

AUGUST  
1975

THIRTY PENCE

Vol. XXXIII  
No. 6

THE  
**SHORT  
WAVE**  
MAGAZINE

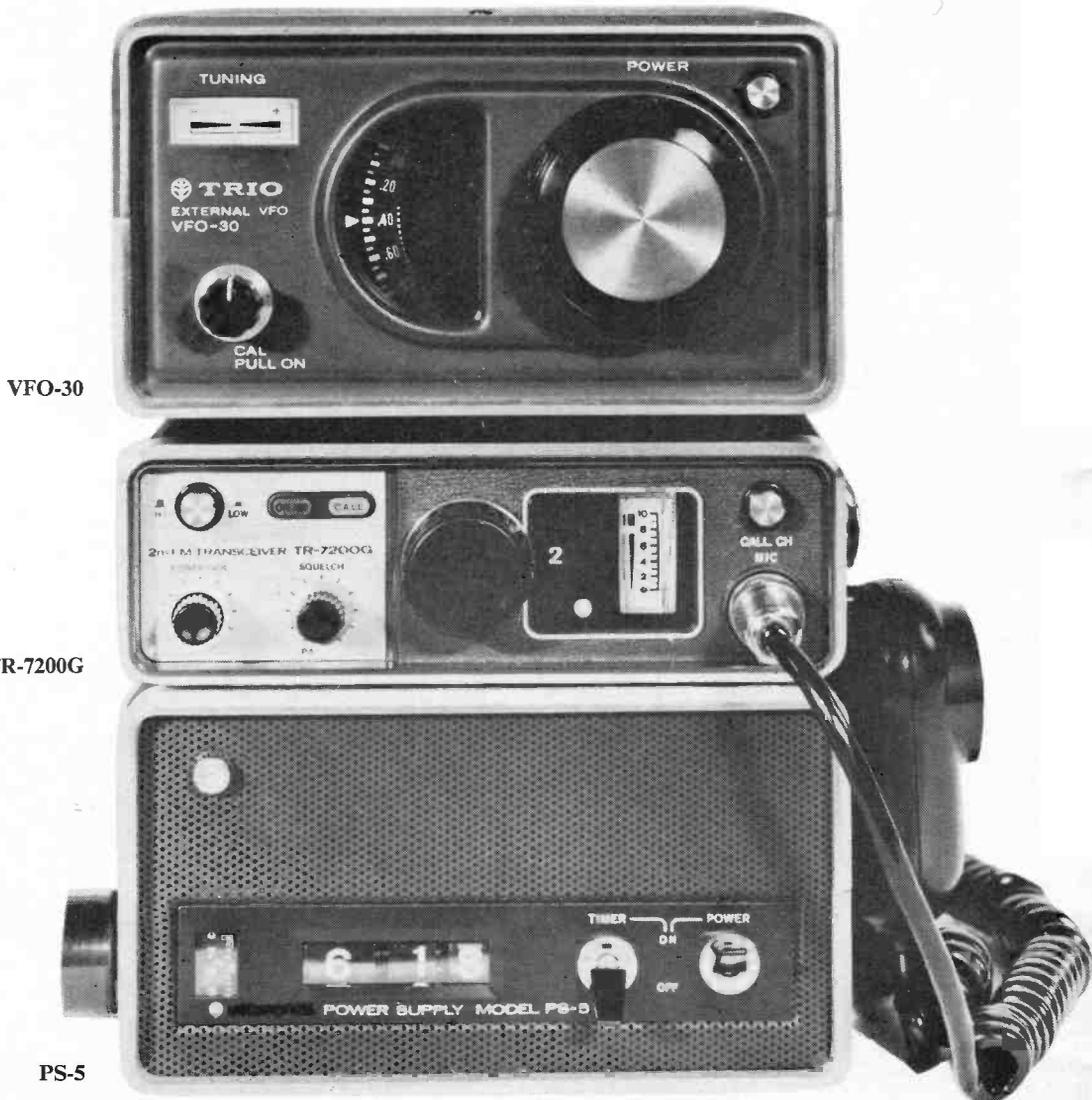
**WORLD WIDE  
COMMUNICATION**

**FOR THE RADIO AMATEUR AND AMATEUR RADIO**

# LOWE ELECTRONICS

## TRIO 2m FM Transceiver

*The rig with all the options*



# LOWE ELECTRONICS

## 2 Metre FM mobile transceiver TR7200G

The TR7200G is now the best selling two metre FM mobile transceiver in Europe. It has always been a favourite all over the world among radio amateurs who demand the very best in performance and construction. Now with a complete range of accessories, the TR7200G offers the ultimate in fixed station and mobile FM operation.

### Performance plus

High receiver sensitivity (typical measured performance  $0.3\mu\text{V}$  for 15dB quieting) gives you a solid readable signal from long distance stations. Also it helps to combat flutter on the received signal when you are mobile in a town since the limiting threshold is superbly low. Minimum transmitter output of 10 watts (typically 14-15 when on the move) together with carefully tailored audio response and a new integrated circuit limiting amplifier gives your signal that outstanding quality that makes people listen. The matching Trio dynamic microphone supplied with the rig further adds to the signal quality and readability.

### Repeater access tone

Generated by the Trio exclusive tuning fork controlled 1750 Hz oscillator. This is the tone generator that does not drift even when the interior of the transceiver is being cooked through sitting in a hot car on a summer's day. Stabilised amplitude output for constant deviation under all conditions. Access first time, every time.

### Superb squelch performance

Utilising the very latest in noise signal detection techniques for a squelch sensitivity of better than  $0.5\mu\text{V}$ . This simply means that you can be sure that the weakest usable signals will open the squelch when with other rigs, you always wonder if you are missing something with the squelch in operation.

### Switched TX output power

1 watt or 10 watts by the touch of a button. Dial illumination colour change to indicate power level in use. Fully variable PA protection which gradually reduces power input to PA with increasing SWR. This allows you to continue operating when your mobile antenna gets wet (and rain really does change the SWR on most antennas).

### Features, features

The 22 channel dial is engraved with all R and S channel numbers so you don't have to wonder "did I put R6 in chan 11 or 12?". It also, incidentally, has channels designated A, B, C, etc. for your Raynet or local frequencies. The LED under the channel number is RF powered and only lights on the channels fitted with a receiver crystal. The "on air" lamp is also RF powered but from the transmit crystals so you know precisely what crystals you have in the

rig. Best engineered mobile mount on the market gives instant slide in/slide out installation with no nasty little screws to fiddle with. Just in case someone else wants to slide out your rig, there is provision for a padlock through the mounting slide to prevent it (of course he could remove the entire dashboard complete with rig). The TR7200G case is dust tight and waterproof and reflects the Trio no compromise design approach. Public address facility. Switchable receiver sensitivity. Helical front and filter, etc., etc. It's the best mobile FM transceiver on the market. Now look at the price, £110 (VAT exc.) fitted 5 channels.

### VFO 30 G External transmit/receive VFO

Matching VFO for TR7200G with some superb construction. Gives full 144-146 MHz band coverage with built-in 600 kHz repeater shift at the touch of a button. Illuminated dial and centre zero tuning meter for easy operation. Built-in calibrate facility allows accurate dial setting against TR7200G crystals. Low frequency heterodyne type VFO for first class stability under all conditions.

### PS5 power supply

To complete the station, the PS5 allows home operation of the TR7200G from 120-240v. AC mains supplies. Electronically regulated 13.8v. DC at 3.2A with tyristor secondary protection. Built-in digital clock with 24 hour timer.

### Sole Importers:

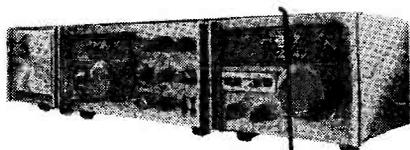
LOWE ELECTRONICS

Cavendish Road, Matlock, Derbyshire

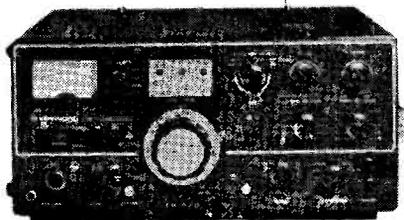


# TRIO

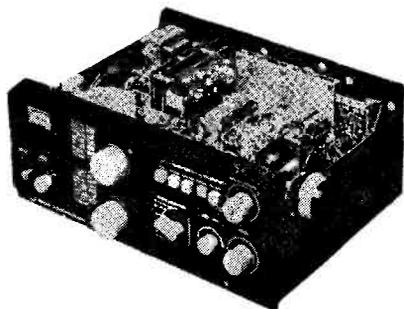
# LOWE ELECTRONICS



TS900



TS520



QR666

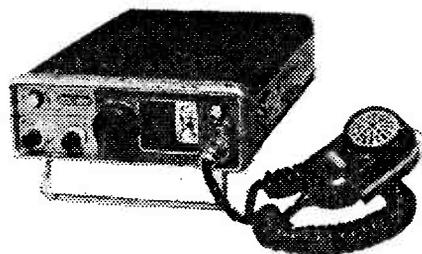


## TRIO

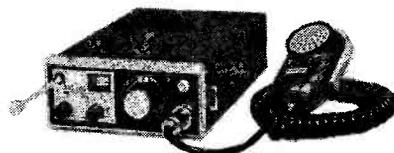
IS NOW AVAILABLE  
IN THE SOUTH  
EAST



TS700



TR7200G



TR2200G

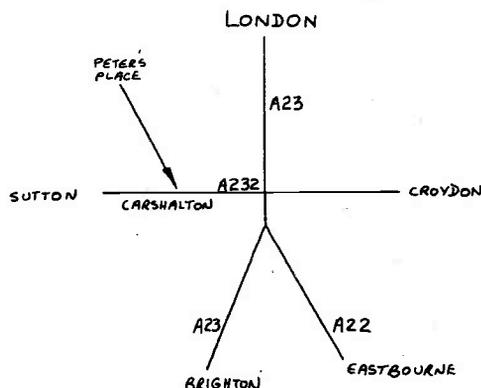
### NEW BRANCH OPENING

Over the last year, there has been a growing demand from the South London area, for a Lowe Electronics branch to be sited there. The price of petrol, and the general increase in the cost of motoring has made it difficult for the average radio amateur to justify a long journey taken just to see the latest amateur radio equipment. We have done what we could to help by making appearances at the major rallies and attending club evenings to demonstrate and talk about equipment but we were aware that there was a need for a permanent home South of the river.

We are delighted, therefore, to announce the opening of a new Lowe Electronics branch in Carshalton. This will be operated by Peter Burton, G3ZPB, who will be stocking and selling the complete range of Trio equipment together with all the other popular Lowe Electronics lines.

Those of you who know Peter will be aware of his courtesy, kindness and reputation for fair dealing. Those of you who have not yet had the pleasure of meeting him, should rush down to Carshalton and press money into his hand in exchange for numerous goodies.

The Office is on the main A232 Sutton Road, just past Carshalton Ponds on the other side of the road.



LOWE ELECTRONICS

SOUTH EAST BRANCH 39 POUND STREET, CARSHALTON, SURREY

OFFICE HOURS : 10 a.m.-6 p.m. MONDAY-FRIDAY

# LOWE ELECTRONICS

<b>TRIO</b>		<b>MICROWAVE MODULES</b>		<b>ANTENNA ACCESSORIES</b>	
TS900 and AC power supply ...	£480.00	MNC144/28 LO ...	£16.30	Coaxial cable 50 ohms type UR43	14p
DS900 DC power supply ...	£64.00	MMC70/28 ...	£15.20	per metre ...	
VFO900 external VFO ...	£110.00	MMC432/28 ...	£18.10	Coaxial cable 50 ohms type UR67	35p
TS900 CW filter ...	£29.00	MMC432/144 ...	£18.10	per metre ...	
TS520 transceiver ...	£290.00	MNC1296/28 ...	£24.00	Coaxial cable 50 ohms type RG-8/U	40p
VFO520 external VFO ...	£55.00	MMC1296/144 ...	£24.00	per metre ...	
SP520 optional external speaker ...	£12.00	MMV/432 ...	£17.50	Twin feeder either 300 ohms or 75	5p
TS520 CW filter ...	£21.00	MMV1296 ...	£25.00	ohms per metre ...	
TS700 2m. all mode transceiver ...	£300.00	<b>GALAXY</b>		Rotator cable 8 core for TR44 or	31p
Fixed channel crystals for TS700 ...	£2.32	R1530 General coverage receiver ...	£750.00	Ham-M per metre ...	
VOX unit for TS700 ...	£15.00	<b>HALLICRAFTERS</b>		Rotator cable 5 core for AR40	18p
TR7200 2m. car transceiver ...	£110.00	FPM-300 Mk. II Transceiver ...	£290.00	per metre ...	
TR2200G hand held 2m. trans-	£80.00	Mobile kit for FPM-300 ...	£10.00	Rotator cable 4 core heavy duty	19p
ceiver ...		Fan kit for FPM-300 ...	£20.00	per metre ...	
Crystals for TR7200G or TR2200G,	£2.32	<b>VENUS SLOW SCAN TV</b>		Rotator cable 12 core heavy duty	44p
each ...		SS2 slow scan station monitor ...	£230.00	per metre ...	
Crystals as above per channel ...	£4.20	SS2 slow scan station monitor kit ...	£155.00	PL259 plugs each ...	36p
VFO30G external VFO for		C-1 camera ...	£255.00	SO239 matching sockets each ...	36p
TR7200G ...	£55.00	F-1 single frame cassette ...	£2.00	Reducers to screw into PL259	12p
VB2200 10 watt amplifier for		T-G grey scale tape ...	£3.00	plugs ...	60p
TR2200G ...	£29.00	T-C checkerboard tape ...	£3.00	PL259 right angle adaptors ...	76p
BP-10 NiCad battery pack for		P-1 Polaroid camera hood ...	£17.00	S.W.R. meter Asahi ME-11B twin	£10.00
TR2200G ...	£11.00	V-1 Viewing hood ...	£7.00	meter ...	
TR7010 2m. SSB transceiver ...	£165.00	<b>ANTENNAS</b>		S.W.R. meter Hansen SWR3	£7.00
RS99S Amateur band receiver ...	£275.00	2m. "J" BEAMS 50 ohm impedance only		single meter ...	
TS99S General coverage transmitter ...	£265.00	5Y/2M 5 element Yagi ...	£4.30	Hy-Gain dipole centre insulator C1	£3.00
QR666 General coverage receiver ...	£130.00	8Y/2M 8 element Yagi ...	£5.60	coax feed ...	£9.50
QR-6MK 500kHz marker for QR666	£8.50	10Y/2M 10 element Yagi ...	£11.00	Hy-Gain Balun BN86 ...	£4.40
Extra for fitting QR-6MK, if required	£1.50	PBM14/2M 14 element parabeam	£16.90	Diamond Balun BU-5 ...	
QR-6FM FM tuner for QR666 ...	£21.00	5XY/2M element 5 crossed Yagi	£8.20	<b>STATION ACCESSORIES</b>	
Extra for fitting QR-6FM, if required	£5.00	8XY/2M 8 element crossed Yagi	£10.20	Morse Keys ...	£5.00
HC-2 Ham Clock ...	£11.00	10XY/2M 10 element crossed Yagi	£14.10	Katsumi Keys EK108D (DC) ...	£28.00
MC-10 hand microphone with PTT	£6.30	D5/2M 5 over 5 slot fed Yagi	£7.92	Katsumi Keys EK108A (AC) ...	£32.00
MC-50 table microphone with PTT	£18.00	D8/2M 8 over 8 slot fed Yagi	£10.50	C.W. Practice Oscillators ...	£2.80
LF-30 low pass filter ...	£9.00	PMH/2C 2 way phasing harness		Low impedance padded headsets ...	£3.25
BFP-2 2m. band pass filter ...	£8.00	circ. pol. ...	£2.85	Teisco DM501 Hand Mike with	£5.56
PS-5 regulated 13.5v. DC psu/digital	£43.00	SVMK/2M mounting kit ...	£2.20	P.T.T. ...	
clock ...		XD/2M crossed dipoles ...	£5.75	Trio Dual Impedance Table Mike ...	£18.00
TV502 2m. Transverter ...	£100.00	UGP/2M Unipole and ground		4-pin mic. plugs ...	48p
<b>NIHON DENGYO</b>		plane ...	£4.15	4-pin mic. sockets ...	48p
Liner 2.2m. SSB transceiver ...	£145.00	PMH2/2M 2 way phasing harness	£3.95	<b>ROTATORS</b>	
LA-106 Linear Amplifier ...	£165.00	PMH4/2M 4 way phasing harness	£9.15	AR 40 Solid State ...	£30.00
FS-100/P 2m. FM Scanning Trans-	£220.00	<b>70cm. "J" BEAMS</b>		TR 44 Heavier duty rotator ...	£50.00
ceiver ...		D8/70 8 over 8 slot fed Yagi	£9.00	CD 44 Improved version of TR 44	£60.00
AMR-104 2m. Scanning Monitor	£65.00	with 3 $\frac{1}{2}$ " boom ...	£12.10	Ham-2 Improved version of rugged	£90.00
Receiver ...		MBM46/70 46 element multibeam	£10.90	Ham-M ...	
Marine Version of AMR-104 ...	£86.00	PBM/70 18 element parabeam		<b>VALVES</b>	
R15E regulated psu for the Liner 2	£21.00	<b>2m. MOBILE WHIPS</b>		6AH6, 6BZ6, 6CB6A, 6CL6, 6U8A,	66p
<b>LOWE MONITOR RECEIVER</b>		"J" Beam $\frac{1}{2}$ vertical swivel mount ...	£6.00	6EW6, 6BM8, 12BY7A ...	£1.30
REC R1420C		<b>G-WHIPS</b>		6JS6C, 6KD6, Matched pairs ...	£4.20
Receiver complete, less crystals ...	£19.95	Tri-bander 20, 15 and 10m. ...	£12.30	6146B, S2001 direct replacement,	£3.20
Receiver complete, fitted 1 channel	£21.87	Multimobile 20, 15 and 10m. ...	£14.30	each ...	£3.20
Receiver complete, fitted 2 channel	£23.37	160, 80 or 40m. coils for the above		6LQ6, Matched Pairs ...	£5.52
Receiver complete, fitted 3 channel	£24.87	each ...	£4.10	<b>CRYSTALS</b>	
Receiver complete, fitted 4 channel	£26.37	Top whip section for the above ...	£1.10	We stock all the popular channels for all the	
Receiver complete, fitted 5 channel	£27.87	Base mount for all G-Whips ...	£1.65	equipment we sell as well as many crystals	
Receiver complete, fitted 6 channel	£29.37	<b>H.F. BEAMS</b>		for other F.M. equipments.	
Above receiver modified for 156 MHz	£21.76	Hy-Gain TH3 jnr. 20, 15 and 10m. 3		Price per single crystal ...	£2.32
Receiver complete, less crystals ...	£24.26	element ...	£74.00	Where 2 crystals per channel are	
Receiver complete, fitted 1 channel	£26.76	Hy-Gain Mk. 3 20, 15 and 10m. 3		required. Price per channel ...	£4.20
Receiver complete, fitted 2 channel	£29.26	element ...	£99.90	<b>FILTERS</b>	
Receiver complete, fitted 3 channel	£31.76	<b>VERTICALS</b>		9-0 MHz. Crystal filters with carrier crystals.	
Receiver complete, fitted 4 channel	£34.26	Hy-Gain 12AVQ 20, 15 and 10m. ...	£25.50	SEIWA YF90F S.S.B. filter ...	£15.28
Receiver complete, fitted 5 channel	£36.76	Hy-Gain 14AVQ 40, 20, 15 and 10m.	£36.00	Kokusai MF455 Mechanical filter	£15.93
Receiver complete, fitted 6 channel	£1.85	Hy-Gain 18AVT/WB 80, 40, 20, 14		Carrier Crystals for Kokusai filters	
Extra crystals for 2m. Band ...	£2.78	and 10m. ...	£56.00	each ...	£2.60

All Prices Exclude VAT and Carriage

## HEAD OFFICE

119 Cavendish Road, Matlock, Derbyshire. Tel. 2817 or 2430 9 a.m. to 9 p.m.

## BRANCH OFFICES

Goring Road, Steyning, Sussex. Tel. Steyning 814466

Soho House, 362-4 Soho Road, Handsworth, Birmingham Tel. 021-554 0708

## AGENTS

Alan GW3YSA, 35 Pen-Y-Waun, Etail Isaf, Nr. Pontypridd. Tel. Newton Llantwit 3809

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

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

OPENING HOURS : 9-5.30 TUESDAY TO SATURDAY INCLUSIVE

73 from BILL G3UBO/VE8DP, ALAN G3MME, JOHN G3PCY/5N2AAC, IAN G3ZYC

# Western Electronics (UK) Ltd SOUTHAMPTON

UNITED KINGDOM MAIN DISTRIBUTOR  
OF  
THE WORLD'S FINEST RANGE OF AMATEUR  
RADIO EQUIPMENT  
BY

## YAESU MUSEN



... introduce the **NEW**  
**FT-221**

with the following features :

- ★ Covers 144-148 MHz in 8 bands
- ★ AM - CW - USB - LSB - FM
- ★ Full Repeater and Reverse Repeater
- ★ VFO or 11 Channel options

Price? Well the best always costs a little more so at £330 (exc. VAT) This is the connoisseur's choice. Delivery? Our first consignment left Tokyo early July so should be available early September.

TO MATCH THE PERFORMANCE OF YOUR FT-221 !

We have excellent stocks of the



6 dB GAIN COLINEAR ... the real performer

**HUSTLER for REPEATER or ANY FIXED STATION OPERATION.** The Hustler Master Gainer is specially designed for rugged mechanical performance and optimum gain achieved through two 5/8 wavelength radiators correctly phased in colinear configuration. Stated gain figure is conservative and maximum radiation is at the horizon!

**ELECTRICAL.** 6dB gain over 1/2 wave dipole. Omnidirectional radiation pattern. Maximum radiation—at horizon. 50 ohm feed impedance. Field adjustable—140-150 MHz. SWR at resonance—1.2:1 measured at antenna. Bandwidth—6 MHz for 2:1 or better SWR. Power—one kilowatt FM. Feed—Shunt with DC grounding. Radiator—5/8 wave lower section, 1/4 wave phasing, 5/8 wave upper section.

**MECHANICAL.** Vertical element—117" long, 1 1/2" telescopic to 3/4" OD high strength aluminium. Radials—four, 21" x 1/8" OD aluminium rod. Connector—SO-239. Vind load—26 pounds at 100mph. Wind survival—100mph. Completely self-supporting. Mounting—fits vertical pipe up to 1 1/2" OD. Shipping Wt.: 6-8 lbs.

**PRICES (ex. VAT) G6-144A £35.90 CGT-144, £25.00**  
(CGT-144 is the mobile version with 5-2dB gain for boot mounting)

**AFTER SALES SERVICE.** Don't forget we cover the U.K.! We may not be your nearest dealer but in these days when no doubt your time is precious it's worth remembering that we are only a phone call away. Dealing with us is your insurance policy to peace of mind in the unlikely event that you need service under warranty. On items too large to post we will collect your transceiver, etc, back free of charge by Securicor. Service (parts and labour) are free (except tubes) and return carriage is free by Securicor. Can you do better anywhere else!



### BANTEX FIBREGLASS MOBILE ANTENNAS

(Carr. 75p) (Ex-Stock) + VAT

70 1/2 70 MHz 1/2 wave ...	£3.00	BGA, 144 MHz, 1/2 wave ...	£6.60
144 1/2 144 MHz 1/2 wave ...	£2.85	B5, 144 MHz, 1/2 wave ...	£5.20
Magnetic mount ...	£7.80	All aerials complete with base.	

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

2 ele. ...	£72.00	4 ele. ...	£164.00
3 ele. ...	£118.00	+ VAT	

### HY-GAIN (Carr. paid) + VAT

Hy tower, 10-80m. (self-sup) ...	£132.00	Hy-Quad, 10-20m. 2 ele. ...	£99.00
18V, 10-80m. vertical ...	£18.00	DB810-15 10-15m. 3 ele. ...	£76.00
12AVQ, 10-20m. vertical ...	£25.00	203BA, 20m. 4 ele. beam ...	£96.00
14AVT, 10-40m. vertical ...	£36.00	203BA, 20m. 3 ele. beam ...	£80.00
18AVT, 10-80m. vertical ...	£52.00	153BA, 15m. 3 ele. beam ...	£44.00
LC800, 80m. coil for 14 AVQ ...	£11.50	103BA, 10m. 3 ele. beam ...	£35.00
TH6DXX, 10-20. 6 ele. beam ...	£119.00	LAJ Lightning arrestor ...	£17.5
TH3MK3, 10-20m. 3 ele. 2 kW ...	£99.90	LA2 Lightning arrestor ...	£3.00
TH3 Jr., 10-20m. 3 ele. 600W ...	£74.00		

### J BEAM (Carriage 75p and VAT extra)

TAS 5/8 pivoting mobile ...	£7.00	D5/2m. Double 5 slot fed ...	£7.92
5Y/2m. 5 ele. ...	£4.30	D8/2m. Double 8 slot fed ...	£10.50
8Y/2m. 8 ele. ...	£5.60	XD/2m. Crossed dipoles ...	£5.75
10Y/2m. 10 ele. ...	£11.00	UGP/2m. Ground plane ...	£4.15
PBM14/2m. 14 ele. Parabeam ...	£16.90	HM/2m. Halo/mast ...	£2.20
5XY/2m. 5 ele. crossed Yagi ...	£8.20	D8/70cm. Double 8 slot ...	£9.00
8XY/2m. 8 ele. crossed Yagi ...	£10.20	PBM18/70 18 ele. Yagi ...	£10.90
10XY/2m. 10 ele. crossed Yagi ...	£14.10	MBM46/70 46 ele. multibeam ...	£12.10

### MOSLEY (Carr. £2) (Ex-Stock) + VAT

Mustang 10-20m. 3 ele. 2kW ...	£70.00
TA33 Jr. "E" for 2" mast ...	£53.00
SWL Listeners dipole ...	£16.00
TA32 Jr. for 2" mast ...	£37.00
TA31 Jr. Rotary dipole ...	£23.00

## Western Electronics (UK) Ltd

Agents: IAN PARTRIDGE, G3PRR, CHESHAM, BUCKS. (02405) 4143  
ALAN CAMERON, GM3OGJ, ALLOA (02592) 4653  
DAVID LACEY, G8YF, SOLIHULL, WARCS., 021-744 4438

Hours of business: 9.15 - 5.15, 9 - 12.30 (Saturdays)

1-3 WEST PARK ROAD, SOUTHAMPTON

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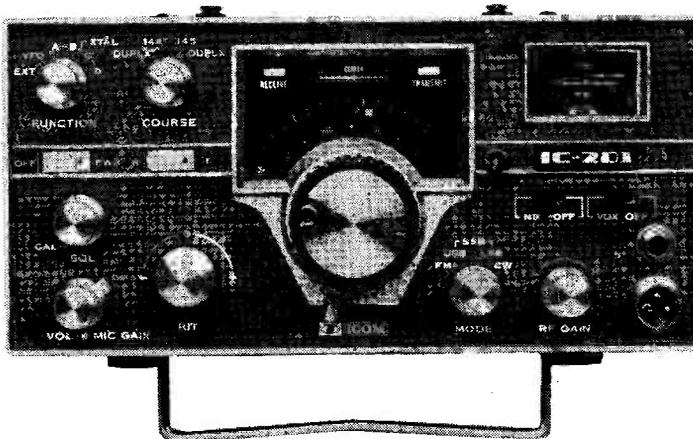
TELEX: 47388 WESTRONICS



# THANET ELECTRONICS

PAUL  
G3VJF

DAVE  
G8ELP



## THE IC-201 — AT LAST!!

The first supplies of this new multi-mode transceiver from INOUE will be with us this month and we will be having regular monthly deliveries after that. The quota for August has already been sold but there are still a few left for September. We have had a couple of samples for testing for the past two months and find that the 201 fully lives up to our expectations of a multi-mode rig from INOUE and has been well worth waiting for! Note that it does not have AM, although of course you can resolve AM as a sideband signal if necessary.

Compare these features with other multi-mode rigs —  
CENTRE-ZERO meter on FM.  
NARROW FILTER on FM for 25 kHz channel spacing.  
Good, well-limited FM.  
600 kHz shift of Tx. using DUPLEX for working repeaters.  
AUTOMATIC tone-burst introduced on DUPLEX.

4 Crystal positions for net and repeater frequencies.  
TWO-SPEED GEARBOX giving easy rapid tuning.  
VOX. Fully adjustable (works on FM if you really want it).  
CW side-tone.  
Full BREAK-IN on CW (separate VOX delay controls for CW and SSB).

RF GAIN CONTROL by adjusting the coupling of two helical filters.  
EXCELLENT NOISE BLANKER.  
R.I.T.  
MIC GAIN control on front panel.  
DIAL-READOUT TO 1 kHz—accurate to 2 kHz or better.

Transistors	...	...	...	...	53
FET	...	...	...	...	16
IC	...	...	...	...	10
Diodes	...	...	...	...	66
Frequency Range	...	...	...	144-146 MHz	
Weight	...	...	...	5.4kg	
Dial accuracy	...	...	...	(-10°C. to 60°C.) ± 2 kHz	
Modes	...	...	...	SSB (usb or lsb), CW and FM	
Ant. Impedance	...	...	...	50 ohms	
Operation Voltage	...	...	...	DC 13.8v. ± 15%	
	...	...	...	AC 230v.	
Size	...	...	...	111mm. x 230mm. x 260mm. deep	

<b>Specification</b>	
<b>Power Output</b>	Receiver
A3J 10W pep	I.F. Frequencies A3J, A1 ... 10-7 MHz
A1, F3 10V	F3... 0-5uV for 10dB S+N/N
Carrier Suppression (SSB) ... > 40dB	Sensitivity A3J, A1 ... 0-4uV for 20dB quieting
Unwanted sideband suppn... > 40dB	FM ... -8dB (uV) or less
Spurious radiation ... -60dB	Squelch sensitivity (FM) ... ±1.2 kHz—6dB points
Deviation FM set to ... 4.5 kHz	±2.4 kHz—60dB points
Mic. Impedance ... 500ohm	FM ... ± 8 kHz—6dB
Operation ... PTT or VOX	± 16 kHz—60dB
	Audio output... 2W
	Speaker ... 8 ohms E. & O.E.



The IC-22A is becoming very popular as THE mobile rig for both simplex and repeater operation. See last month's advert for brief specification or contact us or one of our agents for more details. Fitted with an Automatic tone burst which operates on repeater channels only, the IC-22A comes fitted with 5 or 8 channels. The maximum number of channels available is of course 22.

5 channel version. FITTED 145, S20, S21, S22, S23  
= £115 + VAT  
8 channel version. FITTED above channels + 3  
repeaters or 2 repeaters and S24 = £125 + VAT



## THANET ELECTRONICS

34 CLIFF AVENUE, HERNE BAY  
KENT (02273) 63846



AGENTS  
(by appointment evenings and weekends only)

CRAYFORD  
CRAYFORD ELECTRONICS,  
32 Iron Mill Lane,  
CRAYFORD, Kent.  
Telephone : (03225) 24625

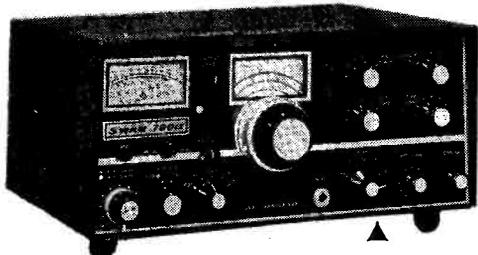
NORTH  
PETER AVILL, G3TPX,  
7 Moorland Crescent,  
Mapplewell, BARNSELY, Yorks.  
Telephone : DARTON (022 678) 2517

LONDON  
TERRY BARNETT, G8BAM,  
7 Cochrane Court,  
Leyton Grange,  
LONDON E10. Telephone : 01-556 9366

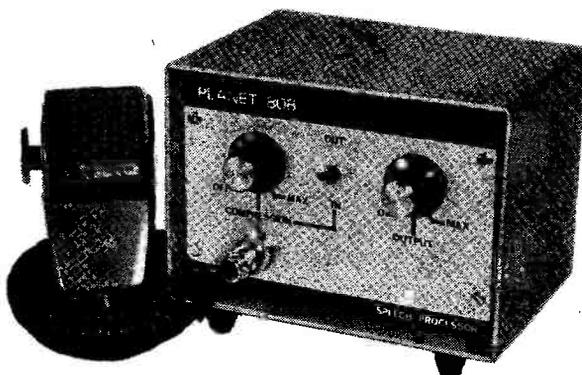
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# AMATEUR ELECTRONICS UK

**SWAN**  
ELECTRONICS



▲ THE 700 CX SWAN'S 700 WATTER



## PLANET 808 ▲

SUPERB NEW SPEECH PROCESSOR!  
STILL AT THE ORIGINAL  
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PRICE OF £33.04



## NEW MODELS!

## ▲ ATLAS RADIO

ATLAS-210 80 thru 10  
ATLAS-215 160 thru 15

**AMATEUR ELECTRONICS UK** ARE DIRECT IMPORTERS OF YAESU, SWAN and ATLAS EQUIPMENT AND MANUFACTURERS OF PLANET PRODUCTS

**SOUTH WALES/BRISTOL AREA.** We are pleased to announce that ROSS CLARE, I.E.R.E., GW3NWS, has been appointed as our agent. Ross is located at Caerleon, near Newport and will be carrying an excellent stock of equipment backed up by first-class test gear and the ability to use it. For friendly, helpful service contact Ross at CAERLEON 422232 in the evenings and weekends—you'll be delighted!

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**(PLEASE SEE YAESU MUSEN POLICY  
STATEMENT IN JUNE ISSUE)**

## Economical Mobile/Base Station FT-201

NOW AVAILABLE WITH  
FITTED DC PSU AT  
**£290 INCLUSIVE**



### ● SOLID STATE 80 THRU 10 METRE TRANSCEIVER

YAESU now brings you the newest addition to its growing family of Solid State transceivers: the FT-201. Performance and portability are among the key features of this economical transceiver along with YAESU innovated modules to simplify service and repair. The FT-201 has features which you would expect to find only in units costing much more.

#### Features

- \* Built-in AC and DC power supplies
- \* 250 Watts PEP SSB, 180 Watts CW and 80 Watts AM
- \* Factory sealed, solid state VFO with 1 kHz readout
- \* Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- \* Built-in front panel adjustable VOX
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- \* Built-in WWV/JJY reception
- \* Adjustable carrier level for tune-up and Novice operation
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- \* Complete line of compatible accessories for flexible station design

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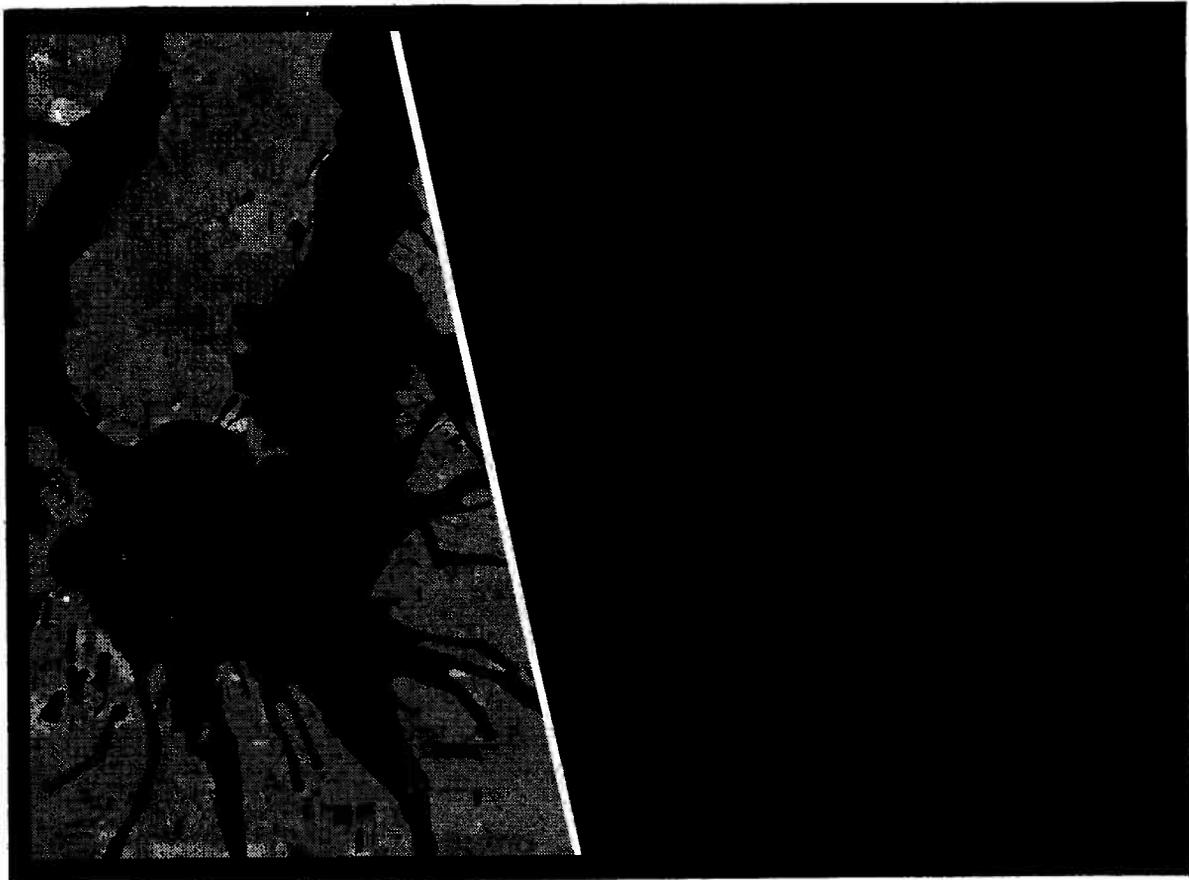
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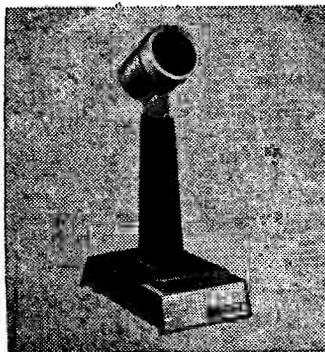
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**SSB-ers:**

## increase talk power, cut "splatter"



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

Shure Electronics Limited  
 Eccleston Road, Maidstone ME15 6AU  
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# PROFESSIONAL PERFORMANCE

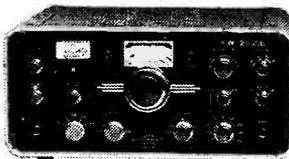
# with KW



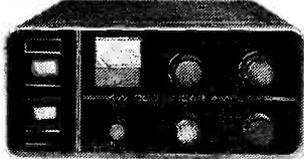
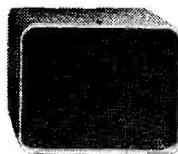
**KW 108**  
**KW 108 Monitor Scope.** Monitor your transmissions 10-160m, two-tone test generator incorporated to ensure optimum linearity for SSB.



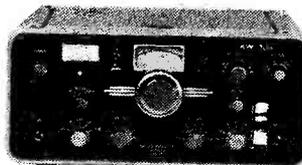
**KW 107**  
**KW 107 Antenna Tuning System.** Incorporates E-Z match, SWR/RF Power meter dummy load, Antenna switch. High power version KW 109 is available.



**KW 2000E and Power Supply**  
**KW 2000E Transceiver** covers all HF Bands 10-160 metres (10 metres in 4 Bands), 500 kHz VFO. SSB/CW. Outstanding TX audio quality. Excellent receiver signal-noise figures. Includes VOX, break-in CW, 100 kHz and WVVY calibrator. Reliable 6146's in P.A.



**KW 1000**  
**KW 1000 Linear Amplifier.** 10-90 metres. 120 watts PEP input max. Designed to be "driven" by KW 2000A/B/E or other Unit of similar power rating. In-built 2.5 Kv. PSU - PA tubes pair 7160L. Very quiet in operation.



**KW 204**  
**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).

**Other KW Favourites.** 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:—  
Easy Terms on equipment available over 12, 18 or 24 months



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## NEW! UNIVERSAL R.F. SPEECH CLIPPER

**INCREASES 'TALK POWER' — ELIMINATES 'FLAT TOPPING'**

**Easy to install — long battery life**

- ★ Simply connect in series with your microphone lead. Needs no internal connection to your transmitter. Push-to-talk facilities are retained.
- ★ Can give increased "punch" or "talk power" comparable to a times-ten power increase, plus improved speech characteristics
- ★ Ideal for SSB, AM, or FM.
- ★ Advanced circuit uses optimised combination of digital and analogue techniques for long-term reliability and stability.
- ★ Seven integrated circuits, one transistor, three diodes.

**DESCRIPTION :** The Datong R.F. Clipper brings the unique benefits of rf clipping to any conventional transmitter. It should not be confused with agc-type speech compressors or af clippers. The Datong R.F. Clipper is a complete closed-circuit ssb transmitter and receiver. Amplitude clipping of the internally generated ssb signal (at 60 kHz) greatly increases the average-to-peak amplitude ratio of the speech input signal. This is achieved without harmonic distortion.

**Price, including delivery by parcel post, only £45 plus VAT at 25%**

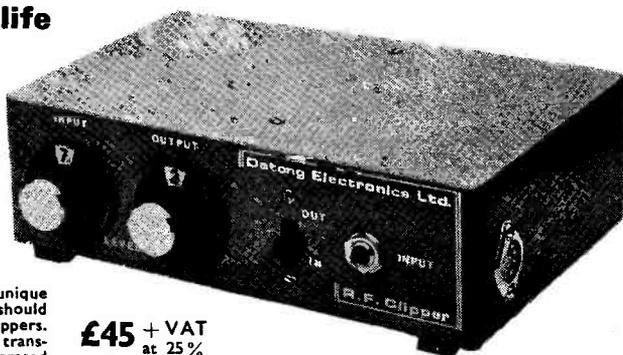
**Add 50p for delivery by registered first class mail.**

Write or phone for full information, including a copy of the installation and operating instructions.

**DATONG ELECTRONICS LTD.**

11 MOOR PARK AVENUE ● LEEDS LS6 4BT

Telephone : 0532-755579



**£45 + VAT**  
at 25%

See Rad. Comm. (August 1974) and S.W. Mag. (July 1975) for reviews of this equipment.

### JAPANESE MICROPHONE SOCKETS

The Datong Clipper is now also available fitted with a Japanese 4 pin screw-locking type of input connector in place of the normal stereo jack. This allows, for example, FT101 or TS700 microphones to plug straight in. Since connection details vary, please specify the actual connections required when placing your order. Price : £47 plus VAT, or, if ordered complete with output lead fitted with matching connector (i.e. lead type RFC/JAP4pin), £48.50 plus VAT for the pair. Add 50p for registered first-class delivery.

# Radio Shack Ltd ★ London's Amateur Radio Stockists

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### SOLID STATE MODULES

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Sentinel 2m.	converter, I.F. 2-4-4-6-28-30	£16.20
Sentinel X	(de luxe version)	£21.00
Sentinel MF 2m.	med. wave converter	£20.25
Sentinel low noise	FET 2m. pre-amp	£7.36
PA-3	dual gate Mosfet pre-amp	£5.94
SM70	70cm. converter	£16.20

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TR-801	FM tuner kit for XCR-30	£25.00
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ATLAS 180	SSB Transceiver	£325.00
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Standard mobile mounting kit	non plug-in	£5.25
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F-1	Sgl frame cassette	£2.50
T-C	Grey scale tape	£3.75
Y-C	Checkerboard tape	£3.75
P-1	Polaroid adaptor	£21.25
V-1	Viewing hood	£8.75
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FT-101B	Transceiver	£412.50
FT-101B	Remote VFO	£60.00
FT-200B	Transceiver & PSU	£268.75
FT-201	Transceiver	£362.50
FR-101D	De luxe Receiver	£412.50
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SP-101	Matching Speaker	£16.25
FL-101	Transmitter	£331.25
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SWAN 700CX	5 band 700V Tcwr. and PSU	£493.75
SWAN SS200A	5 band 300W solid state tcwr.	£618.75

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ARGONAUT	5 Bands 5 watts Transceiver	£225.00
TRITON 2	5 Bands 200 watts Transceiver	£437.50
405	Linear Amplifier for Argonaut	£106.25
210	PSU for Argonaut only	£20.00
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261	De luxe PSU for Argonaut or 405	£75.00
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### HY-GAIN ANTENNAS

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12AVQ	10-20m. trapped vertical	£31.88
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18RMO	Roof mounting kit 14AVQ	£16.25
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TH3MK3	3 element beam	10/15/20m.	£124.88
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DB10-15A	10 & 15m. beam	...	£95.00
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203BA	3 element 20m. beam	...	£100.00
153BA	3 element 15m. beam	...	£35.00
103BA	3 element 10m. beam	...	£29.75
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SY/2M	5 ele. 2m. dipole yagi	...	£6.13
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D5/2M	5 over 5	...	£11.25
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B-1	Bumper mt. st. steel	...	£7.50
C-32	Ball mount	...	£3.75
C-29	St. steel spring	...	£4.13
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Additional coils	40/80/160m.	...	£5.64
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	SB-303	...	£187.50
	FR-500	...	£75.00
	30	...	£112.50
	SONY CRF-5090	...	£125.00
	DRAKE T-4XB...	...	£250.00
HEATHKIT	SB-401	...	£160.00
	Atlanta and PSU	...	£187.50
HEATHKIT	SB-600 Speaker	...	£12.50
HAMMARLUND	Speaker	...	£12.50
	312B4 Console	...	£97.50
COLLINS	Teleprinter 75R with cover	...	£65.00
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## MAGNUM TWO AND FOUR METRE TRANSVERTERS

Our transverters accept low level drive from most HF transceivers in the 28-30 MHz band (other IF's to special order) and convert this signal to the corresponding frequency in the 70 MHz or 144 MHz band. Signals being received in either of these bands, are in a similar manner, converted back to the 28 MHz band.

All power requirements are taken from the accessory sockets of the HF transceiver as in the YAESU MUSEN or SOMMERKAMP range, or with very simple modifications to most other gear, either transceivers or separates. If any details on modifications are required please do not hesitate to contact us.

We have incorporated in our design one of the well known and highly respected "MICROWAVE MODULES" Mosfet converters.—Need we say more.

It has been our experience in industrial electronics that printed circuits, when used in valve circuitry, prove to be unreliable in many cases and because of this we have chosen to "Hand wire" the RF section of the transverter. In doing this, we are confident that it improves the stability and reliability factor of our product.

### SPECIFICATION

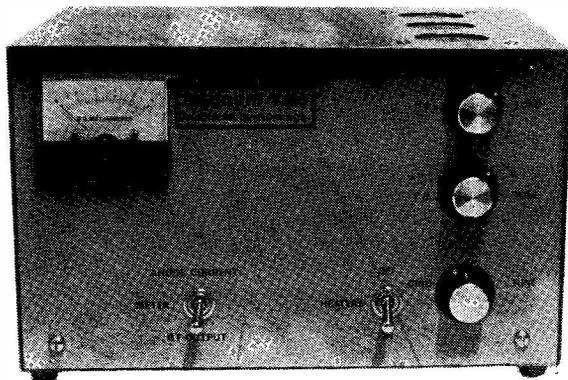
Modes : CW, SSB, AM and FM.  
 Input Drive : Typically  $\frac{1}{2}$  Watt RMS.  
 Output Power : Minimum of 50% efficiency.  
 Typically when used with FT 200, 90-100 Watts  
 SSB output.

### SIZE

10" x 6" x 7".

No special cooling required.

Our transverters are constructed for good mechanical stability, while providing adequate ventilation.



### AGENTS

STEPHEN-JAMES — LIVERPOOL  
 S.M.C. — SOUTHAMPTON  
 CRAYFORD ELECTRONICS — KENT

### PRICE

£87.96 Plus VAT  
 Including all valves, relays and power lead to transceiver.  
 If you already have an M.M. converter in good condition we are prepared to give a generous allowance and use it in the Transverter.

### GUARANTEE

12 MONTH UNCONDITIONAL GUARANTEE, but we exclude from this the PA valve, which is covered by the manufacturers own guarantee for 3 months.

For users of the LINER TWO, TRIO, or in fact any low power 2m. TRANSCEIVER, we are now producing a Linear Amplifier/Receiver Preamp.

This unit is entirely self-contained, operating off AC mains and provides a stabilised low voltage supply to operate the transceiver.

### SPECIFICATIONS

Up to 100 Watts SSB output.  
 Self-contained power supply.  
 Microwave Modules receive PREAMP.  
 Full input and output relay switching.  
 PRICE : £82.97 Plus VAT

### 70 Cm. LINEAR

Compatible with the M.M. Transverter  
 Drive required—Up to 5 watts Rms.  
 Output 50 Watts.  
 PRICE : £36.57 Plus VAT. Complete with valve and power lead.

## ELECTRONIC DEVELOPMENTS

22 BARNMEADOW ROAD, GATEACRE, LIVERPOOL, L25 4UG

Telephone: 051-428 5916



# SOUTH MIDLANDS

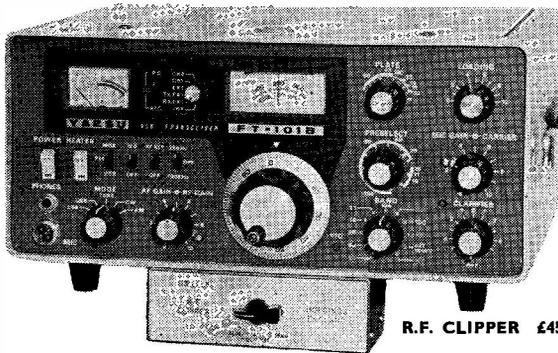
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Experience—We have been importing Yaesu direct for many years. Test equipment costing over £7,000.00 under the personal control of Chris Webster in our NEW improved service department, over £2,000.00 of spares (in the improbable case you need them), all equipment thoroughly checked before despatch and Yaesu sets sent free by Securicor for the non-caller. We also have the largest stocks of masts and antennas, in fact over 500 ex-stock.

24 hours Service. Barclay or Access Card. Just 'phone in quoting your number, we despatch the same day if humanly possible by whatever means you wish including SECURICOR (free for most Yaesu) second-hand equipment and at cost for other items if under 5f. long and less than 45 lbs. weight.

FOR YAESU ITEMS NOT SHOWN THIS MONTH. Please see our previous adverts for the complete range.



### FT101B

£330 + VAT

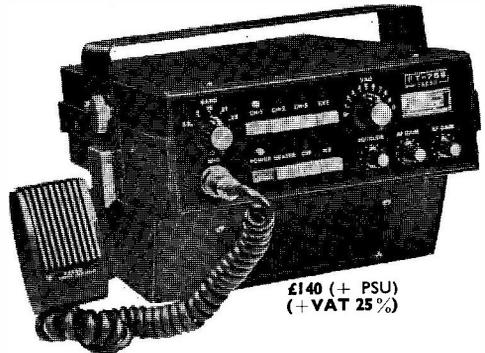
This de-luxe wireless is the descendant of the world famous FT-101 transceiver. Except for the drive and final amplifier stage, the FT-101B features all Solid State circuitry built on reliable and serviceable "computer type" plug in modules. The 101B is contained in a compact 30lb. package designed to go anywhere. All that is needed for instant "on the air" operation from 160 through to 10m. is either 12v. DC or 100-234v. AC and of course an antenna.

R.F. CLIPPER £45

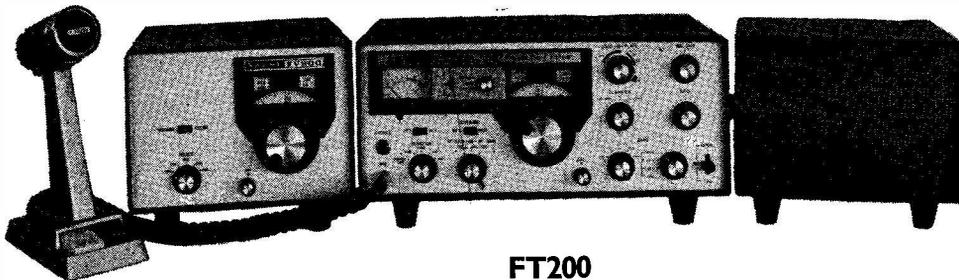
### FT75B

The FT75B is a higher power replacement (120W P.I.P.) of the FT75 the unit which along with the 101 has been responsible for the upsurge in HF mobile operation around the world. On bands 80 through to 10 there are 3 VXO controlled crystal channels as well as provision for external VFO operation. The FT75B is all solid state except the final and driver stages. Included is an excellent noise blanker and squelch circuit for quiet channel monitoring.

Accessories include the FV50C VFO at £35.00, the VC75 microphone compressor and VOX at £18 and the FT75B AC power supply at £35, and the DC75B at £40 illustrated right. (+25% VAT)



£140 (+ PSU)  
(+VAT 25%)



### FT200

The FT200 is still without doubt one of the "best buys" available. Compare its features with similarly priced units. SPECIFICATION : 260W. P.I.P. SSB/CW ; 75W AM 1kHz readout on all bands 3.5-28.5-29 MHz (3 optional 10m. crystals available). Stability : 100Hz 30 min. after warm up. Sensitivity : 0.5µV 10dB/S + N. Selectivity 2.3 kHz (6dB) 4 kHz (60dB). Solid state FET VFO with excellent linearity (like all Yaesu VFO's). Xtal calibrator. VOX/PTT. Clarifier ± 5 kHz. Break in CW keying. Extra crystals from SMC only £2.20 (+ VAT).

ALL THE ABOVE YAESU IS EX-STOCK IN TOTTEN AND DIRECTLY IMPORTED BY US FROM THE FACTORY

- YD844 £13
- FV200 £42
- FT200 £170
- FP200 £44
- (+VAT25%)



**PLEASE NOTE — THESE PRICES DO NOT INCLUDE VAT 25% or 8%**

Terms —Cash with order or credit card holders just 'phone in for, if possible, same day despatch. Immediate H.P. available for card owners for amounts up to £150.00. Holders of current U.K. callsigns (where references have been provided) can be speedily cleared, or normal H.P. at competitive rates is available.

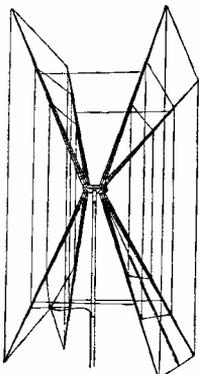


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for 10, 15 & 20m.

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- \* Weighs only 21 lbs.
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- \* Forward gain up to 8 dB
- \* Balun included.
- \* Converts to 3 or 4 ele. quad.
- \* Fibreglass tri-dectic spreaders.
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(Carriage extra)

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Galvanised lattice 10ft. sections 30ft. height with climbing steps on one face. From: £105.90

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Galvanised steel Telescopic 10ft. section with or without rigging.  
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 With rigging kits :  
 30ft.—£29.00      40ft.—£39.00      50ft.—£49.00

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12AVQ 10-20m. Trapped Vertical	£25.00	TH3MK III 10-20m. 3 element	£99.90	402BA 40m. 2 element	£121.00
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BN86 1:1 Balun	£9.50	LA1 Lightning arrester	£17.50	153BA 15m. element	£44.00
562 Rotary bearing	£8.50	LA2 Lightning arrester	£3.00	103BA 10m. 3 element	£35.00

### SMC Trapped Dipoles (Carriage paid)

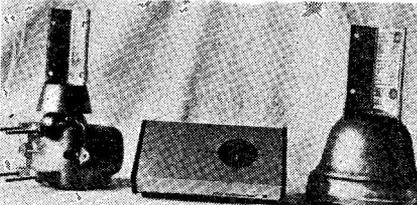
Trapped dipole standard 10-80m. (S) £16.85 High Power version of S (HP) £18.75 Portable version of S (P) £19.50

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### JAYBEAM THE COMPLETE RANGE (and more!) Carriage extra typically 75p (VAT 25%)

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BGA 144 MHz 1/2 wave	£6.60						

### R.F. CABLES Carriage up to 20m

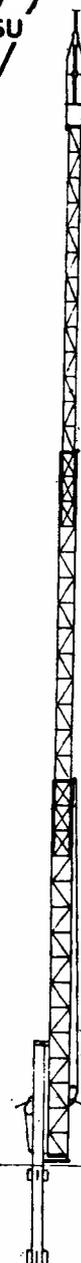
RG8/U 50 ohm...	33p/m.	40p, over 20m 50p ; less for lighter cables).	(NB VAT 8% only)	T3278 75 ohm ...	22p/m.
UR57 75 ohm ...	33p/m.	UR39 75 ohm ...	25p/m.	UR43/76 50 ohm ...	15p/m.
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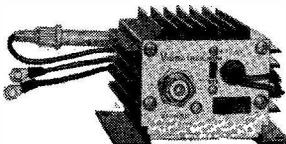
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RF sensing, switchable drop out time, 55B, AM, FM, CW, 12v. DC 10W drive.

RFA-10-100-HBX (801) £75-00  
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## 144 MHz LINEARS RFL



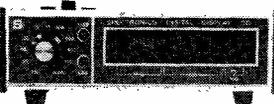
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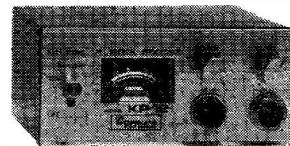
## READOUT UNIT FOR FT-101, etc. DDI

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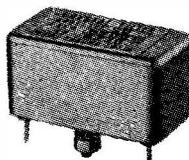
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individually supplied with  $\pm 6$  dB, (25dB), 60dB bandwidths, ripple factor and insertion loss.



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Supplied with six of the most useful channels (S0, S20, S22, R5, R6 and R7), (save £25). Two watts of RF, and  $\frac{1}{2}$  watt of audio make this, with its immunity to image problems, and LF breakthrough, undoubtedly the best buy today, with performance to rival many mobile installations, fitted 6 channels for £75-00.

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<b>FT2F</b> (52 MHz Rx 6 MHz Tx) £3-50 pair, £2-00 each	<b>FT2FB</b> (14 MHz Rx, 18 MHz Tx) £3-50 pair, £2-00 each
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<b>Simplex</b> S0, S16, S20, S21, S22, S23, S24	<b>Simplex</b> S0, S16, S20, S21, S22, S23, S24
<b>Duplex</b> R0, R2, R3, R4, R5, R6, (R7), R8	<b>Duplex</b> R0, R1, R2, R3, R4, R5, R6 (R7), (R8)
<b>Inverse Repeater</b> IR0R, IR2R, IR4R, IR5R, IR6T, IR8T	<b>Inverse Repeater</b> IR0R, IR2R, IR5R, IR6R
<b>FT220</b> Channel crystals, £2-20 each 8 (00, -125, -150, -175, -225, -250, -275, -50, -575)	<b>C146A and C826MB</b> £3-50 pair, £2-00 each S20, S21, S22T, S23, S24
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145-125T 12 MHz HC25/U only £1-00

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<b>C430</b>	ONLY £3-50 pair
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Uses H.F. Transceivers P.S.U. and  $\frac{1}{2}$  watt on 28 MHz for up to 100w. output. Supplied complete with relays and 11-pin plug for instant operation. Microwave Modules receiver converter.

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**MICROWAVE MODULES** (all 28-30MHz i.f., others to order) p & p 30p (25% VAT)  
70 MHz Converter ... £15-20 144 MHz Converter ... £15-20 144 MHz Pre Amp 2 out £9-00 432 MHz Transverter ... £62-00  
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SECONDHAND PRICE LIST—PHONE 04216 4930 FOR LATEST (+ 25% VAT)

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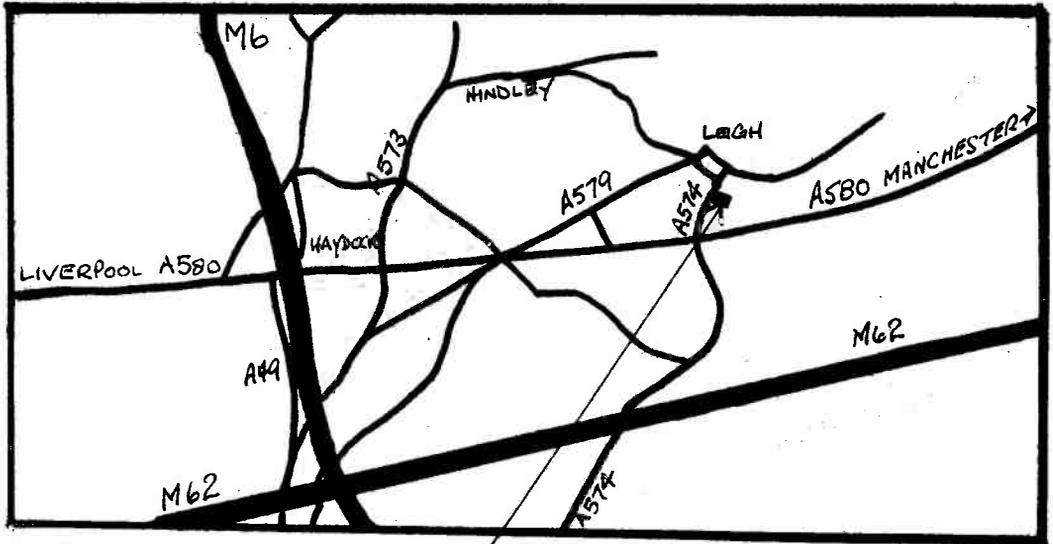
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Two band receiver, 12v. DC .28-30 MHz, 144-146 MHz AM-FM-SSB. Built-in speaker. Hundreds of these receivers now in use. We shall be stocking the complete range of modules by S.T.E. Milan shortly.

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Eddystone EC10MK2 Receiver	... ..	£90.00
IC21XT Transceiver and VFO	... ..	£165.00
KW E-Z Match	... ..	£20.00
Yaesu FT401B Transceiver	... ..	£300.00
Eddystone 730/1 Receiver	... ..	£100.00
Eddystone 940 Receiver	... ..	£150.00
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During the next twelve months we shall be designing and producing on our premises many new pieces of equipment.

For the SWL a new Tuning Unit. 50 switched and tunable positions. Two inputs single wire or co-ax. Will match any random length of wire to your receiver. In a neat cabinet. Price £14.00, post free during August. Delivery from stock.

For the B Licence man an ABSORPTION WAVEMETER. Frequency coverage 65-230 MHz. Ideal for checking for any spurious emissions. A must for any shack. Price £16.00, post free. These are just two of the many items we shall be introducing during the next few months. Designed and manufactured by us. SHOP HOURS 9.30 to 5.30. Founder member of the A.R.R.A.

# The Heathkit 5-band HW-101 transceiver. It'll make you very pleased with yourself.

Like most Heathkit amateur radio equipment, our HW-101 SSB transceiver comes in kit form.

So, besides the enjoyment of using it you'll also have all the satisfaction of knowing you built it.

It should make you very pleased with yourself.

Especially as it's about the best transceiver in its class.

And represents exceptionally good value for money.

Take a look at the technical specifications now and then send for your free Heathkit catalogue.

In it you'll find the whole of our amateur radio range together with full details about the easy payments available with the Heathkit Monthly Budget Plan.

Which should please you even more.

## HW-101 transceiver specifications

### Receiver section:

*Sensitivity:* Less than 0.35 microvolt for 10db signal-noise ratio for SSB operation.

*SSB selectivity:* 2.1kHz min. at 6dB down; 7kHz max. at 60dB down (3.395 MHz filter).

*CW selectivity:* (with optional CW filter installed) 400Hz min. at 6dB down; 2.0kHz max. at 60dB down.

*Input:* Low impedance for unbalanced coaxial input.

*Output impedance:* 8ohm speaker and high impedance headphone.

*Power output:* 2 watts with less than 10% distortion.

*Spurious response:* Image and IF rejection better than 50dB.

### Transmitter section:

*DC power input:* SSB—180 watts PEP; CW—170 watts.

*RF power output:* 100 watts on 80-15M; 80 watts on 10M.

*Output impedance:* 50ohm to 75ohm with less than 2:1 SWR.  
*Oscillator feed-through or mixer products:* 55 dB below rated output.

*Harmonic radiation:* 45dB below rated output.

*Transmit/receive operation:* SSB, PTT or VOX. CW provided by operating VOX from keyed tone using grid-block keying.

*CW sidetone:* Internally switched to speaker or headphone in CW mode. Approx. 1000 Hz tone.

*Microphone input:* High impedance with a rating of —45 to —55 dB.

*Carrier suppression:* 45 dB down from single-tone output.

*Unwanted sideband suppression:* 45dB down from single-tone output at 1000 Hz reference.

*Third order distortion:* 30dB down from two-tone output.

*RF compression:* 10dB or greater at 1 mA final grid current.

### General:

*Frequency coverage:* 3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 28.5; 28.5 to 29.0; 29.5 to 30.0 MHz.

*Frequency stability:* Less than 100Hz per hour after 45 minutes warm-up. Less than 100Hz for  $\pm 10\%$  line voltage variations.

*Modes of operation:* Selectable upper or lower sideband and CW.

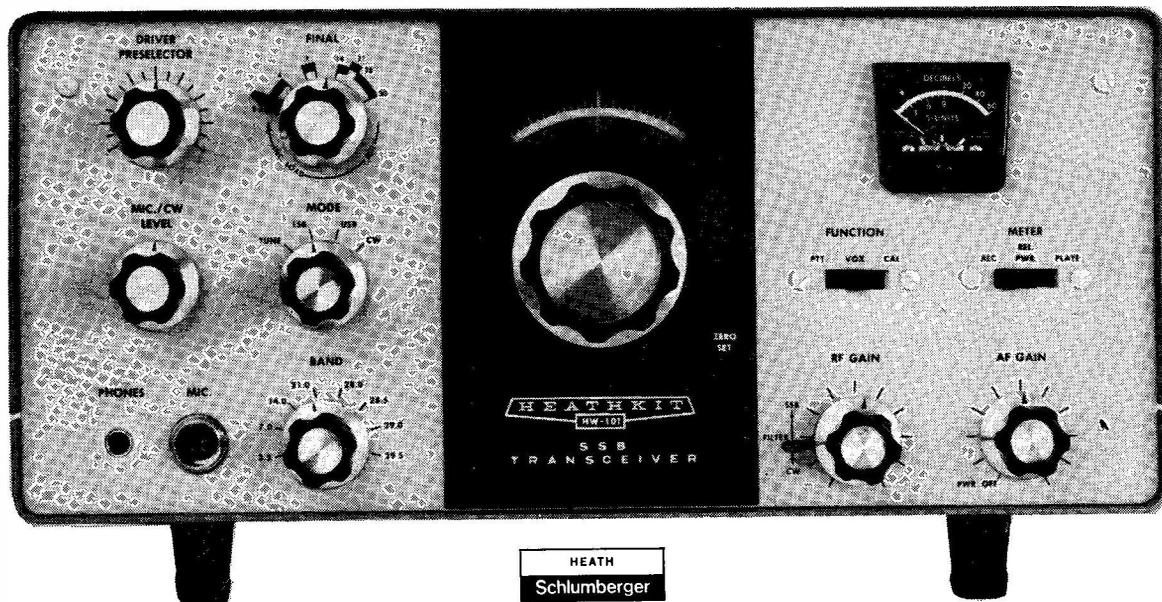
*Dial calibration:* 5kHz.

*Calibration:* 100kHz crystal.

*Audio frequency response:* 350 to 2450Hz.

*Power requirements:* 700 to 850 V at 250 mA with 1% max. ripple; 300 V at 150 mA with .05% max. ripple; —115 V at 10 mA with .5% max. ripple; 12 VAC/DC at 4.76 amps.

*Cabinet dimensions:* 6 $\frac{1}{16}$ " H., 14 $\frac{3}{16}$ " W., 13 $\frac{3}{8}$ " D.



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# SHORT WAVE MAGAZINE

(GB3SWM)

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AUGUST, 1975
No. 382

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# *The* SHORT-WAVE *Magazine*

## EDITORIAL

### ***Purpose***

We have often enough outlined broadly what might be called the Argument for Amateur Radio in face of the Pressure on Ether Space—it being agreed that the ether, like the air we breathe, is free for all to use, subject to reasonable safeguards.

To deal with some questions so frequently asked when Amateur Radio is under discussion, such as—“What good are amateurs?”—“What do they do?”—“Can they serve any useful purpose?”. The quick answer is, of course, that the mere fact of there being some 21,000 of them in the U.K. alone, and over 450,000 in the world of the West as a whole, is by itself a good enough reply to these questions. If no benefits flowed or advantages accrued from the pursuit of Amateur Radio, it could not possibly exist on such a scale—and continue to expand at the rate it does.

It is this fundamental interest in and practical knowledge of radionics that make the radio amateur, and the Amateur Radio movement, so important from the national point of view. As a nation, we are among the leaders in the Electronic Age into which the world has now moved. Amateur Radio is one of the influences by which radionics engineers and technicians of the best type are produced. This is not an imaginary or high-falutin' conception of the value of Amateur Radio, nor even a theoretical appreciation of its potential usefulness, but is actual fact, proved over and over again. These lines will fall under the eye of some of the leaders, senior engineers and executives, of the radio industry, to say nothing of many “lesser lights” in it—let them ask themselves how much they owe to Amateur Radio, and whether it was not as transmitting amateurs that they got their start!

For its educative influence alone, therefore, the healthy development of Amateur Radio is of the utmost importance to the nation. Those who, as juniors, learn the fundamentals simply because they want to get on the air, go on to take out a licence, and then have ideas of becoming professional, are regarded within the radionics industry itself, and by the Services, as being of the very best—provided they progress to getting themselves properly qualified. Amateurs, as amateurs, cannot expect to get far in a professional environment.

And in the larger context, can it be seriously suggested that tens of thousands of radio amateurs, in daily communication with one another all over the world—and to a lesser degree the correspondence, personal contact and mutual interest which such communication entails—do not together contribute anything to international understanding and co-operation?

The fact is that the true potential of Amateur Radio is only dimly realised even within the circle of its own adherents!

*Austin Forsyth  
G6FO*

# COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

THE combination of low conditions at the bottom of the sunspot cycle, the summer weather which will have made many a shack a torture-hole with the heat and humidity, the S9 static when thunder is in the air and tight deadlines mean a somewhat "thin" offering this time—but, alas, 'twas ever thus for the August piece!

A certain QRP bias may have been detected in the writer's offerings of late months . . . true enough, and a home-brewed one-lung perker using a BFY52 transistor, which is being buckled to the ancient Eddystone 888 to form a complete separate flea-power station for Top Band is bringing back much of that peculiar savour of the Amateur Radio game which is lost when one makes the decision to "go commercial." However, all is not entirely light and joy, although the device does work, the 'KFE junk box holds but one Top Band rock, allegedly 1800/1850 kHz according to which of the pins (there are three) are connected. Luckily, it occurred to this old pessimist to check the contraption on a frequency counter, as no amount of tweaking would make the allegedly 1800 kHz frequency come within the band at all, and the supposed 1850 kHz point was always at least 650 Hz high and that adjustment was such as to drive the 1800 nominal kHz even further out of the band. Murphy strikes again! And to think of all those nice rocks we disposed of when the XYL said the junk-box was filling the house . . . oh, well! All this constructional activity is, of course not unconnected with a change in the Big Rig, which now does not cover the 160m. band, concentrating its efforts Eighty-to-Ten. As yet the box containing the TS-520 remains at the bottom of the stairs unopened, such is our devotion to duty.

## The Bands

At the moment of writing, the temperature, well on into the evening, is almost up to 80°F. and the humidity strongly suggests an imminent thunderstorm; and indeed the static crashes coming out of the car-radio on the way home from work were of such nature as to make your scribe hasten straight to the shack and check that all aerials were well earthed down against static build-up. However, over the last few days, our spy in the VHF camp tells us interesting things have been happening on Two, which sound rather as though Ten might have been yielding some interesting EDX openings. Talking of Ten, here we have a band which for a large proportion of the time is effectively dead saving for VHF-mode openings, and yet no one has thought of the gain which would accrue in terms of bandwidth utilisation were some of the repeaters now being foisted off on the 432 MHz band, instead were located on the upper part of Ten and arranged to be switched out of action during the hours when DX openings were likely to happen. After all, for years at a time we have little or no activity on the band, and "use or lose" is as true a phrase now as ever it was a few years ago. And we can ill afford to lose 1.7 MHz of prime frequency; the most interesting band of them all, combining as it does the properties of VHF for most of the time with the greatest DX potential of 'em all when the sunspots are about in plenty.

## Happenings

For much of this, of course, we are indebted, as always, to the West Coast and Geoff Watts' *DX Bulletins*—and these two are fortified by regular monthly notes from W1WY.

Burma first: If all goes well (and it looks pretty good at the moment of writing), 9VIRR may well have been to Burma and *gone*. All we need to stress here is that all those who worked Robin, please give him *honest* reports—if you didn't do it when you worked him, correct your mistake on the QSL card, as the signal-strength info is required as part of a scientific survey. And, if you missed him, don't give up all hope, as indications are that he might well need to be there again before too long. His XZ callsign is not, at the time of writing, known.

Mount Athos will have been concerning many people, and again we are writing before the event, but for a readership who will see this after the action is over. At the moment, the propagation is predicted as being better than average over the period of the SV1GA operation, and it is hoped to mop up most of the remaining Mount Athos demand.

Readers may recall that Fernando Po operation by SMØAGD, when his allowed operating time was cut to about twenty hours only, so that 750 contacts was the full tally. It seems that since then, the place has changed its name to Isla de Macias Nguema Biyogo, after the President, and the capital, which was Santa Isabel, is now called

Pagalu. The problem is the getting of a licence, though, as all the executive activities are in the hands of one man, right under the President, one does not get the feeling that there is much hope of more operation from this spot in the foreseeable future.

To judge by the reports coming in to this piece over the years, San Marino is not all that high on the DX "wanted" list, at least as far as the European DX fraternity are concerned. However, for anyone in need, it might be noted that M1D often lurks around 14240 or 14300 kHz, from 0930z onwards; and on Forty, one might trip over M1C after 2100z, or even on occasion on Eighty.

During the Apollo-Soyuz joint space activity, KH6GKD will be operating either as VR1PE or KH6GKD/KB6, depending on whether he is at Canton or Phoenix Is.

St. Martin and Anguilla are on the cards from around August 6, this being W2BBK, either signing PJ8AA, or later VP2ES.

If you hear or work OJØMJ during August 3-15, on any band Top to Ten, it should be genuine operation from Market Reef again. The QSL address is J. Sinnamo, OH5MJ, Keskuskatu 14B2Y, SF-48100, Kotka 10, Finland. They will be running CW/SSB.

## Top Band

With the release of the younger element of the licensed amateurs quite a marked increase in activity is to be noted—those O and A Level exams., not to mention Technical College and University ones, certainly cramp the style during the Spring while revision is being done in preparation.

G4CTR (Poole) was one who had to face exams., which kept activity down all round; however, on the overall picture he was able to celebrate a 17th birthday by knocking off country number 100. On Top Band, Roger seems to have confined himself to the stations within the U.K.

GM3YOR (Kirkcaldy) reports at length, both on the NFD pickings and the activity from home once the rig was returned after the Field Day. NFD first, and here they worked nothing, although PY1RO was heard down at the low end. Once home again, attention was given to the counties; a couple of new ones were GM2HCZ for Dumfries & Galloway and G3XVF for Norfolk on the key, while SSB found Merseyside in the form of G3DVI. This leaves a situation on CW where all that is required for a "full house," at least as far as English areas go, are Lundy and the Scillies—DX-peditioners please to note! GM3YOR and GM3OLK themselves did a bit of expeditioning in July, unfortunately at very short notice, but dovering Harris/Lewis, North Uist, South Uist, Benbecula in the Outer Isles, plus Sky and Mull in the Inner Islands, and some mainland operating on the way there and back.

The G4BOH (Bury) letter just missed the deadline last time round, although a kindly Editor dropped his score into the requisite slot. Chris—like the others who have exams, and things—found he was not able to get on the air at useful times, but a few points were picked up here and there.

A letter from G4ASV indicates that the Oxford University group will be running their annual DX-pedition this year to Guernsey, from August 28 to September 9, SSB and CW, Top Band and Eighty, using various members' callsigns and the club call GC3OUR/P.

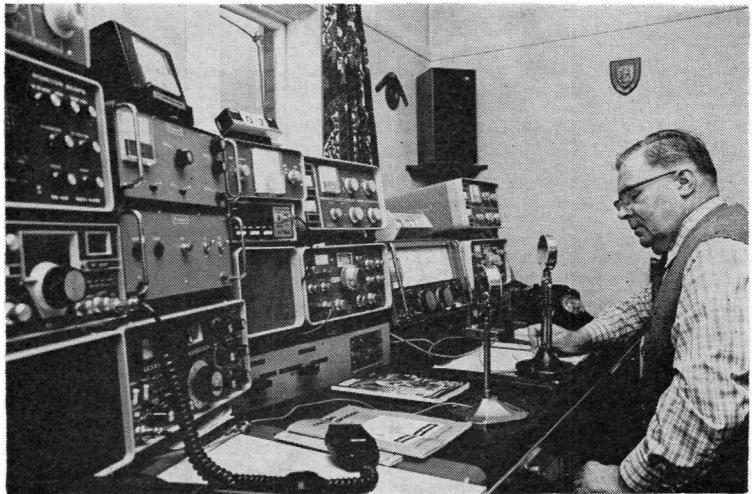
Now we come to G2HKU (Isle of Sheppey) who has a new problem on his hands. It seems some hedgehogs reside beneath the workshop and have been wandering around in daylight, much to the annoyance of the family hound(!); however bad this may be, what is far worse is that said hedgehogs have discovered the G2HKU radials and are well entertained in the practice of digging them up! However, Ted managed his regular stint of contacts, and on Top Band he worked PAØPN, PAØRYS and PAØSOL, the latter using a three-metre whip aerial.

G4AYS (Moir) is still pressing on with his 600 milli-watts on the band, and this time is able to report three more new ones, in North Yorks, South Yorks and Kent—this with the admittedly QRPP signal also under the handicap of being crystal-controlled.

Only eight more points, sorrowfully reports G2BJY (Walsall), out of which three were tickled up by working Herts. on AM; and in addition, a misreading of the AM/SSB contact ruling alters the component parts of his score a bit but not the total. On a different tack, Geoff can now mix business with pleasure by watching the goggle-box—he has acquired and restored an old 1954-vintage TV and intends keeping it as a collectpr's item.

G4CBQ (Derby) is now home on summer holiday from Southamp-

Chas. Young, G2AK, 112 Walsall Road, Aldridge, Walsall, Staffs., well-known old timer now retired from the long-established firm still bearing his name in the business of Amateur Radio merchandising. Chas. says he is now able, at long last, to devote time to his own radio amateur interest, running this modern SSB station, with all-band coverage Top to two metres and much complex sky-wire outside. By April 1976, he will have been licensed for 50 years—a fine record, indeed.



ton University, and so has found time for compiling a final score from down South and another score for the home QTH. The Southampton total was reduced, not just by the onset of exam-fever, but also by the act of lowering the aerial wire a little so as to keep it out of sight, when the combination of reduced tension and a high wind was enough to fetch the lot down!

#### Eighty

One can sometimes feel that this band is spoilt by the few louts from being a pleasant activity for the vast majority of users, whether AM, SSB or CW. However, we must yet again ask for the co-operation of all in keeping the SSB and AM out of the CW end of the band, which is so popular for QRP operators—and others for that matter—for inter-G working. Please, adhere to the Band Plan, for the benefit of all.

G3RJV (Cleethorpes) mentions his own results on Eighty QRP. As a result of the impending move of QTH, George has been playing around with five watts to a Joystick worked against a counterpoise, which last is zig-zagged for the last third of its length to make it fit the space available. Among the QSO's were G3TLX, G3FMW, G3NEO, PA0CMP, and on SSB, right through the evening QRM, G4DKP of Dudley reported the five watt Sideband as R4 although S9.

G2NJ (Peterborough) is another of the QRP stalwarts. Nick reckons his best one of the month was to work G3IGU (Doncaster) who was exhaling a fine 300 milliwatts on a frequency which has been used by AM stations for a net, namely 3575 kHz. Another one was a QSO with G2CAS/M who was keying from the area around the southern end of Lake Windermere—a rarity, a CW mobile.

No DX, says G4DMN sadly. However, Richard is eagerly awaiting the end of the exam. period, when he can escape home, take over the OM's rig, and give things a thorough working-over; meantime, what small amount of time there was on the band was devoted to the WAB nets.

There are far too many QSO's on Eighty QRP to report all of them; this is the summing-up on the G3CED/G3VFA (Broadstairs) log. However, George worked all round Europe with a maximum of one watt input and often rather a lot less, into the Joystick, both in the normal way and also in an experimental coax-coupled set-up. Whatever one may think of QRP operating, or of DX-chasing, a scrutiny of the amount of information packed in to the G3VFA log pages is quite surprising, and this must make the value of the old log as a memory logger much greater and more of a pleasure. For example, one notes that a certain station was worked on CW "using his left foot!" or "no operation in DL QRP contest due to visitors—always some damn thing!" In addition a code is used to summarise the state of the band at the time of a QSO, and much other information is packed into each page.

Nothing worked in NFD, reports GM3YOR; and one suspects that wild horses wouldn't get him on to the band from the home rig!

Still the old FT-101 and end-fed long wire, reports G4CTR; this enabled him to book in DF2QA, HA5DB, LA2JR, DK2BI, EA1FD, PA0BEL and F5LJ—mode not stated.

The QRP at G2HKU is now down to one watt, and at that level Ted reports working OK2BGW/P and PA9TB/P, both at 579 both ways.

#### Forty Metres

This is a very good but much neglected band. While CW DX is by far the most common, it is also true to say that there is no lack of DX on Sideband, and at sensible hours, too—which is not to say that Forty isn't a band worth combing over in the early mornings.

All the G3KFE propaganda on this prompted G4CXM to give Forty his almost undivided attention for a month, so as to see just what could be done. The programme worked out something like this: 0500-0600 was found good for W6, W0, W5, South America and ZL; 0600-0700 showed South America, VK, ZL and W1-5. Later in the day, 1900-2000m S.E. Asia, Africa and VK, peaking 1945-2015. From 2000 to midnight zulu, S.E. Asia, Middle East, Africa, Caribbean; while the period from midnight to 0200z was devoted to Africa, East Coast W's, Central and South America and the Caribbean countries. Times not mentioned were no doubt occupied by eating and sleeping. The actual CW QSO tally shows CO20M, CO5DM, CM2RF, DJ9UN/OHQ, G6ZY/CN/M, H3JEL, H8NVA, KP4EAK, KV4CL, PY1EJW, PY1DXF/8, PY7RX, OA4AHZ, TF3AW, UA2FAU, UD6AR, UD6DFY, UL7GBN, UL7JAA, UL7MC, UM8MBA, UA9CFV, UA9AFR, UK9UBN, VE1-3, W1-4, W8, W9, VK3FC, VK3MR twice, VK3VJ, VK3XB, VK7GV, VP2SPI, ZL3VW and 3D6AW. That was Forty!

Only one SSB contact is mentioned by G2HKU, namely with F0NR/P, which turned out to be G3BA and G3BHT (of VHF fame) off on a trip—Ted always seems to work this pair wherever they go. CW QSO's were made with PY7BOS, UA9FDW, UM8MAX, UL7PBN, W2NZ, K3JH and 9Y4TR.

G4CTR didn't have a lot of luck on 40m., working only G's and DMB00, while the only GM3YOR operation was in NFD, when they worked W1HRH, WA1KKM, WA1QNF, W4BLQ, W4UHC, K5RFJ/4, W5RER/4, W5ZNY and 9J2NFD/P.

Not a lot of forty-metre operation is to be noted by G3CED/G3VFA but the U.K. OK1AEH, LZ1SZ/MM (in the North Atlantic), F5GC, EI9CN, DJ4WP, DK8FD and others were all worked with the tiny rig.

A final cryptic comment on Forty comes from G4DMN—"the darn DX is either too late or too early!"

#### Twenty Metres

Which is where the G3NOF report from Yeovil starts—Don is hardly ever heard on other bands. He reports quite reasonable conditions at times, but much short skip. No VK/ZL's have been logged at 0600, although conditions to W6 and 7 and VE6 and 7 have been good, some of the W7's being in till 1000; East Coast W's were sometimes also audible, to bring them to a right-round-the-clock status. Around 1600 other G's reported hearing the Africans, while late evenings have seen openings to North and South America and the odd longpath VK's and ZL. Gotaways included A6XR, FL80M, KH6OT, KM6EA, VP2ABA, VP2SV and 5U7BA, but that didn't

deter G3NOF from putting his SSB successfully to A4XFX, C31JB, CYCNG, FC6CXF, FG7AN, FG7AO, F9UC/FC, K6DXK, K6RR, K7BXZ (Montana), KV4FZ, MID, OESCA/YK (on the Golan Heights), OJ0AM, SJ9WL (Morokulien), UJ8JGJ, UL7LEZ, VE3HEY/SU, VE7BVH, VK6GU, VP1IL, VP2SPI, W6BD1, W7RS (Oregon), W7YQ (Nevada), W7EQL (Oregon), W7GML (Oregon), W7HSD and W7NTL (both in Montana), W7RPI (Washington), WB8PYI, WA6HCI, ZS6AWU and 9J2JZ.

A plaintive note is heard from G4DMN—"Why doesn't anyone hear me from the school QTH?" Thus, from school there were 4Z4IZ and IM0CBM, while a Sunday at home enabled WA9TVP/7 to be raised.

Now that he is, as it were, in residence in U.K., W4WFL has been getting to work with a Joystick and an FT-101B from Streatham. G5AYL/A did some experimenting and eventually found he was getting best results from Twenty SSB, so since then he has largely stuck to that area. Basically, the results at the time of his letter showed 26 countries booked in, spread over four continents. Some of the more interesting ones included FZ1DR, LU3OF, VP2SPI, HB0AWQ, IM0CBM, UR2RJ, EA6DE, IS0MVE, UA9's and three Corsican stations.

There is no limit to the temerity of this G3CED type—he even lets his few milliwatts loose on the HF bands! Twenty, for example, was used for 21 on his contacts, including SM, DL, YZ, DK, UA1CQ, OZ1VY, UC2OAK, OK's, UK2WWW, UA1AGK, and a getaway in 9H1BX who slowly subsided into the noise and stayed there. On another page we were amused to note a couple of contracts, the first of whom was HB9CM, followed by an incoming 229 from a /P station in Broadstairs who ended by borrowing an ATU!

Twenty for GM3YOR showed with NFD contacts to W1-5, W8, W9, JY9FOC, LU9CV, PY2ZBU, UA9CM, VO1HP, VP9HM/P, ZC4RH, ZE3JO and 9J2NFD/P. Outside NFD, there was some SSB worked in the All-Asia Contest, like for example UA9CBO, UK9ABA, UK9FER and UL7LEZ, all within one thirty-minute period, plus a couple of CW QSO's with UL7RAO and WA1CJE.

G4CTR seems to have spent quite a large proportion of his operating time on Twenty, with the result that SSB booked in such as HV3SJ, VE3BBH, VE3VU, VE3FLE, W7KSA, VE7MR, 5H3JL, ZB2A, ZB2CJ, EA6BG, 9M2DQ, UR2LH, VP8NP, CR4BS, CX7BV, C5AN, M1D, 9K2DO and PY7VKN.

Just one contact on each mode is reported by G2HKU, he mentioning JA1CPZ on CW and WB6PT/MM, in the Gulf of Guinea; the latter was an interesting QSO with the chief engineer aboard the *Mary Elizabeth* which was tuna-fishing, holding 105 tons of tuna when full. Her home port is San Juan, Puerto Rico, and the rig aboard a Swan 500 to a Mini-Quad, of all things—one wonders how easily that would be written off in a great gale of wind.

### Ten & Fifteen

On the evidence of the propagation forecasters and of one's own ears over the previous weeks one would have expected both to be pretty punk, with Ten indeed absolutely dead; but it has *not* been so—very much the reverse, all things considered. Certainly much of it was short-skip, but there were other things.

First in this time is G4DMN, who found LX1SA on 21 MHz, and CT1QN, CT1WW, DK3LQ, ISVEC and IS0NZA, all on Ten.

There were a couple of openings to North America, on the afternoons of June 21 and July 4, both of which Don of G3NOF reckons to be a bit odd—openings of this nature in the peak of the sunspot cycle used often to show around midnight in the summer; some of the W's reckon the openings might have been Sporadic-E due to the hot weather on both sides of the Atlantic. This is *Ten* we are talking about, on which band G3NOF had no problems working C31FO, K1BCG, K1VUJ, K1YZW, K2MEV, K3DML, K3DV, OY5NS, VE3HFO, WA2FUL, WA31NW, WA3TRI, WA4IHW, WA8RLY, W1BFA, W1FZ, W2MB, W4KN, W8NIX, W8FER, W8KBU and WOHVQ, all of them on July 4's opening. As for 21 MHz, it was also a tale of short-skip conditions, although sometimes W4 stations were audible around 2300, and the mid-afternoon on July 4 was also good to W's as it was on *Ten*; sadly, G3NOF was not able to get in among them owing to his long-standing TVI problem, so his only actual 21 MHz QSO's were with LA1ZM and ZS1XG.

Ten was not used at all by G3CED/G3VFA, but his QRP did get fired up on *Fifteen*. Here there were ten contacts in total, all over Europe, and down into the Bay of Biscay where JH2RJY/MM was running twenty watts to a ground-plane but disappeared into the QSB which seems to have been quite a noticeable (sorry, more than usually, noticeable!) feature of the HF bands this past month.

A couple of CW contacts, with JA5CEQ/MM in the Persian Gulf and LU7VO, had to suffice on 21 MHz for GM3YOR, although the NFD *mayhem* brought forth ZE1JL, ZE3JO, ZS5FC, ZS6SVB/P, 4S9LU/P, 5B4AR, 9J2B/P and 9J2NFD/P all on *Fifteen*, plus UB5LU,

9G1LZ, and 9J2B/P on *Ten*. Glenrothes Club, in the course of all this, knocked up 976 QSO's with two stations, giving a total claimed score in excess of 3000 points—it helps if you have some operators on NFD, as this group certainly do; most Clubs fail for the want of competent CW contest ops, or indeed Phone contesters.

G4CTR managed to record contacts on six bands this time, and his offering for 21 MHz showed YV5AMP, KZ5RS, ZS5PG, 5B4ES, EA8JP, 9J2WR, PY4AKL and CR6VI. As for *Ten*, one notes TK6DNN, 13VK, I3DFQ, LA1WQ, I6TIH, UA2FA and 8SM4DQE.

### Comments

G4CTR says he has now obtained a CRT for his SS/TV monitor, and the unit "just about works—some more fiddling *should* produce a picture!" We know the feeling, only too well.

W4WFL/G5AYL/A has one problem about his DX'ing—it seems that every time he racks up a score approaching the 300 countries mark, he moves and so has to start all over again. This time his comment was simple—"worked 26 countries, only 74 more for DXCC!"

G3CED added a note at the top of one of his copy log pages to the effect that the "geese were gagging again; My log would look far more impressive if I weren't such a confounded rag-chewer." Looking down to the marked log entries we see what Geew means—he certainly must do a lot of ragchewing on CW, something which not a lot of us are able to do.

G3XSE (Harlow) does not often rate a mention in this piece, being largely a VHF operator, but he did raise a chuckly one day when he managed to scrounge a 1048-bit PROM and wanted to do something with it. A keyer was decided on, which would provide all the needful for the "rubber stamp" type of CW QSO. After a bit of head-scratching between your conductor and G3XSE a suitable combination of words was thought up and then programmed (the while offering up a silent prayer that it was right—PROM's are still expensive!) to key out the specified phrases. An hour or so later, there was a little two-inches square board with one PROM and about a half-dozen discrete components on it and a couple of wires going off to a Katsumi monitor in one direction and a bench PSU in the other, busily banging out perfect CW for all of one end of a complete rubber-stamp QSO with no one in attendance. It was quite amusing to see people coming in to look for the Morse, finding it and then realising there were no Morse keys or operators in sight!

A long letter from WIBB writing from his "Villa Mon Repos" which is a 182-year-old farmhouse in the country, 325 miles from Boston and with 25 acres of woodland around it, where the man-made electrical noise is at a minimum, but gardening at a maximum after his Pacific trip. The silence on Top Band is quite startling after the home (water-tower) operating spot, so that WIBB wishes he could operate all the time from W1BB/1-in-the-country. The two

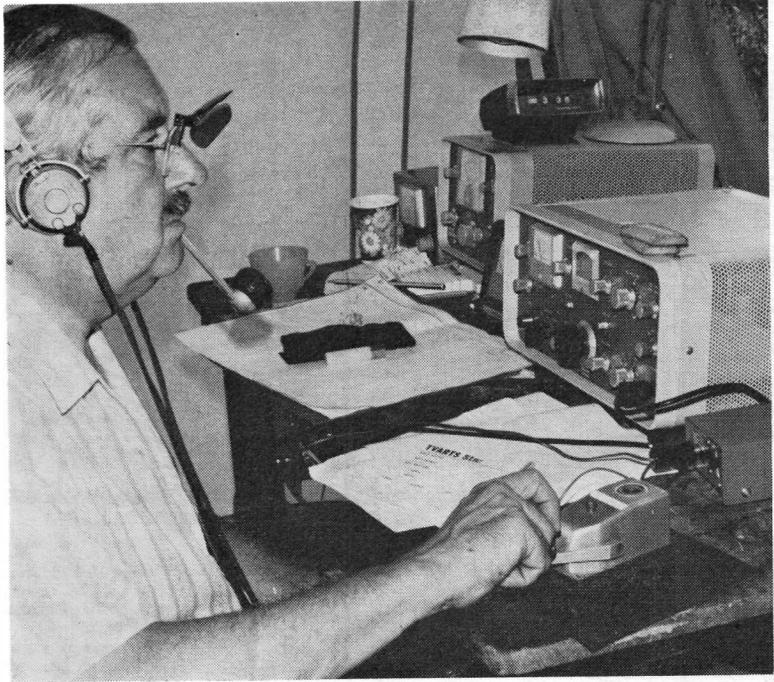
### TOP BAND COUNTIES

October — September

Callsign	AM	CW	SSB	Total
G2BJJ	32	138	65	235
GM3YOR	39	130	49	218
GD4BEG	15	138	40	193
G4CBQ (Home)	56	46	68	170
G4CBQ (Univ.)	105	8	22	135
G4AKY	—	94	24	118
G4BOH	9	68	30	107
G4BWP	27	70	—	97
G4AYS (QRP)	—	82	—	82
G5BHR	3	32	—	35

Each county may be worked once in each mode. AM contacts score three points, CW two points, and SSB one point. AM contacts made by changing over to AM from SSB are not allowed, nor are cross-mode contacts, saving that AM/SSB contacts will be allowed as two points for the mode the station was using, i.e. the SSB station will claim his two points under the SSB heading and the AM end his two points under the AM heading. New U.K. County designations apply, as listed on p.97. Starting date October 1, 1974, closing September 1975.

Alan Mears, G8SM, 6 Carleton Close, Esher, Surrey, president of the Thames Valley A.R.T.S., operating the Club's B-station on 21 MHz for the recent Field Day. The gear was KW-2000 with ancillaries and the key that presented by the late Leslie Cooper, G5LC.



Beverage aerials, each 1100 feet long, had to be repaired in seven or eight places after the winter ice storms, but they are now OK again, along with the horizontal Vee and the "ground-wire" antenna. In total there are five aerials, and a six-position aerial-switching arrangement for instant comparison of signal strengths on each aerial. As Don says, the big resonant aerial not only picks up signals but also noise, so a change to another receiving aerial, such as a loop or vertical, may well result in reduced signals but *better* signal/noise ratio.

G3RJV asks us to mention the favourite QRP frequencies and also that QRP operators, or QRO for that matter, will keep an eye open on these spots, both to avoid QRM and to give the little 'uns a shout; the frequencies to watch are 3540, 7040, 14065, and 21040 kHz, all of course plus/minus 5 kHz or so.

Contests are the *forte* of W1WY—reporting them, that is, not necessarily working in them! This time, Frank's copy includes the European CW DX Contest over August 9-10, which clashes with the Argentine Phone affair. August 16-18 shows the QRP ARC Contest (the U.S. QRP club, not the U.K. one) and the All-Asian CW. After which we go as far ahead as September for the European DX Phone leg on September 13-14.

Further ahead we notice, courtesy 9M2FK, a contest to publicise the SEANET Convention, this year being held in Kuala Lumpur over November 7-9. However, the contest is being played off earlier, over 30-31 August, 001 on 30th right through to 2359 on 31st. Logs and summary sheets go to 9M2FK, Ismail Razak, 281-c Jalan Pekeliling, Bukit Glugor, Penang, Malaysia, postmarked not later than September 30. The same address will provide a full set of rules covering the contest and the Worked All Malaysia Award.

9G1DY writes in to say that after 19 years in Ghana he is being transferred to Sierra Leone after a leave in U.K. A 9L1 ticket has been applied for so activity should be resumed soon. On a different tack, 9G1DY made a SSB 5BDXCC from Ghana, but still lacks the cards from several countries on 3.5 MHz before his application can go in. Incidentally, should anyone need a 9G1DY card, it can be obtained by writing to: N. T. G. Price, Barclays Bank of Sierra Leone Ltd., P.O. Box 12, Freetown, Sierra Leone, after September 30.

It was nice to hear again from G3YRR (Grimsby) who says he has been all but QRT during the poor conditions. However, Charles did give a talk about Amateur Radio to Cleethorpes Rotary Club, and had a very nice vote of thanks at the end from the managing director of Humber Tugs, who said he reckoned that the amateurs had done more in the field of merchant shipping on equipment and procedure than any other group—he had done his homework, which is indeed a pleasant change, particularly from one of such influence in the

area.

The recent RTTY contest organised by BARTG had the usual low U.K. entry! The leading station, I1PYS, racked up all but 23000 points, all continents and 33 countries in 199 QSO's. The hardest continent to find was, it seems, Africa, the others all being well represented. Eleven stations made all continents.

Now a horrible bit of news. From G3NBU/DL, via *Mobile News* we get it that the Germans have now got permission to use their 27 MHz Citizens'-Band walkie-talkies without a licence of any sort. However, there is still a slight control in that the sets must bear an official test number. Home-station type gear is also now approved and tested, and this equipment can be used without the "special reason" needed previously, although the licence costs 15 DM a month. One wonders just how long it will be before that lot splash over into our bands.

Talking of Citizens' Band, it is understood that one of the ideas behind the present restructuring of the licence classes in U.S.A. is basically to make it possible for some of the Citizens' Band occupants who now—quite illegally—chase BC/DX to make their mark on our bands.

Incidentally, the sharp-eyed may have noticed the talk (in some American magazines) of additional amateur allocations, on frequencies between our present bands. This is a cause worthy of support by all countries. The more national authorities support this proposal the better when the next conference becomes due; and even if it does fail at the final reckoning it will have most probably done something to save any more erosion of our present small band-space. Some high-pressure lobbying seems to be called for, all over the world, and while we are on the subject, it would be no bad idea to press at the next conference for restoration of amateur licensing in all the countries where it is at present not allowed, as a prior condition to allocation for other frequencies.

It is not yet clear to what extent the turmoil in Portugal—with the authorities having promulgated a decree "taking over all radio stations"—may have affected CT operation on the amateur bands. Though the CT1/CT2/CT3 stations have never been very active, there are plenty of them shown in the *Call Book* listings.

#### Here's to The Next Time

No, it's *not* Henry Hall writing this piece! But a "next time" there most certainly will be, and for it the deadline will be August 12 latest, addressed as always to "CDXN," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ. Meantime, suggest we all pray for sunspots!



Panoramic scene, West of England Mobile Rally,  
Longleat, Wilts., June 29.

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

**MORE REPORTS AND PICTURES**

First, to correct a stupid error in this space last month, where it was suggested, on p.264, that the North Midlands Rally had been at Trentham Gardens (where it *used* to be) instead of at Drayton Manor Park (where it *actually was*)—this raised a few horse-laughs, but nobody was too unkind, and anyway the argument was not in any way affected.

The outstanding feature of last month's meeting was, of course, the marvellous summer weather—at least until the week-end July 12/13, when the First Test started. There have been huge attendances at some of the Rallies and the notes following give some idea of what has been going on.

For the sixth Elvaston Castle Rally on June 8, they offered at 5p a well-produced lucky-number programme of events—and in perfect Wx had a bumper attendance "in the region of 4000-5000

people, with 1236 vehicles paid through the car park," no less than 29 firms being represented round the trade stands! It was found that most of the talk-in traffic was on two metres (G3ZBI/P) and that SSB was needed on Top Band (G3EEO/P) with few mobiles using AM. The Group have come to the conclusion that they will have to re-cast their talk-in arrangements for future events, probably concentrating more on FM/SSB for the VHF bands, where the greater part of the /M action now is. In addition to the prize draw and the tombola, with £150-worth of prizes to be won, there were various side-shows of general interest. All Rally arrangements and the provision of facilities for visitors were made by members of the Nunsfield Association Amateur Radio Group, and Ian Cage, G4CTZ, the hon. secretary and his helpers are to be congratulated on a very successful day—with, we hope, something into the kitty for Club funds.

This year's "Longleat," on June 29, organised by the Bristol Group and the 18th in their series, was again an outstanding event, the perfect weather undoubtedly contributing to its success. Their statistics are astonishing: No less than 4,100 visitors actually signed



Meeting at Longleat, left to right : G3ZZR, G2FIX, G4DVP and G8BTL. This is an RAF A.R.S. group, G2FIX and G4DVP being regular net operators.



Caravan set-up for the 80-metre talk-in station, with G3JMY operating. Some 40 mobile contacts were made on this band for the Rally on June 29.

in—the count in the Rally car park at 2.30 p.m. 2,166 cars and 12 coaches—and 50 tent/caravans with overnight campers. The talk-in stations worked 22 mobiles on Top Band, 40 /M's on Eighty, and 116 two-metre mobiles, which seems to speak for itself. Visitors came in from all parts of the country, including GM and GW, and there were several interesting callsigns of overseas amateurs on holiday in the U.K. On the trade side, stands were taken by 27 firms, who reported "complete satisfaction and brisk trading." Other organisations represented were the GPO, with their TV sleuthing rig; the 30th Signal Regiment, Royal Signals, showing some of the latest Army equipment; and the Club groups included the R.N. and R.A.F. Amateur Radio Societies, the A.R.M.S., the R.A.I.B.C. and the local arm of the Red Cross, who each year look after the medical side and take care of any casualties.

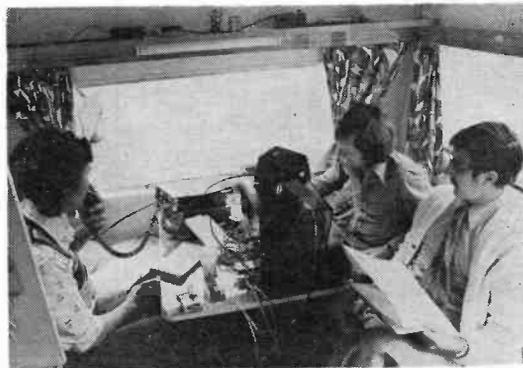
Of course, Longleat is the ideal setting for a Mobile Rally, particularly if the weather is right—it has everything, in beautiful and carefully maintained surroundings. Nevertheless, a big Rally event calls for careful organisation and much forward planning, involving a great deal of hard work—and can be expensive. However, with their years of experience, Brian Croker, G3ULJ, Longleat organiser, with his team, can be relied upon to make the West of England Rally a Good Show.

\* \* \* \* \*

Lest it be thought that we are only interested in the big Rally occasions, let it be said that we are just as glad to hear about the smaller Rallies around the country, each of which we know also involves a great deal of work and preparation. All reports that we receive will be publicised in this space, on the lines of the foregoing. And, of course, pictures are also always wanted to illustrate this feature.



Another Longleat impression—one of the Trade stands in the warm sunshine of June 29, when they had some 5000 visitors (see report). We are also told that there were some of the light-fingered gentry about, in the shape of large women with capacious shoulder bags, scooping up the unconsidered trifle. Apparently, they were soon spotted and hustled out of the ground!



Above—The tented 160m. talk-in station for Longleat. They had 22 mobiles calling in. G3VJJ was operating when this was taken. Below—For Longleat on June 29, the two-metre talk-in station was, as expected, kept exceptionally busy, nearly 120 mobiles being worked by this group of operators, signing G3TAD/P.

#### THE RALLY CALENDAR

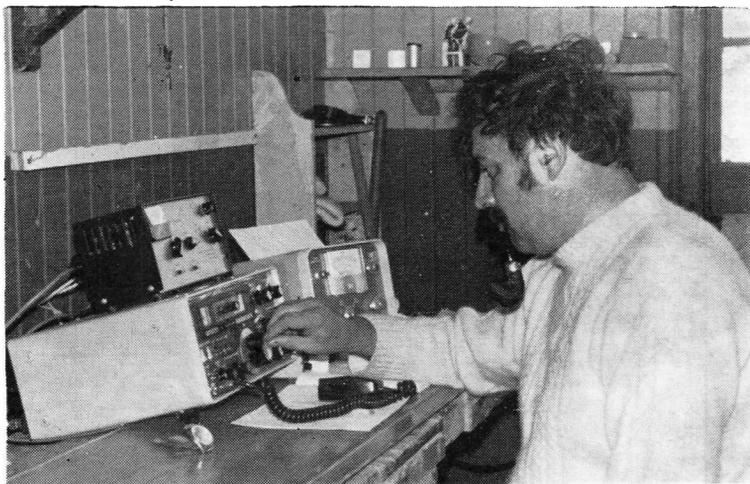
- August 3: RSGB Mobile Rally in the Coach Park, Woburn Abbey Estate, near Luton, Beds., with all the attractions of this well-known stately home. You pay 25p to get in. Details: N. Miller, G3MNV, QTHR.
- August 10: Mobile Picnic at Avoncroft Buildings Museum, Stoke Heath, Bromsgrove, Worcs., B.4091/A.4024, admission payable, free parking and picnic site (bring your own sustenance), bring-and-buy stand and talk-in 2/80/160m. Information: J. K. Harvey, 22 Elm Grove, Bromsgrove, Worcs., B61 0EH.
- August 17: Derby & District Radio Society annual event at Rykneld School, Bedford Street, Derby, as in previous years. Location just off the A.5111 Derby Ring Road, between junctions A.38 Burton Road and A.516 Utttoxeter. All the usual attractions and a monster "junk-sale," with talk-in by G2DJ/A on Top Band, G8DBY/A for two-metre AM/FM and G3ERD/A doing the 2m. SSB. Free admission and parking—but please note no opening before 12 noon. Any further details from T. Darn, G3FGY, QTHR.
- August 24: Torbay Amateur Radio Society Rally at Newton Abbot Rugby Club ground, as in previous years.—L. H. Webber, G3GDW, QTHR.
- August 31: Preston Amateur Radio Society Mobile Rally at Walton-le-Dale Secondary School, Brindle Road, Bamber Bridge (off M.6 at Junc. 29) with talk-in on two metres and Top Band. Tr a

stands, bring-and-buy stall, refreshments and ample parking. Details: G. W. Earnshaw, G3ZXC, *QTHR*.

August 31: Pembroke & District Group annual "bucket-and-spade" party at Regency Hall, Saundersfoot, near Tenby, with talk-in on S20/FM and 144.30 MHz SSB. Discussion of the West Wales repeater project. Car parking free and venue near beach. Further information from: J. Hogg, GW4AKO, 2 Pembroke Road, Pembroke Dock, Dyfed, West Wales.

September 21: Peterborough Mobile Rally at Walton School, Mount-steven Avenue, Peterborough, Cambs. Information from: A. H. Jackson, G8GNV, *QTHR*.

September 28: Harlow & District A.R.S. event at Netteswell-School, Harlow, with bring-and-buy and Trade stands, refreshments, free admission and parking. Details: C. West-Bulford, G8JXU, hon. secretary, Harlow Amateur Radio Society, Mark Hall Barn, Harlow, Essex.



Above — GM8JGB operating GB3IOM, the Glenrothes Club expedition to the Isle of May in the Firth of Forth. Gear consisted of a Collins KWM-2, Yaesu FT-101B, a Europa, with a variety of antennae —so they were well equipped. Below—The notice encountered by visitors to the Isle of May.



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## GOING QRP ON EIGHTY

### KITS FOR LOW-POWER TRANSMITTERS

G. C. DOBBS (G3RJV)

ANY reader of SHORT WAVE MAGAZINE will have realised that QRP activity is not only alive and well on today's bands, but growing in popularity. The advent of commercial rigs like the Health HW-7 and the Ten-Tec transmitters has increased the number of operators intrepidly exploring the bands, armed only with a few watts of RF. Not only is QRP operation a boon to our polluted bands, but it has brought many operators back to the oft-lamented art of home construction. QRP may also herald a return to *real* operating skill on the bands—it is difficult to be a bully with a couple of watts!

Another advantage of QRP working is that it is possible to achieve good results with simple and inexpensive gear. Many such operators are active on 80m. CW, often spreading the RF far and wide with milliwatts of power. This article shows how it is possible for a small outlay in money and time to get on to the QRP bandwagon. The majority of the construction is down using inexpensive kits, with simple home-built additions.

#### The Amtron Kits

*Amtron*, a branch of the American International Crystal Manufacturing Company, have released a series

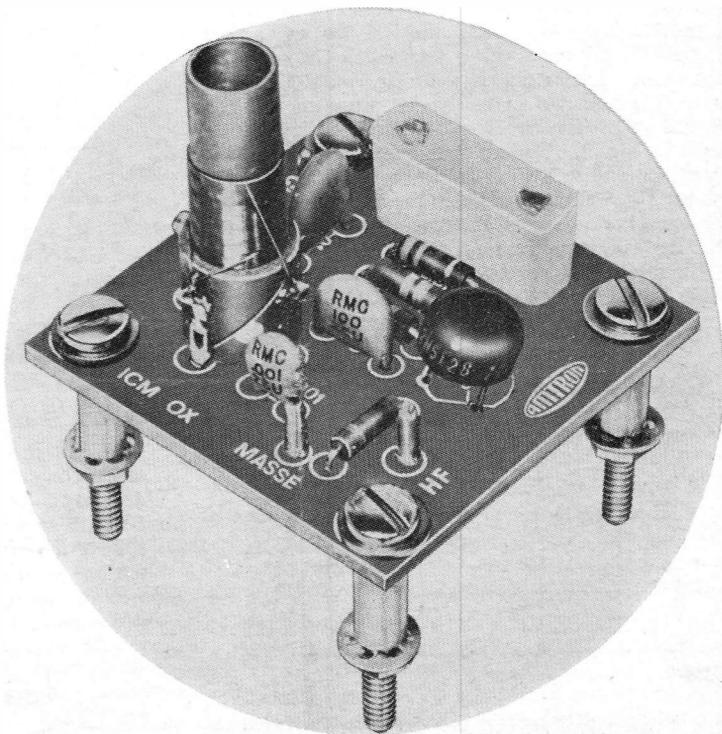
of small kit units to the U.K. market, *J. Birkett* being the suppliers. These kits are relatively inexpensive and contain a printed-circuit board, all the components and even solder to build up simple circuit modules. The kits are supplied with a four-page instruction manual, making it possible for anyone with a soldering iron to make up a "work first time" module. There is a wide range of these kits but we are only concerned with two modules. The UK 905 RF Oscillator and the UK 930 RF Power Amplifier. Both kits are built up on a 1½in. square printed-circuit board and can be constructed in about an hour.

Fig. 1 shows the circuit of the UK 905 Oscillator, a crystal oscillator for the 3-20 MHz range. The usual output is about 1 milliwatt into 50 ohms, but it is easy to modify the circuit to give more output to drive an RF amplifier. The UK 905 is easy to build and is complete with a choice of three coils, according to the desired frequency. For the 80m. band, the "White Coil" is required. The kit is best built up in its original form and tested by finding the output on a receiver. Using a sensitive Rx very little coupling, if any, is required to hear the output signal. The coil core requires peaking. This can be done from the receiver S-meter reading or checking the current of the power supply. The RF output indicator, as described in the July issue, can also be used.

The UK 930 RF power amplifier is equally simple to build. It covers a frequency of 3-30 MHz with a choice of three coils. For the 80m. band, once again the "White Coil" is used. The only slightly tricky part of making up this kit is the winding and wiring of the output link coil, but this is clearly described and shown in the makers'

General appearance of the "Amtron" UK-905 oscillator unit as used with the 80m. QRP transmitter.

£2.65



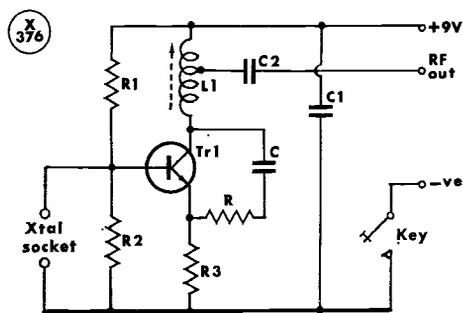


Fig. 1

Fig. 1. Circuit of the UK-905 RF Oscillator, in the "Amtron" kit. Values are: C1, .01  $\mu$ F; C2, .001  $\mu$ F; R1, 10K; R2, 3.3K; R3, 100 ohms; L1, "white" coil; Tr1, 2N3643, but see text; and R 82 ohms, C 100 pF (from table with kit data).

booklet. Using a 12-volt supply, the UK 930 is capable of about 200 milliwatts of RF output. The unit requires very little drive for full output, the requirement being well within the capabilities of the UK 905 oscillator. The two units were, in fact, designed for mutual use. The coil once again requires peaking which can be done in the same way as for the UK 905.

### Simplest QRP Transmitter

The UK 905 oscillator, keyed in the negative power lead, could form a very low output transmitter. Using it with the original low-output impedance circuit, it can be matched into an aerial for local contacts. Modified for higher output impedance, the UK 905 can be fed into the UK 930 to provide a very simple 200 milliwatt transmitter. The modification to the UK 905 is quite easy and is described in the booklet supplied with the UK 930 unit. The circuit of the modified UK 905 is shown in Fig. 2. The original output capacitor (C2) is removed and a 100 pF capacitor, which is supplied with the UK 930 kit, is wired to the collector tag of L1. This capacitor now provides an output to match the UK 930. This modification is shown on Fig. 3.

The method of connecting the two modules is shown in Fig. 3. The 9-volt supply to the UK 905 is keyed and

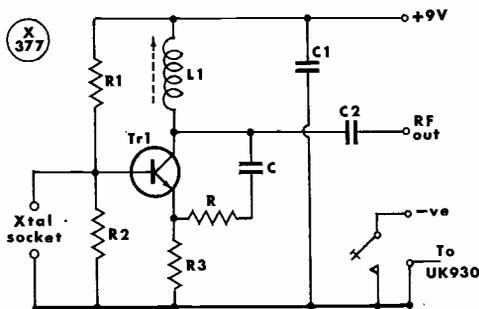


Fig. 2

Fig. 2. UK-905 modified to drive UK-930 RF amplifier, in which C2 is made 100 pF (see text).

a 12 volt supply is used for the UK 930. The UK 930 does not draw any current in the key-up position. This simple arrangement can be tested by feeding the output into a 6.3 volt panel lamp. The coils can be peaked until the bulb gives the greatest light output. (If you can light a bulb with R.F. you can get out on the air!). Armed with this little mite of a transmitter and a carefully matched aerial, it should be possible to get your feet wet on 80m. QRP.

### Setting Up

The usual method of tuning the output stage, in this case adjusting the coil, for a current dip can be confusing when using really low power. It is better to have an indication of the RF power actually going up the spout. The RF indicator circuit shown in Fig. 5 will show the actual RF output. This little device has been found invaluable in QRP work as a relative power indicator at RF. The writer uses a cheap Japanese ex-tape recorder level meter with FSD of 250  $\mu$ A, but almost any moving coil meter of 1 mA or less is suitable. RV1 is set according to the level of RF power to be monitored.

These two simple modules used "bare-back" are really attempting to go QRPP, or ultra low-power but a more viable QRP rig can be made by adding a simple single transistor PA stage.

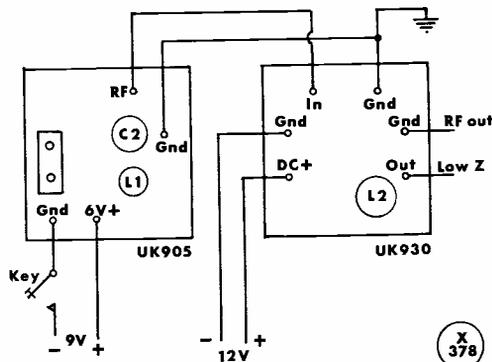


Fig. 3

Fig. 3. Inter-connection between UK-905 and UK-930 to form a CO-PA arrangement.

### The PA Stage

Fig. 4 shows the circuit for a basic PA stage capable of handling an input power of one watt or a little more, depending upon the gain of the transistor used. Surplus BFY51's and BFY50's were tried in the prototype. In spite of the simplicity of the circuit, and its lack of protection for the PA transistor, none of the transistors tested went up in smoke. If a simple transistor tester is to hand, it is a good plan to test the  $H_{fe}$  of individual transistors if surplus types are used. If the gain is found to be excessive (say 80 plus) avoid using such transistors. An effective form of protection is to wire in a 36 volt, 1 watt zener diode into the collector circuit—positive end to collector and negative to earth.

The UK-930 RF amplifier which complements the UK-905, as discussed in the text by G3RJV.

£2.65

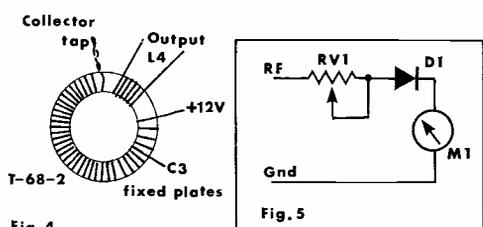
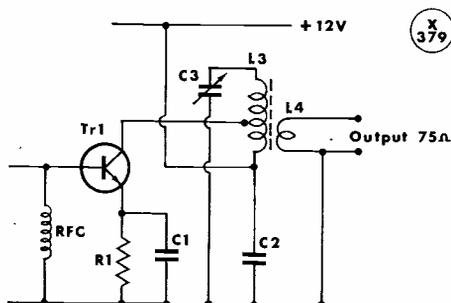
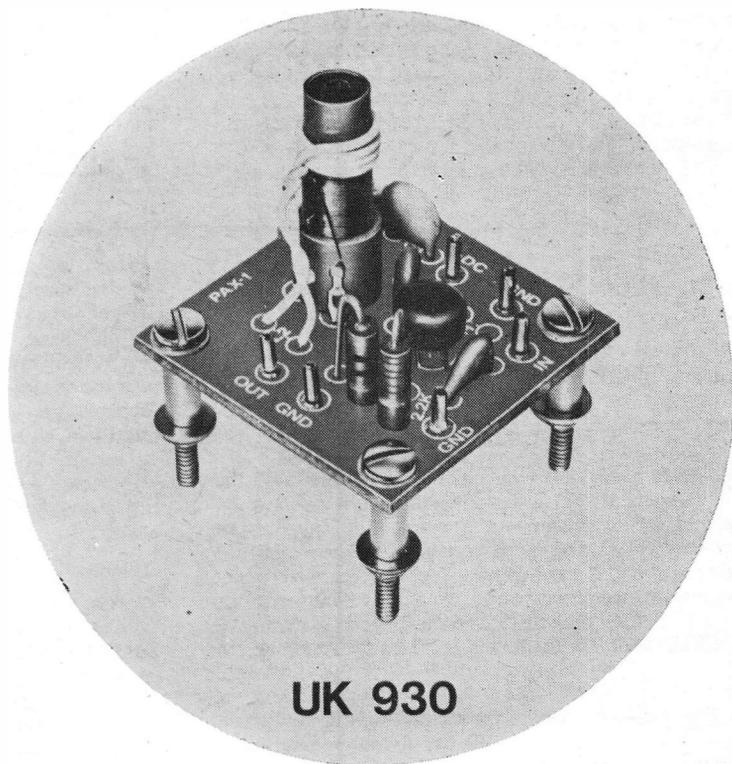


Fig. 4. PA stage to complete QRP transmitter. Values should be: C1, C2, 0.1  $\mu$ F; C3, 150 pF variable; RFC, 2.5 mH; R1, 10 ohms, 1w.; L3/L4, as diagram, with L3 38t. 22g. tapped 10t. from plus end, and L4 10t. 30g. bifilar wound; Tr1, BFY51. Inset Fig. 5. RF output indicator. RV1, 25-50K, preset; D1, OA81 or similar; meter 250 microamp. or less than 1 mA f.s.d.

The PA coil is wound on an iron-powder toroidal core Type T-68-2 (*T.M.P. Electronic Supplies*). These cores offer high permeability and excellent "Q" figures. The main tuned winding should be wound almost to cover the whole circumference of the core, as shown in the diagram. Each time the wire goes through the hole, one turn has been wound. The winding should not be too tight, the 22g. wire being stiff enough to hold the turns in place. L4 is bifilar wound between the 12x end of L3 and the collector tapping. The 30g. section is laid carefully between the turns of the L3 winding. The makers of the core advise mounting them with their nylon screw kit. An epoxy resin did the job as well without any apparent ill effects.

With the key up the PA passes no current. Short wiring and adequate by-passing is important for stability. The PA can be checked for parasitics by metering the supply current and tuning C3, without RF drive to the stage. Any slight meter flicks will indicate parasitic oscillation.

The prototype PA was wired up on a perforated board measuring just over 2in. square. The whole rig was fitted on an aluminium base with a bent-up front panel to carry C3 and a key socket. A tin-plate screen was placed between each stage. All of this adds stability, although the rig appeared to function quite well sprawled about the bench.

The Tx must be fed into a low-impedance source, so some form of ATU is desirable. Tuning up can be

done by field strength. It is better to tune for *RF output*, rather than PA current dips. Here the RF output indicator in Fig. 5 comes into its own, and can be connected directly across the output. Excessive levels of PA current can be cured either by choosing a lower-gain transistor, or by reducing the supply to the UK 930.

Well—there it is, basic and rather “rule of thumb,”

## DX FROM EDAY IS., ORKNEY

### SOME INTERESTING EXPERIENCES

J. M. ROBSON (GM3CFS)

WHEN a decision was made to “radioactivate” the Orkneys in 1973, it was not realised how much would be entailed in putting out a worthwhile signal from this small, bleak and windswept Island. The experience required a lot of hard physical work, there were many frustrations, but it was worth the effort. Many stations got their first Orkney QSO, and the antenna system gave excellent results on the bands 80 to 10 metres.

#### Eday Island, Orkneys

This Island belongs to the northern group and has a population of around 150. There is no water or electricity supply, the former being got from a well or rain-water barrel, the latter from a diesel generator. The Island is served four times a week by both inter-Island steamer and plane, the latter being the aptly named “Islander” which brings the mail and smaller cargo items. No trees grow on these Islands due to the savage climate and the land suffers from “sea blasting” caused by heavy seas crashing against the rocks and sending salt spray a considerable distance inland. The coastline is generally rocky, but there is one fine beach close to the grass airstrip. The seas are extremely treacherous with strong tide rips, which, with the wind in opposition, can result in some dangerous steep fronted seas. Bird life, however, is prolific and varied, with lapwing, oyster catcher, curlew, gannet, tern, eider duck and black-backed gull. The Islanders are friendly and helpful, very resourceful, but taciturn on occasions. There is a community centre for social events and one church. There is also a modern school despite the dwindling population.

Most of the populace run a car, most of them M.o.T. rejects, as it is not necessary to have a certificate on the Islands. Despite this, the local constabulary (from the main Island) make unexpected visits to the Islands. When this occurs, the “bush telegraph” performs admirably, and the unlicensed and unroadworthy cars are hurriedly pushed into barns or buried in haystacks. Cars unfit for further movement litter the farms, or are dumped in the rubbish excavation tip.

The QTH was situated on a promontory pointing north and encompassing about 180 acres. Surrounded by the sea in three directions, exposed to the elements in four directions, it was nevertheless an ideal spot for an antenna “farm”. It was decided to use the Sprite caravan

but a simple rig capable of providing a lot of challenge and fun on 80 metres. A few tips for QRP operation—be patient: Don’t call “CQ” and expect the world to come back to you; wait for a calling station, or tail-end an existing QSO; if in doubt arrange a sked to test the rig. You will be surprised and delighted with what can be done with QRP.

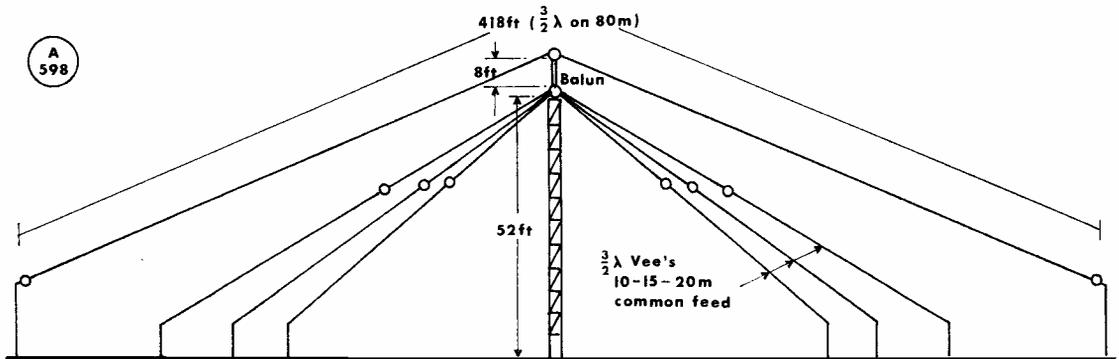
as the shack, as more suitable living accommodation was shortly to be available. Meanwhile, a decision to use a multiband inverted-Vee three half-waves long on 80 metres was made, as the very high winds precluded the use of any kind of beam array. The 70ft. mast to support the antenna consisted of 14 sections of 2ft. steel tube with nylon guys. A series of trestles was made to ease the lifting of the mast and the mast laid on them. It was now a matter of awaiting a calm day for the lifting operation with gin pole and support stays connected ready.

#### Disaster!

The raising of the mast the first fine day did *not* work out as expected. With the tractor pulling strongly and ten men holding the guys, the mast went up quite well, but at about two thirds up, a double kink suddenly formed and the lot dived earthwards. The total damage was two badly bent and three slightly bent poles. The next step was the purchase of a 60 feet “Hamtower” which proved itself well. The freightage was considerably less than that quoted for a telescopic one, that being in the region of £120. So, apart from the lack of facilities on an Island, there are crippling freight charges to contend with. Diesel oil for example cost 28p. a gallon (in 1974) which caused our electricity to be about three times as expensive as on the mainland.

Work was commenced on excavation of the site for base and anchors. Rock was struck after a depth of only 2½ feet, but this difficulty was surmounted by driving in stakes to “key” the cement to the rock. Hardcore for the cement was obtained by taking the tractor and trailer to the nearest point above the shore and hauling up the stones bucket by bucket and emptying into the small trailer. Sand, on the other hand, could be got at the beach without much fuss. Mixing the cement on site and pouring into base and anchor points took nearly three very exhausting days, and it was with relief that base and anchors were dropped into the wet cement.

Erection of the tower presented little difficulty using a simple gantry. Bearing in mind the strength of the winds the tower was only taken up to 50ft. with a further 8ft. of steel tube at the top, the total height including base and tube mount being about 60 feet. As planning permission (yes, even there!) had been sought and granted, the only other proviso was a check with the plane operators. The day they were informed that the tower was complete, the Islander flew over the tower in acknowledgement, his wing tips seemingly about to be lopped off by the steel guys. Following local advice, three additional guy wires were added using fencing wire and three sections of the ill-fated mast served as ground anchors.



### Installation of the Vee

The extremities of the antenna were terminated in two 15ft. poles made up of 6 sections of the original 70 foot mast. The open wire line was made up of 12 gauge aluminium using 4-inch ebonite spacers tied in with copper wire. (This was to have very unfortunate results some time later). In deference to the salt-laden atmosphere, the feeders were given two coats of marine varnish. They were taken down fairly close to the tower until about six feet from the ground and then led off to the caravan. As the horizontal distance was about 90 feet, some vertical support was given as well as judicious straining of the feeders to avoid "flexing" in strong winds. The only way that open wire line could be brought into the caravan, was to drill the window. This was accomplished after three and a half hours using carborundum and steel drills. It was the worst job of all.

### The Shack

As the caravan was to be used in this role for some time, it was positioned close to a 5 foot stone dyke to afford some protection from the elements, and raised on to concrete blocks, before being tied down to anchors. To accommodate the FT-401, home made Z-match, HA1 keyer, etc., it was necessary to extend and strengthen the existing window table. The only remaining thing to do was to bring the "juice" into the shack. The generator of the juice was an ancient Lister single-cylinder diesel, hand cranked, and of 8 h.p. coupled to a 5 kW generator. Turning over this brute was beyond my powers at the beginning, and this, coupled with the engine's fondness for an "Aerosol!" sniff *via* its air cleaner before showing any willingness to start, made it necessary for me to enlist the services of one of the locals. However, practice makes perfect, and within a couple of weeks, the problem was overcome, except on the odd occasion when the engine persisted in running backwards.

### Operating

Operating in the caravan, although cramped was comfortable enough, but at times during gales, there was some vibration and movement despite being tied down. Opening the door brought the sound of the wind tearing through the many guy wires, setting up a banshee wail

and increasing in pitch as the wind gusted to storm force or higher. During the first leg of the ARRL CW contest in 1974, the winds were over 90 m.p.h. in the squalls with the caravan shaking badly. Frequent snow flurries added to the discomfort when going outside to top up the generator during the night. Brewing coffee and getting it into the shack intact, required a very special skill, cooking facilities within the caravan having been terminated. The second day of the contest dawned with no break in the weather, but a break in the feeders was noticed, fortunately close to ground level, but was nevertheless not any easy job to repair under those conditions. These feeders were destined to last less than another 3 months due to electrolytic action between the copper binding the spacers to the aluminium feedline, despite a liberal coating of marine varnish.

### Antenna Performance

The 418 foot inverted-Vee produced results which were extremely satisfactory. In the direction of the main lobes on the higher frequencies, results were comparable to a 3-element beam or similar antenna. In other directions, there was, of course, some fall off, and to offset this, three  $1\frac{1}{2}$  wave Vees for 14/21/28 MHz were installed in the same plane as the big Vee, using a balun and a common low impedance feedline. On 7 MHz results were exceptional, with good reports from VK and ZL and all the W7 districts worked during the ARRL contest. On 80 metres many 599 reports were received from U.S.A. and good reports from PY, LU, CX, UA9, etc. The smaller Vees performed as expected with some gain over a dipole—up to 7 dB on 15 metres, with effectively nine half-waves.

As far as versatility is concerned, the inverted-Vee fed with tuned line has a lot to commend it. Apart from being operable on five bands, one can tune the entire band using a tuning unit and have no fear of a high SWR being presented to the transmitter. The lengths of the Vee legs are not critical and the losses are negligible with open wire line even with long runs. Also, it is an easy antenna to install and requires only one strong central support.

Despite the many frustrations and difficulties in operating throughout the period, a great deal of experience was gained, *i.e.*, mechanical stresses on mast and

tower, and the antenna performance. Quite frankly, considering the simplicity of the  $1\frac{1}{2}$ -wave Vee, the flexibility of the system using 600-ohm open line, and the splendid results obtained, one doubts if this sort of set-up—including the smaller Vees—could be bettered.

## NOISE-BRIDGE FOR ANTENNA MEASUREMENTS

### USING A COMMERCIAL KIT

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

#### Applications

Aerial theory (for instance) is not everyone's cup of tea, but a certain amount of aerial practice *should* be. After all, many constructional hours are spent building a transmitter, say (or a considerable amount of money buying one) to produce a number of watts of RF—the intention being to radiate this RF off the antenna. How well we do this depends on the aerial *and* its feed. Any inefficiency results in power being lost as heat. Power produced at great cost.

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

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

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

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

#### Methods

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

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

It was surprising that no Orkney stations were heard over the period on any band 10-80 metres, but doubtless the vile climate is the reason. Finally it was a pleasure giving so many stations Eday Island, Orkney as a "new one" for the log.

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

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

All become easy and routine with the help of a noise bridge. For a full treatment in the use of the bridge the excellent article by G6LX in *SHORT WAVE MAGAZINE* for July, 1971 is to be recommended.

#### Construction

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

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

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

The third approach opened when it was found that a noise-bridge kit is being marketed by *Cambridge Kits*, 45 *Old School Lane, Milton, Cambridge*, for £6.70, inclusive VAT and postage. This includes everything, with the all-important toroid, ready wound.

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

A piece of perforated board is included, together with a practical layout as well as the circuit, on which to build the noise-generator and amplifier. Although this is perfectly adequate, the writer decided to etch a printed circuit board as it looks better. The recommended

layout was followed and the circuit marked out using some cellulose paint as a resist. A few minutes etch in acidified ferric chloride solution was followed by cleaning, drilling and the soldering in of the components. In all, not more than an hour or so's work.

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

### Calibration

It is recommended that the potentiometer be calibrated at low frequency (2 MHz, say) by using non-inductive carbon resistors as the load. This was done, and on checking with a Model 8 Avo, the potentiometer resistance was found to agree precisely with that of the calibration resistors. This is as one would expect, but it did suggest that calibration could be done at DC,

be merely calibrating the potentiometer itself—angular position against track resistance—and calibration was completed this way. Although a potentiometer with a linear law is supplied, the calibration shows this to be not quite so. Checking various resistors at 144 MHz showed the DC calibration to hold true.

### Finish

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

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

## COURSES FOR THE R.A.E.

### First List

TO qualify for a U.K. amateur transmitting licence, it is necessary to pass the Radio Amateur Examination, held in December and May each year. It is Subject No. 765 in the syllabus of the City & Guilds of London Institute, 76 Portland Place, London, W1N 4AA, from whom can be obtained a set of question papers for recent years, at 30p post free, with the current syllabus.

Also available for those who want to know is an official pamphlet entitled *How to Become a Radio Amateur*, free on application to: Home Office, Radio Regulatory Division, Amateur Licensing Dept., Waterloo Bridge House, Waterloo Road, London, SE1 8UA. This gives essential basic information.

For the Subject No. 765 examination itself, courses are offered at various centres all over the country, mainly on a part-time evening-class basis and usually at nominal fees, these courses coming under the Local Education Authority. Some are, however, organised by local Clubs and other such interested bodies. They all have the same objective: To prepare, from scratch, candidates who wish to qualify for a licence.

Some courses give instruction in both Theory and Morse, for those going for a full licence. Passing the R.A.E. without the Morse qualifies only for the Class-B licence, confined to VHF operation, with G8/3 callsign, e.g., G8XYZ, Full licences are now in the G4/3 sequence, i.e., G4ZZZ.

Following is the First List of Courses as notified to us in time for this issue. Further lists will be published as notifications are received.

Notices should be set out in the form shown here, and addressed to: "R.A.E.", *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ.

**Aberdeen:** At the Technical College, starting Sept. Apply in first instance to: S. Sutherland, GM4BKV, 67 Greenfern Road, Aberdeen (41129), AB2 6TP.

**Barry (Glam.):** At the College of Further Education, Colcot Road, enrolment Sept. 8-10, afternoons and evenings, classes starting Tuesday, 16th (Theory) and Thursday 18th (Morse & Practical). Full course fee £8, or £5 for under 18's.

**Bath:** At the Technical College, Avon Street, details and enrolment at the College, Sept. 11-12, course tutor P. A. Bubb, G3UWJ.

**Bristol:** At Brunel Technical College, Ashley Down, on Monday evenings, 6.45-9.15 p.m., with additional Morse tuition. Details from P. J. Brouder, G3ZJH, *Bristol 41241*, extn. 64. Course to start Sept. 15.

**Canterbury:** At the College of Technology, details on application. Course tutor D. J. Bradford, G3LCK.

**Chesterfield (Derbys.):** At the College of Technology, details from J. A. Gascoigne, at the College.

**Derby:** At the Adult Centre, Blenheim Drive, Allestree, every Tuesday, 7.0-9.0 p.m., commencing on Sept. 23, with R. Buckby, G3VGV, as course tutor. Details of fees and enrolment from the Principal, at the Centre.

**Dudley:** At the Technical College, Dept. of Electrical Engineering & Science, on Tuesday and Wednesday evenings in September, enrolment Sept. 9-10, 6.30-8.30 p.m. Details from Head of Dept.

**Farnborough (Hants.):** At Cove School, St. John's Road, starting October 2, 7.30 p.m., with Morse tuition also available. Course tutor J. Hardy, G3KND. Apply The Principal, Farnborough Further Education Centre (42397).

**Langley (Berks.):** At the College of Further Education, on Friday evenings starting in September, with Theory, Morse tuition and Operating procedures as required. There is also an Advanced Course for radio amateurs already licenced, with an operational station and full laboratory facilities. Details from E. C. Palmer, G3FVC, c/o Education Offices, 48 High Street, Slough, Berks., SL1 1EN.

**Liverpool:** At the College of Technology, Riversdale Road, Dept. of Electronic & Radio Engineering, on Monday and Thursday evenings, 7.0-9.30 p.m., starting on Sept. 15, with enrolment previous week. The College runs a well-equipped amateur-band station signing G3VXY. Further details from Head of Dept.

**London (Chingford):** At Friday Hill House Community and Adult Education Centre, Simmons Lane, E4, starting Sept. 22, 7.30-9.30 p.m., enrolment evening Monday, Sept. 15. Course fee is £4.50, and this is now its 16th season, with the Centre accepted as an examination venue. Details from the instructor, E. Johnson, G2HR, *QTHR*. Tel: 529 2932.

**London (Ilford):** At the County High School for Girls, Cranbrook Road, enrolment Mon.-Thurs. Sept. 8-11, evenings, first class on Sept. 24, fee £4.50 or £2.25 for under-18's. Details, W. G. Hall, G8JM, *QTHR*.

**London (Merton):** At the Technical College, London Road, Morden Park, Morden, enrolment Sept. 8-10, afternoon or evening, course starting Wednesday, Sept. 17, 7.0-9.30 p.m.

**Newport (Gwent):** At the South Gwent College of Further Education, North Road, Newport, on Wednesday evenings 6.0-8.0 p.m., starting on Sept. 17, course tutor L. A. Groucott, GW3YJT. Practical course also available, under C. J. Roberts, GW4COJ. Fees will be about £3.50 for both courses, details from the College.

## TEN-METRE AERIAL AMPLIFIER

FOR OSCARS RECEPTION

W. H. JARVIS, M.A. (GM8APX)

THERE is nothing original about this circuit or layout, which was inspired by the simplicity of a commercial aerial pre-amplifier intended to improve TV signals over 40-800 MHz. It was thought that such a simple approach would probably not work on 29 MHz—but it does, and very well, too. There is no need for any adjustments, for none are possible!

In the circuit, Fig. 1, C1, R1, C2 and R2, L2 can be said to be optional—this is because, in the prototype, the circuit was on the verge of oscillation, giving about 20 dB of gain at 29.5 MHz, measured by S-meter *cum* signal generator. So R2, C2 were introduced to reduce the gain of the second stage. R2 is 270 ohms and C2 47  $\mu\text{F}$ . They bring the gain at 29 MHz down to about 12 dB. As this is more than enough, they should be left in. R1, C1 can be removed, as they have approximately the same effect, whereas the circuit is completely stable without them.

Layout is sketched in Fig. 2 and is not critical. However, the earthed length of Veroboard down the middle must provide quite effective screening between the two stages and should be retained. The 330  $\mu\text{F}$  coupling capacitor bridges this screen. The whole amplifier is simply wrapped in a plastic bag held with a rubber band, and can be hung at the "eye" of the 10-metre dipole.

Coil L is 12 turns of enamelled 20g. wire on a ferrite core, enabling the amplifier—on the roof just below the aerial—to be powered through its output coax.

It has been noticed that this amplifier continues to

give useful gain right down to the 7 MHz area, and would almost certainly be effective lower in frequency if the capacitors were made larger.

There is an increase in background "sharsh" in the absence of signals, but the Q of the tuned circuits of any reasonable 10-metre Rx makes this unimportant. The overall effect of the amplifier is to give a signal about 12 dB up, with a much better S/N ratio.

## CHEAP RF OUTPUT METER

This device is intended for the two-metre and 70-centimetre bands and works by inductive pick-up. It is intended mainly for mobile and portable work and, by using a "magnet mounting," can be held to the bonnet

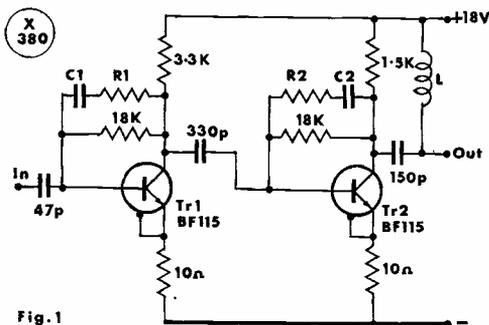
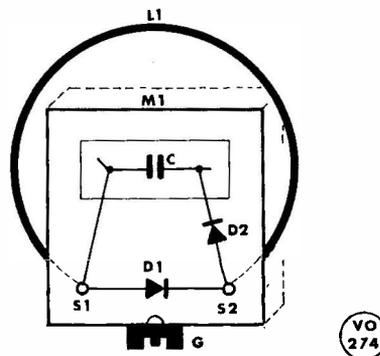


Fig. 1

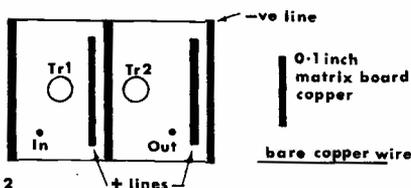


Fig. 2

of the vehicle. No earthing is required, as the RF input is from a stiff loop of coax, L1, length not critical and about 50 cm. (20 ins.) is convenient. The inner and outer are shorted at both ends, fitted with 4 mm. plugs for sockets S1, S2. Diodes D1, D2, are 1GP5's, which appear to work very well up to 450 MHz. Capacitor C is 300  $\mu\text{F}$  or so.

An Eclipse pot-magnet G forms the "sucker" and is secured to a plastic frame carrying the whole instrument. This frame is 65 mm. length of square-section plastic drain-pipe (an off-cut at any builders' merchant or D-I-Y store) cut in half to form a "U". A 2½ in. length is sufficient. The meter is 0-100  $\mu\text{A}$ .

For best results, L1 should be horizontal if polarisation (E-vector) is vertical, and *vica-versa*—in other words, try it either way if you are using a halo or 5/8th wave whip. In some cases, better readings can be obtained by disconnecting at socket S1 and straightening the coax to form a whip pick-up, in which case S1 should be earthed to the magnet retaining bolt on the U-piece.

The whole idea is to use the device as a *comparative* RF indicator. It should therefore always be mounted in the same place on the car and in the same posture when tuning up or making comparisons, and having regard to polarisation when changing aeri-

## Thirteen/Nine

It is not often that we have the opportunity, or indeed the basic information, to report on activity on these frequencies. Much monitoring of 70 cm. and 23 cm. during the past few days has elicited the fact that interest, at least on the East coast of this country and on the Continent—in PA particularly—is increasing. It was gratifying to have this confirmed in a letter from G4BYV (Dereham, Norfolk) who is now active on 13 cm. He reports contacts with G3LQR (Framlingham, Suffolk) and PA0DBQ, and notes that G3LQR has worked the PA0 on both 13 cm. and 9 cm. and found that the QSB was lower on 9 cm. than on 70 cm. over the same path. G8ADC in Bedfordshire has received the G4BYV signal, and is getting a Tx fixed up at the present time. PA0VV has 13 cm. with 9 cm. coming up, and is a potent signal on 70 cm. if you want to arrange a sked.

By careful dimensioning of the antenna and appropriate choice of mixing frequencies, getting on the SHF bands is not as difficult as may at first appear. The bands are harmonically related, so multipliers can produce RF readily enough, and the same dish antenna of quite modest size can give considerable gain at 23 cm., 13 cm. and 9 cm.

## Twenty-Three

As will be seen from the All-Time 23 cm. Table this month, there have been some significant additions to the scores recently. Still leading is G4BEL (Ely, Cambs.) who found May to be most productive in view of the G3WDG expedition, which he worked in Shropshire, Powys, Cumbria, Dumfries, Borders and Durham. Add to this a QSO with DJ1WP for a new country and G3HCW in West Yorkshire for a new country, and the countries/countries total jumps to 35, which is going to take a bit of beating! The DX activity from GM should encourage those who claim that 23 cm. operations from Scotland are a dead loss because there is nobody to work! GM4DIJ is stirring up activity in the Edinburgh area and /P attempts from South of the Braid and Pentland Hills should be profitable.

G3NHE (Sheffield) has pushed his score up quite a bit, also thanks to the G3WDG expedition, which gave him two new countries in the shape of GW and GM and he has added Gloucester, Worcester, Essex, Powys, Durham and Clwyd to his countries score to stand at 24+5, which puts him into second place. He is still waiting for some of the QSL cards, though!

G3JXN (London) added PA0VV to his total (and it was good to learn that John has his 23 cm. and 70 cm. antennas up again) and G3DAH increased his countries score by a contact with OZ9OR on July. G4BYV has added PA to his figures.

Conditions on 23 cm. band were very good during the high-pressure period from the beginning of July, with ON, PA and DL all workable at good strength and the German beacon, DB0IZ on 1296.1 MHz at 5 & 5, although the note was a bit unstable. The Scandinavians were a little more difficult, although OZ9OR was 569 in Herne Bay on July 6, and both he and OZ6OL were being worked by the East Coast stations at considerably higher signal strength on the previous evening. Incidentally, it is of interest to remark once again how little power is required on this band when conditions are good. OZ9OR was running two

# VHF BANDS

A. H. DORMER (G3DAH)

watts only to a 2m. diameter dish!

A welcome newcomer with SSB on 23 cm. is G6NB if you are looking for Bucks. Also new to the band is G8GNZ of Chelmsford. He uses an MV1808 varactor diode in a tripler and gets about 5 watts out of it for 10 watts input on 70 cm. The antenna is a 30-ele. job based on the G8AZM design. The pre-amp on reception is a HP35821E, which Geoff claims out-performs the BFR90.

What a pity that the July Jubilee contest over the same weekend (July 5/6) did not embrace 23 cm.! A few Continentals, who had a parallel contest, called for 23 cm. on 70 cm. and, if they could persuade British operators away from 70 cm. (and 2m. for that matter) had little difficulty in making contacts.

## Seventycems

Conditions over the period at the end of June and start of July were quite phenomenal, with really good extended tropo, propagation and high pressure systems combining to bring many contacts from the South of this country into GM, SM, OZ and LA. A notable feature of this opening was the relatively small arc over which these contacts could be made. The Jubilee contest at the beginning of the month highlighted this in that it was very difficult to get into the West and North-West of the U.K. but as easy as the proverbial log-falling to work the Continent, particularly to Scandinavia. An example which illustrates this point is that of G3PMH/A, operating from near Royston, who made over 100 contacts on the band of which 75% were Continental.

To bear out the contention of the presence of ducting which did not terminate in the North-West, GD2HDZ found the band comparatively dead except for DC1XC on what he describes as "the outstanding evening" of June 23. G3BW in Cumbria echoes this report (although he did make it with G3DAH on July 8) and it seems that G3KMS (Bolton) was also having a fairly lean time of it, even during the Jubilee contest. Readers who are short of contacts on this band might like to note that the three British callsigns mentioned above are to be heard on 432.2 MHz every evening except Saturday at around 2230 BST in three-way QSO which anyone is invited to join. They usually beam South-east. G3BW now has a 4CX250B on this band yielding about 100 watts of RF to a 68-ele. beam at 45ft.,

so should be fairly potent over quite an area. If conditions are right, you might also hear GW3FKB in Anglesea and G13JLA in Tyrone at around the same time, and the five of them would make a very nice DX haul. GM8FFX (Kincardine) has only low power on 70 cm. but his excellent QTH is helping him to make some good DX contacts. And welcome to G4BWG (London) who is now QRV on 70 cm.

This Column has remarked before on the increase in SSB on 70 cm. and the superiority of this mode over others (with the exception of CW) and it was interesting to learn from a report by G2AXI (Basingstoke) that in the eight weeks he has been running SSB he has had more contacts than in any previous year. *Verb sap!*

## Two Metres

Probably the most interesting feature of this band during the last couple of weeks was the intense Sporadic-E opening on July 2. According to G3NSM (Oxford) he observed two phases, the first between 0951z and 1038z and the second between 1127z and 1133z, the later period being much more subject to deep QSB than the first. He worked YU1EXY, who was signing as YZ1EXY, four HG, one OK and LZ1AB, LZ1BW, LZ1AG, LZ2FR and LZ1FO, the best DX being LZ1AG who is in QRA MC64e. All contacts were on CW. He reports also that ZB2VHF was heard as far north as Berwick, but has no further details. His score in the few days around that date was 21 different countries!

Up in Carnforth (Lancs.) G4CZP also recorded the Sporadic-E opening. He first observed signs of it at 1130 BST when Band II was full of Continental FM. The bottom end of 2m. showed signals from HG and LZ and a GW in Anglesea was heard working OE and HG on SSB. A check with G4CDF

## TWENTY-THREE CENTIMETRES ALL TIME TABLE

Station	Countries	Countries	Total
G4BEL	28	7	35
G3NHE	24	5	29
G3DAH	23	4	27
G3JVL	21	4	25
G4BYV	17	7	24
G3OBD	20	3	23
G8ARM	20	2	22
G4ALN	18	3	21
G3JXN	19	1	20
G3COJ	15	3	18
G8AOD	11	2	13
G5DF	11	1	12
G8FMK	11	1	12
G8FJG	7	1	8
G8ABH	7	1	8
G8AII	5	2	7
G8GNZ	4	2	6
G8EOP	1	2	3

in Scunthorpe confirmed that he was also hearing the opening and had worked into LZ, YZ and HG on CW at 1030z. From about 1200z, 'CZP was hearing Spanish broadcast stations on Band II and at 1253z, ZB2VHF appeared on 144 MHz at up to 5 & 9+20 dB with deep QSB and remained audible until 1310z. Unfortunately, the station was operating in beacon mode and no contact was possible—which is a pity since this would have been a G/ZB2 "First" on 2m.

G4CZP also reports a good lift to EI and GI on June 24 (tropo., not Es of course) and his report indicates more SSB activity from EI than one hears of regularly. He quotes as active: EI7D, EI9CT, EI2AK, EI9Q, EI5BA, EI5BH and EI5P.

The Cambridge Wireless Club operating as GM4CIK/P during June seems to have had a very successful trip and have given contacts on 4m, 2m, and 70 cm. to many operators in the Midlands and the South.

Comment about the superlative conditions on 2m, during June and early July is probably superfluous here—they must have been obvious to nearly all. However, details of outstanding achievements which can be incorporated in this Column next month would be welcome.

#### Beacons & Repeaters

Here at home, the Wrotham 2m. beacon has been taken out of service for fundamental modification to the frequency generating circuit—at present a 4 MHz xtal—and an investigation into certain *spurii* on and around the transmitted frequency. The proximity of high power, FM transmissions from the site will probably be found to be responsible for some of these as they carry programme material and there could be all sorts of unexpected mixing effects. The problem is complicated by the apparent

directivity of some of the "weirdies". For example, when GB3VHF was brought on to high power, your scribe did a number of tests with G3COJ, the beacon keeper and, although the signals were well over the RST599 mark at this close range, no *spurii* could be detected, although they were being reported from Essex and further afield to the North. (Even G4CDF up in Humber-side can hear them when the band is open). At one time it looked as if the complainant's receiving equipment might be at fault in that Liners appeared to be badly affected, but further tests showed that the trouble was not confined to this particular transceiver. It is conceivable, of course, that defective metalwork, guys and so on, may be causing the unwanted radiation—it has happened before—and one must hope that a thorough investigation will be made at the site. Meanwhile, the beacon Tx is being modified to generate the 144 MHz frequency from a 72 MHz xtal and doubler which should yield a cleaner signal. Don't expect operation to be resumed for some weeks yet.

Continental beacons which were audible in the U.K. during the recent openings and which will be new to many are:—SK6UHF, QRA GR71e, on 432.053 MHz; LA1UHF, QRA FT04j, on 432.07 MHz; DB0IZ on 1296.01 MHz, and OZ6MBA on 432.45 MHz. The latter, in particular, seems to radiate a very good signal into this country and has been audible at up to 5 & 9+ recently for days on end.

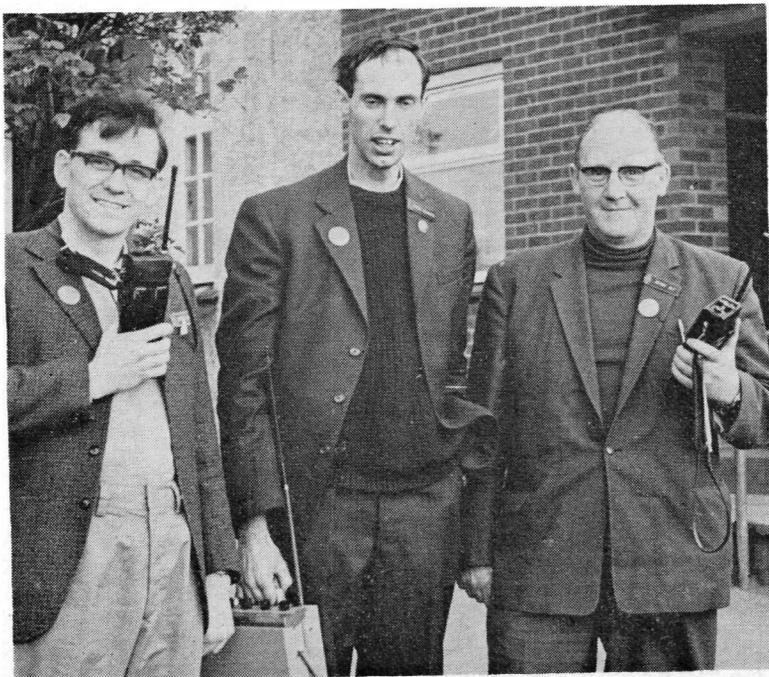
GM8BRM reports working through the Norwegian 2m. repeaters recently. They are on Channel R6 and R8 in Bergen and Stavanger respectively. He had five contacts through them using the IC-225 (which has a repeater facility built in) and a ground-plane antenna, also 18 contacts with LA direct, including one with a mobile in Stavanger who was better over the direct

path than through the repeater! He has recorded these contacts, and says that if any LA operator who might see this would like a copy, he will send one along.

The Barnsley 2m. repeater is now in restricted operation most evenings, 1730-2100 clock, and most weekends. Callsign is GB3NA on Channel R3 with 1750 Hz access tone. Polarisation is vertical and results from mobile tests have shown good coverage in the Leeds, Sheffield, Rotherham, Doncaster and Goole areas. Further afield, and from fixed stations, reception has been reported from Hull, Beverley and Lowestoft. The gear should shortly be operating on a fully automatic basis and reports or further information may be sent to, or obtained from, G8IWA, QTHR.

An assessment is being made of the requirement for a 2m. repeater in the Tyne & Wear area, and those interested are advised to contact G3WYW, QTHR, in order that the fullest possible account may be taken of local views on the matter.

The Kent Repeater Group are progressing rapidly with the design for GB3KR and will be showing some of the equipment and discussing their plans at the next meeting of the South-east UHF/VHF Group at the University of Kent, Canterbury on July 25. The application for the licence has been sent to the Home Office for action. The Essex Repeater Group have reached the stage at which the application for their 70 cm. installation has been passed to the Home Office for approval, and a certain amount of equipment has been procured. This is commercial gear and needs much modification, the more so since they are planning to go for 1.6 MHz spacing between the "transmit" and "receive" frequencies, as recommended by the Warsaw Conference. The antenna is a bit of a monster—a vertical stack of co-axial dipoles 20ft. long which will



Round Peterborough way, there is a net, operating daily on 145.00 MHz, using hand-held transceivers. Left to right, they are G3RED, G3TGO and G8GNV, all members of the Peterboro' Amateur Radio Society. They function as the "Industrial Net" (or "Three Musketeers") during the works lunch-hour.

have an estimated gain of 10 dB and should give coverage over the area Brentwood, Grays, Southend, Bishop's Stortford, Halstead, Dunmow and Colchester. They need all sorts of help, and if you are willing to give them a hand please contact G4CUE, *QTHR*.

There appears to be a certain amount of "feet-dragging" over the issue of the licence for the Central Scotland repeater, application for which was made 18 months ago. Progress with the bits and pieces is rapid now. GM3BJF has produced the solid-state Tx giving some 25-30 watts output, and the Rx is now working, which leaves but the logic and control circuits on which progress is slower. A draft specification has been prepared for GB3GL and GB3ED, the Glasgow and Edinburgh 70 cm. repeaters, and will be submitted in due course.

#### DX-Peditions

The Oxford University Radio Society are mounting an expedition to Guernsey between August 28 and September 9. They will have SSB and CW on 4m., 2m. and 70 cm. and the call signs will be those of the Society—GC3OUR/P, and participants GC3YGF, GC4ASQ, GC4ASV, GC4BIX, GC4BYB and GC8ICZ. They will be operating mainly in the evenings and are prepared to make skeds for 4m. and 70 cm. *only*, via G4BIX, *QTHR*.

G3XDY, G3ZSS and G4CVI are preparing for another trip to GM this year following their most successful effort last season which, in spite of the absence of advance publicity, brought them several hundred contacts on 2m. and 4m. This year they will have three bands available: On 4m.—50 watts, CW/SSB with 4 or 8-ele. Yagi, 2m.—150 watts, CW/SSB with 10-ele. Yagi, and on 70 cm.—150 watts, CW/SSB with 2 x 46-ele. Yagis. The itinerary has not yet been finalised, but will start off on August 31 in Selkirk and provisionally include Peebles, Stirling and Kinross on succeeding days. Between September 4—8, they will be organising for, operating in and recovering from, VHF/NFD, in which they propose to participate from a "secret site". From the 9th to the 14th, they plan operation from Kincardine, Banff, Aberdeen and Northumberland. Times and frequencies are as follows: (All BST) 1800-2000 as GM3XDY/P on 144.27 MHz, 2000-2130 as GM3ZSS/P on 432.3 MHz, and 2130—2230 as GM4CVI/P on 70.2 MHz. Skeds for 4m. and 70 cm. *only* may be arranged via G3XDY, *QTHR*.

We are pleased to report the success of the team of GM8FVC, GM8IZH and G4BTW on scaling the three highest peaks in Scotland, England and Wales in 24 hours, and operating on 2m. from all of them. Readers may recall that bad weather earlier in the year prevented them from making the attempt scheduled for April, but all went well for the weekend of July 5. Congratulations to them on an unusual exploit.

#### Up in GM

We have been taken to task by GM8AKB for suggesting in our report on the May 31/June 1 contest that there was "an absence of 2m., GM contacts in the South." Operating /P with a Liner, he made several contacts with portables in QRA ZM and ZL and one supposes that it is a matter of debate just where South ends and Midlands begin. Certainly, one had in mind rather QRA Locators AK and AL when the comment was

## THREE BAND ANNUAL VHF TABLE

January to December 1975

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
GD2HDZ	34	4	58	10	31	6	143
G3DAH	31	3	47	8	35	10	134
G3ZMD	23	2	54	12	28	7	126
G2AXI	27	2	47	9	23	5	113
G3BHW	—	—	55	16	30	9	110
G4BWG	34	3	57	14	1	1	110
G4BYP	34	4	56	11	—	—	105
G3FIJ	38	3	44	9	6	3	103
GM8FFX	—	—	79	14	4	3	100
G3BW	—	—	57	11	27	5	100
G4CZP	—	—	74	13	—	—	87
G8IAT	—	—	76	11	—	—	87
GM4CXP	14	4	49	13	4	2	86
G8EOP	—	—	40	12	20	4	76
G18HXY	—	—	59	9	5	3	76
G8BKR	—	—	57	9	6	2	74
G3FPK	—	—	56	12	—	—	68
G5DF	34	4	—	—	26	3	67
G8INL	—	—	56	9	—	—	65
G8GLS	—	—	54	10	—	—	64
G13JLA	5	4	38	10	3	3	63
G8GHZ	—	—	50	9	3	1	63
G4AJE	—	—	35	8	15	3	61
G8FMK	—	—	26	2	25	4	57
G4AEZ	5	1	20	9	16	5	56
G8ABH	—	—	29	4	17	5	55
G8FWB	—	—	47	8	—	—	55
G8GII/P	—	—	47	7	—	—	54
G4DNJ	—	—	45	8	—	—	53
GW8HVP	—	—	45	7	—	—	52
G4AIR	29	4	7	2	—	—	42
G4AGE	—	—	23	9	6	1	39
GW8GLG	—	—	30	3	—	—	33
G3EKP	7	3	15	5	1	1	32
G4BKY	—	—	8	2	—	—	10

The Table shows claims to date from January 1, 1975 and will close on December 31, 1975. All claims should be sent to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ as soon as possible after the start of a new month.



"... hearing you now I've got the cans on ..."

made and, from reports received, it does appear that operators that far to the South were very short of GM contacts, however eagerly they may have been sought. It is always a pleasure for the Southrons to make it with GM, so it wasn't for want of trying, and one hopes that the converse is equally true. He also comments on the Liner as a popular piece of gear to take on a portable expedition in spite of its (usual) limitation to below 144.35 MHz and suggests that G station operators should be encouraged to look for GM between 144.15 MHz and 144.20 MHz. Now, here we must differ and point out that this is just about the *worst* area to look for a GM/GI running 10 watts to a portable antenna. Unless one can make a considerable noise—400 watts p.e.p. and a Parabeam for example—the QRM in the South around those frequencies, which has to be heard to be believed, makes it almost impossible, certainly under contest conditions, for a weak signal to be copied, and a far better bet is to get the Liner crystallised for further up the band, or at least to get as near to the upper frequency limit of 144.35 MHz as possible. Chaps *do* tune up there! It was noticeable on this occasion, as well as during the excellent openings at the beginning of July, that operators were catching on to this practice and that SSB was appearing well up the band with good DX results, which would have been much more difficult, if not indeed impossible, if they had been attempted at the very centre of congestion around 144.2 MHz. Reports on activity and conditions from GM and GI are always very welcome, since your scribe cannot *always* get into those countries on 2m. and so get the hottest of hot news, and the prompter the better of course, since there is always a deadline to be met! Glad you brought these matters up, Gordon.

Having said all that about low-power portable operation, it must be qualified by a consideration of propagation conditions prevailing at the time. June 30, as most of us must now know, produced some fantastic DX and GM3VFB was one operator who was able to take advantage of them—and a good site on the Cairn—to make 70 Continental contacts on 2m. in four hours

of operating—and that using a Liner and a 4-ele. beam! He heard several Continental repeaters and was able to access that at Stavanger on R6 and also to contact LA3EQ/M, using an IC-2F, who was a better signal over the direct path than he was *via* the repeater. Very nice going!

GM8FFX in Kincardineshire has also been having a ball on both 2m., which we expect of him, and on 70 cm. which is more unexpected since he is only running one watt of SSB. Recent QSO's on that band have been with G3LQR (Suffolk), PA0VV, DK1KO and G3BHW and G3DAH in Kent. He reports an enormous pile-up of LA stations on 2m. during these good conditions, with LA3RP and LA3EQ by far the loudest, and notes that LA3EQ should be an even better signal shortly when he completes his 500-watt linear. GM3ZBE (Aberdeen) has also been a very good signal on both 2m. and 70 cm. and has made it on the higher frequency with F9FT, DL and OZ among scores of G stations. GM3EOJ now has his *Micro-wave Modules* transverter working on 70 cm. and is using it with good effect to raise the DX, both direct and *via* Oscar VII.

Finally, a reminder about the Scottish VHF Convention. Venue is the Treetops Hotel, Aberdeen, date is September 13. Tickets cost 50p for the Convention only and £3 for Convention and Dinner, and may be obtained from GM8FFX or GM4BKV, QTHR. More details later.

#### VHFCC Awards

To Owen Cross, G4DFI of Bexleyheath, Kent, goes Award No. 242 for 2m. The necessary contacts were made between September, 1973 and June, 1974 the delay in forwarding the claim being due to the non-arrival of the QSL cards! At that time he was licensed under the call G8HYH. For some time he ran 10 watts of AM from a home-built Tx and the FR-DX400S Rx with a 6-ele antenna at 16ft. but has added a Liner to the set-up with which he hopes to be doing quite a bit of portable and mobile work and to gravitate to bands other than 2m. when things permit.

Award No. 243 goes to Vincent Moll,

G8IMV of Maidenhead, Berkshire, this again for 2m. contacts. He first obtained his licence in February, 1974 but his interest in Amateur Radio goes back to his school days in 1927 when he started building receivers. After a lapse of some 45 years, his interest was re-awakened and he joined the Maidenhead & District ARC in 1973 and, helped and encouraged by the members of the Club, to whom he pays tribute, he took the R.A.E. in December, 1973 and received his licence in January, 1974. The Club got him going with a small, two-watt Tx and this with his FR-DX400 and a 5-ele. beam in the loft, saw him on the 2m. air. He has since added a Liner and a FT-220 to the station equipment, and the antenna is now 10-ele. Yagi at 20ft. He uses the Liner to transvert to 70 cm. His next aim is to pass the Morse test.

Reg Kemp, G3YFF of Battle, Sussex, gains Award No. 244 for 2m. He had his first QSO on 2m. on August 30, 1970 using a TR2002 modified as described in *SHORT WAVE MAGAZINE* for March, 1970 and this is still in use, although a 40-watt Tx has now been added. The Rx is an EC-12 with pre-amp and the antenna an 8/8 slot at 40ft. The QTH is at 100ft. a.s.l. but the ridge at 300ft. between Battle and Hastings gives considerable screening in that direction.

Apologies to G4AGE and G3NHE for the omission of their VHFCC Awards Nos. 17 & 18 for 70 cm. from the Table published last month.

#### Auroral Warning Net

An auroral warning net covering England, Scotland and Wales, with links from Sweden, has been set up under the auspices of Charlie Newton, G2FKZ, QTHR, who is the Region I IARU Auroral Studies Co-ordinator. It involves a series of telephone links and is activated in the event of an aurora appearing on any of the VHF bands. Scattered observations, such as are possible under this arrangement, have great scientific value and, although you may not be a member of this net, reports to G2FKZ will be most welcome.

#### General

We are sorry to learn that Joe Ludlow, GW3ZTH, will be leaving the U.K. for South Africa and we take this opportunity of wishing him well in the new country of his adoption. He suspects that there may still be correspondence arising from articles on the 2m. transverter and linear amplifier which he had in the *Magazine*, and asks that any queries should go to GW8EHK, QTHR.

Letters are still being received about the counties and countries which qualify for the VHF Tables. The full list of counties was published in the April, 1975 issue. This list will be amended when the new Scottish Regions are brought into the scheme in January, 1976. There seems to be little controversy about countries, except to point out, yet again, that DM is a separate prefix and that all other German prefixes count as one country only.

#### Deadline

That wraps it up again for this month. Deadline for the next issue is August 9. Please send your reports, news, views and comments as usual to: "VHF Bands", *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ. Cheers for now and very 73 de G3DAH.

## THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for September issue: August 7)

### The Reports

First we must mention the special-interest groups, such as R.A.I.B.C., who cater for those unfortunate SWL's and licensed people who are either blind or disabled. Here, perhaps, this time the most important thing is to note the change of secretary—see the address panel—to which new QTH all correspondence should go, as well as subscriptions, which fell due at the end of June.

A.R.M.S. is the Club which caters for the mobile interest, largely through their *Mobile News* issues, with various other services. Details can be obtained from G3FPK—see Panel.

Then there is the G-QRP Club; devoted to low-power activity on all the amateur bands, with a *Newsletter* which is usually full of interesting material on the QRP front, home-building QRP gear, improvements to commercial equipment, QRP contests, and so on. For those old-timers who harken nostalgically back to 30 years ago when a transmitter had to be constructed to get on the air at all, and when the "Spirit of Amateur Radio" still meant something, to try QRP operating and building, and join the QRP Club could be just like old times!

### Scotland & North

It rather seems that at Glenrothes, playing contests is a major interest, and they in fact had two stations out for Field Day, piling up a handsome score in the process, and enjoying all the fun of a weekend out. For details of the Club's activities, get in touch with GM3YOR, as Panel.

The programme for a course on Basic Electronics is being mapped out this month, for a start to be made in September, says the Star report. The group foregather on Wednesday evenings at the New Inn Hotel, Bramley Town Street, Bramley, Leeds 13.

It looks as though the Sunderland chaps are out of it until September, as their venue at the Sunderland Polytechnic does not re-open until then, so the new Secretary is looking for something better meantime. This being the case, for the very latest information we must refer you to G3DQA—see Panel.

Lots of things are going to happen, or have already happened, to entertain the York group. For example, they had an evening at the University of York Physics Dept. where many interesting experiments had been arranged for them, so much so that a repeat visit seems on the cards. Then there is the special-activity station set up at the

National Railway Museum for Opening Day on September 27—for which the committee well and truly earned their keep by clambering all over the roof of the building looking for fixings for the aerials! They also have the Tollerton Show on August 16, just to keep in training. On top of it all every Thursday evening sees them heading for the Hq, which is the British Legion Club, 61 Micklegate, York.

There are a couple of reports from White Rose, and a sample of their *Newsletter*, which contains quite a good piece on their "Talkbox" for ten metres, and some cartoons of well-known club members. This group are based on 83 Town Street, Armley, Leeds 12, where they can be found on any Wednesday evening, and on the first Sunday morning in each month from 10.30 to 1.30 p.m.

### Midlands

At the time of their last *Newsletter*, the Midland lads had nothing specific lined up for August 19 or September 16; but doubtless something will have been fixed up since then. The venue is the Birmingham and Midland Institute, which is a place known to just about everyone in the Club catchment area; if you are one who may not, then get in touch with the Secretary, as Panel.

On now to Spalding with a very large membership who keep in touch by way of their very fine *Newsletter*. August 8 is, we see, the one to mark in your diary for a visit, and the venue is the Ship Albion, Albion Street, Spalding, for a ragchew and sale-and-swap session.

It is all Activity Nights at Nottingham in August, except that August 7 is down for a Forum. On Thursdays, then, you head for Sherwood Community Centre, Mansfield Road.

Friday is the formal meeting night for South Manchester each week, at Sale Moor Community Centre, Norris Road, Sale; Morse classes precede the main activity. Then, on Mondays, the VHF and D/F-oriented types have another session, this one being at the Club shack. August 1 is a Club Quiz, August 7 a Discussion on Contest Operation, August 15 a complete change by way of a talk on PAL Colour TV System, by G4AOK. This leaves August 22 for a Night on the Air, and the 29th for a mystery lecture.

Up to Wirral we go next, where the routine has for long enough been to get together on the first and third Wednesday of each month at the Sports Centre, Grange Road West, Birkenhead. August 6 is a "special" insofar as we understand it is a Fox Hunt.

Another Wednesday-favouring group is that at Derby, saving that they do it every week, up on the top floor at 119 Green Lane. A Surplus Sale appears for August 6, and preparations for the famous Mobile Rally are made the priority for the 13th. A D/F Practice keeps 'em amused on August 20, and on the 27th they come back indoors for a film show.

For August, Cheltenham forsake their usual evening at the Royal Crescent, Clarence Street on the first Thursday which they normally have, in favour of a conducted tour of the Dowty-Rotol organisation at Staverton; assemble outside the main gate on the old A.40, at 1930 on Thursday August 7, where G3VTS will meet them.

Most Tuesdays there is an informal meeting of the Bury & Rossendale gang, but the second one in each month is always set aside as a "main meeting" with some sort of talk or whatever. They have now

Group at the BARTG convention at Meopham, Kent on May 24—left to right: G8FKO, G8GNV (who also appears in the picture on p.336), G8IZA (the photographer), G8FXV and PA0QRP (who has a nice callsign suffix).



### Names and addresses of Club Secretaries reporting in this issue:

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3 8LB.  
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2 1EZ.  
 BISHOPS STORTFORD: C. Harlow, G8BTK, Thorn Cottage, Old Mead Lane, Henham, Elsenham, Bishops Stortford, Herts.  
 BURY & ROSSENDALE: M. Howarth, G8ECM, 11 Worthington Avenue, Heywood (65911), Lancs.  
 CHELTENHAM (RSGB): G. D. Lively, G3KII, 131 Mandaring Way, Wymans Brook, Cheltenham (34783), Glos.  
 CHESHUNT: R. E. Chastell, 4 Fairley Way, Cheshunt, Herts., EN7 6LG.  
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 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.  
 CRAY VALLEY: M. Tripp, G3YWO, 57 Cathcart Drive, Orpington (38199), Kent.  
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 DUNSTABLE DOWNS: C. W. Stedman, G3XWS, 10 Wychwood Avenue, Luton (27798), Beds.  
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 HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford (3237).  
 MAIDENHEAD: E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead (20107), Berks., SL6 5LA.  
 MIDLAND: A. L. Walton, G3ZKQ, 243 Barnes Hill, Birmingham, B29 5UJ.  
 MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (3552), Sussex.  
 NEWPORT (Gwent): Enquiries to L. A. Groucott, GW3YTT, 2 Durham Road, Newport, Gwent.

NORTH KENT: R. Wells, G4ARQ, 12 Bulbank Road, Belvedere, Kent.  
 NOTTINGHAM: M. C. Shaw, G8IPH, 50 White Road, Nottingham, NG5 1JR.  
 QRP: G. Dobbs, G3RJV, 61 Park Street, Cleethorpes, South Humberside, DN35 7NG.  
 R.A.I.B.C.: Mrs. R. Shepherd, G3NOB, 59 Paintain Road, Loughborough, Leics., LE11 3LZ.  
 REIGATE: R. Wells, G3RIN, 5 Cronks Hill Road, Redhill, Surrey. (Reigate 47659.)  
 SOLIHULL: L. G. Boswell, G4AEJ, 170 Kestrel Avenue, Yardley, Birmingham, B25 8QX.  
 SOUTHGATE: B. Oughton, G4AEZ, 48 Morley Hill, Enfield. (01-366 7166.)  
 SOUTH MANCHESTER: C. Scholefield, G8GDM, Silverdale, 57 St Werburgh's Road, Chorlton-cum-Hardy, Manchester.  
 SPALDING: R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs. PE11 1QX.  
 STAR: T. Leeman, G4BUU, 599 Dewsbury Road, Leeds, 11.  
 SUNDERLAND: D. Macken, G3DQA, 6 Crossways, East Boldon, Tyne & Wear, NE36 0LP. (Boldon 2274.)  
 SURREY: S. A. Morley, G3FWR, 22 Old Farleigh Road, Selston, South Croxson, G42 8PB. (01-657 3258.)  
 SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Sutton, Surrey.  
 TORBAY: M. Yates, G3UIQ, Top Flat, 23 Waverley Road, Newton Abbot (3025), Devon.  
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, Herts.  
 WHITE ROSE: K. Robson, G3VTY, Flat 7, 34 St. James Drive, Horsforth, Leeds, West Yorkshire.  
 WIRRAL: H. I. Crofts, G3DLF, 3 Barmouth Road, Wallasey, Merseyside. (051-638 2515.)  
 WOLVERHAMPTON: J. Nicholls, G8GCV, 27 Denham Gardens, Finchfield, Wolverhampton, WV3, 8LW.  
 YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

got their 18AVT up on the top of Hq. at the Mosses Community Centre, and it is being tested prior to putting the Club station back on the air.

That Dud Charman "Aerial Circus" meeting proved well worth while, reports G4AEJ from Solihull, one visitor even coming in from as far afield as Hereford to make the number on parade up to a couple of hundred—not a bad audience even for G6CJ, who always brings 'em in in droves. It will be a bit of an anti-climax only to have a film show on August 19, at The Manor House, High Street, Solihull.

Although it is eight years, it seems like just yesterday to the older members of Hereford, recalling the inaugural meeting. However, memories don't, sad to say, tell us what is happening to the thriving 1975-style Hereford group. However, we understand they can be found on the first and the third Friday in the month at the County Control, Civil Defence Hq., Gaol Street, Hereford; for the rest, we suggest you check with the secretary.

#### Wales & West

Here we must start by mentioning the desire to form a Club in the area of Newport, Gwent, where an inaugural meeting is set up for September 19 (a Friday) at 1900. The venue for this meeting will be Brynglas Community Centre, Brynglas Hill, Newport. Anyone who means to be there would do well to get in touch with GW3YTT, who is doing the "sparkplugging." Let us hope these efforts turn out well, and add another fine outfit to the lists. (As a matter of interest there used to be an active Club for the district called the Monmouthshire Radio Society—but that was more than 40 years ago!)

The Cornish newsletter usually has some interesting reading-matter, the current one discussing the barometer and also a description of a vertical aerial of a novel type. On the question of the August gathering, it is stated to be on August 7, for a talk by G3NPB on Aerials. As usual, the venue will be the SWEB Clubroom, Pool, Camborne, Cornwall.

Visitors to the Torbay area will be welcome to the club get-togethers on Tuesday evenings at Hq., Bath Lane (rear of 94 Belgrave Road), Torquay. The "formal" session is down for Saturday August 30, when the programme was, at the time of writing, still "in the melting-pot." For more details, contact G3UIQ, as Panel.

#### Now the South

First we call at Bishops Stortford, where, by tradition, there is

nothing in the nature of a formal meeting in August, the normal third-Monday date being given over to a general natter. This is at the British Legion Club, Windhill, Bishops Stortford.

At Verulam, rising costs have forced up the group's annual expenditure to somewhere near the £300 mark, and so the committee are actively pursuing a hunt for ways of economising, among these being a change of Hq. This being the case, we suggest that if you do intend to pay a visit, you get in touch with G3YHY first and if you have any suggestions for a suitable meeting-place, preferably near St. Albans and on a public transport route, capable of holding up to 60 persons, and adequately warm in winter, then pass this on to him as well. In addition to the normal dates, he will be able to tell you about the summer evenings spent at Salisbury Hall, London Colney.

Cheam Library opening times have been changed, with the result that dates previously mentioned have gone by the board. For August the revised date is August 20, a Wednesday. More details from the hon. secretary. The club? Sutton & Cheam

The Croydon area is covered by Surrey, from their Hq. at the Ship Inn, Croydon. However, we do not have the August details at hand, so we have to refer you to G3FWR for the gen.

One way of getting in touch with the Dunstable Downs lads would be to look in at the Woburn Mobile Rally talk-in stations on August 3, which they will be running. Otherwise, head for Chews House, 77 High Street South, Dunstable, on any Friday evening. On August 1, they will be having a /M night, four to a car, taking different routes to a secret rendezvous, working /M via a control station as practice for the Rally. Chatting at the clubhouse takes up August 8, and a Club Quiz the 15th the sides for the teams being picked on the night August 22 is down for a non-formal exchange of ideas at the Clubroom and on August 29 a prize goes to the best try at a short talk on any subject connected with Amateur Radio by a young member under twenty-one years of age.

In order to attend a session of the Southgate folk, you must first arrange to be free on the second Thursday in the month. On this evening, you head for the Scout Hut, Wilson Street, Winchmore Hill Green. This is accessible by British Rail to Winchmore Hill, 123 'bus to the bottom of Station Road and walk up the hill, or a 125 'bus from Southgate Tube station to the Chase Side Tavern, from whence walk up Church Hill to the Green.

For Echelford one sees the form is the second Monday and the last Thursday evenings, at St. Martin's Court, Kingston Crescent, 7.30 for 8.0 p.m. August 11 sees Roy Fairs explain how a recording

is made and distributed so as to appear finally in the home, and on August 28, the entertainment will be in the form of a series of minilectures, which are said always to prove of interest.

North Kent have the second and fourth Thursdays of each month booked at the St. Mary's Institute, 2 North Road, Bexley. For August, we have no details of the activities, for which you should contact the Hon. Sec.

For details of the Mid-Sussex group, based on Marle Place, Leylands Road, Burgess Hill, we should normally refer you to the secretary—however, G3JMB is laid up following a heart attack, so this time we are directing your queries to his predecessor—see Panel. Meanwhile, let us all wish G3JMB a speedy and complete recovery to health and strength.

A "Members Evening" is the fare for Reigate on August 19, when members will be bringing along their bits of home-brewed gear or indeed commercial stuff, to show the others. The Natters are at the Marquis of Granby, Hooley Lane, Redhill, starting at 8.30, for which the August date is 5th.

The high-light of the evening for the lads at Acton, Brentford & Chiswick on August 19 will be a sked with members G3CCD who will be in France as F0UT. FT-101 transceivers will be used at both ends of the path. Meetings are at 66 High Road, Chiswick, as usual.

We immediately noted the large letters on the Chiltern newsletter front page. This advises the membership that after August they will no longer be able to use the existing venue at the Ernest Turner works in High Wycombe. Therefore, suggestions are urgently wanted

for a new Hq., and these can be passed on to the committee at the last couple of evenings at the old QTH, on August 12 and 27 respectively.

Now to Cray Valley, where they have two meetings each month at the Eltham United Reformed Church Hall, 1 Court Road, London S.E.9, on the first and third Thursdays of the month; the first is the formal, the second the natter-sessions.

July 30 is an Extra-ordinary General Meeting, and not as mentioned last time round, the Cheshunt. In August there are two evenings devoted to Morse, followed by informal chatting, these being August 13 and 27. On 6th, G8GXA will be talking about the Telford range of gear, and on August 20, the subject will be Metalwork for Radio Amateurs, by G8JXU.

David Grant of the BBC will be at Maidenhead on Thursday August 7, to talk about Microwave Links; this is followed on Tuesday August 19 by a discussion on the arrangements for VHF/NFD. Both dates are taken at the British Red Cross Hall, The Crescent, Maidenhead, starting at 7.30 p.m.

#### Finale

We have reached the bottom of the pile once again; so the next batch of reports will be giving coverage of the September goings-on, and should be timed to reach us by first post on August 7 latest, which is the usual 22 days before publication date of August 29. The address, as always, is "Club Secretary," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18-1RQ. Meanwhile, 73.

## NEW QTH's

This space is for the publication of the addresses of holders of new callsigns, 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. Be sure to give correct County designation and post-code. Address items for this space to: "New QTH Page," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ.

EI3CV, J. Daly, St. Kieran's, Rope Walk, Black Rock, Cork City, Eire.  
 EI7CV, S. Linehan, 9 Oak Lawn, Castleknock, Co. Dublin, Eire.  
 EI0CT, W. C. Nolan, 25 Beech Park, Athlone, Co. Westmeath, Eire.  
 G4DWO, W. Ingham (ex-G8HZA), Westfield Villa, Westfield Road, Horbury, Nr. Wakefield, West Yorkshire.  
 G14DXK, W. J. Gordon, 14 Ashgrove Park, Strabane, Co. Tyrone, N. Ireland.  
 G4DXO, P. D. Jones (ex-G8GVT), 43 Broad Rig Avenue, Hove, East Sussex, BN3 8EW.  
 G14DYE, E. MacIntyre, 22 Olympic Drive, Strabane, Co. Tyrone, N. Ireland.  
 G4DZF, M. C. Foulds, 140 Elmstead, Tanshouse, Skelmersdale, Lancs., WN8 6BY.  
 GM4DZK, R. F. MacLeod (ex-GM8HYX), 34 Rotherwood Avenue, Knightswood, Glasgow, G13 2RJ.  
 G4EAX, J. Gell, 94 Glapton Lane, Clifton Estate, Nottingham, NG11 8DF.  
 GM4EBP, R. Short, 11 Great Cross Road, Kirkcudbright, Stewartry of Kirkcudbright,  
 G4EBR, N. Beharrell, 21 Brent Avenue, Longhill Estate, Hull, North Humber-side, (Tel: 701390).  
 GM4ECL, A. MacConnachie, 24 Meteor Row, Leuchars, Fife, KY16 0JL.  
 G4ECQ, P. Gamble (ex-G8JUR), 70 Hollywood Lane, Hollywood, Birmingham, Hereford & Worcester, B47 5QJ.  
 G4ECY, P. Walker, 10 Langham Drive, Burton Joyce, Nottingham, NG14 5EJ.  
 G4EDC, R. C. Vane-Stobbs (ex-G8JOG), 47 Palmerston Avenue, Goring-by-Sea, Worthing, Sussex, BN12 4RN.  
 G4EDV, W. Duddle (ex-G8FRR), 28 Rannerdale Drive, Whitehaven, Cumbria, CA28 6JZ.  
 G4EDW, P. Eaton (ex-G8HNH), 12 Corone Close, Folkestone, Kent, CT19 5LJ.

G14EEB, W. M. Fitzgerald, 79 Roddens Crescent, Castlereagh, Belfast, BT5 7JP, N. Ireland.  
 G8JAC, A. J. Jackson, 27 Ellesmere Drive, Hamsye Green, Sanderstead, Surrey, CR2 9EH.  
 G8JJE, B. G. C. Thompson, Tech. (CEI), 21 Birling Place, Corby, Northamptonshire, NN18 0LZ.  
 G8JWS, D. W. Sherwen, 101 Main Street, Frizington, Cambria, CA26 3PE.  
 G8JYB, M. France, 106 Harvey Lane, Golborne, Warrington, Greater Manchester, WA3 3QL. (Tel: Ashton-in-Makerfield 75904).  
 G8KDU, R. D. Eager, Darwin College, The University, Canterbury, Kent, CT2 7NY.  
 GM8KDY, D. W. Calder, 36 Gartshore Crescent, Twechar, Kilsyth (821967), Glasgow, G65 9SX.  
 G8KEN, K. Crouch, 78 Millfield, Hawkinge, Folkestone, Kent, CT18 7DQ. (Tel: 0303-89 2848).  
 G8KGV, P. M. Jessop, 28 Moor Lane, Rickmansworth (74646), Herts., WD3 1LG.  
 G8KHH, C. F. C. Young, 70 Upper Close, Forest Row, East Sussex, RH18 5DS.  
 G8KHJ, P. G. Chapman, 12 Crest Gardens, Mapperley, Nottingham (63828), NG3 5GD.  
 G8KHR, B. Robinson, 10 Clement Avenue, Balderton, Newark, Notts., NG24 3NT.

#### CHANGE OF ADDRESS

EI6BT, J. Cahill, 93 Riversfield, Middleton, Co. Cork, Eire.  
 GC2FRO, E. B. H. Woolley, Le Pavillon, Vaurocque, Sark, Channel Is.

G3EBR, L. Sisson, 23 Sandgate, Penrith, Cumbria, CA11 7TJ. (Tel: 0768 3470).  
 G3GQR, G. A. Burton, 22 Marina Drive, Spondon, Derby, DE2 7AF.  
 G3MCX, W. J. Kennedy, 22 Croham Park Avenue, South Croydon, Surrey, CR2 7HH. (Tel: 01-688 3322).  
 G3MCY, G. C. Moore (ex-ZC4GM), 84 Farley Close, Little Stoke, Bristol, BS12 6HG. (Tel. Almondsbury 612486).  
 G3OHI, A. R. Batty, Mayfield, 57 Kings Road, Wilmslow, Cheshire, SK9 5PW.  
 G3RFG, H. S. Brown, 16 West Way, Moggerhanger, Beds., MK44 3RF. (Tel: Biggleswade 40030).  
 G3SVD, A. Hewitt, 103 Park Lane, That-cham, Berks.  
 G3TML, T. H. Lloyd, 172 Duffield Road, Derby, DE3 1BH.  
 G3VZP, R. T. Morrison, 11 Draycott Drive, Cheadle, Stoke-on-Trent, Staffs., ST10 1NH.  
 GM3WTA, M. L. Kinnerley-Taylor, Womblehill Cottage, Womblehill Farm, Nr. Kintore, Aberdeenshire.  
 G3YRW, J. A. Van Walwyk, 321 Parkside Avenue, Barnehurst, Bexleyheath, Kent, DA7 6NS.  
 G4BHE, B. W. Macklin, 4 Foxmoor Close, Oakley, Basingstoke, Hants.  
 G4CZJ, J. B. Jenkins (ex-DA2YJ/V59ABJ), 18 Hawthorn Drive, Topcliffe Barracks, Thirsk, North Yorkshire, YO7 3EY.  
 G4DEP, D. R. Dabinett, 23 Pool Court, Forest Vale Estate, Pickering, North Yorkshire, YO18 8DR.  
 G4DMO, M. V. Rubeck, 12 Linkfield Lane, Redhill, Surrey, RH1 1JL. (Tel: 0737 63575).  
 G8ATS, J. Reeve, 16 Junction Road, Mildenhall, Suffolk, IP28 7BZ.  
 G8BVR, G. Oddy, 16 Balmoral Court, Stanwick, Carlisle, Cumbria, CA3 9PW.  
 G8GTV, B. S. Raby, 69 Edwin Road, Rainham Mark, Gillingham, Kent.  
 G8HZK, A. E. Lee, 18 Britten Close, Bodenham Road, Hereford, HR1 1TT. (Tel: 0432 67361).  
 G8ILL, D. R. Horton, 53 Calstock Road, Furlongs, Willenhall, West Midlands.  
 GW8JQC, M. J. White, 5 Marlow Close, Mount Pleasant, Rogerstone, Newport, Gwent.

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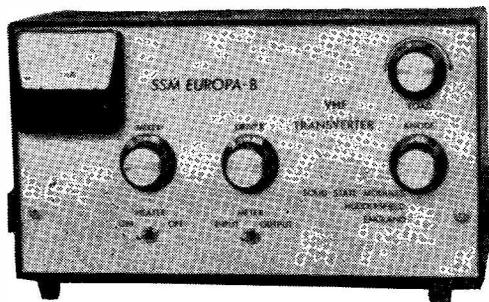
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BC149	12p	IN4148	5p 7413 35p
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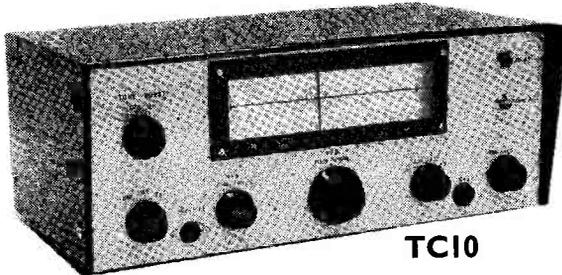
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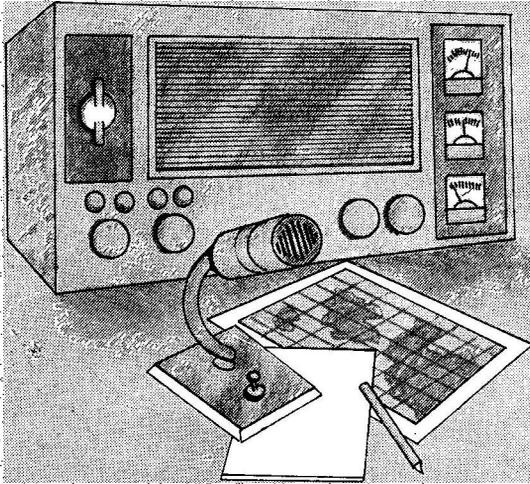
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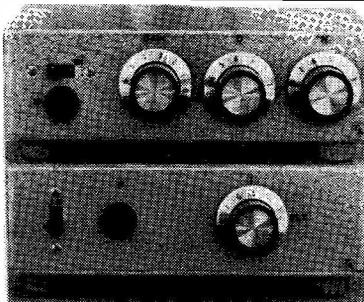
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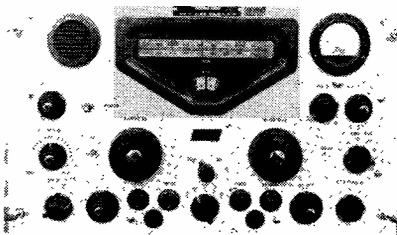
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Battery operated  
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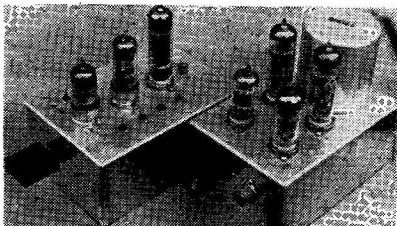
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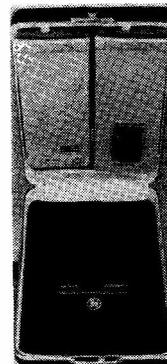
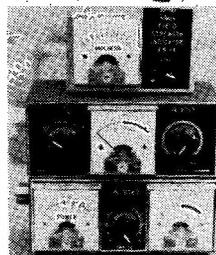
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Crystal oscillator: 116 MHz (zenered)  
Frequency error at 144 MHz: 3 kHz max.  
Power supply: 35mA at 12 volts.  
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We have extended our popular range of single conversion converters to include the following I.F.s:

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I.F.s available ex-stock: 2-4, 4-6 MHz. Price inc. VAT **£18.90**  
This unit was developed to meet the heavy demand for a converter suitable for use with receivers having better performance at lower frequencies. It uses two dual-gate mosfet mixers, both fed from the output of a 70 or 71 MHz crystal oscillator. Selectivity is obtained at the first IF in the 74 MHz range, thereby overcoming the usual problems associated with low-I.F. single conversion converters.

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10 x 3 x 1	44p	10 x 4 x 2	64p
2 x 3 x 2	38p	2 x 5 x 2	42p
3 x 3 x 2	41p	5 x 5 x 2	52p
4 x 3 x 2	42p	6 x 5 x 2	57p
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## READERS

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**For sale:** R.C.A. AR88 general-coverage receiver, £60 or near offer.—Quinn, Betchworth (Surrey) 2974.

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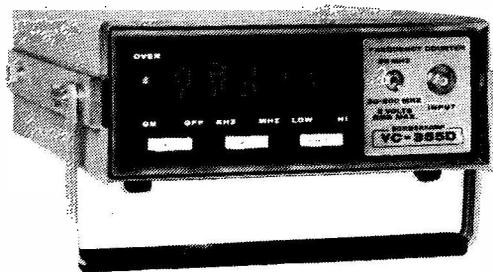
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**For sale:** KW-2000A with AC/PSU, manual, circuit diagrams, Shure mic., spare valves (including 6146's), all leads, in excellent condition, original packing, price £140.—Leach, G4AMZ, 27 Grosvenor Road, Heaton Moor, Stockport, Cheshire. (Tel: 061-432 2985).

**Wanted:** FT-75 or neat Transceiver with all or either 20/40/80m. bands; would consider home built, or W-H-Y? Also Wanted band-change wafers for TCS-12 Rx, or scrap receiver.—Dunn, G3SCD, QTHR, or ring Louth (Lincs.) 2327.

**Manuals:** Pyecat, £4. CAS, £4; 850/4, A41, A42 and C13, £2 each; CT.488, £8.—Brooks, 5 Farrant House, Winstanley Road, London, SW11.

**Selling:** National HRO-5T, with band-spread coil packs, £25. Miniaturised HRO, with bandspreads, £15. Kokusai mechanical filters, with crystals, £10 or without, £8.50. **Wanted:** Trio 500S receiver and Lafayette HA-350 receiver. — de la Bertauche, G3RCO, QTHR, or ring Seaton (Devon) 21016.

**For sale:** R.C.A. AR88D in good working condition, with S-meter, speaker and manual, £40 (no offer). CI-5 "Universal" oscilloscope, new, with leads and manual, £25 (no offer). K.W. E-Zee Match, new, £10. Northcourt 30w. amplifier, new, £15 (no offer). —Ring Roberts, 01-788 8208.

**Sale:** FT-DX150 Transceiver, coverage 10 to 160m., AC/DC operation, ideal portable/mobile rig, £170. Also two 4CX250B's, £3. **Wanted:** FT-200 or FT-500, preferably with remote VFO.—Yeaman, GM4ASY, QTHR, or ring Bishopton (Renfrewshire) 2941.

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**Wanted: Heathkit SB-102, with PSU and speaker.— Ring Barwood, Bristol 772804.**

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**For sale:** Separately or in bulk copies of "Short Wave Magazine" over years 1953-1963. Offers?—Ring Lindseth, 01-656 5173 (Croydon).

**Wanted: Drake SPR4 or R4B/R4C receiver and speaker. Must be perfect and complete with manual. —Sumner, 4 Cherrytree Avenue, Leicester Forest East, Leicester. Tel: Kirby Muxloe (05-3727) 2608.**

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**Wanted:** FR-50B receiver, or similar. **For sale:** AR88 receiver, in fair condition.—Fyffe, 23 Mid Street, Kettlebridge, Fife.

**Sale:** Barlow-Wadley XCR-30 Mk.II receiver, in mint condition (bought April '75), price £98, carriage extra.—Smyth, 234 Dumbarton Road, Partick, Glasgow G11 6TU.

**Selling:** Fully transistorised 10 MHz dual trace 'scope, with locate facilities, £100 or very near offer.—Morgan, 27 Clun Avenue, Pontyclun, Glamorgan, South Wales.

**Sale:** National HRO receiver, with six coil packs and AC/PSU, £25. Heath RF-1U signal generator, coverage 100 kHz to 200 MHz, £13. Sangamo-Weston multi-meter, ranges as Avo, £5. Plug-in 'scope, Y-amplifier Type 1085 for Cossor 1076 oscilloscope, £10 or near offer. All units in very good condition.—Ring Allinson, Aspatria (Cumbria) 20243.

**Wanted:** R.1155 receiver, type "L" or "N". Any condition considered; all letters answered. — Box No. 5434, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

**Wanted:** R.C.A. AR88D or AR88LF receiver, must be in mint condition and not tampered with, state details and price. — Box No. 5435, Short Wave Magazine, Ltd., 55 Victoria Street, London SW1H 0HF.

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**For sale:** Trio 2200 fitted tone-burst, also frequencies R6, R7 and three simplex channels, with Nicads, in good condition, £65. Beltek W.5400, with tone-burst, R6, R7 and five simplex channels, good condition, £65.—Ring Moscrop, 01-471 1762 (London).

**Sale:** Telford TC-7, tunable IF 28-30 MHz, band searcher and squelch fitted, with "G8ACV" converter, £50 or near offer.—Gregory, G3LCV, QTHR, tel: Derby 701516.

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BSY95A TRANSISTORS, 6 for 50p.  
PNP AUDIO TYPE T05 TRANSISTORS, 12 for 25p.  
BLACK PLASTIC KNOBS, ¾" dia., ½" spindle, 4 for 50p.  
RING MAGNETS, 7mm. outside dia., 20 for 50p.  
25-WAY ISEP PLUGS AND SOCKETS, 40p set (1 plug + 1 skt.). Plugs and sockets sold separately at 25p each.  
T03 TRANSISTOR INSULATOR SETS, 10 sets for 50p.  
MIXED ELECTROLYTICS, large bag, £1.00.  
PC BOARD WITHDRAWAL HANDLES, mixed cols., 8 for 50p.  
SOLDER, 20SWG, 60/40 alloy approx., 9 yds, 25p.  
OC200 TRANSISTORS, 6 for 50p.  
PERSEXP COIL FORMERS, 1½in. x ½in. dia., 5 for 25p.  
TURRET TAGS, ⅜" dia., 25p pack.  
ROTARY SWITCHES, min. 4 pole 2 way, 2 for 50p.  
TELEPHONE TYPE EARPIECE INSERT, 50P REEDS (for reed relays). Single-pole make, 5 for 30p.  
MULLARD TUBULAR CERAMIC TRIMMERS, 1-18p, 6 for 50p (as featured in Rad. Comm. Jan. page 25).  
ICs, some coded, 14DIL type mixed, untested, 20 for 25p.  
IF CANS, ½" square, suitable for rewind, 6 for 30p.  
IF CANS, ½" x ¾" x 1", suitable for rewind, 10 for 30p.  
24v. MIN. REED RELAYS, encapsulated single-pole make, 2 for 50p.  
Ferrite Coils on ½" dia. ferrite rings, 3 for 50p.  
Heatsinks. (Approx. 3" x 4" x 2" high). 12 fins (drilled for 1 x T03 transistor). Brand new, 45p each.

VHF RF chokes (wound on 2.2K ½W resistors), 5 for 35p.  
Small Chrome handles, ¼" dia., 1¼" between holes. 1" clearance, tapped 4BA (with screws and washers), 2 pair for 40p.  
Relays, single pole change over, 12v. DC approx. ⅜" x ½" x 1¼", 35p each.  
AT LAST WE HAVE A STOCK OF THE TRIMMERS YOU'VE ALL BEEN ASKING FOR!  
2-6p, 100m. circular, ceramic trimmers (for VHF/UHF work), 3 pin mounting, 5 for 50p.  
ICC Plastic block capacitors, .047 at 250v., 50 for 60p.  
ICC Plastic block capacitors, .022 at 400v., 50 for 60p.  
1½" Polythene chassis mounting fuseholders, 6 for 30p.  
LES Lamps, 24v. 1.2W, 10 for 40p.  
MULTITURN POTS, 10 turn, ½" spindle (ex-equip.), following values available, 2 Kohm, 5 Kohm, 400 Kohm, £1 each.  
BFY51 TRANSISTORS, 4 for 60p.  
BYX 38/300 Stud Rectifiers, 300v. at 2.5A, 4 for 60p.

## MAINS TRANSFORMERS

All 240v. input, voltages quoted approx. RMS (Please quote Type No. only when ordering)  
TYPE 10/2 10.0-10V at 2A, £1.50.  
TYPE 125BS approx. 125V at 30mA. 65p.  
TYPE 28/4. 28v. at 4A, 125v. at 500mA, £4.00.  
TYPE 63/1. 6.3v. at 1A, 85p each, 2 for £1.50.  
TYPE 129. 400v. at 20mA, 200v. at 10mA, 6.3v. at 500mA, £1.25.  
TYPE 72703. 400v. at 10mA, 200v. at 5mA, 6.3v. at 400mA, £1.25.  
TYPE 70462. 250.0-250v., 50.0-50v., 6.3v., £1.75.  
RADIOSPARES 500-WATT AUTO TRANSFORMER, 100/110/150/200/240/250v. tapped input and output step up or step down facility, ex new equip, £6.00. AS ABOVE, but 100-WATT (ex-equipment). £3.00 each.

## VALVES

QQVO3/10 (ex equipment), 75p each.  
2C39A (ex equipment), £1.00 each.  
QQV2/6 (ex equipment), £1.00 each.  
4CX250B (ex equipment), £2.10 each.  
4X250B (ex equipment), £1.50 each.  
DET-22 (ex equipment), 2 for £1.00.

NEW MULLARD SCOPE TUBES, DN7-78, 3" face, complete with CRT base and mu-metal screen, £8.50 each.

SPECIAL OFFER WHILE STOCKS LAST. SILVER ZINC RECHARGEABLE BATTERIES, 12v., 160mA/Hour 2½ x 1½ x ¾" (as used in ITT TXR's). Type ST12B160. Brand new, £1.75 each, 2 for £3.00.

MOBILE CONVERTERS. 24v. DC, input, 13.8v. at approx. 3.5A DC output, fully stabilised, £3.50 each.

HELLERMANN LUBRICANT GRADE C. The ideal lubricant for all rubber goods. Good electrical insulator. 75p per bottle.

TERMS OF BUSINESS: CASH WITH ORDER, MINIMUM ORDER OF £1.00. ALL PRICES NOW INCLUDE POST & PACKING (UK ONLY)

EXPORT ENQUIRIES WELCOME  
PLEASE ENCLOSE STAMPED ADDRESSED ENVELOPE WITH ALL ENQUIRIES

PLEASE ADD 25% VAT

HIGH QUALITY SPEAKERS. 8½" x 6" elliptical, 2" deep, 4 ohms, inverse magnet, rated up to 10 Watts, £1.50 each, or 2 for £2.75. (Quantity discount available.)

EDGEWISE METERS, 50 microamp FSD, centre zero, but can be left hand zero'd display area 1½" x ½", smart modern appearance, £1.50 each.

VARIABLE STABILISED PSU solid state, 240v. AC input, Output 0-24v. DC at 500mA + 32v. at 50mA (approx.). Size 7½" x 4" x 2½" (voltage controlled by external 5k ohm pot). (Less 5k ohm pot), £5.00 each. 5k ohm pots, 3 turn, for above, 75p each.

## PLUGS & SOCKETS

TV PLUGS (metal type), 6 for 50p.  
TV SOCKETS (metal type), 5 for 50p.  
TV LINE CONNECTORS (back-to-back skt), 5 for 50p.  
PL259 PLUGS (PTFE). Brand new, 50p each, or 5 for £2.25. Reducers for above, 15p each.  
SO239 SOCKETS (PTFE). Brand new (4 hole fixing type), 50p each or 5 for £2.25.  
N-TYPE SKTS. (4 hole chassis mounting, 50 ohms, small coax lead type), 50p each.  
BNC PLUGS. (Amphenol, new, packed), 35p each. (4 for £1.20).  
BNC SOCKETS. (4 hole chassis mounting, lead type), 35p each. (4 for £1.20).  
GREENPAR (GE30015). Chassis Lead Terminations. (These are the units which bolt on to the chassis, the lead is secured by screw cap, and the inner of the coax passes through the chassis), 30p each, 4 for £1.00.  
DIN 3-pin LINE SOCKETS, 15p each.  
DIN 6-pin RIGHT ANGLED PLUGS, 20p each.  
BULGIN FLAT 2-pin FLEX CONNECTORS. None reversible, 40p each.  
MAINS LEAD AND SOCKET as used on Continental Test Equipment. New, 50p each.

## ELECTROLYTICS

DUBILIER ELECTROLYTICS. 50µF, 450v., 2 for 50p.  
DUBILIER ELECTROLYTICS. 100µF, 275v., 2 for 50p.  
PLESSEY ELECTROLYTICS. 470µF 63v., 3 for 50p.  
TCC ELECTROLYTICS. 1,000µF 30v., 3 for 60p.  
PLESSEY ELECTROLYTICS. 1,000µF 180v. 40p each, 3 for £1.  
DUBILIER ELECTROLYTICS, 5,000 mfd at 35v., 50p each.  
DUBILIER ELECTROLYTICS, 5,000µF 50v., 60p each.  
DUBILIER ELECTROLYTICS. 5,000 mfd at 70v., 65p each.  
ITT ELECTROLYTICS. 6,800 mfd at 25v., high grade, screw terminals, with mounting clip, 50p each.  
PLESSEY ELECTROLYTICS. 10,000 mfd at 63v., 75p each.  
PLESSEY CATHODE RAY CAPACITORS. 0.04µF at 12.5KV-DC, screw terminals, £1.50 each.