **£46.75**
TH6DX Tribander Beam **£134.00**
TH3MK3 Tribander Beam **£99.00**
TH3JNR Tribander Beam **£68.00**
LC80Q Loading Coil **£10.23**
BN86 Balun **£10.45**

SPACEMARK

S.S.T.V. Monitor **£143.00**

EDDYSTONE

EB37 Receiver **£88.00**
EC10MK2 Receiver **£101.90**
LP3382 Active Aerial

COPAL CLOCKS

Model 227 24 hour alarm **£8.00**
Model 228 24 hour alarm **£10.00**
Model 601 day/date 24 hour **£12.50**
Model 601 day/date Teak **£14.00**

G-WHIP MOBILE ANTENNA RANGE

Tribander Helical 10-15-20m. **£13.53**
40m., 80m. and 160m. coils, each **£4.51**
Telescopic whip for coils **£1.21**
Basemounts **£1.81**
Multimobile 10-15-20m. **£15.73**
40m., 80m. and 160m. coils **£4.51**
Telescopic whip for coils **£1.21**
Flexiwhip 10m. basic with basemount **£10.45**
Coils for 15m., 20m., 40m., 80m., 160m. each **£4.67**
Send S.A.E. for literature on this range.

MICROPHONES

Yaesu 844 Desk Microphone **£16.22**
Yaesu 846 Hand Microphone **£6.32**
Shure 201 Hand Microphone **£6.00**
Shure 444 Desk Microphone **£15.00**
Electro-Voice 619 Desk Microphone **£28.50**
Electro-Voice Desk Microphone **£14.41**
Electro-Voice 715 Hand Microphone **£7.50**

BARLOW WADLEY

XCR-30 Mk. 2 Solid State Receiver **£99.00**
TR801 FM Tuner **£17.25**

ACCESSORIES

Single Meter SWR Bridge **£7.70**
Twin Meter SWR Bridge **£11.00**
Diamond SR435 VHF/UHF SWR Bridge **£18.70**
Omega Noise Bridge TE701 **£14.85**
Omega Noise Bridge TE702 **£21.45**
B & W 5-way Antenna Switch **£9.00**
MF100 Audi Generator **£22.00**
Dipole "T" Pieces **15p**
3" Ceramic Insulators **20p**
2 1/2" Ribbed Plastic Insulators **10p**
Egg Insulators **6p**
PL259 Plugs **40p**
SO250 Sockets **40p**
Cable Reducers **14p**
Line Connectors **80p**
B/Lee aluminium co-ax plugs **10p**
300 ohm twin feeder **7p**
75 ohm twin feeder **7p**
UR43 50 ohm Co-Axial cable **16p**
UR67 50 ohm Co-Axial cable **40p**
UR203 75 ohm low loss Co-Axial cable **14p**
Morse Practice Oscillators **£2.75**
QSL Card Holders. Holds 120 cards **40p**
Tech 15 Grid Dip Meters **£20.00**
Multimeters from **£5.00 to £30.00**

R.S.G.B. PUBLICATIONS

Examination Manual **90p**
Radio Communication Handbook **£4.13**
R.S.G.B. Standard Log Book **63p**
R.S.G.B. De Luxe Log Book **£1.30**
R.S.G.B. Mobile Log Book **26p**
Book prices include postage.

AMTRON

Send S.A.E. for latest catalogue and price list on these exciting kits.

SECOND-HAND EQUIPMENT

Barlow Wadley XCR30 Receiver **£75.00**
IC21XT Transceiver **£145.00**
Sommerkamp FT150 Transceiver **£185.00**
KW2000A AC power unit. Less cabinet **£15.00**
Sommerkamp FL200B Transmitter **£80.00**
Labgear LG50 Transmitter **£15.00**
Trio TS515 Transceiver **£220.00**
National NCX5 Transceiver **£155.00**
KW Atlanta Transceiver **£155.00**

ANTENNA ROTATORS

CDR AR20 Post 60p **£25.30**
CDR AR22 **£30.25**
CDR TR44 **£57.20**
CDR HAM H **£86.90**

Due to heavy postal charges please forward S.A.E. with all general enquiries. All our prices include VAT. Postage extra on small items. Carriage charges by arrangement.

We can arrange delivery and collections in some areas. We pay cash for good second-hand receivers, transmitters, transceivers. Send full details and the price you require. Our second-hand range changes quickly. Please let us have your requirements. If we do not have the model you want in stock, we will let you know as soon as we do. Full after sales service on all equipment. Three months guarantee on second-hand equipment.

On the spot HP facilities. One third deposit, balance payable over 6, 12 or 18 months. Credit terms 10% deposit and balance over 8 months.

Shop Hours—9.30 till 1 p.m. 2.15 till 6 p.m. Half-day Wednesday.

MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION

Radio Shack Ltd ★

London's Amateur Radio Stockists

Just around the corner from West Hampstead Underground Station

HY-GAIN PRODUCTS

18HT	6 thru 80 metre Vertical "Hy-Tower" ...	£145-20
14AVQ/WB	10 thru 40 metre Vertical Trapped Antenna	£32-45
18AVT/WB	10 thru 80 metre Vertical Trapped Antenna	£46-75
LC80Q	80 metre Loading Coil for 14AVQ/WB ...	£10-23
TH6DXX	Super Thunderbird 6 Element 10-15-20m. Beam	£128-70
TH3MK3	Thunderbird 3 Element 10-15-20m. Beam	£99-55
TH3JR	3 Element 10-15-20m. Beam. 600W PEP rating	£68-20
TH2MK3	Thunderbird 2 Element 10-15-20m. Beam	£68-20
HY-QUAD	3 Band 2 Element Cubical Quad Sgl. feed line	£99-00
DB10-15A	10 and 15 metre Duo-Band Beam	£75-90
LA-1	Lightning Arrestor	£19-25
LA-2	In-line Lightning Arrestor	£3-30
400	"Roto-Brake" Rotator	£152-90

C.D.E. ROTATORS

AR22R	...	£30-25
TR-44	...	£57-20
HAM-2	...	£86-90

KW PRODUCTS

KW 2000E	Transceiver with AC Power Supply	£302-50
KW 202	Receiver CW Calibrator	£176-00
KW 202	Matching Speaker	£11-00

KW 204	Transmitter	£187-00
KW 1000	Linear Amplifier	£165-00
KW 107	Antenna Tuning Unit	£66-00
KW 108	Monitorscope	£77-00
KW 109	Antenna Tuning Unit (High Power Version)	£82-50
KW 110	"Q" Multiplier	£16-50
KW 160	Top Band Antenna Tuning Unit	£17-60
KW DC	Power Supply Unit for 2000A/B/E	£52-80
KW VOX	Unit for KW Atlanta/204	£9-35
KW 103	VSWR and Power Meter	£15-40
KW	E-Z Match. 10-80m. Antenna Matching Unit	£22-00
KW	DUMMY LOAD 52 or 75 ohm	£10-45
KW	Trap Dipole 97' Feeder (Standard Model)	£24-20
KW	Traps and T-piece	£6-60
KW BALUN	1 : 1 ratio. Dual impedance 52/75 ohm	£2-75
KW	Antenna Switch	£5-50

KOKUSAI MECHANICAL FILTERS

MF 455-10CK or MF 455-15CK...	£14-30
Matching Crystals ... each	£3-52

COPAL DIGITAL CLOCKS

Model 601	24 hour with day and date	£11-50
Model 222	24 hour	£5-50

ALL PRICES INCLUDE V.A.T.

SECURICOR ★ ACCESS ★ BARCLAYCARD

RADIO SHACK LTD. 188 BROADHURST GARDENS LONDON, NW6 3AY

Just around the corner from West Hampstead Underground Station

OPEN 5 DAYS 9-5. CLOSED 1-2 p.m.
HALF DAY SATURDAY

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

Venus Scientific Inc.

The company that put high voltage on the moon,
now brings you expanding amateur radio technology

2nd generation slo-scan

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

These advances include : **ACCU SYNC**, a diagnostic and tuning aid which converts the SS2 Monitor to an oscilloscope by the flip of a switch that monitors incoming and outgoing video ; **LED SWEEP INDICATORS**, go-no-go lights for ease of servicing ; **CAMERA ADAPTER** provision to accept **Polaroid Color Pack Camera** or **Polaroid Square Shooter**, which enables you to take pictures right off the air ; **SIMPLIFIED INDEPENDENT CONTROLS**.
NOTHING COMPLICATED—CONNECTS DIRECTLY TO YOUR LOUDSPEAKER TERMINALS.

PRICE : £249 including V.A.T.

For the full story on how VENUS' SS2 monitor has become the 2nd Generation of Slo-Scan and a list of accessories, write or call today.

U.K. Agents : LOWE ELECTRONICS RADIO SHACK LTD.

G3EXX S.S.B. PRODUCTS G3EXX

★ **QUARTZ CRYSTALS** ★

Send a stamped addressed envelope with your detailed requirements and alternatives. Many thousands in stock. Metal cased, most types. Remember no money initially, just an "s.a.e. please."

Many satisfied Radio Amateurs and Authorities have been supplied within 7 days. Try us !! New batch arriving any time. We are half the price and quick. S.A.E. is essential for a reply.

EDDYSTONE 940. One owner	£120-00
EDDYSTONE 680X. Excellent	£85-00
ADVANCE B4B. Sig. gen. '55 to 30 MHz	£25-00
MURPHY TR821/H. 2 metres, 12v.	£15-00
FURZEHILL V.T.V.M. 6 ranges. Boxed	£9-00
31-SET. A/C I/P; B.E.M.E. LOOP. Soiled. Both ea.	£5-00
ROTARY RELAYS. 12v. Robust. R.C.A. ... ea.	£1-00
CODAR PRESELECTOR. (Powered)	£5-00
HOMEBIRD ELECTRONIC ORGAN. Needs attention	£62-00

— ONLY CARRIAGE AND PACKING EXTRA —

SPECIALLY MATCHED VALVES FOR LONGER LIFE

PAIR MATCHED 6HF5's R.C.A. (30p)	£6-00
PAIR MATCHED 6146 R.C.A. (30p)	£6-20
PAIR MATCHED 6146B R.C.A. (30p)	£7-20

I FRANCES STREET, TRURO, CORNWALL Tel. 0872-862575

MINIATURE AIR SPACED 3 GANG 365pf TUNING CONDENSERS size 2½" x 1½" x 1½" at 66p each.
MOTOROLA VARI-CAP DIODES type MV 1626 at 30p each.
DIVIDE BY 4 180 MHz COUNTERS untested with data, 3 for £2.
DUAL 2 GHz NPN TRANSISTORS untested with data, 3 pairs for 55p.
10.7 MHz CERAMIC FILTERS with data for 10 kHz conversion at 27p each.
TBA 800 3 Watt AUDIO I.C. AMPLIFIER with data at £1-35.
NEWMARKET NKT 214 GENERAL PURPOSE PNP TRANSISTORS, 10 for 66p.
 ·01 of 500 v.w. DISCS. ·05 of 500 v.w. DISCS. Both at 16p doz.
FETS similar to 2N 3819, 3 for 60p.
FETS MPF 102 and MPF 105 at 44p each.
FETS similar to TIS 98A at 36p each.
VARI-CAP DIODES BA 141 or BA 142 at 44p each.
SPECIAL OFFER VERNIER DRIVES 1" 88p, 2" 99p.
TAD 100 I.C. AMPLIFIER with data at £1-15.
COMMUNICATION SERIES OF I.C.'s untested consisting of x R.F., 3 x I.F., 2 x VOGAD, 2 x AGC, 1 x Mike Amp, 2 x Double Balanced Modulators, 1 x Mixer. The 12 I.C.'s with data for £3.
4-7 to 20pf MINIATURE CERAMIC TRIMMERS, 3 for 10p.
X BAND HIGH Q GALLIUM ARSENIDE TUNING VARACTORS (Schottky Barrier Diodes). For use with GUNN DIODES. Two types available. Type 1, 1pf to 2pf; Type 2, 3-3pf to 4-7pf. Both with data at £1-65 each.
COIL FORMERS 3/16", 3 for 6p; ¼" Alladin at 5p; ⅜" Alladin at 5p.
X BAND GUNN DIODES with data at £1-65.
MECHANICAL FILTERS 450 kHz at £1-20 with data.
10.7 MHz CERAMIC FILTERS with data at 27p each.
X BAND DIODES similar to 1N 23 at 25p each.
MEDIUM FREQ. TUNING VARACTORS untested 330pf at 4 volt, 110pf at 40 volt. Free, 10 MHz at 3 for 30p.
MOTOROLA 2N 4123 GENERAL PURPOSE NPN 250 MHz TRANSISTORS, 3 for 25p.
2N 2646 UNIJUNCTIONS, 44p each.
BF 244 VHF FET, 4 for £1.
GOLD BONDED DIODES unmarked. Good, £3 per 1000.
I.C. SOCKETS 8 pin round at 35p, 10 pin round at 35p, 8 pin dual in line at 35p, 14 pin DIL at 15p, 16 pin DIL at 15p.
10 SILICON BRIDGES UNTESTED 10 amp MINIATURE at £1-25.

J. BIRKETT

Radio Component Suppliers
25 THE STRAIT, LINCOLN, LN2 1JF
 Telephone: 20767

REG. WARD & CO. LTD. (G2BSW)

WE ARE OFFICIALLY APPOINTED K.W. AGENTS FOR THE SOUTH WEST (Somerset, Dorset, Devon, Cornwall)

KW 160 Top band A.T.U.	£16-00
KW 108 Mon. scope	£70-00
KW Atlanta with p.s.u.	£210-00
KW 2000B with p.s.u.	£265-50
KW 2000E TCVR's & A.C. p.s.u.	£170-00
KW 202 Receiver with matching speaker	£160-00
KW 204 Transmitter	£150-00
KW 1000 Linear	£8-25
KW 101 VSWR Meter (52 or 75 ohm)	£20-00
KW 103 VSWR Meter and Combined Power Meter	£20-00
KW E-Z Match, 10-80m. ATU	£60-00
KW 107 Combined E-Z Match, VSWR and R.F. Power Indicator, Dummy Load and Antenna Switch for 4 Outlets	£15-00
KW Trap Dipole 70' 75 ohm Twin Feeder	£22-00
KW Trap Dipole 97' Coaxial Feeder	£24-00
KW Trap Dipole with Balun	£5-00
KW 3-way Antenna Switches (for coax)	£59-00

YAESU

FR50B Amateur Bands Receiver	£245-00
FT101 260w. Transceiver, with mic, spkr. and built-in A.C./D.C. p.s.u.'s.	£63-00
FR50 + Cal. WVVV	£190-00
FT200 Transceiver and FP200 A/C PSU	£210-00
FR400SDX Rx. (with 160 and 2m.)	£13-00
SP400 Speaker	£7-42

EDDYSTONE RECEIVERS

EC10 Mk. II £99-00
 WE ARE THE DISTRIBUTORS OF EDDYSTONE PROFESSIONAL RECEIVERS FOR THE SOUTH WEST.

SHURE MICROPHONES
 Model 444, £13-50; Model 201, £5-70.

USED EQUIPMENT:
ANTENNAE 1-Beam 2 metre Beams in stock. Also Joystick and Joystick A.T.U.'s, Steile Ant. Rotators, 140ft. coils 14G Copper Antenna Wire and Ribbed insulators. T-insulators, U.H.F. Co-ax. Plugs and Sockets. 75 and 52 ohm Co-ax. Cable.

R.C.A. VALVES for KW and Heathkit equipment, 6146, 6146B, 6HF5, 6LQ6, 6GES, 6EAB, 6GV8, 6GK6, 6CM6, 6CL6, 6CB6, 6BN8, 6HS6, 6EW6, 12BA6, 12BE6, 12B20, 6J56C, 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. Add 10% VAT to all prices except used equipment. WE STOCK R.S.G.B. PUBLICATIONS, LOG BOOKS, Etc.

HP TERMS AVAILABLE CARRIAGE EXTRA ON ALL ITEMS
AXMINSTER - DEVON Telephone: 33163

G. W. M. RADIO LTD.

All prices include VAT and post/carriage.

TEST EQUIPMENT. All standard mains

RECEIVERS B40D. A few available in good clean condition and tested £60. Also a very few B40a as last month, £55.

MAINS TRANSFORMERS. Multi primaries for all voltages to 250v. Two types, 0-350v. 435 mA, 0-200v. 45 mA, £2-50. 12v. 2-2A, 6-3v. 1-2A, 6-3v. 3-5A, 6-5v. 11A, 6-3v. 3A, £2-50.

CRYSTAL OVENS. 12v. complete with 100 kc/s. octal based crystal £2. Small fans 115/230v. with 2½" impeller, £1-50.

NOISE GENERATORS CT82 for comparative Noise Factor measurements in Receivers covering 100 kc/s. to 160 mc/s. Clean condition, untested, £7-50.

RADIO TELEPHONES. All 25 kc/s. Cambridge dash mounting H/B 6 channel, £30. Vanguard boot mounting, with control box, speaker and lead. AM25 H/B 6 channel £30. Storno FM H/B single channel model CQM 13C/12 with control box, lead and mike, £12-50.

REED RELAYS. 4 pole normally open, 5v. DC coil as used in recent Electronic Keyer design, 16p each (plus 10p post for any number). Also reed inserts 1½" overall (body length 1-1½"). Diameter 1-14". Max. ratings 250v. DC and 500 mA. Gold clad normally open contacts, 69p per dozen, £4-12 per 100, £30-25 per thousand.

TRANSMITTER P.A. UNITS, STC T4188. Tunes 2-8 to 18 Mc/s., manual or 28v. motor driven. 13" x 8" x 8". Pair CV518 (4x150) 28v. blower cooled. Bases are NOT U.H.F. type. Ideal basis for linear amplifier construction, £8-75.

RACAL 55B ADAPTORS RA218 for RA17 and RA117 Receivers clean and untested, £30.

JB 4 gang 500 pf variable capacitors, ceramic insulated, ¼" shaft, £1-27.

JB 72-1 slow motion drives. Friction/spring loaded gear type complete with 1½" lead flywheel, ¼" shaft, 75p.

AERIAL INSULATORS, 1½" white egg type, 6 for 55p.

TRANSCEIVERS. B44 Mk. 3. 3 channel, 4 metre, 12v. supply and speaker built in. Clean, untested £10.

All Receivers and Test Equipment are in working order at time of dispatch
 Carriage charges included are for England and Wales only

Telephone 34897

Terms: Cash with order, Early closing Wednesday.

40-42 PORTLAND ROAD, WORTHING, SUSSEX

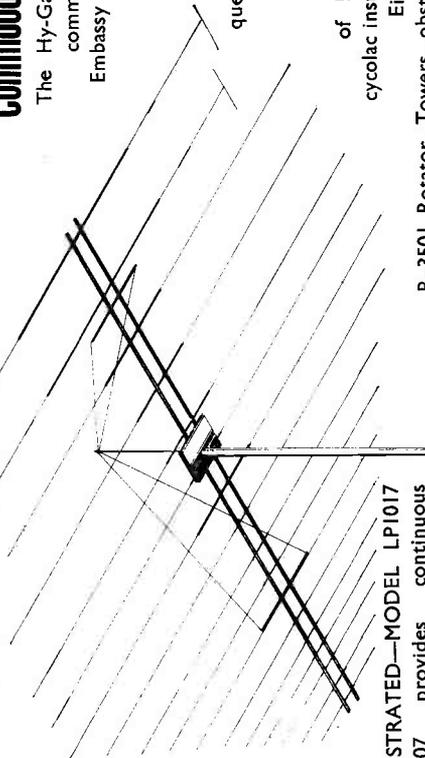
Professional performance with Hy-gain beam and KW equipment

Continuous coverage across 10-15-20-40 metres

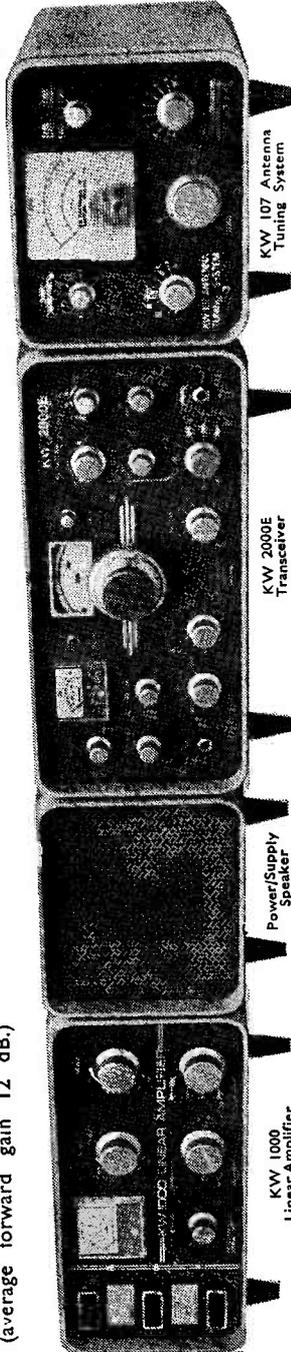
The Hy-Gain LP-1007 and LP-1017 were originally designed as commercial systems for use on marine HF SSB circuits, Embassy and commercial systems. These high performance antennas give the amateur radio operator, performance not offered by conventional amateur band antennas.

Frequency coverage is continuous across the frequencies of 13 to 30 MHz for the LP-1007 and 6.2 through 30 MHz for the LP-1017. The antennas may be operated in or out of the amateur bands with consistent results. Both systems are constructed of lightweight aluminium members, with high impact cycloc insulators for long, trouble-free life.

R-3501 Rotator, Towers, obstruction lights and other accessories are also available. Prices on request.



ILLUSTRATED—MODEL LP1017
LP1007 provides continuous coverage across 10-15-20 Metres (average forward gain 12 dB.)



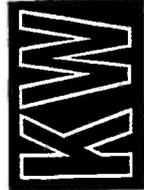
KW 1000 Linear Amplifier
KW 2000E Transceiver
KW 107 Antenna Tuning System
KW 160 Antenna Tuning Unit
Power/Supply Speaker

A COMPLETE RANGE OF EQUIPMENT FOR THE RADIO AMATEUR—SEND FOR CATALOGUE AND ASK FOR DETAILS OF THE NEW KW109 HIGH-POWER SUPERMATCH THE NEW KW160 ANTENNA TUNING UNIT.

KW Communications Ltd.
 Write or 'phone for catalogue KW Communications Ltd.
 1 HEATH STREET, DARTFORD, KENT.
 Tel: Dartford 25574/21919

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

A MEMBER OF THE DECCA GROUP OF COMPANIES



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.

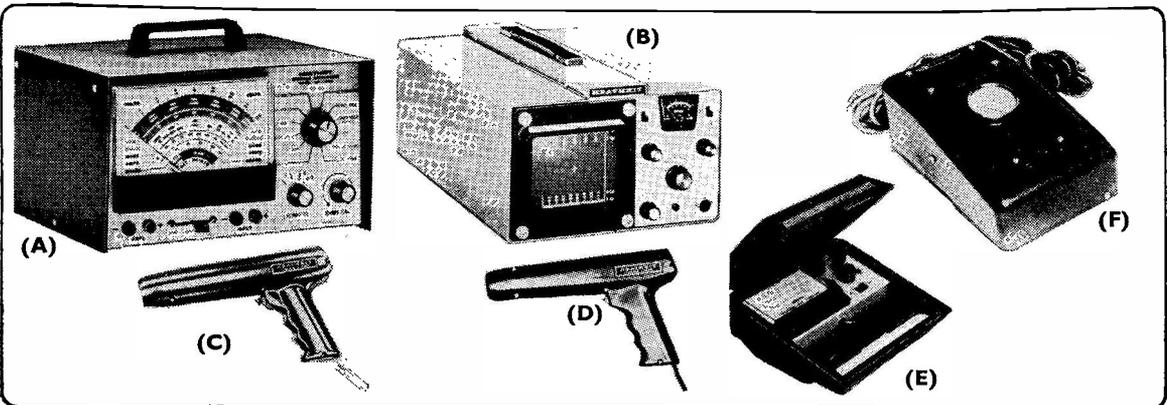
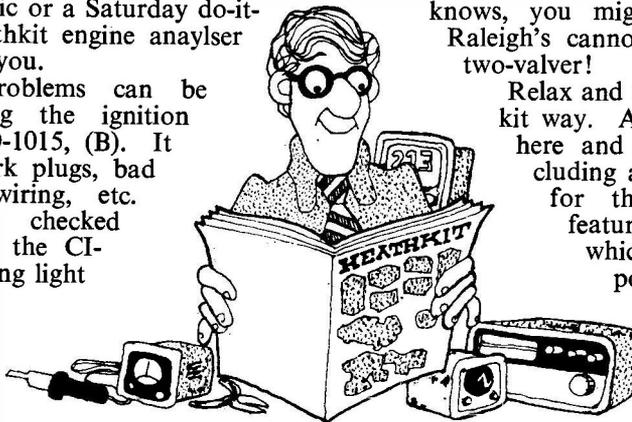
Timing can be checked quickly with either the CI-1020 solid-state timing light (C)

(C) or the CI-1040 inductive pick-up timing light (D).

Our handy portable 3 in 1 tune-up meter, the ID-29, (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/6/74
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

SHORT WAVE MAGAZINE

(GB3SWM)

ADVERTISERS' INDEX

	Page
Aero & General Supplies ...	217
Amateur Electronics (G3FIK)	170
Antec	223
Ashley Dukes (Honda) ...	222
B. Bamber Electronics	<i>back cover</i> , 217
J. Birkett	180
B.B.C.	221
British National Radio School	218
CJL Ltd.	<i>inside back cover</i>
I. N. Cline	216
Cohen T.V. Aerials <i>inside back cover</i>	
Derwent Radio	221
G3HSC (Rhythm Morse Courses)	221
G.W.M. Radio e	180
Hamgear Electronics ...	219
Heath (Gloucester) Ltd. ...	182
D. P. Hobbs Ltd.	217
K.W. Communications Ltd.	181, 223
Lowe Electronics	172, 173
Marketing Services International	218
S. May (Leicester) Ltd. ...	217
Microwave Modules ...	184
Miniwise	222
Mosley Electronics ...	175
North West Electrics ...	223
Partridge Electronics Ltd.	<i>inside front cover</i>
Radio Shack Ltd.	179
R.T. & I. Electronics Ltd.	171
Semicon Indexes	222
Severn-Trent Water Authority	217
Shure Electronics Ltd. ...	169
Small Advertisements ...	216-221
Solid State Modules ...	174
Southern Surplus Merchants	216
Spacemark	171
S.S.B. Products	180
Stephens-James	178
S.W.M. Publications	213, 214, 219, 220, 222, 223, 224
Telecommunications International Agency Ltd. ...	215
T.M.P. (Electronic Supplies)	216
Reg Ward & Co. Ltd. ...	180
Western Electronics ...	176, 177
W. H. Westlake <i>inside back cover</i>	
Chas. H. Young Ltd. ...	175

Vol. XXXII JUNE, 1974 No. 368

CONTENTS

	Page
Editorial	185
Communication and DX News, by E. P. Essery, G3KFE ...	186
The Mobile Scene	191
Modifying The FR-50	193
Microphone Pre-Amplifier, by G. R. Thomas, G4AWJ ...	193
Third-Method SSB Exciter, by G. C. Clemerson, B.Sc., G4CLT ...	194
Paraboloid for Twenty-Three, K. H. Parkes, G3EHM ...	199
Specially on The Air	201
VHF Bands, by A. H. Dormer, G3DAH	203
The Month with The Clubs—From Reports	208
New QTH's	212

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

Advertising: Charles Forsyth

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 (£3.20 first class) post paid
Overseas: £2.75 (\$7.00 U.S.), post free surface mail

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

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

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.

E. & O. E. VAT Reg. No. 239 4864 25

183

STOP!

Are you interested in buying top performance VHF or UHF equipment? Then look no further! . . .

Our equipment and customer service are second-to-none. We note that we are still the only British amateur radio manufacturer with sufficient confidence in the robustness and reliability of our equipment to offer an UNCONDITIONAL ONE YEAR GUARANTEE inclusive of FREE SERVICE and REPAIRS.

144 MHz CONVERTER FOR SSB

This latest version of our standard 28 MHz I.F. 2 metre Converter, with an additional coax socket giving local oscillator output at 116 MHz, can be used as the heart of a high performance 2m. SSB transverter. The excellent sensitivity of this converter is defined by the low noise dual gate RF stage. For SSB use this is particularly important if the DX-potential of the mode is to be realised.

Technical Specification

Noise figure: 2.8 dB max.
Gain: 27 dB typ.
Image rejection: 65 dB typ.
116 MHz output power: 5m W min.
Crystal oscillator: 116 MHz (zenered)
Frequency error at 144 MHz: 3 kHz max.
Power supply: 35mA at 12 volts typ.
Available ex-stock. Price inc VAT **£17-93**

144 MHz MOSFET CONVERTER

I.F.s available ex-stock: 14-16, 18-20, 24-26, 27-7-29-7, 28-30 MHz. Price inc. VAT **£16-72**
This design has been optimised to obtain the best sensitivity possible with the latest diode-protected dual-gate mosfets. Both RF stage coupling and oscillator injection circuits use band-pass transformers to maximize performance across the band.

144 MHz DOUBLE CONVERSION MOSFET CONVERTER

I.F.s available ex-stock: 2-4, 4-6 MHz. Price inc VAT **£16-72**
This unit was developed to meet the heavy demand for a converter suitable for use with receivers having better performance at lower frequencies. It uses two dual-gate mosfet mixers, both fed from the output of a 70 to 71 MHz crystal oscillator. Selectivity is obtained at the first IF in the 74 MHz range, thereby overcoming the usual problem associated with low-I.F. single conversion converters.

144 MHz DUAL OUTPUT PREAMPLIFIER

This two-stage mosfet preamplifier has two separate isolated outputs, for feeding two receivers, for example. The gain is 18dB, and the noise figure is 2.8 dB. The noise figure is individually optimised on each unit using our new automatic noise measuring equipment. Price inc VAT **£9-90**

144 MHz 5 WATT AM TRANSMITTER

5 watt input, six channel crystal controlled. See last month for full details. Price inc VAT **£35-75**

VARACTOR TRIPLERS

We manufacture varactor triplers for 432 and 1296 MHz. Both are highly stable, with low level harmonic output, and capable of AM operation at the 50% power level. These units are aligned using swept-frequency and swept-power drive sources, the output of each unit being monitored on one of our spectrum analysers. Great attention is paid to harmonic suppression and linearity. All harmonics are greater than 40dB down on the wanted output.

432 MHz VARACTOR TRIPLER

Maximum input power at 144 MHz: 20 watts. Typical output power (at maximum input): 14 watts. Price inc VAT **£19-25**

1296 MHz VARACTOR TRIPLER

Maximum input power at 432 MHz: 24 watts. Typical output power (at maximum input): 14 watts. Price inc VAT **£27-50**

432 MHz MOSFET CONVERTER

I.F.s available ex-stock: 14-16, 18-20, 24-26, 28-30, 144-146 MHz. Price inc VAT **£19-91**
This unit uses a dual-gate mosfet mixer for excellent strong-signal performance preceded by two BFY90 transistor RF stages for high sensitivity. All UHF tuned circuits are printed using Microstrip technology, and a crystal in the 100 MHz region is used in the oscillator chain to overcome unwanted beats in the tuning range.

1296 MHz CONVERTER

This converter has been developed using an extension of the microstrip techniques that have been well proven in our 70 cm converter design. Two versions of the design are available using either a 95 MHz or 105-666 MHz crystal to produce I.F.'s of 144-146 MHz or 28-30 MHz respectively, corresponding to the 1296-1298 MHz band. We are using crystals of a very tight tolerance to minimize the offset that would otherwise be very noticeable when using a high performance 28-30 MHz tunable receiver. The multiplier chain uses three BFY 90 transistors and the mixer is fabricated using a pair of MA 4882 Schottky diodes in a balanced hybrid ring configuration. The I.F. head amplifier uses a selected low noise dual-gate mosfet to give an overall noise figure which is typically better than 8.5 dB, and again of 25 dB. Microstrip UHF circuitry ensures repeatability of this high performance design. The unit is housed in the same small die-cast box as the rest of our range of converters and is fitted with 50 ohm BNC connectors for optimum UHF performance. The converter operates from a nominal 12V supply and is available in negative earth version only. Price inc VAT **£26-40**

MICROWAVE MODULES LIMITED

11 CRANMORE AVENUE, CROSBY, LIVERPOOL L23 0QD Tel: 051-928 1610 9 a.m.-8 p.m.

The
SHORT-WAVE
Magazine

E D I T O R I A L

Communication

Many years ago, it was said in this space that radio amateurs were privileged still to use the simplest, most elegant, accurate, reliable and unambiguous method of radio communication yet devised. They still are—and we refer, of course, to the art and practice of CW telegraphy.

It has often been said since (though never by us) that “CW has had it,” or “Why do we need to know Morse, anyway?” or “Most amateurs never touch the key again after passing the Morse Test.”

Well, the answers are that a large proportion of AT-station operators, all over the world, still do use CW as a regular thing—because they find it an interesting and entirely satisfactory method of communication. As to why the Morse Test is a necessary qualification for a radio amateur licence (for the HF bands) in every country of the world, there are several answers: The most cogent are, first, that by international agreement Amateur Radio is defined as a self-training service, and to justify this concept then radio amateur operators ought to be able to communicate by telegraphy. Secondly, the requirement to learn Morse, and pass a test, effectively separates those who take Amateur Radio seriously from those who would just like a licence “to talk to their friends over the air.” (Of course, there are infinite shades and variations of this proposition, but it is a fair generalisation.) Thirdly, while it is probably true that many amateurs never do use the key after passing the Test, this does not justify its abolition. Learning Morse is like learning to swim—once you know how, the ability is never lost, even if the execution is indifferent due to lack of practice. Fourthly, to take and pass the Morse Test is in itself a satisfying achievement.

What it comes to is that since the objective of the great majority of radio amateurs is to communicate, and CW is one method of communication it is just as important in the amateur context as telephony—and a great deal cheaper and more efficient!

Austin Forsyth
G6FO

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

HOW quickly time flies! It seems only a day or so ago that your old scribe was complaining about winter conditions, and here we are again complaining about summer conditions. However, it's all part of the roundabout of Amateur Radio, and if conditions were always the same, even if good, we'd soon get bored with it.

There have been flashes of life here and there on Ten, even, and as this piece comes to be written the summer static is beginning to show on Top Band; the bands in the middle of these two are all, to a greater or lesser extent, doing their proper thing, which is to provide us with someone to communicate with, preferably at DX.

Ten Metres

9M2DQ (Penang) writes with various items of news, not least of which is that they have completely lost two metres, taken by the Government for other purposes. As for Ten, it has shown a surprising amount of activity in those parts, even at 1730z which is 0100 their time. On April 1, at 1400z, Cyprus and Spain were raised; the 5th, F's, I's, IT, YU, EA, 4X4 and at midnight local 8R1G; April 6 saw contacts with VQ9, 5X5's, HC2, 9G1, and on the 9th A51PN. On April 11 5U7BB, 5U7AZ and HC2JN were worked, and on the 18th there VK/ZL contacts for the asking. All this on ten metres—though in Malaya.

Not an actual contact, but an observation, by G2BJY (Walsall) who took a listen round at 0730 GMT on April 10 and found the DLØIGI beacon romping in at S9, indicating the possibility of an opening later that day; sure enough, on return from a shopping expedition the band was open to Europe with S9 signals both on CW and SSB. Later, 1700-1830 clock, there was also some DX: CR6AL, CR6JO and 9H1.

G3NOF reckons that the word "patchy" has applied once again. He hears that there were some early-

morning openings, and he himself found, around 1000z, signs of life from 4X4, ZC4 and the USSR, followed, in the early afternoons by openings to Southern Africa, CR6, CR7, ZE, ZS and 7Q, but not much from South America. SSB contacts were made with CR6QU, TR8WR, ZC4HC, ZS1EZ, ZS1PF and ZS6EL.

Fifteen

G4AFJ (Nottingham) makes his re-appearance, primarily to pass on the word about VP8NO, of which more anon. For himself, Geoff has an FT-101B and a TA33 fixed on a southerly heading. On 21 MHz, he worked 5Z4OW, ZD7FT, JY5UNM, PY1BDU, EA8CO, VP8KF, MP4BBF, VP8NO, PY7AZQ and KC4AAC.

One feels sympathy with G2HLU (Reading) who took the trouble to have a go in BERU, and found when the time came that he could only raise one station on Fifteen, in the shape of 9J2BO. It is certainly frustrating when conditions turn sour like that.

9M2DQ makes no mention of DX worked on Fifteen, save to say that around 1000z he usually works G5AFA on 21355 kHz, although the third member of the group, G6RC, is temporarily out of it while moving QTH and getting set up again.

GW4BLE similarly has no mention of actual DX worked on the band, Stephen being obviously somewhat shattered by the discovery that although he is only three short of the century in countries on 21 MHz there is such difficult DX as F, SM, PA, and DL/DM *not* worked! However, says your old scribe, it's one thing to work 'em, but quite another to get the cards in, which will be the next part of the exercise. Then, having the "ton up" on 28, 21, 14 and 7 MHz will be the time, no doubt, to pounce on the screaming inhabitants of Eighty and wrest another hundred countries from them, too!

In the mornings around 0830, says G3NOF (Yeovil) there have been long-path openings to JA, and then

short-path around 1100; in the early afternoons JA, VU, VK, VS9 and 9V1 have been heard, with CR8AB' audible for a full two hours one afternoon, followed later in the afternoons by South Africans and W's, quite often. His log shows his SSB as reaching A4XFE, JA5EWQ, JA5LOO, JA6JDO/3, JDIACH (Ogasawara), JE1BSD, JR3SOT, VU2GDG, 9V1RW, 9X5PT, VS9MJ and VS9MB.

Now Twenty

Good in parts. It certainly helps if you have a good location, full power and a beam—though if you haven't, all is not completely lost.

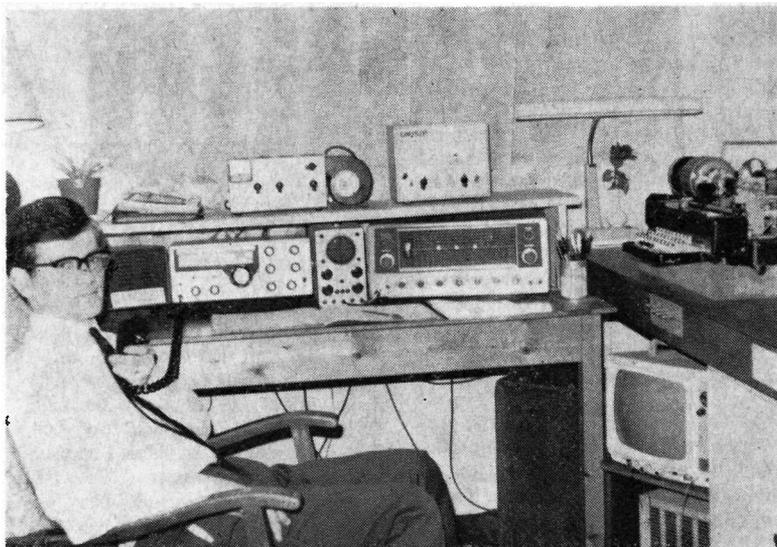
For your conductor, a frustrating period. Having found a spell when conditions seemed to be reasonable, the old man got his switch to "send" and was startled to hear various zizzing noises from within the linear, and on looking through one of the holes that let the hot air out, flashes were also noted although it could not be established for certain just what was flashing over to what. On taking it all down, it transpired that one of the big bottles had gone intermittent between grid and cathode, and in its path away had also gone the bias adjustment to that valve. But it took an awful long time to appreciate that the flashes had been *inside* the valve and reflected off the glass of the other bottles, before we gave up looking for burn-marks.

G2BJY took a look at the CW end of Twenty, and raised FC2CC, OH2BGM / OHØ, OX3HV, UD6DFK, UH8BO, UH8BX, UI8IK, UI8IR, UJ8JBR, UL7GAX, UKØBBA, UKØWAA, VS6EY and XW8BP.

G4AFJ got RS57 from VK6WC on the long-wire, while VP8NO, PY7BNY, HC1XG, VK2XG, ZL4BX, VP8NS and PY7ZAV were all raised by means of the TA33.

9M2DQ mentions working ZL4NJ/A Campbell Island, who can usually be found in the Pacific DX Net, 14265 kHz although at 0630z it is a job to raise him from Malaysia

R. Baton, B.Sc., GM3SZP, 61 Water-side Road, Kirkintilloch, Glasgow was licensed as G3SZP in March '64 but has been a GM for the last two years. He runs an FT-200 transceiver and a Europa converter for two metres, and also has an HE-80 for general coverage, with a small AM Tx for 80/160m. working. He has an interest in RTTY, using a Creed 7B. Aerials are a multi-band dipole and a 5-ele Yagi for two metres, with rotator.



due to the QRM from Europeans coming in by long path. Another net to watch for is the Royal Signals Club net, 14275 kHz on Wednesday afternoon between 1400 and 1600z or even later.

Twenty in BERU was pretty useless, avers G2HLU, who could not even raise VK during the contest on this band. However, Harold had some consolation in receiving his 30 w.p.m. sticker to his "G3BZU" QRQ Certificate. It took him two years to get from the 25's rate up to thirty, nearly there several times but one word wrong, and now he reckons it will be impossible for him to write fast enough to go higher in speed even though he may be able to read the actual Morse. So . . . take heed you faint-hearts, and get stuck in to Morse practice for a Class-A licence!

G4CXM (Paignton) bewails the lack of sunspots preventing the DX from hitting his trap dipole, although what really makes him cuss into his beer is the sound of those Southern Europeans happily working JA stations which are quite inaudible in the U.K. On CW, for him, there were OX3CS, UL7EAA, KP4DLC, VU2HQ, VP7BL, ZL4AW, VK200, U18LAE, UK9XAS, TF3GA, UD6DFK, XV5AJ, W6BZN and VE6BKZ. The SSB complement included PJ2RR, VE8RCS, VE8DC, 9M2TR, FC6CQA, IC8SQS, DU1EJ/3, EA9EO, JD1ACH, ZF1JA, ZD7SD,

ZD3N, VP1MT, 9Y4VV, KH6CA, 5W1AU, CR3WB, W7IKD/6, VP2SV, 4S7PB, 4S7SW, EP2EO, EP2JP, VS5MC, VS6GM, OY7BD, LU7DX, VE6AKL, CT2BM and SM2DWH/S2.

In G3NOF's book, Twenty has been open to VK/ZL from 0600, and on some days the path to the Pacific over the North Pole has been "giving" at the same time; a little later KL7 and VE8 have been heard, with W's from 1100z to midnight. In the early evenings there have been some openings to Africa. It all adds up to contact on Sideband with CR3WB, FP8CT, HZ1AB, JA8BMK, VE8CD, VK2TG, VK3ANO, VK3ATI, VK3CE, VK3XI, VK6AB, ZK1DX, ZL4KF, ZS1WX, ZS6AOM, 4S7PB, 5W1AU, 5Z4GK and 5Z4JE.

G2HKU (Sheppey) succumbed to the lure of QRP from a lantern battery as power—after starting his amateur career on DC mains, he should have learnt all about it!—and so did not spend a lot of time with the big rig; however, he rang the bell with M1D, KH6CA and VK3HE on SSB, plus UAØACJ on the key.

G3YJS (Maidstone) is in an area where five amateurs live within a hundred yards—which must raise the problem of who to blame when anyone gets TVI! However, he himself has a clean bill of health. He reckons that with his Viceroy, KW-600 linear, and KW-77 receiver,

to work DX on SSB is a greater achievement than when using CW; he has YA, VQ9, CR6, VK, CE, FC, YS, FY, 9G, KG6, ZS, XV and much else booked in but is in difficulties with the return QSL's, even though when sending IRC's he sends ample. His difficulty in getting into the Pacific and the Far East, he modestly puts down to lack of operating know-how, but maybe operating times are more the problem, particularly as he has a garden 160 feet by thirty to keep up.

Points from the Post

G2BJY holds the view that any amateur worth his salt should brew his own gear—all of it—and his belief that the difficulty of obtaining components is a large factor in forcing people to go commercial. While, as Geoff argues, it is no harder to build SSB gear than to put together a superhet receiver, one suspects that for many amateurs, an SSB rig is a "black box" that they are a bit afraid of. G2BJY set himself the task of getting on ten-metre Sideband, and in fact was able to construct both the transmitter and the receiver in two month's worth of spare time, once the required bits were to hand.

As for the components shortage, one wishes it were as simple as Geoff reckons; your scribe in his daily routine is being asked several times each day to suggest alternatives for all sorts of components which are

quoted with unacceptably long delivery times, and the situation is daily becoming worse. To specify a different component from the original one, merely by inspection of published physical and electrical data, is tantamount to doing one's development on the shop floor, and is fine just as long as it works—but there are always recriminations when the poor old Project Engineer comes unstuck, from the shop floor and inspection on the one hand, management on another, and usually the customer whose goods are delayed in consequence as well!

Summing it all up, G2BJY and your conductor are agreed that the decline in construction among the Amateur Radio fraternity is a thoroughly bad thing, but on what to do about it—well, we just don't know what to suggest!

A letter from XW8BP outlines his QSL problem. DL7FT has the logs from November 1967, and will accept cards direct, with s.a.e., to 1 Berlin 47, Petunienweg 99, Germany, but *not* through DARC or the bureau system. From November 1973, on the other hand JH1ARJ is handling the QSL's, which are to go via JARL—in other words the Bureau system. Incidentally, a laconic line in the middle of XW8BP's letter indicates he might have to QRT before so very long—one hopes not from Amateur Radio completely.

When W4WFL was in the U.K. he passed over to your conductor a letter from XV5AA, which indicates that the Viet Nam Government has notified both ITU and FCC that they approve of the operation of XV5AA and XV5AB in contacts with other parts of the world. XV5AA has the home call WA7QDG and XV5AB has W5EVD.

G8PG (Upton) comes in at this point, mentioning the AGCL/DL QRP Contest, which will run from 1800z July 6 till 1500z on July 7. Rules are as for the Winter contest saving that operation will be permitted on all bands 3.5 MHz and 28 MHz. It is understood that DJ7ST/OHØ will be on during the contest, working 21 and 28 MHz which might please the Five-Band DXCC merchants. Speaking as a QRP operator, G8PG notes that QRO stations nowadays often seem to go out of their way to work the

Reporting the HF Bands

QRP stuff, which is very much appreciated.

A DX-pedition is being mounted by VP1MT and VP1JR, both of whom are members of the Royal Signals group, to English Cay, from 2359z June 14, till 2300 on June 17, probably using the call VP1B, with frequencies 14.130 \pm 10 kHz, 21.150 \pm 10 kHz, and on Ten, frequencies as requested and depending on band conditions. There will be a special QSL for the operation, provided by the Ministry of Information, Belize, British Honduras—cards to them can be sent via G4RS. As a matter of interest, English Cay lies about 15 miles off the coast of British Honduras, at 17° 20' North, 88° 2' West.

Details of Ex-G Club nets are forwarded by G2FUX; there is the World-Wide Net on Sundays, SSB at 1900 GMT, on 14.347 MHz; the Pacific Net, Saturdays at 0500 GMT, also on 14.347 MHz; an Australian net on 3650 kHz on Wednesdays at 0900 GMT, and a World-Wide CW Net, on 14.065 MHz, Saturdays at 1900 GMT. U.K. stations are particularly invited to call in on these nets.

Blackwood Club are holding a convention, at Oakdale, Gwent, on September 22, at which items of special interest to the DX-ing types will be the tape-and-slide lecture entitled "PJ9GIW, 1973" in which Van Fair, W4GIW, will give an illustrated account of his contest operation from PJ9, a showing which will be the first time ever in this country. In addition there will be a talk on LF DX working, and a run of the ARRL film "Hams Wide World."

Forty

GM3JDR (Wick) first: Don, having recently got his aerials up, has rejoined the fray. His SSB tally includes JY3ZH, VQ9M, 5B4BZ, UA9ACN, UA9BE, TR8DG and VK7GK, with CW giving him contacts with FG7AO, VQ9M, UA9FAY, UL7MG and UD6DFY,

to prove the old touch has not deserted him after his lay-off.

At G4CXM, Ray stuck to CW on Forty, and made his number with VP9BK, VE2JL, FG7TD, PY7CER, UM8MBA, PY2RG, K4YKZ, W8CQN, UD6DHC and a 5T5JG who "went" when QTR was sent and who in any case was not at an appropriate time, so would appear to be another Fred Phoney.

As for G2HLU, he found Forty was a better proposition than Twenty for much of the time, and worked VK and ZL, which he could not achieve on the latter band.

9M2DQ is finding DX operation on Forty SSB to be an increasingly difficult proposition, partly because of QRM from a USSR commercial on 7075 kHz beamed on China, and possibly more so because the remainder of the band is occupied by serried ranks of JA's all talking to one another; however, he did manage to raise XV5AC, 4S7PB, 9M8SDA and some HS's.

GW4BLE still has his 18AVT/WB on the go, and with it has managed to connect on Sideband with HK5CPH, VK2AVA, SM4CGA / YV5, XE1CCK, XFIA, YS1FMS, TI2AJF, PY2ELV, PY4BTK, PY4PA, PY5AFE, PY9QV, VP9AD, ZL3RB, 9H1BB, ZL2AUJ and VK2WC. In between times GW4BLE was out portable on two-metre SSB—deserter!

While his SSB made it over to YV6MO, CW was more profitable to G2HKU, contacts being registered with K1SHN, W1BGD, K1RQE, WA2DIG, W3UV, K4II and W4ZSH.

Eighty

A voice out of his distant past looms up for your old conductor with the next letter, which comes from G3NAP (Goventry), who was a schoolboy neighbour, along with G3NBQ, of the writer's about twenty years ago. Now G3NBQ is DX himself, old KFE sits in the CDXN desk, and Barry discourses on the-ins-and-outs of Eighty as

he finds it after recently deciding to have a go at DX on that band. So far he is not getting out too well, owing to aerial problems, but much listening has been done. As Johnny Morris would put it, the band is "Bung-full o' gubbins"—but how much of that gubbins is *legal*, wonders G3NAP. There is, as ever, a great deal of downright inconsiderate operating, calling CQ on top of a QSO and so on, all over the band, but, by contrast there is some good stuff about both as to operating and to DX quality, much of it at the CW end of the band.

G2NJ (Peterborough) sends comments on the QRP front. Although the noise level has been rather high around noon, several QRP stations were raised, the lowest-powered one of all being G4AZO, running 500 milliwatts to put a 569 signal into Peterborough; G3PHV in Chesterfield, with his 200 feet of aerial, was 579, and G8PG was copied at 569 despite the fact that conditions were all against QRP on that occasion—both the last two stations were at the two-watt level. Up to S-point at RST 589 was G4AL, using three watts to a transceiver near Derby, and G6ZS was about the same strength from Bolton with four watts. As G2NJ might put it, anything

much above four watts doesn't *really* rate as QRP! Another QRP station comes up for mention in Nick's second letter in the shape of G2CAS, up in Harrogate, who was running six hundred milliwatts. This all goes to show how little power is necessary even on such a bedlam of a band as Eighty, if the chap behind it knows what he is about.

Another sad note in the letter from 9M2DQ, to add to the loss of two metres out there. Jimmy believes that, probably in July, all the range 3.5 to 3.8 MHz will be opened to the JA's, in addition to the very restricted portion they already have around 3550 kHz. 9M2DQ rather dreads this opening-up of the band for the Japs, but consoles himself with the thought that in Malaysia they are permitted to work up to 3.9 MHz, which will give a little area of escape, by working split-frequency downwards; he already finds West Coast W's coming in well to him around 1430z on 3806 kHz.

G4AFJ, writing on behalf of VP8NO, says Mike plans an 80-metre dipole and has already heard such as 4X4NJ, PY2BW, 16FLD and OK1KPU on the band, although not many actual QSO's had trans-

pired at the time of writing; in addition VP8NO believes he has a phoney *alter ego* trading on the band, so when you hear a VP8NO, make sure its the right one!

G2HKU has been running between one and two watts to a Ten-Tec PM2B transceiver on Eighty and getting a lot of fun out of it. To make it more interesting he made his contacts during the evenings, through all the normal QRM at that sort of time. DJ5LU, GM3HGA, GW5TW, G3KHZ, G4CWN and one contact lasting 75 minutes solid with G3ZNF were the results of his efforts. Ted now reckons to transfer his peanut whistle to Forty and Twenty, still using the "G5RV" aerial which has served him for years—he reckons it responds well to the little tickle of RF from the QRP rig.

Top Band

Just one mention this time, but that one is of considerable importance. The June Top Band Activity Period covers the whole of June, and on into July, conditions permitting. The objective is to work North-South QSO's to DX. In general, the frequencies in use will be the DX-window in which the Europeans transmit, and the area 1800-1808

John Bundock, G4CJQ, 28 Retingham Way, Chingford, London, E.4, was licensed in August '73. In spite of a manual disability he passed his Morse Test by learning to use the "side-swiper" type of key. Starting on Top Band with a home-built Tx, his present interest is 20m. CW, for which he has a good aerial on the roof of a block of flats. The station itself is in a cupboard.



kHz where the Transatlantic stations will be. Others will use one area or the other depending on who they are after, save that the ZS stations will be on 1930-1925 kHz transmit, listening at the 1806 or 1825 kHz areas as the case may require. The times for all concerned is 0001 to 0030 GMT, extending later if conditions are specially ripe. Generally, says PY1RO, who is spark-plugging the effort with EI9J, although the static level is higher than winter, signals on the good openings peak to much higher levels to more than restore the balance. PY1RO will be out of it during June, in the States, but will again be QRV from July 10. Meantime, he can be reached for any more details and skeds: Rolf Rasp, PY1RO, c/o Digital Equipment Corp., Parker Street, Bldg PK-2, Educational Services, Maynard, Mass. 01754, U.S.A. A final point, which might save someone some frustration, is that after calling CQ, it would not be a bad idea to check *on your own frequency* quickly before sliding on to the bottom of the band—just in case DX is calling you there, which could well happen in these Trans-Equatorial sessions.

More Points

First we have a contest to mention, namely the All-Asian DX affair, run this year for the fifteenth time by JARL. The battle is between the Asians and the rest of the world, all bands 1.8 to 28 MHz, classification of stations being single operator, single-band and all-band, multi-operator all-bands, no multi-transmitter section. Exchange, for the OM's RS(T) plus the age of the operator, for YL's RS(T) plus 00. Score one point per QSO; Asians use their non-Asian countries as a multiplier, non-Asians to use the total of Asian *prefixes* worked, all-same CQ WPX list. A point to watch here is that JD1 Ogasawara is in Asia, but JD1 Minami Torishima is in Oceania. KA contacts do not count. Logs to show time in GMT, fill in the country or prefix column only, the first time a prefix is worked. Add a summary sheet, which is *essential*, showing the scoring and other information, plus a signed declaration that the rules and regulations have both been observed. Disqualification will result from

violation of the regulations concerning the licensee locally, or the rules of the contest, unsportsmanlike conduct, or taking credit for incorrect QSO's or multipliers in excess of 2% of the total made on the same band. Contest dates are: *Phone*, June 15-16; *CW*, August 24-25, 1000-1600z.

That WIGGY operation from China, about which we expressed doubts last time, did in the event fail to get off the ground.

It is understood that shortly AC4 will join the sad list of "deleted" countries from the DXCC list.

That new A9 prefix covers the old MP4B—one, Bahrain, the calls issued so far all apparently being in the A9X—block.

The convalescence of LU5HF1 in the Canal Zone after the shooting in Cordoba continues to be satisfactory, and Fred has written to *West Coast DX Bulletin* thanking the kind people who sent him so many messages, cards and flowers from all over the world.

The prospect of any operation from Clipperton, FO8C, seem to be somewhat faint in the cold light of day, in view of the fact that the general reaction of the authorities concerned is along the lines of "get lost!" even if couched in more official words.

Another one which is persistently rumoured, and with some good reason, but which to date has not shown up, is the Mount Athos effort—but it is still possible that it will have appeared by the time this reaches print.

G3YJS is perhaps lucky in having his son, G4CJH, in the MPT set-up, and between them they have spent much time over the related questions of aeriels, earths and TVI. One thing he has done is to put in a *nine-foot* stake to provide the DC earthing to the base of the 12-AVQ and its radials. This earth is taken by means of heavy-duty coaxial cable, inner and outer strapped at the earth stake, and the outer floating at the aerial end where the inner of the earth cable is connected to the radiator. This means that effectively the earth cable connection for the aerial is itself screened, and it is also arranged to be a non-resonant length. In addition, the shack earthing is to a bus-bar which in turn is strapped to four

nine-foot earth stakes all bonded together so that there is no connection whatever with the mains earth in the shack; this must help both in minimising noise pick-up and also with the propagation of interference of local TV's. At the rig, *two* low-pass filters are used in the aerial feeders, plus a Z-Match, mains filtering, numerous ferrite beads, screened cable wherever it can be applied and make to be of non-resonant length, even down to the mike lead; an old 405-line TV is five feet away from the rig, and is operated from a set-top aerial hung in the garage, to make sure the TV starts with a poor signal from the TV station. On the K.W. Viceroy, the meter has been boxed-in and filtered as that was where most of the RF leakage occurred, and a stub has been fitted in the PA compartment. In addition there is a Harmoniker filter for Twenty available but not in use and not needed. So, gentlemen, that's how to deal with TV from an operator who has the courage to operate, knowing he has taken all precautions and is in the clear.

And, one may remark, all very fine, but why this perpetual harping on the subject of TVI and its beating? Because, in a nutshell, we British amateurs are the weakest in the world when it comes to TVI, and for people like W's, JA's and the Iron Curtain countries, G's are rare DX, at least on the HF bands, during TV hours; in many cases although the operators would love to work DX, they have accepted the wide-spread notion, which seems to be self-perpetuating, that TVI is incurable. *Any* keen operator can cure himself of TVI, if only he will bestir himself in the first place, and in the second will combine forces with another chap locally to deal with both their problems—it is far easier and quicker if you work in pairs.

Conclusion

That's it for another time; sincere thanks to all those who send in their news and views not forgetting of course Geoff Watts *DX-News-sheet*, and the *West Coast DX Bulletin*. For next time, the deadline will be **June 7**, first post, addressed to CDXXN, SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ.

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

REPORTS AND PICTURES

With the Mobile Rally season now well under way—and more events notified—it seems that, as in previous years, these Sunday occasions for radio amateur gatherings are as popular and as well supported as ever.

Our latest notice from the Home Office Press & Information Unit (*see* Editorial comment, May) shows that there are now some 4,400 /M licences in issue, of which about 27% are Class-B (VHF). With nearly 20,000 U.K. amateurs licensed, in both categories, the mobiles form a goodly percentage of this total.

Up at Drayton Manor Park on April 21 they had a crowd estimated at 3,000 for this annual North Midlands event. Drayton is, of course, a well-known show place, regularly open to the public, with good catering and car parking facilities, also a number of outdoor attractions. The trade stands reported lively business and our information is that all concerned felt the whole event had been another resounding success.

Much the same comment applies for the Spalding & District Amateur Radio Society "Tulip Time" Rally on May 5. Despite dull and cold weather, attendance was in the region of 1,000 people. They had eight trade stands and various other attractions were laid on for the young and their mothers. On the /M side, some 30 mobiles were worked on two metres but only a handful on Top Band, though there were four times as many cars on site fitted for 160m./M than in previous years. Here again the organisers feel that their event was a success, in spite of the Wx.

We have also to report the *cancellation* of the Wessex rally, previously notified for July 21, for reasons, we are told, "outside the organisers' control."

THE RALLY CALENDAR

June 2: Most unfortunately, notice was received too late for our last issue, though this may be seen soon enough for some people in GI to get to Castlewellan Forest Park, Co. Down, for the Bangor & District Amateur Radio Society second annual rally, at a very fine *locale* for an event of this kind. We can only hope that the Bangor boys do have a good attendance.—J. McCormack, G14CSO, 17 Victoria Avenue, Newtownards, Co. Down, Northern Ireland.

June 9: Located near Derby, the fifth Elvaston Castle Rally, at this 200-acre country park, with weekend caravan and camping facilities. Approach by the B.5010, just off the A.6 Derby-Loughborough, with easy access to Junc. 24 on the M.1. There will be talk-in by G3EEO and G3ZBI (bands/frequencies not stated), a good range of trade stands, bring-and-buy stall, and Army demonstration teams.—K. W. Clamp, Nunsfield House, Amateur Radio Group, 11 Cavendish Court, Shardlow, Derbyshire, DE7 2HJ. (*Tel.:* Derby 792374).

June 16: East Kent Radio Society event at Westgate Hall, Canterbury, opening at 12 noon, with trade stands ("junk" and "shiny box" varieties) and talk-in on 1980 kHz AM and 145 MHz FM (station call signs not stated). Canterbury is about 1½ hours from London down the M.1 and is in a holiday resort area.—P. S. Nicholson, G3VJF, *QTHR*.

June 30: Upton Mobile Rally, at Hill Secondary School, Tunnel Hill, Upton-on-Severn, Worcs., one mile west of the Severn, on the A.4104. Talk-in will be given by G8JC (3750 kHz SSB) and G3GJL (SSB 144.20, AM 145.00 and FM 145.50 MHz). Sports,

General view of the car park for the North Midlands Mobile Rally at Drayton Park, Staffs., on April 21, when they had a very good attendance in sunny weather.



fancy dress for children up to 14, refreshments, model railway and aircraft displays, trade stands, and bring-and-buy stall.—B. A. Jones, G8ASO, *QTHR*. (Tel.: Worcester 29208.)

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

July 14: Anglian Mobile Rally at Colchester, organised by the local Club. (*No further information available*).—E. T. Jacobs, 26 Pondfield Avenue, Colchester, Essex.

July 21: Cornish Club Rally (*no further information available*).—M. C. Locke, G3NKE, *QTHR*.

August 11: Derby Radio Rally, Rykneld School, Bedford Street, just off Derby outer ring road. Opening at 11.0 a.m., with free admission and parking, and ample covered accommodation. Draw prizes and the famous monster junk sale, also numerous trade stands. Talk-in on 160m. (G3ERD), 4m. (G2DJ) and 2m. (G8DBY).—T. Darn, G3FGY, 1 Sandham Lane, Ripley, Derbyshire.

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

August 18: Bromsgrove Mobile Picnic, Avoncroft Museum, Bromsgrove.—J. Dufrane, 44 Hazelton Road, Bromsgrove, Worcs.

September 15: Peterborough Mobile Rally, as last year. *Details later*.

Organisers are invited to let us have a report on their event as soon as possible after it, so that it can be covered in this feature. Good photographs are also always wanted for general illustration. Address to: "The Mobile Scene," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ.



The Versatower installation used for the communication and talk-in stations at the North Midlands Rally. It is mounted on its own towing vehicle.



The well-stocked raffle stand at the recent White Rose Rally, Leeds, with Tom Beaumont officiating. The lady is Mrs. G3VTY.

MODIFYING THE FR-50

SOME PRACTICAL NOTES

This piece is based on notes by VK3OM in a recent issue of the Australian "Amateur Radio."—Editor.

THE FR50 is a double conversion receiver with a 5172 kHz first IF to a 455 kHz second IF with ceramic filters to give a three kHz band pass that was reasonable for both AM and SSB. The selectivity was fixed with no provision for change.

The front end was of the tunable type as distinct from the larger FR100 receiver which is crystal locked. Although the oscillator was transistorised, its stability was *not* one of the goods points of the receiver. The valve line-up was straightforward with a 6BZ6 RF, 12AT7 first mixer, 6CB6 second mixer with a crystal locked transistor oscillator, two 6BA6's as the 455 kHz IF, 6BE6 product detector, 6BA6 BFO, and a 6AW8 for the audio.

In its original form the FR50 is of course an amateur-band-only receiver, covering from 80 to 10 metres, with a special position for WWV on 10 MHz. The dial was the same type as used on all the Yaesu gear of that time and featured one kHz calibration, although the accuracy of this was not comparable with the larger receivers and transceivers. Overall performance was quite fair with the exception of the tunable oscillator stability, and a rather high front end noise level.

The modifications to enable the receiver to cover the 160-metre band were worked out by VK3BOB. The band switch position labeled JJY (the Japanese WWV) is used for 160.

When the receiver is set up for 10 MHz the oscillator for this band is tuned to 15,172 kHz. In order to cover 160 metres it is necessary to drop this to 6,972 kHz. All that is needed is a single 330 μF silver mica condenser across the JJY oscillator coil in parallel with the existing fixed padder.

The antenna and RF coils are re-tuned in rather a different manner. Here, of course, it is rather a long way to pad the 10 MHz coils down to 160, but not so far for the 80-metre front end coils and this is just what we do. First, on top of the chassis you will see the trimmers for the antenna and RF coils. Yaesu have put in a few spares, three in fact. Wire these in parallel and add a 220 μF ceramic condenser also in parallel. Then wire the next section in the same way, disconnect the JJY antenna and RF coils and tape up the connections for future use. Now wire the paralleled trimmers to the JJY position on the band switch and at the same time arrange the 80-metre coils to connect also to the JJY position.

To align the set for 160, set the tuning dial to "O" and adjust the oscillator trimmer to bring in 1800 kHz. Now 1860 will appear at 450 on the dial. To complete alignment, peak the antenna and RF coils with the three parallel trimmers.

As the dial now covers only 60 kHz it will be necessary to make up a graph of the new calibration against the old—or perhaps exact frequency is not so important on this band.

MICROPHONE PRE-AMPLIFIER

VALUES FOR 12 dB GAIN

G. R. THOMAS (G4AWJ)

ACQUIRING a dynamic microphone of unknown origin led to the construction of the pre-amplifier discussed here.

Plugging the microphone into the FR-200 showed the output to be greatly lacking as opposed to the normal station microphone. Measurement on a 'scope indicated an output of just over 200 mV from the station microphone whilst the unknown specimen gave only 100 mV which is quite a considerable drop—it required the FT-200 gain to be virtually wound full up.

The transistors chosen for the amplifiers are OC71 which have at low collector current adequate *beta* gain. Any germanium general purpose transistor should work in the circuit, as the transistors are zero biased, giving a lot of leeway in transistor choice.

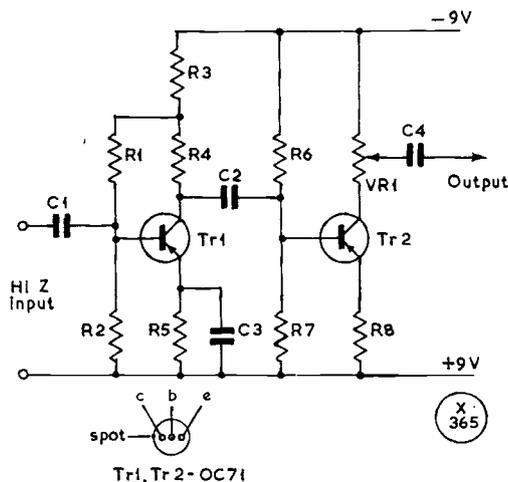
Grounded-emitter stages are chosen because of their medium input and output impedances. The decoupling capacitor across the emitter resistor of the first stage short circuits the emitter to positive supply as far as AC is concerned.

The second stage emitter resistor was left unby-passed as it was felt that a reduction of gain could be tolerated with the resultant negative feedback and thus some increase in stability.

Both stages give a phase shift of 180° which is of no consequence; AC current gain is high as is also the AC voltage gain; the first stage has fixed gain whilst the second stage is a gain-controlled transistor.

The unit was constructed on the usual small piece of Veroboard and powered by a PP3 9v. battery.

Measurements on a 'scope showed a nice clean



Circuit of the pre-amplifier. Values can be: C1, 0.22 μF ; C2, C4, 0.1 μF ; C3, 100 μF , 6v; R1, 18K; R2, 2.7K; R3, R4, 3.3K; R5, 1K; R6, 180K; R7, 56K; R8, 4.7K—all rated $\frac{1}{4}$ W. VR1, 10K miniature linear; Tr1, Tr2, OC71. Gain about 12 dB.

output and for a 100 mV input an output of 400 mV. This can be shown to be a gain of 12 dB. Tests on the air revealed the FT-200 gain had to be set lower than normal due to this 12 dB, which puts in some extra 200 mV as opposed to the station microphone. Reports indicate speech quality to be slightly topky, against

normal reports using the station mike.

The circuit and components list is shown herewith. By using the pre-amplifier with the normal station microphone it may be held a little further away from the mouth for the same gain, which allows a little more freedom about shack.

THIRD-METHOD SSB EXCITER

USING LOGIC CIRCUITS

G. C. CLEMERSON, B.Sc. (G4CLT)

THERE are three possible ways of generating an SSB signal. These are the phasing, filter, and third methods, and are shown in block diagram form in Fig. 1. The phasing methods, once quite popular, has largely been superseded by the filter system, which is easier to set up, and can be used for transmission and reception—an obvious advantage in transceiver design. The “third method,” which is sometimes described as a combination of the other two, has never attracted much interest among amateurs.

In the third method, two oscillators are used. One operates a radio frequency f_c . The other is an AF oscillator with a frequency f_p , which is at the centre of the audio passband. Each oscillator feeds a pair of balanced modulators via a 90° phase shift network. The two pairs of balanced modulators are connected together by two identical low-pass filters, which have a cut-off just below f_p . Because this is a low audio frequency, very high performance filters can be easily constructed using simple LC circuits.

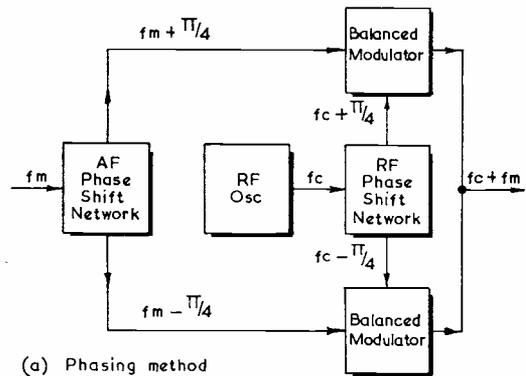
In essence, two single sideband signals are produced. One is a lower sideband with a nominal carrier at $f_c + f_p$, and the other an upper sideband with a nominal carrier at $f_c - f_p$. Both sidebands are produced in each “arm” of the circuit, but with opposite phases. When it is correctly adjusted, either the lower or upper sidebands cancel in the output tank circuit, depending on the relative connection of the two 90° phase shift networks.

A simple way to produce the required AF and RF phase shifts is to use digital integrated circuits. Fig. 2(a) shows one suggested method. The main disadvantage of this circuit is that very high speed devices are needed to give an output above one or two megahertz. By using “double ended” drive to the clock inputs, the frequency division can be reduced to two, and higher frequency output obtained with cheaper circuits.

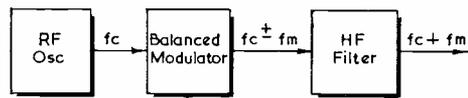
The generator described in this article uses two dual type-D flip flops, SN7474, and is capable of producing SSB output at above 6 MHz. The connection of the integrated circuits is shown in Fig. 2(b). To change from upper to lower sideband, it is only necessary to reverse the phase of one balanced modulator. This is most conveniently done by reversing the connections to the Q and Q outputs of one flip flop, preferably the one operating at audio frequency.

Construction

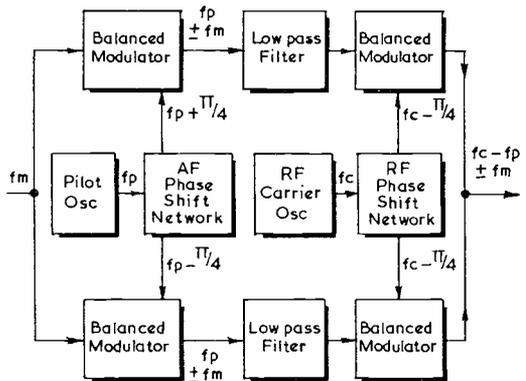
The unit is constructed on two $6\frac{1}{2}$ in. x $4\frac{1}{2}$ in. printed circuit boards. All the active components are mounted on one board, and the other one contains the two LC filter networks. The two boards are mounted one above the other in a small aluminium box. Power supplies are



(a) Phasing method



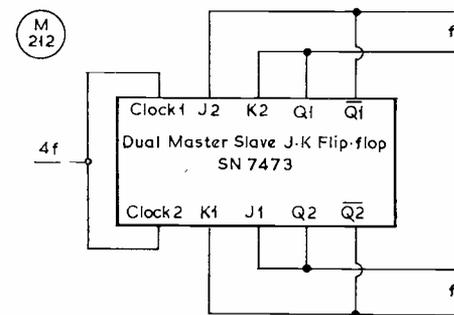
(b) Filter system



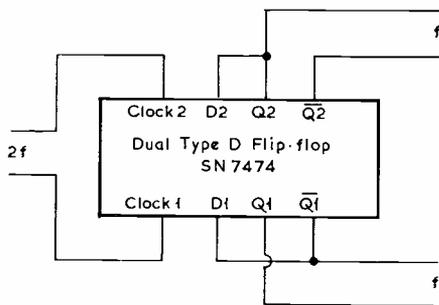
(c) The Third Method

Fig.1 THREE METHODS OF PRODUCING SSB





(a) Using Dual Master Slave J-K Device



(b) Using Dual Type D Device

Fig. 2 PHASE SHIFTING WITH INTEGRATED CIRCUITS

not included, and a stable source of 5v. at about 70 mA is required.

The selection of components for use in the prototype was made partly on the basis of what was readily available. Other constructors might wish to make substitutions, particularly for the transformers and filter inductors. Close-tolerance units are only required in the pilot tone oscillator and the filters, and a method of selecting suitable values for the latter is given below.

Circuit Description

The system will function as either a generator or detector of SSB signals. For simplicity, only the generator action will be described. When used for reception, the input and output are reversed, as is the signal path, but otherwise the circuit action is similar. The preset balancing controls are adjusted for best SSB output, and should not need resetting for use as a detector.

Fig. 4 is the circuit diagram of the main unit. Audio input reaches both "arms" of the circuit via RV1, the Audio Balance control. In the upper "arm" it is taken via T1 to the double balanced mixer D1-D6. Because both the audio input and the audio carrier (*i.e.*, pilot tone) are in the same frequency band as the DSB output, a single balanced mixer is not possible here. Diodes D1-D4 provide balanced switching, and diodes D5 and D6 act as clamps, eliminating the need for balancing presets. The arrangement gives a higher output than a ring mixer, and needs no adjustment.

The reference level for both the double balanced mixers is set by the emitter follower Tr1. If a higher degree of pilot carrier suppression is required, the potential divider R5, R6 can be replaced by a small preset potentiometer.

The audio pilot tone is generated by the multivibrator Tr2 and Tr3, which operates at 3.3 kHz. Since the accuracy of the audio phase shifting depends on the mark-to-space ratio of this waveform, close tolerance components are used for R8, R9, C2, and C3. Outputs are taken from both collectors to IC1, which produces quadrature outputs at 1650 Hz to feed both balanced modulators.

The output from the centre tap of T1 consists of audio frequencies from zero to 3.3 kHz. These are normal and inverted double sidebands of the pilot tone at 1650 Hz. It is taken through one of the low-pass filters, which removes the upper sidebands and any residual carrier, and reappears on the main board at C4. Similarly, the output from T2 passes through the other low-pass filter, and is applied to C5.

The audio signals at C4 and C5 are taken to the modified ring mixer, D13—D16, via T3 and T4. This circuit is identical to the type used in many phasing excitors. Quadrature RF drive is obtained from IC2, via T3 and T4, at 6 MHz. RV2 and RV3 provide RF Balance controls for both arms of the circuit. SSB output is taken from the common tank circuit via a link winding.

Tr4 operates as a xtal oscillator at 12 MHz, and drives Tr5 and Tr6 via the centre tapped transformer T5. It would be possible to provide fine adjustment to the RF phasing at this point, but if the centre tap of T5 is not decoupled to RF, it is not necessary. The transistors Tr5 and Tr6 act as switches, and provide suitable outputs to drive IC2.

Filter Details

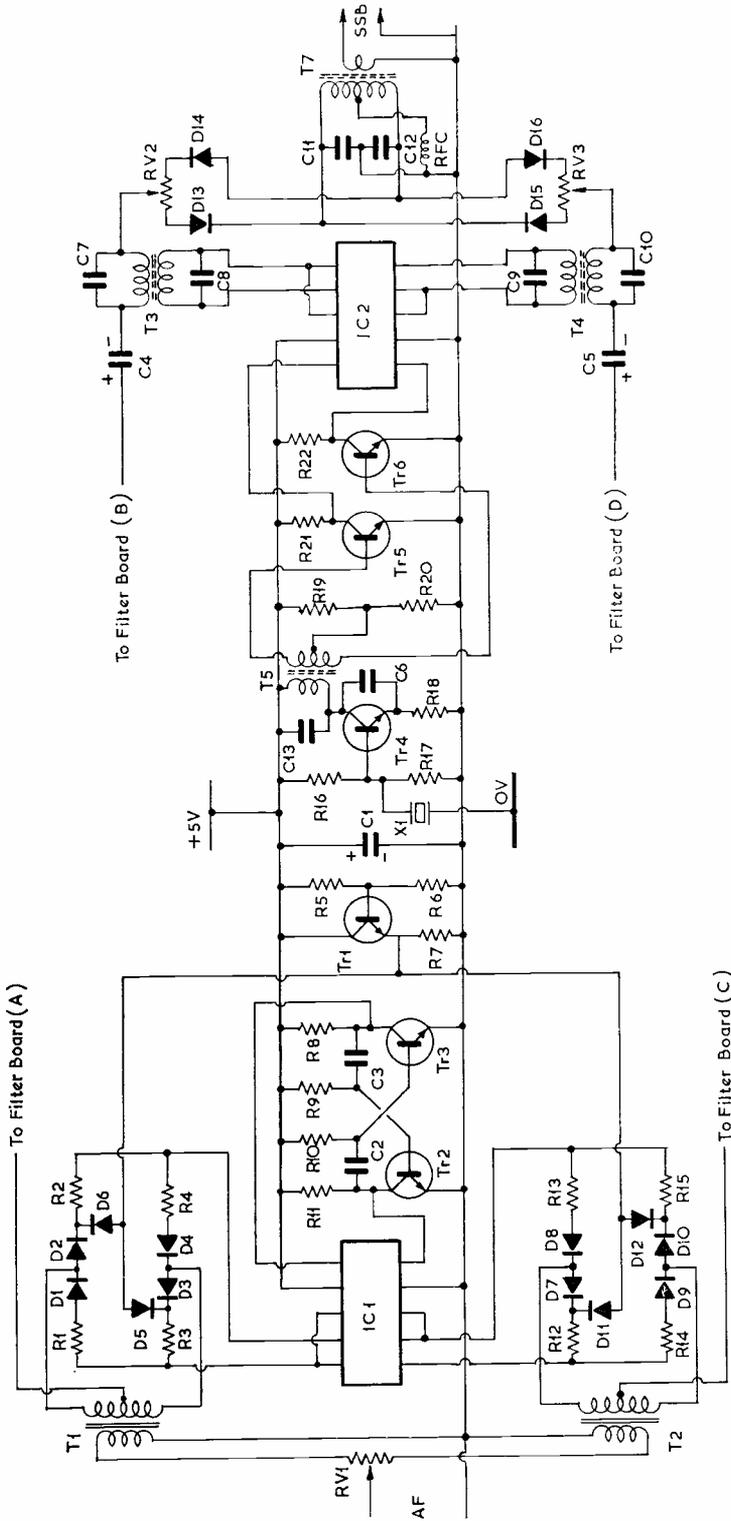
The circuit of the filter board is shown in Fig. 5. It was designed to have a cut off at 1350 Hz, which gives an audio response from 300 to 3000 Hz. The actual response is not as critical as the matching of the two filters. Any imbalance here will cause different audio phase shifts, and spoil the unwanted sideband suppression.

For the prototype, all the inductors were wound on ferrite pot cores, and final adjustments made with a commercial inductance bridge. An alternative method, which gives equally satisfactory results, is to connect a 1 μ F capacitor across the inductor, and then measure the resonant frequency with an AF signal generator and an AC voltmeter. (Smaller values of shunt capacitance may cause errors, because of the self-inductance of the windings).

A similar method can be used for the capacitors. Each capacitor is connected across a known inductance, and the resonant frequency checked. Matched values of capacitance should then be used in the corresponding locations in each filter.

Testing and Setting-Up

An oscilloscope with a bandwidth of at least 6 MHz is needed to set up the balance controls. The SSB output will contain harmonics of the 6 MHz carrier, and the

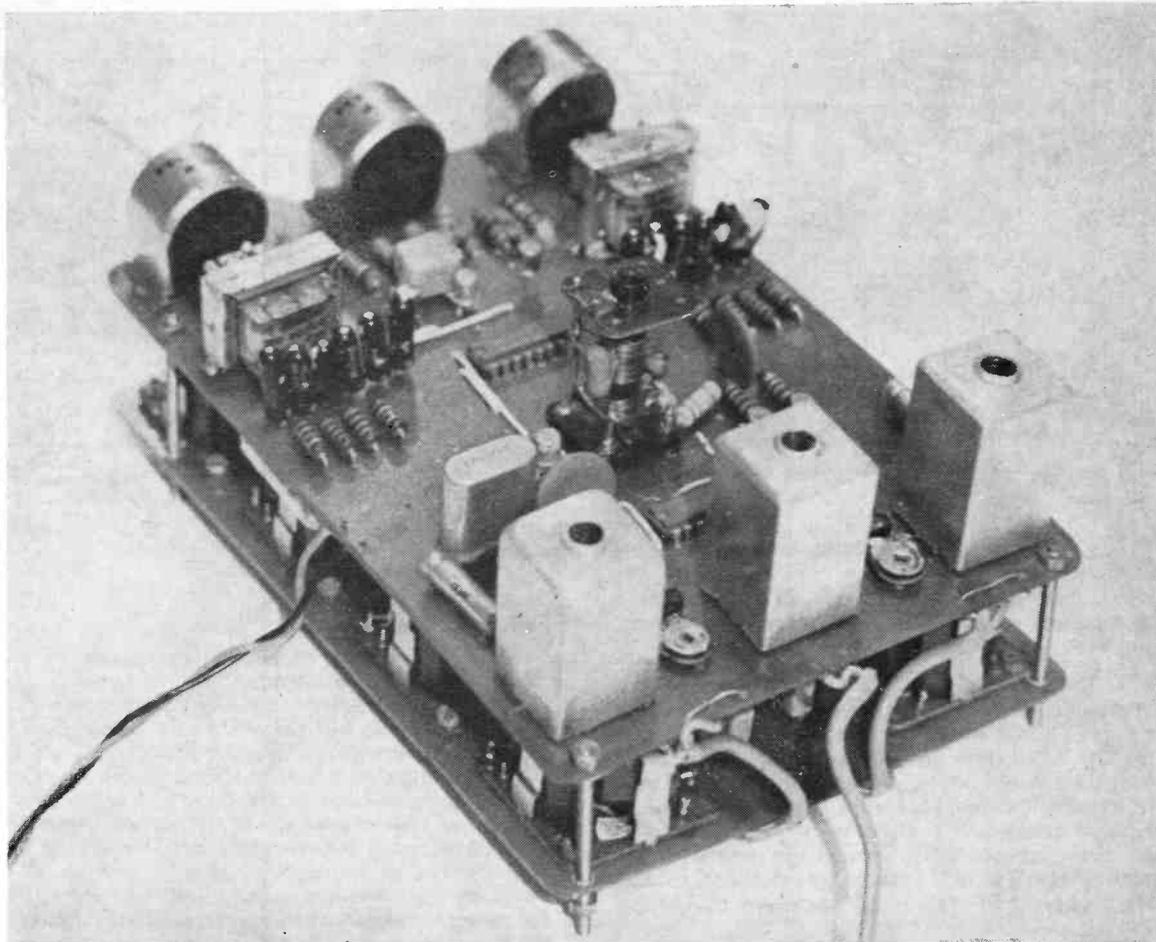


M
213

Fig. 3 CIRCUIT DIAGRAM OF MAIN BOARD

TABLE OF COIL DATA

- T1, T2 = Any two identical small centre-tapped AF transformers, such as *Radiospares* T17.
 - T3, T4 = Primary 30 turns, secondary 20 turns, spaced quarter-inch from primary.
 - T5 = Primary 10 turns, secondary 5 turns centre-tapped, spaced half-inch from primary.
 - T7 = Primary 16t. centre-tapped, secondary 3t. p.v.c. wire over middle of primary.
 - RFC = 5 mH RF choke of usual pattern.
- Except for T1, T2 and RFC, all coils close-wound using 28g. enamelled on 0.3-in. formers with screening cans. In this circuit, there is no "T6" nor value for it.



Constructural form for the circuit Fig. 3, opposite

Table of Values

Fig. 3. The Main Board

C1 = 1001 μ F	R16 = 8,200 ohms
C2, C3 = 022 μ F, 1%	R17 = 2,200 ohms
C4, C5 = 10 μ F	R19 = 22,000 ohms
C6 = 5 μ F	R20 = 470 ohms
C7, C10 = 82 μ F	RV1 = 2,000 ohms, lin.
C8, C9 = 120 μ F	RV2, RV3 = 1,000 ohms, lin.
C11, C12 = 470 μ F, 2%	DI-DB6 = OA91 diodes
C13, C15 = 100 μ F	IC1 = SN7474
C14, C18 = 0.25 μ F*	Tr1, Tr2 = BC-108
C19, C23 = 0.38 μ F*	Tr3, Tr4 = BSX-20
C13, C17, C20, C22 = 0.47 μ F*	Tr5 = 12.7 MHz, HC-U type
R1, R4, R13, R14 = 560 ohms	Tr6 = 31.5 mH*
R2, R3 = 270 ohms	Tr7 = 115 mH*
R12, R15 = 3,300 ohms	L1, L4 = 31.5 mH*
R5 = 3,300 ohms	L5, L8 = 115 mH*
R6 = 2,200 ohms	L2, L3, L6, L7 = 10,000 ohms, 1%
R7, R8, R11, R18, R21, R22 = 1,000 ohms	
R9, R10 = 10,000 ohms, 1%	

Notes: All resistors and capacitors 20% tolerance unless otherwise marked. Where marked * see text for method of selecting these components. C1 can be built up by 1 μ F + .001 μ F.

oscilloscope should be connected to the unit by a small RF transformer tuned to 6 MHz. The controls are then adjusted to display the envelope of the RF output.

Initial adjustments are made without any audio input. Oscillator transformer T5 should be adjusted until output is obtained at 6 MHz, and then both T3 and T4 can be peaked for maximum output. The RF balanced modulators are now set by adjusting RV2 and RV3

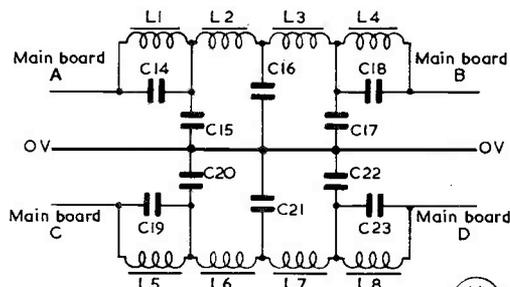


Fig. 4. CIRCUIT OF FILTER BOARD

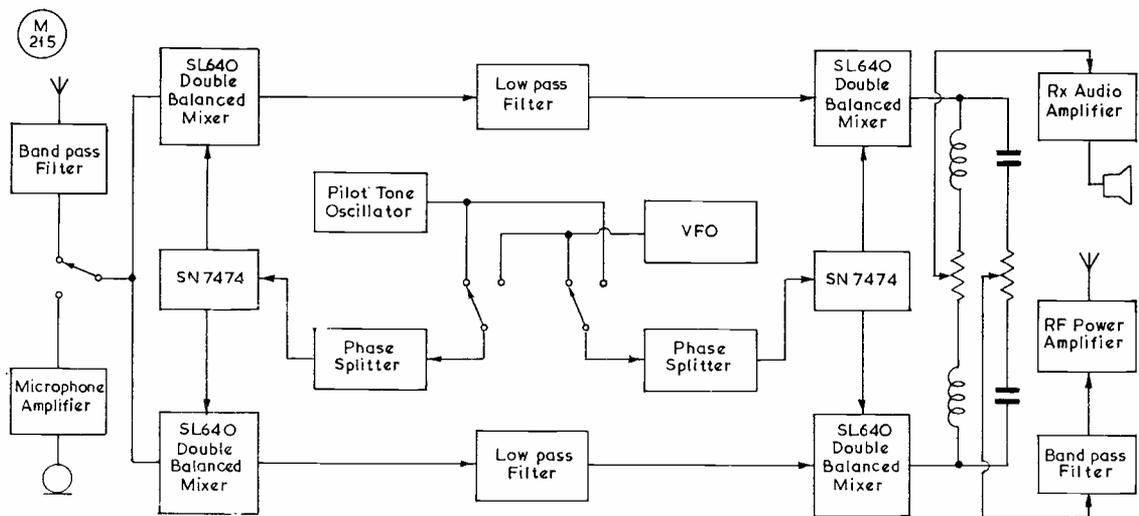


Fig. 5. PROPOSED THIRD METHOD DIRECT CONVERSION TRANSCEIVER

for *minimum* output. The two controls will interact somewhat, and several successive adjustments will be needed.

When the RF circuits have been set up, apply about 5 volts of audio at around 1000 Hz to the input, and carefully adjust RV1 for minimum ripple on the RF envelope. It should be possible to obtain less than 5% ripple with careful adjustment. If this is not achieved, try slight adjustments to the cores of T3 and T4. As a last resort, the coupling between the primaries and secondaries of T3 and T4 can be altered, but this should not prove necessary if the transformers have been wound carefully.

Performance

A poor Third-Method Exciter does not produce any output in adjacent channels, or at the carrier frequency. Imperfections show up as a steady output at the centre of the passband, and as inverted sideband in the same channel as the wanted sideband. The prototype had a residual output at some 45 dB down, and some inverted sideband at about 26 dB below the wanted sideband.

Any comparison with filter-type exciters is difficult, because the unwanted sideband does not have the same significance. In practice, it is almost completely swamped by the wanted sideband, and the only effect is to give the signal a characteristic sound which several operators have commented on.

When used for reception, the unit produces some output at the pilot frequency. This can be easily eliminated by the use of a simple band-stop filter in the audio amplifier. There will be a small "hole" in the AF passband, but this is not noticeable and is in fact already present due to the AC coupling between the low-pass filters and the RF circuits.

Further Development

One of the most interesting applications of the Third Method is in direct-conversion transceivers. The prototype was not suitable for this purpose because of the xtal oscillator, and the number of tuned circuits. Another version is currently under development which, it is hoped, will overcome these difficulties. A simplified block diagram is shown in Fig. 5.

The use of integrated circuit (IC) mixers eliminates some of the preset controls and reduces the size of the unit, but it does introduce some extra complexity in "transmit" to "receive" switching. DC coupling to the RF mixers removes the phasing errors which are caused by differences in the tuned transformers of the prototype. The system is ideally suited to use with a mixer VFO, since the SSB output has twice the stability of the tunable oscillator, and does not contain any unwanted products of the mixing process.



"... You sound pretty weak to me ..."

PARABOLOID FOR TWENTY-THREE

DESIGN AND CONSTRUCTION FOR A PRACTICAL DISH

K. H. PARKES (G3EHM)

ALTHOUGH there is a fair amount of design detail for 23 cm. dishes, details of their actual construction are remarkably scanty. The following method and sequence of construction, will it is hoped, encourage amateurs interested in this band to go ahead and make one.

Choose first, the diameter of the dish you wish to construct. In the example given, a diameter of 48 inches was chosen, with a depth of 10ins. giving a focal length of 14.4 inches.

Y^2 Where y is dia. of dish

From the equation $x = \frac{Y^2}{4f}$, x is depth of dish
4f ,, f is focal length

work out values of x for y equals 3in. and multiples of 3in. up to 24in. Table I gives the calculated values for the example being described.

Get a large sheet of paper (wall lining paper) and draw a base line of 48 inches. Draw in the verticals and carefully sketch in the complete paraboloid. Pin or paste this to a sheet of $\frac{3}{4}$ x 12 x 48in. blockboard and saw out the templet. This will be used in the construction of the dish.

The following materials are required:

15 yards of galvanised iron fencing wire $\frac{1}{8}$ in. diameter.

4 yards by 1 yard of galvanised or tin dipped $\frac{1}{2}$ in. wire netting.

2 feet of $\frac{1}{2}$ in. diameter copper tube (small bore central heating variety).

1 foot of galvanised iron conduit to slide over copper tube (threaded for 2 or 3in. at one end).

Locknuts, sundry copper wire and $\frac{3}{8}$ in. brass brazing rod, and one galvanised iron disc, 16g. 9in. diameter.

The construction of the dipole can now be undertaken, but with some important additions. First, the $4\frac{1}{2}$ in. copper reflector (double-sided copper laminate board can be used), situated in front of the dipole 16 $\frac{1}{8}$ in. holes equally spaced, drilled around its periphery about $\frac{1}{8}$ in. in from the outer edge.

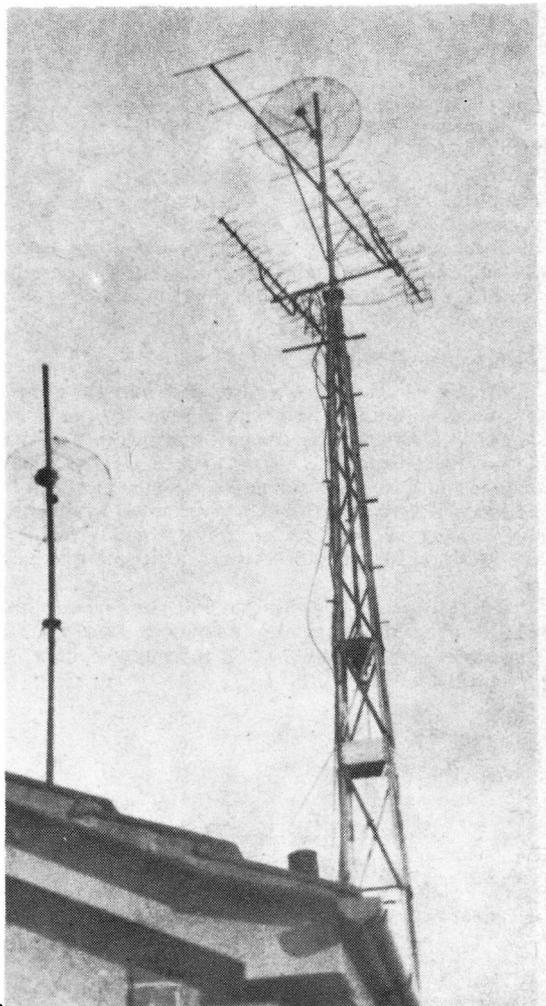
Second: The inner conductor made of $\frac{1}{8}$ in. brass rod has a $\frac{1}{16}$ in. hole half-inch deep, drilled in the end remote from the reflector. This enables the coaxial cable to be passed up the copper tube and secured by soldering the inner conductor to its central wire.

Fig. 1 gives the dimensions of the dipole. The holes for which are drilled first. The upper one is enlarged to provide a sliding fit, the lower one for a wedge fit. The copper tube is slit with a backsaw to the requisite depth, the surplus being broken off and the slot cleaned up. The inner conductor is temporarily wedged into position. The upper half of the dipole is trapped gently through the hole to meet it. The lower half is wedged in its hole. After careful alignment, apply "easy-flo Flux" as a

watery paste. Get up to a red heat with a blow-lamp and apply silver solder. The small reflector can then be drilled $\frac{1}{8}$ in. in the centre, fitted over the protruding inner conductor and together with the copper sleeve, soldered with soft solder. This sleeve can be made from a piece of the copper tubing, split and expanded.

One end of the coaxial cable can be got ready. It should be prepared as per Fig. 2. Although final connection is deferred until the dish is constructed, it will be seen that the inner conductor will fit into the drilled hole provided. The two copper braids can be passed through the slots, bent back, wrapped with copper wire and secured with soft solder.

A blow-lamp gently applied to the inner brass rod will permit solder to flow into the hole provided. When



The G3EHM set-up, showing two 4ft. dishes for the 23 cm. band, constructed as described in the article. The higher one has been in place for more than 12 months. Other antennae are for two metres and 70 centimetres.

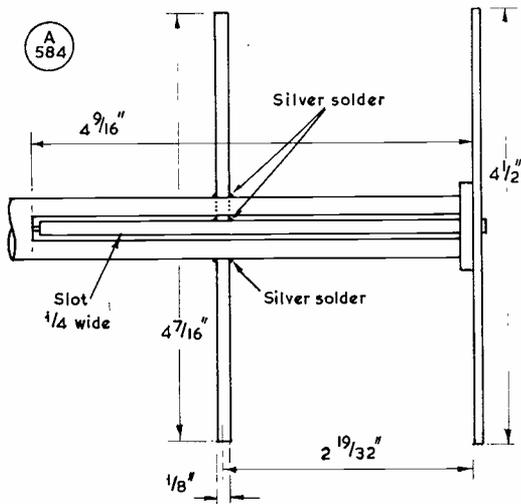


Fig. 1. Dimensions and mechanical details for the 23-centimetre dipole and reflector assembly.

complete, clean up and liberally flood with polystyrene cement to prevent ingress of water.

Although there may be some doubts about having the cable permanently attached, the positive connection thus made is much superior to coaxial fittings in a weather location.

Construction of Dish

Use the garage floor as a base. Drill into it to a depth of about half-inch, a hole with a small masonry drill. Make up a rudimentary compass and mark with chalk a 48in. diameter circle. Lay on this chalk line the fencing wire, using a copious supply of weights to secure in position. Overlap by 6 inches or so, bind with copper wire and flood with solder. The wooden template previously made should fit neatly between the wire circle.

The galvanised iron disc should have a central hole which just clears the conduit tubing. If necessary this disc can be made slightly concave by repeated hammering around the centre.

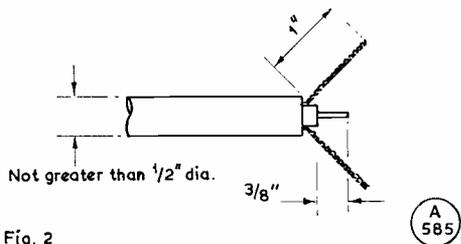


Fig. 2

Fig. 2. Preparation details for the end of the coax cable—and see text. Positive, well protected connections are needed at this point.

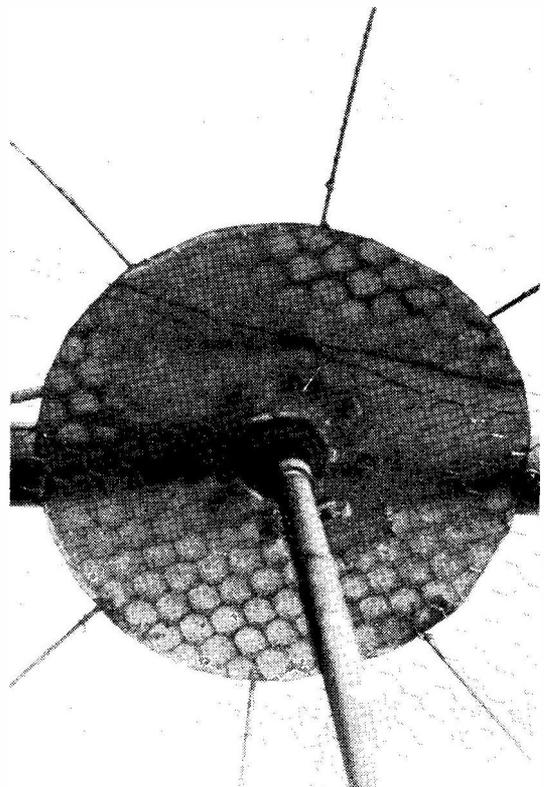
TABLE I

Y	3"	6"	9"	12"	15"	18"	21"	24"
X	0.1563"	0.625"	1.406"	2.5"	3.906"	5.624"	7.656"	10"

Values used to construct the template

However, the error caused by using it flat can be neglected.

The iron disc is temporarily secured to the top centre of the template. Cut off a length of fencing wire plus two inches to go over the profile of the template. Make a hook shape at one end with a stout pair of pliers and hook it on to the wire circle. Bend it over the template and produce another hook on the opposite side. The necessity of weights on the circle will now become apparent; Flux and flood with solder the end joints. Since the parabolic curves would cockle up in the centre if this was repeated, the wire at the centre must be soldered to the galvanised iron disc for 2in. from the edge and then sawn off. This is repeated until 8 ribs are soldered on. An alternative method is to drill eight 1/8in. holes at 45° intervals about one inch in from the



Showing the copper aerial tube, the conduit and the galvanised iron disc. See text and compare with drawings.

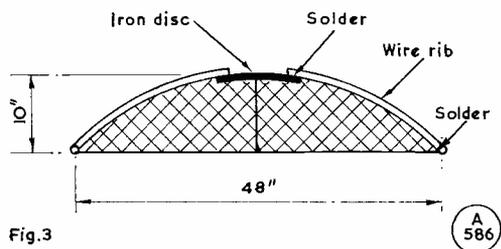


Fig. 3

Fig. 3. The wooden template showing the galvanised disc and the wire ribs—and compare photograph. This needs doing carefully to get a good shape and a rigid dish.

edge of the iron disc, bend the ribs sharply at right angles $\frac{1}{4}$ in. from the end, fit into hole and bend over and secure as before at the circumference.

A wire circle of two feet diameter is prepared and placed concentric with the outer rim. It is advisable to make up a substantial quantity of 4in. lengths of tinner copper wire to bind the various intersections. These are soldered.

The framework is now up-ended for the wire netting to be fixed. The netting is cut in half, since it is impossible to mould it to the contour in one piece.

Lay one section on one half with an overlap of about 3 inches. Work from the outer edge inwards, cutting an occasional slit from the centre to make it fit. Secure at the intersections. Bend over the surplus at the periphery and trim off. Drill and tap the conduit tube 4BA and insert one or more 4BA grub screws to secure the sliding aerial tube at any point. Fit the coaxial cable as described.

To enable the rim of the dish to be concentric with the dipole, a series of nylon cords are attached to the holes in the copper disc. These are adjusted and fastened to the outer rim. This tends to correct any warping made in securing the netting and in addition, makes the whole structure rigid. It obviates sag when mounted vertically. Details of construction can be seen in the photographs.

A dish made as above has been in operation for over twelve months in a most exposed position at 850ft. a.s.l. and is giving good results on the 23 cm. band.

SPECIALLY ON THE AIR

There is going to be a good deal of activity under this head, as the listing herewith shows.

On the subject of QSL'ing S/A stations operating under a "special GB" callsign, we are asked by G8NL (i/c GB QSL bureau) to explain that unless repository s.a.e.'s are lodged with him—addressed to the GB callsign concerned—cards incoming cannot be forwarded to whoever is responsible for that GB station's operation.

G8NL says that as a result of the Special Activity working over the years he has literally 1000's of unclaimed cards because individual GB-station QSL managers have failed to lodge s.a.e.'s with him for cards incoming.

What it all boils down to is that (a) If you are QSL'ing a GB-special station you should send your card direct, or (b) If you expect cards from GB-special stations via bureaux you should lodge s.a.e.'s with G8NL, or (c) If you are responsible for the QSL procedure of a GB-station, you should make sure G8NL has envelopes addressed back to you. His own address for all this is: C. Turner, G8NL, 56 Sunny Bower, Tottington, Bury, Lancs., BL8 3HL—and, remember, he does this QSL work as an entirely voluntary chore. All he asks for is intelligent co-operation so that cards can be cleared expeditiously.

GB3TMY, June 1-30: Sustained operation on 10-160m. and two metres. Colour QSL's for all contacts, including SWL reports, via bureaux or direct on receipt of stamps.—R. Bellerby, G3ZYE, Physics Laboratories, Kelly College, Tavistock, Devon, PL19 0HZ.

GB3SOL, June 8: For the Solihull Carnival, Tudor Grange Park, the local Club will be working 20-160m. and two metres.—L. G. Boswell, G4AEJ, QTHR.

GB2FES, June 8: For the Leyland (Lancs.) Festival, operation to be AM on 2m. and 160m., other bands CW/SSB, with a special card to confirm QSO's and reports.—R. Banister, G4BEE, QTHR.

G3SAD, June 8-9: Operated by Stevenage & District Amateur Radio Society to mark the grant of local borough status, exhibition station on the HF bands, also running VHF and RTTY.—C. Barber, G4BGP, QTHR.

GB3KCW, June 10-13: For the Kilbirnia (Ayrshire) Civic Week, 1800-2100 BST, with SSB on all bands 15-80m. QSL's via R. J. English, GM3YKE, QTHR.

GB2NTF, June 13-16: For the Trades Fair at Newton Abbot, on the 15-80m. bands.—L. H. Webber, G3GDW, QTHR.

GB3NS, June 15: For the Nottingham Scout Event, operating all bands 160m. to two metres, from Wollaton Park.—P. Carey, G3UXH, 1 Coach Drive, Eastwood, Notts.

GB3BA, June 15: At the Broughton Astley Gala, Blaby, Leics., on all bands 2-160m. All SWL reports (with s.a.e.) will be acknowledged.—J. E. Hall, G3FZQ, QTHR.

G4ACQ/A, June 29: Kent Coast Radio Club station, on all bands 80m. to 2m.—L. Randall, G4ACQ, 5 Linden Road, Westgate-on-Sea, Kent.

GB3TMY, July 1-27: As for GB3TMY above.

GB2DHC, July 6: Run by the Torbay Amateur Radio Society at Buckfastleigh for the Devonport Home

for Children Fete.—L. H. Webber, G3GDW, *QTHR*.
GB3SFG, July 11-13: Operated by the Southgate Radio Club for the Finchley Carnival at Victoria Park, N.3, running 2m./4m./160m. and 10-80m.—A. E. Edwards, G3MBL, *QTHR*.

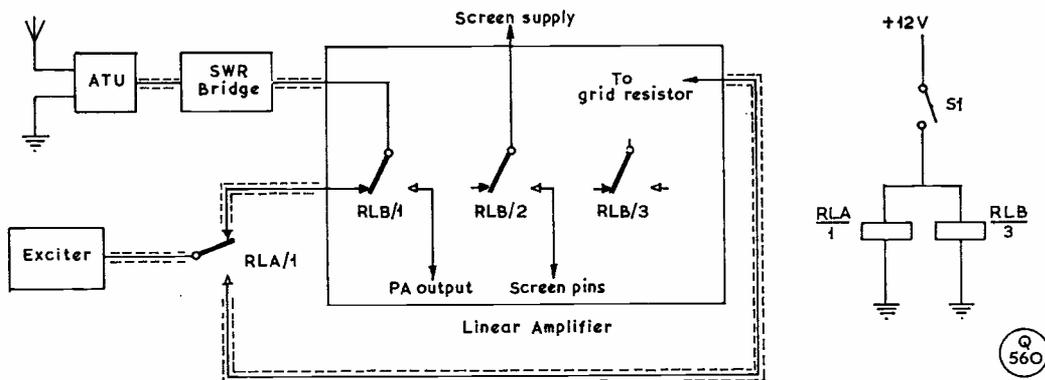
We would be glad to have short reports on these events, with photographs where possible—these should be about post-card size, bright prints, with details on a separate sheet. Address to: "Specially on The Air," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

LINEAR RF AMPLIFIER SWITCHING

Following this article, by GW4BCD, in our January 1974 issue (pp. 660-669) queries have arisen as to the

method of switching used by the author. It is shown below.

The third c/o contact on the internal relay could be used for switching the Exciter but this would put the input-output of the RF amplifier too close together and could lead to instability. The AC side could be supplied by the switch controlling the EHT supply, thereby to make the application of screen voltage without HT on the plate impossible—this being the important point (the screen must never receive HT unless there is voltage on the anode). In this circuit, RLA1 is single pole change-over, RLB should be a heavy-duty 3-pole c/o, and S1 is for on-off.



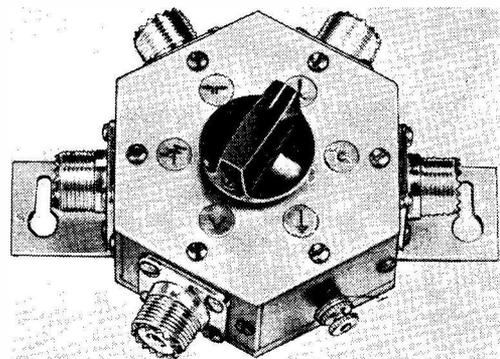
NOTE ABOUT DX-PEDITIONS

We are frequently asked by eager-beavers—intending to set out for the wilds of mid-Wales, northern Scotland, the less-populated Channel Islands and even Andorra, Monaco or Luxembourg—to give them publicity for activity on this-or-that band, "skeds to be fixed with whoever-it-is, special QSL cards to be minted for the occasion," and so forth.

In too many instances, nothing in fact ever happens on the air. The "expedition," if you can call it that, never gets off the ground, either because the transport fails, or essential items of gear are not available, or the Wx is too bad, or the key man falls ill, or the hoped-for commercial backing is not forthcoming, or the participants have a row amongst themselves and decide to call the whole thing off. In the meantime, they have had their advance publicity, in immortal print, and the keen chaps have been on the *qui vive* for a callsign that never comes out. We can count on the fingers of both hands the number of times this sort of thing has happened in the last few years.

In future, we will not publicise DX-peditions—to anywhere on any band—more than one month in advance, e.g., in July issue for a August, and the notice must be supported by the name/callsign/QTH of the individual responsible for the organisation, the correspondence

arising and the QSL arrangement. On the other hand, we are well aware that there are properly-organised DX-peditions that do not fall within these strictures, and to them we would always give publicity support.



New coaxial switch offered by Heathkit, the HD-1234, is designed to switch one RF source either to aerial or dummy load. It has four positions, is rated 1 kW, and can be used against four load points. Price about £7.

Contests

CONDITIONS during the 70 MHz Open contest of April 21 could not be described as particularly good, although there was some nice DX around if one dug for it. A cause of satisfaction for many was the fine signal from G13FFF/P in Larne operated by G3VPK and G18AYZ. GW4BUC/P and GW4ABR/P in Gwyned and Powys respectively seemed to be the only Welsh portables making any significant headway. GD2HDZ was on and made it into Dorset and Gloucester but had to finish early due to TVI. G3ONX (Gloucester) worked into Cumberland with just one watt. G3RWM (Coleshill) had 26 SSB QSO's, which shows which way the wind is blowing on this band. G3EKP (Blackburn) worked eleven GI and one EI out of a total of 22 contacts and G3OHH (Mow Cop) had two good DX contacts with GI (G13FFF/P and G14DBB/P in Dungivan).

It is too early to give a synoptic of the 144 MHz Open contest of May 4/5 as few reports are yet to hand but the following represents the rather parochial view of the event as seen from G3DAH. Well to the fore at the start on Saturday afternoon were the GW portables and by the end of the first hour several were passing scores in the thirties which is pretty good going. GM8DMZ/P also made a welcome appearance at this time. Some EU activity was observed during the course of the evening and into the early hours, mainly F, ON and PA, although DJ came through briefly just after midnight and again around lunch time on Sunday. It was remarkable that the AM/FM operators taking part in the event were so few compared with similar occasions last year, and remarkable also was the small amount of CW, since conditions were only a bit above average and this mode should have paid off. Several checks around 145-41 MHz seemed to point to most SSB operators having migrated to the low end of the band and indeed the QRM there gave the impression that this was another 2m. sideband contest. Operating techniques were slick in most cases and only a couple of really poor quality signals were noted. There was a tendency to congregate unnecessarily

VHF BANDS

A. H. DORMER—G3DAH

on the SSB calling channel, with consequent QRM, while there were plenty of clear frequencies between 144.25 MHz and 144.30 MHz, which is close enough to the centre of activity to attract attention and yet be clear of interference. Many operators, particularly the portables, did not announce their locations when calling CQ and remembering the emphasis which was given to "putting oneself in the mind of the chap at the other end" by G3LTF during his address at the Twickenham Convention, failure to use this procedure may well have cost points. Scores over 200 were made by several G stations but, as usual, the Continentals were piling up points well above this figure. (DC9DZ/A passed 338 at 1400z). All in all, an event which called for little criticism and much satisfaction.

Forthcoming Events: The 70 MHz portable contest has been moved from June 9 to June 2 to avoid a possible clash in the demand for CW operators for this event and NFD. Microwave Field Day is June 15/16 and the Region 1 (RSGB) VHF Contest takes place on June 23.

The WAB VHF Phone contest is slated for June 30 between 0900z and 2100z. Full details from R. L. Senter, G4BFY, 10 Toll Bar Avenue, Bottesford, Notts., NG13 0BB.

DX-Pedition and Portable Operations

Dates for the G8AGU/GM3JFG

trip to GM have now been changed to May 27—June 7. Other details as given last month.

Peter Lennard, G3VPS, is off on another foray, this time to Northern G and Eastern GM. July 6/7, Cumberland with Northumberland as alternative; July 10/11, Angus; July 13/14, Kincardine; July 16/17, Aberdeen. Operating times 1830z onwards each evening except for July 6/7, the Jubilee UHF/VHF Contest weekend, when he will be on for Saturday evening and all day Sunday. QRG, 70.33 MHz with 70.16 MHz as alternative, CW/Phone. Skeds to G3VPS, QTHR with s.a.e.

The Oxford University Radio Club are planning an expedition to Kirkcudbright / Dumfries / Selkirk during the week July 6-13. They will have AM/CW/SSB VFO controlled and FM xtal controlled on two metres. Callsign (presumably) GM3OUR, and skeds can be arranged via G4BIX, QTHR.

G3YJI will be operating on 2m. from Guernsey during July 6-18 with FT-101 and Europa transverter. Flintshire will be activated by GW8COP on 2m. SSB and GW8IMB on 70 cm. AM every Wednesday evening, 2000-2400 clock during the period July 3-September 25; 23 cm may also be available. Skeds via s.a.e. to GW8COP, QTHR. G8HQA is also planning a trip to GW; he will have 2m. SSB at Llanberis in Caernarvonshire, May 26—June 1 and July 21—August 3. He will be up at 1,500ft. so there should be a reasonable chance of working him. G8BPJ will operate portable from Merioneth on June 9. He will have A3, and possibly A3j on two metres and A3 on 70 cm. Skeds, QTHR.

GM8APX *et al* will be testing a site at Lude, near Blair Atholl on A9 on June 16. The object is to determine the sort of coverage which may be given by the proposed BBC repeater there. They will have 2m. and possibly 70 cm. also. Skeds via GM8APX, QTHR. G8AWK will be operating portable in Invernesshire between June 22 and 29th and would welcome skeds. QTHR.

VHFCC Awards

Peter Roberts, G8GJB, is normally resident in Herne Bay, Kent but while studying for his electronics qualification he lives in Hampton

Hill, Middlesex and it is from that QTH that he has made, and got confirmation of, the necessary contacts for his 2m. Award No. 217. He was first licensed in August, 1972 and started on the band with an HW-17A running 10 watts to an indoor 4-ele. beam located on the top of the wardrobe! He got an 8-ele. up outside at 20ft. in March, 1973 and in the October fired up a Murphy base station, modified to give FM and AM with 35 watts input to a QQV03-20A. He uses a mosfet converter tuning 4-6 MHz into a Lafayette HA-600. He is now QRV on 70 cm.

From Thame in Oxfordshire, Ray Cox, G8FMK gains Award No. 218 for his efforts on two metres. He was first licensed in October, 1971 and all his equipment is home-built. The converter has a BFY90 front end with AF139 mixer. In the early days, the Tx ran 40 mW from a transistor rig, but a choke modulated EF183 was added subsequently and this is now followed by a QQV03-10 at 18 watts input. The 8-ele. Yagi is at 30ft. Ray has 70 cm. gear and, as can be seen from the Tables, is now QRV on 23 cm.

Bradford, Yorks., is the QRA of Geoff Oughtibridge, G8GKY, and it is from there that he gains Award No. 219 for 2m. operation since August, 1972. The Tx winds up with a QQV03-10 in the final with 10 watts DC input, and this is modulated by a single EL84. The Sentinel converter precedes a Trio JR-500S and the skyhook is a 6-ele. at 37ft. a.g.l. and 575ft. a.s.l.

Beacons

Latest position from official sources regarding the operation of the U.K. beacons is as follows:—*GB3DM*, in operation at the top end of 2m. as is *GB3ANG*. The decision, whether to move them to the allotted beacon sub-band at the bottom end of 2m. is still under consideration. *GB3VHF*, inoperative at present awaiting delivery of xtal for 144.15 MHz. *GB3GW*, on 144.25 MHz and is likely to stay on this frequency. *GB3CTC*, at present inoperative, cause unknown but is likely to stay on 144.13 MHz when it comes back. *GB3DM* on 70 cm., keyer and Tx in position and to come into operation at the bottom end of the band at any time now. (Possibly 432.05

MHz). *GB3SC*, in operation on 432.025 MHz. *GB3SU*, resumed working, and *GB3SX* due to start up again in the immediate future.

Two interesting Continental beacons are *OZIALS* on 432.98 MHz and *DBØKP* on 432.007 MHz. Both in operation.

It is hoped that *GB3DD*, a 23 cm. beacon organised by members of the Dunstable Downs Club, will be on 1296.05 MHz shortly. Transmission will consist of a continuous carrier with the callsign keyed every 20 seconds in F1. Later in the year, there should be another beacon with the same callsign, on 432.016 MHz, with the call keyed in A1.

The list of VHF beacons given in February, 1974 issue of *SHORT WAVE MAGAZINE* may now be amended to reflect the changes shown above and the following: Delete *SM4UKV*; *LA1VHF*, now 145.965 MHz; *OZ71GY*, on 145.987 MHz.

Hakon Berg, SM6CEN, advises that all Swedish beacons will QSY to around 144.9 MHz in the not too distant future because of the strong opposition from SSB operators in both SM and OH who, for a long time, have worked between 144.150—144.200 MHz. It seems likely that LA and OZ beacons may also be moved to around this channel.

The Scottish Scene

We have been taken to task by Jock Inglis, an ardent 2m. SWL, for putting GM8IEN in the Kingdom of Fife in the April "VHF Bands." Apologies, it should be in Alloa, Clackmannanshire, and hopefully this will suffice to keep your claymore back on the wall, Jock!

Our best wishes for a speedy recovery from a damaged knee and shoulder caused by a fall go to GM6XI. If you wonder why you haven't heard him on the air recently, here is the explanation, but he should be fit enough to operate on 2m. from Kintyre during the first two weeks of July.

The George Watson's College Radio Club have three new licencees among their members: GM8IOG, GM8IQR and GM8IRZ—and it is understood that six more members were preparing to sit the recent R.A.E. GM3ILV now operates a Pye base station at the home QTH and a "Cambridge" in the car, and is enjoying considerable success with

both. GM8HXM, who suffered so much from a defective TV amplifier in his vicinity, has now moved QTH and is in the clear again. It is not reported whether the move was *because* of the TVI.

Congratulations go to the S.E. Scotland three-centimetre group, on their recent success in establishing a new inter-GM record for the band—150 km. GM3FYB, GM3DXJ, GM8BKE and GM8HEY set up shop on Cairn o' Mounth and worked GM3OXX and GM4BWT on Cheviot Hill with Q5 signals both ways.

Stop Press: In conjunction with the Barry Radio Club, GW4BRS, GM3OXX and GM3DXJ set up a new British record for a 3 cm. contact of 243 km. between Cairnsmore of Carsfairn in Kirkcudbrightshire (2,600ft. a.s.l.) and Snowdon (3,560ft. a.s.l.). Equipment at both ends was a 10 mW Gunn diode Tx with a 30-inch dish. Signals were 10 dB over noise at the GW end and 2/3 dB over noise in Scotland. The Barry Club team consisted of GW4AMV, GW3PPF, GW3TKH, GW8FGD, GW3WBU, GW8GJW and GW3Z1Y. Wx at the time was reported as intermittent rain at both ends and the GW lads were 800ft. into the cloud. May 11, 1974 is a date that none of them is likely to forget! Congratulations to all concerned.

Great credit is due to them for their enthusiasm in activating a band which is not all that popular in Scotland, and for the design and engineering skill which made such achievements possible. But for the shortage of reasonably priced Gunn diodes (*Birkett* is out of them) one might expect even more activity. These really are dandy little devices—they will produce 20 mW at 10 GHz with a supply of 7v., and this with a 40 cm. diameter dish, should produce a perfectly readable signal over 30 miles or so. GM3OXX is off to the Isle of Man shortly and is looking for 3 cm. skeds.

An extensive conversion programme to make the Pye Vanguard receiver fully tunable is under way in the Edinburgh area. In this connection, GM3XI draws attention to the article by GW3VPL in *SHORT WAVE MAGAZINE* of June, 1973 which has been very helpful in this respect. For those contemplating a

similar conversion for the Cambridge, plus NBFM facilities on both "transmit" and "receive," the Bury & Rosendale Radio Society have produced a publication called *Feed-back* which gives some excellent advice and which may be obtained for 50p from G8GTP, QTHR.

GM8GEC has built a 40w. solid state linear for his mobile installation which is producing excellent results. SSB activity in GM is now nearly all at the low end of Two although getting the appropriate xtals is still a snag.

The recent openings on 2m. were used to good effect in Fife and North Berwick. GM3OLK and GM3YOR in particular were having a ball and GM8IAP in Cellardyke was pleased to work 17 PAØ's during his first experience of extended tropo. conditions. GM3BQA has been heard complaining that he only worked about 40 Continentals! The chaps who might have cause to complain are surely the Edinburgh operators who were not hearing, let alone working, a thing. Still, they have got Princes Street, the Castle and the Festival!

GM3ZBE, Inverurie, was pleased to find that the opening on April 9 extended up to the 70 cm. band. He worked six countries including PAØ, DL, ON, G (G4BYV and G3DAH), GM, and F5VA who was only running one watt p.e.p. out! Alex himself now has some 200 watts of SSB available. His new QTH is working out well, and for those who would like a sked on 70 cm., the address is: A. M. K. Allan, Tulloch Ard., Westhill of Crimond, Keith Hall, Inverurie, Aberdeenshire.

GM3FFX and GM8IKT were operating portable from the Cairn o' Mounth during the recent Open Contest and were running nearly 400 watts p.e.p. to a 10/10 to great effect. This is the first time that really high power has been used from the Cairn, and it certainly paid off. Several S9++ signals were heard, notably those from G4CXL in Weybridge and G8FAB/P in Wiltshire, via meteor pings. GM4CAN/P were in Banff on the Saturday of the contest and in Moray on Sunday. They promise more operation from these rare counties during the summer.

The "Liner 2"

The modification scheme operated

by Bill Lowe to convert this gear for operation at the low end of the band is going ahead like a bomb. They report that they are up to their

eyes in this work, but will still come to the aid of callers who can wait, since the time involved in the actual modification and re-alignment is not

THREE BAND ANNUAL VHF TABLES January to December, 1974

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3NHE	32	5	57	16	38	10	158
G3DAH	27	5	43	13	26	7	121
G5DF	27	3	37	12	21	4	104
G3ZDY	—	—	60	11	6	5	82
G3OHH	30	5	27	6	11	2	81
GD2HDZ	15	4	30	10	16	5	80
G2AXI	21	3	32	8	9	1	74
GW8FOL	—	—	55	12	—	—	67
G3FIJ	20	2	22	8	11	3	66
G8GHZ	—	—	43	7	7	1	58
G8ECO	—	—	38	6	10	2	56
G4AEZ	2	1	33	6	11	2	55
G4AGE	—	—	15	5	28	7	55
GW3KGD	—	—	39	12	—	—	51
GW8BXQ	—	—	38	11	1	1	51
G8FWB	—	—	45	6	—	—	51
G8FUI	—	—	35	8	5	2	50
G3AHB	—	—	35	7	6	1	49
G8GNE	—	—	30	8	7	2	47
G8CBU	—	—	38	4	—	—	42
G8HHI	—	—	33	4	—	—	37
G4CZP	—	—	32	5	—	—	37
G8DGR	—	—	31	3	1	1	36
G8GXE	—	—	29	5	1	1	36
G8HQA	—	—	30	4	—	—	34
G8HQQ	—	—	27	3	3	1	34
GM3ZBE	—	—	19	5	3	6	33
G8BPP	—	—	27	5	—	—	32
G8FMK	—	—	—	—	29	2	31
G3FPK	—	—	29	2	—	—	31
G8BPJ	—	—	23	2	1	2	28
G3XSK	—	—	21	6	—	—	27
G8GGP	—	—	20	5	—	—	25
GW3XJQ	—	—	16	7	—	—	23
G18EWM	—	—	15	8	—	—	23
GW4BXE	—	—	14	9	—	—	23

Notes

1. Claims should be on the basis of the old county boundaries until January 1, 1975.
2. The Table shows claims to date from January 1, 1974 and will close on December 31, 1974. Claims should be sent to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ at monthly intervals.

very great.

Talking of "Liner 2" operation at 144.2 MHz, several instances have been reported of *spurii* around 145.4 MHz. A possible cause of this is the second harmonic from the 38.533 MHz oscillator beating with the 28.6 MHz SSB signal to give 48.466 MHz, the third harmonic of which is 145.4 MHz. Lacking access to a spectrum analyser, it has been found that finding the spurious signal on a Rx and adjusting the 116 MHz tuning for minimum output on 145.4 MHz without significantly reducing the RF output can effect a cure. A word of warning, though—this is a tricky piece of apparatus to play around with unless you have appropriate test equipment and know just what you are doing since the final result may be to clear one channel only to introduce *spurii* on others, both in and out of band.

Twenty-Three Centimetres

G5DF (Reading) has now gone over to a *Microwave Modules* varactor tripler for this band which he finds a substantial improvement on the 2C39A. He plans to add a pair of 2C39a amplifiers. He has skeds with G4ALN (Romford) at 9 p.m. on Tuesdays and Thursdays and he and G8FEV (Abingdon) both call G4BEL (Ely) after the latter's test with G3JVL (Hayling Island) at around 9 p.m. on Mondays. G3JVL has regular skeds with G4BEL, G6XM (Wilts.) and G3OBD (Dorset).

In Thame, G8FMK now runs a varactor tripler using 1N4148 diodes to give 400 mW of AM. This is fed to a 9-ele. Yagi at 31ft. The converter uses a BFY90 RF Amplifier and AF239 mixer. He has had several contacts with G8FEV over a distance of 27 km.

G8CBU reports that the Dunstable Downs Club beacon should be operative within the next few weeks. The antenna is already up. QRG will be 1296.05 MHz and power is 15-20 watts *output*.

Four Metres

Conditions have been pretty quiet on Four recently although there have been minor lifts. Peter, GD3VPS/P during May 13-16 was a fair signal in the Southeast (peaking 549 in Herne Bay) but QSB was troublesome and unless one knew

exactly where to look, and when, the contacts could have been missed quite easily.

Sunday-morning SSB activity continues to increase although it is noticed that some operators are working "transceive" and presumably using prime movers with narrow filters and no AM/FM demodulators, since several instances have been noted where they have failed to respond to AM/FM calls a bit off frequency. There is a long time to go before SSB becomes the primary mode on Four and a separate receiver is a most desirable asset until the situation changes.

G3NHE (Sheffield) should have SSB shortly, but is usually on the band on Sunday mornings with AM/CW.

It is regretted that an error crept into the Tables of Values for the 4m. transverter PSU on page 79 of the April, 1974 issue of the *Magazine*. R6 and R7 should be 20 ohms and not 20 kilohms as shown.

Two Metres

Activity fairly low in most parts for the past few weeks, with the exception of the contest and the "No Callsign" brigade still taking up the SSB calling channel for long periods. GW8FOL in Anglesey had it good, though, with 200+ mile contacts most evenings, GI, GM, GD and GC all copied at fair strength. He has his 4CX250B linear completed and is ready to go as soon as the PSU is finished. G8ECO in Camberley also has a 4CX250B amplifier on the stocks. G3XDY (Grimsby) found the opening on April 8/9 brought in EU's right up to the DM border. He notes that 144.35 MHz-144.40 MHz is good for many German stations, and that those who continue to operate around 144.2 MHz are experiencing QRM from repeaters which have not yet moved to their new frequencies. He was called by an LX at this time, but lost him in the noise before he could get the full callsign. Going back in time a bit, G3TBU was on mobile with eight watts of AM in Shropshire during the January opening and was pleased to get an SWL report of 5 & 5 from Gijon in Spain! Who wants a pair of 4CX250's under those conditions?

TWENTY-THREE CENTIMETRES

ALL-TIME TABLE

Station	Counties	Countries	Total
G8ARM	20	2	22
G3EHM	14	2	16
G4ALN	10	3	13
G8AOD	11	1	12
G5DF	5	1	6
G8FMK	4	1	5

G8GKN is now G4CPO and operates from Harrow-on-the-Hill with 10 watts of 2m. signal and an 8-ele. beam on the 500ft. a.s.l. site whence he can read the time on the face of Big Ben (with a telescope!). He would like to arrange skeds with a GW. The QTH is: Moretons, Harrow-on-the-Hill, Mdx. G8GPR is now G4CZP and G8FUR has become G4DCV.

G8BPP (Worcester) reports having worked six GD stations recently (GD8EXI, GD8DMA, GD3TNS, GD3YDB, GD3FLH and a visitor there, GD8FFX/P) and these, together with the other regulars GD2HDZ and GDFOC, mean that I.O.M. activity is still on the up and up.

A comment from G8GXE (Stoke Poges) raises an interesting point. During the open 2m. contest he found that just over one third of his contacts were with SSB operators although he was on AM. Perhaps the new band plan, which puts DX operations at the low end of the band, is encouraging cross-mode contacts, particularly now that one doesn't have to tune far from 144.20 MHz to find a DX AM/FM station. He puts in a plea for DX-expeditions to ensure that they have with them a Rx capable of resolving AM/FM so that everyone gets a fair crack of the whip. G3OHH (Mow Cop) reports hearing no SSB on 145.41 MHz during this contest. Someone is getting xtals from somewhere! **Repeaters:** According to the U.K. FM Group (Southern and London) *Newsletters*, repeater activity in this country proceeds apace. The Bristol Channel job, GB3BC, should be in operation very shortly. It is located at Mynydd Machen, five miles N.W. of Newport, Mon., at 1,600ft. a.s.l. Input and output frequencies are the same as those of GB3PI, *i.e.* In on 145.15 MHz, and Out on 145.75 MHz, but tone access is 1750 Hz, 50 Hz higher than for GB3PI.

Development of the gear for the Southern repeater, GB3SN, is proceeding—also the hardware for GB3LN, the Crystal Palace device, the licensing proposal for which is still with the Post Office, is virtually complete. The requirement for the Clyde/Forth repeater has been formulated but there is little progress to report on the construction of the equipment. The U.K. FM Group (Northern) have a proposal under consideration at the present time.

A convincing case can be made out for repeaters on 70 cm, and indeed on 23 cm, also, and one looks forward to the time when some enterprising group of enthusiasts will get cracking with some concrete proposals.

Seventy Centimetres

A brief reference was made last month to the possibility of auroral contacts on 70 cm. It can now be confirmed that G8AGU in Devon had such a contact with G8EPG in Sheffield on March 16 and that SM3AKW (QRA IW30e) worked UR2EQ (QRA NT61c) by the same medium. That should give the propagation experts something to think about!

G3NHE (Sheffield) now has 15 watts of SSB/CW from a QQV03-20A but was delighted to work G, GW, PA, ON, DC and OZ recently while still running *one* watt out! The band can't be quite as dead as may be thought since he adds that he had 66 QSO's with 36 different stations on 19 evenings in a month when there was no contest activity.

Another low power operator is G3XDY (Grimsby). During the good conditions over April 8/9 he made it with GM3UAG, DC6LN, ON5BD, several PA and G, and all this with one watt out!

G4ALN (Romford) is putting the final touches to his new PA and has established, successfully, skeds with ON5FF in Ghent on Tuesday, Thursday and Sunday evenings at 2000z on 423.20 MHz. They never seem to miss. G4BEL (Ely) has a sked each Tuesday evening at 2000 clock with PA0VV on 432.2 MHz SSB which you are welcome to join.

General Information

Maps showing the new counties which have come into existence since

April this year are now becoming available. Three appear to be suitable for our purposes. The *Geographia* shows both the new and the old boundaries, while the *Geographers* gives only the new boundaries, but has a good marginal gazetteer locating most of the well-known places. Both are reasonably priced at 40p. Standord's *General Map of Great Britain* is a good buy at 35p but shows the new boundaries only, although these are distinguished by really clear colouring. Available at, or through, your local news-agent if he stocks maps.

Just a reminder that for the purpose of the Annual VHF Tables we are working on the *old* county boundaries and names until the end of this year.

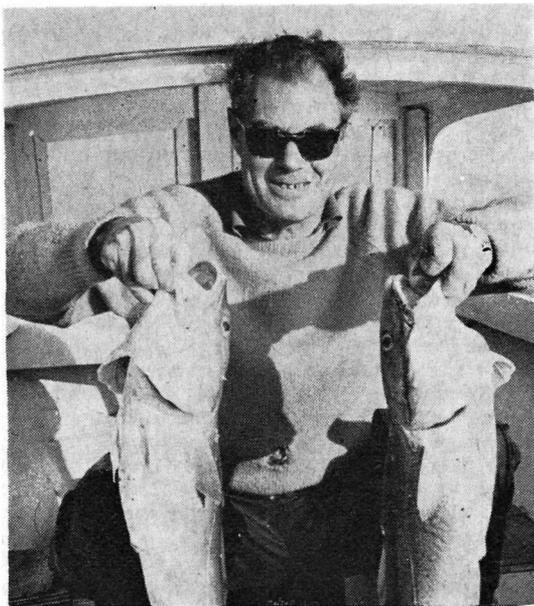
G8BBP got in touch with Min-PosTel with a query about operating hand-held equipment, and received a reply of which this is an extract: "The method of authorising this particular use of your amateur station has now been decided. The mobile use of amateur equipment by a pedestrian is not covered by the Amateur (Sound) Licence. However, since you hold the Sound Licence, please accept this letter as the

necessary authority to operate your Amateur station as a pedestrian. The callsign G8BBP/M should be used, and this letter should be attached to your Amateur (Sound) Licence and carried with you at all times when this mode of operation is employed." So now you know!

A copy of the Medway Amateur Receiving and Transmitting Society (MARTS—G2FJA) *Newsletter* has just been received from which it is learned that the Society has been in existence since 1922. It was then known as "The Wireless League" and meetings were held in the house of the current president—G6NU. In 1928, the name was changed to MATS and shortly after to MARTS at the request of receiving members. There cannot be many Clubs dating so far back, though we do know of several such.

Deadline

Deadline for the next issue is **June 7**, provided that there are no more industrial troubles. Please send your news, views, comments and claims to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Cheers for now and **73 de G3DAH**



Some of us fish for VHF/DX, others for cod. These two magnificent specimens were caught by G3BHW (Margate), who is also pretty successful with the DX, when out in their boat with G3DAH, who on this occasion caught nothing—oh, well you can't succeed all the time!

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for July issue: June 6)

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

SOMEONE once asked just what qualifications justify your old conductor natter on about Clubs and Club life, so for the record it would be as well to state it. He is a licensed amateur, and a consistent Club member, this year enjoying his first year *out* of office since the local group was formed; and he is by way of being a "country member" of other radio groups, attending their meetings whenever time and domestic chores permit. His membership of one radio group or another has continued for more than twenty years unbroken—and as he writes this piece each month he sees reflected in the mail all the mistakes he has seen his own clubs make, being made all over again somewhere else. They say there's *nothing* new under the sun!

Our reports this time are taken regionally, taking first the extra-territorial group.

Sad news for WAMRAC members; G3AGX writes to advise of the sudden death of G3NGF, Rev. A. Shepherd, the founder-secretary of WAMRAC, and a hard and sincere worker for the cause, not only his beliefs but also Amateur Radio. Under the circumstances, we are sure G3AGX will forgive us if we quote him as the contact for any Methodist amateur wishing to join, at least for the time being until more permanent arrangements can be made.

Royal Signals write this time to advise of a DX-pedition by two of their members to *English Cay* off the coast of British Honduras, over June 14-17, and this has rather taken notice away from their Club activities. Suffice it to say that any serving or retired Royal Signals type ought to be a member—details from G3DPS, at the address in the Panel.

Changes in the R.A.I.B.C. management are announced, with Frances, G3LWY, and husband Joe, G3ESR, retiring from their respective offices after twelve long years of devoted service, having done far more than their titles of secretary and treasurer respectively ever implied. They are being succeeded by G3HXN and his XYL, to whom all future correspondence should go, address as Panel, p. 211.

R.A.F.A.R.S. caters for all those who are or were in the Royal Air Force, by way of *Newsletter*, QSL card services, and other activities in the field of Amateur Radio. Details from the hon. secretary.

It seems quite a while now since last we heard from the Ex-G Club. This one is for anyone of British

nationality of naturalisation who are for any reason domiciled abroad. They have a World-Wide Net on Sundays at 1900z, 14.347 kHz Phone, or Saturdays on 14065 kHz at 1900z for CW, plus a Pacific and an Australian net; U.K. stations are invited to chip into any of these.

A.R.M.S. looks after the interests of the lovers of the /M facet of our hobby, as it has done for some 15 years now.

Southern

As usual, this is the fattest wad, and the top one is from **Southgate** where we note the date and the day quoted are different; however we believe it to be June 13, at the Scout place in Wilson Street, although at the time of writing there are no details available as to what goes on.

Verulam have Charlie Newton, G2FKZ, asking himself publicly "What is Magnetism?" for their entertainment on June 19, at the Market Hall, St. Albans. The June informal meeting is at Salisbury Hall, as in previous years, with a station on the air, and a short talk. The date for this visit to London Colney is June 5.

On to **Reigate** where on June 4 the lads foregather at the "Marquis of Granby," Hooley Lane, Redhill, to make their final dispositions for NFD. Then on June 18, there is the formal session when G8AAI will be talking about Repeaters and FM.

The programme published in their *Newsletter* by the **Echelford** crowd does not go as far on as June, probably because they have just had an AGM. Anyhow, no problem as we are told they get together on the second Monday and the last Thursday of every month at St. Martins Court, Kingston Crescent, Ashford, Middx.

While some groups seem quite unable to plan a programme, others of similar size or location can get themselves set up with a year's programme ahead; one such is **Dartford Heath D/F**. In June we see they have a Club night on June 7 at the Scout Hut, Broomhill Road, Dartford; on the 16th they are off to the qualifying D/F event at Slade; on the 23rd they are running their own D/F Hunt; on the 30th there is the qualifying event at Derby, and as if this lot were not enough, a footnote says there will be evening and Sunday D/F events laid on at short notice and "advertised" to the members by a mention on the Sunday-morning nets at 1100, around



The R.A.E. class held at the High School, Knottingley, Yorkshire, with their instructor, G3HCW, seated second from left (with cup). He is a very successful R.A.E. tutor and three of those shown here, seated right, passed the December examination.

1930 kHz.

Away to the East, to Colchester who have now found a place at Stanway Comprehensive School, Winstree Road, Stanway, which, incidentally, is also to be the venue for the Anglian Rally on July 14. For more details, dates, times, and so on, of the meetings we have to refer you to the Secretary—see Panel, p.211.

It seems to be the first Thursday in the month for Cray Valley, the venue being the usual one at Eltham United Reformed Church Hall, 1 Court Road, for the formal session, and a fortnight later at the same place for the ragchew evening. Start at 7.30 for 8.0 p.m.

At Milton Keynes they have a place at Wolverton Youth Club, where they can be found on the second Monday of the month, June 10, for a talk on Slow Scan TV Techniques. Incidentally their DX-pedition event this year will be to Northumberland, from July 20-27.

The weekly sessions of the Worthing Club are held at the Rose Wilmot Centre, Littlehampton Road, as follows: On June 4, NFD preparations, and on the 11th a report on the same event. June 18 is called "Talk In," and on June 25 there is the Summer Sale.

Tuesday, June 18 is a red-letter day for the Sutton and Cheam lads—they can change round their junkboxes at the Surplus Sale! There will also be a report on the NFD activity, and on June 5 we note they have a demonstration station going at Sutton Fayre. The Hq. is at the Library, Cheam.

G3CCD is the speaker for Acton, Brentford and Chiswick, and his topic will be Stage 2 of his two-metre SSB transceiver construction project. This one will be, as usual, at Chiswick Trades and Social Club, 66 High Road, the date to reserve being June 18.

We have often commented in these pages that most successful groups have a member who is always doing something for the Club while others sit back and listen. The "someone" for Silverthorn is G2HR, who has popped up in a new task of *Newsletter* compiler. The front page tells us that the venue is Friday Hill House, Simmons Lane, Chingford, and we know they get together there on a weekly basis, we believe on Fridays. However, to make sure, get in touch with G4AJA, as Panel.

Quite the most professional-looking *Newsletter* cover-page we have ever seen adorns the Farnborough effort; and it is also a lot more comprehensive inside than the average—we only hope they can keep up the pace! As for the group meetings, they are at the 8th Farnborough Air Scouts Hut, Rectory Road, on the second and fourth Wednesdays in each month.

For the Crystal Palace fellows, the date to book is June 15, when the speaker is to be Bob Burns, G3OOU, his subject being "SSB." As ever, the place to head for is Emmanuel Church Hall, Barry Road, London, S.E.22.

Stevenage have two events booked for June: On the 6th, the talk will be on Transistorised Receivers, and the 20th is a Beginners' Evening. Meeting place is Hawker-

Siddeley Dynamics, Ltd., Gunnels Wood Road.

Down in the West

Plymouth is our first port of call, to the Club Hq., Virginia House Settlement (located at rear of the Breton Arms, Buckwell Street) on the first and third Tuesdays of each month. On June 4, G3RMZ will talk to the members about SSB reception, and June 18 is down for an Open Evening.

On Saturday, June 29, the **Torbay** group will have an NFD retrospect (meaning inquest or *post mortem*) and a Film Show, the Hq., being at Bath Lane, 94 Belgrave Road. In addition there are understood to be regular meetings during the week, and on June 13-16 a special-activity station signing GB2NTF will be in operation at Newton Abbot Trades Fair. More details from G3UIQ, as Panel, opposite.

The club room of the Cricketers Arms, Windham Road, Bournemouth, is Hq. for the **Wessex** Amateur Radio Group, on the first Friday of every month and the Monday seventeen days later—that is, for June, the 7th and 24th, the latter date being for G3NIL to talk about Phase Lock VFO's.

Cornish are as strong as ever, and now have 163 members, which is pretty good going. They get together at the SWEB Clubroom, Pool, Camborne, on June 6 for a Film Show, followed by Questions and Answers.

In a letter primarily intended for CDXN, GW4BLE mentions the **Blackwood** group, and the fact that they are holding a convention at Oakdale, Gwent, as far ahead as September 22. For details of current Club goings-on, we suggest you contact him at the address shown in the Panel.

A good idea is put forward by the **Axe Vale** hon. secretary. It seems that on May 4, they organised an exhibition of Amateur Radio, with a brace of operational stations, displays of old and modern equipment, DX QSL cards, and so on, plus stands by local trader Reg. Ward and the nearby Racal Instruments establishment. As there was no charge for admittance, they no doubt got quite a few people in to have a look, and, we hope, the membership received a boost in consequence.

For details of the normal meetings at St. Clare's Education Centre, Seaton, we have to tell you to get in touch with the Secretary.

Midlands

This covers a sizeable chunk of territory, and for our first report we head for its northern limit, to **South Manchester**, where, as usual, the lads will congregate at Hq. on Fridays—Sale Moor Community Centre, Norris Road, Sale. In addition there are weekly VHF group meetings on Mondays at the club shack, Greeba, Shady Lane, Manchester 23. On the Fridays there is an activity each time—for instance, on June 7 a discussion on Aerials; the 14th sees G3UYG talking about Amateur Television; on the 21st a mini-D/F contest and a discussion about the Region 1 VHF contest; and on the 28th G8EUX will discuss Modern Circuit Design. Quite a range of interesting activity.

A special-event station is being set up on June 8 to support Solihull Carnival, in Tudor Grange Park, by the local **Szlihull** group. In addition, there is the normal Club meeting on June 18, at the Manor House, High

Street.

At **Worcester** they are "playing away" on June 3, by visiting a computer installation, but they will be home again in time for Saturday 15th, at the Old Pheasant Inn, New Street, when the use and abuse of Test Equipment will be demonstrated.

The **Hereford** Hq. is at the County Control, Gaol Street, on Friday evenings. However, we notice from the *Newsletter* that they resume their policy of having quite a few outdoor events during the summer so we feel you should get in contact with G4CNY for final details, QTH as Panel, opposite.

Never any doubt about the **Coventry** programme or venue—the secretary "lays it all on the line" each month. For June they have Nights on the Air on June 7 and 21st, a Tape Lecture on Integrated Circuits on the 14th, and an Open Night on the 28th; they foregather at Baden-Powell House, St. Nicholas Street, Radford Road, on these dates (Friday evenings).

Although we know the **Wolverhampton** chaps get together weekly, the only date for which we have any information at the time of writing is June 3, when the subject will be the conversion of surplus R/T sets for operation on the VHF bands—always a topic of interest. The venue is at Neachells Cottage, Stockwell End.

Up North

Up as far as Scotland; to be more precise, to **Glenrothes**, where they assemble on Wednesdays at the Clubroom, The Library Building, Douglas Road, Leslie, Fife. Perhaps the main thing in June is the NFD Preparation session on June 2.

Also on Wednesday evenings is **Lincoln**, at the Astronomical Society, Westcliffe Street, off Burton Road, Lincoln. June 5 is a two-metre Project Night, and Films are down for the 12th; a Treasure Hunt occupies the 19th, and for the 26th there is an Open Forum.

Another place where Wednesdays each week is favoured is **Derby**, at 119 Green Lane. For the 5th there is a Junk Sale, and on the 12th a Treasure Hunt. A D/F event starting at 7.30, outside the clubroom, occupies June 19, and on the 26th there is a Film Show. Add to this a station in NFD, and the Derby D/F qualifying event on the 30th, and you realise someone must do a lot of work for this Club.

York have their being in the British Legion Club, 61 Micklegate, York, where they get together every Thursday evening. During the near future we understand they have several visits lined up, so for the latest details contact G3WVO, who will give you the gen.

Every Wednesday it is for **Star**, at their Hq. in the New Inn Hotel, Bramley Town Street, Leeds 13. For the last week in August and the first week in September they are running a DX-pedition to North Wales on 14 and 144 MHz—anyone wanting skeds with them, contact G3ZWA, *QTHR*.

Since his last letter, the scribe at **Nottingham** attended the AGM and found himself propelled into the "hot seat." However, whatever his office this year, he will still write to tell us that the meetings occur every Thursday evening at Sherwood Community Association, Woodthorpe House, Mansfield Road; the details of the programme will no doubt have been settled by the time

Names and Addresses of Club Secretaries reporting in this Issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3-8LB.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
 AXE VALE: T. J. Greenwood, Hampdenwood House, Harepath Road, Seaton, Devon, EX12-2SK.
 BLACKWOOD: S. Cole, GW4BLE, 87 Thornbury Park, Rogerstone, Newport, Gwent.
 BURY & ROSSENDALE: C. Kirby, G8HQW, 2 St. Peters Place, Haslingden, Rossendale (4915), Lancs.
 COLCHESTER: E. T. Jacobs, 26 Pondfield Road, Colchester.
 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.
 COVENTRY: G. A. Whenham, G3TFA, 33 Chapel Street, Bishops Itchington, Warks.
 CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidcup.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN. (01-699 6940.)
 DARTFORD HEATH D/F: Mrs. M. Worbey, G3XVC, 13 Havelock Road, Dartford (22889), Kent.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21931), DE3-7GE.
 EAST LANCS.: W. E. Baxendale, G8FDG, 28 Westland Avenue, Darwen, Lancs.
 ECHELFORD: A. J. Wenham, G3ZXA, 28 Pinewood, Sunbury-on-Thames (86440), Middx., TW16-6SG.
 EX-G: F. W. Fletcher, G2FUX, 53 St. Ives Park, Ringwood (3561), Hants., BH24-2JX.
 FARNBOROUGH: R. C. Bagwell, G8ECO, 33 Frimley Green Road, Frimley, Camberley, Surrey.
 GLENROTHES: A. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife, KY1-2LH.
 HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford.
 HULL: R. C. Andreane, G4CMT, 10 Vermont Street, Hull.
 LINCOLN: G. Cogan, 4 Fourth Avenue, Scampton, Lincoln.
 MILTON KEYNES: R. S. King, G8CHK, 7 Brackley Road, Towcester, Northants.
 NOTTINGHAM: S. F. Claringburn, G8HLD, 49 Fernleigh Avenue, Westdale Lane, Nottingham, NG3-6FN.

PLYMOUTH: C. Mitchell, G3UVS, Kechil Rumah, Green Lane, Velverton, Devon, PL20-6BW.
 R.A.I.B.C.: S. Boakes, G3HXN, Cambridge Villa, Bristol Road, Cambridge, Gloucestershire, GL2-7BQ.
 REIGATE: F. H. Mundy, G3XSZ, 2 Conifer Close, Reigate (43130), Surrey.
 ROYAL SIGNALS: Capt. (TOT) J. Cooper, G3DPS, Royal Signals, Blandford Camp, Blandford Forum, Dorset.
 R.A.F.: F/Lt. V. J. Ludlow, Royal Air Force Amateur Radio Society, Hq. R.A.F. Station, Locking, Weston-super-Mare.
 SILVERTHORN: C. J. Hoare, G4AJA, 41 Lynton Road, South Chingford, London, E4-9EA. (01-529 2282.)
 SOLIHULL: L. G. Boswell, G4AEJ, 170 Kestrel Avenue, Yardley, Birmingham, B25-8QX.
 SOUTHGATE: B. Oughton, G4AEZ, 48 Morley Hill, Enfield. (01-366 7166.)
 SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, Cheshire, M33-3GW.
 STAR: T. Leeman, G4BUU, 115 Asket Drive, Seacroft, Leeds, LS14-1HX.
 STEVENAGE: C. Barber, G4BGP, 473 Canterbury Way, Stevenage, Herts., SG1 4EQ.
 SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Sutton, Surrey.
 TORBAY: M. Yates, G3UIQ, Top Flat, 23 Waverley Road, Newton Abbot (3025), Devon.
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, Herts., WD2-5JQ.
 WAMRAC: L. Colley, G3AGX, 13 Ferry Road, Wawne, Near Hull, HU7-5XU.
 WESSEX: G. A. Moore, G8BBN, 108 Stewart Road, Bourne-mouth.
 WIRRAL: F. Smith, G3YGL, 72 Church Road, Bebington.
 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.
 YORK: K. R. Cass, G3WVO, 4 Helworth Village, York.

this piece comes to be read.

Now to Wirral, where the lads get together on the first and third Wednesdays of each month at the Sports Centre, Grange Road West, Birkenhead. June 5 is a pre-NFD briefing, and as for the second meeting, since there appears to be a discrepancy over dates in the *Newsletter* we have at hand, it would be better to contact G3YGL to confirm—see Panel, above.

At East Lancs. G8EJB will be talking about "Two Metres, Equipment and Such" on June 6, at the YMCA, Shear Bank Road, Blackburn. Looking forward, they seem to have quite an interesting programme set up for some months to come.

Bury and Rossendale members are finding themselves involved in a higher level of enthusiasm and activity than has been noted for several years, says the *Newsletter*. To find out about this enthusiasm, why not pay a visit? The second Tuesday of each month, at the Mosses Community Centre, Cecil Street, is the main meeting, but they are also to be found informally on any Tuesday at the same place.

We wondered a bit about the absence of reports from Hull of late, but this time they have re-surfaced to tell us they are still assembling the crowd at 592 Hessele Road every Friday evening.

Conclusion

Once again we have reached the bottom of the heap, and so it remains for us to ask you to send in your

news, covering the *July* events of your group, to "Club Secretary," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18-1RQ. As for its arrival, well, make it be here by first post on **June 6**. Likewise, forward dates are **July 4** and **August 8**. *BCNU*.



"... without prejudice, you could be five and nine ..."

NEW QTH's

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

- EI0CP**, S. Taaffe, 4 Ardee Terrace, Dundalk, Co. Louth, Eire.
- G4BOC**, H. Hodgson, 1 Harris Street, Askam-in-Furness, Lancs., LA16 7BY.
- G4CIY**, J. A. Cass, 5 Lark Drive, Wellingore, Lincs.
- G4CUU**, J. M. Brown, Darley House, Darley, Harrogate, Yorkshire.
- G4CVD**, P. M. Petty, 130 Whitstable Road, Canterbury, Kent, CT2 8EG.
- GW4CWQ**, D. R. J. Phillips, 162 St. Helens Avenue, Swansea, Glam., SA1 4NQ.
- G4CXM**, R. James, 21 Blackbrook Avenue, Broadsands Park, Paignton, Devon.
- G4CXQ**, D. L. Dyer, Damir, 10 East Park, Mount Ambrose, Redruth, Cornwall. (Tel. Redruth 4886.)
- G4CYF**, C. S. Tully, Falstone, 23 The Drive, Dovercourt, Harwich, Essex, CO12 3SU.
- G4CZA**, K. J. M. Newman (ex-G8ICX), 2 Skys Wood Road, St. Albans, Herts., AL4 9NZ.
- G4CZL**, A. J. Rogers, 39 Wicks Crescent, Formby, Liverpool, L37 1PD.
- G4CZP**, R. M. Crossley (ex-G8GPR), 29 Westover Road, Warton, Carnforth, Lancs., LA5 9QT.
- G4CZS**, S. C. Kershaw, 11 Langdale Close, Gatley, Cheadle, Cheshire, SK8 4QW.
- G4CZV**, A. R. Wilson, 24 Anson Road, Hull, Yorkshire, HU9 4SN. (Tel. 0482 75972.)
- GM8ILV**, J. McLeod, 17 Johnston Terrace, Port Seton, East Lothian.
- G8IMI**, C. J. Kitchener, 19 Chestnut Close, Haverhill, Suffolk, CB9 9HX. (Tel. Haverhill 2852.)
- G8IML**, C. C. Keys, 9 Tomlins Court, 65 South Norwood Hill, London, SE25 6BZ. (Tel. 771 0240.)
- G8IPK**, C. J. Knight, 10 Brocklebank Lane, Allerton, Liverpool, L19 4TA. (Tel. 427 4493.)
- G8IPT**, P. R. Hughes, 48 Hall Green Avenue, Stretton, Burton-on-Trent, Staffs., DE13 0HG.
- G8IQT**, T. C. Spicer, 101 Ancaster Avenue, Grimsby, Lincs., DN33 3LP. (Tel. Grimsby 70011.)
- G8IQZ**, C. R. Harris, 74 Charnwood Road, Barwell, Leics., LE9 8FL.
- G8IRU**, L. G. Ouseley, 23 Cromer Close, Little Gaddesden, Berkhamsted, Herts.
- CHANGE OF ADDRESS**
- EI2CI**, J. M. Purfield, 12 Wolseley Street, South Circular Road, Dublin 8.
- G3AFT**, Grafton Radio Society, Whittington School, Highgate Hill, Highgate, London, N19 AF12.
- GW3CBA**, J. Kellaway, 50 Winston Road, Barry, Glam. (Tel. Barry 77793.)
- G3GNR**, R. E. Short, North Trew Farm, Highampton, Beaworthy, Devon.
- G3JHI**, R. L. S. Hathaway, A.F.C., c/o Officers' Mess, Hq. Strike Command, R.A.F. High Wycombe, Bucks.
- GD3JIU**, M. R. Thompson, 12 Briarfield Avenue, Birch Hill, Onchan.
- G3JQC**, G. W. Hawksworth, Kenton, 16 Birkhead Street, Heckmondwike, Yorkshire. (Tel. Heckmondwike 402707.)
- G3MAX**, F. Nicholls, Sunnybank, Racecourse Lane, Cotebrook, Tarporley, Cheshire.
- G3MCY**, G. C. Moore, Highfield Farm, Glentham, Lincoln.
- GM3MGT**, A. W. Hope (ex-G3MGT), 11 Craigs Road, Edinburgh, EH12 8EH.
- GM3MHG**, J. Enderby, 95 North Drive, Troon, Ayrshire.
- G3PKS**, J. H. Stock, Sunset, 29 Priory Road, Wells, Somerset, BA5 1SU. (Tel. Wells 73015.)
- G3VNJ**, C. H. Fowler, 8 Shardlow Road, Hornsea, E. Yorkshire, HU18 1EY.
- G3VXO**, B. J. Fielding (CTIEQ), Casa Ancora, Areias de S. Joao, Albufeira, Algarve, Portugal.
- GM3WOJ**, C. W. Tran, Cairnlea, Sandhead, Stranraer, Wigtownshire.
- G3WYY**, J. R. Smith, Oak House, Croston, Preston, Lancs., PR5 7HB. (Tel. Croston 233.)
- G3XMI**, M. J. Prior, 8 Market Place, Coleford, Glos. (Tel. Coleford 2717.)
- G3XOY**, L. J. P. Wood, 9 Grassmere Close, Highwoods Estate, Mexborough, Yorkshire.
- G3YRU**, P. R. Wilby, B.Sc., 42-C Woodville Gardens, Ealing, London, W.5. (Tel. 01-997 6566.)
- G3ZOI**, D. J. Deane, 99-A Bedford Avenue, Hayes, Middlesex.
- G4ALC**, J. B. Balls, Quorn Cottage, Church Lane, West Runton, Cromer, Norfolk. (Tel. West Runton 357.)
- GM4AWA**, R. T. Payne, c/o 26 North Donside Road, Balgownie, Aberdeen, AB2 8PA.
- G8ATV**, I. A. R. Dredge (ex-VS6GA), New Cottage, Idovery, Dauntsey, Chippenham, Wilts.
- G8DIN**, D. S. Cooke, 11 The Avenue, Nunthorpe, Middlesbrough, Tees-side, TS7 0AA.

SOME TITLES DESCRIBED

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.

92p

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

£1.62

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

£1.15

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.

O/P

TRANSISTOR FUNDAMENTALS Vol. I

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.

£1.95

RADIO CIRCUITS

By Thomas M. Adams

This volume goes into great detail in explaining the action of the various circuits used in radio receivers—also voltage analysis and signal substitution methods for servicing typical valve and transistor receivers.

£1.85

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.

£1.82

BEAM ANTENNA HANDBOOK

By William I. Orr, W6SAI 3rd edition

This completely revised 3rd edition of Bill Orr's popular book covers beam antenna theory, design, construction, installation, and adjustment. Includes ionosphere theory; transmission lines; matching devices; new inducto-match system; parasitic beams; all-metal arrays; multiband beams; wire beams; 20 and 40 metre compact beams; design charts and SWR curves for beams—six to forty metres; how to evaluate your beam; test instruments and how to use them; different types of installation. A "must" for the serious DXer whether he buys or builds his beam.

200 pages

£2.13

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.

£2.39

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 cover 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.

£1.35

ALL ABOUT CUBICAL QUAD ANTENNAS

By William I. Orr, W6SAI

This book discusses the theory, design, construction and operation of Cubical Quad antennas. It covers the Quad's history, operation and characteristics; multi-element and concentric Quads; the X-Q Quad with 3 dB gain over normal design; the new Tri-Gamma match; new, improved feed systems; new, sturdier construction; true angle of radiation; antenna tuning and maintenance. Contains data never before published! All you need to know about Quads!

96 pages

£1.82

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 practicing 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 semiconductors.

124 pages, including 110 illustrations

£1.31

(American and English Books)

The above prices include postage & packing.

Delivery is from stock.

Available from

Publications 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)

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. **£1.33**
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 **85p**

HAVING FUN WITH TRANSISTORS

by Len Buckwalter

It covers 13 exciting transistorised projects, and while creating, one can learn, and while learning one can find enjoyment for himself, his family and friends as he builds such unusual items as BORIS the talking skull, or a unit that enables you to see while blindfolded. All is described in a simplified form so that even a youngster can understand it. **£1.61**

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 discreet 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. **O/S**

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. **£2.65**

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 telecommunications terminology. **O/S**

MICROPHONES

by A. E. Robertson

A general treatment, in twelve chapters with appendices.

£1.67

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. **£1.75**

American & English Books.

The above prices includes postage and packing.

Available from

Publication Dept., 55 Victoria St., London SW1H 0HF

SHORT WAVE MAGAZINE

01-222 5341

(Counter Service. 9.30-5.15. Mon. to Fri.)

(Nearest Station: St. James's Park)

(GIRO A/C. No. 547 6151)

TELECOMMUNICATIONS INTERNATIONAL AGENCY LTD.

P.O. BOX No. 4, BROCKENHURST (NEW FOREST), HANTS.

Tel.: Brockenhurst 3434, 3430 & 2219 after 6 p.m. and weekends

RADIO TELEPHONE NEW

MURPHY AM 10 watts, 70-174 MHz. 12-24v., 12½ kHz, dash mount. TR.1005/125.
Ministry of Posts and Telecommunications type approval Certificate No. RTD 545. £155.00 (multi-channel available)

MURPHY F.M. 12 watts single channel. 12-24v., 12½ kHz, dash mount. 70-174 MHz. TR.1006/125.
No. RTD 1009. £165.00 (10 channels available)

MURPHY F.M. Midshipman 25 watts. 12-24v. Marine Bands. 156-157 MHz.
No. RTD 1080. £185.00 (10 channels available)

MURPHY Marine Base F.M. 25 watts. 156-157 MHz.
No. RTD 1080F £255.00 (10 channels available)

MURPHY F.M. 40 TR 144-145 MHz. 12 channel FM transceiver for the 2MTR enthusiast. Double conversion Rx 0.5 µV input for 20 dB sig./noise. Less than 1 dB increase in AF output for 100 dB change > 0.5 µV. TX output into 50 ohms > 35 watts. Deviation adjustable 0-15 kHz pre-emphasis characteristic from 300 HX to 3 kHz relative to 1 kHz. Supplied complete with microphone holder, etc. For further details send S.A.E. £127.00, carriage £1.50

MURPHY FM40 PA. 70-174 MHz. Add on RF amplifier. 10 watts input > 35 watts into 50 ohms output.
With automatic RF switching. 12v. DC £35.00, carriage £1.50
Without automatic RF switching. 12v. DC £30.00, carriage £1.50

LINER 2 Add on amplifier module comprising of 40 watts PEP amplifier and preamp for the RX extremely simple to use with any liner 2 but could be easily adapted for use with any TX RX requiring more power and better sensitivity.

With RX Preamp £47.42, carriage £1.00
Without RX Preamp £40.10, carriage £1.00

VALVES

QQV03-10A	£1.50	ECC 85	40p
ECC 83	30p	EL 85	35p
KT 66	£1.75	ECF 80	30p
EAC 91	£1.50	EF 95	35p
ECF 82	38p	EL 33	95p
EF 91	33p	EL 80	25p
EY 84	50p	EBC 81	22p

postage 5p

BNC Free sockets	22p
5 pin type B Din plugs	14p
PL259 plugs, sockets and reducer	80p
Painton 6 way plugs	12p
5 pin type B Din sockets	8p
PL 259 UHF sockets	21p

LOUDSPEAKER. Miniature 1½" 3 ohm. New £1.50
ELAC 5 x 3 at 8 ohm elliptical. New postage 8p 75p

HAND SETS. New SB Brown handsets Carriage 65p £4.94

TRANSISTORS

PT 4176D 44w.	£3.00	AF 2395	30p
PT 4176C 20w.	£2.23	OC 60	10p
PT 4176B 10w.	67p	OC 44	10p
PT 4176A 3w.	45p	OC 75	15p
2N 4427 5w.	67p	OC 35	25p
2N3866	48p	OC 200	10p
2N3819	25p		
AF 239	20p	IN 91	25p
ME 1001	18p	V 100	85p
2N 5180	48p	2N 2369A	15p

BF 115	15p	ACY22	14p
BSX26	10p	ACY 20	10p
BC 108	10p	OA200	4p
OA10	15p	AC 126	8p
ASZ21	25p	OAGO	4p
OAZ200	30p	OA 47	6p
OAZ207	30p		
CA3011	92p	Carriage 5p.	

NEW STUD UHF POWER DEVICES

TIA 6B 400 MHz 1 watt output	70p
TIA 4B 400 MHz 3 watts output	£1.44
TIA 7B 400 MHz 9 watts output	£3.67

NEW STUD VHF RF POWER DEVICES

TIA 6B 2, 2 watts	70p
TIA 4B 2, 4 watts	£1.44
TIA 7B 2, 10 watts	£3.67

Details and spec. available on request.

GEC FM Base Station 12½ kHz type approved in extremely good condition. In working order, complete with desk controller £66.60, carriage £1.00

MURPHY 821. Converted to 2 MTRS. 2 channel TX. Tunable TX (Heathkit HW17 Tuner). Working £21.60, carriage £1.00
High band and Low band whip aerials. New, £1.00, carriage 10p

NEW MURPHY PSU stabilised 12.5v. DC at 2.5 amps. £9.00, carriage 45p

NEW MURPHY PSU stabilised 12.5v. DC at 10 amps. £25.00, carriage 45p

DC-DC INVERTOR. 24v. output at 2.5 amps £7.00, carriage 45p

Xtal Ovens. Cathodeon 68p, carriage 5p

RELAYS. Aerial changeover 12v. DC £1, carriage 10p

COSSOR MOTORBIKE Mobile units, lowband. £9, carriage £1.00

DESK MICROPHONE. Kits including 200 ohm insert. £1.80, carriage 20p

SGB BASE MICROPHONE with stand £5.50, carriage 20p

SGB CLASSIS. Ultra modern base or mobile microphone dynamic. £7.00, carriage 20p

NEW MURPHY STAB SUPPLY. Small compact. Mains operated stabilised DC supply in attractive metal case 110 or 240 AC. 12.5v., 5 amps DC. £18.00, carriage 75p

INVERTORS. 12v. in, 6v. out, 5 amps. £1.50, carriage 10p

RELAYS. 24v. octal 2 P 2W. 45p, carriage 5p

OCTAL PLUGS for microphones, power units or speakers 23p

SG BROWN MICROPHONE stowage units, new. 45p, carriage 5p

S G BROWN. Fist Microphone. Dynamic 300 ohms, IC. 100 Series. £4.50, carriage 10p

FREE MURPHY CATALOGUE ON REQUEST

ALL PRICES EXCLUDE V.A.T.

HAVE YOU HEARD THE CALL OF THE EMU?

The EMU CALL. This new Emu unit will give your own Call sign in MCW from a small loudspeaker repeated once a minute at a speed of approx. 10 wpm. Placed at a suitable distance from the microphone it will give station identification in the background. This will ensure that you are not criticised for forgetting to give your call at the required intervals. Housed in an attractive two tone cabinet measuring 97 x 180 x 75 mm., it is self contained with its own PSU requiring only to be connected to the mains supply. The design employs 74 series TTL plus transistors. These units will be individually built and programmed with your Call sign. Delivery will be approx. 2/3 weeks. Full money back guarantee if not satisfied and returned undamaged in 10 days. Price: **£28-50.**

EMUPRESSOR. This well tried Unit speech processor that gives a 3dB change of output for a 40dB change of input is still available at **£7-80.**

EMUMARKER. This compact Xtal calibrator giving markers at 1 MHz, 100 kHz and 10 kHz, or in EMUMARKER 25 version a 25 kHz output instead of the 10 kHz. Either model now **£9-00.**

EMU FM UNIT. The Unit to convert your Rx for FM reception. Requiring only one connection to the main Rx, containing its own audio and output stages. Squelch and AFC output. Housed in a two tone box 2½" x 2½" x 6" **£13-50** or PC version at **£11-50.**

For fuller details see previous advertisements or write to :

I. N. CLINE

15 KNIGHT AVENUE, CANTERBURY
KENT, CT2 8PZ

YAESU TRIO EDDYSTONE

can now be supplied quickly to order
also

Any marine communications equipment and navigational aids supplied. Installation and maintenance service for North, Mid Wales and Wirral areas.

Amidon type toroid cores as previous ads. W2AU baluns, balun kits, etc. Data sheets available for cores.

S.A.E. with all communications or

Tel.: Pontyodkin 846 (035287) 7 days, evenings included.

T.M.P. (Electronic Supplies)

3 Bryn Clyd, Leeswood, Mold,
Flintshire, CH7 4RU.
(Office Only)

WALKIE TALKIE No. 88 ex-WD 14 valve, 4 channel transmitter/receiver unit, **£6-50**, carriage 68p, limited supply. **No. 19** ex-WD used transceiver, valved unit, only **£6-50**, carriage **£1-40**. **PADDED MOVING COIL** ex-WD, unused headphones, great at **£1-50**, plus 35p p and p. **AMERICAN** ex-WD featherweight, low resistance headphones, unused, **£1-25** plus 25p p. and p. **LOADED STAFF CAR AERIALS**, unused, ex-WD, **£1-25**, 25p p and p. **2 4ft. TANK AERIAL TOP SECTIONS**, 85p, 35p p and p. **MAINS MOTORS**, unused, powerful ½in. spindle, **£5**, 75p p and p. **HOSES**, approx. 60ft. x ½in., **50p**, 20p p and p. **SALVAGE TELEMETER**, multi-valve receiver speaker and tape unit, vast value sealed cartons, **£4**, carriage **£1**. **HELMETS STEEL** genuine ex-WD. Bargain at **£1-25**, 37p p and p. **BRITISH EAGLE** surplus black gold braided, 2-piece quality suites, few at **£7**, 50p p and p. **MORSE KEYS**, quality ex-WD. 12 for **£5**. Sample **62½p**, 20p p and p. All add 10% VAT plus s.a.e.: callers welcome.

SOUTHERN SURPLUS MERCHANTS LTD.
66 London Road, Kingston-on-Thames, Surrey
Tel.: 01-546 9263

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

PYE Fixed Base Station, high band, and complete high-band **Pye Ranger** (12-volt boot model), ideal for amateur communication home to car, very clean, and with all manuals and fittings. **£60** plus **£5** carriage, The Lot.—SSB, 1 Frances Street, Truro, Cornwall. (Tel: 0872 862575, evenings OK).

FT-101 OWNERS? Why compromise with other more expensive RF clippers? **G3LLL's RF Clipper** is designed only for the FT-101. Gives talk-power in kilowatt class without linear (5-10 with Linear!) plus extra gain and selectivity on "receive". No circuit board modifications required for Mk. II or B-type. Buy with FT-101 or FL-2100 for special price.—Details from Holdings, 39-41 Mincing Lane, Blackburn, Lancs., BB2 2AF. Tel: 59595/6).

SOLARTRON CD.1400 oscilloscope in very good condition, **£90**. Pye Base station with mobile, in working order, **£35**. Pye Vanguards, low band, very good condition, **£10**. Also thousands of components, send s.a.e. for lists.—**Q Services Electronic (Camberley), Ltd.**, 29 Lawford Crescent, Yateley, Camberley, Surrey, GU 17. (Tel: 0252 871048).

QSL CARDS and G.P.O. approved Logs (hard back), prompt delivery. Send 5p s.a.e. for samples.—**Eimtree Press, Looe, Cornwall, PL 13-1JT.**

VERNITRON Ceramic Filter Resonators, 455 kHz. Special types for SSB and NBFM. Send s.a.e. for list.—**Amatronic Ltd.**, 396 Selsdon Road, South Croydon, Surrey, CR2 0DE.

ATTENTION JR-310 Owners: Have your JR-310 converted into a JR-310 super-de-luxe — Top Band, Crystal Calibrator, improved 40-metre performance, 29.5 to 30.1 MHz (for two-metre converters) and Alignment checked, at cost of **£16-50** inclusive VAT for receivers in as-new condition (sorry, no hashed-up specimens accepted). Securicor return carriage **£3-30** if required. Accessories, VAT and post paid, for D-I-Y types (but sorry no gen.), SSB or CW filters, **£16-50**, Top Band crystal **£3**, crystal for 29.5 to 30.1 MHz, **£3-30**. Details for s.a.e.—**G3LLL, Holdings Ltd.**, 39/41 Mincing Lane, Blackburn, Lancs., BB2 2AE. Tel: 59595/6).

JULY Issue: To appear June 28, if possible. Single copies at 32p post free will be sent by first-class mail for orders received by June 26, subject to supplies being available.—Circulation Dept., Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H 0HE.

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

SALE: Yaesu FT-DX401 Tx in absolutely mint condition, proclaimed as one of the best on the air; reason for sale — gone separates (chance to buy at **£120** under today's prices) first **£230** secures.—De Bono, G3NJK, QTHR. (Tel: 05376-5675 Leicesters).

SALE: Capacitors, panels, plugs, sockets, very cheap, new and surplus, must clear the lot; send s.a.e. for bargain list. Two only U50 DX Test Meters, brand new, £8 each. Standard jack plugs, 10p each. 50K skeleton presets, four for 10p. (Norwich).—Box No. 5224, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

SELLING: FT-75 transceiver, FP-75 PSU, two metre Transverter in matching cabinet, Price £155 or near offer. 2 x MBM4-6, 2/14P. — Allen, G8FAP, QTHR.

FOR SALE: Yaesu FT-2FB plus FP-2AC/B PSU, 12 months old, mint condition, f.w.o. 144.48, 144.60, 145.00 MHz, plus GB3PI, with accessories, cost £150 but £100 secures. Reason for sale: Excess speed (money goes too fast!).—Ring Somers 0296 (Aylesbury) 83506.

SALE: Hy-Gain 18-AVT/WB vertical aerial for 10 to 80m., in excellent condition, with instructions. Price £27, carriage paid.—Mickleburgh, G4BRF, 85 Carey Park, Polperro, Cornwall.

FOR SALE: Ideal VHF QTH, 230-ft. a.s.l., good take-off in all directions, comprising: Semi-detached with 3 bedrooms, lounge diner, central heating, garage, utility area, £8,500 or near offer.—Ord, 40 Norham Avenue, Horsley Hill, South Shields, Co Durham. (Tel: Sunderland 71481).

WANTED: ART/13 in good condition and complete, with no mods.—Advertiser, 60 Granville Road, Welling, Kent. (Tel: 01-303 8873).

SELLING: Viceroy Mk. IV, excellent, £70. AR88D receiver, excellent, £45. Wavemeter (FSM), £5. Test meter, £5. 10-in. communication speaker, £4. Collins mechanical filter, 2 kHz/455, £10. Collins BFO, 455 kHz, £4. Minimixer converter, £9. BC-453, £3. TU5B, £1. Sideband filter, 8400 kHz, and carrier crystals, £5. Crystals 454 and 456 kHz, £3. M/c phones and key, £2. Crystal for HRO, £1. 832A valves, £1 each. 813 valves at £2 each. Carriage extra smaller items. — Miller, 72 Station Road, Banks, Southport (25007), Lanes.

WANTED: Lafayette HA-55 aircraft band receiver, also T.W. or G. & D. nuvistor two-metre converter with 2.0-4.0 or 4.0-6.0 MHz IF, and HRO coil pack to cover 28-30 MHz. — Fry, G3TZV, 3 Geneva Road, Bramhall, Stockport, Cheshire. (Tel: 061-439 6174).

FOR SALE: Antenna Rotator, OK for small 20-metre beam, boxed and unused, £18. Four-Metre BCC low-band 30w. base station, with remote control unit, one working mobile and several "gash" units suitable for spares, £15. Vidicon Scan and focus coils, £5. TV Engineer's case with compartments for valves, meter and tools, with 65 modern TV valves, £15. Digital Clock, SN7400 series IC's and seven segment displays, working but requires attention, £8. Smith's 0-6000 r.p.m. tachometer, unused, £4. Radiospares de luxe O/P transformer and heavy-duty mains xformer, £2-50, both unused. Speakers: Celestion G.12 in cabinet, £5; Stentorian tweeter and cross-over network, £3. QQV06-40A, new, £5.—Craven, G3PUN, QTHR or ring Reading 695858.

WANTED: TGS-10 TDMS, good price paid; also Racal RA-66B panoramic adaptor. **SALE:** Nickel-cadmium battery 30v. 100 AH with charger and 115v. 400 cycle inverter, £15. Type 75R teleprinter silence cover, £10; with pedestal, £15.—Fletcher, 62 Moorbridge Lane, Stapleford, Nottingham, NG9 8GU (Tel: 0602 397446).

MANUALS: 250 titles available, state requirements.—Brooks, 5 Farrant House, Winstanley Road, London, S.W.11.

WANTED: Eddystone S.750 or S.640 Rx, also Panda Cub or K.W. Valiant Tx. Please contact Morgan, G3MFM, 073525 3701 (Nr. Reading, Berks.).

EXCHANGE: Wavemeter Class-D for good quality straight Morse key, or will purchase a key.—Buck, 112 Fairfax Avenue, Hull, HU5 4RB.

G3HEO**G8FAL****D. P. HOBBS LTD.**

Most radio components for the amateur, including: Trio equipment, Microwave Modules converters, J-Beam aerials, Bantex whips, test meters, etc.

THIS MONTHS BARGAIN OFFER

18PF Butterfly capacitors, 30p.

24mHz coils in cans with core, 15p.

72mHz double-tuned coils in cans with cores, 18p.

ALL NEW EX-PYE CAMBRIDGE

Prices include postage, add 10% for VAT

11 KING STREET, LUTON

Telephone 20907

DON'T BUY A DIGITAL CLOCK

UNTIL YOU HAVE SEEN OUR LEAFLET AND SPECIAL DISCOUNT PRICE LIST FOR RADIO AMATEURS and S.W. LISTENERS. (s.a.e. please). WE ARE YOUR SPECIALISTS, HAVE THE MOST COMPREHENSIVE AND LARGEST STOCKS, CHECK EVERY INDIVIDUAL CLOCK, AND ALWAYS DESPATCH BY RETURN.

Aero & General Supplies**NANAIMO HOUSE, 2 RINGWOOD AVENUE,****LEEDS LS14 1AJ.****TEL. 658568****G3ACQ offers:**

TRIO 9R 59DS £46.75. Yaesu FT 75 Mobile. Second-hand FR 50. Solid State Modules V.H.F. 2 Metre Converters. Stolle Rotors. J Beam—and **CRYSTALS LARGE STOCKS** — s.a.e. please. 60,000 in stock.

S. MAY (Leicester) LTD.**12/14, CHURCHGATE, CITY CENTRE, LEICESTER, LE1 4AJ****Telephone : 58662****SEVERN-TRENT WATER AUTHORITY****Warwickshire Water Supply Division (Coventry)**

FOR SALE (as viewed).

MARCONI V.H.F. SIGNAL GENERATOR Type TF1064

Covering 68 MHz to 470 MHz in three ranges, with direct reading incremental control on each range. Output controlled by a piston attenuator calibrated from 0.5 micro volts to 10 milli volts.

Modulation, a.m. and f.m. at a fixed 1000 Hz.

I.F. oscillator with five positions for plug-in crystals to give five spot frequencies between 290 kHz and 16 MHz. Complete with handbook.

WANTED**PYE RADIOTELEPHONE EQUIPMENT***Top Prices Paid***B. BAMBER ELECTRONICS****20 Wellington Street, Littleport, Cambs.****Tel. ELY (0353) 860185**



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-6/4

BRITISH NATIONAL RADIO & ELECTRONICS
SCHOOL P.O. BOX 156, JERSEY, CHANNEL ISLANDS

NAME: _____

ADDRESS: _____

_____ BLOCK CAPS please

MSI MARKETING SERVICES INTERNATIONAL

(A COOKE INTERNATIONAL ELECTRONICS COMPANY)

NEW GEC RC600B midband, single channel 25 kcs. FM Radio
telephones 20w. output. Receiver can be removed and operated
separately. Transmitter can be mounted under dash or in boot.
Supplied in makers box with mike plugs etc., but less loud-
speaker (3 ohm) and interconnecting lead (12 way). Price
including carriage in U.K. ... **£35-00**

Ex system, overhauled Cossor CC701 AM 12½ kc/s. High band
mobiles. Dash mounting, solid state, about 7w. output. Price
including carriage in U.K. ... **£75-00**

NEW Raytheon Marine R/T. Solid state. VHF 6 channel compact
units complete in makers box at (carriage inc.) each **£160-00**
Marine aerials to suit above ... (carriage inc.) **£25-00**

LIMITED FRESH STOCKS OF GEC RC500's High Band FM
25 kc/s. hand held personal R/T. Pocket size. Works on 144 MHz
with good results, only needs crystals (2) and a DKZ225 DEAC
battery. New in makers box ... (carriage inc.) **£25-00**

Can be supplied crystallised up to your choice at extra cost.
New miniature mains cable, 3 core, PVC ... per metre **8p**

Miniature mains transformers, 240AC in 12volt 120ma. out ea. **80p**

New unmarked transformers OCT1 ... ea. **12p** or per 100 **£10-00**

Ex WD watches cleaned and overhauled as necessary. Longines
pocket, chrome case white face black numerals centre sweep
seconds hand ... (carriage inc.) **£12-00**

Omega wrist stainless case, white face, black numerals, centre
sweep seconds hand ... (carriage inc.) **£9-00**

A few with black faces, larger waterproof case ... **£12-00**

New Stentorian speakers 5" square 45 ohm in makers box. ea. **50p**

Bags of assorted resistors and capacitors. New useful values,
our choice ... per bag **50p**

Stocks change continuously, if you don't see what you want,
write in enclosing a S.A.E. and we will try to help.

Terms: Cash with order. Carriage on orders under £11, 20p extra
unless otherwise stated. V.A.T. please add 10%. Trade customers
welcome.

RAMALLA HOUSE, ANCTON LANE,
MIDDLETON-ON-SEA, BOGNOR REGIS, SUSSEX
Telephone: Middleton-on-Sea (STD 024-369) 2849

SELLING: Drake R-4B, less than one year old,
£195. Drake MN-4, £45. Comdel speech processor,
mint, £60. G-Whip Multimobile 71 aerial with 40m.
and 80m. coils, £16; Creed Model 85R, new condi-
tion, with manual, £12. — Barry, G3UFU, 15 Fair-
lawn Court, London, W4 5EE. (Tel: 01-944 6931).

EXCHANGE: Eddystone 770R VHF receiver in good
working condition, with plinth speaker and
manual, **FOR** a general coverage receiver. **W.H.-Y?**
—Box No. 5223, Short Wave Magazine Ltd., 55 Victoria
Street, London SW1H-0HF.

SALE: HRO MX receiver, coverage 50 kHz to 30
MHz, with nine coil packs, power supply, set of
valves and handbook, £25 or near offer; PCR
receiver, 550 kHz-22 MHz, £6 or near offer. Buyers
collect. —Tye, 5 Ball and Wicket Lane, Hale,
Farnham, Surrey.

WANTED URGENTLY: Circuit, data and informa-
tion on Industrial Electronics oscilloscope Model
587. Copies paid for, or originals returned. Details
and price please.—Ring Steddy, Caterham 4546
(Surrey).

OFFERING: "Short Wave Magazine," Vol. 1 No. 1
to Vol. 29 No. 12, total of 309 monthly issues, only
15 copies missing; Vols. 1 and 2 are bound; all in
good condition. Also Vol. 2 No. 6 to 12, and Vol. 3
No. 1 to 7, being last copy due to outbreak of war.
"QST," Feb., Sept., Oct. 1936, and Sept. 1939 issues.
RSGB "Bulletin," 1950 to 1967, 183 copies in all.
"Practical Wireless," 1953 to 1971, 132 copies
altogether. Best offer accepted. Buyer collects.—
Turner, 56 Reeds Avenue, Earley, Reading, Berks.

SELLING: Liner-2 (low-end), with PSU and pre-
amp., almost new, £120. "Microwave Modules" 144
MHz converter, IF 14-16 MHz, £10. Linear, 150w.,
144 MHz, with built-in PSU on Imhof chassis, £25.
One-kilowatt linear, 144 MHz, no PSU, needs atten-
tion, £25. Pye Tx, 50w., AM/CW, built-in PSU, £15.
Osker SWR-200 power meter, £15.—McHenry, 2a
Park Town, Oxford. (Tel: 0865-56321).

WANTED: TCS-12 receiver with external PSU and
BFO, must be in working order, £12 offered.
(Required by CW-crazed SWL). Details please.—
Heslop, 4 Willow Close, Brandon, Durham DH7 8AH.

SALE: AR88D Rx with S-meter, £32 or near offer;
Heath DX-100U Tx, £25; both with manuals. (Going
transceiver). Prefer buyers collect. Also Bauer
keying lever, mint, £3.75.—Hainsworth, G3ZNK,
QTHR. (Tel: Rawdon 4599, Yorks.).

FOR SALE: Codar CR-70A, PR-40 and speaker, as
new, £25.—Maddison, 59 Brampton Tower, Bassett
Avenue, Southampton (67394), Hants.

FOR SALE: Drake TR-4 with remote VFO and PSU,
one owner, mint, £230 cash only.—Tynan, G3TNL,
QTHR.

WANTED: Telequipment S-51B oscilloscope. Details
and price please.—Berden, G3RND, QTHR. (Tel:
098-382 5398, evenings).

SELLING: Eddystone 940 receiver, £95; Sommer-
kamp FR-DX500 receiver with Trio SP-5D speaker,
£95; Taylor Model 67A signal generator, £15;
Superior Instrument Co. Model 650A signal genera-
tor, £7; Triplet Model 1632 signal generator, £15;
Pye Ranger portable transmitter converted to mains.
£4; Avo Model 8 with case and leads, £10; Avo Test
Bridge, £6; Avo Electronic Testmeter, £15; BC-221M
U.S. Army frequency meter, £10; Uncased 'scope,
working, £5. All cash. Buyers collect.—Ring Street,
021-777 6517 evenings, or 021-705 8201 office hours.
(Birmingham).

SALE: Eddystone EA-12 Rx in almost mint condi-
tion, with handbook and plinth speaker, £150.—
Lovell, G3JUW, 5 Montpelier Road, Ilfracombe,
Devon.

WANTED: Power unit for SP-400SX, and copy of
"QST" August 1970.—Everall, 36 Eleanor Road,
Waltham Cross, Herts.

JULY Issue: To appear June 28, single copies at 32p post free will be despatched first-class mail on receipt from printers. Orders by June 26, with remittance to: Circulation Dept, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

FOR SALE: Eddystone 940 receiver, requires some mechanical attention. ARRL/RSGB Handbooks, £60 or near offer. A gift.—Higgins, 14 Wallingford Avenue, London, W.10.

SELLING: FT-401 transceiver with speaker, in first class condition, £205; also BC-221 with AC/PSU chassis, £15. (Berks).—Box No. 5227, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: TR-44 rotator or similar. Also 50-ohm low-loss coax cable. — Linney, G3VQL, The Hollies, Kinton, Nesscliffe (230), Salop.

WANTED: FR-40SDX or similar good receiver, must be in mint condition. Details and price please.—Walton, 2 Billy Mill Avenue, North Shields, Northumberland (Tel: 089-45 79887).

FOR SALE: Very cheap, as buyer must come long way to view or collect! Quantity Creed 7B's with 24v motors, in good order. Distortion analyser. Double 6v and HT power supply; another, suitable for high-power finals, smoothed. Various common valves. Admiralty UHF receiver, by BTH, covers 70 cm. — Jarvis, GM8APX, QTHR, or ring 08822 (Kinloch Rannoch) 379.

EXCHANGE: R.216 VHF receiver with matching PSU for similar Rx with 12v. PSU.—Peters, 4 Spencers Bellevue, Lansdown Road, Bath, BA1 5ER.

WANTED: Details and information regarding Admiralty set Type P.104. Cash for all information received.—Northcott, 60 Harvell Street, Plymouth, Devon.

SALE: Trio JR-310 with Top Band and matching SP-5D sneaker, mint condition, £60; Codar AT-5 with AC/PSU, £15.—Powell, 70 Linden Road, Dunstable (607443) Beds.

WANTED: Hy-Gain 18-AVT/WB vertical aerial. Details and price please.—Grainger, 50 John Street, Brierley Hill, Staffs. (Tel: Dudley 55948).

EXCHANGE: Photographic equipment valued at £ over £400, including Bronica S.2A camera and MPP universal enlarger FOR SSB station gear, transceiver or separates but latter preferred, must be in original unmodified condition; s.a.e. for full list, please.—Box No. 5221, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

EXCHANGE: World's smallest, lightest, portable television receiver, new, FOR Barlow-Wadley Mk. II receiver.—Ring Palmer, 01-378 2303 (Richmond, Surrey).

SELLING: FT-150 transceiver with Top Band addition on Aux-3 position, power reduction switch, two spare PA valves, DM-150 mic., £170 or near offer. (Changing to FT-101). Delivery by Securicor arranged if required.—Dodge, GM3PCX, Firchside Lodge, Albert Street, Nairn, Scotland.

WANTED: Tech TE-15 GDO. Selling: R.1155 Rx, rough condition. Offers?—Taylor, 39 Openshaw Road, Abbey Wood, London, SE2 0TD.

WANTED: Accurate late-model BC-221 with charts, PSU and modulator, must be in good unmodified condition. Details and price please.—Capt. Taylor, 633 Sig. Tp., BFPO 12.

WANTED: Heathkit HW-17A with HW-17-1 DC inverter, HG-10 VFO and handbook. Details and price please.—Burgess, G8EWL, QTHR. (Tel: Uxbridge 51715).

SALE: DX-40, £10; 2m. Tx, 12v., modified, with PSU, £12; PR-30, £4; Ranger, Low-Band, £4; 30-ft. two-section wooden tower, £4. Buyers collect or carriage extra.—Banister, G4BEE, QTHR. (Tel: Chorley 6202 after 6 p.m., Lancs.).

HAMGEAR ELECTRONICS

Presenting our latest preselectors for the serious Dxr:—

THE P.M.IID, covering 1.5 to 34 MHz in five overlapping bands.

Has a built in PI tank antenna tuner.

Has a listen thru switch position.

Has an average gain better than 32 dBs, checked over the ranges.

Will suit most communications receivers, but not your transistor portable.

Has an FET plus two bipolars in cascade, common emitter mode with negative feedback.

Battery powered and priced at £11-50, plus 27p postage.

THE P.M.IIX. Specification as the P.M.IID but has a mains power supply, complete with indicator and fuse. Price £16-50.

THE P.M.IIF. Specification as P.M.IID but has a built-in calibrator as well, having switched outputs at 1 MHz, 500 kHz, 100 kHz, 50 kHz and 10 kHz. Complete with mains power supply, fuse and indicator. Price £22-50.

P.M.IIFB. Specification as P.M.IIF but with extra outputs on the calibrator at 1 MHz, 500 kHz, 250 kHz, 100 kHz, 50 kHz, 25 kHz, 10 and 5 kHz. Price £29-50.

All units plus 27p postage.

Send for details of these and our other units.

Office, 2 Cromwell Road, Sprowston, Norwich,
NOR 65R

WORLD RADIO/TV HANDBOOK 1974

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.

£3.05

(The above price includes postage and packing).

from:

SHORT WAVE MAGAZINE
55 Victoria Street, London, SW1H 0HF

CALL BOOKS

INTERNATIONAL :

RADIO AMATEUR CALL BOOKS (1974)	
"DX Listings"	£3-82
"U.S. Listings"	£4-25
"G's" only 1974 Edn.	75p

MAPS

DX ZONE MAP (GREAT CIRCLE) In colour with Country/Prefix Supplement Revised to September 1973	£1-20
AMATEUR RADIO MAP OF WORLD Mercator Projection — Much DX Information — in colour. Second Edition	66p
RADIO AMATEUR MAP OF THE U.S.A. AND NORTH AMERICA State boundaries and prefixes, size 24" by 30", paper	62p
RADIO AMATEUR'S WORLD ATLAS In booklet form, Mercator projec- tion, for desk use. Gives Zones and Prefixes (New Edition)	£1-11

LOG BOOKS

Standard Log (New Glossy Cover)	62p
Receiving Station Log	46p
Minilog	26p

(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 including U.K. P.P.I. etc.	£4-95
*Beginner's Course with two 3 speed L.P. records with books including U.K. P.P.I. etc.	£3-65
*Single 12" L.P. Beginner's with book including U.K. P.P.I. etc.	£3-00
*Single 12" L.P. Advanced with book including U.K. P.P.I. etc.	£3-02
Three speed simulated GPO test. 7" d.s. E.P. record. including U.K. P.P.I. etc.	£1-00

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/C No. 547 6151)

WANTED: Buy or borrow circuit diagram for R.1475 receiver.—Murphy, Athlone Road, Ferbane, Offaly, Ireland.

WANTED: Any spares, especially RV29-800 valves for Nazi German communication Rx Type Kw.E.a (made in 1941), or would consider defunct or damaged Kw.E.a for cannibalisation; also mains PSU for same ("Netzschlussagent NA6"); R.308 VHF Rx, condition unimportant provided complete and working.—Clyne, 78 Halford Road, Ickenham, Uxbridge, Middlesex UB10 8QA. (Tel: Uxbridge 30006 after 7 p.m.).

WANTED: Pye International Model PE-80 mains SW receiver. Good price offered.—Whiteley, 25 Pine Road, Todmorden (2169), Lancs, OL14 8EE.

SELLING: Liner-2 with mains PSU, £100; two-metre linear, with 4CX250 and PSU, 2-2 kV at 770 mA. £35. Linear amp. with two 4CX250, 225-400 MHz, OK for 70 cm. or 2m. conversion, £22. Murphy transistorised linear, two metre 12v., 40w. p.e.p., £30. **WANTED:** Good HF SSB rig. Details and price please.—Smith, 30 Brunswick Road, London, N.15 (Tel: 01-800 6932).

SELLING: Pye CAT general coverage Rx complete with RM PSU etc., all in excellent condition. Offers?—Ring Hounslow, Northampton 31362.

FOR SALE: Yaesu Museu FT-DX400 transceiver, coverage 80-10m., complete with matching microphone and operating manual, excellent condition, £100 or near offer.—Bates, 20 Ashford Road, Wellington, Somerset.

SELLING: 625-line television camera with lens, cable and 9-in video monitor, excellent condition, £70. Prefer buyer inspects and collects.—Ashby, G4AYT, 25 All Saints Close, Whitstable (3563), Kent.

FOR SALE: K.W. Viceroy Mk. III Tx, AM/CW/SSB, with fitted extra half-lattice filter, original handbook and circuit diagram, immaculate condition with heavy-duty aerial changeover relay. Price £55, buyer collects.—Ward, G8EEN, 77 Chichester Park, Westbury, Wilts.

SALE: VHF twin tetrodes to 200 MHz, Type 832/VT118, boxed, £1.50 each. Pair each HK-24 and HK-24G VHF triodes, new and boxed, £1 each. Mercury rectifiers Type 866. Little used, good, 50p each. Four Eimac 4-65A's, new, boxed and unused, £4 each. Heater transformer for 866's, canned 230v. primary, HV insulated, £3. —Addie, G8LTL, QTHR. (Tel: Blakesley 321, Northants.).

SELLING: Barlow-Wadley Mk. II Rx, £55. Carriage paid, or free delivery 50 miles Northampton.—Watton, G4AYZ, QTHR. (Tel: 0604-33834).

FOR SALE: J-Beam 14-ele 2m. Parabeam, nearly new, with 8-ft. mast. £12. R.107 Rx, 1-2-18-0 MHz, fair, £8. Heath DX-40 and VF-1U partly converted for 160m., £15. Heavy duty transformer, 1100v., £8. G4ZU-type Minibeam, 10-15-20m., disassembled, some insulators broken, £8.—Byrom, G3UCR, QTHR. (Tel: Tadworth 3252 evenings, Surrey).

SALE: Swan 350 transceiver with calibrator, external VFO and AC/PSU. £175. Trio JR-500SE. £42. Telford TC-7 Mk. II, tunable IF 28-30 MHz. £33. High-power balun, £7. Sony 101 tape recorder, £20. RX-60N receiver with Codar PR-30X preselector, £16. LED 75-ohm SWR bridge, £5. Prefer buyers collect.—Lewis, G4APL, 20 Annes Walk, Caterham, Surrey.

OFFERING: RITTY Creed Model 75 printer, less motor, otherwise perfect. Offers? **WANTED:** KV6 9 MHz filter and xtals.—Osborne, G3YGM, QTHR.

WANTED: Pye W15.AM Westminster, dash mounted. Details and price please.—Green, G3TRL, QTHR. (Tel: 051-355 2017).

FOR SALE: Avo Model 8, completely overhauled, £26; TS-60R Minimeter £3.—Box No. 5222, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF.

URGENTLY REQUIRED: Plug-in coil packs for Eddystone 358X receiver. Would consider scrap Rx with coil set if price acceptable.—Taylor, G3YJM, QTHR. (Tel: Preston 36279).

BARGAIN: K.W. Viceroy Mk. III Tx, K.W. E-Zee Match, and matching KW-77 Rx, £80. Labgear LG-300 Tx, 150w., coverage 80/10m., with matching mod./PSU, £35. G.E.C. BRT-402E Rx, £35. All in good condition and with circuits. Or £130 The Lot.—Wilde, 25 St Dennis House, Manor Close, Melville Road, Edgbaston, Birmingham. (Tel: 021-454 2612).

FOR SALE: Eddystone 750 Rx with matching speaker and S-meter, £50.—Ring Church, Hemel Hempstead 50321 after 5.30 p.m.

SELLING: S.S.M. PA-3 pre-amp., £3; HC6U crystal, 44-766 MHz, £2.—Edwards, 126 Danescroft Drive, Leigh-on-Sea, Essex.

SELLING: Sony CRF-230 Global transistor battery/ mains portable receiver, 23 bands, in mint condition (list price £379), accept £200 or near offer.—Tully, 5 Armstrong Drive, West Moor, Newcastle-upon-Tyne, Northumberland.

FOR SALE: Collins KWM-2 transceiver, 60 hours' use only, £500. K.W. SWR bridge, new, £6. Two German Zenith walkie-talkies, unused, £80 the pair.—Ring Goodbody, 01-592 7800 daytime, or Romford 61191 evenings.

FOR SALE: Limited quantity of fibreglass/copper laminate printed circuit board, 1p per square inch, any size. Please send s.a.e. to fit.—Taplin, Camelot, Moor Lane, Southorpe, Fakenham, Norfolk.

SALE: B.44 transceiver, 4-metre, £8. Pair of new '6-40's, £4. Pair of new '6-40's, £4. 455 kHz mechanical filter with carrier xtal, £5.—Osborne, G3YGM, QTHR.

SELLING: Chassis-mounting, ex-equipment capacitors: 2 micro-farad, 1500v., 40p; 4 micro-farad, 2,000v., 50p; 2 micro-farad, 1,200v., 30p; 2 micro-farad, 500v., 20p; 4 micro-farad, 350v., 20p; also 1N4007 1,000v. pin diodes, 10p. (Yorks).—Box No 5225, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

OFFERING: AR88LF, £20; DX-100U, £30. Both "or near offer." Carriage extra. **WANTED:** T.W. Communicator, or similar, for 2 metres.—Bushell, GW3OSV, Park East, Clarbeston Road, Pembro, West Wales.

WANTED: R.206 Mk. II receiver with power supply and manual, must be in excellent condition. Your price paid if up to required standard.—Ring Billington, 01-656 9882 after 8 pm.

FOR SALE: Trio 9R-59DS Rx with speaker. Offers? Four-metre converter and power pack, £2. Press-to-talk microphone, £2. Valves and components going cheap.—Walsh, 65 Lees Road, Mossley (2755), Ashton-under-Lyne, Lancs, OL5 0PE.

EXCHANGE: Mobile power supply for all Heath or K.W. transceivers, £20. Or W-H-Y to swap?—Warrick, G3VCI, QTHR.

WANTED: HQ-170A amateur bands receiver, must be in excellent electrical and mechanical condition. Details and price please, cash transaction. Will collect within 150 miles of London.—Box No. 5226, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

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 4.95 including P.F. etc. (overseas £1 extra.)

For further details of course Ring 01-660 2896 or send 4p stamp for explanatory booklet to:—S. BENNETT, G3HSC (Box 14) 45 GREEN LANE, PURLEY, SURREY

BBC requires OPERATIONAL ASSISTANT/SCHEDULE RESEARCH MONITOR for its Monitoring Service at Caversham, near Reading, Berks. Duties include checking of voice transmissions, compiling schedules and writing short listening observations. Holders also have to ensure that language monitors obtain the best possible reception of foreign broadcasts covered. A certain amount of night shift work is involved and the holder will be required to undertake tours of duty overseas. Applicants should have an interest in international broadcasting and must be able to operate communications receivers and other monitoring equipment. Ability to identify the main languages is essential and knowledge of at least one foreign language is an advantage. Shortlisted candidates may be required to undergo tests. Starting salary £2,235 rising by annual increments to £2,820 plus 10% or 15% shift allowance.

Write for application form to PERSONNEL OFFICER,

BBC, Caversham Park, Reading, RG4 8TZ, quoting reference 74.G.219.SWM.

DERWENT RADIO

5 COLUMBUS RAVINE, SCARBOROUGH. Tel. SCA 65996
Showroom open Tuesday/Thursday/Friday/Saturday

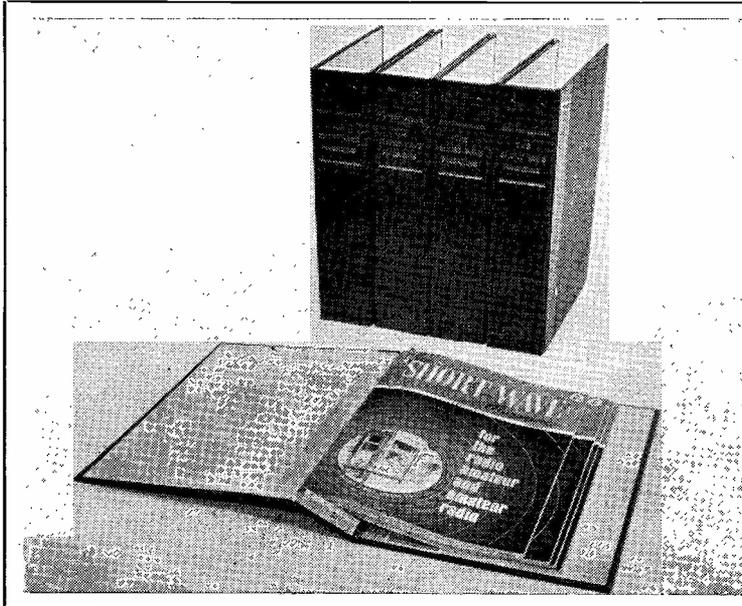
KW 202 Rx and Spkr	£176-00	Transistors 2N3819	38p
KW 204 transmitter	£187-00	2N3053	26p
KW 107 match	£66-00	2N3055	44p
KW EZ match	£22-00	3N140 & 141	80p
KW 103 swr and power	£15-40	BC 107 108 109	12p
KW aerial switch	£5-50		12p
KW Balun	£2-75	10PF variable capacitor	17p
KW Atlanta vfo	£39-00	25PF double bearing cap	30p
Yaesu FR50B	£71-50	30PF double bearing cap	30p
Yaesu FL50B	£82-00	50PF DIFF	19p
Unica UR1A	£27-50	100PF double bearing	33p
Skywood CX203	£35-70	500pf two gang	60p
Lafayette HA800	£62-00	90pf two gang	66p
Trio 9R59DS	£51-70	Liliput lamps, 6v. or 12v.	8p
Codar multiband kit	£12-65	Large Car Type crocs.	8p
TE15 GDO	£16-50	Mono/stereo headphones	£2-65
Sentinel 2m. converter	£15-12	Decon printed cct. pen	75p
Sentinel 4m. converter	£15-12	300 ohm twin feeder yd.	8p
Sentinel 70cm. converter	£15-12	Telephone pick-up coil	38p
Sentinel 2m. pre-amp	£7-15	Verobard assortment	60p
2 way intercom	£2-86	Veropins .1 or .15	17p
2,000 ohm headset	99p	Egg insulators	6p
1-20v. D.C. p.s.u. 1A stab.	£11-80	Panel "SP" meter 2"	£1-80
7" speaker 8 ohm	38p	R substitution box	£1-80
3 1/2" speaker 8 ohm	48p	C Substitution box	£1-65
6 BA bolts pack	11p	Pre set caps 4.5 p 3/20pf	5p
6 BA nuts pack	11p	10-40 10-120pf	3p
20 IC's with data	£1-10	Service head/mic. set	£1-40
G Whip tribander	£11-58	Panel mains neon	20p
Whip aerial	£4-40	Meter test probe and leads	38p
G Whip 160/80m.	£9-90	In line fuse holder	8p
G Whip flexiwhip	£9-46	20mm. fuse links 500ma	2p
Coils	£4-67	to 3A	44p
G Whip basement	£1-59	36" chrome Whip aerial	88p
Whiptraps standard	£3-00	36" chrome Whip aerial	13p
Whiptraps high power	£4-10	Mini push switches	27p
Shure 201	£6-50	Ali boxes 2 1/2" x 4 1/2" x 1"	27p
Dynamic 50K ohm P.T.T.	£3-95	2 1/2" x 4 1/2" x 1 1/2"	30p
"J" Beam Halo	£1-82	2 1/2" x 4" x 1 1/2"	29p
Boom mic (ceramic)	£4-95	2 1/2" x 4" x 1 1/2"	27p
4 digit impulse counter	12p	7 1/2" x 4 1/2" x 2"	40p
50 resistors	22p	3 1/2" x 4 1/2" x 2"	33p
50 1w. resistors	22p	3 1/2" x 5" x 1 1/2"	4p
50 capacitors	33p	Banana plugs black or red	5p
50 disc ceramics	15p	hono plugs	7p
20 wire wound resistors	50p	Phono sockets	8p
10 mixed potentiometers	80p	Phono sockets double	12p
10 mixed wafer switches	40p	Phone sockets four way	10p
10 croc. clips	10p	Ferric chloride 1lb bag	35p
Mixed sleeving pack	10p	10 .1mf 400v. capacitors	17p
American flat 2-pin plug	17p	10 mixed electrolytics	35p
Line socket for above	40p	10 mixed silver micas	12p
14 and 16 way DIL sockets	33p	3 C60 cassettes (screw fix)	£1-00
KW 2000A D.C. p.s.u.	40p	Morse practice oscillator	with key
Amphenol PL259	33p		£1-50
SO239 single hold fixing	8p		
Reducer	9p		
Double sided copper clad	9p		

Second-hand equipment:		We will give good prices for quality cams, either as trade-in or cash.	
Sentinel 2m. converter	£12-00		
Trio 9R59DS	£8-00		
Pho hiband ranger	£8-00		
Eddystone EC 10	£40-00		
Eddystone 750	£60-00		
Trio 9R59DE	£38-00		
R.F. test oscillator	£11-00		
KW 2000A D.C. p.s.u.	£25-00	Swan 350 D.C. p.s.u.	£30-00
TW 160m rx	£4-00	Ten Tec PM23 Xceiver	£30-00
Labgear 160m tx £ p.s.u.	£22-00	Heath 5" lab scope	£35-00
Codar AT5 tx rough	£14-50	National NC 33	£18-00
Heath RF sig gen	£14-00	Eddystone 680x	£65-00
Heath GDO & UHF coils	£12-00	Codar AT 5 tx	£19-00
Ex WD Morse key	33p	Codar T28 rx	£14-00
		Codar 12v. p.s.u.	£10-00
		Eddystone EC10 II	£60-00
		Yaesu FR50b	£58-00

QSL POCKETS for 120 cards 40c incl. VAT/Post. 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.

PLEASE ADD EXTRA FOR CARRIAGE. S.A.E. FOR LISTS MAIL ORDER TO

(Telephone 63982)
28 HILLCREST AVENUE, SCARBOROUGH, YO12 6RQ



CREATE YOUR OWN REFERENCE LIBRARY

The "EASIBINDER" is designed to bind 12 copies of the Magazine as you receive them month by month, eventually providing a handsomely bound volume for the bookshelf.

No need to wait until twelve copies are assembled. As each copy is received, it is quickly and simply inserted into the binder. Whether partially or completely filled, the binder is equally effective, giving the appearance of a book, with each page opening flat.

Strongly made with stiff covers and attractively bound in maroon Leathercloth and Milskin, the binders have only the title gold blocked on the spine.

Price £1.15 post free.

(Available end of February 1974)

PUBLICATIONS DEPARTMENT
SHORT WAVE MAGAZINE
55 VICTORIA STREET
LONDON, SW1H 0HF

*Subscription rate to Short Wave Magazine is £3.20 (First Class)
£2.75 (Second Class) for twelve issues.*

GET IT TAPED THE COMMUNICAIDE MORSE MASTER

is the certain way to learn morse

START NOW PICK A PACK TODAY

Each pack contains three 90 minute tapes

BEGINNER PACK	...	...	3—8 w.p.m.
INTERMEDIATE PACK	...	...	8—12 w.p.m.
ADVANCED PACK	...	...	12—15 w.p.m.
FIGURE PACK	...	...	3—8 wp..m.
QUALITEST PACK	...	Simulated exam exercises	

Special Offer for the Complete Beginner
90 min. Introductory Tape for only £1.65

Discover for yourself how our unique home study techniques will sustain your interest and enthusiasm. Seven day refund guarantee. Any one pack £6.30. Any two packs £12. Any three packs £17.55. Any four packs £22.80. The complete course of five packs £27.00. State whether Cassettes or L.P. tapes required.

MINIWISE PRODUCTS
P.O. Box 99, Bletchley, Milton Keynes, MK3 5BR

HONDA GENERATORS

AT COMPETITIVE PRICES

Models 300—4000 watts A.C. and 6, 12 and 24 volts D.C.

IMMEDIATE AVAILABILITY MORE LIKELY IN SPRING & SUMMER
For full details, terms and **COMPETITIVE PRICES WHICH INCLUDE FREE DELIVERY IN THE UNITED KINGDOM**, Call, Write or Phone **GODALMING 23279**. Open Tues. - Sat.

**Ashley
Dukes**

FARNCOMBE STREET,
FARNCOMBE,
GODALMING,
SURREY

THE INTERNATIONAL TRANSISTOR DATA MANUAL - 1974

The improved and updated 1974 edition contains basic characteristics on upwards of 20,000 transistors of international origin and the most comprehensive listing of substitutes. Make sure of your copy by ordering NOW and save £1.00 on the r.r.p.

SEMICON INDEXES LTD.
Free Post, Wokingham, Berks., RG11 1BR
Price to SW.Mag. readers (UK only) £7.80 inclusive

**MOBILE ANTENNAE**

4 metres :		
Unity gain quarterwave, with hinge base (A5-2)	...	£2.41
with screw base (A6-1)	...	£2.35
2 metres :		
+4dbD 5/8 wavelength, with hinge base (A5-6)	...	£4.15
with screw base (A6-5)	...	£4.10
with swivel base as for broadcast Antenna, including moulded-in 4m. cable UR73 (A7-4)	...	£5.73
70 cms :		
+4dbD 5/8 wavelength, with hinge base (A5-10)	...	£3.18
with screw base (A6-9)	...	£3.12

FOR HANDHELD SETS

Helical antennae type FX. Flexible, rugged and one-third $\frac{1}{4}$ wavelength. They can give improved performance to standard $\frac{1}{4}$ waves both electrically and mechanically. Many terminations available, i.e.:

FX 2 metres with BNC termination	...	£3.36
FX 4 metres with Pye Bantam termination	...	£3.49

LARGE S.A.E. FOR CATALOGUE

ALL PRICES INCLUDE VAT

ALL ANTENNAE ARE SET ON FREQUENCY AND REQUIRE NO ADJUSTMENT

PIECE PARTS AVAILABLE SEPARATELY

ANTENNA & ELECTRONIC CONSULTANCY

74 UPPER SHERBORNE ROAD,

Basingstoke, Hants., England

Telephone : Basingstoke 27527

North West Electrics

ALL PRICES ARE INCLUSIVE OF VAT

SPEAKER CABINET. 7 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 5" fitted with 7" x 4" 8 Ω speaker, 3 watts. Grey finish as Trio/Eddystone, £5.75 plus post 25p.

CABINET FOR FREQUENCY COUNTER. 12" x 3" x 6" with cut out to suit 8 digit readout. Ventilation louvres, silver stove enamelled, £3.57, post 30p.

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

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. Board £1.65 each, post 10p. Board size 4 $\frac{1}{2}$ " x 3".

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. Board, £1.65 each, post 10p. Board size 4 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ ".

8 DIGIT READOUT BOARD ASSEMBLY. £4.95 each, post 10p. Printed to use ZM1020 1" dia end readout tubes. Front board takes holders for ZM1020s and 7414N 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" x 2 $\frac{1}{2}$ ". Front or Back board available, £2.47 each, post 10p.

All boards are High Quality print on fibre glass. Holders for I.C.'s low profile 14 or 16 pin, 17p each, post paid.

READOUT TUBES. ZM1020 1" dia. end viewing £1.50 each, post 5p.

Postage where unstated 5p each; any excess would be refunded. We welcome all enquiries, however small. Stamped addressed envelope please. Hours of business: 9.30 a.m.-6 p.m. Tues. Fri. 9 a.m.-5 p.m. Sat. Closed all day Mondays.

NORTH WEST ELECTRICS

769 STOCKPORT ROAD, LEVENSHULME
MANCHESTER 19 Phone: 061-224 4911

MEMBER OF THE RADIO AMATEUR RETAILERS ASSOCIATION

Sales Manager

K.W. Communications Ltd (part of the Decca Group) need a dynamic Sales Manager, for an interesting situation to head up their Amateur Division.

Excellent working conditions, salary dependent upon qualifications and experience, Radio Amateur licence is desirable.

If you are interested in joining our team in an expanding company please write in full confidence to: R. G. SHEARS, Director.

K.W. Communications Limited,
1 Heath Street,
Dartford, Kent.

**CALL BOOK
1974**

**NOW AVAILABLE
FROM STOCK**

DX LISTINGS £3.82

U.S. (Only) ,, £4.25

The above prices include postage and packing.

Please order your copy early from:

Publications Dept.,
SHORT WAVE MAGAZINE
55 Victoria Street, London, SW1H 0HF
01-222 5341

Technical Books and Manuals

(ENGLISH AND AMERICAN)

AERIAL INFORMATION

ABC of Antennas	92p
Aerial Handbook (Briggs)	89p
Amateur Radio Antennas (Hooton)	£1-89
Antenna Handbook, Volume 1	£1-79
Antenna Round-Up, Volume 1	£1-50
Antenna Round-Up, Volume 2	£1-80
Antenna Handbook, 12th Edition (ARRL)	£1-42
Beam Antenna Handbook, 4th Edition	£2-13
Quad Antennae 2nd Edition	£1-82
Simple Low Cost Wire Antennas	£1-75
73 Vertical, Beam and Triangle Antennas (by E. M. Noll)	£2-55
73 Dipole and Long-Wire Antennas (by E. M. Noll)	£2-33

BOOKS FOR THE BEGINNER

Amateur Radio (Rayer)	£1-63
Beginners Guide to Radio (7th Edition)	£1-15
Beginners Guide to Transistors	£1-15
Beginners Guide to Colour TV	£2-08
Better Short Wave Reception, 2nd Edition	£1-82
Course in Radio Fundamentals	£1-17
Foundations of Wireless and Electronics	£2-06
Guide to Amateur Radio	90p
Ham Radio (A beginner's Guide) by R. H. Waring	£1-75
How to Become a Radio Amateur	65p
Learning the RT Code	30p
Morse Code for the Radio Amateur	24p
Radio, by D. Gibson	87p
Radio Amateur Examination Manual	90p
Simple Short Wave Receivers (Data)	90p
Understanding Amateur Radio	£1-40

GENERAL

ABC of Electronics (by Earl J. Waters)	£1-60
FM & Repeaters for the R. Amateur	£1-63
ABC of FET's	£1-38
Easibinder (to hold 12 copies of Short Wave Magazine together)	£1-15
FET Principles, Experiments and Projects	£2-17
Making Transistor Radios (R. H. Waring)	£1-32
Guide to Broadcasting Stations (17th Edition)	84p
Having Fun with Transistors	£1-61
110 Semi-Conductors Project for the Home Constructor (Iliffe)	£1-31
How to Listen to the World—8th Edition	£1-90
110 Integrated Circuit Projects for the Home Constructor (Hard Back)	£1-90
Know Your Oscilloscope (by Paul C. Smith)	£1-82
Microphones	£1-67
Practical Integrated Circuits (Newnes-Butterworth)	O/P
Practical Transistor Theory	£1-15
Practical Wireless Circuits	£1-35
Prefix List of Countries	24p
Radio Engineers Pocket Book (Newnes) (N.E.)	£1-27
Shop and Shack Shortcuts	£1-77
The Fascinating World of Radio Communications	£1-74
Test Equipment for the Radio Amateur	£2-00
99 Ways to IMPROVE YOUR SHORT WAVE LISTENING	O/P
Telecommunications Pocket Book (T.L. Squires)	£1-33
World Radio and TV Handbook 1974 Edition	£3-05

O/P (Out of print)

T. O/S (Temp. out of stock)

THE ABOVE PRICES INCLUDE POSTAGE AND PACKING.

Many of these titles are American in origin.

HANDBOOKS AND MANUALS

Amateur Radio DX Handbook	£2-18
Electronic Circuit Handbook, Vol. 1	£1-43
Electronic Circuit Handbook, Vol. 2	£1-43
New RTTY Handbook	£1-82
RTTY Handbook (Tab)	£2-60
Radio Amateur Handbook 1974 (ARRL)	£2-90
Radio Amateur Handbook 1974 (ARRL) (Hard Cover)	£3-70
Radio & Electronic Handbook	£1-33
Radio Amateur Operators Handbook, 12th Edition	O/P
Radio Communication Handbook (RSGB)	£4-13
Rtty A-Z (CQ Tech. Series)	£2-28
Radio Handbook (W. I. Orr) 19th Edition	O/P
Surplus Conversion Handbook	£1-38
Slow Scan Television Handbook	£2-15
Television Interference Manual (G3JGO)	91p

USEFUL REFERENCE BOOKS

Amateur Radio SSB Guide	£1-60
Amateur Radio Techniques—4th Edition	£1-85
Care & Feeding of Power Grid Tubes (Elmas Division of Varian)	£1-61
Engineers' Pocket Book—6th Edition	£1-49
Guide to Amateur Radio	90p
'G' Call Book 1974	75p
Hams' Interpreter	80p
Hints and Kinks, Vol. 8 (ARRL)	63p
Radio Amateur Examination Manual (N.E.)	90p
Radio Data Reference Book (3rd Edition)	£1-02
Radio, Valve and Transistor Data (Iliffe), 9th Edition	92p
Service Valve and Semiconductors Equivalents	36p
Single Sideband for the Radio Amateur (ARRL), 5th Edition	£1-68
Single Sideband Theory & Practice) by H. D. Hooton	£3-52
Sun, Earth and Radio by J. A. Ratcliffe	92p
Surplus Schematics (CQ)	O/P
Transistor Pocket Book	O/P

TRANSISTOR MANUALS

ABC of Transistors	£1-34
Field Effect Transistors (Mullard)	£1-97
Having Fun with Transistors	£1-61
Handbook of Transistor Circuits	£2-39
Transistor Audio & Radio Circuits (Mullard)	£1-98
Transistor Fundamentals: Basic Semi-Conductor Vol. III, and Circuit Principle, Vol. 1	£1-95

VHF PUBLICATIONS

VHF Handbook, Wm. I. Orr	£1-81
VHF Manual (ARRL)	£1-38
VHF/UHF Manual (RSGB)	O/P

Amateur Radio Awards (RSGB)	£1-40
Questions and Answers on Radio and TV	85p
Integrated Circuit Pocket Book	£2-65
International Transistor Data Manual (Semicon)	£5-60
Teleprinter Handbook (RSGB)	£5-27

Available from

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)

SHORT WAVE MAGAZINE

AMATEUR AERIALS

J-BEAM, 2 METRE
& 70 CENTIMETRE ARRAYS

plus Stolle Rotators
plus 75 or 50 ohm cable

EX-STOCK

Ring Southend-on-Sea 32496 — ask for Ham Aerials

CASH WITH ORDER

MEMBER OF N.F.A.C.

COHEN T.V. AERIALS CO. LTD., 645 London Road, Westcliff-on-Sea

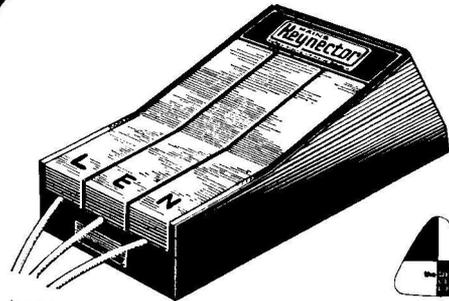
THE VHF COLUMN...

PYE High Band VANGUARDS AM25B, single ch. in good order, unit only. All valves included, £7 each, post and packing £1 each.
PYE Low Band VANGUARDS AM25B, as above, £7 each, P/P £1.
PYE High or Low Band VANGUARDS AM25B, less QQVO3/10 and 20, £5 each, P/P, £1.
PYE High and Low Band AM25Bs, less above valves and a few other bits, £3-£4 according to how complete, P/P 75p each... ideal spares or rebuild. Any of the above £7 models with slight faults, complete £5 each, P/P, £1. Spares for AM25B. Mod/Mute/AF/IF Boards, 50p each, P/P 15p. 6 ch. ledex units, £2 each, P/P 20p. 25 kHz Filters, £1-50, each, P/P 15p. Carriers for Vanguards/Rangers, 50p each, post 25p any number.
HUDSON AM108. Low Band dash mobiles, complete and very good order. Transistor PSU and Mod. with telephone type handset. Mk. 2 version switchable + or - earth, £5-25 each, P/P £1. Mk. 1 version + earth only, £5, P/P £1.
PYE RANGERS. Dash Low Band Models, complete, tested, £4, P/P £1. Less valves and mic. models from 50p each according to condition, to £2 each, post extra. Plenty of Ranger spares.
VALVES. Ex-equipment. QQVO3/10s, 45p, post 10p; QQVO3/20a, £1-90, post 15p; ECC88/EC91/ECC81/12AT7/6CB6/EF95/6AK5/6BH6, all 10p each, post 10p any number. Mixed lots of the above and other, 20 for £1, post 15p. Valve Screening Cans for above, 20 for 50p, mixed, post 15p.
STORNO Viscount LB FM with controls, excellent order, £20, post £1.
PYE UHF Base Station with TT and line controls, £40, but must be collected, 1 cvt.
XTALS. The following in HC6U, ex-equipment, 8-946/8-968/8-971/9-447/9-448/9-451/11-155/12-700/12-879/12-881/12-885/37-275/37-287/7-997, all 40p each.
AERIALS. New 1/2 wave Stainless Steel Mobile types with base as used by Police, Fire, etc., £2-55 each, post 20p. State frequency to be used.
KODAK VERIFAX. Photocopier complete, £25, carr. £2 (cost £80 3 years ago). Coming in Pye HB Cambridges, boot unit only. Write for details.
CIRCUITS available for AM25B/AM25T Vanguards/Cambridges/F27AM Base/Bantams, also conversion details available for most sets. Write for separate lists of circuits available, from 25p to 50p each. Send a S.A.E. for latest up to date lists of equipment and circuits. If you need any spares for the above let me know, everyone answered, but S.A.E. please.
WANTED—Surplus stocks of Radio Telephone equipment and bulk lots of HC6U Xtals. Prompt cash payment and collection for bulk lots. Exchanges for above considered.

W. H. WESTLAKE

CLAWTON, HOLSORTHY, N. DEVON. Tel.: 0409-253758
Ministry Registered RTD-1059

QUALITY **CJL** ECONOMY



(109)

KEYNECTOR - The modern streamlined 'Keynector' provides a safe, simple and quick way of connecting leads to the A.C. mains. Built-in safety switch interlocked to provide automatic isolation together with neon light and 13A fuse. Ideal for numerous applications including test and experimental work... £3.20

Please send item(s) **109**
I enclose crossed cheque/P.O. for £
(Price is inclusive of P&P & V.A.T.)

NAME _____ SWM6
ADDRESS _____

CJL C.J.L. LTD. P.O. BOX 34, CANTERBURY, KENT, CT1 1YT.

SPECIAL 50p PACKS

VALVE BASES B9G ceramic, 2 for 50p.
TO5 Heatsinks, star type, 10 for 50p.
Belling Lee TV Plug, 6 for 50p.
Standard Jack Plugs, 4 for 50p.
STC Telephone inserts Rx, 50p.
Pye Mike inserts, new, 50p.
Valveholders, assorted, 10 for 50p.
Mullard Tubular Trimmers, 1 18pf, 6 for 50p.
Silver plated PA Coils, mixed bag, 50p.
Terryclips, mixed bag, 50p.
5 pin Din Plugs, 270 deg., 5 for 50p.
5 pin Din Sockets, 270 deg., 5 for 50p.
AC128 Transistors, 6 for 50p.
Rubber Grommets, mixed bag, 50p.
Electrolytics, mixed bag, 50p.
Silicon Rubber Sleeveing, 1mm. bore 50 yds., 50p.
Reed Relays, 12v. 400ohms, 2 pole make, 2 for 50p.
Min. Switches 4 pole 2 way, rotary spindle dia. 4mm., 2 for 50p.
Relays, 12v. 4 pole c/o, 3a contacts, 2 for 50p.
Bulbs, 6-3v. 3A, capless, 20 for 50p.
Capacitor Clips, mixed sizes, 10 for 50p.
Fuses, 1½" and 20mm., mixed bag of 25 for 50p.
Stereo Jack Sockets, 2 for 50p.

Miniature slider switches, 2 pole, 2 way, 5 for 50p.
 Xtal Plates, containing 2 HC6U sockets and one 1-10pf trimmer (no coils), 3 for 50p.
 Min. 4 core Screened Cable, 10m. for 50p.
Chrome Equip. Handles, new 2½" centres, 2 pairs for 50p.
 Valves, min. CV types, 20 for 50p.
Bandpass Filters, 25-32.5 MHz RT type, 50p.
Pots, 10 different values, 50p.
 Self adhesive foam pads, 30mm. x 20mm. x 3mm. thick large roll, 50p.

SPECIAL £1 PACKS

2N3055 type Power transistors, new, unmarked, 5 for £1.
 Capacitors, mostly elect., asstd., large bag, £1.
 Plug in relays, 4 pole c/o, 430 ohm, 12 22v., with bases, 3 for £1.
 BY185 Rect. Sticks, 35kV at 2.5 mA., ideal for scopes or SSTV monitor, £1.
 Circuits of Pye Vanguard AM25B, showing TX, RX, Inverter, etc., 65p, post paid.
 Circuits of Pye Cambridge AM10D, showing TX, RX, Inverter, etc., 55p, post paid.

TRANSISTORS (NEW)

2N3819, 25p; AFZ11, 50p; AFZ12, 50p; OC200, 20p; BD121, 50p; AC128, 10p; NK0032, 25p.

VALVES

QQV03 20A (ex equipment), £2.20.
DET72 (ex equipment), £1.00.
2C39A (ex equipment), £1.10.
4CX250B (ex equipment), £2.20.
YL1080 (ex equipment), £1.00.
6BH6 (ex equipment), 2 for 50p.
EZ81, New, 25p.
EF80, New, 25p.
E88CC (ex equipment), 25p.
E88C (EC88 new), 2 for 50p.
 Large Stocks of Valves available.
 Many hard to get items.
MOD KIT. All transistor, ex Pye AM10, containing Audio PCB, all necessary transformers, transistors, etc. Everything except a few R's and C's, with circuit diagram, £4 each.
EXTRA OUTPUT TRANSFORMER, to enable above kit to be used as Audio output stage, as well as modulator, 30p.
METERS, 1mA, marked 0-100, mirrored scale, back mounting, 3½" x 1½" display area, brand new, £1.50.
ELECTROLYTICS, 8000mfd at 25v., screw terminals, ideal for low volt PSU, 3½in. x 2" dia., 40p each, or 3 for £1.00.
RADIOSPARES 500 WATT AUTO TRANSFORMERS, 100-110-150-200-220-240-250v tapped input and output step up or step down facility, ex-new-equip., £5.50, carr. 50p.

B. BAMBER ELECTRONICS

20 WELLINGTON STREET, LITTLEPORT, CAMBS.

PHONE: ELY (0353) 860185 (Tues. - Sat.)

CRYSTALS type B7G glass 54 kHz 55p.

CRYSTALS type HC6U in kHz, £2 each.

9015 9018 9021 9025 9028 9031 9037 9040 9043 9050 9053 9056
 9059 9060 9065 9075 9227 9255 9261 9276 9284 9287 9294 9341
 9344 9411 9412 9431 9433 9438 9451 9465 9477 9479 9480 9481
 9484 9486 9487 9493 9494 9497 9505 9526 9527 9543 9551 9552
 9559 9563 9566 9569 9572 9573 9575 9581 9590 9591 9594 9600
 9602 9604 9605 9608 9611 9612 9631 9634 9653 9718 9723 9728

DIECAST BOXES (New ITT)

3½ x 4½ x 1½, 65p; 3½ x 4½ x 2½, 80p;
 3½ x 4½ x 3½, £1.10; 6½ x 4½ x 2½, £1.20;
 10½ x 6½ x 2½, £1.85; 8½ x 5½ x 4½, £2.25.

MAINS TRANSFORMERS

Ex PYE F27 Base Station Tx., 465v. at 500mA. 6-3v. at 8A, £5.50.
 40v. at 2A, 80p each.

20-0-20v. at 1.5A, 60p each, 2 for £1.

13-0-13v. at 100mA, 40p each, 3 for £1.

MOD. TRANSFORMERS (ex equipment) with data.

P.P. EL84/6V6 to QQV03-20A, £1.50 each.

Mike inserts, Pye type 4103F, new, 50p each.

HIGH QUALITY SPEAKERS

6in. x 4in. elliptical, 2in. deep, 4 ohm, 90p each, 2 for £1.70.
 8½in. x 6in. elliptical, 2in. deep, 4 ohm, recess magnet, rated up to 10W, £1.50 each, 2 for £2.75.
 DIN Speaker sockets, 2 pin (flat and round), 4 for 30p.
 Xtal Ovens, 80 deg. or 10 deg., 40p each, Bases, HC6U or 2XHC25U, 10p.
 Ferrite Rods, 5½in. by ½in. dia. with Med. and Long wave coils, 15p each.
 Hash filters, with two chokes and one transformer choke (for use in mobile supply leads), 20p each.

SHEPHERD CASTORS, trolley fitting, 4in. wheel, rubber tyred.

Brand new £2.75 per set of 4.

IDEAL FOR VARICAP TUNED RECEIVERS...

BECKMAN, DUODIAL, Min. counting turns dial, ½in. dia., with locking lever, 0-100 on main dial, with 0-14 on hundreds dial, for standard ½in. spindle, brand new, boxed, £1.50 each.

AS ABOVE... 1½in. dia. dial, ½in. spindle, £2.00 each.

MULTITURN POTS (for use with counting dials above) 2 Kohm, 100 Kohm, 400 Kohm, 10-turn, available only, Linear, ½in. spindle, brand new, £1.00 each.

PHILIPS (A1/220) 12V, 50W, Quartz lamps, ½in. x 1½in., ideal for emergency light from car battery, 50p each.

HONEYWELL, min. single pole c/o Microswitches, ½in. long, ½in. wide, by ½in. high, with roller trigger, brand new, ideal for Press-to-talk mikes, 25p each.

REES MACE, Mains suppressor boxes, ideal for receiver mains lead, 25p each.

CABLEFORMS, mixed box of various colours and types of wire, all new, manufacturers surplus, ideal for home constructors, 50p box.

COMPUTER TAPE, 1in., on 14in. spools, last few, to clear, £1.00 reel, carriage 50p.

BARGAIN OF THE MONTH

TRANSFORMERS, Mains input, 16v. at 6A + 45v. at 100mA (for relays, etc.), made by Gardners, few only, £3.50, carriage 50p.

CALLERS WELCOME BY APPOINTMENT

S.A.E. FOR ALL ENQUIRIES, PLEASE

TERMS OF BUSINESS: CASH WITH ORDER

PLEASE NOTE: ALL PRICES INCLUDE VAT

Post and packing: 20p on all orders (except where stated)