

The SHORT WAVE *Magazine*

VOL. XXXII

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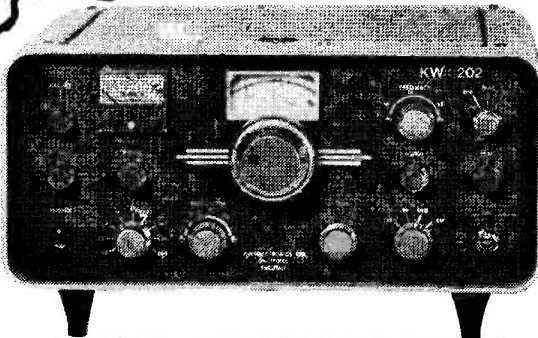


WORLD WIDE COMMUNICATION

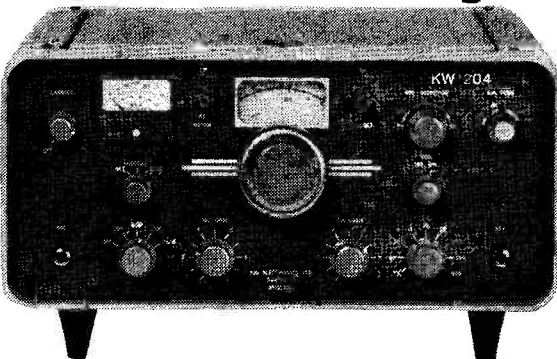
Professional performance with KW



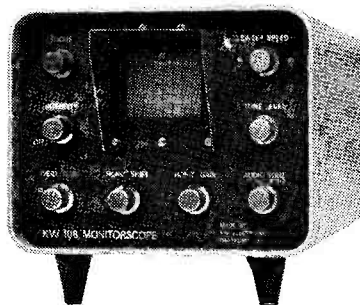
KW 202 Receiver.
One of the finest Amateur Band Receivers on the market. SSB filter and "Q" Multiplier. Excellent sensitivity and stability. Two-speed tuning 10-166 metres.



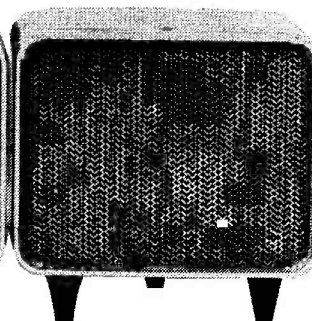
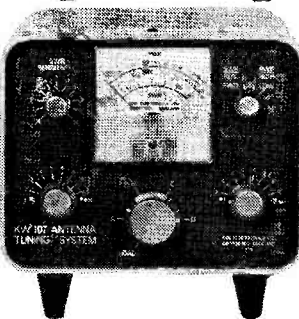
KW 204 Transmitter.
Well-known for really good audio quality (SSB) and a favourite with CW enthusiasts, 10-160 metres. Reliable PA Tubes (2 x 6146).



KW 108 Monitor Scope. Monitor your transmissions 10-160m. two-tone test generator incorporated to ensure optimum linearity for SSB.



KW 107 Antenna Tuning System
Incorporates, E-Z match, SWR/RF Power meter Dummy load, Antenna Switch. A high power version KW 109 is also available.



Other KW Favourites. KW 2000E Transceiver 10-160m. a quality product; KW 1000 Linear Amplifier; KW E-Z match ATU; KW 160 ATU; KW 103 SWR/RF Power meter; KW Dummy Load; KW Traps (the original and Best); KW Trap Dipoles; KW 109 Supermatch (High power version); KW Low pass Filter; KW Balun; KW Antenna Switch.

Stockists for Hy-Gain beams and verticals, CDR rotators, Shure microphones, etc.

KW Spares are normally carried for a minimum of five years after date of manufacture of equipment.



Write or phone for catalogue to :-

KW Communications

(Decca Communications Limited)

1 HEATH STREET, DARTFORD, KENT
Tel.: Dartford 25574/219191

Easy Terms on Equipment available over 12, 18 or 24 months.



TRIO ELECTRONICS INC.

During recent months our Representatives have visited major Amateur Radio distributors in the U.K. with a view to appointing a Sole Agent to handle our exciting new range of Amateur Equipment.

The major consideration in making the appointment is that the distributor must set the very highest standards of after-sales service which implies workshop facilities capable of maintaining such standards.

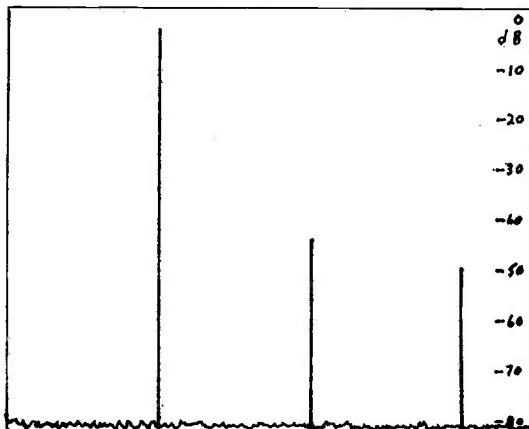
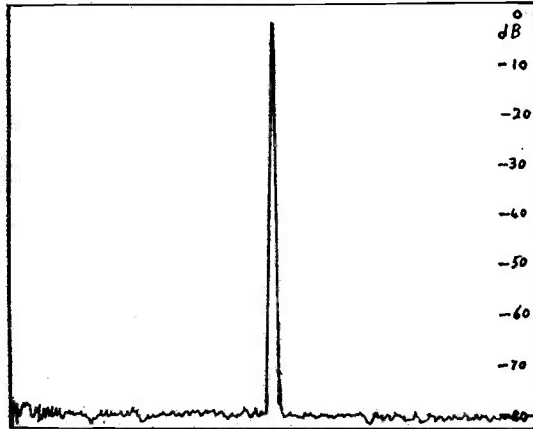
We have pleasure in announcing that we have chosen LOWE ELECTRONICS to be our appointed U.K. Sole Agent for Amateur Equipment.

NEW! 2 METRE CONVERTER KIT — Read on

DO YOU WANT TO RECEIVE AND TRANSMIT ON 2 METRES OR 4 METRES?
EUROPA TRANSVERTER—EX-STOCK

4 metres SSB is quite popular now, the new owners of 4 metre Europas tell me they look very good alongside their 2 metre one. The Europa gives you:

- ★ Well established and highly reliable design.
 - ★ Direct plug into accessory socket on Yaesu/Sommerkamp equipment—multicore lead supplied. Compatible with other transceivers and receiver/transmitter combinations. We can tell you how to do it, with Heathkit, KW, Trio etc.
 - ★ High transmit power—up to 200W input—50 per cent efficiency.
 - ★ Excellent receive converter performance—2dB noise figure.
 - ★ Extremely stable operation.
 - ★ Extraordinary clean output.
 - ★ Attractive appearance inside and outside—size 9" x 4½" front panel 4½" deep.
 - ★ Low price: £76.68 complete. £63.18 less valves—valves required are 2 off 6QV03/10, 1 off 6QV06/40A. Additional 12.6V amps. transformer for use with 6.3V A.C. heater Yaesu equipment (FT401, etc.), £3.24 or in a case to match the Europa £6.37.
- J BEAM — 4 metre 4 element aerials in stock—£6.70 plus £50 carriage.



DO YOU WANT TO RECEIVE BETTER ON 2 METRES?
2 METRE PRE-AMPLIFIERS (2 MODELS TO CHOOSE FROM)
—EX-STOCK.

If you want the ultimate in 2 metre sensitivity:

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—1dB. Gain—18dB.
- ★ High selectivity tunes circuits. Price £7.36.

If you want a small unit:

THE PA3 DUAL GATE MOSFET PRE-AMPLIFIER—EX-STOCK

- ★ Small (about one 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—2dB. Gain—18dB. Price: £5.40.

DO YOU WANT TO RECEIVE ON 4, 2 AND 70 cms.?
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 outperform the others. Nothing I can say is more convincing than what the customer says.

SENTINEL 2 METRE 28-30 MHz CONVERTER KIT!

To all those who have asked us to make a converter kit, good news. I have said in the past that we did not do a converter kit because of the alignment problem. However, for the past two years we have manufactured 28-30 MHz converters using 116 MHz crystals and this makes alignment a simple task, using a multimeter and your receiver. The kit comes complete with a box and all components as used in our standard Sentinel converters, at a cost of about the same as you could pay for the components, only £11.00.

To obtain any of our products. We can despatch 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. 12 months' guarantee on our products. Paul G3MXG.

SOLID STATE MODULES

63 Woodhead Road, Solid, Lockwood,
Huddersfield, HD4 6ER Phone 0484-23991

MANUFACTURERS AND SUPPLIERS OF COMMUNICATIONS EQUIPMENT

MEMBER OF THE A.R.R.A.

If the worst comes to the worst and it doesn't work, send it back here with £2.00 and we will make it work for you, so you can't lose.

SENTINEL DUAL GATE MOSFET 2 METRE CONVERTER—EX-STOCK

Now with much improved metalwork. 2 metre IFs 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 IFs use 116 MHz crystal with no crystal multiplication. Noise figure—2dB. Gain—30dB.

MOSFETs protected against reverse supply connection and excess voltage.

Size: 2½" x 1½" x 3" long, except the 2-4 MHz and the 4-6 MHz which are 4" long. Price £16.20.

SENTINEL X DUAL GATE MOSFET 2 METRE CONVERTER

A de luxe version of the above converter, containing a mains power supply or external battery operation. It has front panel R.F. gain control. Technical data is the same as the Sentinel. Stock I.F.s 2-4 MHz, 4-6 MHz and 28-30 MHz. Price £21.06.

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

Receives 2 metres on a conventional M.W. B.C. receiver, very good used with a car radio. I.F. output of 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 £20.25.

SM70 70CM CONVERTER

This one uses an IF output of 144-146 MHz. This has enabled us to produce a very high performance converter with a noise figure of 3.5dB for only £16.20.

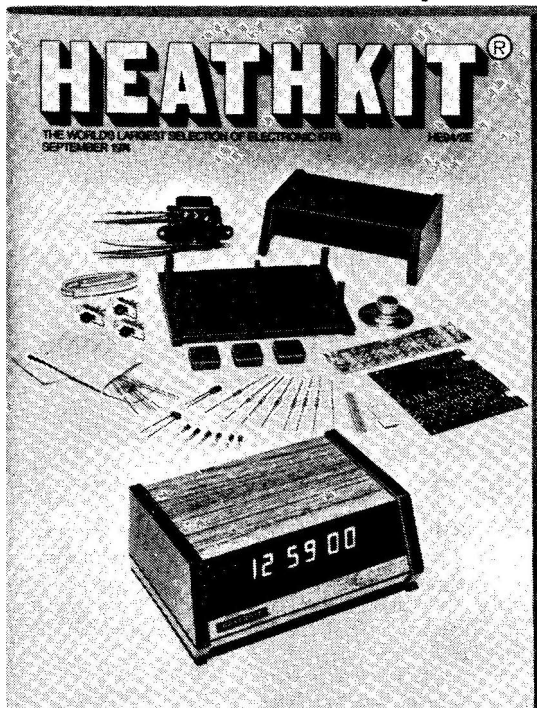
At last, what you've been waiting for. The new Heathkit catalogue.

Since receiving the last Heathkit catalogue you've no doubt spent quite a time thumbing through it and deciding which models to build.

You've probably also been waiting in expectation for the next catalogue. And wondering what goodies it holds in store for you.

Believe us, it's been well worth the wait.

The new Heathkit catalogue is now out. And it's the largest ever (64 pages of it). Bulging with new models, new innovations and new ways to make building Heathkit even more interesting.



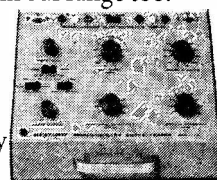
All the familiar faces will be there too. Like our very popular digital clock for instance – the one on the cover of the catalogue.

There's also a de-luxe version available now. The GC-1029AE. With features like an automatic display dimmer for night operation and an automatic stand-by battery in case of power failure.



Another new model is the AJ-1510A digital FM stereo tuner. In fact, we call it our 'Computer Tuner' because to select stations you simply tap out the frequency on a keyboard. And the AJ-1510A will lock on to the selected station instantly and precisely.

There's a new instrument in our range too. In the shape of a Semiconductor Curve Tracer – the IT-1121. Connect it up to an oscilloscope and it'll accurately display operating parameters of virtually any type of semiconductor.



Send us the coupon now and we'll send you your free catalogue, with details of these and other exciting new models. Or, if you happen to be in London or Gloucester, call in and see us. The London Heathkit Centre is in Tottenham Court Road (where else?) at no. 233.

The Gloucester showroom is next to our factory in Bristol Road.

Either way, we're waiting to hear from you soon. Heath (Gloucester) Limited, Dept. SW-94, Bristol Road, Gloucester, GL2 6EE. Tel: Gloucester (0452) 29451.

The new Heathkit catalogue. Out now. FREE.

To: Heath (Gloucester) Limited, Dept SW-94, Gloucester, GL2 6EE. Please send me my free Heathkit catalogue.

Name _____ Address _____

Postcode _____

Remember easy terms are available with the Heathkit Monthly Budget Plan



TELECOMMUNICATIONS INTERNATIONAL AGENCY LTD.

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

NEW RADIO TELEPHONES. FM or AM. High, low and Marine bands.
Catalogue on request.

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	£2.00	EL 33	95p
EAC 91	£1.50	EZ80	25p
ECF 82	38p	ECC 81	22p
EF91	33p	KT 77	£1.50
EY 84	50p	EL 84	35p
E 80 CF	40p		
BNC free sockets			22p
5 pin type B Din plugs			14p
PL 259 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 Postage 8p
ELAC 5 x 3 at 8 ohm elliptical. New 75p

HAND SETS. New SG Brown handsets £4.94, carriage 65p

TRANSISTORS

PT 4176D 44w.	£3.00	AF 239	20p
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
2N 3866	48p	OC 200	10p
ME 1001	18p	IN 91	25p
2N 5180	48p	V100	85p
2N 2369A	15p	ACY22	14p
BF 115	15p	ACY20	10p
BSX 26	10p	OA200	4p
BC 108	10p	AC 128	8p
OA 10	15p	OA47	6p
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OAZ 207	30p		
CA3011	92p		

Carriage 5p.

NEW STUD UHF POWER DEVICES

TIA 6B 400 MHz 1 watt output 70p
TIA 7B 400 MHz 9 watt output £3.67
Details and spec. available on request.

MC MURDO RED RANGE

24 way plugs	40p
32 way plugs	50p
32 way sockets	50p
F. & E. plugs	45p
12v. 2.2w. lamps MCC 643	10 for 10p

ULTRA FM & AM BASE STATION. 12½ kHz type approved in extremely good condition. In working order, complete with desk controller £66.60, carriage £1.00

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

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

XTAL OVENS. Cathodeon 68p, carriage 5p

RELAYS. Aerial changeover 12v DC £1.00, carriage 10p

COSSOR MOTORBIKE UNITS. Lowband, various conditions. Callers only £5.00 each

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

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

SGB BASE MICROPHONE with stand £5.50, carriage 20p

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

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

SG BROWN. Fist microphone. Dynamic 300 ohms £4.50, carriage 10p

SG BROWN DIPLOMAT. 16 ohms Head Set and 50 k ohms microphone £7.50 each

SG BROWN DIPLOMAT HEAD SET. 22 ohms, complete with din plug £5.00 each

VOLUME CONTROL BOX with jack socket, 150 ohm 50p ea.

PBX OPERATORS PACIFIC HEAD SETS. 150 ohms. Microphone 3 k ohms. Complete with earpiece assembly kit £7.50 each

STEREO HEADSET. 8 ohms £5.00

POWER CONTROLLER/DIMMER SWITCH complete, 5 amps. 75p each

12-WAY LEDEX SWITCHES, 12v. 50p each

DUE TO REORGANISATION, WE HAVE A SELECTION OF VARIOUS COMPONENTS FOR SALE AT A VERY LOW PRICE SUITABLE FOR THE AMATEUR MARKET. CALLERS ONLY AT ADDRESS BELOW.

ALL PRICES EXCLUDE VAT

SUBJECT TO EQUIPMENT BEING UNSOLD

Telecommunications International Agency Ltd.
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Hants.

AMATEUR ELECTRONICS G3FIK

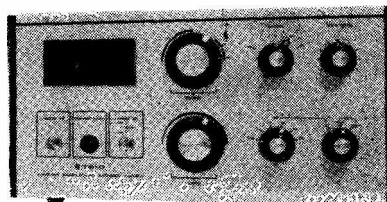
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IF IT'S—
SORRY OM, CAN'T READ YOU!

Then beat the QRM with Trio's TL-911

ONE OF THE FINEST LINEARS AVAILABLE
AT ANY PRICE.



NOTE THE FEATURES—

- ★ 2KW PEP INPUT
- ★ SOPHISTICATED CIRCUITRY, 6 TUBES,
3 TRANSISTORS, 27 DIODES, 1 THYRISTOR
- ★ AUTOMATIC PROTECTION CIRCUIT TO
PREVENT OVERLOADING
- ★ INDIVIDUAL MONITORING OF PA TUBES
- ★ DYNAMIC BALANCING OF PA CIRCUIT
- ★ DUAL ALC
- ★ SWR METERING INCORPORATED

IDEALLY MATCHES THE TRIO TS-510 AND TS-515 BUT WILL SUIT ANY
MEDIUM POWER RIG

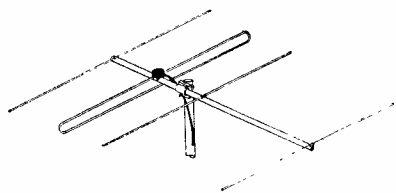
FIRST-CLASS VALUE AT **£155.** VAT INCLUDED, CARRIAGE PAID !

A FULLY ILLUSTRATED LEAFLET UPON RECEIPT OF YOUR S.A.E.

(BE SURE TO SEE OUR ADVERTISEMENTS ON OTHER PAGES)

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

HY-Q ANTENNAS announce the first of a new range of amateur antennas



20 Metre 20M/UP

Normally antennas of the unipole and groundplane type require a reasonable space because of the ground-plane (radials) and in consequence becomes impossible to erect in congested areas. The great advantage with our unipole is that it has been designed to perform without groundplanes, and can therefore be mounted at the gable end, the eaves, or on a simple house chimney.

These will feature for two metre a halo, four, six, eight and ten element yagis. Cross polarised yagis are also readily available.

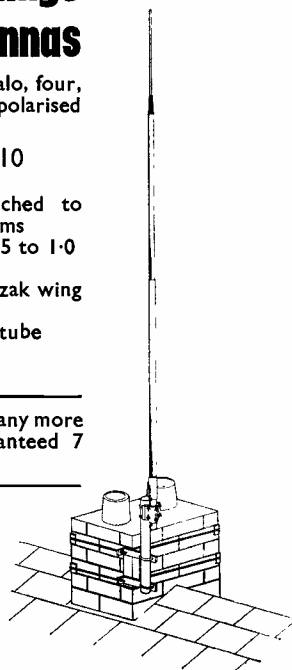
2 Metre 2M/4-6-8-10

Specification :—
New linear balun matched to cover the band, 50 Ohms
Impedance better than 1.5 to 1.0
Mazak Castings
Aluminium bolts with mazak wing nuts
High quality aluminium tube
P.T.F.E. Balun.

All antennas listed plus many more are ex stock or a guaranteed 7 day delivery.

Coming Shortly

New 20-15-10 metre beam with each radiator completely isolated from the others via a single feed line.



ANTENNAS LTD
PONDWOOD CLOSE,
MOULTON PARK, NORTHAMPTON
TELEPHONE 0604 48129 AND 48120

Waters & Stanton Electronics

IC-210 2M TRANSCEIVER

FM transceiver 144-146 MHz.
Vfo Tx and Rx. AC or DC operation. Repeater tone burst, etc., plus microphone £279.00

LINER 2SSB 2M TRANSCEIVER

144-10-144-34 MHz V XO controlled, direct frequency read-out, R.I.T. 10w. o/p £142.00

J-BEAM AERIALS NOW IN STOCK

S.A.E. FOR CATALOGUE AND PRICES

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HQ-1 2 element "mini-beam"
1.5kW £54.00
B24 2 element "mini-beam" 1.5kW
RK3 3rd element kit £42.12
C4 tri-band vertical (needs no radials) £27.00
Catalogue available s.a.e. £24.30

G-WHIP MOBILE ANTENNAS

Tribander helical, 10-15-20m £13.53
40m., 80m., and 160m. coils £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 and basemount
15m., 20m., 40m., 80m. and 160m.
coils £10.45
S.a.e. for catalogue.

ROTATORS

AR30 £27.00
AR40 £32.40
Stolle 2001 £33.50
5 core cable... ..per yd. 15p

VHF WHIPS

2m. 5/8th stainless steel, inc. base
2m. 5/8th spring base professional
2m. 1/2 wave inc. base £2.50
4m. 1/2 wave inc. base £4.01
"No hole boot mount" £3.30

MFJ PRODUCTS

CWF-2BX 80Hz cw filter in case £11.90
CWF-2 module only £8.90
CWF-3 module £5.40
25/50/100 kHz xtal calibrator module
500mw audio amp. £9.20
£3.60

ACCESSORIES

50 ohm coax cable ... per yd. 17p
Coax plugs 12p
Pvc covered antenna wire ... per yd. 5p
Wightraps "high power" £4.00

70 ohm coax 9p
Insulators 11p
SO259 dipole centre insulator £1.95
Compact 80/40 dipole £9.75
Waters 80-10m. dipole kit 1.5kW £11.00

MICROWAVE MODULES

2m. AM transmitter £35.10
2m. converter 4-61F and 28-30IF £16.45
4m. converter 28-28.7 IF £16.45
70cm. converter 28-30 IF £19.45
1296 MHz converter 28-30 IF £23.75
2m. dual output pre-amp... .. £9.75

SOLID STATE MODULES

2m. converter 28-30 and 4-61F £16.20
70cm. converter 144 MHz IF £16.20
PA3 miniature pre amp 2m. £5.40
2m. FET pre-amp £7.35
Europa SSB 2m. transverter with valves £76.70
Less valves £63.00
Also 4m. transverter at same prices.

MICROPHONES

Shure 201 £6.00
Shure 444 £15.00

SECONDHAND

KW 2000B transceiver £180.00

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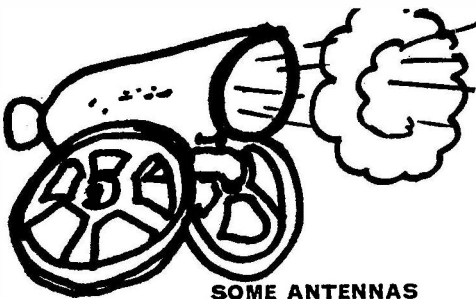
PRICES INCLUDE 8% VAT

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Hours of Business : 9.00-5.30 MONDAY TO SATURDAY

EARLY CLOSING WEDNESDAY



SOME ANTENNAS

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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
DI-10 Ground Plane, 10 metres £22.00
DI-2 Ground Plane, 2 metres £8.00
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 £18.00

Send for HANDBOOK containing full details of Antennas and other technical information. 33 pages 25p. Refundable upon purchase of Antenna.

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BASIC
PRICES.
ADD VAT

TRI - BANDERS

TA-33 Jr. High Power Model incl. Balun
3 Elements, 10, 15 and 20 metres £46.00
3 Elements, 10, 15 and 20 metres £40.30
TA-33 Jr. 2 Elements, 10, 15 and 20 metres £28.50
TA-31 Jr. Rotary dipole, 10, 15 and 20 metres £18.00
Classic-36 6 elements, 10, 15 and 20 metres £115.00
V-3 Jr. Trap Vertical, 10, 15 and 20 metres £13.00
MCQ-3B Cubical Quad, 10, 15 and 20 metres £85.00
El-Toro Vertical, 20, 40 and 80 metres £12.50

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

All antennas available ex works carriage and insurance extra

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Electronics Ltd

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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 £291-60.

MICROWAVE MODULES
2m. AM Transmitter ... £35-10
2m. Converters (state I.F.) ... £16-40
4m. Converters ... £16-40
432 MHz Converters ... £19-44
432 MHz Varactors ... £18-90
1296 MHz Converters ... £25-92
1296 Varactor Tripler ... £27-00
144 MHz Dual output Preamp ... £9-72

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 £140-00.

SOLID STATE MODULES

2m. Converter ... £14-95
70 Cm. Converter ... £14-95
PA3 Dual Mosfet Pre-amp ... £5-40
2m. FET Pre-amp ... £7-31
Europa SSB Transverters complete with valves ... £79-52
Transverters. Less valves ... £63-18

J BEAM

2m. 5 Element ... £5-21
2m. 8 Element ... £6-51
2m. 10 Element ... £11-80
2m. 14 Element Parabeam ... £17-64
All prices of beams include carriage. Send S.A.E. for full catalogue of rotators, beams, masts, clamps, etc.

ANTENNA ROTATORS

AR22R ... £29-70
AR30 ... £27-00
AR40 ... £32-40
CD44 ... £56-16
HAM-M ... £85-32

YAESU

FT101B Transceiver ... £356-40
FT401 Transceiver ... £334-00
FT200 Transceiver ... £232-20
FT75 Transceiver ... £144-00
FR400SDX Receiver ... £226-80
FL400 Transmitter ... £208-44
FL2100 Linear ... £210-00
FR50B Receiver ... £70-20
YC355D Frequency Counter ... £137-16
SP400 Loudspeaker ... £14-04

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KW202 Receiver ... £172-80
KW204 Transmitter ... £183-60
KW1000 Linear Amplifier ... £162-00
KW107 Antenna Matching Unit ... £64-80
KW108 Monitor scope ... £75-40
KW E-Z Match ... £21-60
KW 160m. Tuning Unit ... £17-28
KW Balun ... £2-75
KW 3 way Antenna switch ... £5-40

KW103 SWR/Power Meter ... £15-12
KW109 Antenna Tuning Unit ... £81-00
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Yaesu 846 Hand Microphone ... £6-30
Shure 201 Hand Microphone ... £5-95
Shure 444 Desk Microphone ... £16-00
Shure 444 Desk Microphone ... £16-00
Electro-Voice 619 Desk Microphone ... £28-35
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Electro-Voice 715 Hand Microphone ... £7-45
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IC2IXT Transceiver 2VFO ... £185-00
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Omega TE701 Noise Bridge ... £12-50
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Trio TX599 Transmitter ... £125-00
Trio 9R59DE Receiver ... £40-00
Trio SP5D Speaker ... £4-00
KW600 Linear ... £70-00
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It does not apply to Yaesu equipment!

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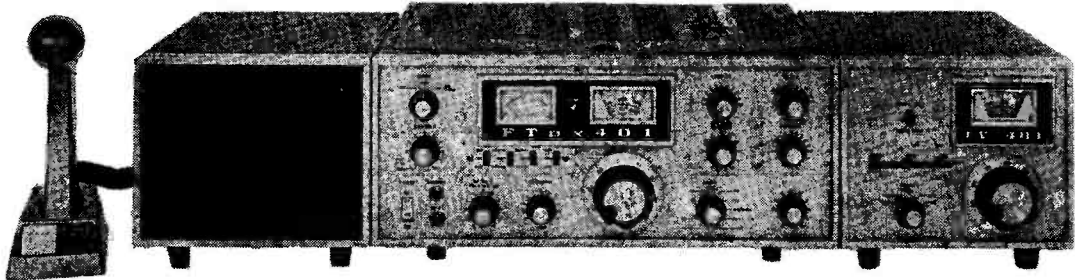
Take your pick! Either refer to the R.S.G.B. Review April 1973, or our test on an off-the-shelf

YD-844

SP-400

FT-401

FV-401



RECEIVER MEASURED PERFORMANCE

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

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

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

SENSITIVITY

Input Freq. MHz	S + N : N for 0.5µv emf dB	S + S : N for 1.0µv emf dB
3-6	16	22
7-1	19	25
14-2	19	25
21-2	19	25
28-7	20	26
29-7	20	26

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DC-200 DC PSU for FT-200 ...	£51
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YC-355 WE 35MHz. AC/DC/PSU	£110
YC-355D 220MHz. AC/DC PSU	£127
YO-100 Monitor Scope	£93

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FV50C VFO for FT75	£28
FV-101 VFO for FT-101	£48
FV-101B VFO for FT-101B	£42
FV-200 VFO for FT-200	£42
FV-401 VFO for FT-401	£42

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SP-101	£9
SP-101B	£13
SP-400/401	£11
SP-101PB Phone Patch	£29

LINEAR AMPLIFIERS

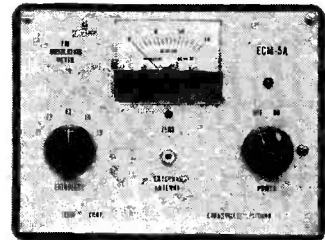
FL-2000B	£195
FL-2100B	£195
FL-2500	£150

ACCESSORIES

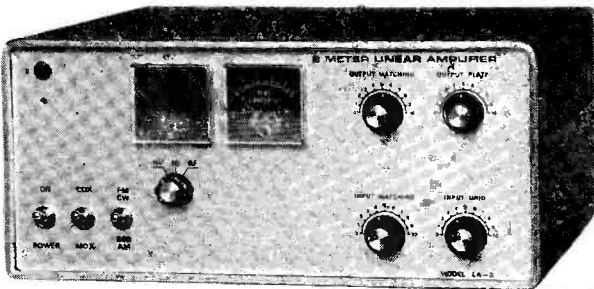
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FF50DX L.P. Filter	£12.25
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- ★ BATTERY POWERED FOR PORTABLE USE.



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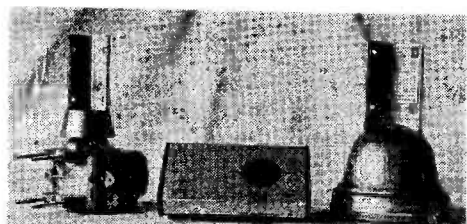
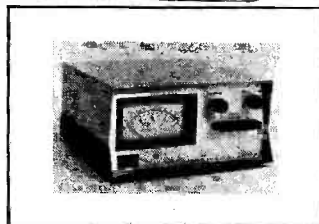
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AR30, £25

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1296 MHz	144-146 IF	
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ATU

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STABILITY — Less than 100 cycles after warm-up. Less than 100 cycles for 10% line voltage change.

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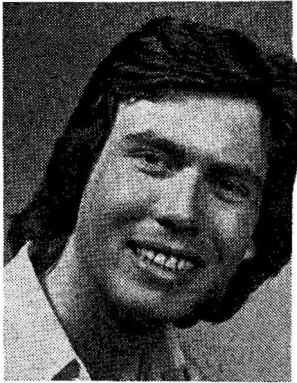
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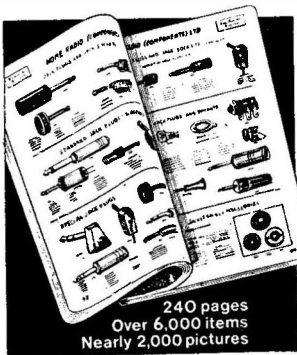
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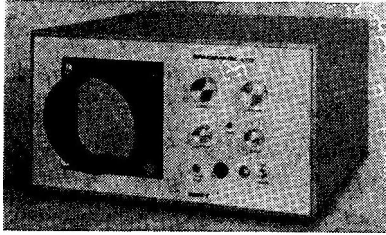
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ADVERTISERS' INDEX

	Page
Aero and General Supplies	386
Amateur Electronics (G3FIK) ... 341, 350, 387	387
Amateur Radio Retailers Association ...	384
The Amateur Radio Shop, G4MH (Huddersfield) ...	387
Antec ...	389
Ashley Dukes (Honda) ...	395
B. Bamber Electronics <i>back cover</i> , 395	395
J. Birkett ...	348
British National Radio School	396
Communique ...	352
Derwent Radio ...	393
Electrovalue Ltd. ...	390
Eley Electronics ...	387
G3HSC (Rhythm Morse Courses) ...	389
G3LLL Holdings ...	390
G.W.M. Radio ...	348
Hamgear Electronics ...	384
Heath (Gloucester) Ltd. ...	339
D. P. Hobbs Ltd. ...	389
Home Radio Ltd. ...	349
HY-Q Antennas Ltd. ...	341
K.W. Communications Ltd. <i>inside front cover</i>	337, 365, 366, 367, 368, 396
Lowe Electronics	337, 365, 366, 367, 368, 396
Marketing Services Inter- national ...	349
S. May (Leicester) Ltd. ...	389
Microwave Modules Ltd. <i>inside back cover</i>	342
Mosley Electronics ...	342
Mulhall Electronics ...	391
North West Electrics ...	388
Partridge Electronics Ltd. ...	346
Radio Shack Ltd. ...	347
Royal Air Forces Association	395
R.T. & I. Electronics Ltd. ...	386
Semicon Indexes ...	395
Small Advertisements ...	388-394
Solid State Modules ...	338
Southern Surplus Merchants	395
Spacemark Ltd. ...	350
S.S.B. Products ...	388
Stephens-James Ltd. ...	343
S.W.M. Publications 385, 391, 392 393, 394	392
Telecommunications Inter- national Agency Ltd. ...	340
Telford Communications...	386
T.M.P. (Electronic Supplies)	387
J. & A. Tweedy Ltd. ...	386
Waters & Stanton Electronics	382
Reg Ward & Co. Ltd. ...	348
Western Electronics Ltd. 344, 345	345
W. H. Westlake ...	348
Chas. H. Young Ltd. ...	346

(GB3SWM)

Vol. XXXII

SEPTEMBER, 1974

No. 371

CONTENTS

	Page
Editorial— <i>Realities</i> ...	353
Communication and DX News, by E. P. Essery, G3KFE ...	354
The Mobile Scene ...	357
Getting Going on 23 Centimetres, by A. H. Dormer, C.Eng., M.I.E.R.E. (G3DAH) ...	360
Transistor Cascode IF Amplifier, by A. Gouldstone, G3TAG ...	362
Easy Top Band Vertical, by F. G. Rayer, T.Eng., A.I.E.R.E., G3OGR ...	364
Ground Plane for Two ...	369
"SWL"— <i>Listener Feature</i> ...	370
Booster for the FDK Multi-2000, by W. H. Jarvis, GM8APX ...	373
VHF Bands, by A. H. Dormer, G3DAH ...	374
The Month with The Clubs— <i>From Reports</i> ...	378
Courses for the R.A.E.— <i>Second List</i> ...	382
New QTH's... ..	383

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

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351

The SHORT WAVE Magazine

EDITORIAL

Realities

We do not have to tell anyone seeing this that prices have been rising, and look to be continuing to increase—the world of print and publishing is in no way protected against the trend of current events.

For us, the last three years or so have been particularly difficult. During that period, we have had two increases in printing charges. The cost of paper has risen steadily. Postage and distribution rates have gone up no less than three times. In step with all this, there have been increases in all the day-to-day expenses of running the business.

Until now, it has been possible, by the most stringent economy and careful management, to hold off the effect of these cost increases. The cover price has remained unchanged since January 1972.

The position now is that—with great reluctance and after the most careful consideration of the foreseeable circumstances—we have to put the cover price of *SHORT WAVE MAGAZINE* up to 30p, to take effect with the next (October) issue, due out on September 27. This is the first increase for nearly three years. Because of the heavy postal charges now in force (and further increases in prospect) we have also to rationalise the all-in charge for direct subscribers—that is to say, those who receive their copies by addressed mail. Therefore, and also with effect from October 1st, the subscriber rate will be £3.75 for a year of 12 issues, with posting at least one day before publication date, and no distinction as to postal category.

In the meantime, subscriptions now running will be honoured at the old rates until their expiry. (And it might be pointed out that this means in effect, our carrying, in the case of these standing subscriptions, the higher postage rates already in force for many months yet).

For nearly 40 years, since the inception of *SHORT WAVE MAGAZINE*, we have always enjoyed the support of a strong following, readers and advertisers. We hope that those who have not been with us very long will understand the present circumstances and continue to give us their support.

Austin Forsyth
G6FO

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

PERHAPS the main feeling in the mail this time is that conditions, like the Stock Exchange, have managed to make something near rock-bottom—as though the sunspot shortage were not enough there has been much storm with attendant noises of rain and lightning static. True enough but even under these conditions it has been possible for some interesting QSO's to take place on all the bands, but only provided one was prepared to scan them all and take the one which showed the best combination of effects at that particular time, and provided one did not expect every QSO to be a new country.

During the period under review your conductor managed personal QSO's with G2NJ, G3KPO and G2BJY in that order, to have a fine natter with G2NJ, marvel at the things with which people listened to broadcastings, or chased DX with G3KPO and his collection of working antiques, and to marvel at the ingenuity and improvisation in the G2BJY home-brews (of two stations, garden and ale!). Of course, the topic was radio—what else?—and our united, considered opinion is that although conditions are poor, it's still a great game.

Looking round the bands, we start on 160 metres, a good old band, rather neglected of late years. This month the static level most of the time has been quite alarming, and when out mobile the whip has picked up assorted foul noises from the multitude of overhead power lines that infest the countryside. It is noticeable that the really high-voltage circuits seem, in dry weather, to produce far less noise than the low-voltage jobs, but when they are wet—oh, dear!

To combat the lack of GDX activity—there is always, it seems, plenty of the super-DX activity for those who live for trans-continental QSO's—at this end consideration is being given to the possibility of a new ladder, based on the revised "counties" or administrative areas into which the country is now divided, and including a selection of islands. More of this next month if plans mature.

G2HKU (Sheppey) remains faithful to Top Band, and this month his offering includes SSB QSO's with DK2QL, PA0HIP and PA0PN, while CW accounted for DLIAP1, DL6AQJ, OL6ARX and PA0CFW. Ted complains about his meagre pickings this time and reckons we should all retire at 40 and devote ourselves to DX as being more rewarding—or is it?

EP2BQ seems to have been finding trade brisk; operating during 2340—0130z, in the early part of July from the 11th, he worked DK3BJ, G3LYW, G3ORP, G3WXS, GB3TMY, GM3YOR, OK1KPU, OK2PEW, OL8CCP, PA0HIP, while from SWL friends one notes that the W's and KV4FZ are coming in at their due times despite the season. PY1RO is now back home from his American trip and active, while a new prefix is PT9DM, QSL address P.O. Box 911, Brasilia, Brazil.

Eighty

Here of course, the majority of the DX is at the ends of the bands and it becomes essential to know just where one is sitting in the band, as well as to have a stout heart if one is to wrinkle it out. One supposes that, in general, CW is the preferred mode for Eighty among the chasers in the bottom few kHz, though even there one has noted the odd S9 ragchew blotting out interesting stuff.

G2HKU tried his luck on 80m. with just the one watt of CW, to raise GM4ABO, GW3XHJ and 9H1BB.

G8HX (Mansfield) by the sound of it has been working-up his aerial systems to good effect. Frank mentions 5T5FP for a new one; the chap called a YU who failed to respond so Frank took him when he made a second call, and he also mentions a /MM in LA0QP who runs from Middlesbrough to OH and SM and was raised when he was in the middle of the North Sea. Frank mentions the number of QRP stations about, PA0CEJ, crystal on 3553 kHz and two watts; PA0ZAV with five watts; PA0MIB running watts; and DK8EO who has 8 watts and a chirp, plus UQ2GFM who puts quite a fat signal into your scribe's place with ten watts. Frank notices the number of SP, HA and YU stations about when he has a late-night spell, and wonders whether these guys ever sleep! A good question, and it certainly says much for their enthusiasm for Amateur Radio.

G2NJ (Peterborough) has, apart from his main station, one of these delightful little Heath QRP rigs with which he is mightily pleased, and one has to admit that its tiny size makes the normal shack with all the subbins strung out on a bench look faintly comic, though of course, both serve their purposes. Nick took in the QRP scene, with QSO's to GM2CAS/M on CW, G2CAS/P from Holy Island (when the latter had a kite up for an aerial) in very poor conditions; GW5TW for the latter's first QSO with his new three-watter;

G3PHV also at three watts from Chesterfield, PA0CEJ at two watts from Kooga/Dzaan, G3YIO in Walsall for a 579 from two watts, and G3ZWA of Boston on one watt. On the /MM front one lunch-time there was SM7FDN/MM on CW from the car-ferry m.s. Vallann bound Felixstowe from Sweden.

Comments

G2NJ, when your scribe was visiting, showed him the sad affair of his garden-end mast, which obeyed the law of gravity, to the detriment of its upper end, which is now, pending repairs, down from fifty feet: to about thirty until the heavy-gang can be pressed into service to get the last few feet back up, which will be tricky in a narrow garden.

G3ATU (Roker) has been silent for a long period, but makes a come-back to take issue with his old buddy G2HKU on the relative ease of working DX on SSB or CW. As Stan sees it, CW sounds the same wherever it comes from, be it T9x or T7ck, but when you start to listen to voices the trouble begins. For a start, a great many French, Spanish and Portuguese DX stations don't speak English, which means you speak their language, or go without! Then there are the gabblers, the chaps who give their own call every two hours, the "hola-hola" set, and the "tuning-up on rare DX" brigade, who between them all add up to a right mess! All this, of course, is looking at it from the point of view of a G after his bit of DX, but when G3ATU turns himself into his *alter ego* as ZB2CJ, things alter somewhat! For a start, one is DX right under the noses of the Southern Europeans, so a lot of the problems speak with Italian accents! In addition, a call on any band, with the possible exception of Ten, generates an instant pile-up, and although the ploy of "listening three up" (or down, as the case may be) does help, there is always a residuum of dimwits blasting away at zero-beat, whether on CW or SSB—but whereas one can be defeated on Sideband, on CW that 600 Hz filter does its stuff to help. Summing it all up—its easier to work 'em by hand!

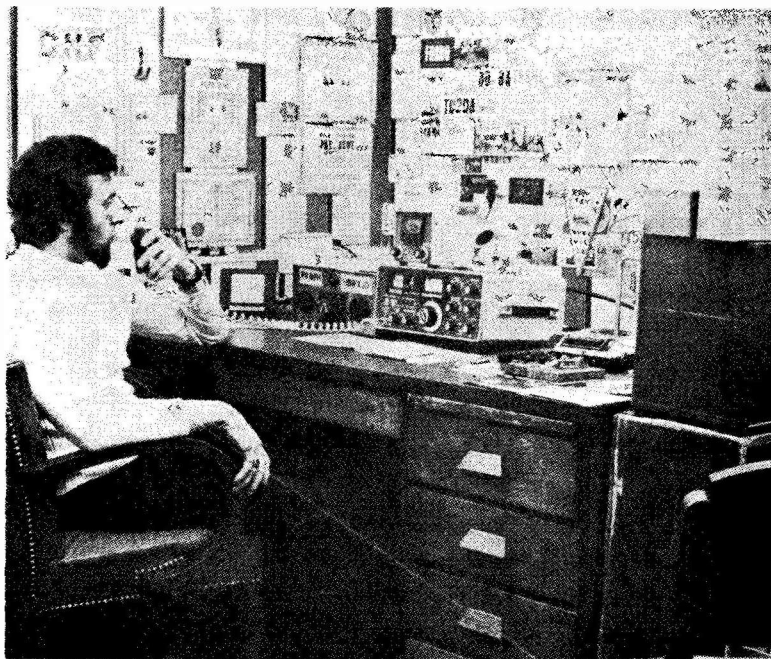
G4CXM (Paignton) has found the call of his particular salt-mine rather too pressing of late, which lost him a lot of operating time. Now there is a matter of a couple of months on the Continent, touring round ON, DK, HB, I, YU, SV, F, EA and CT1 minus rig; but it is hoped to make a detour and find time to look in at 4U1ITU, which visitors can operate. Return is due for October-end, hopefully before the autumnal conditions break.

Forty Metres

Basically, a wicked waste of a good band. As many of his friends will point out, your old scribe is much more of a DX listener than a DX operator these days, and one of his pet hobby-horses is the treatment of Forty. Those who use it, in the main, are only out for inter-EU phone or CW ragchews, and time and time again one finds them sitting on a weak, but quite workable DX signal; again, let someone call DX down at the bottom of the band on CW—the situation is similar at the other end on SSB, sad to say—then instead of a deafening silence while those on or near the channel collect their wits and take a listen, oh, no, there is an instant bedlam of big signals all calling madly for the DX and disregarding the fact that the guy who called it in the first place is at least entitled to finish his QSO before the ruckus starts! In addition, on Forty, there is a remarkable tendency, happily decreasing of late years, for those on channels near the DX to be possessed of fiendish chirps and clicks which cover the DX signal even though off his nominal frequency! But, there are W's, JA's, VK's, ZS's and such, not to mention South Americans, there for the asking at times when you and I can be operational. Perhaps we should call a World DX Day on Forty, when all the DX stations in the world and all the chasers thereof, would forsake the other bands and all appear on Forty when the resulting welter of good operators knocking off the DX and QRM'ing the lids would possibly clear the band of boneheads and bring it to a realisation of its potential!

The improvement in the aeriels at G8HX is such that he now finds RF all over the case of the Tx and receiver as soon as the key is pressed—the penalty of working a basically Marconi system from an upstairs room! Frank is going to try tuning the earth, not for a quarter but a half-wavelength, so as to get the RF off the panels. He has now worked 305 DOK areas on this band and wonders if he will ever get the cards in for the DLD-300, although he has the DLD-200 in the bag. Another one, this time from SP-land, is the Nicolas Copernicus Award; a just commemoration of a brilliant thinker.

Station of F6BFH, Alain Duchauchoy, 21 Rue de la Republique, 76 Bihorel, France, who also runs /M and has multi-element beam antennae.



G2NJ had several contacts with G2JL, G2JL/MA and G2JL/MM, from his yacht *Reine de Mai*, following his progress along the West coast of France to his objective in Northern Spain. Another call used on the trip was F0GR/MM, and regular skeds were kept with G3GQS. The gear at G2JL/MM comprises a Marconi transceiver at 80 watts and a vertical, quarter-wave, aerial.

G2HKU used both modes, he not being one to favour either, and the SSB raised YV5MO and 9H1BX, while CW accounted for W1WQC/4.

VE3HHN/G4DGZ has recently been in the U.K. at Sutton, Surrey, but at home hails from Toronto—his address for all G4DGZ contacts is: Colman M. Jones, G4DGZ/VE3HHN, 7 Jackes Avenue, Apt. 108, Toronto, Ontario M4T-1E3, Canada. He only managed one U.K. contact during the two months prior to his trip over here, in G5JL, though he had many, both at club level and on the air, to compare the different approaches in G and VE. Look out for him on Forty or Twenty. At 15, he has a busy school programme and a week-end job, but he will, nonetheless, be pleased to offer service to anyone wanting a QSL manager—either write him, or look out for him on CW at the low end of Forty, around 0300-0500z.

Although he uses mainly the HF bands, G4CXM does not neglect his chances wherever they may be; Forty seemed good to VK and ZL in the mornings, and a new country was raised on 40m. in the shape of LU8ADK, worked on CW.

Now Ten

Still the odd event of interest, despite the shortage of sunspots. Only rare looks at Ten, reports G4CXM, although Ray didn't miss it all, as he worked IS0XBU and OY2J on Sideband.

G3NOF (Yeovil) returns to the lists after a spell off due to trouble with the machinery. On Ten, Don made no contacts, but notes that although the band was generally dead when he looked, there were some true short-skip openings with strong U.K. and near EU signals, with a few USSR stations also to be heard.

There is not a lot said about Ten, avers G4AGZ (Hayle) and he proceeds to point a moral by noting his score of 95 countries worked and 75 confirmed since October 1971. In addition, David has a list as long as your arm of stuff worked since *mid-March*; and he is amusing himself in the short-skip openings by trying to work the counties on Ten—a novel idea. His list shows LU, VP8, W4, W3, PY, CX7, CX8, ZS1, ZD8, FY7AN, VP2AR, more LU/PY's, EL8G, 4X4, 5Z4, CR6, PS7BDX, CE, CX1BBR, CQ6OR, 9G1DY, CV2T, CR7BQ, 9L1JM, 9H1, SV1, more 5X4, PY's, CR0 again, TU2DV, CR4BS, 5B4ES, ZS's, ZE, YV5MM, HH2WF, KV4DB, 9Y4EH, 4U1ITU, ZP5GP, CX8DM, 6W8DY, UA6HCZ, XTA2L, P0AHY FC, IC8CIZ, another load of East Coast W call areas, EA8BK.

EA2LG (who was using just the one watt), 9Y4, 9L1JT, 9G1HY, EL2AK, and a fine crop of G, GM and GI counties, the GI being hooked at 2248z. Now who says Ten is dead!

Fifteen

Although there are few reports this time on 15m., for many people when it is open it is by far the best band to use for good DX contacts without the amount of "accidental" QRM which so often wipes up a contact on Twenty.

G3NOF seems to have found all the times when the band was in poor shape although "open" in the non-DX sense; he heard a few PY's, P's assorted, and 9J2DT as about the pick of the crop.

G4CXM worked EL7F, OY2J, both on SSB, and keyed to 9A1FF.

The offering from G3YRR (Grimsby) has his usual somewhat sardonic tone—he found, on 21 MHz, a station, commercial, signing with the *Internationale*, and complete with great whiskers sprouting either side all the way up the band. Otherwise, Nix.

Twenty Metres

Admittedly, we always say that Twenty is where the action is; but it is odd the way we all seem to take refuge on 14 MHz when the sunspots aren't helping in any way, when the rain static is S9 and, when the lightning static blots out Top Band, Eighty or Forty. When all else fails, try Twenty and then a Good Book in that order.

Despite all the fireworks in the way of weather, your conductor gets the feeling that during the few days prior to this offering being put together, conditions on the band of an evening have perked up a little, with all continents heard during the period 2100-2200 clock at workable strength, although the Africans required to be searched for with some diligence and not all of the continents showed up on any one evening; and this after an earlier skim round had suggested the band was either dead or just going out.

G3NOF agrees that things were patchy; a few weak VK's but no ZL's were heard around 0730z, and there were at the same time sometimes brief openings to KH6, KL7 and the Pacific. Short skip prevailed during the day and often late into the evening, and one QSO of note resulting from this was with two GI's, a GM and a VE1, all at S9! From 2100 until the early hours, the W's have been workable, and in the mornings around 1130; the late hours were also on occasion good to South America. The SSB QSO list includes DA2QC/M/HB0, DA2QW/M/HB0, EI0CL, F0AHY/FC, FG7AO, FP0YY, G3RSP /MM off Kenya, IC8CIZ (Capri), ID9DMK (Lipari Is.), JY6MSM, JY9GR, KS6EZ, KH6QZ, KH6HML, KP4EAX/H18, M1D, OX3EA, SQ8GVM, TA2QR, TG9DD, VE7TM, VP2DM, VP5KG (Turks and Caicos Is.), VU2GDG, W3JAK/MM in the North

Reporting the HF Bands

Atlantic, XE1AAV, YV's, ZD7SD, ZF1GA, ZS3AW, 5W1AR, 6Y5HM. Not bad for an ailing band!

His 14 MHz CW, reports G4CXM, went out to VK2EO, VK3AMM/2 (otherwise G6XJ in disguise, and it is interesting to note that G6XJ also had a hand at the G4CXM end, having manufactured himself the trap dipole that station used for the QSO!) KH6CF, UK9MBA, UK9ABA, CX2AQ, VE3HGN, VE3HBF and GW4CFC, while his SSB penetrated to the receivers at PY4DK, SQ9KRT (a new variation of the SP prefix), YV4AKK, LU4ECO, SM3AVQ, OE9ABI, DM8SOP, OE6HZG/TF, GC3GS/A, LX1BJ, CF3DTG and VP9GE, illustrating clearly the short-skip-mixed-with-DX which has been so much the keynote of the band this time.

G3UZ (Goring-by-Sea) always has his tuppence-worth on Twenty, on the key, and this added up to QSO's with JA3DGE, JA3EFH, JA5PL, ZE3AA, YK5CDL, CE5BB, 5Z4OX, 9Y4TR, 9M2DW, LU2CAP, UM8FI, UH8AC, UH8MAX, PY1ZAE, CT3AS and W5QBP/MM.

On operating tactics, G2BJY (Walsall) tried a CQ DX one evening at 1845z, and raised U18GAC, so he followed up this QSO with another "CQ DX," which scared up VP2VBU, Tortola; then the VP2 disappeared under the calls from all Europe! Such are the manners of the permissive society. Other interesting QSO's on the band were had with IS0LSV, and OG7AA for a new prefix. On a different tack, does anyone have a QSL address for VP2VBU?

G2BON (Aldridge) returns to the lists after an absence partly due to the disruption of our deadlines, but more because of the lack of DX—or so he says! Since he took up DX-chasing a couple of years ago, he has piled up 119 countries for DXCC, but is still short of eight cards to make up the magical hundred. Recent QSO's on the band were with UL7EZ, OY1M, UK9AAN, OY1A, OJ0MA, I3GRX/IL7, UK6FAF, 5Z4JD, IB0JN, HK3GWR, UD6BQ, 5Z4OT and 5Z4PF, UK9AAQ, CR6QU, K9KGA/6W8, 9J9WL, UH8BX, F0CH/FC, V55LH, 3B8AX, KC5SX and FG7XL.

GM3ZXL (Glasgow) enters the fray at this point, kicking off by mentioning sixty QSO's this year with KX6BU, an exiled Scot from Ayrshire, leaving KX6 on the very day this is being written, to return to California. Andy uses all Heathkit gear built up himself, the SB-102 and the SB-200 linear, with a TH6DXX beam at 66ft. to try and look out of the valley in which he is situated, even though said

valley is itself at 230 feet a.s.l. Despite the poor band conditions GM3ZXL connected his SSB to KP6KR, FO8EE, PZ1BK, VR1AC, YJ8DE, HR3JJR, KL7AJR, VP5KG, VP2VAL/MM near FO8, KL7HAQ, PJ3RR, KM6DZ, KX6LP, ZL2AUX, A35FX, ZL2AM and ZL2KM.

That odd characteristic of Ten, of producing a DX reply to a CQ on an apparently dead band, was noted on 14 MHz by G8HX; Frank put out his CQ on July 31, and promptly got a call from W6TXZ who had 1 kW into a two-element beam. The encounter ended with G8HX being called by W6VY, who had been listening to the earlier QSO, and all at a time when the band seemed to be completely dead from the DX point of view. It was under somewhat similar circumstances that G8HX clicked with VK8HA. Frank also connected with Fred Phoney, this time in the guise of a CW signal signing "KC6C" and disappearing when called.

We have already mentioned G4DGZ/VE3HHN, and it remains for us to point out that this lad had dipoles only for 7 and 14MHz, strung awkwardly out of an apartment building in downtown Toronto; to this he has coupled an FT-200. Pounding brass with such a set-up and working over to the U.K. pretty regularly on Twenty or Forty will soon turn him into a dab-hand at the game, we reckon.

The SSB from G2HKU percolated LG5LG in Morokulien, now fitted out with new Drake and Heathkit tackle, while on CW, Ted made his reckoning with KH6IJ, UA9URS, UL7WH and UV0EN.

This and That

G3YRR (Grimsby) mentions that W3CTR, well-known on the Ex-G club net on Twenty, has been back to his home town of Grimsby, where of course the lads at the Wheatseaf reminded Don of the taste of good ale and talk. On a different theme, Charles feels we are all rather too touchy about the items we see in the public print about Amateur Radio. As he says, it is a hobby, not a sacred rite, and a piece for the general reader must be understood by him, which chops out all the jargon instantly. He feels that this "aloofness" about Amateur Radio transmits itself to the ordinary reporter trying to write up a story, who thus thinks of us as a toffee-nosed bunch.

Nice to hear again from 5N2ABG that was, now operational again as G4DGR with the same KW-2000A, although the G-QTH is somewhat restricted in terms of aeriols. Eric has all his 5N2ABG logs with him, and will QSL any contact short of a verification, even though he has sent cards to all stations worked from 5N2-land. The address to write to is in the month's "New QTH" page.

A letter from W6AM (Long Beach) includes a photograph of XE1A/XF1A, who has been top of the pile in no less than 32 of the big DX contests, attending the Visitors Day at W6AM's Rhombic Farm and looking into the bowels of the W6AM/6M kilowatt amplifier. On a different topic, Don has a couple of offerings: The energy crisis

JA6SVP, though only recently licensed in the Japanese 6th District, is one of their keenest DX operators, with what may now be called a standard range of Jap communication equipment.



is just like the good old days . . . cooler rooms, candle light, rowing, sawing wood, and walking to the store!

G2BJY reverts to the question of home-brewing versus owning commercial and reckons the chaps who don't construct anything ought to have their licences amended to give them Citizen's Band status!

G2BJY gets support on this topic of home-construction from G2BON, not so far away, firing all his big guns in a mighty broadside of three pages of well-argued foolscap. Firstly, he enquires a bit acidly why in Heaven's name people in a sane society are prepared to spend upwards of £250 for just one piece of equipment? Again, is SSB in relation to AM just like stereo and mono—a mere gimmick? Something to promote sales? How many people in this country with Linear Amplifiers capable of over the kilowatt run them at the legal limit? By this argument it should be level with the chap who builds a kilowatt CW rig, loads it up to the lot and puts it on the air! Tom reckons these guys who have Quads at 60 feet, kilowatt linears and commercial rigs are not amateurs, but *professionals*; some have licences but have never done so much towards their station as hang up an aerial. His proposals to right the situation are these. First, scrap the R.A.E.; secondly, bring back the old AA licence; thirdly, a maximum of 25 watts input, CW only; fourthly, all gear, including aerials, to be home-built, the aerial to be home-designed also; fifthly, no transmitting types of valves or semi-conductors to be used, and lastly, all operation to be crystallised, a strictly search-and-call operating procedure to be enforced; and any infringements noted to cause loss of the licence.

All this advocacy of home-brew and tighter licensing goes unopposed for the moment, so let your scribe try and look at the other side of the coin. First, let it be said that in principle he is all in favour of the revival of the old AA licence and of some tightening of the rules. However, the R.A.E. is essentially an international-law requirement and must therefore stay in some form or other. He would also agree to the idea of the first year on the air being with restricted power and CW, if only to train the licensee to an adequate CW speed and operating-procedure standard; the latter is far too sloppy on modern Phone bands. On the other hand, the argument G2BON puts forward about SSB is not so strong—it has become the standard form of telephony for all but broadcast stations and business radio on VHF, not because of its manifest superiority, but because its band width is less and the carrier QRM from adjacent channels is eliminated, enabling narrower bandwidth to be utilised. In amateur terms it means three sideband stations in the area taken by one, hopefully well set-up, AM signal; one at the upper, one at the lower sideband, and one, with a bit of crud, sitting in the middle between the other two. With the rise in the number of amateurs on the air alone, to go back to AM would be ridiculous. Again, some 30% of all radio amateurs are truly professionals, in the sense that they earn their daily crust at some level in the electronics industry. As for this argument about the cost of a rig, just consider Mister Average, paying

out to a couple of hundreds for a colour TV and many £100's every couple of years or so for a shiny car the purpose of which is not more than to stand outside the house and impress the neighbours. Personally, G3KFE doesn't give a darn whether a station is commercial or home-brew, and he feels that any attempt at organising people to build or to buy is a reversion to that kind of regimentation against which we fought Hitler's War.

On a much more light-hearted note, G2HKU notices the number of USSR stations on Phone who speak *good* English—but almost always with an American accent and idioms! Makes you think, doesn't it!

DX Details

Contest-wise we are in a relatively slack period, with nothing important on the horizon this month. However we do have the 1973 CW results from the *CQ-CW* Contest, in which U.K. stations made a bigger noise than for long enough. We had no representation in the all-band categories, but on the single-band front we note G3KWK fifth on Eighty, G13OQR third on Forty, G3FXB fourth on Twenty, G3HCT second on Fifteen, and on Ten we see G5BAU at fourth, and G3RUX at sixth. Congratulations to all these stations on a fine effort in a highly competitive event.

That Spratly expedition by VS5MC proved abortive, in that when they came in sight of Spratly, it was occupied and had radio masts erected. Politically, there is strong feeling that the Chinese Republic had claims on this group in the China Sea; thus it seems that the operation from Spratly Is. by IS1A, 'way back, was the last Amateur Radio action we shall see from the Island, at least for a very long time.

Another one in the melting-pot was the Mount Athos expedition, due to fire up late-August and still believed to be on schedule. However, there is now doubt about the legality of these Mt. Athos forays, and it seems in dispute as to whether there ever has been any *legal* operation from Mount Athos—"legal," that is, in the Amateur Radio sense. However, if ARRL accepts the documentation and allows Mount Athos as a "country," then it can be a country for scoring purposes! So work 'em and QSL 'em first, and wait for the problems to sort themselves out afterwards!

Activity from Tokelau is likely if all goes well, the spark-plug here being WB6CZB, who has been signing 5W1AL of late.

Nauru operations by JA1OCA were due to start on August 31, and continue until September 8, with breaks to operate a ciné camera, so as to record for posterity what a DX-pedition is really like for the operators.

Close Down

That's it for this month. Our thanks are due to all those who reported, and of course to Geoff Watts' *DX News Sheet* and the *West Coast DX Bulletin* for much information.

Deadline for next time will be September 9 latest, addressed as usual to "CDXN," *SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ*. And now for some DX, to hear or to work!

* * * THE MOBILE SCENE * * *

REPORTS AND PICTURES

ACCORDING to our Calendar, there have been no less than 26 Mobile Rallies scheduled for this Season, of which there are now only two left to play off, Harlow and Peterborough.

Attendances and trade support have, generally speaking, been very good—Rallies, having become social occasions, also attract those keen radio amateur types in a mood to spend money. They look for bargains round the trade stands.

The Longleat event on July 7 brought in about 2,000 visitors—not their largest recorded, it being thought that the TV coverage of the World Cup Final on that day somewhat reduced the potential attendance (indeed, many were heard on the air saying they would be at the TV and not at Longleat). However, amongst the keen visitors were the party from Guernsey—they chartered an aircraft to Southampton and then came on by road to Longleat—dedicated enthusiasm indeed, and we are only sorry that we have not got a picture of this group.

Logs from Longleat show 97 contacts on Top Band, 64 on Eighty and 58 stations worked on two metres, mainly talk-in QSO's. One of the radio amateur visitor events was the "walking D/F Hunt," confined to the grounds which, we are told, drew a large entry. The new hon. secretary/treasurer of the RAIBC, G3HXN and his XYL, were present to meet members of that group.

Once again, Longleat—in a wonderful setting, with so many amenities for visitors—was a very successful occasion, on which G3ULJ and the Bristol Group team are to be congratulated.

According to one of our correspondents, it was a case of "Woeful Woburn" on August 4—not the fault of the RSGB (as some seemed to think) but the Wx. In heavy and continuous rain, everybody present was, so to say, "confined to camp," under the dripping canvas of two large marquees. Added to this was the fact that the "usual offices" and the refreshment bars were about a quarter-mile from the scene of operations. You had to get wet to do anything or go anywhere.

On the other hand, the signposting and the talk-in facilities (organised by the Dunstable Downs Club) were excellent. There was a strong trade representation and no doubt the Wx, keeping the visitors under cover, gave a great fillip to business!

The Derby Mobile Rally on August 11 falls into quite a different category. The weather was good; the attendance up to standard (after all, this was their 17th such event in a continuous series); it was all, or could be, under cover; there was ample free parking (and nothing to pay to get in); and the attractions were those that have been proved successful for this event. Because of the central location, there was good trade support, and the press round the stands augured well for business. For years the organisation of this Rally has been undertaken by the Derby & District Amateur Radio Society, with Fred Ward, G2CVV, and Tom Darn, G3FGY, as the prime movers. Once again, they and their helpers turned in a Good Job.

Rally events to come are as follows:
September 22: Harlow & District Amateur Radio Society annual event, at Netteswell School, Harlow, as last year, with talk-in on Top Band. 80m. and 145-00 MHz, signing G6UT/A. Attractions

will include trade stands, bring-and-buy stall and a grand raffle. Free admission and parking, refreshments available on site.— B. G. Capper, G4BDC, 36 Woodhill, Harlow, Essex, CM18 7JT, or B. W. Nappey, G3YDI, QTHR.

September 29: Organised by Peterborough Radio & Electronics

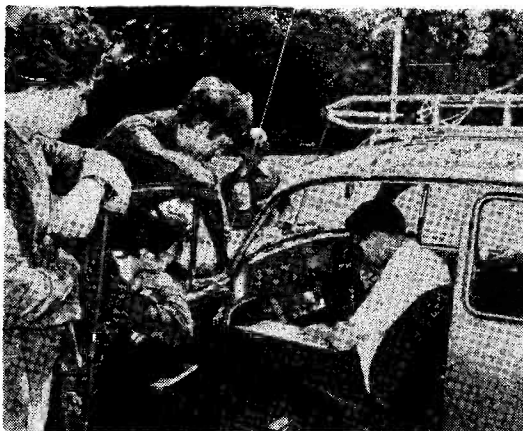
Society, at Walton School, Mountsteven Avenue, off Lincoln Road, about four miles north of Peterborough city centre. Talk-in 2m./160m. from about 10.0 a.m. for the 11.0 a.m. opening. There will be trade stands, a raffle and refreshments available on site.— A. Jackson, G8GNV, QTHR. (Tel.: *Castor 353*.)



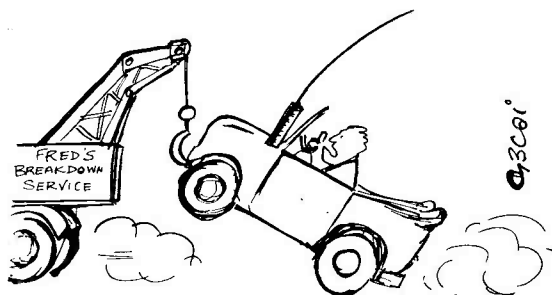
For the Mobile Rally at Beverley, Yorkshire, the car parking arrangements were unusually efficient—this is a general view of the assembly of visitors' cars on what turned out to be a very warm day.



Seen at the North Midlands Mobile Rally, the multi-band/M aerial now in use by G5AXK, of Weston-on-the-Green, Bicester, Oxon.

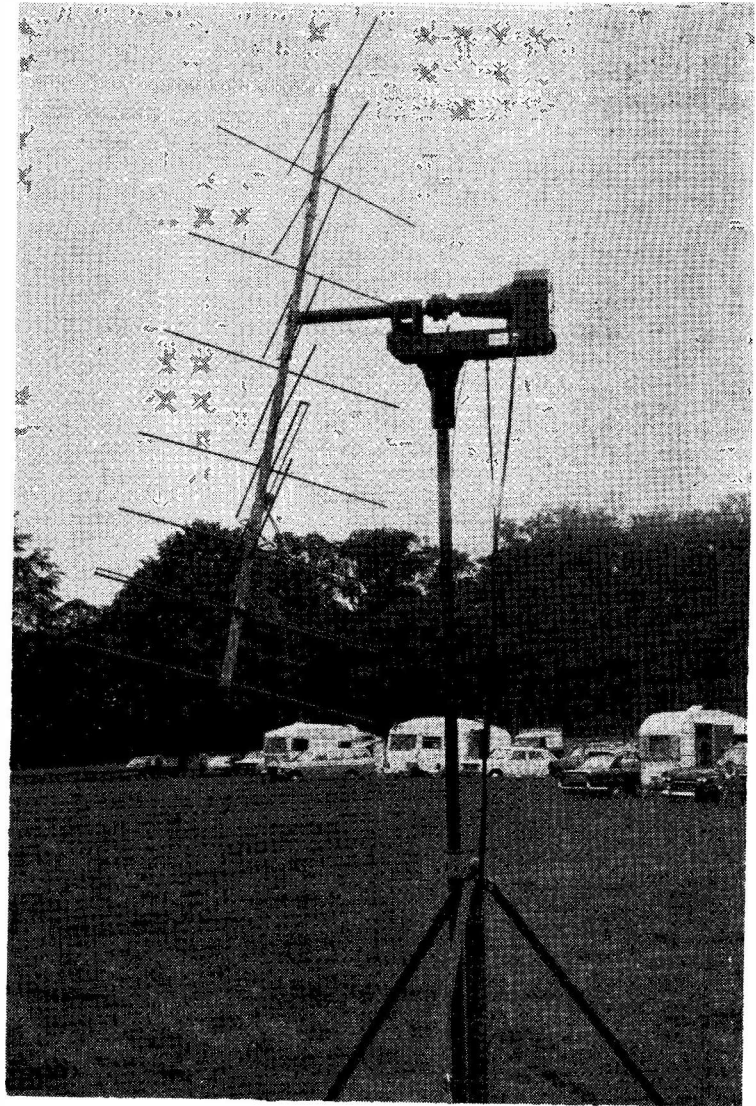


Having his door leant on by, left to right, G4CXZ, G3YNO and G4CRU was G3RDM, operating G3AMW/P on 160m. at the Hull & District A.R.S. Mobile Rally.



“... got myself quite hooked on this mobile lark ...”

For the Mobile Rally at Longleat, Wilts., organised by the Bristol group, one of the attractions for visitors was a working demonstration of weather-satellite tracking, the display being in an adjoining cabin, always crowded with viewers. This picture shows that these antennae need only be a few feet above ground. Regular readers will remember that G3HMO has had several articles in "Short Wave Magazine" on the subject of amateur Wx-satellite reception.



SPECIALLY ON THE AIR

Following is the last of the activities notified under this heading. All interested should note the QSL procedure for Special Activity Stations, as explained on p.201 of the June issue of *SHORT WAVE MAGAZINE*.

G3CAR, September 7: For the 28th annual Wycombe Show, The Rye, High Wycombe, Bucks, organised by Chiltern Amateur Radio Club, operating all bands 10-80m., CW/SSB. Skeds offered, and all contacts to be QSL'd by special card. Visitors welcomed.—A. C. Butcher, G3FSN, 70 Hughenden Avenue, High Wycombe, Bucks. (Tel.: 494 24835.)

GB3TC, September 13-15: Operated for the Tiptree Carnival, running all modes on all bands Top to two metres, with the possibility of RTTY on 80-20-2m. QSL's direct or via bureaux.—M. J. Quec, G3ZWW, 18 Oak Road, Tiptree, Essex, CO5 0NF.

GB3CSV, September 14: Put on by the Leicester 91st Scout Group for the visit of the Chief Scout, operating on two metres only. All contacts and reports QSL's by special card.—Harriman, 91st Leicester Scouts (*this is all the QTH we get*).

GB3BS, September 21-22: For the Basingstoke Show, Stratton Park, Kempshott, put on by the Basingstoke Amateur Radio Club, working 2/15/20/80m. HF-band operation on SSB, and FM on VHF. QSL's via bureaux, or direct with s.a.e.—P. J. Sterry, G3CBU, Ashley, Orchard Road, Basingstoke, Hants.

GB3HFA, September 20-22: Put on for the "Hobbies For All" event, by Grimsby Amateur Radio Society, working all bands, including two-metre SSB on 144.23 MHz. Special QSL card for the new county of Humberside.—D. Johnson, G8HAE, 3 Ethelstone Road, Grimsby, Lincolnshire, DN34 4EF.

GETTING GOING ON 23 CENTIMETRES

USING COMMERCIAL EQUIPMENT

A. H. DORMER, C.Eng., M.I.E.R.E.
(G3DAH)

IN view of the increasing interest in UHF, the author decided that it was about time that he did something about the next band up from 70 cm. That decision taken, a review was made of current designs and operational techniques for 23 cm., and the conclusion arrived at was that there were two approaches which should be considered. One could go straight away for SSB via a suitable mixer (probably 1152/144 MHz) and run high power with a 2C39A or, better still, a 3CX100A5 (or a pair of them!) some form of parabolic dish antenna, possibly 5ft. in diameter to get adequate gain, and a really hot, and therefore very expensive, converter.

The second approach was to run fairly simple equipment and get the feel of the band and UHF techniques generally before proceeding further. This second approach was adopted.

The question then was whether to design and build from scratch or go, in part at least, commercial. Eventually, the time factor and non-availability of certain items of expensive test equipment decided the issue, and the present set-up at G3DAH consists of a mix of a 34-element Yagi, a modified version of the G4BEL pre-amp and the *Microwave Modules* converter and varactor tripler.

The Antenna

A look at the antenna mast, which now carries beams for 4m., 2m. and 70 cm. and, eventually an HF bands beam, ruled out the possibility of a dish of adequate size on weight and space considerations alone. Some sums were done on a corner reflector to see what gain might be obtained from this system. With two half-wave sides at right angles to each other, and a dipole driven element, a maximum gain of 12 dB can be obtained when the dipole is located 0.25 λ from the corner. At 60° angle, a spacing 0.4 λ gave maximum forward gain of 10 dB. Smaller angles were investigated, but the feed impedances dropped to very low values and, in spite of an increase of gain of

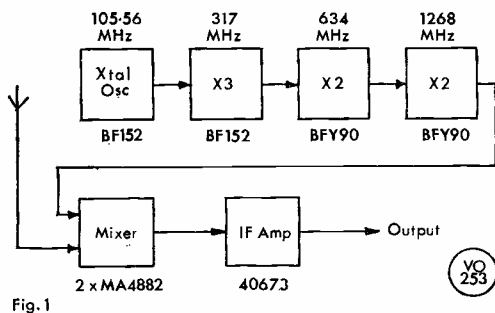


Fig. 1

Fig. 1. Block diagram of "Microwave Modules" 23-Cm. converter for 28-30 MHz IF.

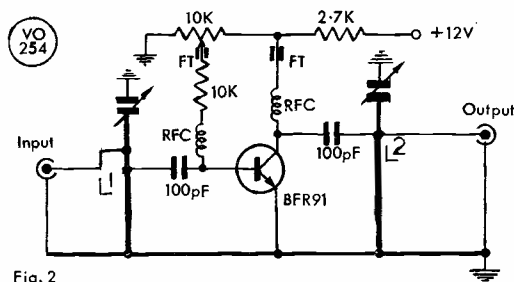


Fig. 2

Fig. 2. Circuit for a 23-Cm. pre-amplifier.

some 2 dB, the arrangement becomes impractical.

The reflex aerial showed possibilities, particularly if two structures are stacked horizontally, when a gain of some 18 dB may be realised, but the assembly tends to be rather unwieldy with 2 λ sides, and mounting presented a problem in the author's case.

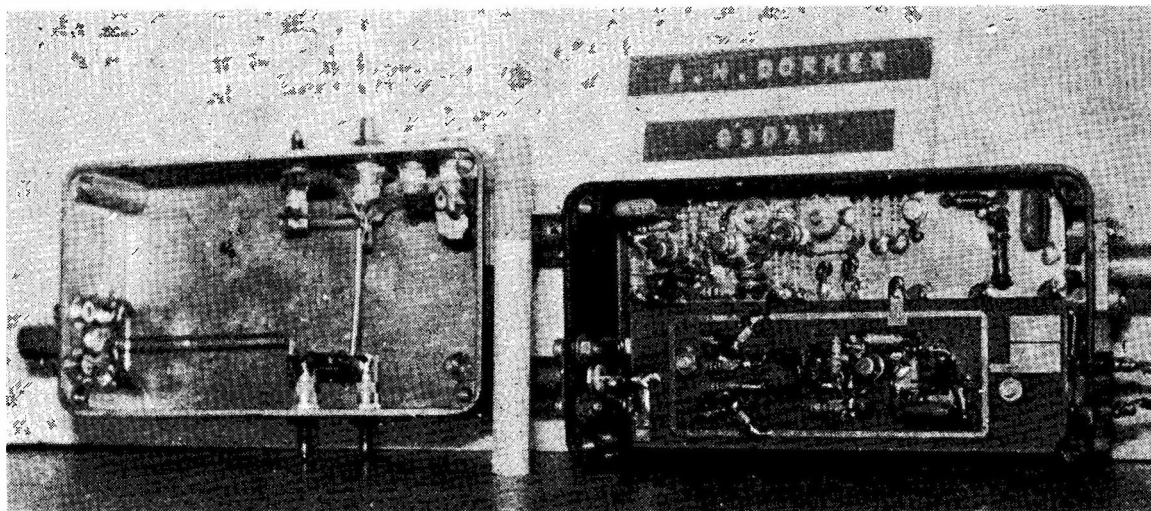
A Yagi began to look the best bet, and several designs were examined, the final choice being the 34-element model developed by G8AZM. This has a gain of about 18 dB and is fairly simple to construct and feed. If the boom length of 6ft. presents a turning circle problem, it has been found that reducing the number of directors from 32 to 16 will not lose all the theoretical 3 dB since the current in the elements more remote from the radiator is small and contributes little to the forward gain. (G2DD quotes a loss of 0.1 dB compared with the expected 1 dB if seven directors are removed.)

It goes without emphasis that good quality co-ax must be used for the antenna feed. Belling-Lee BL.063 is suitable, fits Type N plugs, has a loss of about 4 dB per 100ft. and is reasonably priced. It may be noted here that Type N and Type BNC plugs and sockets have an upper frequency limit of 10 GHz, whilst the UHF type (PL259) is good to 200 MHz only.

Converters

The more obvious choice for the home constructor lies between converters with an IF of 144 MHz or those with a 28 MHz IF. It may be argued, with some justification, that an IF as low as 28 MHz is undesirable on this band, and indeed, in areas of high transmitter density, second channel QRM would probably be a nuisance. Against this must be weighed the disadvantage of tying up a 2m. converter which might be wanted for cross-band working and, in the writer's case, of having a non-standard IF. There seemed little to choose between the two designs from other points of view—both required access to workshop equipment, and both gave comparable performance, but it seemed a good idea to have a look at what the professionals were doing before making a final decision.

The only 23 cm. converter commercially available is that produced by *Microwave Modules* of Liverpool, and this was examined closely. Fig. 1 shows the block circuit diagram. It uses printed circuit micro-strip techniques for all UHF and microwave circuitry, is small in size and economical to run. The mixer consists of two MA4882 Schottky diodes in a balanced configuration



The "Microwave Modules" varactor multiplier (left) and converter unit (right) for the 23-centimetre band, as discussed in the article. The VBC77J varactor is bolted through the chassis at the top of the left-hand enclosure, with the output and idler tuning circuitry to the right of it. In the converter itself, the osc. chain is above the p.c. board and below is the ring mixer. The input and output matching stubs are adjacent to the BNC sockets. Cigarette for size comparison.

driven by a hybrid ring. The antenna is connected to the ring at the central balance point which gives high sensitivity and good isolation between the antenna input and injection frequencies. A capacitive stub compensates for input lead inductance. The IF is picked off from the diodes via a ferrite transformer and feeds a 40673 dual-gate mosfet amplifier. The oscillator chain comprises BF152 and BFY90 transistors multiplying from a 105.6 MHz or 96 MHz xtal, depending upon the IF, and gives ample mixer injection. The model tested showed nearly 30 dB of gain and an overall noise figure of about 8 dB and, unless one is going into a very high price bracket for the input transistors, this result compared very favourably with other published designs. The use of the diode ring mixer inevitably means low input impedance and wide bandwidth. An interdigitated filter at the input was tried without conspicuous success, and finally a BFR91 pre-amp (Fig. 2) was constructed, and this improved both gain and selectivity. No spurious responses were detectable in the main Rx (FR-DX500), but half the injection frequency (634 MHz) appears, albeit at low level, at the antenna input socket and this could cause trouble with TVI. The pre-amp reduced this output to negligible proportions. From all these considerations, the decision was taken to use this particular converter. Fig. 2 shows the outline circuit of a pre-amplifier to a design by G4AHH which could hardly be simpler but which is very effective indeed.

Transmitters

With a low power driver on 432 MHz already available, the fairly obvious way to get on to 1296 MHz is to use a varactor tripler, bearing in mind always that such a method is unsuitable for SSB operation, although NBFM

can be passed through at full power level and AM at half power. Valve triplers were considered, but required (in some cases expensive) power supplies, and they take up more space for a given output.

The *Microwave Modules* tripler gives 14 watts output for 24 watts input and the output is remarkably clean. The double tuned circuits at input and output contributed to this result, and looked after load impedance changes also. This power output is perfectly adequate to drive a high power PA of the 3CX100A5 type.

Varactors have some nasty habits if not set up meticulously with sophisticated test equipment (which the author does not possess) and the decision was taken to go commercial with the idea of adding amplifiers at a later stage.

The foregoing notes merely indicate one practical approach to getting on 23 cm. fairly quickly, without much trouble and without the need for expensive test equipment. There are, obviously, those who will wish to "roll their own" and other, more technical, solutions may be found in the literature for those with access to well-equipped laboratory and workshop facilities.

* * *

The following observations may be of some use to those who are stimulated by this article to have a go on UHF for the first time.

Except under extraordinary propagation conditions, very few contacts are made directly on 23 cm., the usual procedure being to set up the QSO on 70 cm. and then work on three times the 70 cm. frequency to avoid retuning the Tx. This practice also helps in locating a weak signal on 23 cm. As the use of transverters employing additive mixing rather than tripling becomes more

popular, this practice will diminish. If a transceiver is used somewhere along the line, a second, independent Rx is a great advantage, but if one is not available it is convenient to choose a 70 cm. frequency such that, when multiplied by three, the output lies between 1296.1 MHz and 1296.5 MHz so that the usual transceiver operated as an IF strip and covering the amateur bands in 500 kHz steps will not require bandswitching at either end of the QSO.

All the usual modes are heard on the band, with SSB on the increase. NBFM, in spite of reception (and other) disadvantages, and CW, have an edge over AM in that full power may be run through a varactor tripler stage.

Propagation is not limited to line of sight by any means (*vide* the QSO between G4BEL and OE2OML). The important thing is to have a clear take-off in the desired direction rather than a great amount of antenna

height. With a good converter, 10 watts of RF output and an antenna with a gain of around 15 dB, ranges of about 100 miles should be possible under all but very poor conditions.

There is a significant increase in signal strengths during the late evenings and early mornings and long-haul skeds should be arranged to take advantage of this fact. A check on the two 23 cm. beacons, GB3DD on 1296.05 MHz and GB3LDN on 1297.95 MHz will confirm this statement. Failing reception of these beacons, listening to regular skeds, details of which appear in this journal from time to time, will indicate DX possibilities.

* * *

The author wishes to thank those who have so readily offered their advice and help, notably: G3JVL, G4AHH, G4ALN, G8ACN and G8FPH.

TRANSISTOR CASCODE IF AMPLIFIER

DESIGN AND CIRCUITRY

A. GOULDSTONE (G3TAG)

IN the design of radio receivers and transceivers the importance of a good intermediate frequency amplifier cannot be over emphasised. It is in this section that most of the signal amplification takes place, and its performance will control the characteristics of the complete equipment.

Basically the unit should have a voltage gain of about 80-90 dB and should contribute as little noise as possible to the receiver as a whole. Additional requirements are good selectivity and the ability to handle signals of wide dynamic range.

Over the past few years developments in solid-state technology have made the first and last of these requirements quite easy to achieve. The second requirement (selectivity) is not the problem it used to be because the majority of IF amplifiers are now preceded by a high-performance mechanical, ceramic or crystal filter. It is, however, a wise precaution to limit the bandwidth of the amplifier to prevent the amplification of wide-band noise generated by the circuit itself.

Cascode Amplifier

An RF amplifier using a single transistor is not really suited for use in an IF strip. It is difficult to apply AGC to such a circuit without causing it to go non-linear. Therefore, strong signals will produce quite severe distortion. Also, if high stage gain is required neutralisation may be necessary to prevent instability. To overcome these problems a cascode circuit was chosen, an example of which is shown in Fig. 1. Input signals are amplified by the common emitter transistor Tr2, the collector of which is connected to the emitter of Tr1. This transistor is in the common-base configuration and serves, amongst other things, to isolate the input of the stage from the output. It will be noticed that there is quite a miss-match between the output of Tr2 and the input of Tr1, the output impedance of Tr2 being high

and the input to Tr1 low. In practice this will not matter because the complete stage has far more gain than we will ever need. The un-bypassed resistor R1 provides negative feedback to the amplifier and is selected to produce a voltage gain of 40-45 dB.

A very useful point about the transistor cascode is its high output impedance. This allows the use of untapped RF and IF transformers without the loading problems imposed by the single transistor common-emitter amplifier. AGC can be achieved by varying the bias voltage of Tr1. This, by emitter follower action, will change the collector emitter voltage of Tr2, altering its gain.

Improved Circuit

A much better way is to include another transistor as shown in Fig. 2. This transistor, Tr3, forms a differential amplifier with Tr1. If the base voltage of Tr3 is a little below that applied to Tr1 this extra transistor will be cut off and will have no effect on the operation of the circuit. As the base voltage is increased, the emitter voltage of Tr3 will rise until it begins to reverse-bias the emitter of Tr1, reducing the amplifier's gain.

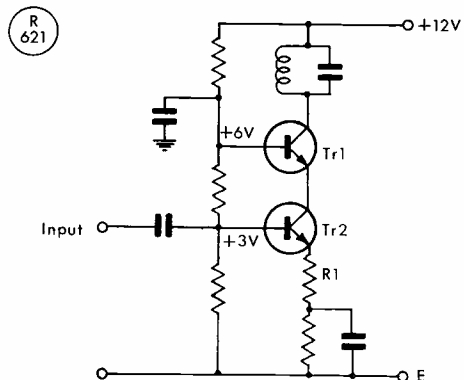


Fig. 1 Cascode Amplifier

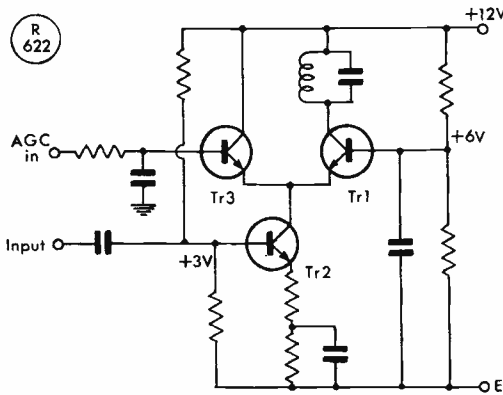


Fig. 2 Improved Cascode Amplifier

Complete IF Amplifier

Fig. 3 shows the circuit of a complete IF amplifier for 455 kHz using two gain controlled stages as described. The total voltage gain was adjusted to be about 80 dB by selection of the emitter resistors R4 and R10. It should be noticed that the whole primary winding of the *Denco* transformers is used, the collector tap being ignored.

The output of the final IF transformer T2 is fed via the step-up transformer T3 to an emitter follower Tr7. This provides a low-impedance drive for the AGC rectifier D1, ensuring rapid charging of the time-constant capacitor C14. This capacitor, together with the discharge resistor R20 and the cathode of D1, are connected to the non-inverting input of the DC amplifier IC1. The amplifier is floated midway between the +12-volt supply rail and ground by returning its inputs to

the junction of potentiometer R17 and R18. Its output therefore sits at about +6 volts and swings upwards with increasing signal, progressively turning on Tr1 and Tr4. Potentiometer RV1 is provided to adjust the bias voltage of Tr2 and Tr5, and its setting will determine the level at which the AGC begins to operate.

The output voltage swing of IC1 is about 600mV and may be used to supply AGC to a preceding RF amplifier and to drive a signal-strength meter. If manual gain control is required a switch should be included between the DC amplifier output and R22. The AGC line can then be taken to a potentiometer, the output of which can be swung between +6 and +7 volts.

Construction

The prototype amplifier was built on a PC board measuring about 6 x 2ins. Component layout and connections were drawn on 0.1in. graph paper and the drilling points transferred to the copper clad board by

Table of Values

Fig. 3. Cascode IF Amplifier complete

C2, C3,	R17, R18 = 2,200 ohms
C4, C5,	R19 = 4,700 ohms
C6, C8,	R20 = 100,000 ohms
C9, C10,	R21 = 240,000 ohms
C11, C12	R22 = 13,000 ohms
C1, C13,	RV1 = 10K pre-set
C15 = .01 μF, disc cer.	IC1 = 741 Op-Amp
C7, C14 = 25 μF, 15v. elect.	D1 = 1N914
R1, R8,	T1, T2 = <i>Denco</i> 1FT. 13
R9, R12 = 15,000 ohms	(see text)
R2, R6 = 6,800 ohms	T3 = Half-inch ferrite
R3, R7 = 3,000 ohms	ring core, Pri. 12
R4, R10 = 30 ohms	turns, Sec. 36
R5, R11 = 470 ohms	turns
R13 = 22,000 ohms	Tr1, Tr2,
R14 = 47,000 ohms	Tr3, Tr4,
R15 = 1,000 ohms	Tr5, Tr6,
R16,	Tr7 = BC-108, or similar
	(see text)

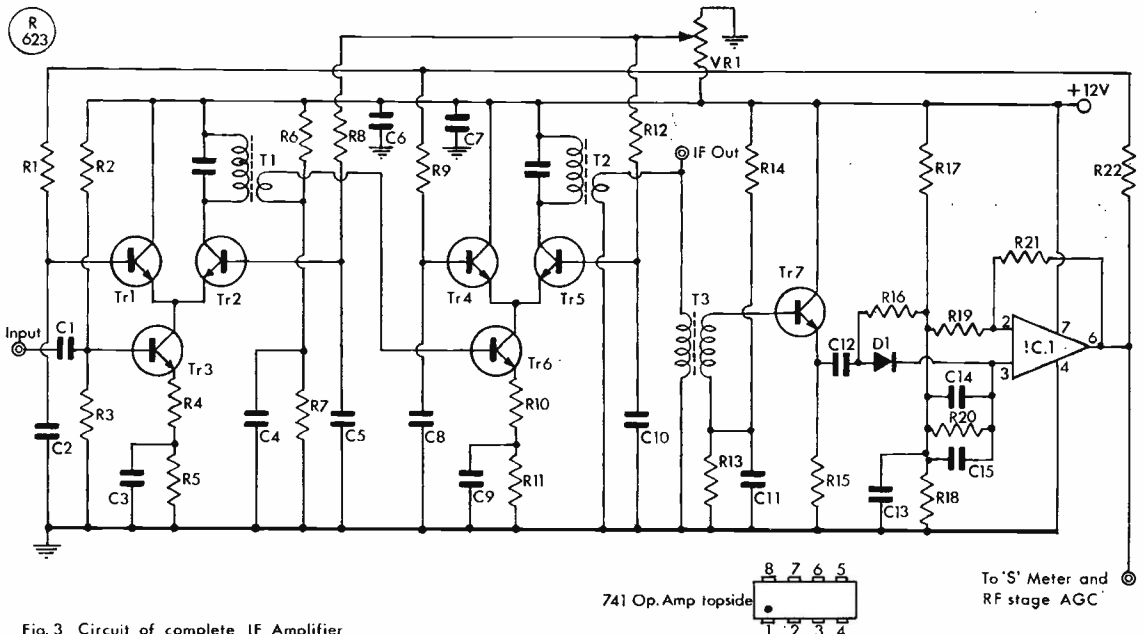


Fig. 3 Circuit of complete IF Amplifier



To 'S' Meter and RF stage AGC

pricking through with a compass point. A *Radiospares* etch-resist pen was used to copy the connections on to the copper and the board etched in ferric chloride in the normal way. Because of the high gain of a circuit of this type other forms of construction are not recommended if instability is to be avoided.

Whilst the circuit shown gave first-class performance it may well be possible to improve its characteristics

without altering the basic design. For instance, a lower noise figure might be obtained by using genuine RF transistors and running them at a lower collector current by increasing the total emitter resistance of Tr3 and Tr6. Also T3 could be dispensed with by replacing T2 with a *Denco* IFT 14. Although they are shown here in a 455 kHz application the amplifier stages have been used successfully up to 30 MHz.

EASY TOP BAND VERTICAL

LAYOUT FOR RESTRICTED SPACE

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

A MOBILE aerial needs to be robust, reasonably compact, and it should be resonated at the favoured operating frequency. Much less stringent requirements apply to a fixed vertical used at a permanent location. The aerial described here is of the latter variety. It will not give better signal strength than a full quarter-wave Marconi, but will permit 160m. to be used in circumstances where there is no space for an extended wire aerial.

There is no need for trial adjustments to the loading coil or element lengths, as it is intended that final tuning should be at the transmitter, with the matching circuit provided here.

Short Verticals

Fig. 1 shows three vertical aeriels. That at A has no loading coil, and would probably consist of a self-supporting alloy tube, though wire could be used if some top support were available. If this aerial could be quarter-wave long it could have excellent efficiency and no loading would be necessary. However, such a length is normally impossible on 160m., as the aerial would approach 130ft. high.

A shorter aerial must thus be used, as at B, with a loading coil to make up the electrical length. The vertical aerial could then be any length reasonably obtainable, the loading coil being adjusted to suit. This can give reasonable results, if the vertical is not too short in terms of a quarter-wave. With much shorter verticals, satisfactory results can be achieved, but radiation efficiency is not good.

Another method of loading is shown at C. Here, the loading coil is moved up the vertical aerial. This increases current in the lower portion under the coil, and hence radiation is improved. The aerial length and loading coil of C can be critically adjusted so that the system is resonant at the wanted frequency. The aerial can then be used with good efficiency on this and near frequencies, but will need re-adjustment for larger changes in frequency.

Another approach is to employ an aerial like C, but to make it somewhat short in terms of an electrical quarter-wave. An additional coil is then necessary, similar to B, but this can be at the transmitter, and can be situated for easy adjustment, to allow the whole system to be set up for any wanted frequency. This is the method

employed in the easy 160m. vertical described.

With this further means of adjustment available (similar to coil B, Fig. 1) it will be realised that none of the dimensions or other details of the aerial construction are critical. They can, in fact, be varied through quite wide limits, without upsetting the whole system.

The 160m. Vertical

Fig. 2 is the whole system. The top is 4ft. long. L1 is 130 turns of 16g. rubber or plastic insulated wire, occupying 14in. winding length on a 1in. diameter former. The bottom section of the aerial is 9ft. 4in. long. It was fixed to a post to give a clearance of about 6ft. 6in. for the lead, to clear a path. The whole lead-in is 12ft. long, part of this descending inside the shack to the loading coil L2. The latter has 55 turns of 18g. wire, and

(cont'd p.369)

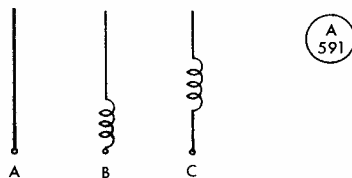


Fig. 1 Three Verticals

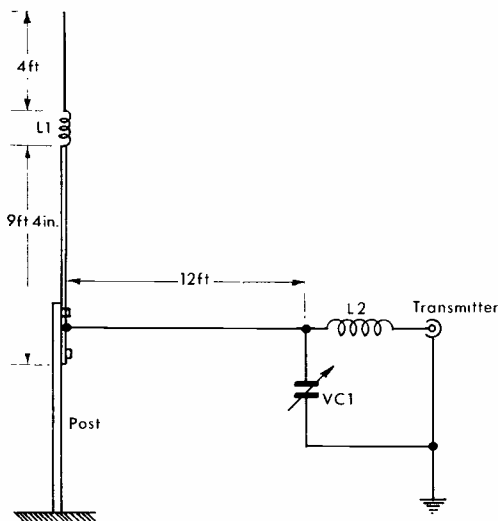
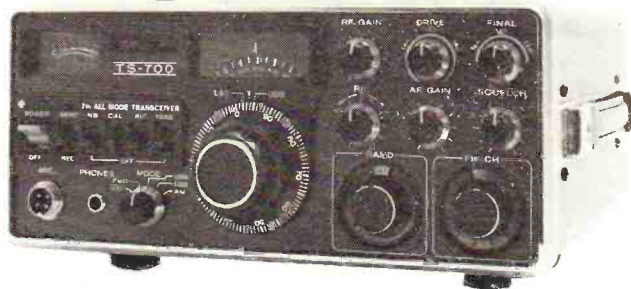


Fig. 2 The Complete 160m Aerial System

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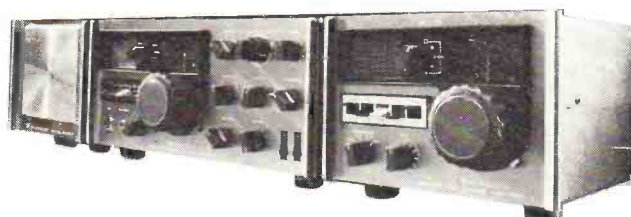
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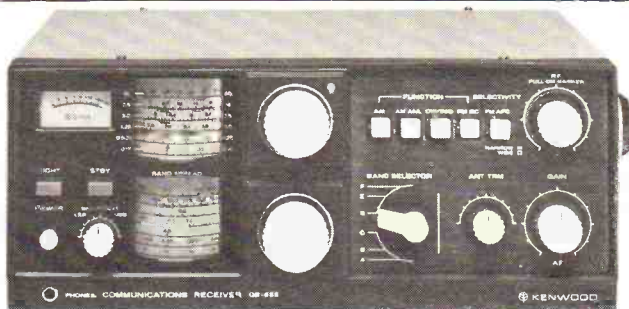
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WORTHING
STEYNING 814466

LEWES
RINGMER 812071

is 2in. in diameter, the turns occupying 4in. VC1 is 250 $\mu\mu\text{F}$.

Construction

L1 was wound on a broom-handle. Two coats of shellac will keep out the wet and dry in a few minutes. A clearance hole to anchor the wire is drilled through about 2in. from the top. The wire is passed through and plugged, and L1 is wound, and finished in the same way.

The top 4ft. was some stiff $\frac{1}{8}$ in. aluminium wire which was to hand, but $\frac{1}{8}$ in. to $\frac{3}{8}$ in. or other alloy tubing would be better. The wood is centrally drilled to be a tight push fit for this top element. The top of L1 is connected to it. A tight clamp or terminal connection may be used. Soldering will require a large iron and aluminium solder such as *Enthoven* 071210. Alternatively, use *Jubilee* clips, well doped.

The bottom element is of large enough diameter to accommodate the considerable length of broom-handle at this end of L1, and a screw both prevents this slipping down to foul L1, and forms a connection from L1 to the tube.

A bottom fixing was made from a clamp cut from scrap metal folded round the tube and screwed to the post both sides, and also a projecting piece of wood forced into the bottom of the tube, and in turn screwed to the post. (The post was actually one corner of an out-building.) A screw attaches the lead-in, of 7/26 or other stout wire.

As mentioned, the whole is purposely less than an electrical quarter-wave, so that additional inductance can be used at the transmitter end, for convenient adjustment. As a result, any of the dimensions given can be varied, to suit the location, or items available. An increase in the length of elements, or mounting height, would be of advantage. Construction should be reasonably strong, though there is not much surface area

presented to wind pressures. L1 can be bound with adhesive tape to keep out wet.

Matching

The system will not load the transmitter until the whole is adjusted to present a load within the range of transmitter adjustments available. Significant changes to the aerial might make it necessary to vary L2 from the details given. A surplus tapped or roller-coaster inductor would be excellent here. VC1 need not of course be the value mentioned, provided it is found to have enough capacitance when tuning up. The latter can be by any of the usual methods.

Should an RF ammeter be placed in the lead-in, tuning can be for maximum current, about 0.3A to 0.4A or so being expected with the usual Top Band transmitter.

With an SWR indicator in the co-axial lead from the Tx to L2, L2 ought to be adjustable as well as VC1. Otherwise, the system may load and appear to radiate satisfactorily with some impedance other than that intended presented to the Tx, and then SWR indications will be confusing.

When the PA "tune" and "load tuning" positions are known for 50-75 ohms or so, VC1 can be adjusted so that these take up somewhat similar settings.

The use of a field-strength meter or other methods could also be used. The setting for VC1 is fairly sharp. No doubt series-tuned and other ATU devices could be adjusted to give similar results, if preferred or to hand.

Earth

The desirability of a really good earth system for all end-fed aerials of this and similar type is well known. The ground lead may go to buried wires, earth spikes, or whatever form of radio earth is available.

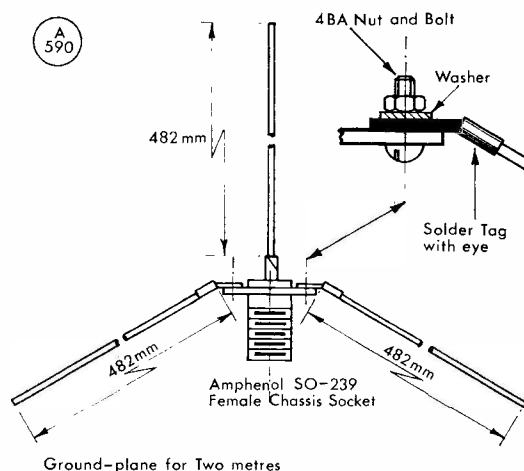
GROUND-PLANE FOR TWO

HERE is a description of a cheap and yet very efficient ground-plane antenna for 144 MHz, as used by PA0AKN, and described in *CQ-PA* for May. The drawing should be self-explanatory.

The length of the radials is 19 ins., or 48.2 cm., and the material is hard-drawn copper wire 2 mm. in diameter (say, 14g.). The matching for a 72-ohm cable is achieved by bending the radials 45° below horizontal. For 50-ohm cable, this angle should be about 10°. An SWR bridge inserted in the feed cable enables the SWR to be brought towards the 1 : 1 ratio.

It is best to use as many radials as possible, with a minimum of three.

A.H.D.



• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

THIS QSL BUSINESS — LETTERS FROM NEWCOMERS — SOMETHING ON /AM LICENCES AND OPERATING — GENERAL NEWS AND VIEWS — THE LADDERS

OUR preamble this time is given to us on a plate, by way of a letter from G. J. S. Reading (*Dartmouth*) who has been both licensed amateur and SWL in DX countries and an SWL in various parts of the U.K. He describes how he started sending SWL reports from MP4B-land and had poor returns; then he became MP4BDV, some time after his start as an SWL in 1961, and found himself inundated with useless SWL reports which rapidly swallowed up the stock of QSL cards set up for QSL'ing his MP4BDV contacts. It made him sit up and take notice, to put it mildly.

His next move was to analyse what was wrong with these reports, and it became evident that, in the first place, SWL's had to discard the prevalent idea of sending off a card to every station heard, in the hopes of building up a good collection quickly. Secondly, the attitude had to be cultivated of making sure that the report, from whatever country the SWL came, had to be useful, which in effect meant that it had to tell the recipient things he didn't—and probably couldn't—already know. For example, our correspondent started his own improved SWL technique by tackling VS9MB. This station was followed for a whole week, ending up with four foolscap pages of reports, which when collated and sent off direct, resulted in a reply direct, with a letter of thanks and an invitation to visit should he ever be in the area.

The information to be obtained and noted on your report sheet should be along the following lines (it obviously will vary in detail as circumstances of the reporting vary): Chose your band, look around and latch on to a weak DX signal. Note his degree of drift, if any, and the extent of any such QSB. Check the rest of the band, and note the strength of other signals from the same area which may be coming through, likewise note the strength of the signals from those nearby countries which are likely to be involved with QRM on any contacts the DX chap makes in your area. Go back to your man, and note the level of man-made and natural interference coming in on the signal, clearly distinguishing as between the UB5 station on top of him, the G station at the end of the road who just knocks your receiver flat, and the noise from the neighbouring power-line. If you have a local G paralysing your Rx, and you use an attenuator to try to clean things up, say how much attenuation was needed to effect a cure and how strong the offending local G station was. Specify clearly your receiver and aerial/earth system, and, if the report is going to a country where data on modern receivers might be expected to be scarce, give him the number of valves, FET's or transistors built in it. Follow your details on the station and aeriels—don't forget which way your aerial "fires" in this bit—go on to indicate any problems you may have in his direction, so that he can assess your report against your operating facility and so compare it against that of any transmitter he might be after in your area, i.e., if your S6 report suggests he should expect S9 or S1 from a local "average" amateur in the area. This all, as indicated, means you must be *informative* about your station as well as his signals.

Reports should go direct, so that they arrive while your report still constitutes an indication of the possibilities of the moment, and should of course be accompanied by IRC's or an envelope stamped up with the correct amount in his own country's stamps. Above all, when looking for a victim, follow him for a half-hour or so first, so that you can see whether he is getting in to your local area well; if he is, even a detailed report such as is suggested will probably not rate a reply. If he is coming in at an "odd" time, suggesting funny things are happening in the ionosphere, it is good to check on his beam heading—a directional loop set up is a help here—so as to tell whether his path is very out-of-normal, too. When it is all collected, then collate it into digestible form, by use of, for example, a graph of signal strength against time GMT on each session of listening to him, with the QRM level plotted on the same curve but in different colour, so he can see how he fared during the period. Make your mass of information *digestible*, but always include the material from which the graphs were taken so, if he feels inclined, he can check it through and,

maybe, compare it with other good reports in a similar way.

We bet all your work will more than double your reply rate!

First-Timers

D. Jewell (*Leicester*) started with a transistor portable listening to locals on the medium-wave image signal, but has progressed to the Trio 9R-59DS and an 80ft. wire twenty feet high. As he has heard some amateurs in G-land on 7.2 MHz according to the dial, he wonders a bit about the calibration accuracy—one wouldn't expect better than 1%, more likely 2%, on a general-coverage receiver. Dave notes that Trio recommend a 3.5 MHz crystal for a calibrator, rather than one at 100 kHz, and wonders why. Think about it this way: On 30 MHz, a dial calibration accuracy of one per cent means the receiver could be 300 kHz adrift, so with a crystal of 100 kHz one would have up to six pips around the point to choose from. However, the recommended one gives you band-edge markers on all bands bar 1.8 MHz (where it is hardly needed, anyway) from which, by inspection of the existing dial markings, a reasonable estimate of actual frequency can be obtained. On different tacks, Dave finds his receiver tends to want to oscillate at certain positions of the aerial trim control, a situation best alleviated by making an ATU only not to tune the signals in and peak them but, in so doing, to give the receiver the feed impedance it wants—the hooting is probably only caused by the "funny impedance" of Dave's aerial on Twenty.

R. Niedziolko (*Harrow*) also has a Trio 9R-59DS, fed by 110 feet of wire at thirty feet. Richard would like some details or references on Aeriels, and one would say to that the current, thirteenth, edition of the *ARRL Antenna Book*, or one of the more recent editions; and if one wants the aerial dope plus a lot of other stuff, then of course it comes down to the *ARRL Radio Amateur's Handbook*. All the transmitting aeriels described in these manuals are, of course, equally applicable to Rx antennae.

D. J. Porter (*Doncaster*) bought an R107 receiver at an auction a couple of years ago, made it play, and promptly tripped over G3ZAK on Eighty; after a search, David located G3ZAK, who had given his rough location over the air, and paid him a visit. Later came a move of house, which gave the XYL a chance to complain about R107 sitting on top of the TV (can't say I blame her! J.C.) so the next move was an HRO with one coil, covering 14-30 MHz. Now there is a Creed 7B teleprinter, but still work needs to be done on the HRO, so D.J.P. would like some "gen" on the receiver, offers of other coils, or whatever, for which we would think a scan of the small advertisements in this or any recent issue would be worth while.

Older than his receiver is the claim advanced by N. Brockett (*Herne Bay*) who is 52; his PCR receiver is probably thirty years old so there is not all that much in it! On a more serious note, Norman recounts how, having learned the letters of the Code, he found a CW station sending slowly enough to try and copy. A string of letters were written down which, when cut up into words, read "my name is Wolf, Wolf, Wolf," this being his first decoding of any Morse signals. Norman got a great kick out of friend Wolf, and is now spending more time with Morse. True enough, and how it eases that enormous "hump" in learning it, to get a station's call, name, and QTH, with all the feeling of achievement that it gives—far more than the eternal drag of copying jumbled letters off a tape.

Lots of questions appear in the letter from C. Davies (*Norwich*). First BH7AA: This *could* be a Chinese amateur station, as the call letters BF and BU are all allocated to China, but somehow we doubt it. SJ9WL is, as Chris guesses, quite OK and fairly well known. The "4ZNK" is almost surely a miscopying of the very active 4ZANK in Israel. Maritime Mobiles usually sign /MM, with Region 1, Region 2, or Region 3, to indicate which parts of the world they are in. In broad terms, Region 1 is Europe, Africa and parts of Asia; Region 2 the Americas; and Region 3, the rest of the world.

An interesting letter from A. C. Roberts (*Shephed*) who clearly likes to listen rather than learn Morse! He wants to know the best time to get in on the ten-metre openings—in general, around a couple of hours either side of noon for the ionospheric occasions although many occur at different times, even in the early evening. Perhaps the

best way of checking the band is to note the frequency of the ten-metre beacon stations, listening for any signs of beacon signals. It will be noted that often when the band is open in the sense that the Mauritius beacon is clearly audible, there will still be no actual activity; this is the time for the transmitting amateur to speculate a CQ, something he would never do on a crowded band, and sometimes he will get a real prize back for it. This is the fascination of the band — its unexpectedness.

B. J. Macartney (Wokingham) is another of the Air Traffic Control types to become an SWL, with a Yaesu FR50B, to a long-wire and TA-33Jr—the neighbours thought he was daft to put up such an aerial and dafter still to want to rotate it! On queries, prefixes such as RA3 and RP2 are the Russian stations with VHF-only tickets (they class 28 MHz as VHF) equivalent to UA3 and UP2, and so on. The assorted variations on the I-theme are parts of Italian territory; a fairly recent development on the old "II for everybody" to a system where the prefix gives some idea of location, the numeral being associated with the postal regions of the country while the second letter indicates which group of offshore islands one is hearing.

* * *

G4BPM (Thetford) writes to set E. Parker (Hove) right about PI1ROS, which is a Dutch school station, Rinjlands Lyceum, Oegstgeest, near Leiden, with which the operators can improve their facility in languages. Being a school station is making it of special interest to G4BPM who is himself a retired headmaster.

A slow-scan TV monitor is now in the shack of *P. Barker (Sunderland)*, who is making another activity of chasing awards while the bands are so dull at the moment, and he is also secretary of the local radio Club, which latter is a very effective way of keeping one off the air!

Although his tally of prefixes is only six this time, thanks to a spell in hospital and an operation, *W. J. Hutchinson (Hornchurch)* consoles himself with the thought that now he is once again convalescent but won't be back to the salt-mine for a few weeks yet, he will be able to get a goodly crop for his next entry.

R. Holland (Malvern) writes approvingly of the article in the July SHORT WAVE MAGAZINE on Quad aerials for VHF, he having been spending most of his time up there of late with a converter into a 9R-59D, coupled to a four-over-four at 16 feet.

The *H. M. Graham (Harefield)* filing system slipped up for once last time, when he logged an OJ0, only to discover, on going back through his old documents and logs, that he had in fact first heard and claimed OJ0MR during the Christmas recess in 1969, probably the first time that Market Reef was activated. On a different tack altogether, Maurice notes in his letter the dates and times of ten-metre openings observed from Harefield, which varied from 14-25 to nearly 20.00z, and on average lasted about 30 minutes at a time. Fifteen metres was a dead bore and Twenty only middling, the revealing comment here being that it would be almost a novelty to hear some W's!

D. Sharred (Birmingham) queries whether SVICH/C should be counted as a C1 under the rules, or as an SV1. The question really is whether the suffix /C is used to indicate, for example that the station is other than a mainland Greek. However, the stations on, for example, Crete, do not sign in this fashion, and so we must fall back on the assumption that it is meaningless for HPX purposes; thus the chap counts as SV1, unless someone can prove to J.C. that the /C suffix can be interpreted as having a territorial significance.

B. Russell (Runcorn) remarks somewhat bitterly that while a QSL from XX-land takes three days to his doormat, first-class letters from twenty miles away sometimes take a week. True, and the English mail system was a bit faster in the days of the Penny Black!

Although he has a nil report this time, the letter from *J. Fitzgerald (Gt. Missenden)* is always of interest. This time John comments on the apparently chronic lack of VHF activity in the South-East of England even though he is hearing GB3SC at a low of 559 and often much stronger, which shows the receiving set-up to be OK. Of course, one has to recall that there is not, as yet, a rash of commercial gear available for 432 MHz, which is possibly a pointer to its freedom both from activity and from pirates, which used to be a function of Two Metres years ago. Nowadays, we have the sort of situation that occurred a day or so ago, when the Barkway repeater had to be turned off because some buffoon was grinding a gramophone through it.

An interesting question pops up from *S. Eldridge (Crawley)* who finds his CR-70A is giving two lots of each amateur band around 900 kHz apart. Clearly, a case of image interference, and it rather sounds as though the 14 MHz signals appearing on 13.2-ish MHz are the right ones, the ones near 14 MHz on the dial most likely being in fact around 15 MHz. Sounds like a careful session with a calibrator is called for to find out what is exactly what! On a different line, SQ is a variation on the SP theme in prefixes which is being used by the Poles as a commemorative activity.

ANNUAL HPX LADDER

(Starting date January 1, 1974)

SWL	PREFIXES	SWL	PREFIXES
P. Rooney		S. Lawrence	
(Liverpool, L4-7TE)	454	(Market Harborough)	353
M. Eccles (Lancaster)	426	S. McHugh (Pontefract)	345
R. Swan		B. F. Hughes (Worcester)	291
(London, SE19-2LG)	417	A. J. Gullis	
S. Sharred (Birmingham)	413	(Ogbourne St. George)	286
W. H. Smyth (Hartlepool)	412	D. J. Porter (Doncaster)	282
J. Bell (Hampstead)	392	J. Hesman	
B. J. McCartney		(Birmingham, B42-2AR)	268
(Wokingham)	387	B. Russell (Runcorn)	264
M. L. Peters (Newbury)	369	W. McFaul (Londonderry)	261
M. Peirse		G. George (Woodmancote)	258
(Liverpool, L18-6HX)	368	A. C. Roberts (Shepshed)	229
R. C. Woolley (Ashbourne)	360	S. H. Bandy (Luton)	208
K. Salter (Newton Abbot)	357	C. Davies (Norwich)	204

Starting score 200, in accordance with HPX Rules. All Prefixes in this list to be heard in 1974. When a score of 500 is reached, transfer to the All-Time table will follow.

For HPX Rules, see p.43, March 1974

HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
W. Bingham		B. Thomas (Pontefract)	758
(Carrickfergus)	1553	K. A. Whiteley (Castleford)	756
R. Shilvoek (Kingswinford)	1435	C. K. Verstage (Old Basing)	733
T. Rootsey (Ilford)	1405	S. Eldridge (Crawley)	731
S. Foster (Lincoln)	1377	P. Barker (Sunderland)	668
K. Kyezor (Perivale)	1295	L. Thomas (Castleford)	674
J. Fitzgerald		B. Cushing (Hove)	650
(Gt. Missenden)	1194	Mrs. J. B. Jane (East Looe)	643
R. Carter (Blackburn)	1149	L. Craven (Alvechurch)	621
A. W. Nielson (Glasgow)	1139	Alvin Buchman (New York)	618
L. A. S. Poole		C. L. Lee (Ilford)	610
(London, N.21)	1090	D. Sharred (Birmingham)	608
H. Alford		G. F. Gullis	
(Burnham-on-Sea)	1049	(Ogbourne St. George)	593
M. J. Quintin		J. R. Cowan (Rochford)	591
(Wotton-u-Edge)	1045	G. Lucas (Kennoway)	585
B. Hughes (Worcester)	1003	M. Kitchener (Hitchin)	533
P. C. Jane (East Looe)	970	R. Smye	
G. W. Raven		(Shrewsbury School)	526
(London, S.E.13)	950	M. Smith (Matamata,	
J. H. Sparkes (Trowbridge)	948	New Zealand)	512
A. West (Herne Hill)	912	M. Rodgers (Harwood)	502
C. Henderson (Beckenham)	873	CW ONLY	
M. Cuckoo (Herne Bay)	862	A. Glass (Plymouth)	1031
N. Hembrey (Northiam)	857	T. Rootsey (Ilford)	723
N. Askew (Coventry)	855	W. B. Taunton (Meopham)	675
R. H. McVey		C. Henderson (Beckenham)	617
(Weston-s-Mare)	846	H. A. Londesborough	
A. R. Holland (Malvern)	845	(Swanland)	592
H. M. Graham (Harefield)	817	M. F. Parry (Shrewsbury)	561
W. B. Taunton (Meopham)	796	G. Richards (Aberdeen)	381
E. W. Robinson		S. Sharred (Birmingham)	341
(Bury St. Edmunds)	794	A. F. Roberts	
J. Gravell (Burry Port)	775	(Kidderminster)	301
H. A. Londesborough		A. W. McNeill (Newbury)	299
(Swanland)	771	W. Hutchinson	
E. Parker (Hove)	771	(Hornchurch)	282

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

The question of a /MM signing from Region 1 has already been mentioned; but *W. Bingham (Carrickfergus, C. Antrim)* has another angle on it, when he wants to know if G13SUM/MM/1 counts as a G11. No, Billy, and we have also, regretfully, to disallow your "LC1J" and "OG7AA" although SJ9WL in Morokulien is quite OK.

More queries from *R. C. Woolley (Ashbourne)* who has L12A, SV1CH/C and JY1GR. The first one could well be genuine—one recalls L12B on the *Kon-Tiki* raft—but the writer has no knowledge of its antecedents. SV1CH/C we have already accounted for, and JY1GR is quite OK and pretty active.

DX on Forty is something few people have the courage to try for, but *A. Glass (Plymouth)* found quite a lot of it on CW around 0630, such as VK, JA, ZL and so on, with W's at the same time noted on Eighty.

Success in the May 1973 RAE was followed by a pass in the Morse Test, says *A. W. McNeill (Newbury)*, with the result that all listening has stopped in favour of a crash-programme of building—main and auxiliary PSU's, a five-band VFO, all completed, and the CC Tx for Eighty CW is well on the way. Congratulations to Mac, and soon may we hear him on the bands.

Not only does the computer print out his entry each month for *R. Swan (London, S.E.19)*, but also it is made to produce a complete up-date of the overall list, generate statistics on QSL's, such as which is the best way to send them, which countries are the best at replying to reports, and so on, with normal business being allowed on to the machine in the intervals!

Nice to hear again from *J. R. Cowan (Rochford)* who is now junior sparks aboard the m.v. *Donax*, GSYU, and finding the life is great. However, thanks to a labour dispute ashore he had been swinging round his hook off Anglesey for most of the week in which he wrote, and getting rather fed up with it.

M. J. Quinton (Wotton-in-Edge) philosophises in his letter on the need to pension off his *Trio 9R-59*, owing to its having developed a slow-motion drive to end 'em all thanks to a slipping drive-cord, after 7½ years at that! So, the old thing is to be put out to grass and the occasional BBC programme, and a FR50B will take over the prefix task.

The advent of a Collins 75A-3 receiver has done things for the enthusiasm of *M. F. Parry (Shrewsbury)* and as a result more dipoles, for 14 and 21 MHz have gone up alongside the 7 MHz one previously used.

We nearly missed the letter from *S. Sharred (Birmingham)*. This was because he switched his sheets round between a CW list and a Phone one, with the letter part hidden away in the middle! Top Band listening at the CW end has brought the score up quite a bit, with KZ5AA, VP2LBJ and VP2EEL heard, albeit neither CP1EU or 9J2LF have delighted the Sharred ears; his total heard on 160m. is now twenty-seven countries with fourteen of these confirmed.

S. Lawrence (Market Harborough) mentions hearing at S9+40 a DL on Ten who was using only ten watts and has his doubts about the power input. The thing here to be remembered is that he may have been heard under a VHF-type propagation mode, and this may well account for the high received strength; indeed, if Ten is open in the normal way, one of the delights is the ability to get S9 reports worldwide with very low power, as old-timers will recall. On a different tack, he refers to hearing the 5Y7ADA/AM mentioned by D. Sharred some time back, only in his case the chap was using 5YADA/AM. This operator is clearly using the *aircraft* call on the amateur bands quite frequently, and it is a surprise that it has not been stopped by the authorities ere now, as it has been going on at intervals for some years.

His attenuator is now working, reports *K. Kyezor (Perivale)* and giving fine results in the way of helping to hear the DX signals under cross-modulation conditions. Our new rule about allowing HPX entries to stand if the move of QTH is less than 100 miles pleases him no end, as he is shortly to move about 50 miles to a new QTH.

Licence Point

A long letter from *R. Kell (Seahouses, Northumberland)* indicates the changes he would like to see in "SWL." Basically, he wants to see us cut the "chat" in favour of more in the way of simple leads on, for instance, workshop practice, fault-finding, and so on. Changing tack a bit, while he has nothing against the "black-box" operators as such, he has found out for himself what they are missing. He would like to see them all new RAE entrants, sending out QSL's to DX stations before they qualify for their own ticket. A good point this, and there is no doubt at all that the ex-SWL Dx'er shines out when he first comes on the air with his own call, simply because he knows what constitutes bad operating and avoids it. Perhaps one should add one's own rider to this; J.C. doesn't give a cuss if a chap uses only commercial gear (and so misses half the fun of the game) as this is an operator's personal choice, and he wouldn't presume to

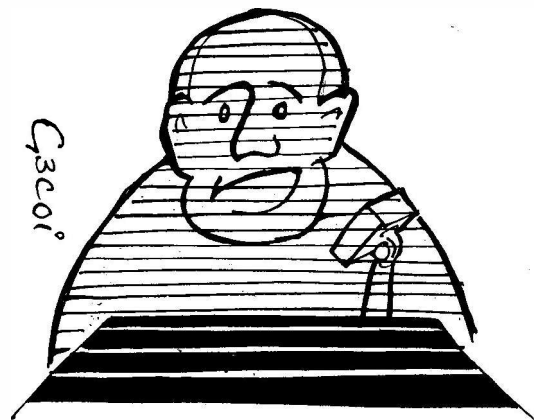
interfere in this. However, he does feel that a period of "L-driving" is called for before a chap can be let loose on his own.

We may crib about the UA Klub set-up, but we know those Russian stations are training their new licensees in operating practice and we tend to excuse their fumbling because of this. The system could be operated quite as well over here, with Club stations being operated—under supervision by chaps appointed from the members as knowing how it is done—until the supervisors are satisfied and prepared to say so, when the trainees could be allowed to go on to a proper ticket, either G8 or G4 as the case may be. If the chap is far away from such a Club, let him spend a year on the key, with low power, while he learns the ins-and-outs of procedure, which is even more important on CW than on Phone, because bad procedure on CW is evident immediately to the perpetrator of it. Frankly, J.C. doesn't care if those new on the air do deprive themselves of half the fun by never building a bit of their own gear—anyway such types are in practice few and far between—but he *does* care when some buffoon with a new call blunders around in a local net and makes a right Charlie of himself, and in the process fouls up the net as well. After all, a Top Band net is leisurely compared with a DX scrimmage even on the same band, so heaven only knows what a mess our buffoon will make of the band if he happens to hear GM3SVK/P rattling them off from Bute or somewhere and tries to make a contact. And if he has 14 MHz capability and tries there—one shudders to think of it! Compare these with such smart and savvy operators as, for instance, G3XAP, or YL/G3XVC, or any one of many others who started the SWL way, climbed well up the HPX Ladder before getting their tickets, and then started assaulting the DX on the bands to the tune of 100 countries worked in the first couple of months, with no dithering on the way and no getting under other people's feet on the chase. This lack of operating know-how, even down to the basic requirements laid down in the licence, is the bane of Amateur Radio in this country today, and far, far, more important than whether a guy buys or builds his gear.

P. C. Jane (Looe) had his query answered in the last SWL piece, so no more here; Peter seems to have found several of these "ITU" stations to make a good addition to his score.

That darn Telly! bewails *R. Carter (Blackburn)*, he having spent too much time with the sportscasts to the detriment of his score and the annoyance of his XYL who wants to have them banned! Ben notes the surprising amount of 28 MHz activity, with the band open one day recently from 1030 to 2130 clock, although admittedly without much in the way of new prefixes for a chap so high up the Table. Still, the point is that the band *can* open despite the position in which the sunspot cycle sits.

M. Peirse (Liverpool) complains that last time we got his name wrong and also his receiver—sorry, OM, but your fist is nearly as unreadable as J.C.'s own! Anyhow, the receiver is a VEF-204, covering 160, 80, 40, and 15 metres but not apparently Twenty, it being mainly meant as a BC receiver. Malcolm questions the /A series as a separate set of prefixes—not allowable, because the /A is not any indication that the station is any different from a normal one, saving when he is in a different call area or country, e.g., G3KFE could be counted as G3 but if you then heard GW3KFE/A banging away you



"... been doing some slow-scan TV recently ..."

could count him as GW3 only, in addition to the G3.

A. Buchman (Jamaica, N.Y., U.S.A.) is still, to his regret, awaiting his Joystick, ordered from the local agent back in April, although a batch of tuners have come through. Al has an interesting (and knotty!) point when he asks whether an F3/M/W2 counts as F3/M or W2/M? Whatever answer one gives it will only be an arbitrary one, so let us go for the letter of the rules and call this one a W2 mobile. Now watch the protests roll in!

How do the aeronautical mobile prefixes work? This query comes from S. McHugh (Pontefract) who logged a station signing "5HMMT /AM" on July 17. Such stations, like another mentioned earlier, are not aeronautical mobile amateur callsigns in the strict sense but the calls of the aircraft. A true /AM licence involves the holder in first of all having his normal station ticket, and the /AM licence is normally simply a document varying the conditions of the normal ticket to permit aeronautical operations from an aircraft in flight on the amateur bands and using the station call /AM. There may also, as with /MM licences, be an element of "station licence" about it, whereby the authorities will inspect the proposed set-up before they will grant the /AM ticket, something that does not happen with a normal station; this inspection is to determine that the set-up will not cause QRM to the normal aircraft communications, electronics and electrical equipments, nor be a hazard in the aircraft in any other way, whereas the normal amateur-station inspection is merely to establish that the station is up to scratch as far as the licence goes at the address on it, with no questions at all as to how it is hung together or whether the lights blink when the key goes down. However, countries giving /AM licences have no doubt their own ways of achieving the desired end; one suspects these chaps who use the aircraft callsign on the amateur bands are doing so because their licensing authority insists

that for safety they must use the aircraft gear.

Two letters are in the pile from A. West (Herne Hill) as his first one missed the 'bus last time round. He has been listening on Ten, and as an example of what can be done, his SB-303 has found 61 countries on the band since April, including such short-skip as GW4 and PAO, as well as other continentals. His main problem in the prefix line generally is now the Pacific area—join the club!—and with band conditions as they are, it looks like a continuing problem.

What a good early-morning band Forty is has now been acknowledged by R. H. McVey (Weston-super-Mare) after a session logging for Dad, G3GMC, during SSB Field Day from 0600-1000 when they knocked up 75 contacts; all that remains is to get up early enough one weekend to take advantage of the effect!

Others

Here we acknowledge those who have only sent in scores, or who mentioned nothing of general interest in their letters this time, as M. Cuckoo, Herne Bay; B. Cushing, Hove; the Gullies, Ogbourne St. George; H. A. Londesborough, Swanland; W. McFaul, Londonderry; M. Peters, Newbury; G. W. Raven, London, S.E.13; G. Richards, Aberdeen; E. W. Robinson, Bury St. Edmunds; M. Rodgers, Harwood; K. Salter, Newton Abbot; R. Shillock, Kingswinford; W. H. Smyth, Hartlepool; W. B. Taunton, Meopham; C. Verstage, Old Basing; K. A. Whiteley, Castleford.

Final

And that about wraps up the parcel for this time. For next, the deadline will be September 19 arrival, addressed to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

BOOSTER FOR THE FDK MULTI-2000

IMPROVING A TWO-METRE TRANSCEIVER

W. H. JARVIS (GM8APX)

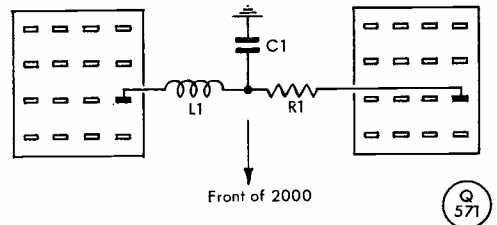
IT has been found that the FDK Multi-2000, a two-metre transceiver with FM and SSB facilities, is an excellent piece of equipment, but for DX attempts from isolated and mountainous areas (such as the writer's QTH), a larger output and better sensitivity are necessary.

Telecommunications International Agency, Ltd. (Brockenhurst, Hants.) offer a beautifully constructed module by G8CQS, which boosts the power output to around 40w. p.e.p., and increases receiver gain by some 12 dB. This unit is actually designed to match the Liner-2, but fine results have been obtained with the Multi-2000; however, a slight modification is needed to the Liner or the 2000, so as to feed a small DC through the normal aerial coax lead, to switch the relays inside the booster. Details for modifying the Liner-2 are included, and here are the modifications for the Multi-2000.

Take off the top and bottom covers, ignore the freely plastered "Don't Touch" stickers, and look for the tag ends of the two change-over relays. With the 2000 bottom upwards and front towards you, these are about two thirds of the way to the back, and hard over on the left. Their tags are decoupled by a cluster of disc ceramics.

Part of Ry2 handles the aerial change-over. The additional components needed to put a trickle of 12v. DC through the aerial output are sketched. R₁ is 10K, allowing only about 1 mA of DC to reach the booster input; this switches on a single transistor which in turn operates the change-over relays in the booster.

R₁ is also sufficiently high to minimise loading and



detuning effects as far as the RF parts of the 2000 aerial filter circuit is concerned.

L₁ and C₁ might well prove to be unnecessary; they were added to make sure that none of the RF output got back into the other parts of the 2000 circuit. C₁ is .0022 μF and L₁ is two layers of 16 turns of insulated wire, an *ad hoc* choke found useful for discouraging RF over a wide range of frequencies.

As a devout "shamateur," as those of us who actually buy equipment are sometimes called, the writer has been very pleased to find two pieces of commercial gear, one Japanese and the other British, which work so happily together.

Turning to the innards of the booster, or "linear," it may be regarded as consisting of four sections: Inverter, PA, relay operating circuit, and mosfet preamp. The inverter uses two 2N3055's to produce 28v. for the PA. The PA consists of a 2N4128, and it will handle the 100% duty cycle of FM operation without ill effect; it is thoroughly "heat-sunk." The relay operating circuit has already been mentioned, and the mosfet preamp uses a BFS28 with diode protection at both ends.

Congratulations are due to the designer and maker. This unit can be recommended to anyone who, like the writer, enjoys his occasional DX attempts, but is very short of time for home construction.

Openings on Two

A CONSIDERABLE amount of correspondence has been received reporting the recent Sporadic-E and Auroral openings—for which many thanks. Though space will not permit a detailed analysis here this correspondence has proved to be most useful and interesting.

The following notes may give some idea of the spread of the two phenomena.

2m. Aurora, July 6, 1974: In Anglesey, GW8FOL noted the start at 1430z and the finish at 1623z. He worked G, GW, GD and GM, but heard nothing outside the U.K. GM4CXP in Roxburgh, raised DL, PA and Southern G and GW between 1415z and 1638z. He also reports an aurora on July 23 between 1555z and 1715z during which he worked SM, GW and G, and heard OZ and DL. G4DHF in Grimsby missed the start of the opening, but booked in GM8DBX and G8DML just before the band folded at 1630z. No second phase was observed. Down in Cheltenham, G4BBR first noticed *Ar* signals at 1500z and worked, during the next 50 minutes, into GM, GW, GD and G, all on SSB. Like GW8FOL, he heard nothing from outside the country. Optimum beam heading was due North the whole time. G3XDY (Grimsby) was another who made no contacts outside the U.K. He worked GM and GW before the *Ar* signals disappeared at 1537z. Just to finish it off, SM7AED worked, UC2, UQ, UR, SP, DL, LA, PA and one G in London. How does that strike you?

2m. Sporadic E, July 9, 1974: A plot of the contacts reported shows that the Sporadic-E centre was located around the Dortmund area of Germany. Contacts were made at distances of up to 2,000 km., which puts this opening as one of the best we have had. The following very condensed report gives some indication of the activity. G8GLS (Preston, Lancs.) worked HA, HG and OE. G4CZP (Carnforth, Lancs.) made it with YU, HG, DJ, OE and OK, and had 25 contacts with the East of Europe, all told. Between 1208z and 1305z, GM3SZP (Glasgow) raised YU, DJ and OE with signal strengths up to 5 & 9 + 20 dB. In the same area, SWL Angus McGugan logged YU at 5 & 9 + with an indoor 6-ele. beam! What might be a G1/OE1 "First" may have been set up by G14PW in Co. Antrim by his contact with OE1HNA at 1215z. GW8FOL (Anglesey) worked HG, HA, OE, OK and DJ. G8HQA (Shrewsbury) had OK1MBS as his best DX. G8DSP (Liverpool) made it with HG and OE1 at 5 & 9+ both ways; he heard HG5AIR but could not complete the contact. G8IBB (Ripon, Yorks.) had 11 contacts into Eastern Europe in 90 minutes, including YU, DJ, OE and HG. In Walsall, Staffs., G4BPPY noted the start of the opening at 1016z and worked, mostly at 5 & 9, HG, OE, OK, YU and HA. GD2HDZ, alerted to the opening by GD8EXI, was just in time to make it with OE3 and YU, and has got his long-wanted OE QSL card at last! GD8EXI himself worked HG and OK for two "Firsts," plus YU, OE, HA and DJ. G4CXL (Weybridge, Surrey) and G3BHW (Margate, Kent) worked YO, which seems to have eluded every one else.

For most observers, this spor-E event was over by about 1230z, but there seems to have been a short lift to the NE, probably tropo, but possibly associated with the *Es* centre, later in the afternoon. GW8BXQ (Pembroke Dock), G3XDY (Grimsby) and G3OHT (Hull) all had contacts with SM

VHF BANDS

A. H. DORMER—G3DAH

stations in the Stockholm area. The path was only open for a few minutes and nothing more was heard after 1630z.

The most potent signal during the splendid opening was probably that from HG5AIR in Budapest. He worked 55 G, 10 GW, two GI and GD, and one each F, SM.

Beacons & Balloons

GB3VHF is back in service again on 144.15 MHz, and very welcome too. The electronic keyer is now giving excellent results after some initial troubles with RF getting into the logic circuits, and the new Tx emits about 7 watts. In due course, this will be followed by a solid-state amplifier to bring the power up to some 40 watts. Responsibility for the operation of the beacon is now with G3COJ.

During recent stormy weather, with much static about, the protective trip on the PA of GB3SC has operated resulting in a very reduced signal, since the output then consists of such RF from the driver as feeds through the capacitance of the 4CX250B. The beacon-keeper has the situation well under control, though.

Several comments have been received about the non-reception of GB3SX in the Midlands. Initially, it was thought that the change in frequency (it is now on 70.985 MHz) might have afforded the explanation, but this has been shown not to be the case. Operation is not continuous—there appears to be a random operating cycle, and this, too, might account for some of the reports. One begins to wonder, though, whether there may not be some sort of squirt on the antenna since, in Herne Bay, the signal is *always* around the 599 mark, much better than formerly, and yet it is not designed to beam in this direction at all. Curiouser and curiously!

GB3GI on 145.990 MHz is now back in operation. Reception of this beacon is a good indicator of *Ar* propagation, as it transmits to the NW for half its cycle.

The Swiss beacon on 2m., HB9HB, is now radiating on 144.125 MHz and has been heard at good strength recently. A new French beacon is operating on 432.000 MHz with the callsign F9UP. The QRA locator is CH56g.

The Cyprus beacon, 5B4CY, now operates on 144.139 MHz between 1400z-1430z and 1630z-1900z daily. Power is 40 watts input to a 6/6 slot. Contact 5B4WR for further details. (It is not known whether operation has been affected by the recent troubles).

The list of VHF/UHF beacons published in February, 1974 "VHF Bands" should be amended to include foregoing changes.

Mirabel III is to be launched on September 1 from near Nancy, QRA EI21c, at 1400z, the duration of the flight being estimated at three hours. The translator will receive signals between 432.1 MHz and 432.4 MHz and re-transmit them over 145.6 MHz-145.9 MHz. It will accept any mode, but SSB and CW are recommended. Two beacons will be carried, one on 145.2 MHz with the word "Mirabel" sent in FSK (700 mW) and the other (100 mW) on 145.6 MHz with the signal shifted 500 Hz every second. An innovation is that a video signal forming the word "Mirabel" will be radiated on 438.5 MHz.

An *Anjou* balloon is to be launched on September 15. No further details yet to hand.

Contests

Results: Twenty-six entries for the May 23-Cm. contest is indicative of the increasing interest in this band, and should warrant the introduction of more events for 1296 MHz. There are still plenty of weekends free before propagation starts to deteriorate towards the end of the year. The lead in the portable section was taken by G3JQA, /P in Staffs., with 12 watts output to a 34-ele. Yagi, followed by G4CCC in Berks. G4BEL (Cambridge) headed the fixed station list with a very comfortable margin of 739 points over G3JVL. 'BEL has 150 watts available to a dish antenna.

The 23 cm. contest was followed the next day by the 432 MHz Open, and G3JQA once again led the portable field by a narrow margin over G5HD. G8ERW in Herts. won the fixed-station section, followed by G8FMK in Oxfordshire, a very creditable performance by two operators denied the advantage of CW.

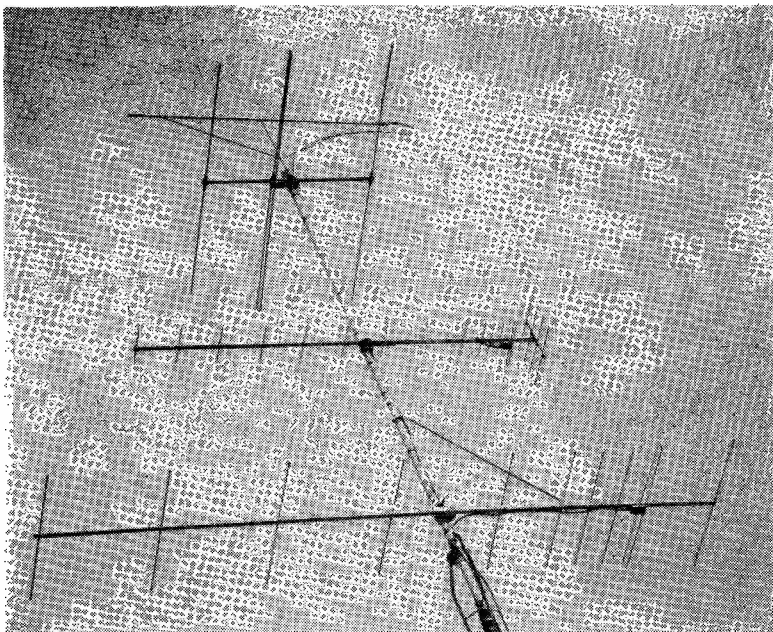
The "Region 1 contest" organised by the Ainsdale Club, was won by the Club, thanks, among other things, to a contact with ZB2VHF. (G3XSN/P in Liverpool was the only other entrant to work the ZB2). The single-operator section was headed by GD2HDZ, while G4BWG turned in the best score from outside the Region.

TWENTY-THREE CENTIMETRES

ALL-TIME TABLE

Station	Counties	Countries	Total
G4BEL	24	7	31
G8ARM	20	2	22
G4BYV	15	5	20
G3JVL	16	4	20
G3COJ	15	3	18
G3JXN	17	1	18
G4ALN	14	3	17
G3DAH	14	3	17
G3EHM	14	2	16
G8AOD	11	1	12
G5DF	10	1	11
G8FMK	9	1	10
G8FJG	7	1	8
G8EOP	1	1	2

VHF aerial system at G3DAH, mounted on a Strumech tower at a site 120ft. a.s.l. In ascending order, the beams are: 10-element for two metres; 14-element for Seventycems; three-element for four metres; and the new 34-element for 23 centimetres. These radiators are on a 15-foot stub mast and the upper array is at 50ft. a.g.l.



Reports: Conditions were average for the 432 MHz Open on July 21 and deteriorated as the event progressed. Two outstanding signals in the South-East were those from GW3AWM/P (New Radnor) and G8AGU/P (Devon).

Propagation was good in the South for the 70 MHz affair on July 28 but very poor in the North. GM3ZSX mentions that GB3SU was at S3 during the week preceding the event and that it dropped to SO/1 during the contest. There's Murphy for you! All British prefixes were available, two much sought after being G14DBB/P and GC3WMR/P (Jersey). One of the best scores heard was that of GW3WRA/P in Brecon who was approaching the century mark towards the end of the event. There was an encouraging number of stations active, but it remains to be seen how many logs come in. The use of SSB was widespread, followed by CW, with AM/FM coming a poor third—another straw in the wind!

The 70 cm. Cumulatives seem to have got off to no more than an average start. Pity one of them did not occur on August 6, when ON and PA were both coming in at good strength. Look out for the last two on September 3 and 11.

Future Events: September 7/8, VHF NFD. September 14/15, International A/TV. September 14/22—BARTG VHF RTTY. September 15, 22 and 29, 1296 MHz Cumulatives. October 5/6, UHF NFD.

DX-Peditions

Peter Lennard, G3VPS, sends along some gen on his recent trip to GM. He stopped off in Cumberland *en route* and made 59 contacts from there in spite of difficulties with the camping site which prevented him from operating before the Sunday morning. Most of these contacts were on phone, which gives a pointer to how good the conditions were at that time. Things had changed

appreciably for the first night alongside the Angus beacon, but improved the next day to yield 26 QSO's, with G3VPK at 585 km. as the best DX. There was an S3+ noise level for most of the time and this was the explanation for the failure of some of the more distant stations to raise Peter.

From Kincardine, the best DX came from G5DF (Reading) at 620 km., which is pretty good going. "Birdies" from the local TV station were a problem here, and once again the more distant operators had a job getting through, even on sked, although the situation was considerably eased by the efforts of G3FDW, who acted as MC for some of the time. Aberdeen, Peter says, was a dead loss. He tried three different sites, but what with the TV "birdies" which were so strong as to render the band unusable on the first night, and the appalling Wx at the Cockbridge site on the second day, he was only able to make one contact—with G3JYP in Appleby, Westmorland. The gear ran 30 watts output to a 4/4 at 24ft., with a mosfet converter into an EC10 for reception. In view of all the difficulties he encountered, the DX he worked was very good indeed, and the thanks of many of us must go to him for his initiative.

G8FQE and G3NAS will be operating /P in GM by the time this appears. They will have SSB on 144-17 MHz and plan both morning and evening sessions. The trip was to start in Stirling, and they planned to visit several other counties, announcing their intentions the previous day.

The Bangor University boys are planning a trip to GM (eight different border counties) starting September 14 and ending September 21. Times are 1930z-2300z each evening and 0545z-0715z, mornings. QRG: 432.2 MHz and 144-16 MHz. Callsign is GM3UCB. Skeds (with s.a.e. and details of equipment) via A. J. Wade, Fodol Farm, Bangor, Gwynedd.

The Scottish Scene

It was good to hear that the Sporadic-E opening of July 9 extended to North of the Border. It is often claimed, and justifiably so, that the Southerners get the best of this sort of propagation. (To forestall the next Sassenach comment, what about all those aurorae you get and we don't?) GM8CFS (Peebles), about to repair to a convenient hostelry for a glass of lunch, switched on the "Liner-2" in the car to see if any of the locals would join him, and was delighted to have a 5 & 9 SSB contact with a YU. An unconfirmed report says that he really did enjoy his lunch, although the champagne bubbles made him sneeze! GM3AEY (Kirkcaldy) was another who made it with the YU. He also worked HA and heard some Russians. GM3SZP (Glasgow) was alerted to the opening by the behaviour of the TV set and the QRM on Band II, made it with three YU, one DJ7 and two OE. Nice going!

SSB on 2m. continues to increase in the Edinburgh area. Known newcomers are GM3OWU, GM3XZE, GM4DGT, GM4DGS, GM6X1, GM8BKE, GM8IAP and GM8EKF. Great credit is due to young Ross, GM4CLH, who is emitting such a clean signal from his H-B transverter. GM8DIJ has also produced his own transverter to work with the new FT-560. A few octaves up from 2m., George Burt, GM30XX, has an SSB rig under construction for use on his 3 cm. portable forays.

There is now an active net on 4m. in Edinburgh and district with GM3OWU and GM3BQA QRV on this band. GM8DIJ (Edinburgh) continues to plough a lonely furrow on 70 cm. and is persisting with his one-man activity night on Tuesdays, on the hour between 1900 and 2100 BST, but getting few takers. He was delighted to work Paul Widger, operating as GM8AGU/P on his recent trip.

VHF interests should be well catered for

THREE BAND ANNUAL TABLE

TWO METRES

January to December, 1974

Station	Counties	Countries	Total
GD2HDZ	75	13	88
G4CZP	72	13	85
G3NHE	66	17	83
GW8FOL	67	16	83
G3XDY	70	12	82
G3DAH	62	18	80
G4AGE	63	11	74
G5DF	58	15	73
GW3KGD	57	15	72
G8GHZ	61	10	71
GW8BXQ	52	12	64
G4MXP	52	11	63
G8FWB	51	10	61
G3AHB	50	10	60
G8DGR	50	10	60
G4DHF	51	9	60
G8GGP	50	9	59
G4AEZ	46	11	57
G8ECO	48	8	56
GW8HVP	49	4	53
G3FIJ	40	13	53
GM3ZBE	44	8	52
GW8FKB	44	7	51
G8GNE	40	10	50
G8EOP	41	7	48
G3BW	43	5	48
G8CBU	42	5	47
G8HHI	39	7	46
G8HOA	37	7	44
G8FUI	35	8	43
G8BBP	37	5	42
G8GLS	36	6	42
G2AXI	32	8	40
G18EWM	30	9	39
G8GXE	29	5	34
G3OHH	27	6	33
G3SHY	27	6	33
G3FKP	29	2	31
G8HYH	27	4	31
GW4BXE	20	11	31
G8HQQ	27	3	30
G8FMK	25	2	27
G35XK	21	6	27
G8BPF	23	2	25
GW3XJQ	16	7	23
G8EKP	15	4	19

THREE BAND ANNUAL TABLE

FOUR METRES

January to December, 1974

Station	Counties	Countries	Total
G3NHE	50	6	56
G3DAH	43	8	51
G5DF	44	7	51
G3OHH	39	7	46
GD2HDZ	36	6	42
G3FIJ	29	4	33
G8EJP	21	7	28
G4AGE	24	3	27
G3XDY	22	4	26
G2AXI	21	3	24
G3SHY	15	3	18
GM3ZBE	12	2	14
G4AEZ	11	2	13

now that GM4BYF has been elected president, and GMGEC secretary, of the Lothians Radio Society.

The proposal and technical specification for the Scottish repeater are now with the Home Office, and there seems to be every hope that they will be accepted. This has raised the question of finance, and the sponsors consider that the risk in making some preliminary purchases, at very favourable cost, due to the generous co-operation of various commercial enterprises, is justified. A "Repeater Fund" has, therefore, been opened, and any donations would be gratefully received by the hon. treasurer of the Central Scotland FM Group, GM8DUJ, QTHR. The aim is to raise about £200.

G3TVY and G4AFJ seem to have made a considerable impression on the Scots, one of whom took the trouble to ring up and say so, during their recent trip to Perthshire where they operated on two metres. Their techniques were good, they did all the right things about access to sites and they seem to have made a lot of friends in the process. Go thou and do likewise!

Conventions

The Scottish VHF Convention takes place on Saturday, September 28 in the Tower Block Building of the University of Dundee. The subsequent Dinner is to be held at the nearby Angus Hotel. As customary at these affairs, a series of lectures has been arranged, and GM3OXX and GM3DXJ, who have been breaking the U.K. 3 cm. records recently, will be demonstrating the gear they used. For the Convention only, the cost is 40p, for the Dinner only, £2 and for both £2.25. Overnight accommodation can be arranged at £2.60 per night for bed and breakfast. Ample parking space is available and GM4BIP will provide talk-in. Tickets, and further information available from Frank Hall, GM8BZX, QTHR. See you there.

The Welsh Amateur Radio Convention is scheduled for Sunday, September 22 at Community College, Oakdale, near Blackwood, Gwent (ex-Monmouth). Time is 1000 to 1800 BST and talk-in is available on 80m. and 2m. (GW6GW and GW3WTZ/A respectively). They will also be using the Bristol Channel repeater, GB3BC, for long-haul talk-in. The programme includes lectures and trade show and further information may be obtained from GW4BLE, QTHR.

Group/Club Activities

The U.K. FM Group (Northern) will be

participating in the 1974 VHF NFD under the call GB3FM. The location of the station will be very close to the site of the proposed Northern repeater (GB3NA) near Barnsley, and will use comparable power. It is hoped, therefore, that some indication will be given of the possible coverage of the repeater. They will transmit FM but will be able to receive all modes on two metres, the only band they will use, and will welcome reports on contacts, which will be acknowledged by special QSL card.

The Southampton Group have arranged a Convention for Saturday, September 21, 2 p.m.—8 p.m. at the Southampton College of Art, East Park Terrace, College of Technology. A series of lectures has been arranged, and trade stands have been organised. Admission is 50p. Further details, programmes and tickets from G8CEH, QTHR.

The next meeting of the South-East VHF/UHF Group is on October 11, when Jack Brooker, G3JMB, will be talking about electronics and mechanisation in the Post Office. Venue as usual is the Electronics Building Lecture Theatre, University of Kent, Canterbury.

R.A.F. Sealand now have the callsign GW8ITZ and are planning to operate from Kintyre during VHF NFD. Changes of personnel have kept this once very active Club dormant for quite a time now, but thanks to the efforts of GW8AAP, G3NTI, GW3LAI and GW8DEZ it looks as if we can expect activity from them on 2m, 70 cm. and 3 cm. in the not too distant future. How about 4m?

VHFCC Awards

G8DSP (Anfield, Liverpool) gains Award No. 222 this month with a 2m. claim. Stan Collier first became interested in Amateur Radio as an SWL in 1956 and took the R.A.E. in 1959. Business kept him off the air until June, 1970 when he obtained his present call. At that time he ran a Pye 2002 and R.215, but subsequently graduated to an 832, an Eddystone 680, an 8-lee. Yagi and a Microwave Modules converter. He was relatively inactive during 1972/3, but a Christmas present of a "Liner-2" from his wife revitalised him, and he is now to be heard regularly on the band.

Geoff Black operates on 2m. as G8HPD in Wheatthampstead, Herts., and since August, 1973, when he first came on the band, has managed to get the 100 cards required for the Award with a 50% return rate. The equipment in use is a Heathkit SB-303, which replaced the original Trio JR-500SE, with a dual-gate mosfet converter. The transmitter runs 8 watts of phase-modulated RF to a QVQ03-10 in the final and the antenna is an 8/8 slot at 375ft. a.s.l. and 35ft. a.g.l. Plans are in hand for 70 cm., for which band some of the gear is already built. Geoff is a member of the Dunstable Downs Radio Club and so gets plenty of good advice about matters VHF/UHF/SHF! He gains Award No. 223.

Up in Bolton, Lancs., Chris Moulding qualifies for Award No. 224 for 2m. working as G8FDL. He was first licensed in August, 1971 and ran a variety of equipment over the last three years. He now has a Telford TC5 Tx with the TC6 VFO, and this drives a pair of 2C39's in parallel, grounded-grid, to 13 watts input on FM. The Rx is an SSM low-noise pre-amp, a Microwave Modules converter and the Lafayette KT320. Chris has used cubical Quads ever since he

started up, and the current version is a 4 x 5 element array installed in the roof space, with a forward gain of 14 dB over a reference dipole. He intends to dispose of all his FM gear and go for a TS-700, which will be operated both at the home QTH and from /P locations. The QTH is 437ft. a.s.l. with a good take-off in all directions, but with Winter Hill only some four miles away, there is heavy QRM during contests when the visiting groups get busy!

We are pleased to issue Seventycem Award No. 17 to Martin Dann, G3NHE, who operates from Sheffield on the 430 MHz band. This pairs up with Award No. 142 issued in November, 1971 for his 2m. work, and he is now collecting the requisite number of cards for the 4m. Award. Most of his contacts were made on FM with a '3-20A tripler giving five watts RF into a 46-ele. Multibeam, initially at 35ft. but now at 44ft. with a remarkable improvement on results. The AF239 pre-amp precedes a bi-polar front-end converter into an AR88. The site, at 425ft. a.s.l. is good except to the South-West, where a water tower at 100 yds. spoils things a bit. Martin now has SSB on 70 cm. and, although running low power, puts a good signal into the South-East.

News Items

Two Metres: Good to hear G5YV of Leeds back on the 2m. air again, this time with SSB. He was very active on the band in 1949/50 when it was first released to us, and the G3DAH log for those years contains many entries for CW contacts with him.

G8HQA (Shrewsbury) is looking for regular two-metre skeds on SSB with stations

over 100 miles from his QTH, with the idea of doing some propagation investigations. QTH: 3 Cruckton Close, Shrewsbury, Salop. Wish we could get a little more 4-metre activity from that county!

From a correspondent who shall remain anonymous: "Heard on 2m. SSB the other morning—I've got a birdie that comes out slap on the FM channel, *hi, hi*, but I'm not bothered about in-band radiation, *hi, hi!*. Perhaps he should be hung, high, high!" No further comment!

GM3ZBE reports a good tropo. opening on the band on July 24 with the axis definitely N/S, but with a bias for transmission from the North. Both he and GM8FFX were giving poorer reports than they were getting. He worked numerous G stations as well as PA, ON (mobile), OZ, F and various DL. One would like to see an investigation into this "one-way propagation" phenomenon which occurs far more frequently than one would expect. Alec comments on the good operating practices of most G stations during the "pile-ups" on his frequency, but is not too happy about the chap who says "Please look for my friend who is running one watt to a roof-space halo down in the valley" while there is a queue waiting for him. Point taken? He hopes to be up on 70 cm. and 23 cm. before too long, and for the next eight weeks he will be monitoring 70.2 MHz, beaming South, between 1900z and 2200z on Monday evenings.

G3PBE, Reigate, Surrey, reports a good opening into HB9 early on the morning of July 22. He accessed the Swiss repeater (HB9F) and worked nine HB9 (three of them mobiles) and several DL/DJ. This device

accepts input on 145.1 MHz and transmits on 145.7 MHz, and apparently no tone-burst is required. This one is worth watching!

The pirates are about again! G8BNO reports receiving QSL cards for contacts he has never made. He would be grateful if anyone who has "worked him" during April, 1974 would get in touch (QTH, p.94 April issue).

Seventy Centimetres: G3NHE (Sheffield) finds that conditions have got to be really flat before it becomes impossible to work stations on SSB or CW at 150 miles plus. Your scribe must agree with this statement and draw attention once again to the desirability of calling into what may seem to be dead band. Over and over again, one learns of chaps who say "I spend as much, or more, time listening as I do transmitting" and that being the case, a CQ call has a good chance of resulting in a contact. The old comment "Use or Lose" is still very appropriate for this band.

G3BW in Cumberland (Cumbria) is now QRV on 70 cm. with a '320A in the final and a *Microwave Modules* converter. He finds the going a bit of a slog from his rather remote QTH and is planning to increase power with a 4CX250B final which is now just out of the drawing board stage. This is still a difficult county for the Southerners, so it is worth while having a look for Bill's SSB around 432.2 MHz.

Deadline

Please send your news, views, claims and comments to "VHF Bands," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ by September 6, latest. Cheers for now and 73 de G3DAH.

B.A.T.C. CONVENTION

This year's British Amateur Television Club annual meeting will be on September 28, 10.30 a.m. to 6.30 p.m. at the Benn Memorial Hall, Newbold Road, Rugby, on the A.426, from Junc. 20 on the M.1. Ample free parking adjacent to the Hall. There are hourly trains from Euston, also from Birmingham, Liverpool, Carlisle and Glasgow to Rugby Midland station, within 10 minutes walk of the Hall. Those arriving for the convention by train can ring *Rugby 5321* for transport on arrival (from the box on the station) if the Wx is really too bad to walk it. The programme includes the B.A.T.C. AGM, an exhibition of members' A/TV equipment, and discussion groups on the subject of A/TV—which means the transmission and reception of television on the 430 MHz amateur band. Further details from the hon. secretary, J. J. Rose, G6STO/T, QTHR.

"SIMPLE LINEAR AMPLIFIER"—Correction Note

We have been informed by G3SZC, author of the article "Simple Linear RF Amplifier" in the August issue, that he should have shown C16 (across D2, to the left of the diagram) at 1000 μ F, 40v. working, and that the bias voltmeter is connected across points A-B after R5: it should read almost zero with 1250v. on the plates of the PL509's.

There has been some criticism by the purists about the use of PL509 line-output valves at all in this con-

figuration—but this disapproval has been voiced ever since line-output valves were first suggested for amateur RF amplifiers. However, a cogent point made by GW8DXA (Cardigan) is that a resistor made up to 167 ohms and rated 20 watts should be included in the series heater circuit D1, R6 to keep the applied voltage around 120v. His point is that with the circuit as shown on p.312, August, the PL509's could be heavily over-run on their heaters.

Yet, according to G3SZC, they have been working happily for years in the circuit he is using.

NEW HEATHKIT CATALOGUE

Anyone wishing to be right up-to-date with what is happening, or what is possible, in the home-construction field as regards Amateur Radio (and much else in the way of electronic equipment) should have the latest *Heathkit* catalogue. Of course, the *Heath* kits have been available for many years—with the so-well-presented box-of-parts and the accompanying lucid and well-written constructional manual. There must be 1000's reading this piece who already have bits of *Heathkit* gear—whether transmitters, receivers or the ancillaries that go to make up a fully operational Amateur Radio station. For a free copy of this new catalogue, write: *Heath* (Gloucester), Ltd., Bristol Road, Gloucester, GL2 6EE.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for October issue: September 6)

THE time for MCC is coming round again. This year's event, the 29th in the series, no less, will take place over the week-end November 16-17. The Rules, much as last year, will be published in the October issue, due out on September 27.

They are a reticent lot up North! For long enough we have regarded Derby as the Midlands but put them in the "North" section to make a better balance. Little or nothing in the way of news has come from GM for months, although we know they are active and doing things, so it was quite a surprise this month to see two reports from Scotland—but there must be twenty or more Clubs in GM—whatever do they do with themselves?

Southerly Reports

Bishops Stortford recently gave your conductor a prize rocket for not mentioning them occasionally in this piece. This group has a place at the British Legion Club, Windhill, where they can gather on the third Monday in every month, first before the meeting in the bar downstairs, and later for the formal meeting and lecture in the room set aside for them upstairs.

The winter session of the Shelburne Youth Centre radio group is down for September 2, and from then on, on Mondays and Thursdays, the Hq. centre being in Hornsey Road, London, N.7, close to Holloway tube station, where they are open to all ages and have a RAE class promised. It is also said that ample components are available to keen constructors.

September for Sutton and Cheam members means the 17th, and the talk on that date will be the second part of G2CZH's discourse on How Power Stations Work. Looking forward a little, one is pleased to see a lecture on How to Use the Repeaters is scheduled for October 15—it should be on every Club programme where members are in the repeater-served parts of the country.

Cray Valley were saddened recently by the death of G3TCC, a stalwart member and for long a holder of one or another office, as well as being a fine organiser of their social events. He will be missed. For the future, we notice the gang foregather on the first Thursday for the talk or film-show or whatever, and on the third Thursday for the ragchew; both are at the Eltham United Reformed Church Hall, 1 Court Road, London, S.E.9.

Even when he is away on holiday, the Maidenhead secretary gets his report in on the dot—more credit to him. He says they have a place at the British Red Cross Hall, The Crescent, Maidenhead, on the first Thursday and the third Tuesday. September 5 sees a session of Any Questions, especially for newcomers; they compete in VHF/NFD over the weekend September 8/9; and then on September 17 there is G3VXZ to talk about and demonstrate Slow Scan TV.

For more years than one cares to think of, the same hand has written the *Newsletter* and been the secretary for Crystal Palace, which longevity seems to be a sure recipe for success for a group, in Amateur Radio or otherwise. On Saturday, September 21, the topic of the evening will be Batteries, G4AVV giving forth the "gen."

Now to Reigate, where September 17 is the booked date. G3VKQ will be talking about RTTY, at the usual place, St. Mark's Hall, Alma Road. However, we are told that there is a change likely for the Natter session on October 1, so if you intend to make contact then, you would be well advised to contact G3XSZ at the address in the Panel.

Bexleyheath Clocktower is an easy marker to aim for; thus, finding the North Kent crowd on the second and fourth Thursdays of each month should also be easy, as their Hq., the United Reformed Churches Hall is hard by, the actual entrance being in Chapel Road. However, for what actually is going to happen at the September meetings we have to refer you to the hon. secretary, see Panel p.380.

Holiday radio activities will be reported on by the members of Acton, Brentford & Chiswick when they get together on September 17 at Chiswick Trades and Social Club, 66 High Road, Chiswick.

About this time of the year one expects to start hearing from the various University and Polytechnic clubs recruiting for new men among the coming intake. This year is no exception with a couple to note, one North and one in the South. The latter is Oxford University who have a stand at the Freshmans Fair on October 11, in the Examina-

tion Schools, where anyone is welcome to make contact once the Michaelmas Term is under way. If you want more details, contact G4BIX (address as Panel) before term starts, or, after that, at St. Edmund's Hall.

A bit of a boob, says the Basingstoke secretary, who gave the wrong date for the recent Le Court fête. Nonetheless, they managed to have a pleasant day, and to contribute something to the funds of this Cheshire Home by organising a sweep on the matter of the longest-distance contact to be made during the event by G3TCR/P. Oddly enough, this turned out to be a QSO with VE2DNN near Montreal, a former resident of Le Court! Turning now to the future, we notice September 14 down for the AGM, also VHF/NFD to participate in, and a special-activity station to be set up at the Basingstoke Show, as GB3BS on September 21 and 22, at Stratton Park, Kempshott. Unfortunately the Hq. address is not stated, so for that we must refer you to the secretary, as Panel p.380.

It looks as if the Milton Keynes chaps are on the move, as they now advertise their meeting at Lovat Hall, Silver Street, Newport Pagnell, for the AGM on September 9, with hopes of continuing to use Lovat Hall for future events. This being so, doubtless it would be a good move to get in touch with G8CHK before attending, just to be on the safe side.

Alternate Fridays are booked for West Kent activities, with September 6 and 20, October 4 and 18 noted particularly, at the Adult Education Centre, Monson Road, Tunbridge Wells, although no details are given as to the activities. Information from the secretary, see Panel.

Worthing next, where the venue is at Rose Wilmot Centre, Littlehampton Road. September 3 is naturally enough given over to preparations for VHF/NFD, the site for which is to be Chanctonbury Ring; September 10 is down for the AGM—doubtless a chance to deal with the offenders if they don't win the VHF/NFD event! An informal follows, on September 17, and on the 24th there will be a talk, subject not yet decided.

* * * *

Four times weekly is the programme content for the Barking chaps—Mondays, a constructional evening, then Morse classes on Tuesdays, Operating on Wednesdays, with the Club stations on the air, and Thursdays for the "general" evening, lectures, films, discussions, and so on, starting September 5, the first week of the new session, at Westbury Recreation Centre, Westbury School, Ripple Road, where there is car parking, and easy access from bus or train.

All sorts of things seem to be on the brew at Mid-Sussex, to judge from the *Newsletter*. This not only contains details of the Programme, but an article on a two-metre VHF transceiver project, an instalment of their thriller, a cartoon, humour, and a list of Club crystals available for sale to members. We see that over August while Marle Place (their Hq. in Burgess Hill has been closed) they have been meeting at each others' homes. Now it is September, things are back to normal, and you can try Hq. with confidence; you can hardly miss the aerial farm as you approach, with a triband beam on a sixty-foot telescopic tower. The arrangement is to get together on alternate Thursdays, but at the time of writing we don't know just what is fixed up for the programme.

On to Echelford, at St. Martin's Court, Kingston Crescent, Ashford, Middlesex, on the second Monday and the last Thursday of each month. As we understand the situation, nothing is arranged at the moment due to the lack of a social secretary—any volunteers?

Stevenage pretend to be QRT in August, but still things happen! However, September 5 is the first of the "official" new season, when there will be preparation for VHF/NFD, and some mini-lectures; then on September 19, they are going to try to plot polar diagrams and gain of 144 MHz aeriels. All this is at the Hawker Siddeley Dynamics works in Gunnels Wood Road, Stevenage.

The Southgate *Newsletter* is notable mainly for the funny cartoon on the front page—no wonders which member this may represent! However, all the vital information is inside. They get together, we see, on the second Thursday in each month, at the Scout hut in Wilson Street, just off Station Road, Winchmore Hill, starting at 8.0 p.m.

No lack of data from Verulam this time; there are, by reason of the vagaries of deadlines, two *Newsletters* and reports advising us of the goings-on. September 18 is the date, when Lowe Electronics will be giving the talk, demonstrating the latest in the field of commercial Amateur Radio. The Hq. is at the Market Hall, St. Albans. The final of the summer informals also comes in September, on September 4, at Salisbury Hall, London Colney—the place where the Mosquito wooden aircraft was first developed, and in pre-war days the home of Sir Nigel Gresley of steam-engine fame.



Members of the Torbay Amateur Radio Society visited the Longleat Mobile Rally on July 7 in force, style and comfort. The arrangements for this highly successful outing were made by G3UIQ, their hon. secretary, and he saw to it that the coach was loaded with the essential comestibles.

West Counties

That head was going to be West Counties, until we realised, at the last moment, we had nothing from GI!

So to Plymouth where the compiler of their *Newsletter* would seem to have at his command quite the most temperamental duplicator in the field—however, the contents of *QUA* are well worth the struggle to read most months. It is first and third Tuesdays in each month, at the Club Hq., Virginia House, Bretonside, located at the rear of the Breton Arms, Buckwell Street, and near St. Andrew's roundabout—and, once found, the visitor or attending member is assured of a West County welcome.

At Yeovil they find time to get together every week, XYL's or no, at the Youth Centre, 31 The Park. For more details, contact G3NOF, at the address in the Panel.

Basic Radar is the topic for Cornish on September 5, the speaker being G4CUH. The Hq. is at the SWEB clubroom, Pool, Camborne. However, looking a little ahead, we notice that the venue for October's meeting, on the 3rd, is changed, just for this once, to be at the Cornwall Technical College.

Now to Torbay and the hon. secretary reports that the group still progresses, the main pre-occupation having been the Mobile Rally preparations. RAE classes kick off on October 1, with the enrolment down for the second week of September. For more details of this Club, where they have visitors during the holiday season, we suggest you contact the hon. secretary—see Panel, overleaf.

One was a little doubtful about including the next two in the Westerly clip, but here goes: Hereford have a place at the Civil Defence Hq., Gaol Street, where they assemble on the first and third Fridays in the month. Incidentally this is another group who have managed to fix up an RAE class, at the Hereford Technical College, given enough enrolments—September 3-5 are the enrolment dates.

Pre-designed Top Band Transmitters are to be built by the members of Shirehampton (Bristol) who have just obtained their RAE passes—one hopes it will engender a liking for this facet of Amateur Radio. The lads can be located on any Friday at Twyford House, High Street, Shirehampton.

Midlands Area

Always a difficult area of the country to define, and our very first letter caused us to think more on the subject before finally placing it in this pile; Warrington, who have a very orderly scribe who puts things just as we would like them, even if we do have some difficulty in reading his "fist!" The meetings are on Tuesdays, at 8.0 p.m., the venue being the Thames Board Club, Manchester Road. On September 1 they have a Mini-Rally—it sounds rather like the real thing to us!—at Peninsula Barracks, Warrington, including as it does trade stands, amateur TV, talk-in stations, an antique radio display, Club stands, amusements for the XYL and harmonics, and much else. As for the programme for the normal weekly sessions, while no specific dates are given, the activities promised sound as though someone is

doing a mighty lot of work organising things—Good!

No argument about Bromsgrove, who now get together at Avoncroft Art Centre—this seems to be a change from the last time they wrote—where they can be found on the second Friday in every month. For September this makes the 13th, and the talk will be about Satellites, by G3HAZ. Visitors are specifically mentioned as being welcome.

There was recently an AGM at Stratford-on-Avon which reflects the change of secretary quoted in the Panel. We also notice a change of Hq. here, to be the College of Further Education, Alcester Road, at which spot they get together on alternate Fridays.

Coventry will be amusing themselves by going on the air on September 13 and 27. On the 6th, there is a "University Challenge" type of Quiz to be played off: Easier questions maybe, but the same system of inter-linked push-buttons all done electronically, just like the real thing. There is, of course, the matter of VHF/NFD (mentioned so often this month that to repeat the dates would be wearisome) and on September 20 comes a Hi-Fi demonstration. It all boils down, basically, to a case of every Friday evening, at Baden-Powell House, St. Nicholas' Street, Radford Road.

If you are in Blackburn, on the first Thursday of the month, why don't you look in on the East Lancs chaps? They are to be found at the YMCA, Sheerbank Road. Although we don't have any details for September, we notice on October 3 a talk and demonstration of radio control of models, and in November a Slide Show of members' radio rooms. During September there is also VHF/NFD, which, it is hoped, will be taken from Billinge Hill, Blackburn, with a caravan from which to operate.

Effectively it is a question of every Tuesday at Bury & Rossendale—the formal meeting is on the second Tuesday, but the lads are also to be found at Hq., nattering, every other Tuesday. The Hq. is at The Mosses Community Centre, Cecil Street, Bury, where, during September, the RAE classes will once again make a start. An interesting thought for other groups is that this crew have a "stand committee" whose task is to seek out and put on a stand at any local exhibitions which may be opportune; the benefit is quite measurable in terms of new members found.

At South Manchester there is always plenty to do; they must have easy-going wives in that part of the country! The main meetings are at Sale Moor Community Centre, Norris Road, Sale, each Friday. On

THE 29th MCC

This will take place over the week-end November 16-17. Rules in the October issue and to be much as last year.

September 6 they have a mini-lecture contest, followed by a Sale of Surplus Equipment on the 13th, non-members welcome. Three members get together on September 20 to fix up a demonstration of Leak and Wharfedale Hi-Fi, and on September 27 G4BJT talks about Chemical Energy. On top of all this, the VHF and the D/F contingent also have Monday evening meetings at the Club Shack, Greeba, Shady Lane, Manchester 23.

Thursday, September 5, will see the finale, in more ways than one, of Dick Sutton's series of colour TV talks given to the Cheltenham folk at the Royal Crescent Hotel, Clarence Street, as he is emigrating to Australia. On a different tack, the lads seem to have had "adventures" during their June Field Day with PSU's and generators playing up, to spoil an otherwise very successful event.

It is traditional for Wirral to have a Fox Hunt for the August meeting, and this year, to stop the chairman winning they elected him to be the fox! Meetings are on the first and third Wednesdays, at the Sports Centre, Grange Road West, Birkenhead, and in addition to these, on September 1 there is the Radio Exhibition at Warrington; VHF/NFD will be entered; and over the weekend September 14/15 some of the lads will doubtless be going to the Lancaster University ORM.

For VHF/NFD the Solihull chaps seem to have dropped out, as they are having a camping weekead, operating Top Band, Eighty and maybe Two from Chipping Norton. This is a "families" affair, and visitors will also be welcome. Then on the 13th, they have a social evening at the "Glovers Needle" in Worcester, travelling there in a coach leaving Solihull Civic Car Park at 7.30; and the following day there is a visit to the BBC studios at Pebble Mill. Only after all this do we come to the actual Club meeting, for which to date there is nothing arranged. The Hq. address is at the Manor House, High

Street, Solihull.

North & Scotland

Another of their mammoth Junk Sales falls to be mentioned for Star, down for September 11, at the New Inn, Bramley Town Street, Leeds 13, which is also where the chaps can be located on any Wednesday evening.

Grimsbury have their place at the Community Centre, Duncombe Street, where they are in Room 3 on alternate Thursdays. Look out for them over September 20-22, operating GB3HFA (Hobbies for All) from a Hobbies Exhibition locally, all bands up to 144 MHz. September 26 will see them listening to G3CCH on Meteor Scatter, which should be a special attraction, he being one of the experts on this mode.

Those interesting WIBB tape-and-slide lectures are still available for Clubs interested, says G3MDW of Northern Heights to whom applications should go—see Panel for his address. For 15 years now Arthur has been arranging the programme for the Northern Heights chaps and begins to find it tough going—beats this old scribe how he keeps it up! September 4 is down for a committee meeting, the 11th is set aside for a talk on a visit to U.S.A., and on the 25th there will be a talk on Slow Scan TV.

Our first trip north of the Border for many moons takes us to Mid-Lanark, who are at Wrangholm Hall Community Centre every Friday evening, the routine being to alternate between a week of "formal" stuff, film show, lecture, or whatever, and a week of nattering, Morse practice and operating the Club station, the while the canteen does a roaring trade—thirsty work, nattering and punching a key! In addition, RAE classes start in September, weekly on Wednesdays. For more detail, contact GM3KMG, as in Panel.

The secretary at York is finding so much to do that he is puffing

Names and Addresses of Club Secretaries reporting in this issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gundersbury Avenue, Acton, London, W3-8LB.

A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.

BARKING: R. E. Clark, G8BXC, 62 Waltham Road, Woodford Bridge, Woodford Green, Essex, IG8-8DN.

BASINGSTOKE: R. H. Oakley, G8FKT, 81 Camrose Way, Basingstoke.

BISHOPS STORTFORD: C. Harlow, G8BTK, Thorn Cottage, Old Mead Lane, Henham, Elsenham, Bishops Stortford, Herts.

BROMSGROVE: J. Dufrane, 44 Hazelton Road, Marlbrook, Bromsgrove, Worcs.

BURY & ROSSENDALE: C. Kirby, G8HQW, 2 St. Peters Place, Haslingden, Rossendale (4915), Lancs.

CHELtenham (RSGB): G. D. Lively, G3KII, 131 Mandaring Way, Wymans Brook, Cheltenham (34785), Glos.

CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.

COVENTRY: G. A. Whenham, G3TFA, Lavernock, 33 Chapel Street, Bishops Itchington, Warwickshire.

CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidecup, Kent.

CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN (01-699 6940).

DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21931), DE3-7GE.

DURHAM UNIVERSITY: P. Whittle, G4BBU, 1 Blinco Road, Urmoston, Manchester, M31-1NF.

EAST LANCs.: W. E. Baxendale, G8FDG, 28 Westland Avenue, Darwen, Lancs.

ECHELFORD: A. J. M. Wenham, G3ZXA, 28 Pinewood, Sunbury-on-Thames (86440), TW16-6SG, Surrey.

GRIMSBY: D. Johnson, G8HAE, 3 Ethelstone Road, Grimsby, DN34-4EF, Humberside.

HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford (3237).

HULL: F. Moss, G8GDD, 334 Ings Road, Kingston-upon-Hull, HU8-0NA, Humberside.

LOTHIANS: J. McVicar, GM8GEC, 31 Lochend Road North, Musselburgh, Midlothian, Scotland (031-665 2420).

MAIDENHEAD: E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead (20107), Berks., SL6-5LA.

MID LANARK: D. H. Plumridge, GM3KMG, 7 Waterside Gardens, Hamilton, Lanarks., ML3-7PY.

MID-SUSSEX: J. Brooker, G3JMB, 20 Farnham Avenue, Hassocks, Sussex.

MILTON KEYNES: R. S. King, G8CHK, 7 Brackley Road, Towcester, Northants.

NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogdan, Halifax (44329), West Yorkshire.

NORTH KENT: R. Wells, G4ARQ, 12 Bullbank Road, Belvedere, Kent.

ODDFELLOWS: M. P. Roche, G3YJS, 16 Norrington Road, Maidstone, Kent.

OXFORD (University): D. D. Price, G4BIX, St. Edmunds Hall, Oxford.

PLYMOUTH: S. E. Croft, 2 Crozier Road, Mutley, Plymouth.

R.A.F.: Sqn/Ldr. V. J. Ludlow, G3JLZ, R.A.F.A.R.S. Hq., R.A.F. Locking, Weston-super-Mare, Avon.

R.A.I.B.C.: S. R. Boakes, G3HXN, Cambridge Villa, Bristol Road, Cambridge, Gloucestershire, GL2-7BQ.

REIGATE: F. H. Mundy, G3XSZ, 2 Conifer Close, Reigate, Surrey.

SHELburne YOUTH CENTRE: F. C. Smith, Warden, Shelburne Youth Centre, Benwell Road, London, N.7.

SHIREHAMPTON: R. Andrews, G4BWB, 82 Wellington Hill West, Westbury-on-Trym, Bristol, BS9-4SN.

SOLIHULL: L. G. Boswell, G4AEJ, 170 Kestrel Avenue, Yardley, Birmingham, B25-8QX.

SOUTHGATE: B. Oughton, G4AEZ, 48 Morley Hill, Enfield (01-366 7166), Greater London.

SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, Cheshire, M33-3GW.

STAR: T. Leeman, G4BUU, 115 Asket Drive, Seacroft, Leeds, LS14-1HX, West Yorkshire.

STEVENAGE: C. Barber, G4BGP, 473 Canterbury Way, Stevenage, Herts., SG1-4EQ.

STOCKPORT: G. R. Phillips, G3FYE, 6 Ross Avenue, Davenport, Stockport, Greater Manchester.

STRATFORD-ON-AVON: J. Morgan, 21 Quiney's Road, Stratford-upon-Avon, Warwickshire.

SUNDERLAND: P. Barker, 15 Buttermere Street, Grangetown, Sunderland, SR2-9NJ, Tyne and Wear.

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 (25633), Herts., WD2-5JQ.

WARRINGTON: R. Davies, Poplar Avenue, Penkett, Warrington.

WEST KENT: M. Stanton, G4CCQ, Sweetbourne Cottage, Hastings Road, Lamberhurst, Kent, TN3-8JG.

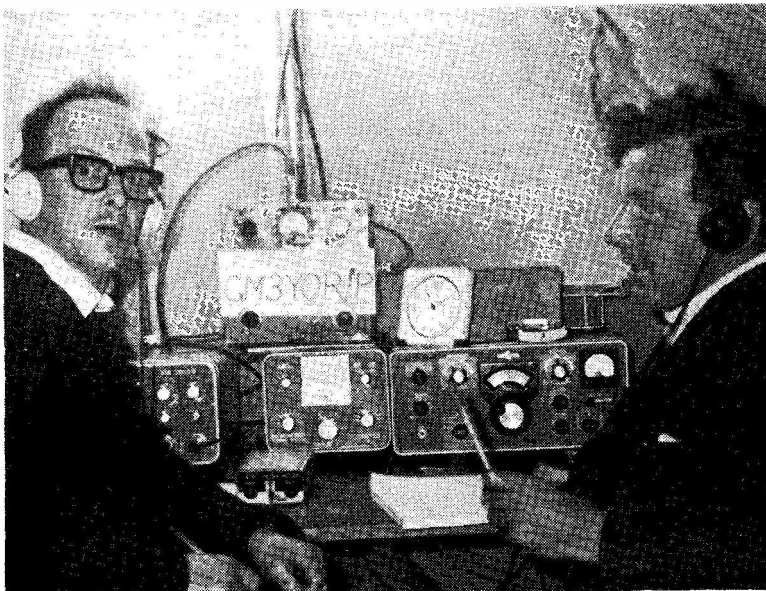
WIRRAL: F. Smith, G3YGL, 72 Church Road, Bebington.

WORTHING: G. Hooper, G8ETL, 12 Bramble Crescent, Durrington, Worthing (62013), West Sussex.

YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.

YORK: K. R. Cass, G3WVO, 4 Heworth Village, York, North Yorkshire.

The well-known Scottish Club group, Glenrothes, put in an entry for this year's Field Day signing GM3YOR/P, making a total claimed score of 2396 points. In the picture are, left, GM3PQF, with GM4ALK. They report conditions as having been not too good but nevertheless some reasonable DX was worked.



a little as he writes! The summer is, and has been, full of outside activities for the crowd—"showing the flag" at various shows, operating as G3HWW/A, G3XFM/A, and GB3TS (at Tellerton Horticultural Show, this last). As far as the clubroom is concerned, there are enough talks and activities fixed up to keep them going handsomely through to the Annual Dinner on October 25. The Hq. is at the British Legion, 61 Micklegate, and if you want to know more, then we refer you to G3WVO, in the Secretaries' Panel.

Derby were quite determined to be in the Midlands group, but sadly we had to draw the line a bit South of them so they are, for our purposes, Northerners—anyway, everything North of Watford is "Injun territory" to this scribe! Seriously, this is a very active and long-lived Club, getting together weekly at 119 Green Lane, Derby. September 4 is a Surplus Sale, September 11 sees someone talking about Low Definition Television and on September 18 there is a D/F Practice Night. Then on the 25th there is a Film Show, while on Sunday, 29th, comes the D/F final for the president's cup, details on which are obtainable from G2CVV, as Panel opposite.

Back to Scotland we go, up to Lothians, where a new secretary has taken over and been instructed to report. They start the winter session on September 12 with a presidential address, followed on September 26 by a Junk Sale, and October 10 by GM8FM talking about Repeaters. All these second and fourth Thursdays are taken at Room 7, Riddles Court, High Street, Edinburgh, from 7.0 p.m. on for a formal 7.30 start.

Another University opening now, this time Durham, where it is proposed to start a radio club and to have the call G4DUR reserved for it. Anyone interested should get in touch with G4BBU, either at the address shown in the Panel, or, during term-time, c/o St. Chad's College, South Bailey, Durham. Let us hope the proposal meets with every success.

Sunderland will be at the R.A.F. Association Club, Merton Street, near the multi-storey car park, on September 3, to make preparations for their 80-metre Field Day, and on September 17 for a talk by G2BS on Miniature Transmitters and Receivers. They then move back to their normal home, Sunderland Polytechnic, for October 1, when G3YJG will talk about SWL Aerials. Any further details wanted from the secretary, for whose address see Panel.

The Blossoms Hotel, Buxton Road, is the home of the Stockport troops, where they may be found on the second and fourth Wednesdays of each month. This makes September 11, when G2JT of *Aerialite* will talk about Developments in Co-Axial Feeders, and September 11, when they receive a visit from G2AMV. Looking forward to October 11, we see an interesting one, when G3NOA of *Ferranti* discusses "Extra-Terrestrial Power Sources" and, stimulated by this, the members all try to get rid of their PSU's at the Junk Sale on October 23.

There is nothing like a bit of publicity. Hull recently made their

first showing in the Hull Show at East Park, using GB3HS, and while there they made 300 contacts. It was hoped, at the time of writing, to see some new faces as a result of the activity, and by now it is probably true that new faces outnumber the old ones! At 592 Hessele Road, the Hq. address, they can be found on any Friday evening: September 6 for VHF/NFD preparation, September 13 for a Model Railway Night and the start of RAE classes, September 20 for G3RDM to talk about Tape Recording for the Amateur, and on the 27th "Getting Ready for the Morse Test"—and what better objective to couple with an RAE class?

Help!

R.A.F.A.R.S. recently had a letter from a blinded ex-R.A.F. warrant officer and they are anxious to get in touch with the W.O. who unfortunately did not give an address. However, it is known that he has been lent a receiver by someone. Thus, would anyone who did lend an Eddystone S640 Receiver to a blinded Mr. E. P. Williams please contact the R.A.F.A.R.S.—see Panel—or, alternatively, write to your scribe at the address in the final paragraph of this piece, and he will do the rest. And, even if you didn't lend this receiver yourself, if there is anyone you know who owns one, ask him if he has lent it out, and if it is him, again let us know, regardless of whether he is a reader or not. Thanks!

Having mentioned the Royal Air Force in the previous paragraph, we may as well continue with the other non-local associations, first among whom this month is A.R.M.S. who cater for the /M enthusiasts anywhere in the world—this month they announce a new member in DJ0YD/M.

The Independent Order of Oddfellows now have a "Ham Club," as they choose to call it, with nets held on 14273 kHz on Sundays at noon GMT, Tuesdays and Wednesdays at 2015z—G3YJS seems to be the spark-plug in this country, and his address therefore appears in the Panel.

Finally, R.A.I.B.C. catering for the invalid and bedfast radio amateur or SWL. For years we have been noting how much G3LWY used to put into running the Club, and it looks as though G3HXX and his XYL, who have taken over the chores of the Club, are following well in her footsteps. If you know anyone interested in radio and invalid or bedfast, then get him signed up; and while you're about it, sign up yourself as a supporter, always wanted to help with transport and visiting.

Conclusion

We seem to have come to the bottom of the pile. Now think on to next time, when your news should be of the October doings, and send it all to reach here on September 6 latest, addressed as always to "Club Secretary," *SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ.*

COURSES FOR THE R.A.E.

Second List

FOLLOWING are the R.A.E. Courses notified since publication of our first list on p.314 of the August issue of *SHORT WAVE MAGAZINE*.

Additionally to the general information given there about Subject No. 765—which those who contemplate taking a course of instruction for the radio amateur licence should note—it ought also to be mentioned that, if your locality is not covered in the List given here or on p.314, August, you may be able to get information from the local office of your Education Authority. Generally speaking, these courses come under the Local Education Authority plans for Further Education, so that fees are nominal—but usually a certain minimum number of students (12-15) is required to justify establishing a course. This number can, in many cases, be recruited through Radio Clubs in the area or by local press advertising.

When making enquiries, always quote "Subject No. 765, City & Guilds of London Institute." Please do *not* address enquiries to us—the point being that we know only about the courses notified to the *Magazine* for publication, as listed here.

- Amersham:** At the College of Further Education, Stanley Hill, also with Morse tuition if required. For details, ring *Amersham 21121, Extn. 27*.
- Ballymena, Co. Antrim:** Commencing mid-September at the Technical College, Trostan Avenue. Details from the Principal.
- Bangor, Co. Down:** At the Technical College, two evenings a week, starting mid-September, with C. Billington, G13WSS, as course tutor. Information from the College, or G13WSS, *QTHR*, telephone *Hollywood 4277*.
- Barry, Glam.:** At the College of Further Education, Colcot Road, classes in Theory, Morse and practical work, starting Tuesday, September 24, and Thursday, 26th, 7.0-9.0 p.m. Fee for course £5.25, enrolment evenings September 16-18. An all-band amateur station available for students. Further details from D. H. Adams, GW3VBP, at the College.
- Bedford:** At Westfield School, Queens Park, commencing mid-September, on Wednesday evenings, 7.0-9.0 p.m. Full details from course tutor, E. Elsley, G3YUQ, *QTHR*.
- Boreham Wood, Herts.:** At the College of Further Education, Elstree Way, on Wednesdays, 7.0-9.15 p.m., starting on September 18, enrolment September 4-5, evenings, at the College. Lecturer G. L. Benbow, G3HB.
- Bradford:** On Monday evenings, at the Technical College, Great Horton Road, with N. Short, G3YEE (*QTHR*, telephone *Bradford 664220*) as instructor, or apply at College.
- Bridgend, Glam.:** At the Technical College, on Wednesday evenings, 6.0-9.0 p.m. Details from B. Jones, GW3WRE, *QTHR*.
- Bristol (Shirehampton):** Theory and Morse at Shirehampton Amateur Radio Club, Twyford House, commencing late September. For details of enrolment and dates apply as soon as possible to R. Andrews, G4WBW, *QTHR*.
- Burslem:** At the Longton Annexe, College of Further Education, Moorland Road, on Thursday evenings, 7.0-9.0 p.m., with Morse on Monday evenings. Enrolment during first week September. Lecturers K. H. Parkes, G3EHM, and E. Lycett.
- Burton-on-Trent:** At Rolleston Evening Institute, Needwood School, on Tuesdays, 7.30-9.30 p.m., starting on September 17. Further details from the Institute (Mr. Smith), telephone *Burton 812333*, or from the course tutor, R. I. Buckby, G3VGW, *QTHR*, 'phone *Derby 672245*.
- Canterbury:** At the College of Technology, course lecturer D. J. Bradford, G3LCK. Enquiries to him, *QTHR*, or at the College.
- Dudley:** At the Technical College, enrolment September 2, at the College.
- Dundee:** At the Kingsley Technical College, Old Glamis Road, first class on September 5, 6.30-9.0 p.m. Enrol at class or call at College. Further details from D. Coupar, GM3YVX, *QTHR*, or ring *Dundee 75054*.
- Durham:** At the Technical College, Framwellgate Moor, commencing in September, Theory and Morse, Fridays 6.30-9.30 p.m. with F. L. Firth, G8JD, as course tutor. Enquiries to Head of Engineering Dept., at the College.
- Farnborough:** First class on October 3, 7.30 p.m., at Cove County Secondary School, St. John's Road. A course in Morse will also be available. Apply to the Principal, Further Education Centre, at the School.
- Glasgow:** At the College of Nautical Studies, 21 Thistle Street, on Tuesdays and Thursdays, 7.0-9.30 p.m., commencing September 10. Fee £3.00, payable on enrolment, on opening evening. This is a full course, covering Theory, licence conditions and Morse, with no prior knowledge assumed or required.
- Gosforth, Northumberland:** Starting in September, at the Secondary School, North Road, on Tuesday and Wednesday evenings, weekly. Course tutor D. R. Loveday, G3FPE. Prospectus and further information from the Principal, at the School.
- Grantham:** At St. Hugh's School, on Mondays at 6.45 p.m., starting on September 16. Enrol at the class. Instructor A. Ellis, G3PJR.
- Heanor, Derbys.:** At the College of Further Education, Ilkeston Road, on Wednesday evenings (Theory) and Thursday (Practical), starting September 18, enrolment at the College, evenings September 4-5.
- Horsforth, Leeds:** At Airedale & Wharfedale College of Further Education, Calverly Lane, Horsforth, on Wednesday evenings. Course tutor, R. Short, G3YEE, *QTHR*. Also at this College, on Thursday evenings, Morse tuition and advanced Amateur Radio course, with fully-equipped amateur-band station, workshop and test gear. Course tutor G. Denby, G3FCW, *QTHR*.
- Kirkcaldy:** At the Technical College, St. Brycedale Avenue, Theory and Morse classes starting in September. For details apply Principal, at the College, or H. Cook, GM8FXZ, *QTHR*.
- Lincoln:** At the College of Technology, Cathedral Street, enrolment evenings September 9-10, at the College. Instructor R. Goodchild, G4CLL, telephone *Lincoln 30641*.
- London (Acton):** At the Technical College, High Street, on Wednesdays, 6.30-9.0 p.m., commencing September 25, enrolment evenings September 12/18.
- London (Battersea):** At the Adult Education Institute, Latchmere Road, Lavender Hill, within three minutes Clapham Junc. Station, every Thursday evening, 7.0-10.0 p.m., enrolment week commencing September 16, any evening. Course instructor, D. Shepherd, G3YNP, *QTHR*.
- London (Highgate):** At Archway School, Highgate, N.19, lectures starting on September 23, 7.0-10.0 p.m., enrolment week beginning September 16, 7.0-9.0 p.m., at the School. Tutor B. C. Bond, G3ZKE.
- London (Ilford):** At the Evening Institute, Cranbrook Road, starting September 25, enrolment September 9-12, 7.0-8.30 p.m., at the Institute, fee £3.00, or £1.50 for juniors. Tutor, W. G. Hall, G8JM, who has been running this Course very successfully for many years.
- London (Wembley):** At the Evening Institute, Copland School, Cecil Avenue, basic fee £3.00, with reductions in suitable cases. Course starts September 16, 7.0-10.0 p.m., in two sections, Morse and Theory. Enrolment September 9-11, evenings. Main requirement in students is enthusiasm for Amateur Radio, no previous knowledge being necessary. Further enquiries welcomed by I. Bayliss, G8CZQ, *QTHR* (telephone *West Drayton 81-47258*). This course was started by A. J. Bayliss, G8PD, many years ago, and has always been most successful.
- Loughborough:** At the Technical College, Radmoor, for two terms starting on September 17, 6.0-9.0 p.m., Theory and Morse instruction, fee £3.55, enrolment September 9-11, 6.0-8.0 p.m., with D. R. Doughty, G3FLS, as course instructor.
- Manchester (Openshaw):** At the Technical College, Whitworth Street, enrolment September 9-11, evenings. Further details from the College, or A. B. Langfield, G3IOA, *QTHR*.
- Manchester (Swinton):** At Moorside High School, East Lancashire Road, on Thursday evenings, commencing September 26. Details from P. Whatmough, G8BFP, *QTHR* (telephone *794-3706*).
- Motherwell, Lanarks.:** Class to be arranged by Mid-Lanark Amateur Radio Society, apply D. H. Plumridge, GM3KMG, 7 Waterside Gardens, Hamilton (*28759*), Lanarkshire.
- Newport, Mon.:** At the College of Further Education, Nash Road, on Wednesdays, 6.30-9.30 p.m., with a practical constructional class on Monday evenings, same time. Tutors GW3YTJ (Theory) and GW4COJ (Practical). Apply to the College, or L. A. Groucott, GW3YTJ, *QTHR*.
- Perth:** At the Technical College, Crief Road, commencing September 23, 7.0 p.m., enrolment evenings September 2-6. Course tutor D. Morris, GM3YEW.
- Princes Risborough, Bucks.:** At the Adult Education Centre, Merton Road, Theory on Mondays, lecturer R. Whiting, G3POF, and

Morse on Thursdays, taken by S. Ford, G4ACV, both sessions 7.0-9.0 p.m. Classes start September 23, enrolment evenings September 11-12, at the Centre.

Sheffield: At King Edward School, Darwin Lane, starting October 2. Details from J. Bell, G3JON, *QTHR*, or ring *Sheffield 367774*, evenings.

Slough: Offering both basic R.A.E. and advanced Amateur Radio classes on Friday evenings at the College of Technology, Wellington Street, covering Theory, Morse and Operation (with G3XPL on the air), including full laboratory facilities and, if desired, a course for the College diploma in Advanced Amateur Radio communication. This is an established, well organised and successful instructional project, under the guidance of E. C. Palmer, G3FVC, and D. R. Vizard, G3UKS. Apply Dept. of General

Studies, at the College. Enrolment September 10-12, 10.0 a.m.-8.0 p.m.

Stevenage: Starting September 27, 7.0-9.30 p.m., at the College of Further Education, enrolment September 10-12, evenings, at the College.

Wigan: At the Adult Centre, Mesnes High School, Parsons Walk, enrolment evenings September 16-18, at the Centre, with the course instructor in attendance. Classes start September 23, 7.0 p.m.

Wolverhampton: At Wombourne Evenings Institute, Ounsdale Schools, Wombourne, enrolment September 9-10, first class on September 16, 7.0 p.m., with R. W. Tomkys, G3NOW, as instructor.

NEW QTH'S

This space is for the publication of the addresses of holders of new call signs, or changes of address, in EI, G, GC, GD, GI, GM and GW of stations not already listed. All addresses published here will appear in the U.K. section of the American "CALL BOOK" in preparation. Please write clearly and address on a separate slip to QTH Section.

G3CAA, J. R. de L. Simpson (*ex-ZC4CA 5B4CA*), 30 Meadow Drive, East Ayton, Scarborough, Yorkshire, YO13 9EZ.

(Tel: *West Ayton 2370*) (*Re-issue.*)

G4CHO, S. F. Jenkins, 31 Briar Close, Horndean, Hants., PO8 9ED.

G4CRI, K. McCardle, 3 Vyvyan Place, Helston (2260), Cornwall.

G4CSM, D. Chaplin, 134 Upper Richmond Road West, London, SW14 8DS.

G4CXT, M. R. C. Bell, 1 The Vineries, Burgess Hill, Sussex, RH15 0ND.

G4CZF, D. K. Wilkins, Westwood, Chavey Down Road, Winkfield Row, Nr. Bracknell, Berks.

G4DBC, B. G. Capper (*ex-G8CUA*), 36 Woodhill, Harlow (0279 38453), Essex, CM18 7JT.

G4DBX, L. J. Stubbs (*ex-G8CLR*), 96 Coleridge Way, Crewe, Cheshire, CW1 12F.

G4DCS, H. J. Paice, 14 Rutland Street, Grantham, Lincs., NG31 6DU.

G4DEH, P. J. McGorman, 285 Salters Lane, Redditch, Worcs.

G4DEV, S. L. Newport (*ex-G8FJZ*), 101 Elibank Road, Eltham, London, SE9 1QJ.

G4DFE, W. A. Raybould (*ex-G8FUI*), 16 Brookbank Road, Gornal Wood, Dudley, West Midlands, DY3 2RX.

G4DFI, O. L. Cross (*ex-G8HYH*), 2 Chapel Road, Bexleyheath, Kent, DA7 4HN.

GM4DGC, A. Paterson (*ex-GM8HWV*), Jesmond Dene, Statton Road, Brighton, Falkirk, Stirlingshire, FK2 0TY.

G4DGL, E. L. Mills (*VE1AST*), 23C Cranmer Road, Cambridge, CB3 9BL.

G4DGN, R. E. Andrew, Holnicote House, Bardney Road, Wragby, Lincoln.

G4DGR, E. A. Lomax (*5N2ABG*), West End T.S.O., Accrington, Lancs., BP5 4NQ.

G8INO, A. Brown, The Bungalow, 56 Electric Avenue, Harrogate (63135), Yorkshire, HG1 2BB.

GC8ITE, Glenfield, Le Foulon, St. Andrews's, Guernsey, C.I.

G8IUA, S. K. Clark, 19 Marlow Crescent, Twickenham, Middlesex, TW1 1DD. (Tel: 01-892 2174.)

G8IUF, E. S. Overton, 85 Windsor Street, Salisbury, Wilts.

G8IUQ, M. D. Wareing, 29 Clarendon Road, Swinton, Lancs.

G8IVZ, L. Roddie, 2 Sedgewick Road, Hollingbury, Brighton, Sussex.

CHANGE OF ADDRESS

G2HOP, J. H. Parrish, First Drift, Wothorpe, Stamford (3125), Lincolnshire, PE9 3JL.

G3GB/T, H. B. Shields, 13 Longnor Green, Gamesley, Glossop, Derbyshire.

G3HJL, F. R. Bailey, 25 The Oxleys, Old Harlow, Essex, CM17 0EA.

GM3JFG, Rev. Canon I. W. T. D. McHardy, 1 Dean's Road, Fortrose, Ross-shire.

G3LB, A. R. Yates, Nethersett, Littlethorpe Road, Ripon, Yorkshire.

G3LWH, G. Twist, C.B.E., Q.P.M., LL.M. (*E15CF*), 5 Honister Gardens, Westover Road, Fleet, Hants.

G3MCY, G. C. Moore (*ex-ZC4GM*), Potamos, Yermasoyias, Limassol (63772), Cyprus.

G3RKH, Rev. J. L. Marshall, M.A., 35 Lonsdale Way, Oakham (3907), Rutland, LE15 6LP.

G3SGH, J. R. M. Hewitt, 28 Mardol Road, Kennington, Ashford, Kent.

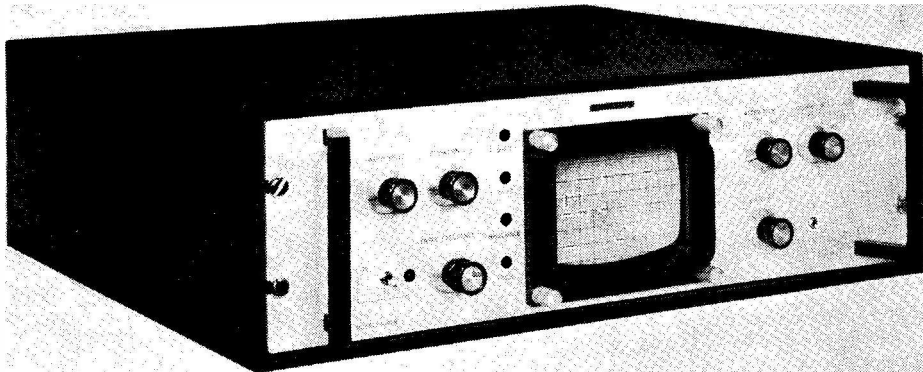
G3WQK, Southdown Amateur Radio Society, 29 Hawkstowm Crescent, Hailsham, Sussex.

G3ZOT, J. R. Hewitt, 28 Mardol Road, Kennington, Ashford, Kent.

G3ZVZ, Dr. D. P. Nicholls, 84 Ravenoak Road, Cheadle Hulme, Cheshire. (Tel: 061-485 8018.)

G4CHG, P. Ashton, 7 Conway Grove, Cheadle, Stoke-on-Trent, Staffs., ST10 1QG.

G8BNO, C. R. Street, Brockwells Cottage, Little Horsted, Uckfield, Sussex, TN22 5QS.



The new Eddystone Panoramic Display Unit 1061B/1 for operation with their range of UHF/VHF receivers having an IF output of 10.7 MHz. The sweep is adjustable from 20 kHz to 1 MHz per centimetre and centre frequency can be identified by accurate markers. Sensitivity is of the order of 10 microvolt/cm., controllable over 0-40 dB in 10 dB steps.

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- P.M.IIX** The mains version of the P.M.IID, having a transformer/silicon power supply with indicator. Has a Teak effect plastic laminate front panel with bronze hammer finish. Priced at **£16.50** plus 30p postage.
- P.M.IIF** An identical specification to the P.M.IID plus the addition of a complete calibrator with separate switched outputs at : 1 MHz, 500 kHz, 100 kHz, 50 kHz, 10 kHz. Harmonics of these outputs are available to the limit of our test receiver at least, that is 144 MHz. Has a transformer/silicon power supply with indicator, Blue laminate front panel with silver hammer case. Priced at **£22.50** plus 30p postage.
- P.M.IIFB** Specification as the P.M.IIF, but has extra switched outputs on the calibrator as : 1 MHz, 500 kHz, 250 kHz, 100 kHz, 50 kHz, 25 kHz, 10 kHz, 5 kHz. Has a Teak effect front panel with bronze hammer case. Priced at **£29.50** plus 30p postage.

All these units have engraved numerals on the panels, nothing to wear off. Please send 3½p stamp for details.

2 CROMWELL ROAD, SPROWSTON, NORWICH, NOR 65R.

Technical Books and Manuals

(ENGLISH AND AMERICAN)

AERIAL INFORMATION

ABC of Antennas	O/S
Aerial Handbook (Briggs)	93p
Amateur Radio Antennas (Hooton)	£1-94
Antenna Handbook, Volume 1	£1-84
Antenna Round-Up, Volume 1	£1-55
Antenna Round-Up, Volume 2	£1-85
Antenna Handbook, 13th Edition (ARRL)	£1-62
Beam Antenna Handbook, 4th Edition	£2-20
Quad Antennae, 2nd Edition	£1-87
Simple Low Cost Wire Antennas	£1-80
Vertical, Beam and Triangle Antennas (E. M. Noll, "73")	£2-60
Dipole and Long-Wire Antennas (E. M. Noll, "73")	£2-38

BOOKS FOR THE BEGINNER

Amateur Radio (Rayer)	£1-68
Beginners Guide to Radio (7th Edition)	£1-20
Beginners Guide to Transistors	£1-20
Beginners Guide to Colour TV	£2-13
Better Short Wave Reception, 3rd Edition	£1-88
Course in Radio Fundamentals	£1-21
Foundations of Wireless and Electronics	£2-13
Guide to Amateur Radio	90p
Ham Radio (A Beginners Guide) by R. H. Waring	£1-75
How to Become a Radio Amateur	70p
Learning the RT Code	33p
Morse Code for the Radio Amateur	27p
Radio, by D. Gibson	92p
Radio Amateur Examination Manual	91p
Simple Short Wave Receivers (Data)	95p
Understanding Amateur Radio	£1-47

GENERAL

ABC of Electronics (by Farl J. Waters)	£1-68
FM & Repeaters for the Radio Amateur	£1-70
ABC of FET's	£1-40
Easibinder (to hold 12 copies of "Short Wave Magazine" (together)	T.O/S
FET Principles, Experiments and Projects	£2-25
Making Transistor Radios (R. H. Waring)	£1-35
Guide to Broadcasting Stations (7th Edition)	88p
Having Fun with Transistors	£1-67
110 Semi-Conductor Projects for the Home Constructor (Iliffe)	£1-90
How to Listen to the World (8th Edition)	£1-98
110 Integrated Circuit Projects for the Home Constructor (Hard Back)	£1-98
Know Your Oscilloscope (by Paul C. Smith)	£1-89
Practical Transistor Theory	£1-20
Practical Wireless Circuits	£1-41
Prefix List of Countries	25p
Radio Engineers Pocket Book (Newnes) (N.E.)	£1-31
Shop and Shack Shortcuts	£1-85
The Fascinating World of Radio Communications	£1-82
Test Equipment for the Radio Amateur	£2-10
Telecommunications Pocket Book (T. L. Squires)	£1-38
World Radio and TV Handbook, 1974 Edition	£3-15
Dictionary of Telecommunications	£2-45

HANDBOOKS AND MANUALS

Amateur Radio DX Handbook	£2-25
Electronic Circuit Handbook, Vol. 1	£1-50
Electronic Circuit Handbook, Vol. 2	£1-50
New RTTY Handbook	£1-90
RTTY Handbook (Tab)	£2-68
Radio Amateur Handbook 1974 (ARRL)	£2-94
Radio Amateur Handbook 1974 (ARRL) (Hard Cover)	£3-74
Radio Amateur Operators Handbook	82p
Radio & Electronic Handbook	O/S
Radio Communication Handbook (RSGB)	O/S
RTTY A-Z (CQ Tech. Series)	£2-35
Surplus Conversion Handbook	£1-45
Slow Scan Television Handbook	£2-22
Television Interference Manual (G3JGO)	92p

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WANTED: Eddystone communication receiver, must be in good working order throughout. Details and price please. (Sutton, Surrey).—Box No. 5349, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SALE: Hallicrafters SX-28 "Super Skyriider," excellent condition, £25. Ex-W.D. sectional 35-ft. mast with canvas carrier.—Ring Clare, Hull 811361.

WANTED: Marconi Type TF-1064 Model M signal generator, or similar.—Green, G3TRL, QTHR. (Tel: 051-355 2017).

WANTED: Avo 8 movement, or meter. — Eddy, Laity Moor, Ponsanooth, Cornwall TR3 7HS. (Tel: Devoran 862148).

SELLING: Circumstances force sale of Racal RA-117 receiver, excellent condition and performance, complete with case, dust cover and handbook, £350 or near offer. (Warwickshire).—Box No. 5350, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: Two-element 3-band beam, TA-32Jr. or similar; also vertical, all-band if possible. —Hadler, G4CZU, 30 Fletcher Road, Whitstable, Kent. (Tel: Whitstable 62560 after 6 p.m.).

FOR SALE: Pye Cambridge tunable Rx, £24. KW-107 antenna tuner and Pwr/SWR, £35. Two-metre AM Tx with 3-10 modification, 6BW6's, compact, £12. "Cannonball" 160m. SSB Tx, with PSU, small, £14. Withers 2m. 6CW4 converter, IF 28-30 MHz, £10. Withers 70 cm. with PSU, 14-16 MHz IF, £10.—Roberts, G3AQX, Cottage Farm, Wessington, Derbys. (Tel: Alfreton 2943).

WANTED: Capacitor 16 mF, or near, 2 kV working. **FOR SALE:** Hammarlund HQ-170 receiver, fitted 240v. transformer and Telechron timer, checked and overhauled, £70. Labgear Labmatch SWR meter, £3. Blower fan with 24v. motor, £1-50. FET converter, 144 to 28/30 MHz, diecast case, £3-50; FSK oscillator for 2m. RTTY, diecast case, £2.—Addie, G8LIT, QTHR. (Tel: Blakesley 321, Northants).

SELLING: TDZ Rx p/c board, 50p; Toyo filter, £1; TA.D100, 75p; vari-cap, 50p, or The Lot, £2-50. Eddystone 888 and S-meter, £50. "Microwave Converters" 2m. double converter, IF 4-6 MHz, £8; 70cm., 28 MHz IF, £10. **WANTED:** FT-101 Mk. II or Model B, and 67-3333 MHz xtal; "Ham Radio" Sept. '70; "QST" for Dec. '66 and August '70. To buy or borrow.—Day, G8FSK, QTHR. (Tel: Kidlington 2215).

WANTED: Eddystone 640 Rx. Details and price please.—Conelly, G3UXE, 19 Norfolk Road, Maidstone, (50583), Kent.

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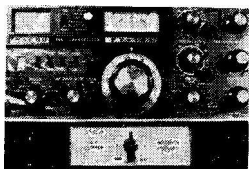
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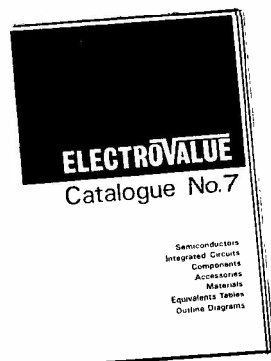
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FOR SALE: Eddystone 730/4 with fitted SSB and FM detectors, £60. Pye Cambridge, AM/FM, working on 145 MHz, £30. Creed 7B and RTTY converters, £15. Three 4CX250B valves, base, transformer, capacitors and semi-built 2m. linear, £15.—Goadby, G6BZN, QTHR. (Tel: 0455-35621, Himckley).

SELLING: Heathkit OS-2 oscilloscope, professionally assembled, 100% perfect (list price £54), accept £30.—Warrick, G3VCJ, QTHR. (Tel: Cooden 4726, STD 042-43).

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WANTED: Eddystone 870A receiver (mains), or Heathkit GR-54, or GC-1U/GC-1A Mohican; in good condition. Details and price please.—24 Maxwell Street, Swindon, Wilts. SN1 5DR.

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SELLING: KW-2000E, few months old, mint condition, £245. Buyer collect or arrange carriage. (N. Ireland).—Box No. 5353, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SALE: Heathkit SB-310 Rx, coverage 80-40-20-49-31-25-19-16m., AM/SSB filters and manual, £75 or near offer.—Willson, G3WNS, 146 Three Bridges Road, Crawley, Sussex.

SELLING: Liner-2 (low-end), little used, superb condition, £110.—Ring Gregory, G3LCV, Derby 701516.

FOR SALE: Racal RA-117 Rx.—Ring Shields, Yelverton 3318 after 6 p.m. (Devon).

FOR SALE: Yaesu FRDX-400SDX, coverage 160-10m., and 4.2m., with headphones, handbook, packing-case, as new, £160. Eddystone S.640, poor condition, £10. ICS RAE course and RSGB RAE manual, £10. Buyers collect or pay postage.—Plant, 13 Highfield, Elton, Chester. (Tel: Thornton-le-Moors 433).

WANTED: Racal RA-137 LF adaptor; Marconi TF-144H signal generator; Teletype 32 page printer; Collins R.389 or similar LF receiver; Telegraph terminals Type CV483 and CV432. Details and price please.—Passfield, 30 Greenleaf Close, Tulse Hill, London S.W.2 (Tel: 01-674 5825).

SELLING: HM-102 wattmeter, £12. SB-610 Monitor-scope, £35. Eddystone 840C Rx, needs tidying, £30. KW-2000A with PSU and mic., £135. All "or near offer."—Axford, G4AQZ, QTHR. Tel: 025584-632, after 6 p.m.).

WANTED: Pye Westminster W.15AM dash, mounted, or Motafone. Details and price please.—Green, G3TRL, QTHR. (Tel: 051-355 2017).

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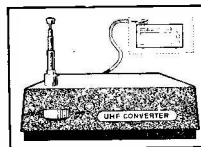
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COMPLETE STATION FOR SALE: KW-2000B transceiver, Shure 202 mic., K.W. E-Zee Match, K.W. combined SWR/Powermeter, with all manuals, in absolutely first-class condition, £195. Also Heathkit SB-610 monitor 'scope, as new, £48.—Beekar, G3WY, QTHR. (Tel: Evesham 45497).

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SALE: Yaesu FR-50B receiver, coverage 2/10/15/20/40/80m. and Top Band, with xtal calibrator and tape output, mint condition, £85.—Ring Lunn, Hythe 2000 after 7 p.m. (Hants).

SELLING: KW-77; Viceroy; E-Zee Match; SWR meter; R.1155N receiver; T.1145M transmitter; Type 193 crystal checker; BC-221; Headphones; Codar receiver; ATU; Avometer; VHF receiver. All s.a.e.'s answered. (Lancs). — Box No. 5351, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HP.

WANTED: Faulty CR-100 or B.28 receiver; any condition acceptable, even incomplete. Please state price. Distance no object. — Briscoe, 27 De Vere Gardens, Cranbrook, Ilford, Essex. (Tel: 01-554 6631).

SELLING: Two-metre converter, IF 4.6 MHz, 12v. neg. earth, six transistors, 35 MHz xtal. uncased, fits 15 by 10 by 5 cm., £4.50. Ceramic Filter, type LF-C20, £1.—Jarvis, GMBAPX, QTHR. (Tel: 08822-379).

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2m dual output preamp	£9-90	Decon printed ckt. pen	90p
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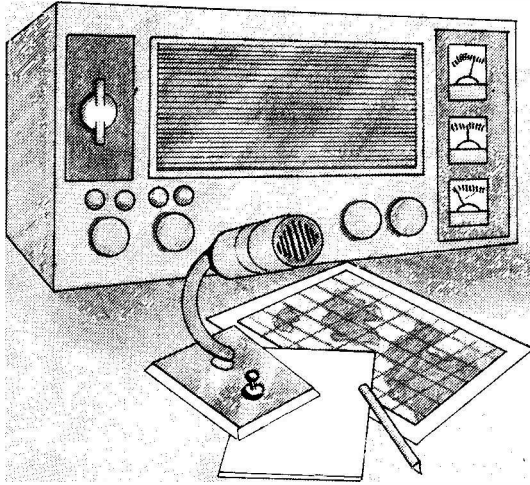
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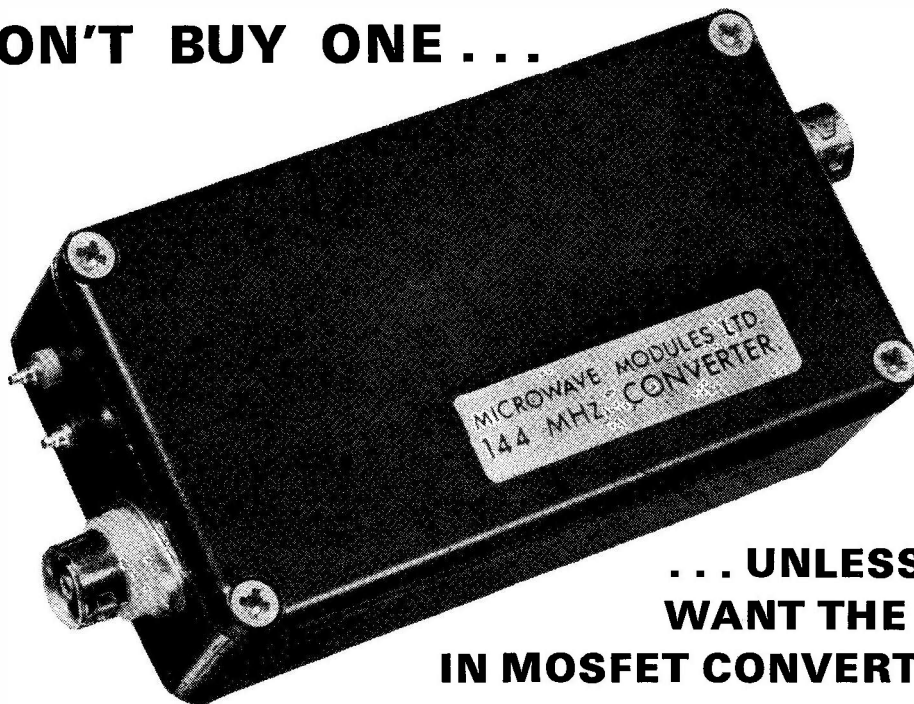
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MULTITURN POTS (for use with counting dials above) 2 Kohm, 100 Kohm, 400 Kohm, 10-turn, available only, Linear, 1/2in. spindle.

PHILIPS (A1/220) 12V, 50W, Quartz lamps, 1/2in. x 1 1/2in., ideal for emergency light from car battery, 50p each.

HONEYWELL, min. single pole c/o Microswitches, 1/2in. long, 1/2in. wide by 1/2in. high, with roller trigger, brand new, ideal for Press-to-talk mikes, 25p each.

CABLEFORMS, mixed box of various colours and types of wire, all new, manufacturers' surplus, ideal for home constructors, 80p box.

CRYSTALS, type HC6U in kHz, £2.00 each.

9015 9018 9021 9025 9028 9031 9034 9037 9038 9040 9043 9050

9053 9056 9059 9060 9065 9100 9137 9172 9222 9227 9255 9261

9276 9284 9287 9294 9316 9319 9341 9344 9411 9412 9431 9433

9438 9459 9481 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

CRYSTALS, type HC6U in MHz (X3-10-7 for 2M Rx), £2.00 each.

51-575 51-5866 51-59166 51-600 51-6916 51-71667 51-7208

51-725 51-72916 51-7416 51-75 51-75833 51-800 51-825

51-8333 51-9333 51-9750 51-98333 51-9916 52-0916 52-125

52-1333 52-1416 52-1750 52-1833 52-19167 52-200 52-2166

52-2333

NOTE: When ordering Xtals please send cheques or open postal orders, as these can be returned if out of stock, also state alternative if acceptable.

PLEASE NOTE: STAFF HOLIDAYS, FIRST WEEK IN SEPTEMBER. All orders sent during this period will be dealt with promptly on our return.

B. BAMBER ELECTRONICS

20 WELLINGTON STREET, LITTLEPORT, CAMBS.
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