

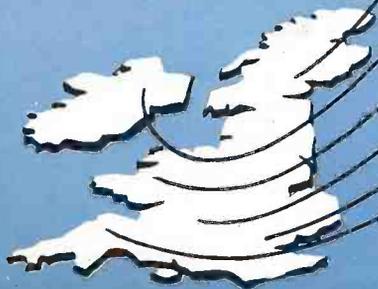
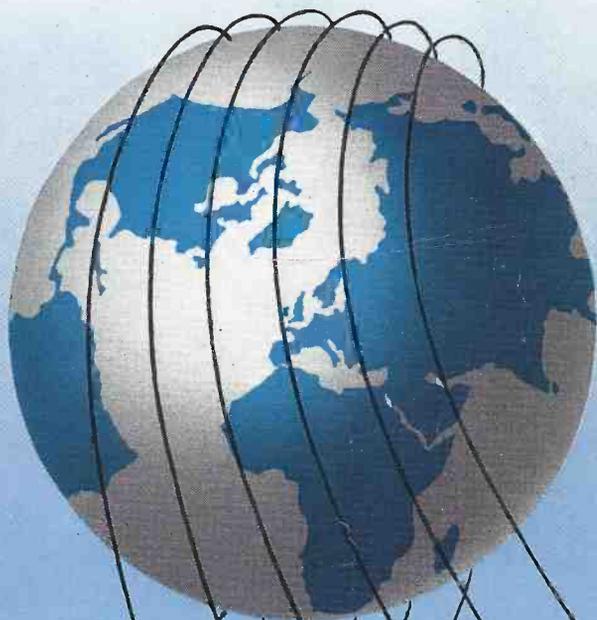
35p

*The*  
**SHORT WAVE**  
*Magazine*

VOL. XXXIV

MARCH, 1976

NUMBER 1



**WORLD WIDE COMMUNICATION**

# TS-700G

with the added refinements which YOU requested



Trio proudly presents the new 2 metre FM, AM, SSB, CW transceiver TS700G. It has been custom made to meet the requirements of *all* 2 metre amateurs, particularly of those who travel around and enjoy DX contacts not only from the shack at home but also en route. Trio's new TS700G features all the convenience and outstanding qualities that most 2 metre operators can only imagine: fixed frequency transceive operation on 22 channels in the 144-146 MHz range—of course also single channel simplex and two channel duplex transceive modes—and all this without waiting for a vacant repeater frequency and what's more: when the lunatic fringe jam your local repeater, just use the VFO to move down the band and carry on the QSO. If there is too much activity on 2 metre FM—particularly when outstanding propagation conditions exist, and you can only hear multi station rubbish—just switch to SSB or CW and enjoy an interference free contact. With the TS700G, you will be still on the air when the others have to close down.

Outstanding DX performance has also been the predominant feature of the TS700, the predecessor of this de luxe transceiver. Many TS700 owners have amassed QSLs from all over Europe because DX QSO's of hundreds of miles are commonplace with the TS700G—particularly using the SSB mode. In conjunction with a suitably orientated antenna, you can even enjoy transcontinental QSO's via OSCAR satellites.

The world wide success of the TS700 was a stimulant for Trio's engineers to create something even more outstanding. Aided by valuable suggestions from 2 metre operators world wide, Trio developed the TS700G, the 2 metre specialists transceiver which enables you to participate in VHF activity wherever you are; and on FM, AM, SSB or CW—just as you prefer.

And these are the most important features:—

Improved FET front end in the receiver section with narrow band tuning characteristics, setting new standards for freedom from cross modulation and overload. Sensitivity is now better than 0.25 microvolts for SSB/CW, (10dB S — N/N ratio) and better than 0.4 microvolts for FM (20dB quieting). This means that stations which were lost in the noise can now be copied loud and clear.

Built in 1750Hz tuning fork controlled repeater access tone generator (Trio exclusive) together with repeater and reversed repeater offset without retuning main dial. Together with complete VFO coverage, you can operate on all current or any future repeater systems and monitor repeater input or output channels at the turn of a switch.

Improved calibrator system providing check points at 100 kHz intervals for accurate dial checking. During calibration, the receiver antenna input is disconnected to prevent interference from incoming signals.

Extended meter functions now giving S meter for normal reception, relative output meter in the transmit mode for accurate tuning and centre zero tuning meter for FM reception to get the signal spot on into the discriminator.

TX/RX switching either by means of the PTT microphone supplied or VOX operation using the accessory control unit VOX-3 now available.

The choice of mains (120 240v, AC) or battery (12-13.8v, DC) operation gives your TS700G complete mobility from fixed station to portable contest use. You have the best station for all uses with the TS700G.

The TS700G features the same reliable, stable, rugged and contest proved circuitry which made its predecessor, the TS700, the most popular 2 metre all mode rig throughout the world. Just ask the operator who owns one. You will also want to own Trio's new 2 metre specialists' rig—the TS700G.

Sole Importers: LOWE ELECTRONICS  
119 Cavendish Road, Matlock, Derbyshire  
Tel.: Matlock 2817/2430



# LOWE ELECTRONICS

## PRICE LIST — MARCH 1976

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	Net price	Price to include VAT	Carr.		Net price	Price to include VAT	Carr.
<b>TRIO EQUIPMENT</b>							
TS900 transceiver & AC P.S.U.	£480.00	£600.00	£2.50	6JS6C, 6KD6 matched pairs, per pair	£4.20	£5.25	51p
VFO900 external VFO for TS900	£64.00	£80.00	£2.50	6146B S2001 each	£3.20	£4.00	36p
CW900 CW filter for TS900	£29.00	£36.25	50p	6LQ6 matched pairs, per pair	£5.52	£6.90	51p
TS520 transceiver 12v. DC 240v. AC	£318.00	£397.50	£2.50	<b>VHF MARINE RECEIVERS</b>			
SP520 matching loudspeaker	£20.00	£25.00	*62p	ASV 1515 less crystals	£24.00	£32.00	*48p
VFO520 external VFO	£64.00	£80.00	£2.50	Belcom AMR104H scanner less crystals	£67.44	£84.30	*75p
TV502 matching 2m. transverter	£100.00	£125.00	£2.50	Seiwa MR-2 pocket monitor less crystals	£37.76	£47.20	51p
CW520 CW filter	£24.00	£30.00	21p	Seiwa MS-2 pocket scanner less crystals	£42.72	£53.40	51p
TS700G 2m. all mode transceiver	£324.00	£405.00	£2.50	Crystals for the above receivers	£2.32	£2.90	15p
VOX-3 matching VOX unit	£20.00	£25.00	66p	<b>VHF AMATEUR RECEIVERS</b>			
TR7200G 10W car transceiver	£130.00	£162.50	£2.50	ASV 1515 less crystals	£24.00	£32.00	*48p
VFO300G remote VFO with repeater shift	£64.00	£80.00	£2.50	ASV 1515 less crystals	£38.48	£48.10	*48p
PS5 mains power supply digital clock unit	£44.00	£55.00	£2.50	NR-56 tunable 2m. FM receiver	£38.48	£48.10	*48p
TR2200G 1W 2m. handy transceiver	£88.00	£110.00	£2.50	Seiwa MR-2 pocket monitor, less crystals	£37.76	£47.20	51p
VB2200 10W amplifier	£36.00	£45.00	*62p	Seiwa MS-2 pocket scanner less crystals	£42.72	£53.40	51p
Ni-cad battery pack	£8.15	£8.80	30p	Belcom AMR104H scanner less crystals	£53.44	£66.80	*75p
RS99 De-Luxe amateur band receiver	£272.00	£340.00	£2.50	Crystals for the above receivers	£2.32	£2.90	15p
S599 matching loudspeaker	£20.00	£25.00	62p	<b>MICROWAVE MODULES EQUIPMENT</b>			
T599S De-Luxe transmitter	£272.00	£340.00	£2.50	MMC 70 28 4m. converter	£15.12	£18.90	Post
OR666 general coverage receiver	£126.00	£132.50	66p	MMC 144 28 LO 2m. converter	£15.92	£19.90	Paid
QR6FM F.M. tuner supplied separately	£5.00	£6.25		MMC 432 28 70 cm. converter	£18.08	£22.60	
Extra charge for fitting and alignment	£11.24	£14.05	36p	MMC 432 144 70 cm. converter	£18.08	£22.60	
QR6MK 800 kHz crystal marker	£2.00	£2.50		MMC 1296 28 23 cm. converter	£23.92	£29.90	
Extra charge for fitting	£2.00	£2.50		MMC 1296 144 23 cm. converter	£23.92	£29.90	
TR7010 2m. SSB transceiver	£176.00	£220.00	£2.50	MMV 432 70 cm. tripler	£17.52	£21.90	
PS5 mains power supply digital clock	£44.00	£55.00	£2.50	MMV 1296 23 cm. tripler	£25.04	£31.30	
HC2 ham clock	£12.00	£12.96	*48p	MMDO 50 50 MHz counter	£61.11	£66.00	
MC10 hand microphone	£8.00	£10.00	21p	MMD 500P 500 MHz prescaler	£71.20	£89.00	
MC50 table microphone	£18.00	£22.50	*48p	MMT 432/28 70 cm. transverter	£71.20	£89.00	
LF30A low pass filter	£12.00	£15.00	51p	<b>CATRONICS PRODUCTS</b>			
BPF2A 2m. band pass filter	£20.00	£25.00	51p	DFM 5V 180 MHz digital frequency meter	£120.37	£130.00	£2.50
TR3200 70cm. handy transceiver	£130.00	£162.50	£2.50	500 MHz prescaler for above	£25.00	£27.00	24p
Ni-cad battery pack	£8.15	£8.80	30p	<b>FILTERS</b>			
<b>UNIDEN EQUIPMENT</b>							
2020 transceiver	£380.00	£475.00	£2.50	Seiwa 9 MHz. SSB crystal filter	£11.00	£13.75	15p
8010 external VFO	£82.00	£102.50	£2.50	Carrier crystals for the above filter	£1.50	£1.87	15p
8120 matching loudspeaker	£24.00	£30.00	*62p	Each	£1.50	£1.87	15p
<b>NIHON DENGYO</b>							
Liner 430 70 cm. SSB transceiver	£228.00	£285.00	£2.50	TRIO LF30A low pass filter	£12.00	£15.00	51p
Liner 2 2m. SSB transceiver	£145.00	£181.25	£2.50	TRIO BPF2A 2m. band pass filter	£20.00	£25.00	51p
LA-106 2m. linear amplifier	£158.00	£197.50	£2.50	SHINWA 1110 2m. band pass filter	£10.80	£13.50	51p
R115E regulated P.S.U. for Liner 2 and Liner 430	£24.00	£30.00	£2.50	SHINWA 1110G 2m. band pass filter	£36.80	£46.00	51p
<b>VENUS SLOW SCAN T.V.</b>							
SS2 Slow Scan station monitor	£230.00	£287.50	£2.50	SHINWA 1006 2m. low pass filter	£9.00	£11.25	51p
SS2 Slow Scan station monitor kit	£155.00	£193.75	£2.50	SHINWA 28 MHz transverter band pass filter	£10.80	£13.50	51p
C-1 camera	£285.00	£318.75	£2.50	SHINWA 1005 H.F. low pass filter	£8.00	£10.00	51p
<b>CRYSTALS</b>							
We stock I.A.R.U. channels for the equipment we sell.				<b>STATION ACCESSORIES</b>			
Price per single crystal	£2.32	£2.90	15p	Morse keys	£6.00	£7.50	51p
Where 2 crystals per channel are required	£4.20	£5.25	15p	Katsumi keys EK108A	£32.00	£40.00	*48p
<b>VALVES</b>							
For common valves it pays to shop at one of the large importers who buy in such enormous quantities that they can sell retail at a lower price than we can buy wholesale. We do, however, maintain stocks of the more unusual valves which are used in the equipment we sell, and which you may find some difficulty in obtaining.				Low impedance padded headsets	£3.68	£4.60	51p
6AH6, 6BZ6, 6CB6A, 6CL6, 6USA,				TRIO MC10 hand microphone	£8.00	£10.00	24p
6BM16, 12BY7A, 6EW6	66p	82p	21p	TRIO MC50 dual impedance table microphone	£18.00	£22.50	*48p
6GK6	£1.30	£1.62	21p	Kuranishi wattmeter dummy load RW15D	£25.00	£27.00	*62p
				Kuranishi wattmeter dummy load RW120D	£55.00	£59.40	*75p
				TRIO ham clock HC-2	£12.00	£12.96	*48p
				Microphone plugs as fitted to TRIO and YAESU equipment (4-pin)	48p	60p	12p
				Matching sockets for the above	48p	60p	12p
				Maeden speakers	£2.00	£2.50	36p

LO, LO, is NaOne on 145 MHz, or are you all having a CSta asked the PO inspector. Don't BMarassed by my question, but is it Sntial to have such low deviation determined by MPirical means, or is it all PI in the sky? BCing you G3PCY.

# LOWE ELECTRONICS

	Net price	Price to include VAT	Carr.
<b>ANTENNAS</b>			
<b>H.F. BEAMS</b>			
Hy-Gain TH2MK3	£83.10	£103.87	£2.50
TH3Jnr	£85.10	£106.37	£2.50
TH3MK3	£122.10	£152.62	£2.50
TH6DXN (Carriage by BRS)	£146.50	£183.12	£2.50

<b>H.F. QUAD</b>			
Hy-Gain Hysquad 2 element	£135.50	£169.37	£2.50

<b>H.F. VERTICALS</b>			
Hy-Gain 12AVQ	£27.10	£33.87	£2.50
14AVQ WB	£39.50	£49.37	£2.50
18AVT WB	£56.10	£70.12	£2.50

<b>RAK ANTENNAS</b>			
A-8XL 80m. dipole	£9.50	£11.87	*62p
AL-48DXN 80-40m. trap dipole	£20.00	£25.00	*75p
Midy VN 80m. to 10m. trap dipole	£32.00	£40.00	*87p
Listener III SWL antenna	£20.00	£25.00	*62p
Listener I SWL antenna	£7.50	£9.37	*48p
HD-26A extendable dipole	£8.00	£10.00	33p

<b>HF MOBILE ANTENNAS</b>			
"G" Whip tribander helical	£13.53	£16.91	£1.00
"G" Whip multimobile	£16.73	£20.91	£1.00
L.F. coils for the above whips	£4.51	£5.63	45p
Telescopic whips for the above	£1.22	£1.52	45p
Base mount for all "G" Whips	£1.81	£2.26	45p

<b>VHF UHF ANTENNAS</b>			
<b>"J" BEAMS</b>			
5Y 2M	£4.90	£6.12	£2.50
8Y 2M	£6.40	£8.00	£2.50
10Y 2M	£12.60	£15.75	£2.50
PRM14 2M	£19.20	£24.00	£2.50
5NY 2M	£9.40	£11.75	£2.50
8NY 2M	£11.70	£14.62	£2.50
10NY 2M	£16.15	£20.18	£2.50
Q4 2M	£9.60	£12.00	£2.50
Q6 2M	£12.80	£16.00	£2.50
D5 2M	£9.00	£11.25	£2.50
D8 2M	£12.00	£15.00	£2.50
XD 2M	£6.60	£8.25	£2.50
UGP 2M	£4.75	£5.93	£2.50
MMB48 70 cms.	£13.90	£17.37	£2.50
MMB88 70 cms.	£18.50	£23.12	£2.50
12NY 70 cms.	£19.00	£23.75	£2.50

<b>PHASING HARNESES</b>			
PMH 2C 2m. for circular polarisation	£3.25	£4.06	51p
PMH2 70 2 way for 70 cms.	£3.75	£4.68	51p
PMH4 70 4 way for 70 cms.	£7.80	£9.75	51p

<b>VHF UHF MOBILE WHIPS</b>			
"J" Beam 2m. 5/8 whip type TAS	£7.65	£9.56	£2.50
WW1 1/2 wave window mount	£10.00	£12.50	£2.50
70 cms. 5/8 whip type U3	£4.75	£5.94	51p
70 cms. colinear type U4	£7.10	£8.88	51p
70 cms. colinear type U5	£12.30	£15.37	51p

<b>ANTENNA SPECIALISTS ASP201</b>			
↓ wave whip	£2.50	£3.12	24p

<b>ANTENNA SPECIALISTS ASP157</b>			
↓ wave gutter mount	£7.54	£9.42	51p
Luso 5/8 2m. gutter mount	£20.00	£25.00	£2.50

<b>MARINE MOBILE WHIPS</b>			
"J" Beam 2m. 5/8 whip type TAS	£7.65	£9.56	£2.50

<b>ANTENNA SPECIALISTS ASP201</b>			
↓ wave whip	£2.50	£3.12	24p

<b>ANTENNA SPECIALISTS ASP157</b>			
↓ wave gutter mount	£7.54	£9.42	51p

<b>ANTENNA ACCESSORIES</b>			
Coaxial cable 50 ohms UR43 per metre	14p	15p	02p
Coaxial cable 50 ohms UR67 per metre	35p	38p	04p
Twin feeder 300 ohms per metre	6p	6p	02p
Twin feeder 75 ohms per metre	6p	6p	02p
Rotator cable 4-core heavy duty per metre	10p	11p	03p
Rotator cable 5-core per metre	18p	19p	03p
Rotator cable 8-core per metre	31p	33p	03p
Rotator cable 12-core heavy duty per metre	22p	24p	04p
PL259 plugs	36p	39p	12p
Reducers for PL259 plugs	12p	13p	12p
SO239 sockets	36p	39p	12p
PL259 in-line connectors	60p	65p	12p
PL259 angle adaptors	76p	82p	12p
SWR Metere, single meter	7.80	£8.42	51p
SWR Meters, twin meter	£10.00	£10.80	51p
REACE Antenna Impedance Bridges	£22.00	£23.76	62p
Crystal oscillators for the above, each	£5.20	£5.62	21p
Hy-Gain C1 centre dipole insulator	£3.00	£3.75	30p
Hy-Gain BN86 Balun	£10.49	£13.12	51p
Diamond BU5 50 ohm balun	£4.40	£5.50	51p
Diamond BU 75 ohm Balun	£4.40	£5.50	51p
RAK CX2(A) coaxial switch	£10.00	£12.50	27p

<b>ROTATORS</b>			
CDE AR40	£32.10	£40.12	£2.50
CD44	£67.25	£84.07	£2.50
Ham-2	£103.00	£128.75	£2.50
Rotator cable 4-core per metre	10p	11p	03p

Our terms are cash or cheque with order—despatch of stock items is by return. If any item is out of stock, your money is immediately refunded.

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EASY TERMS

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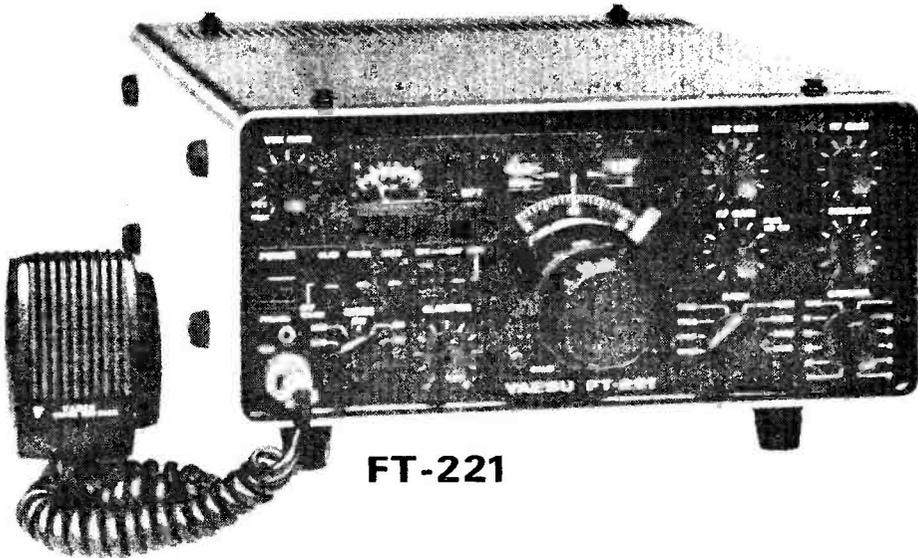
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73 from **BILL G3UBO/VE8DP, ALAN G3MME, JOHN G3PCY/5N2AAC, IAN G3ZYC**



# THE NAME IS YAESU



**FT-221**

## ● Solid State Ultimate 2 Metre Transceiver with Versatile SSB/FM/CW/AM Operation

Here is a compact, versatile transceiver designed for the active 2m enthusiast. The FT-221 features all mode operation—SSB FM CW AM—with repeater offset capability. Advanced phase lock loop circuitry offers unsurpassed stability and clean spurious free signals. Modular, computer type construction offers

reliability and ease of service. Preset pass band tuning provides the optimum selectivity and performance needed on today's active 2m band. Join the fun on FM, DX, or OSCAR, with the FT-221 transceiver. Another winner from the world's leader in amateur communications equipment.

### Features

- \* Complete 144-148 MHz coverage in 8 band segments
- \* Dual rate, concentric VFO dial drive with better than 1 kHz readout
- \* Built-in AC and DC power supplies
- \* SSB CW AM operation
- \* Selectable 600 kHz repeater offset
- \* Built-in VOX and break-in CW
- \* External tone input connector
- \* Built-in 100 kHz calibrator
- \* Built-in effective noise blanker
- \* Three way metering: S meter, power output, and FM discriminator
- \* 11 crystal channels per band segment - Total 88 channel
- \* SSB output 12 watts PEP  
FM CW output 14 watts  
AM output 2.5 watts  
Built-in speaker

## THESE ARE THE LATEST CHAPTERS

# MUSEN—THE REPUTATION IS UNPARALLELED!

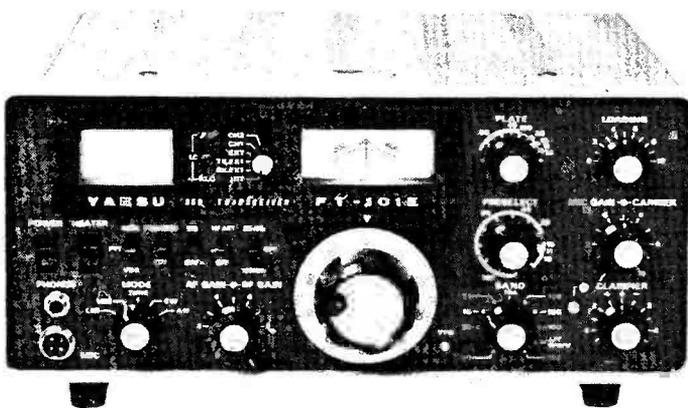
## FT-101E/EE

### ● Solid State 160 thru 10 Metre Transceiver

The world's number one transceiver now offers even more value and performance in one, compact, thirty pound package. An effective RF Speech Processor is a built-in integral part of this exciting transceiver. Now you can realise that extra talk power to cut through the pile ups—without the addition of a linear amplifier. Except for the final and driver stages, the FT-101EE features the latest in solid state technology, incorporating time proven, plug-in "com-

puter type" modules for unparalleled reliability and serviceability. New lever type switches offer easier operation. Here is a complete radio station designed to go anywhere—ideal for today's active amateur. Just add an antenna and 12 volt DC or 100-234 volts AC for instant operation on 160 thru 10m. The FT-101E/EE is another step forward in amateur communications from the world's leader in communications equipment. YAESU—The Radio Company.

FT-101 TRANSCEIVER



	FT-101E	FT-101EE	FT-101EX
160m Bnd. Cry.	✓	✓	X
80m Bnd. Cry.	✓	✓	✓
40m Bnd. Cry.	✓	✓	✓
20m Bnd. Cry.	✓	✓	✓
15m Bnd. Cry.	✓	✓	✓
11m Bnd. Cry.	✓	✓	✓
10mA Bnd. Cry.	✓	✓	X
10mB Bnd. Cry.	✓	✓	✓
10mC Bnd. Cry.	✓	✓	✓
10mD Bnd. Cry.	✓	✓	X
WWV JJJ	✓	✓	✓
Bnd. Cry.	✓	✓	X
Marker Bnd. Cry.	✓	✓	✓
Fix (CHI CH2) Bnd. Cry.	X	X	X
CW Filter	X	X	X
RF Processor	✓	✓	✓
FIX Unit	✓	X	X
DC-DC Converter	✓	✓	X
Cooling Fan	✓	✓	X
Microphone	✓	✓	X

✓ Installed.  
 X Not installed  
 ✓ Available as option  
 X Receive only

### Features

- \* Built-in AC and DC power supplies
- \* Built-in RF-speech Processor for increased talk power (E model only)
- \* 260 Watts PEP SSB, 180 Watts CW, and 850 Watts AM.
- \* Factory sealed, solid state VFO for optimum stability and accurate 1 kHz readout
- \* Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- \* Built-in, fully adjustable VOX
- \* Automatic break-in CW operation with sidetone
- \* Selectable 25 kHz and 100 kHz calibrator
- \* 5 kHz receiver clarifier w/ separate ON/OFF switch
- \* Built-in WWV JJJ reception
- \* Heater switch to be shut off final tubes for conservation of current drain
- \* Reliable easy to operate lever switch
- \* Adjustable carrier level for tune-up and novice operation
- \* Built-in speaker
- \* High-Q, permeability tuned, RF stages to provide the performance required even in base station operation
- \* Includes dynamic, hand-held type microphone
- \* Indicator lights for interval VFO and clarifier operation
- \* Eight pole SSB filter for unparalleled selectivity on today's crowded bands
- \* All mode operation—SSB, CW and AM
- \* Built-in internal crystal control provision and Dual VFO adaptor
- \* Complete line of compatible accessories for flexible station design

## IN THE YAESU MUSEN SUCCESS STORY

READ ON FOR THE MAIN THEME ➔



**REMEMBER! WHEN YOU CHOOSE YAESU  
YOU ARE DEALING WITH THE WORLD'S  
★ LARGEST MANUFACTURER OF ★  
AMATEUR RADIO EQUIPMENT**

## The Ultimate Base Station Combination

JUST TWO MORE  
RECENT EXAMPLES  
OF YAESU'S LEAD  
IN THE AMATEUR  
FIELD



**FL-101 Transmitter**



**FR-101 Receiver**

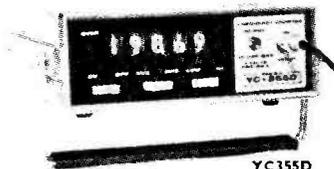
Four models now available

FR10IS	STANDARD
FR10ID	DE LUXE
FR10ISD	STANDARD WITH DIGITAL DISPLAY
FR10IDD	DE LUXE WITH DIGITAL DISPLAY

- Solid State Receiver with Total Spectrum Coverage 160 thru 2 Metre plus provision for Major Short Wave Broadcast Bands

**ON THESE PAGES WE HAVE DEPICTED ONLY  
A SMALL PART OF THE TOTAL YAESU  
RANGE, SUCH NOW IS ITS SCOPE — PROOF  
ENOUGH THAT AMATEURS THE WORLD  
OVER PREFER YAESU MUSEN — THE TRUE  
SPECIALISTS IN AMATEUR RADIO  
EQUIPMENT.**

# YAESU MUSEN



YC355

## DIGITAL FREQUENCY METER

The YC355 counts from 5Hz to 35 MHz. The D model's prescaler extends this range to over 200 MHz. The ingenious design offers a dual range system (providing eight digit readout but using only five cold cathode tubes) and operation from mains, or 12v. DC, at the flick of a switch. The accuracy offered is time base (1 MHz crystal ( $\pm 0.0005\%$  at 25°C,  $\pm 0.0025\%$ , 0 to 40°C)) + 1 count. Input impedance is switchable 1 Mohm or 50 ohm (B.N.C. socket), construction is on double sided epoxy board. Size 8 $\frac{1}{2}$ " x 3" x 11" (12 $\frac{1}{2}$ ") weight 7 lbs.

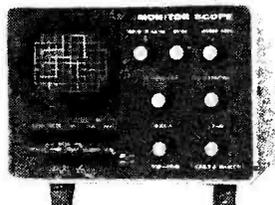
## NEW

### POWER METER/DUMMY LOAD

The YP150 is a fan cooled 50 ohm dummy load (V.S.W.R. less than 1.2:1 at 145 MHz) and power meter, for 1.8 to 200 MHz. Calibrated 6, 30 and 150W, FSD on a large 3 $\frac{1}{2}$ " x 2" meter with maximum error of 10% FSD. Size 4 $\frac{1}{2}$ " x 6" (17") x 11" (12"). Weight 6 lbs.



YP150



YO100

## MONITOR SCOPE

The YO100. The Multi purpose monitor offers —through line display, 1.8 to 60 MHz (145 MHz at reduced ratings), of transmitted signals, of 10 to 500W, monitoring of the IF of a receiver (3.18 MHz standard 445 kHz and 9 MHz options), trapezoidal display audio and R.T.T.Y. portrayal. Built in 1.5 and 1.8 kHz oscillators permit the measurement of power, in accord with statutory two tone P.E.P. measurement requires.

## NEW

### DIGITAL DISPLAY

The YC601 digital display unit (for 101 and 401 series (3.18 MHz IF)) indicates transmit and received frequencies to 100Hz on six bright green, 9 segment gas discharge tubes. Built in mains P.S.U., (consumes only 10W), gate time of 100mS., size 3" x 8 $\frac{1}{2}$ " x 9" (10 $\frac{1}{2}$ ") and weight 5 $\frac{1}{2}$  lbs. Supplied complete with connecting cables, etc.



YC601



*Yaesu Musen Authorised UK Distributors*

**Western Electronics (UK) Ltd**



**AMATEUR ELECTRONICS UK**



**SOUTH MIDLANDS COMMUNICATIONS LTD.**



# Western

## SAVE £'s £'s £'s BUY FROM 'WESTERN' HELP US AND HELP YOURSELF!!

We have so much stock that we do not really look forward to having to load it all into several vehicles when we transfer our Head Office to Lincolnshire in April, so we thought it made much better sense to give you a **SPECIAL PRICE REDUCTION** to reduce our stock, rather than line the pockets of the removal company! Naturally, this is a "once in lifetime" occurrence, so do not miss this unique opportunity to get yourself a bargain! All items sold at reduced prices will carry the manufacturer's warranty, but not our free collection and delivery service on warranty claims.

**SPECIAL OFFERS ON THE FOLLOWING ITEMS ONLY:**

**ANTENNAS:** JAYBEAM NEWTRONICS WILSON **ANTENNA ROTORS:** CDE

**COMMUNICATIONS EQUIPMENT:** ATLAS, BELCOM, BRAUN, FDK, FRONTIER, TEMPO, AND YAESU MUSEN

**MASTS:** ALIMASTS AND TELOMASTS. **TOWERS:** TELETOWERS

## BUY IN CONFIDENCE FROM 'WESTERN' . . .

We carry extensive stocks of spares for CDE and YAESU, so when you buy from us, you will have the peace of mind that goes with knowing that your supplier can provide an efficient after-sales service.

## DRAKE C LINE — for excellent performance



R4C



T4XC

DRAKE PRICES (INC. VAT) FREE DELIVERY BY SECURICOR

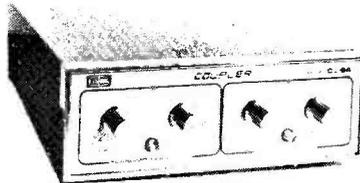
R4C Receiver	£380.00	AC4 AC psu for T4XC	£80.00	SSR1 Receiver	£225.00
T4XC Transmitter	£395.00	M54 Speaker for R4B	£18.75	TR4C Transceiver	£410.00

## NEW! Antenna Tuning Units. HF type CL66. VHF type CL99

IF YOU WANT A NICELY STYLED ATU WITH ANTENNA SWITCH AND TUNING INDICATION . . . THIS IS IT!

### CL-66 Specification

Built-in 4 way antenna selection for 3 co-axial lines, and 1 long wire.  
Input impedance: 50-75 ohm unbalanced.  
Output: 10-600 ohm (3.5 MHz 200 ohm) unbalanced.  
Insertion Loss: Less than 0.5 dB.  
Tuning Indication: By means of L.E.D. (13-5v. DC supply reqd.)  
Power Handling: 500w.  
Price: £53.75 including carriage VAT.



**CL-99 144 MHz ATU**  
Input impedance: 50 ohms unbalanced  
Output: 20-200 ohms unbalanced  
Insertion Loss: Less than 0.3 dB.  
Power Handling: 200w.  
Price: £41.25 including carriage VAT.

## WESTERN FOR TEST EQUIPMENT

SEE OCTOBER ADVT. FOR FULLER DETAILS

### VALVE VOLTMETER, TE-65



\*With new 6" full-view meter  
\*Compare it to any peak-to-peak V.T.V.M. made by any other manufacturer at any price.  
Specification: DC V: 0-1-5-5-15-50-150-500-1500v. (using HV Probe, up to 3kV). AC V: 0-1-5-5-15-50-150-500-1500v. RMS. 0-1-4-4-14-40-140-400-1400-4000P-P. Resistance: Rx 10-100-1K-10K-100K-1M-10M (0.2Ω-1000MΩ). Decibel: -10dB to +65dB. Power source: 105-125, 220-240v. AC, 50/60 Hz. Tube Complement: 12AU7, 6AL5.

### RF SIGNAL GENERATOR, TE-20D



\*Factory calibrated and tested  
\*Dual output RF terminals  
\*Separate Variable Audio Output  
Specification: Freq. range: 120 kHz-500 MHz (7 bands). Freq. accuracy: ±2%. Audio output: to 8 volt. Internal modulation: 400Hz approx. Tube: 12BH7A, 6AR5. Power source: 105-125v., 220-240v. AC, 50/60 Hz. 1x watts. Employs a Xcal socket and can be used as below: (a) Self-calibration. (b) Marker generator.

### TEST EQUIPMENT PRICES

(including P. & P. and VAT):

SE-250B Injector	£3.24
SE-350A Tracer	£16.96
SE-360 Tracer/Injector	£19.17
SE-6850 Generator	£46.44
TE-15 G.D.O.	£27.00
TE-20D R.F. Generator	£27.00
TE-22D A.F. Generator	£35.64
TE-40 AC Millivoltmeter	£37.80
TE-65 V.T.V.M.	£37.80
TE-68 Insul. Tester	£48.60
TO-3 Oscilloscope	£91.80

# Electronics (UK) Ltd



Standard's superb '3-in-1' Transceiver for the serious FM Repeater operator—the **STANDARD C828!**

There's no other choice!

BASE STATION — MOBILE — PORTABLE

We're so fascinated by this little beauty that we think it makes everything else "obsolete" (or expensive!). The Price! **£168.75** inc. VAT.

- \* 10 watts (Hi), low (Lo) output.
- \* 12 channels SIMPLEX or REPEATER, 10 Ch. fitted.
- \* Single crystal control means you only have to buy 1 CRYSTAL PER CHANNEL.
- \* Fitted S1, S20, S21, S22, S23, R3, R4, R5, R6, & R7
- \* LED (BUSY) indicates whether you have accessed the repeater or not.
- \* LED's to indicate EXTERNAL VFO, TRANSMITTER ON REPEATER OPERATION.
- \* SPEAKER/MIC gives PRIVATE LISTENING and has switch to override the channel selector enabling a changeover to be made to an external VFO (Type CV110).
- \* TONEBURST is built in (Automatic on "Repeater").
- \* NEW LEATHER CARRYING CASE ANTENNA TYPE FCB-011 (available later) makes the C828 into a 12 Ch. 110w. portable unit.

## THE STANDARD C146A SETS THE STANDARD

AT NEW  
LOW  
PRICES

- \* Tone burst built-in and can be switched-off
- \* Has the finest range of accessories available and it's twice the power!
- ... it's half the weight!
- ... and about one third the size to a competitor!

### STANDARD

The Standard C146A is a 5 Channel (2 fitted) 2 watt unit fitted with adjustable toneburst for 1700 and 1750 Hz repeaters. The CSA Base Charger unit enables the C146A to be used as a main station and recharges Ni-Cad batteries (set of 10 required).

### PRICES (Carriage paid inc. VAT)

CV-110, VFO for C828	£50.00
C146A 2m. Hand Transceiver, 5 channel	£100.00
SY-200 Synthesizer	£112.50
C430 UHF Transceiver 10w. 10 ch.	£181.25
C432 UHF Hand Transceiver 5 ch.	£131.25

Ni-Cad Batteries, set of 10 ... £8.64

C-205K remote speaker for all models ... £11.25

CAD external antenna coupler ... £2.50

CSA Base charger unit for C146 ... £18.75

CAT-08E Rubber flexible antenna ... £3.75

CMP-08 External Microphone for C146 and C432 ... £11.87

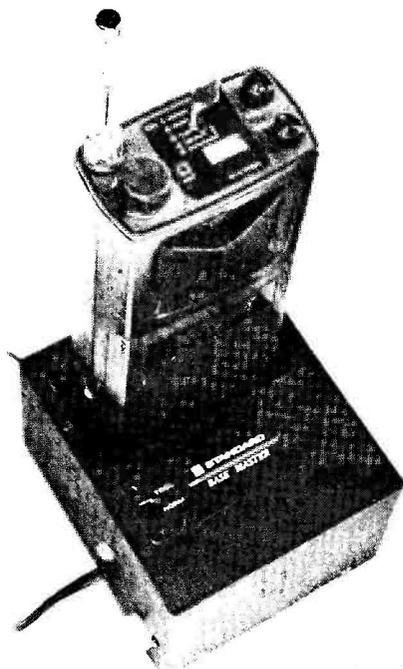
C-12 230-3 AC PSU ... £93.75

Crystals, per pair ... £5.62

### ACCESSORIES

C-12 230-5AE AC PSU for all models	£31.25
C-12 230-6E AC Charger for C146A and C432	£3.75

**SPECIAL OFFER. FREE SET OF NI-CADS.** Buy a C146A and 2 pairs of crystals and we will include a free set of 10 Ni-cad batteries.

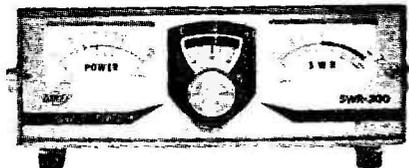


BACK IN STOCK AGAIN

### THE OSKER SWR200 POWER METER

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

Price: **£22.68** inc. VAT.



## Western Electronics (UK) Ltd

Agents: LES LYSKE, G13CDF, NEW-TOWNARDS (0247) 812449  
ALAN CAMERON, GM3JGJ, ALLOA (02592) 4653  
DAVID LACEY, GB1YP (Evening) Norwich (0603) 868581  
HOURS OF BUSINESS: 9.15-5.15; 9-12.30 (SATURDAY)

1-3 WEST PARK RD., SOUTHAMPTON

TELEPHONE: SOUTHAMPTON 27464

CABLES: WESTRONICS, SOUTHAMPTON

TELEX: 47388 WESTRONICS



**G3LRB  
G3MCN  
G3TYE**

# STEPHENS-JAMES LTD.

**47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA**  
**TEL. 052-35 76790**

Yaesu FT101E Transceiver	£493.00
FT101EE Transceiver	£468.75
FT221 VHF Transceiver	£398.12
FT200 Transceiver	£326.00
FT401B Transceiver	£412.50
FR101S Receiver	£337.50
FR101S Receiver (Dig'l)	£431.50
FR101D Receiver	£437.00
FR101DD Receiver (Dig'l)	£531.00
FL101L Transmitter	£343.00
SP101 Speaker	£18.75
YO-100 Monitor scope	£131.00
YP-150 Wattmeter	£55.00
YC355d Freq. Meter	£146.00
Drake R4C Receiver	£380.00
T4X Transmitter	£395.00
TR4C Transceiver	£410.00
AC-4 AC power unit	£80.00
M5A Speaker	£18.75
SSR-1 Receiver	£225.00
TV-1000 Low Pass Filter	£15.00
Decca Communications KW204 Transmitter	£312.00

KW107 Tuning Unit	£85.00
KW109 Tuning Unit	£97.50
KW104 VSWR Meter	£20.00
KW E-Z Match	£31.50
Belcom Liner 2 Transceiver	£182.40
LA106 Linear Amplifier	£206.50
R11EE psu for Liner 2	£31.25
Hy-Gain Antenna Range 12AVQ 10-15-20m Vert.	£37.00
14AVT WB 10-15-20-40m Vertical	£60.00
18AVT WB Vertical 10 thro 80m	£73.25
TH3MK3 10-15-20m Three Element	£155.75
BN86 Balun	£13.75
CDR Rotators AR22	£40.00
AR22	£31.25
AR30	£37.50
AR40	£37.50
CD44	£75.00
HAM-2	£112.50

Uniden 2020 Transceiver	£475.00
E010 VFO	£100.00
8120 Speaker	£30.00
Omega TE-701 Ant. Noise Br.	£22.50
TE-702 Ant. Noise Br.	£30.00
SWR Meters ReacE Hansen type single meter	£6.60
AEC10 Single meter	£6.20
AEC50 Twin meter	£11.20
Oskerbloch Twin Power meter	£25.92
Barlow Wadley XCR-30 Solid State Rec.	£160.00
Accessories Tech IS G.D.O.	£21.50
Morse Keys	£7.50
Katsumi Elec. Keyer	£40.00
SpaceMark ETM-3b Key'r	£49.98
Bauer Keying unit lever	£6.97
Planet Speech Comores'r	£35.00
Technical Associates Audio Filter	£32.50

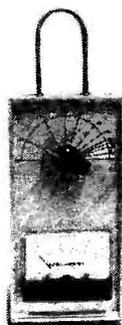
Audio Compressor	£28.12
G-Whips mobile antenna range. Full range in stock, send for leaflets. SAE please.	
Microwave Modules. SAE for information.	
Jaybeam. Full range of beams, quads, masts, clamps, couplers, etc. Send SAE for catalogue.	
Secondhand Equipment Swan 500 Transceiver	£320.00
Swan 300B with D.C. psu	£300.00
Drake R4C Receiver	£325.00
KW Viceroy Mk. 4 Tx.	£80.00
Heathkit HW32 with H.B. psu	£75.00
KW77 Receiver	£80.00
Magnum 4 Transverter	£65.00
Accessories PL259 Plugs 46p, SO259 Sockets 40p, Cable reducers 15p, In Line Connectors 75p, Elbows 95p, 4 pin plugs 65p, Sockets 60p.	



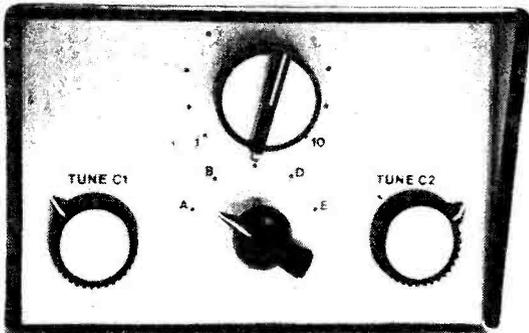
Electronic Developments MAGNUM 2 and 4 Metre Transverters. 28 MHz low drive input, CW, SSB, AM and FM. Inclusive of relays and power lead, size 10" x 6" x 7". PRICE £110.00, post £1.00.



Electronic Developments MAGNUM 2 metre LINEAR AMPLIFIER, MICROWAVE MODULES, Rx Pre-amp, RF switched. Self contained power supply. Full input and output relay switching. Up to 100 watts SSB output. PRICE £105.00, post £1.00.



VHF Absorption Wavemeter. 65-230 MHz. PRICE £16.00, post free.



SWL Tuning Unit Mk. 1. 50 switchable tunable positions. Two inputs singlefeed or co-ax. Suitable for any antenna over 15ft long on 2-30 MHz. Produced in demand to many requests. Hundreds now in use. PRICE £15.50, post free.

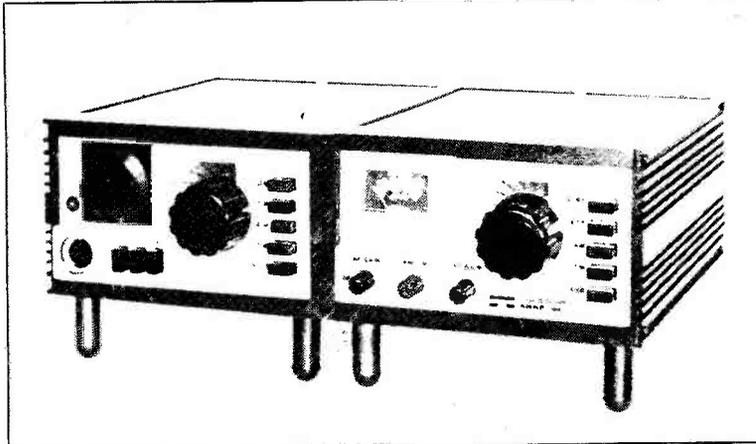
Instant HP and Credit facilities available. Barclaycard and Access facilities. After sales service on all equipment. Part exchanges welcome. Items sold on commission basis. Saves you advertising costs and assures you of good price. Spot cash paid for clean equipment. SAE with all enquiries please. Postage extra. Minimum postal charge 20p on small items. Carriage by arrangement. Free in some areas. All our prices include VAT at the Current rates. No Parking Problems

SHOP HOURS 9.30 TO 5.30 MONDAY TO SATURDAY

NO PARKING PROBLEMS

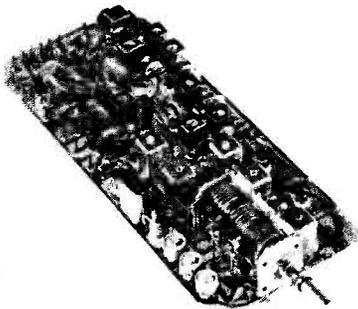
# S.T.E. MILAN VHF EQUIPMENT

During the last twelve months the popularity of the range of equipment by S.T.E. has been growing. The ARAC 102 receiver has been a "Best Seller" (have you seen any second-hand?). Later in the year the Atal Transmitter came into stock and all reports have been good. Now we are offering the complete range of modules for the D.I.Y. enthusiasts. Transmitters, receivers, etc. The construction of these modules are first class — the P.C.B.'s are the finest we have ever seen.

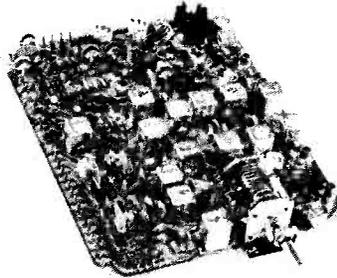


**Price List (includes postage)**

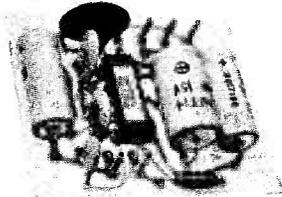
ARAC 102 Receiver	... £108.00
Atal 228 Transmitter	... £147.00
AR10 Receiver Module	... £37.75
AA1 Audio Amplifier	... £4.40
AD4 FM Discriminator	... £4.99
AL8 Linear Amplifier	... £29.00
AT22 Transmitter	... £55.50
AR20 C.C. Receiver	... £57.50
AT23 C.C. Transmitter	... £39.00
AS 15 Stabilised psu D.C.	... £10.00
AG 10 Tone Generator	... £4.75
AC2A Converter 28-30 MHz	... £23.00



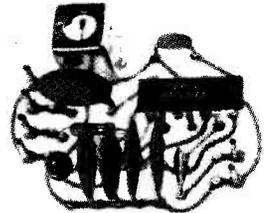
**AR10** Mosfet receiver. 28-30 MHz Double conversion superhet. RF and amplifiers stages are gate protected mosfets for good sensitivity and low intermodulation. Noise limiter and squelch circuit. AM, SSB and CW reception. 12v. DC.



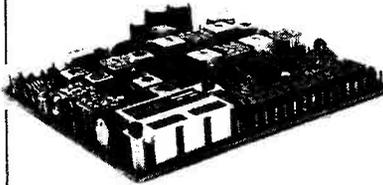
**AT 222.** A complete transmitter exciter unit for 144-146 MHz on AM or FM. VFO controlled or fixed channel operation. Complete with microphone pre-amp., speech processor including active audio filter. 1 watt output. FM, 25 watt AM. Output impedance 50-75 ohm adjustable. Frequency deviation 3-10 kHz adjustable.



**Audio Frequency Amplifier.** Output power 1.5 watt at 12v. Output impedance 8 ohm. Frequency response 100-15,000 Hz within 3 dB. Sensitivity 12mV.



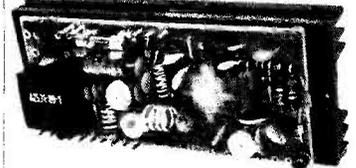
**455 kHz FM Discriminator Amplifier.** Limiting threshold 100uV. Amplitude modulation rejection 40dB. Audio output voltage at 1 kHz 200-300mV frequency deviation + or - 3 kHz.



**AR20.** 12 channel FM receiver 144-146 MHz. Input impedance 50-75 ohm. AM-FM modes. Sensitivity 0.2uV AF output 3 watts. 12v. DC operation.



**AT23.** 12 Channel FM Transmitter. 3 watts. 144-146 MHz. Frequency deviation 3-10 kHz adjustable. 12v. DC operated AF input sensitivity 2mV adjustable to 50 mV.



**Linear Amplifier.** Frequency 144-146 MHz output 10 watts FM, 8 watt PEP SSB, 8 watt AM. Input power 1 watt FM, .25 watt AM-SSB. Input impedance 50 ohm output impedance 50-75 ohm. 12v. DC.

## STEPHENS-JAMES LTD.

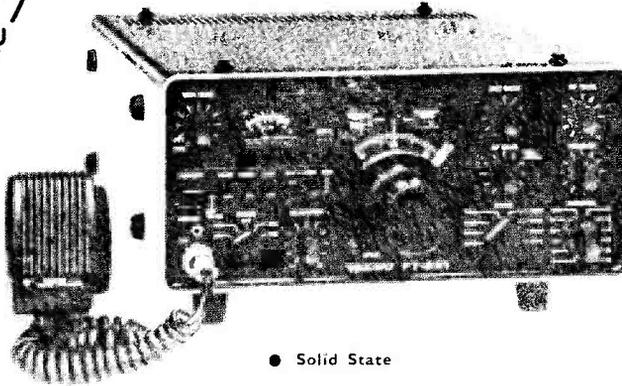
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TEL: 052 - 35 76790

# AMATEUR ELECTRONICS UK



## YAESU MUSEN MAIN AGENTS



ON THESE PAGES  
WE SHOW A  
SELECTION OF  
THE FAMOUS  
BRAND NAMES  
WE IMPORT

### FT-221'

SSB FM CW AM 2 Metre  
Transceiver

● Solid State

## BOTH EX-STOCK

TOGETHER WITH ALL ITEMS  
FEATURED IN THE MAIN  
YAESU ADVERTISEMENTS  
ALL BACKED UP BY A FIRST-  
CLASS AFTER SALES SERVICE  
AND FREE SECURICOR  
SERVICE

### FT-101E/EE

160 thru 10 Metre Transceiver  
E MODEL WITH R.F. PROCESSOR  
EE MODEL LESS R.F. PROCESSOR



## FT-201 Mobile/Base Station

ASK ABOUT OUR  
SPECIAL OFFER ON  
THIS MODEL



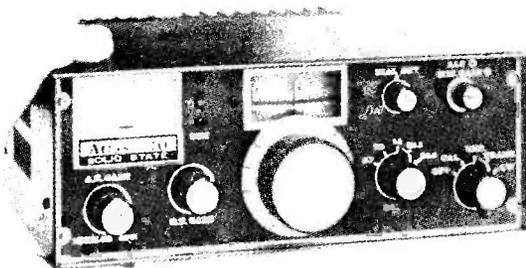
# AMATEUR ELECTRONICS UK — YOUR FIRST CHOICE FOR YAESU MUSEN!

**508-514 ALUM ROCK ROAD  
BIRMINGHAM 8**

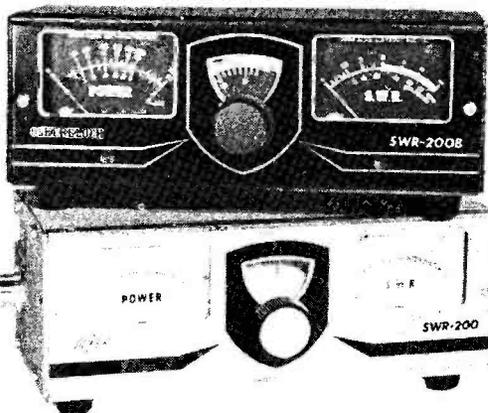
**021-327 1497  
6313**



**The Sensational ATLAS 210/215X — Latest Models !**



**OSKERBLOCK**



**SWAN  
ELECTRONICS**



**SWR200B £24.00 Plus £1.92 VAT  
SWR200 £22.00 Plus £1.76 VAT  
(P P 85p)**

THE 700 CX SWAN'S 700 WATTER—OTHER MODELS FROM STOCK

**AMATEUR ELECTRONICS UK** ARE DIRECT IMPORTERS OF **YAESU, SWAN & ATLAS** EQUIPMENT

PLUS MANY OTHER PRODUCTS—A COUPLE OF STAMPS (NO ENVELOPE REQUIRED) BRINGS OUR FULL STOCKLIST, USED EQUIPMENT LIST OR ATLAS LEAFLET—IF YOU WOULD LIKE THE LATEST SWAN LITERATURE OR THE YAESU MUSEN MAIN CATALOGUE—DUE TO LIMITED SUPPLIES OUR CHARGE FOR EACH REMAINS AT 25 PENCE POST PAID, BUT FOR THE BENEFIT OF THE SERIOUS ENQUIRER THEY NOW COME TO YOU TOGETHER WITH OUR CREDIT VOUCHER VALUE £1 FOR USE AGAINST YOUR FUTURE YAESU OR SWAN PURCHASE.

**CREDIT TERMS: NEW LOW DEPOSIT — TRADE-INS WELCOMED**

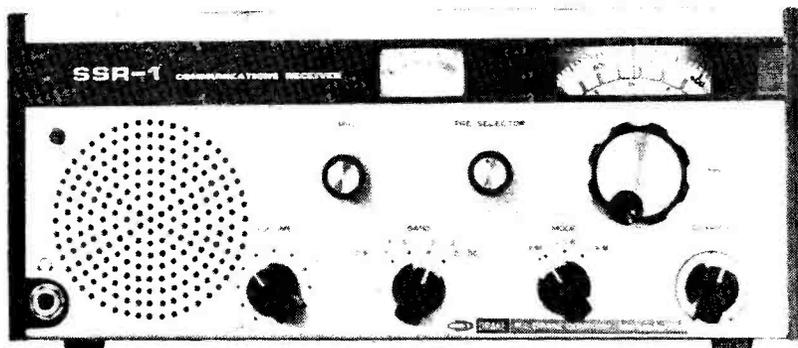
**NEW BRANCH** NOW SERVING A LARGE AREA OF THE SOUTH-EAST, AMATEUR ELECTRONICS UK—COASTAL, 316-318 NORTHDOWN ROAD, CLIFTONVILLE, KENT. FOR COURTEOUS ATTENTION AND A SQUARE DEAL WHY NOT 'PHONE KEN McINNES, G3FTE, AT THANET (0843) 22060—YOU WON'T BE DISAPPOINTED.

**AGENTS:** SCOTTISH—RON TURNER GM8HXQ WISHAW 72172  
WALES AND WEST—ROSS CLARE GW3NWS CAERLEON 42232

# Radio Shack Ltd ★ London's Amateur Radio Stockists

Just around the corner from West Hampstead Underground Station

## NEW DRAKE SSR-1 RECEIVER



- Synthesized      ● General Coverage      ● Low Cost
- All Solid State      ● Built-in AC Power Supply
- Selectable Sidebands      ● Excellent Performance

UK PRICE £225, EXPORT PRICE £185 INC. SURFACE POSTAGE

### SPECIFICATIONS

Frequency Coverage :	0.5 to 30 MHz in 30 ranges each tunable over 1 MHz range with a dial having 10 kHz graduations.
Reception Modes :	CW, USB, LSB, AM
Sensitivity :	At least 10 dB S/N under the following conditions :
	MODE      FREQUENCY      INPUT LEVEL
	SSB      0.5-2 MHz      1.0 $\mu$ V
	SSB      2-30 MHz      0.3 $\mu$ V
	AM      0.5-2 MHz      3.0 $\mu$ V
	AM      2-30 MHz      1.0 $\mu$ V
	(AM : 1000 Hz at 30% modulation)
Output :	Capable of 200 mW output on SSB at 2 MHz with input signal of 0.5 $\mu$ V and 2 Watts output with 5 $\mu$ V input.
Audio Distortion :	Less than 5% at 2 Watts.
Calibration Accuracy :	Within 5 kHz at all frequencies.
Selectivity :	BANDWIDTH
	MODE      — 6 dB
	SSB      3 kHz $\pm$ 25%
	AM      5.5 kHz $\pm$ 25%
Image Rejection :	Greater than 50 dB.
IF Rejection :	Greater than 50 dB at fd below 20 MHz. Greater than 40 dB at fd above 20 MHz.
Antenna :	Self-contained telescopic whip antenna. External connection to terminal strip. (75 ohm input impedance—unbalanced.)
Audio Output Provisions :	Internal 8 Ohm speaker and phone jack on front panel that disables speaker when plugged in.
Muting Provisions :	External mute jack (RCA type) that provides normal reception with closed circuit and mute with open circuit connections.
Power Supply :	8 type "D" (1.5v.) dry cell batteries. Tapped transformer to provide operation from 117v. $\pm$ 15% or 240v. $\pm$ 10%—20%. 50-60 Hz source with automatic switch over to batteries when AC line is disconnected.
Current Consumption :	Less than 100 mA quiescent at 12v. DC.
Dial Lights :	Momentary push button to light when on battery operation. Always on for AC operation.
Clarifier :	Tunes minimum of $\pm$ 2 kHz and maximum of $\pm$ 5 kHz.
Size :	13in. (33 cm.) wide, 11in. (28 cm.) deep, 5.5in. (14 cm.) high.
Weight :	14 lb. (6.4 kg.).

DRAKE ★ SALES ★ SERVICE  
SECURICOR ★ B.R.S. ★ ACCESS ★ BARCLAYCARD ★ HP

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DO YOU KNOW A BARGAIN WHEN YOU SEE ONE? MANY OF THE PRICES OF THE R.L. DRAKE COMPANY WERE INCREASED FROM FEBRUARY 1st. RADIO SHACK LTD., the U.K. importers and distributors, INTEND TO SELL AT THE OLD PRICES FOR AS LONG AS POSSIBLE.

COMPARE THE PERFORMANCE AND COST OF DRAKE RECEIVERS, TRANSMITTERS AND TRANSCEIVERS, WITH OTHER EQUIPMENT ADVERTISED IN THIS MAGAZINE. SEND US A S.A.E. AND WE'LL BE HAPPY TO SEND YOU DETAILS OF ITEMS IN WHICH YOU ARE INTERESTED. INCIDENTALLY, MOST ITEMS ARE EX STOCK.

## DRAKE RECEIVERS AND ACCESSORIES

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2-CC	Q multiplier-speaker for 2-C	£40.00
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FL250	Filter for R-4C (250 kHz)	£38.75
FL500	Filter for R-4C (1-500 kHz)	£38.75
FL1500	Filter for R-4C (11.5 kHz)	£38.75
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FL5000	Filter for R-4C (16.0kHz)	£38.75
4-NB	Noise Blanker for R-4C	£31.25
MS-4	Matching speaker for R-4C	£18.75
SPR-4	Receiver — General Purpose	£412.50
AL-4	Loop Antenna for SPR-4	£18.75
S-NB	Noise Blanker for SPR-4	£50.50
SCC-4	100 Hz Calibrator for SPR-4	£15.50
TA-4	Transceiver adaptor for SPR-4, T-4XC	£28.00
	DC Power Cord for SPR-4	£4.50
	Amateur Bands Crystal Kit for SPR-4	£20.00
	Time and freq. Crystal Kit for SPR-4	£17.50
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	Teletype Commercial Kit for SPR-4	£15.00
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34-PNB	Plug-in noise blander	£50.50
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DC-4	12v. P.S.U.	£92.50
MMK-3	Mobile mounting kit	£5.00
RV-4C	Remote V.F.O.	£80.00
FF-1	Crystal control	£34.50

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T-4XC	SSB Transmitter	£395.00
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MN-4	Antenna match	£75.00
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W-4	RF wattmeter	£47.00
WV-4	RF wattmeter	£55.75
C-4	Station control	£272.50

## ADDITIONAL ACCESSORIES

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TV3300LP	L.P.F. 2kW	£15.00
RP-500	Receiver protector	£54.50
7072	Hand mic.	£13.25
7075	Desk mic.	£26.25
	Accessory crystals	£4.50
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## HUSTLER MOBILE ANTENNAS

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RM-15		£8.00
RM-20		£8.68
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RM-80		£11.56
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SF-2	3 wave whip	£8.75
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CGT-144	2m. collinear with mount	£31.25
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4BTU	10-40m. vertical	£57.50
PACKAGE	deal RM-80S and 4BTU	£70.00
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S105	Top sectional QD-1	£5.00
G-144A	2m. collinear	£43.75
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N6502	Philips main unit	£9.50

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401A	Magnetic	£10.00
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444T	Desk model + preamp	£23.75

## ROBOT SSTV

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70B	Monitor	£368.75
Kit	to convert 70A to 70B	£81.25
Model E	macro lens	£49.50

## VENUS SSTV

SS-2	Monitor	£250.00
	Camera	£312.50
P-1	Polaroid adaptor	£21.25
V-1	Viewing hood	£8.75

## MICROWAVE MODULES

MCC144	Converters (state IFF)	£18.90
MM144 2B	LO	£19.90
2m. Preamp		£11.30
MMC432 2B		£22.60
MMC70 2B		£18.90
MMV 1296		£31.30
MMV 432		£21.90

## YAESU MUSEN

FT-101E	Transceiver	£498.75
FV-101	Remote VFO	£65.00
FT-401B	Transceiver	£412.50
FV-401B	Remote VFO	£65.00
FT-200B	Transceiver	£318.75
FT-201	Transceiver	£400.00
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FR-101D	Digital receiver	£531.25
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FL-2100B	Linear	£293.75
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YC-355D	Dig. freq. meter	£45.00
YO-100	Monitorscope	£113.40
YP-150	Dummy load wattm.	£55.00
YC-601	dig. readout unit	£112.50

## MISCELLANEOUS ITEMS

MFJ filters CWF-2 BX		£16.87
KOKUSAI mech. filters MF455 10CK		£16.25
BELLING LEE H.P. filters		£3.75
SW-10	spl. meter	£7.56
SWR-50	twin meter	£10.80

## JAYBEAM ANTENNAS

4Y 4M		£11.63
5Y 2M		£6.13
6Y 2M		£8.00
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HM 2M		£3.13
SPM portable mast		£8.00
Q4 2M		£12.00
Q6 2M		£16.00
MBM48 70		£17.40
PMH 2C		£4.07
PMH2 2M		£5.63
PM70 4		£9.75

## USED EQUIPMENT

<b>RECEIVERS</b>		
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DRAKE R-4C Amateur Bands		£285.00
DRAKE SPR-4 General purpose		£312.50
EDDYSTONE 730 4 General coverage		£135.00
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EDDYSTONE 1000 General coverage		£250.00
RACAL RA-17 General coverage		£395.00
TRIO JR-599 custom special		£250.00
TRIO QR666 General coverage		£137.50
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YAESU FR-50B		£87.50
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KW 204 As new		£204.00
<b>TRANSCEIVERS</b>		
DRAKE TR-4C		£300.00
HEATHKIT HW-7 and PSU		£50.00
HEATHKIT HW-202 with TB PSU		£150.00
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10 models to choose from  
Drive 1-15W output 12 to 160W  
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FT-101E De luxe	£395.00
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FP-501 AC PSU Speaker	£55.00

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FR-101DD De luxe digital	£425.00

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YPI50 Power meter	£42.00
YC 601 Digital Readout	£95.00

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FT2 AUTO FM autotune	£215.00
FT-221 Multimode 2m	£318.00
FT-224 FM24 channel	£135.00
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XF103 CW Filter (FT501)	£23.00
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RF101 RF Clipper FL101	£28.00
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# THE MAIN YAESU MUSEN DISTRIBUTOR

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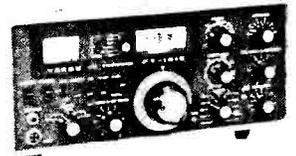
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Also FR101S — FR101SD — FR101D with FL101 Transmitter. The FR101 in the de luxe version offers: Coverage from 1.5 kHz including all SW broadcast and H.F. amateur bands. (23 in all) to 144 MHz AM, FM, 55B, CW are catered for, each with separate crystal filter. Transceive operation with the FL101 or FT101. Digital versions, and the matching FL2100B linear amplifier of 1200 Watts pip are available Ex Stock from S.M.C.



FR101DD



FT101E

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From: £135

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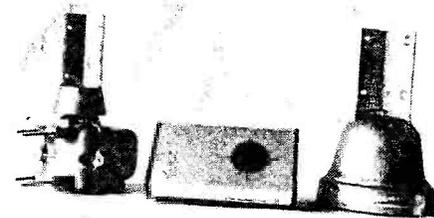
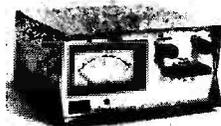
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In production now for over three years and in use all over the world and ideal for normal tropo or OSCAR work. The Europa B plugs into Yaesu/Sommerkamp equipment and you are on VHF. All other HF equipment can be used with our Europa power supply the CPS 10.

The Europa B gives you:

- \* The confidence of our most efficient back up service in the 12 month warranty period and beyond.
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- \* Cleanest output spectrum available. All spurious outputs—80dB.
- \* Price: £109.37 complete to plug in and from stock.

## EUROPA COMPLETE POWER SUPPLY TYPE CPS 10

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## SENTINEL DUAL GATE MOSFET CONVERTERS

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- \* Strong signal and overvoltage and reverse polarity protection built in.
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ADVERTISERS' INDEX

	Page
Aero & General Supplies ...	55
Amateur Electronics (G3FIK) 12, 13	
Ashley Dukes (Honda) ...	61
Axial Products Ltd. ...	51
Baginton Electronics ...	54
B. Bamber Electronics <i>back cover</i>	
J. Birkett ...	50
British National Radio School	52
C. & C. Electronics ...	55
Cambridge Kits ...	60
Campione Electronica ...	46, 47
Catronics Ltd. ...	51
Crayford Electronics ...	63
Datong Electronics Ltd. ...	45
Derwent Radio ...	58
G3HSC (Rhythm Morse Courses) ...	62
G.I. Amateur Supplies ...	61
G.W.M. Radio Ltd. ...	55
Hamgear Electronics ...	61
Heath (Gloucester) Ltd. ...	20
D. P. Hobbs Ltd. ...	56
Home Radio Ltd. ...	49
J. Yu ...	63
K.W. Communications Ltd. ...	45
Lee Electronics Ltd. ...	53
Lowe Electronics <i>inside front cover</i>	
1, 2, 3	
S. May (Leicester) Ltd. ...	55
Microwave Modules Ltd. ...	54
Mosley Electronics Ltd. ...	60
Partridge Electronics Ltd. ...	53
P.M. Electronic Services ...	56
Radio Shack Ltd. ...	14, 15
R.T. & I. Electronics Ltd. ...	49
Small Advertisements ...	57-62
Solid State Modules ...	18
Southern Surplus Merchants	56
South Midland Communications Ltd. ...	16, 17, 62
Spacemark Ltd. ...	59
S.S.B. Products ...	60
Stephens-James ...	10, 11
S.W.M. Publications <i>inside back cover</i> , 55, 56, 58, 59, 64	
Tape Talk ...	61
Technical Associates ...	57
Thanet Electronics ...	44
T.M.P. Electronic Supplies	56
J. & A. Tweedy Ltd. ...	63
Reg Ward & Co. Ltd. ...	62
Waters & Stanton Electronics ...	48
Western Electronics Ltd. ...	8, 9
W. H. Westlake ...	63
Yaesu-Musen Co. Ltd. ...	4, 5, 6, 7
Chas. H. Young Ltd. ...	52

# SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXXIV

MARCH, 1976

No. 389

## CONTENTS

	Page
<b>Editorial</b> ...	21
<b>Communication and DX News</b> , <i>by E. P. Essery, G3KFE</i> ...	22
<b>Marine VHF for Yachts</b> , <i>by J. C. Vears</i> ...	26
<b>Book Review—ARRL VHF Manual, 6th Edn.</b> ...	29
<b>HF Band Converter</b> ...	30
<b>"SWL"—Listener Feature</b> ...	33
<b>VHF Bands</b> , <i>by N. A. S. Fitch, G3FPK</i> ...	36
<b>The Month with The Clubs—From Reports</b> ...	40

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

*Advertising:* Charles Forsyth

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19



# The SHORT-WAVE Magazine

## EDITORIAL

### MOBILE RALLY SEASON—1976

The list following up-dates (and corrects) that given on p.631 of the January issue. **March 28**, White Rose Mobile Rally, Lawnswood High School, junction A.660 A.6110, opening at noon, with talk-in on two-metre SSB by G4DXA, FM by G3FCW/A (Ch. 22, listening on R3) and G3XEP A on or near 3760 kHz. Plenty of free parking. **April 25**, North Midlands Mobile Rally at Drayton Manor Park, near Tamworth, Staffs., from 11.30 a.m. **May 2**, Tulip-Time Rally, at Glead School, Halmer Gardens, Spalding, Lincs. **May 23**, Northern Mobile Rally, Victoria Park Hall, Keighley, West Yorkshire. **May 30**, Hull Mobile Rally, at College of Agriculture, Bishop Burton, nr. Beverley, Humberside. **June 13**, Rally in the grounds of Elvaston Castle Country Park, near Derby. **June 20**, R.N. Amateur Radio Society Mobile Rally at H.M.S. *Mercury*, East Meon, Petersfield, Hants. **July 18**, Cornish Radio Amateur Club Rally, at Camborne, Cornwall. **August 29**, Torbay Amateur Radio Society Rally.

We would be glad to have reports and pictures covering these events—address to: Editor, "Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ—also details of other Rally events.

### BARTG NEWS BROADCASTS—GB2ATG

We are informed that the British Amateur Radio Teleprinter Group (hon. secretary: J. P. G. Jones, GW3JGG, 40 Lower Quay Road, Hook, Haverfordwest, Dyfed, SA62 4LR) have started RTTY "newsletter broadcasts" on Sundays, w.e.f. 7 March and signing GB2ATG. The schedule is 1200z on 3590 kHz, F1, shift 170 Hz; 1230z on 144.6 MHz, F1, 850 Hz; and at 1245 on 144.6 MHz, F2, shift 170 Hz. The stations transmitting for March will be, on 80m.: G3IIR, G3OZF, GW3JGG, and on two metres: G3IIR, G3OUF, G3OZF. Reports will, of course, be welcomed—but please note that GB2ATG is licensed "for broadcast only" and no communication with that station is permitted.

### NORTHERN RADIO SOCIETIES' ASSOCIATION CONVENTION

The annual convention and exhibition run by the NRSA (which has now become a regular feature of the annual calendar of events) is being held this year on Sunday, April 25, again at Belle Vue, Manchester, from 11.0 a.m. As usual, this is a united Club venture, with a

large attendance of trade exhibitors. Talk-in on AM-FM SSB will be provided on two metres, also AM-FM on 4 metres (70.26 MHz), all stations signing GB3NRS. It is hoped that the local repeaters GB3MP (R6) and GB3RF (R7) will be functioning before April 25. As well as the Trade show and Club stands, there will be competitions and a raffle. Entrance to the Exhibition Hall is at the rear of Belle Vue, opposite the main car park, off Hyde Road, A.57. Information from: G. L. Adams, 2 Ash Grove, Knutsford (4040), Cheshire, WA16 8BB.

### CORRECTION—"RF BRIDGE UNIT"

In this article in our January issue, the circuit (A) on p.640 should show a connection from the negative side of the meter to earth, *i.e.*, the screening box, which itself should be earthed.

### PASSING OF TWO PIONEERS

The death is reported of Werner Alexanderson, at the age of 97. He was famous as the developer of the "radio HF alternator" that bears his name, *i.e.*, the machine ran at a speed to produce a frequency suitable for long-wave telegraphy—in effect, it could be connected directly between aerial and earth and then run up to a speed to give the required wavelength. It emitted a most distinctive note and was in successful operation for many years at commercial long-wave stations installed by the American General Electric Company. Alexanderson made his career in radio, and held no less than 342 American patents.

Another pioneer, whose name is well known in our world of Amateur Radio—Hidetsugu Yagi—has died in Tokyo at the age of 89. It is doubtful if he himself made much out of his prime invention, the Yagi-type of aerial, which has been copied and is used throughout the world for all manner of communication systems in the VHF/UHF/SHF fields. It is interesting that he first proposed his reflector-dipole-director principle as long ago as 1919, when VHF operation of any kind was almost unknown.

### G5ZG LEAVES £140,000

In this space in our December issue, we reported the death of Sir Roger Hawkey, Bt., G5ZG, of Takeley, Essex, one of the real old-timer amateurs. His will has been proved at £140,669.

*Austin Forsyth  
G6FO*

# COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

IT may be recalled that last month we used the services of a son-in-law to repair a roof and at the same time to put a new set of radials on the vertical: the saga continues, thuswise: Try all four bands on 14AVQ, 14-21-28 fine—but on 7 MHz, more RF returning than going, must have a problem. Go find son-in-law to beat his ears, son-in-law gone home. *Bother*. Next morning, see piece of wire hanging from roof guttering. Son-in-law, when he sees it, says "That's not the radial I put up!" Get secret weapon from garage, very useful for aerial-wire problems: comprises four four-foot tank-whip sections slotted together, with half a Channel I TV driven element taped on the end, with a button-hook taped to the end of that. Separate stray wire from forty-metre radial and lo! it's the lead-in for the Top Band wire. Luckily, it can be "got at," so we rapidly attach it back to the internal part of the system. Junior-op, walks in and asks if at the same time the other break he noticed yesterday has been mended yet. Where? Having repaired this break also, retire to shack, try receiver, no significant change in levels or tuning. Cannot believe this is true, so investigate the entire run of the long-wire within the house; where it has been cunningly hidden behind a cupboard, we find yet another break! Mend this one, and the whole system springs to life! The interest in this case lay in the fact that the 888 was recently pressed into service again as a Top Band receiver, after several years of serving as tunable JF for a VHF converter, so we had forgotten the sort of gain-settings which produced useable output from the speaker on Top Band; and in addition, over the few preceding days, a different ATU was being tried out on the long-wire, with a view to feeding it on all bands. Had we still had the KW-2000B in use, or the previous ATU, we would have spotted instantly that something was up. So, to add to the shack records, there is now a list of typical gain settings of the 888 on DHJ, and of the ATU tuning and switch position for both ATU's. But, you may ask, what about the 14AVQ on 7 MHz? Well, so far as can be deduced at the moment, all the traps are OK, but the top section is just not connected electrically to the upper trap, even though it is still physically firmly in place. Doubtless, when we get that son-in-law over here at the weekend...

On an entirely different theme this old scribe has had an entirely new glimpse of the old Phone CW controversy. At this moment, a mild lung infection seems to have reduced the vocal output to S1, far below the needs of fully-modulating the rig; which would be awful were one to be struck at home like this for several days of boredom and unable to use a Morse key—your scribe is at least able to forget aches and pains while pounding the brass!

## The Bands

You may recall that we quoted W4UMF as saying the bottom of the sunspot cycle would not come until the smoothed sunspot number got below ten. Well, Zurich predicted the Smoothed Sunspot Number for January as 9, for February 8, March 7, and April 6. Who knows, we might be creeping up to the turn this year yet!! However, this is the March issue, and this is the time when the seasonal lift should start doing its stuff for us, so all is not lost.

## Rockall

What a coincidence that, after we had gone to print, last month, we had a letter from G3APA (Coventry) enclosing an article with photographs describing various landings on Rockall which appeared in January 1976 *Yachting World*. Judging by the pictures, any sort of boat landing would be quite hazardous, and any operation would be most definitely dangerous if weather conditions deteriorated—one would think there would be a good chance of operator, gear, aereals and all just "going over the side!" The details are being sent on to DA1VH.

## Bit Missing

That paragraph about G5DX and his doings up on Hadrian's Wall last time was a bit shortened in that somehow we missed the page with the last sentence on it. In this last bit we would have added that the call from G3TGW, when G5DX-P was at the Roman signal station Vindolanda was an odd coincidence since, some thirty years before, G5DX had spent some of his time teaching the G3TGW-to-be the mysteries of—you guessed it!—*Latin*.

## China Again!

It is reported in the February issue of the German magazine *QRV* (owned and edited by our old friend Felix Körner, DL1CU) that BV2A, name of Tim Sh-Chen, is officially licensed at Taipei, Taiwan,

China. He uses BV2A on 14025 kHz CW, and the call BV2B on 14218-14250 kHz SSB. His antennae are a 20m. ground-plane and a 3-ele. beam, and he has been heard working EU's. BV2A is an old-timer, and an old hand at the game, having in earlier years held the calls AC3WW (Tsintau), XU6A and C3YW from Foo-Chouu. As these details came via JA3DWT (Osaka), who is QTHR, it would probably be worth sending cards that way. In any event, we would be very interested to have reports of anyone hearing or working BV2A B.

## Ten Metres

In the Newtownabbey area of GI lives G14EIZ: Bill reports that on Saturdays around midnight, he, with G13LEG, G14CFQ, G13GTR, G14DAV, G13IVJ, all work on 28.6 MHz. On January 10, there was an Aurora opening when quite a few stations were worked, with the usual difficulty in identifying on Phone; however, it is understood that G13IVJ raised some W's that night, and G14EIZ himself worked an SM and a brace of Icelandics, TF3AN and TF3AC, both in Reykjavik. This is the sort of activity which should be encouraged during the bottom of the sunspot cycle, as Ten is the ideal area for local nets, for example, now that Two is just a mass of poor-quality SSB plus simplex and repeater FM without callsigns, with the additional advantage of demonstrating *usage of the band*, which is, like all bands open to us, absolutely vital if we are to hold our grip on our allocations. Have a listen, and if you hear the GI lads, send 'em a QSL if you can't break in, or an SWL report; they'll be interested.

For the rest, if every one of use takes care to check Ten every time we have a look round, and put out a CQ even though the band appears dead things will begin to hum a bit; after all, this sort of thing would put up the band-occupancy no end, and result in some very interesting contacts by way of ground-wave, or VHF-type tropo, evenings. Get your local Two-metre and Four-metre DX'ers to put you on their grapevine, and when the word goes out that VHF is active due to a lift, then get on Ten and put some CQ calls out. Then it won't be our fault if we lose our rights to the band!

## Fifteen

Having dismissed Ten in terms of no signals heard at all, G3NOF (Yeovil) goes on to consider Fifteen, where most signals have been heard during daylight hours, frequently first-hop I and YU, Africans in the mornings from about 1000z, with VK6 and YC a little later; in the early afternoon, a few stations were coming from the Middle East. There was quite an opening into Florida during the ARRL Phone Contest. In terms of contacts, it added up to: A4XVJ, A2CME, FB8ZG, OK4IZ MM (off West Africa), ON5GT:MM (in the Gulf of



... can't let you go without seeing the rig ...

Guinea), TU2EI, VK6HE, W4's, 5B4AP, 5B4DA, 5N2ESH, G91LZ, 9G1TF (Accra Trade Fair) and 9K2DR.

G4DMN offers the band damnation with faint praise; all right at times, he says, but the only thing of interest ET3PG.

Back in January, we enquired about G4CBC/MM; this led to a letter from G3ZGC/MM, in which he says G4CBC/MM is a very senior radio officer indeed, whose son signs G4AWW; the /MM gear is either a Trio TS-520, or an FT-75, operated to a 14AVQ aerial.

#### Twenty Metres

Even if you have a beam atop a high mast, the band is not all that good; this being the case, the situation of the man with the low dipole or best-bent-wire is indeed, in terms of DX, deplorable!

G3NOF found the band opening to VK/ZL on the long path for about an hour from 0830, though sometimes they would stay in later. W's from about noon to an hour or so after sunset; around 1800 the skip has been longer to W6, W7 and KH6 on a few evenings, and at about the same time there have been Africans about. After closing, it sometimes re-opens later to Central and South America. CR9AK, VS6DR and VS6HI were gotaways, while SSB QSO's were completed with AA7EQL, AA7ZLC, AC7BGH, AC6ABC, HZ1TA, KH6BB, OE6DK/YK, TU2BX, VK2ALH, VK2DA, W7VY, ZB2BL, ZL2CE, 7P8AC and 9G1TF.

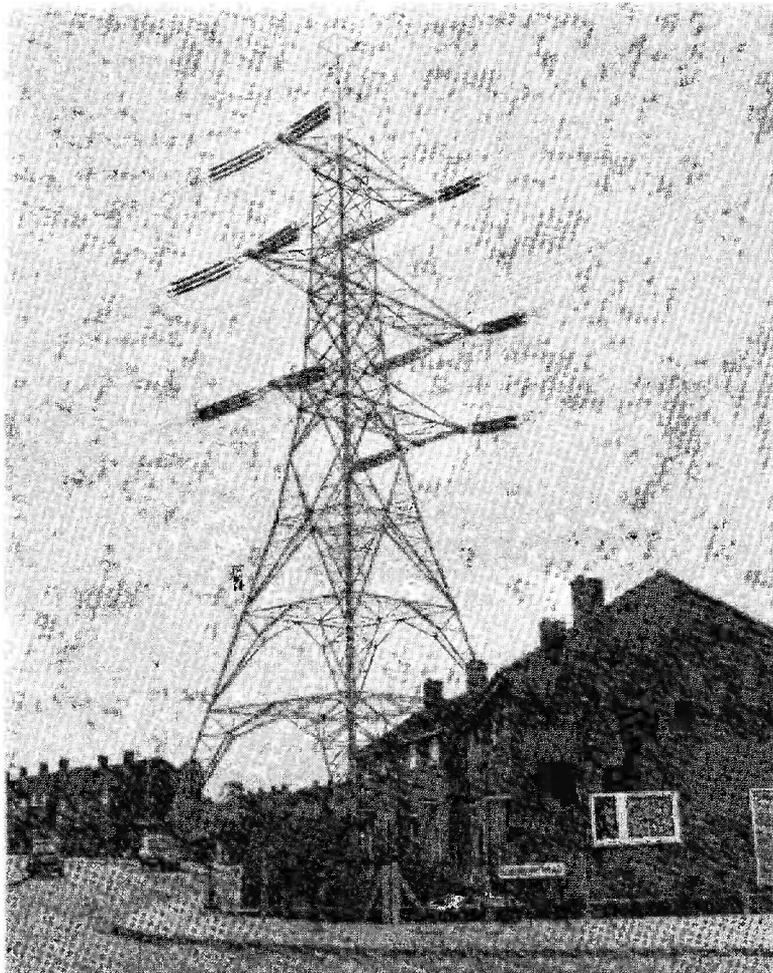
G2HKU (Sheppey) seems to be suffering severe regulation problems with his mains supply, which seems to dither about quite badly as the local load of night-store heaters and such come on up the road, and then disappears altogether for an hour at a time. This sounds like a very good justification for having a big beef at Authority on the

one hand, and for the installation of a suitable constant-voltage transformer for the shack on the other. A CVT properly designed is quite expensive, admittedly, but on the other hand it will catch the mains voltage changes so quickly the rig just won't feel them, for mains variations between, say, 180 and 250 volts or better. The one here was thrown out of a test-equipment rack ten years ago, and has been doing duty in the shack ever since; the extra wee bit of temperature rise is ideal for keeping the feet warm as well! In the way of QSO's, Ted mentions his usual ones with ZL1AAE and ZL1VN, plus M1D, all on SSB.

G4BHY (London N.W.3) has been in hospital recently, and so it was arranged to send the rig away for a decoke at the same time; a borrowed Barlow-Wadley receiver with a three-foot aerial and six U2 batteries went into the hospital, on which G4BHY was able to listen to F6CYL's net on Twenty, including ZS5TU, ZS5PH, ZS6AKG, 9J2WR, F6CPH and G3MOW; on some mornings ZL2AM, Napier, was like a local, and ZL2AUX was audible most mornings also. How frustrating to hear but not to be able to answer, the more so once the gang got to know that G4BHY was hearing them but couldn't answer back—but the comments no doubt did a lot to boost the G4BHY morale.

GW4BLE (Newport, Gwent) seems to have spent most of his time on Twenty Sideband; the odd weekend operation, 0800-0900, an hour around lunchtime, then evening time from 1700 to 2000 or so. Since the GW4BLE new QTH is sloping down to the South-West from some 450 feet above sea level, the ground favours contacts into the Caribbean and South America; and this is where 90% of the contacts in fact were. The log included C6ABC, CT2AK, CT2AU, D4CBS, EA8LK,

Nice-looking QTH—or is it?! The pylon came after the house, bringing the HT-noise QRM with it—but even at that, one wonders if the local planners would grant permission for a tower and a rotary beam!



EA8CR/EA9, FG7XN, FYOBHI, HI5ORCD, HISEL, HI8XGF, HI8XKC, HK3CVN, HK7DMU, HP1GN, HP4GW/MM (Region 11, and sailing about in an old Scottish fishing trawler), HR1SO, JA, JH, JR's, all long-path 0800-0900, KZ5AS, KZ5BC, KZ5EK, PJ3DO, PZ1AP, PZ9AB, TD76PW (a special from TG9PW celebrating the Bicentenary of Guatemala City), TU2EG, VP2DM, VP2KF, VP2KJ (Nevis Is.), VP2MAI, VP2MF, VP2SV, VP9AN, ZL1-4 long-path in the early mornings, XJONED/MM, 6Y5MJ and 6Y5FM —plus the usual crop of East Coast W and VE's, the odd W7, and one each VE4 and VE6. We also hear from Stephen that he has me! G4CXM, who is at the moment still hunting for a place from which it would be possible to get on the air; meantime, it would appear, Ray operated JA from a local SWL's QTH, and promptly got a load of TVI problems!

These sort of band conditions show the vertical or the end-fed wire to the worst advantage, bewails G4DMN (Shrewsbury), he having now got a beam, although the TA33Jr is only 20 feet up (soon to go up another 10 feet—this accounts for two of the pieces of the 40-foot mast which went west in the January 2 gale! That gale also saw off the TV aerial, the tree holding up the other end of the eighty-metre aerial, and some tiles from the roof. The vertical and the longwire between them yielded CT4BB, FC9UC, HI8XYZ, VK2AAB, VK2AFG and VP9HX/MM, while two days with the beams showed A4XBB, AD7RSC (Seattle), FG7TD, VE5ZL, XJONEA/MM, VK6LKL, ZLIUY and 4X4HF.

G3ZGC/MM is, at the time of writing, in the Persian Gulf, and due to return to U.K. at the end of March. On the outward trip, Richard mentions one or two QSL's of interest; UA1JJ/M, Slava, a CW contact with the USSR Molodyozhnaya base in the Antarctic, and OK4FCA/MM, aboard the Czech bulk carrier *Bratislava* (OLGO), when he was off PY. Then there was SMCCT/MM, on the Swedish ship *Pacific*, running three wats of CW from the Caribbean area on 14025 kHz, and finally ZS6CTR/MM, the South African frigate *Protea*, acting as guardship for the 1976 Capetown to Rio de Janeiro yacht race; Jan was going very slowly, following up the last ship. Leaving the /MM lads, there were regular contacts with AJ3AA, possibly better known as KV4AA, in the Virgin Is.

G3RJV (Calverton) is still plodding along with the Joystick and four wats of RF; he finds the combination gets out quite well, despite not being able to get on the band at the "right" times; most of the European QSO's with this set-up net him an S7 or S8 report.

The log from G3CED (Broadstairs) has been somewhat shortened by the need to work, and in any case it has been mainly LF band operation. However, it is interesting to notice that the mast is still not up again, operation being confined to 300 milliwatts and the indoor Joystick, initially with eight feet of feeder, and later with just 1½ inches of feeder; George seems to have worked all round Europe with this high-powered machinery, saving for a getaway in IOZMI "who lost interest when he learned that G came before 3V!"

### Musings

Is it not odd the way more and more people are of late heading downwards in frequency for their DX? Those who a couple of years ago wouldn't have thought of Forty or Eighty are now rarely found anywhere else; the music-hall butt has suddenly turned into an artist, capable of the heights of a Menuhin. But, and make no mistake about it, the capability has *always* been there. We, poor wights, have in the main been too dazzled by the brilliance and the ease of the higher bands; but now that light is dimmed almost to extinction, and it becomes clearer what the lower bands can give.

A letter from the Colvins to *WCDXB* indicates that they made some 12,000 contacts from Funafuti, divided as to 4,000 signing VR1Z, and the rest as VR8B; it is worth noting that they closed down when the proportion of repeat QSO's got too high, and they do *not* want to QSO the same station umpteen times while they are on a DX-pedition. The next stop is to be a month from 3D2KG; and indeed, a day or so before this writing, Lloyd and Iris had been heard dishing out the contacts in their own inimitable style.

That PY0PO/PY0BXC operation from Fernando de Noronha seems to have come up on time, and to have been pretty skilful in the pile-up handling business. PY0PO QSL's go to PY7PO, and those for PY0BXC to, not surprisingly, PY7BXC.

If you came across 7P8AG or 7P8AH recently, you will have worked SM0AGD or SM4CEN. It seems that the getting of the licences took all of fifteen minutes, and so the operation made 1,850 lucky contacts happy, more or less on the spur of the moment. QSL's to SM3CX5.

By the time you get round to reading this, time will be against you, should you want to work PJ8KI, who will be probably going QRT around March 2, having been operational since February 14.

Those who anxiously wait QSL's for the FR7ZL/G operation can relax; we hear that these, and 3B9DA's cards, have all hit the mail box.

Does anyone know of the address of G3HLS, Arthur Woolven, who was last heard of at 21 Park Avenue, Farnborough Park, Kent? If so, please get in touch with G3CNA, F. C. Potter, *QTHR*, as he has a message to pass on to G3HLS from WITFT/MM.

G2NJ (Peterborough) recalls that once upon a time—and to a youngster with a G4 call it must sound like a fairy tale!—stations on the air used to have a "signature tune" by way of a gramophone record; indeed one wonders whether this usage in Amateur Radio, like so many more, antedates the use by the BBC of the "signature tune" without which no programme today is considered complete. Nick recalls discussing the tunes used with G6AB recently; 20M of Brentford always came up with "Take a pair of sparkling eyes" from the Gondoliers, back in 1922 on 440 metres, while G6AB himself used "There was an old sow," and G2LZ had "Lady of Spain." G2UUV started with the Skaters Waltz, and ended the day tests with the Stein song, or at night with "The end of a perfect day." A reminder of G2DQ (now, sadly a Silent Key) within the past few days, is that his tune was "The Wedding of the Painted Doll." Even so recently as your scribe's first ticket, one seems to recall that there was a clause stating that a record could be used for certain tests, provided one only used one record in any 24-hour period. Just *imagine* the bedlam on the air were this the practice today—an overdriven SSB "Eye" station spluttering all over the band with the voice, for instance, the great Gigli—the while the G4 down the road turns his beam on you with the Osmonds, and old G3 something-or-other tests out his new SSB rig with Flanders and Swann singing "Have some Madeira M'dear!" Doubtless the Iron Curtain countries could come in on the act, though it would seem sacrilege to have Borodin (pop-sized some years ago as "Stranger in Paradise") treated in this heartless manner.

### Forty

For the bloke who doesn't believe in looking inside his rig, and runs a transceiver alone, the case is lost here; however, should he have a spare receiver (doesn't every good DX-er?) and the energy so to hook it up that it and the transceiver can be used as separates, (or should he be a "separates" man, anyway) then all is not *completely* lost. The first problem is to clean up the noise, which in the average situation is largely receiver-generated due to overload from the megawatt-plus-rhombic broadcasters, both in and around the band, and this is where the attenuator comes in handy; if you are not a believer, run down to the local TV shop and speculate a few coppers on a coaxial attenuator of, say, 20 dB nominal, stick it in the receiver feed line and recheck the band; it will be *quite* a surprise! Of course, from time to time different values may be more appropriate, but it is the *principle* of the thing one needs to establish; building a suitable adjustable attenuator is a mere evening's exercise. There is an old saying that "If you can't hear 'em, you aren't going to work 'em, even though you *may* accidentally raise 'em."

The other problem is the aerial; and for those of us not endowed with Herculean towers capable of supporting delta loops or Quads, there is still quite a range of choice; even this low in frequency a ground-plane on the house is by no means inelegant to the neighbourhood eye, and the results are pleasant enough in the log in all conscience. However, the old rule that a horizontal dipole needs to be a half-wave or its multiples in height seems to mean that the dipole is largely a device on Forty for infilling the countries list with those European areas normally regarded as mere QRM.

G3CED's log is shorter than usual this month, and shows but one contact on Forty; his was DJ6BW, mid-morning and as high as 7080 kHz for a nice solid QSO using 300 milliwatts again.

G3ZGC/MM reckons that for him quite the best DX of the trip was to work G2QY in Cheltenham when the ship was near Z53 oddly enough the band was full of Europeans but none of them seemed to hear Richard's calls.

G4DMN (Shrewsbury) complains that since returning to school he has only had three QSO's in as many weeks! Prior to this, though good results were obtained on the vertical, with SSB exchange involving CT3AR, EA8DI, JA1DJL, JA2GWS, LU9DVA, PY2DOP U05FP, W1, W4, ZL2AMP, ZL3NE and a lone KP4CKY on CW.

A wry smile from G4BLE: After last month's report on the 7 MHz aerial, it was duly dropped and the whole shooting-match renewed before re-erection—once back up, and, lo! . . . TVI!

Only one contact for G2HKU (Sheppey), still deeply embroiled as he is with voltage variations on the mains, and the "things" which happen with digital readouts; and that was a CW QSO with UL7PBM

### Eighty Metres

*Scene:* 3793 kHz, around 1700z. *Stage left*, one DX station, a one G having a QSO on SSB with the DX station. *Enter*, stage *right*, the local net dressed as (and acting the part of) villains. chorus: "Why can't these blankety-blank DX stations use some other part of the band?" *Curtain.*

Members of the Sutton & Cheam Radio Society who were operators on, respectively, their "A station" G2DMR (4th in the overall with 13,418 points) and the "B station" G4ADM (13th with 10,742 points). In the picture are, left to right: G4ADM, G3LCH, G4CWH, G3DCZ, G4BFJ and SWL Hunt. They all met at the G4ADM QTH on the Sunday evening after the event.



Seriously, one wonders at these eighty-metre wallahs at times. After all, DX is allocated by gentleman's agreement the top ten kHz while the ragchewers on Phone have the remaining 190 kHz to themselves—and yet, they not only spread over the DX segment at the top of the band, but over the CW area at the other end. Why, oh why, can't the authorities revert to the pre-war practice of making Eighty a "special allocations" or, alternatively, take some *firm* action against the worst offenders for the good of all?

G4DMN says, at the start of his report: "I need a better aerial!" Nonetheless, he is up to 84C worked, this month's lot including CT2BV, EA6CK, FP8DH, FP8DX, TF5TP, UK2FAA, VE3DTE, VP1BJ, VP9HX/MM, W1-4, W5DS, W5TMN, W8-9, W4EV/VP9, ZB2GF and 3A2AH, all worked on SSB.

G8HX (Mansfield) has very largely stuck to Eighty of late; this because on HF so many QSL requests come in from SWL's chasing the "G300 award," for which it seems you total up the numbers of the G call signs heard until the total reaches 300; as Frank is a G8 he is worth another eight pips towards the application. Shades of Fred Karno! If *that* is what Certificate-Hunting is about, what the blazes to WAC, WAZ and DXCC mean? Make the blooming thing into a YR-300 and that might be worth going after—one doubts whether there would be many YR's unlogged by the time one has the required total; but G-300—ask yourself! However, to revert to G8HX for a moment, Frank has most of his contacts these days on Eighty CW, saving for one regular sked with a DL; a wet morning saw the aerial loading change, and, worse, the 20-watt fluorescent tube in the bedroom started to light up—a sure sign something was awry. On a different tack, a useful Q-signal to use when working an operator like G3KFE is QSD—"your sending is bad or faulty," which being interpreted means "please use the *other* root."

G2EKU stuck to his one-watt last on Eighty this time, and of course this meant CW; it netted QSO's with DJ4UF, DK3JB and SM2GLM/6.

No one-watt touches for GW4BLE—he has an FL-400 and FR-400, plus an FL-2000B linear, with which to energise the chosen aerial; and the top of the tower at which level the HF beam sits is at 70 feet. Perhaps this sort of set-up is the reason why, though Steve only made a couple of Sideband contacts this time, both were with ZL's.

For G3CED/G3VFA, it is still QRP all the way at 300 milliwatts to the Joystick; on Eighty this seems to have been quite enough power to work all the way up and down the U.K. in daylight and to have some of those long CW ragchews in which G3CED seems to specialise.

G3RJV is a little unwell and has not therefore been as active as he might have been; however, his QRP Club activity still blossoms, and it is quite likely there will be 200 applications for membership by the time this comes to be read. One interesting QRP contact was with G5VU locally, who was running the one watt; so he was very promptly

sent all the dope on the Club!

G4AYS (Moira) had a little change by borrowing a Ten-Tec PM2B at a couple of watts and applying it to the "DL AGCW QRP Contest"; no lack of contacts but a shortage of multipliers inhibited a high score, but six countries were worked.

A nice letter from GM30XC (Aberdeen) was aimed at Justin Cooper rather than CDXN, but is interesting to notice that the GB2BP station they ran on the oil platform Forties Charlie, 110 miles East of Aberdeen worked 790 stations in 59 countries with a total of 319 U.K. stations logged. There are still some GB2BP cards in hand, so any of you SWL's who heard 'em can send your report to: S. Crabtree, GM30XC, *QTHR* (with an s.a.e., of course).

### One-Sixty

Has been blooming of late—naturally since 'KFE is off his old hunting-ground for the moment!

G4EAX (Nottingham) busy with construction, has cut down the activity a lot; first, a stabilised PSU up to an amp. or so, and then the "G3ZVC board," which last is aimed at becoming eventually the Top Band rig. On the receiver side, the ex-G4CBQ HA-350 receiver has been obtained, albeit so far this has not been persuaded into enabling G4EAX to work the W's on Top Band like its previous owner used to! This is a problem with a new bit of gear; to know whether it responds best to soft words or curses!

Another, even more recent call, belongs to G4EPL (Hucknall) who set off along the radio road on November 13, 1975; 90% of the activity so far is on Top Band, with a KW-2000A and a vertical, top loaded and thirty feet high; somebody mentioned the Ladder in a QSO and after a bit of time with map and log the information was extracted and thought worth an entry—good for Les!

Next, we have the Grafton Top Band Contest for 1976. The dates are given as: *AM only*, March 20; *CW only* March 27, and *SSB only*, April 3, in each case from 2130 to 2359 GMT. Competitors to enter two sections only, CW plus one of AM or SSB. Logs to be post-marked no later than April 18, Certificates to first and second, plus a certificate to the section individual winners. Further details from, and logs to: J. Groom, G8FQM, 2 Oakwood Crescent, London N.21. Incidentally, in the letter mentioning this contest, one was amused to note at first the writer equated "Phone" with "AM"—the locals must have poor-ish SSB quality!

Also we have the 1975 Grafton winners list: GM3YOR takes the overall, without leading any of the sections; G3ZJK comes second overall and leads the AM contingent; G3ZYY entered the SSB leg only and won it, and G3XWZ did likewise with the CW. Congratulations to all.

Next letter comes in from GM3YOR (Kirkcaldy) himself; Drew has been playing with VHF, which as he neatly puts it, "if difficult if you are interested in contacts and CW!" The HF activities were

somewhat limited due to the weather, so he and GM30LK concentrated their attentions on the CQ WW 160 Contest from a new *P* site, where they had first an inverted-Vee dipole, centre at 90 feet, firing Stateside, and secondly a dipole sloping from 90 feet at one end to 10 feet at the other, sloping towards the States; the item at the driving end was the FT-101B. The weekend's activities led to 217 contacts with 24 countries and 24 States/Provinces for a claimed score around 60,000. The DX worked included EP2TW, HC1XG, KP4AN, KV4FZ, KZ5BC, OK4FCA/MM (who was near PZ1), VK6HD, YV10B, 4X4NJ and 9H1CG; among the VE's we notice VE3BWW (Ham Whyte, ex-G6WY), and one of the original compilers of CDXN) still pounding away, and the W's came from all the call areas saving W6, W7, and WØ. With VE1, VE2, and VE3, plus VO1, it made a nice overall tally. On the Countries question, GM3YOR is putting in a Countries Worked total since November 1 1975 at 27; 26 of them on the key and four on SSB.

Then we come to WIBB's invaluable *bulletin*. As Stew says, there is no doubt that the number of DX-peditions carrying Top Band news these days is very largely thanks to Messrs. Drake and Yaesu, who have the band on their standard rigs. WIBB himself seems still to be leading the countries race with his 127 countries, the latest of which was EA8CR/BA9, though others are nearing the magic total, such as W4RRB now at 92C; and it is Gene of course who spark-plugs the Top Band DX Association who do so much to get the expeditioners to try a spell on the band. W5RTQ has left his Texas spot for a new home in W6's Mojave Desert, with acres of land for aerial farming. The intention is a brace of 135ft. towers to be endfire to Europe and ZL, Broadside to JA and ZS, plus Beverages for receiving!

On a different point entirely, the question of the earliest time for an Atlantic crossing is raised; the present claim is the VO1KE/GD4BEG QSO, at 1740z, over two hours before sunset-time—this is

handsomely better than the 1802z earliest back in 1973. Those VK's certainly stick at it; VK5KO was "on" 350 mornings out of the 365 in 1975! His rig is an FT-101 with an AR-88 as back-up. On a different line again, we have all heard of the tales about the guy who worked some DX for his very first QSO—how about WAØDII? He made it with VK6HD on Top Band for his first-ever DX on any band! OA8V didn't reckon much to the Transequatorial tests this year and has rather retired to Oscar-chasing—he says he's getting too old to burn the candle at both ends. ZD7WT is on Top Band again, using the ex-ZD7FT rig and aerial; he is ex-ZD8BD so knows the form well. Keep an eye open for ZETJX and ZE1EN, as both are active on the band but although hearing plenty of DX, they don't seem to be able to raise it! 0300 to 0330z seems to be about the right time to listen for them.

PAØHIP/LX/P was a new one, and it seems their trip over January 17 and 18 was quite successful, working lots of EU's, VE's and W's right into W7. One wonders how the nine-country DX-pedition of YE1ASJ will fare, February 5-28; to date no reports have come in on this one, which was to cover VP2A, VP2D, VP2L, VP2G, FG7, 8P6, 9Y4, PJ8 and FM7.

### Finale

There, good people, the space runs out on us, as indeed does the time—we now have to dash out to the post before the box is cleared. This being so, there are one or two odd points raised in letters which have been passed over or deferred till next time, for which, please, forgiveness.

Meantime, keep 'em rolling; the deadline for next time is March 9; distinctly, tight at that, one fears. Address, as ever, is to "CDXN," *SHORT WAVE MAGAZINE, BUCKINGHAM MK18 1RQ*. Meantime, au *voir, bonne Chance*.

## MARINE VHF FOR YACHTS

### IDEAS FOR THE SMALL-BOAT MAN

J. C. VEARS

**T**HE past two years or so have seen a considerable increase in the number of yachts and motor cruisers with marine VHF R/T installations. The reason for the trend towards VHF has come about mainly because of the phasing out of DSB in the 2 MHz band over the period from 1st January 1973, to be completed by January 1983. No new DSB installations have been permitted since January 1973. However, the cost of new MF SSB equipment starting from the region of £1,000 is prohibitive for many yachtsmen. The alternative is VHF which, although subject to range limitations, has a number of advantages to offer in cost, ease of installation and facilities available.

The writer, having been an SWL on the amateur bands for many years, also developed an interest in the subject of Marine Radio. Therefore, when a 21ft. motor cruiser was acquired, early attention was given to the installation and licensing of marine VHF on board and it is thought that a general description of marine equipment and facilities applicable to yachts may be of interest to readers.

#### Frequency Allocation

VHF frequencies allocated to the marine service are in the band 156-165 MHz. This band is sub-divided into International and Private sections, the former containing the main channels used by yachtsmen, apart from a single frequency channel in the Private band which is allocated to specific Marinas, Yacht Clubs and their members. The band 156.025—162.025 MHz consists of 55 International channels including the interleaved

channels created by the change from 50 kHz to 25 kHz spacing completed on 1st January 1973. Commercial shipping and yachts share many of the International channels which are assigned for Intership, Port Operations and Public Correspondence services, with a common Calling and Safety channel. All Public Correspondence and some Port Operations channels are two-frequency to enable duplex working by suitably equipped vessels. Channels are identified by number rather than frequency, e.g. Ch. 16 for Calling & Safety; Ch. 6 for 1st choice Intership, etc.

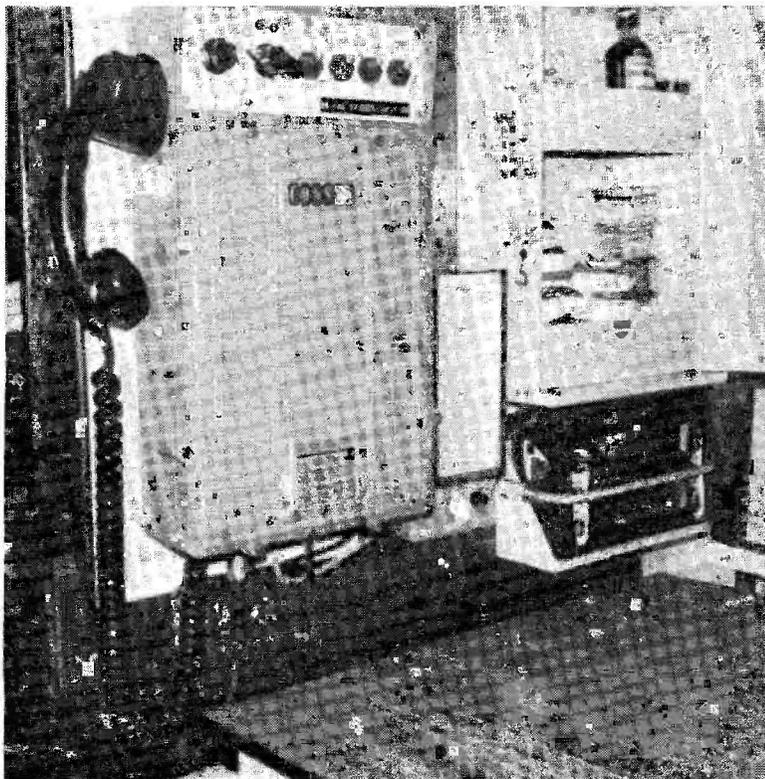
#### Equipment

The prospective buyer is faced with a wide choice of type-approved radiotelephones, some being versions of the land-mobile types familiar to amateur mobile operators and others by manufacturers specialising only in the marine field. Frequency modulation is used and R/F output is limited to 25 watts for all vessels. Provision also has to be made for reduction to not more than 1 watt for local working. At least 10 channels are usually available in current equipment intended for a main installation, although 3-channel "personal portable" sets can also be obtained. Apart from the mandatory fitting of channels 16 and 6, the choice of other channels is left to the owner and decided upon having regard to the local facilities in the intended cruising area.

A typical and adequate arrangement of channels fitted for a yacht would consist of 6 and 8 (inter-ship); 12 and 14 (port operations); 16 (calling & safety); 25, 26 and 27 (public correspondence). These eight channels are probably the most widely used in the U.K.

The original R/T installed on the writer's craft was a 6-channel, 12-watt set of robust and weatherproof construction which became available after previous service on a Grimsby fishing vessel. This set was re-crystallised by the suppliers for channels in use in the Lower

Cossor six-channel 12w. VHF radio-telephone as fitted on the writer's small motor-cruiser "Lalia," call-sign MOIR. A handset extension and weatherproof speaker are switched to near the steering position. Under the cupboard is a general-purpose Rx covering the BC/MF and VHF-marine bands. The handset shown gives a good size comparison.



Thames area. Subsequent modification to 25 kHz channel spacing also had to be made to meet the later requirements. A rather more versatile 12-channel, 25-watt R/T has recently been added to the installation.

A point of interest is that a number of marine R/T receiver sections have two RF heads to maintain efficiency over the band and also provide for a dual watch facility.

At the lower end of the price range a 12-channel, 25-watt R/T supplied with crystals for 8 channels can be installed for about £220. At the opposite end of the scale although, as with MF SSB, out of the scope of the average yachtsman, over £1,000 would be required to purchase a 59 channel, 25 watt equipment using synthesiser techniques and with full duplex, dual watch and local/remote control facilities, etc. A feature of the more expensive equipment is the robust construction to better withstand the marine environment.

### Aerials

Aerials of course play a large part in the efficiency of any VHF system and several problems have to be overcome in marine applications. One of these is the relatively wide bandwidth to be covered by the aerial at the same time maintaining a reasonable VSWR at the band edges. A type widely used on all classes of vessel is the coaxial dipole, encased in fibre-glass and resembling a "broomstick" about 4ft. in length. In small craft this can be base-mounted to a cabin top or by brackets to the super structure or mast. Sailing yachts obviously have a great advantage of extra range gained by the ability to

site an aerial at the main masthead. High-gain aerials fitted to the cabin top or wheelhouse roof are popular for motor cruisers. These often take the form of a fibre-glass covered and tapered whip type aerial about 1in. diameter at the base. A  $\frac{1}{2}$ -wave version is about 5ft. in length, a 6 dB gain Collinear design about 9ft. A gain of 9 dB is quoted for four  $\frac{5}{8}$ -wave stacked elements in a 20ft. whip. Effective height of the shorter aerials can be increased by the use of matching mast extension tubes. Ratchet base mountings permit the lowering of aerials for clearance under bridges, etc. One disadvantage of the higher gain aerials is the effect of any appreciable rolling of the boat at sea on the narrower beamwidth. The coaxial dipole radiation pattern would provide more consistent communication under these conditions—50-ohm coaxial feeders are used and of interest is the availability of RG58 C/U, a higher grade of coaxial cable with tinned copper conductor and screen and a toughened sheathing to withstand marine conditions rather better than standard cable.

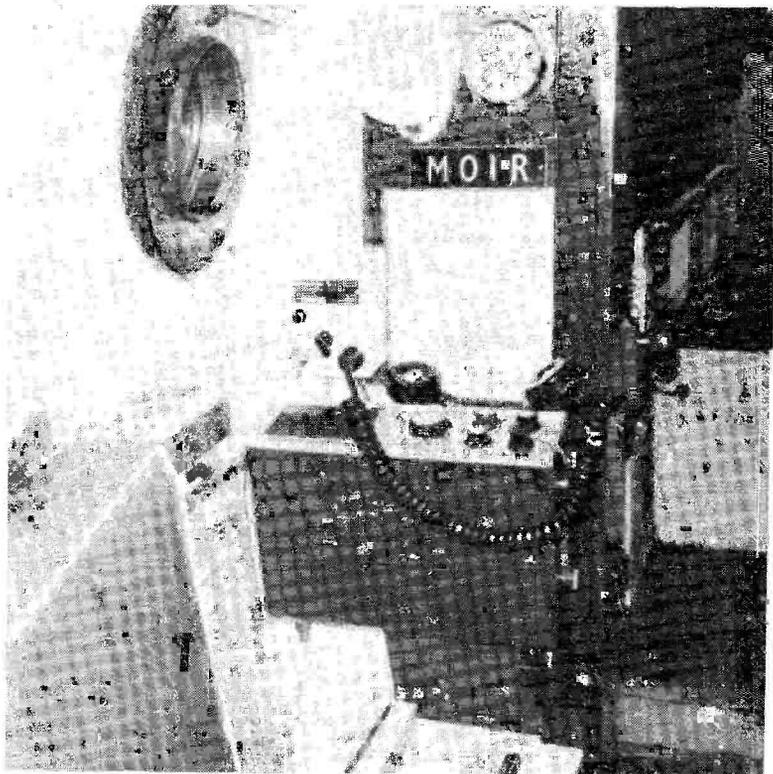
Over a period of time the writer has compared the performance of three types of aerial on board his vessel *Lalia* (callsign MOIR). Best results to date have been from  $\frac{5}{8}$ -wave vehicle-type whip mounted on the wheelshelter roof. The roof being of fibre-glass, aluminium strip radials were fitted underneath to provide a ground plane. The whip section was cut to the marine band and refined with the aid of a *ThruLine* wattmeter to give minimum VSWR on Ch. 16.

Craft requiring full duplex facilities have the problem

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"Lalia" is also fitted with Seavoice R/T and on the clip-board to the left of the set is the ship's radio licence and the current PLA notices to yachtsmen.

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of siting two aerials in such a way as to avoid interaction, not an easy matter on a small craft, or have to adopt the more expensive solution of a duplex filter.

### Licensing

The minimum operating qualification required by yachtsmen to use R/T in any marine band is the Restricted Certificate of Competence in Radio-Telephony. The oral and practical examination for this certificate is often taken on board the owner's craft at the time of official inspection and licensing of the installation. The certificate permits operation of any ship radio-telephone station provided the carrier power does not exceed 50 watts, or 250 watts in the case of transmitters requiring no manual adjustment of frequency determining elements apart from a channel switch. A U.K. call-sign is allocated in the G+ three letters, M+ three letters or the latest 2+ three letter series.

### Facilities

The formalities having been completed, the VHF equipped yacht has access to a number of useful facilities. Of first importance is the ability to obtain assistance in a distress situation and although there is not as yet an official VHF distress frequency to compare with 2182 kHz on MF, a call on VHF Ch. 16 Calling & Safety channel should stand a good chance of interception around a large part of the U.K. coast. A number of Coastguard stations now keep watch on VHF Ch. 16 in

addition to MF, and are able to work to R.N.L.I. life-boats on another VHF channel which is not permitted to yachts except those acting as Coastguard auxiliaries. Most Post Office coast stations provide a public correspondence service on VHF. Initial calls are made on Ch. 16, a double-frequency working channel then being designated. A maximum range of 40 to 60 miles can be expected in view of the high elevation of most coast station aerials. Some remotely controlled VHF stations are in operation or planned to provide continuity of service between the main stations, *e.g.*, Thames Radio controlled from North Foreland and Bacton Radio in Norfolk from Humber Radio.

An increasing number of Port Authorities are providing a VHF operation and information service. These range from the complex multi-channel networks of the Port of London Authority and Southampton Harbour Board associated with radar surveillance, to a single channel at small harbours. Although intended for commercial shipping these stations are normally willing to give local advice to yachts if only to ensure that they do not inadvertently impede the movement of large vessels within the port. Pilots also make extensive use of VHF, often taking portable sets on board vessels which are not fitted with VHF.

Inter-ship channels provide an efficient means for yachts cruising in company to keep in touch. The 1-watt low-power output is adequate for the short ranges involved as well as reducing interference to other distant users of the same channel.

In conclusion it can be said that the presence of VHF R/T on board a yacht adds considerably to the safety and enjoyment of cruising. In the writer's case it

also provides valuable experience in preparation for the time when it is hoped to obtain an Amateur Radio licence—G8+3 of course!

## BOOK REVIEW

### "RADIO AMATEUR'S VHF MANUAL"

#### *Sixth Edition*

Whilst there are general technical Amateur Radio handbooks available that seek to deal with all the amateur bands, there is no disputing that VHF/UHF techniques call for a "bible" of their own. One of these is the *Radio Amateur's VHF Manual*, published by the American Radio Relay League.

The first chapter is headed, "How It All Started" and should make fascinating reading, especially for the younger VHF'ers, who may be quite unaware of the enthusiasm with which the early pioneers exploited the "useless" VHF's. Some quite spectacular DX was worked in the 56-60 MHz band in the periods immediately before and after Hitler's war.

The short chapter on propagation is packed with the essential information needed by the serious VHF experimenter. The communication possibilities on each band are discussed, followed by detailed descriptions of tropospheric bending, sporadic-E, auroral propagation, back-, ionospheric-, and tropospheric-scatter, E-M-E and satellite communications. (The part dealing with meteor scatter includes a useful Meteor Shower Data Table.) Three useful monograms are included for finding station range capabilities, effective receiver sensitivity and aerial-height gain.

The basic requirements for VHF reception are spelled out in the next chapter in an easy-to-read manner, with numerous, typical circuits illustrating amplifiers and mixers. This general discussion is followed logically by a section on practical designs of preamplifiers, converters and receivers using discrete components and integrated circuits. Whilst commercial components are frequently specified for such things as RF chokes, the values are usually given so that alternatives can be used.

The section devoted to transmitters and VHF stations covers the design and practical construction of a great variety of equipment, from VFO's, VXO's, through a small 2m. transceiver to kilowatt amplifiers using pairs of 4CX250R valves. One of these amplifiers incorporates anode lines cut from flat, sheet brass, whilst the other utilizes standard copper plumbing tube and fittings. A criticism of this section might be that no valve data table is included to cover the popular VHF/UHF types.

The chapters on aerials are very good and virtually

every kind of VHF/UHF array is dealt with. At the outset it is made clear that all gain figures refer to that over a half-wave dipole rather than the often used, isotropic source. This section is copiously illustrated with graphs, tables and sketches, enabling the home constructor to make many different arrays of proven performance. The difficulty of designing a high gain, long Yagi for the 2m. band—13 elements on a 24ft. boom—is immediately obvious from the polar plots of the performance over the band 144-146 MHz. Optimized for 144-145 MHz, the plots reveal very mediocre performance at 146 MHz.

No VHF manual would be complete without a section on FM and this book is no exception. The difference between FM and PM is explained and compared and there are numerous circuits given for generating FM and receiving FM signals. In this latter context, circuits are presented for digital (pulse counting) and PLL detectors. Repeaters are briefly mentioned, no doubt because this topic is the subject of another ARRL manual.

The chapter entitled "UHF and Microwaves" is rather brief but nevertheless covers the essentials of such things as cavity resonators, wave guides, TWT's, parametric amplifiers and varactor diodes for frequency multiplication. The well-known, 1972, K2RIW Kilowatt Amplifier for 432 MHz using two 4CX250B's in *parallel* is featured.

There is a comprehensive section on test equipment including a range of absorption wavemeters, field strength indicators, an aerial matching unit, impedance bridge, directional coupler, noise generator and dummy loads, followed by a chapter on the causes of, and cures for, interference.

The final chapter is called "Bits and Pieces" and seems to be comprised of afterthoughts or items that could not be fitted logically into other parts of the book. It includes a piece on silver plating and on making RF chokes.

This latest edition of the *Radio Amateur's VHF Manual* runs to 352 pages. The abundant circuit diagrams are augmented by many photographs of the designs described and there is an adequate index. The book is obtainable from stock at £2.65 post free, from the Publications Dept., Short Wave Magazine, 29 High Street, Welwyn, Herts., AL6 9EE.

N.A.S.F

## HF-BAND CONVERTER

FOR 7-28 MHz WITH ANY RX TUNING BC RANGES—CRYSTAL-CONTROLLED — BAND-SWITCHED

If you have a good general-coverage MW/LW receiver, such as a BC-453—or any such Rx embodying a few of the refinements outside the scope of ordinary broadcast receivers—, this converter will give good results on the 10-15-20-40m. amateur bands.

No excuse is made for it being a valve-type design—in this case, the highly-efficient 6.3v. miniatures, cheaply available by the thousand, and still in wide use in many commercial designs. The probability is that those required will be on the shelves of experimenters who had them “in stock” for years.

The circuitry involves two crystal-controlled frequency changers in cascade to enable the 7, 14, 21 and 28 MHz amateur bands to be tuned on a BC-453, or any other receiver covering the LW-MW broadcast bands, 150-550 kHz, or of that order.

The design meets the requirements for a receiver combining high performance with low cost. Excellent stability and reasonable selectivity are provided by the BC-453 itself; the bandwidth is quite good, and can be improved by the use of a (calibrated) secondary tuning knob. The major snag is the low frequency range, 0.19-0.55 MHz. This can be raised by two methods: (i) By rewinding the front end coils—because of the low IF of 85 kHz, this method is only satisfactory up to one megacycle (300m.) above which the image ratio becomes unacceptable, or (ii) by the use of converters. For the 1.8, 3.5 and 7 MHz bands a “standard” converter configuration will suffice. Above 7 MHz the image ratio deteriorates rapidly and precludes the use of simple converters, although the first 100 kHz or so, *i.e.* 0.45-0.55 MHz, may be used as the tunable IF for converters working up to about 15 MHz. For higher frequencies a double conversion arrangement immediately becomes the solution—*see* Table I for the frequency relationships in this converter, and Fig. 1 for a block schematic of the general arrangement.

The choice of the first IF is not critical, and 2.7-3.05 MHz was chosen merely because a suitable crystal (2.5 MHz) for the second conversion oscillator was available (suggested alternatives are listed later).

### Circuit

Orthodox circuitry is used throughout in the interests of simplicity. After the first conversion it is necessary to include a stage of amplification, V4, so that the extra selectivity (from L6 and L5) will attenuate the image (and any other nasty effects) associated with the second conversion. A band-pass coupler, or one tuned circuit, was found inadequate.

There seemed no point in using plug-in coils for the first conversion oscillator, so the convenience of a switch was invoked, although L1-L2 and L3-L4 are plug-in types so as to keep the circuit “Q” high in the RF and mixer stages.

The 6BZ6 has been specifically recommended for RF stage service since it has the advantages both of high slope, for plenty of gain, and a semi-remote cut-off,

which reduces the occurrence of cross modulation, *i.e.* it has a large signal-handling capacity; this valve was designed for TV/IF service. A 6BA6 is a good second choice and can be used in this converter with no changes except that the cathode resistor, R2, of V1 should be changed from 180 ohms to 68 ohms.

For the first conversion a 6BE6 was chosen in preference to a pentode, as it allowed for more precise adjustment of the oscillator injection, especially necessary in a band-switched circuit. The primary of L5 seems to resonate near the 14 mc band, and some slight instability resulting round V2 (occurring only on 14 MHz) was removed by a 56 ohm  $\frac{1}{2}$ -watt resistor, R6, connected between L4-C2 and pin 7 of the 6BE6.

### Construction

The chassis used measures  $7\frac{1}{2}$ in. x 6in. x 2in. deep. With this chassis size, there is adequate space, but the controls on the front of the chassis will need careful arrangement.

The electrical layout follows circuit sequence if viewed from underneath the chassis, as this was more convenient for development work than the more conventional method.

The screens are  $\frac{1}{8}$ in. off the chassis so that wires may pass underneath. All heaters were decoupled with .0018  $\mu\mu\text{F}$  tubular ceramic condensers (not shown in the circuit), although actually this may only be necessary for

Circuit complete for the CC HF-band converter. Plug-in coils are used in the first two stages. V1, V2, V3 can be regarded as an orthodox converter arrangement for feeding into an LF-coverage receiver (represented by V4, V5) except that here the conversion in V5 is crystal-controlled and tuning is done on a BC-453, or any similar Rx, which can be regarded as a tunable Amp. (Inset) Block diagram of the HF-band crystal controlled converter. To explain the conversion process (which is the same for all bands) the signal frequency is taken as 14 MHz. By converting in two steps, the image ratio is kept very high.

TABLE OF VALUES — Circuit of the HF Band Converter

C1, C2 = 30 $\mu\mu\text{F}$ , variable	R9 = 100,000 ohms
C3, C4 = 50 $\mu\mu\text{F}$ , variable, ganged	R11 = 47,000 ohms
C5, C9,	R13 = 68 ohms
C19, C23,	R14 = 33,000 ohms
C24 = 100 $\mu\mu\text{F}$ silver mica	R15, R16,
C6, C7,	R18 = 1,000 ohms
C8, C10,	R17 = 4,700 ohms
C14, C16,	(All resistors $\frac{1}{2}$ watt or larger, except R3, R7 and R13, which should be $\frac{1}{8}$ watt or larger.)
C17, C18 = .001 $\mu\mu\text{F}$ tubular, or disc ceramic	Sw A-B = 2 pole, 4-way wafer
C11, C15,	Ry = 2 pole change-over type relay, fitted externally
C27 = 33 $\mu\mu\text{F}$ silver mica	RFC 1,
C12 = 10 $\mu\mu\text{F}$ silver mica	RFC 2 = 2.5 mH RF choke
C13 = 220 $\mu\mu\text{F}$ silver mica	RFC 3 = 14 mH RF choke
C21 = .005 $\mu\text{F}$ tubular paper	X1-X4 = <i>See</i> Table 1
C20, C22,	X5 = 2,500 kc crystal
C25, C26 = .01 $\mu\text{F}$ tubular paper	L1-L10 = <i>See</i> Table 2
R1 = 1 megohm	RV1 = 25,000 ohm logarithmic variable resistor
R2, R7 = 180 ohms	V1 = 6BZ6, or 6BA6 ( <i>see text</i> )
R3 = 56,000 ohms	V2 = 6BE6
R4, R10,	V3 = 6AM6
R12 = 1,800 ohms	V4 = 6BA6
R5 = 20,000 ohms	V5 = 6J6
R6 = 56 ohms	
R8 = 22,000 ohms	

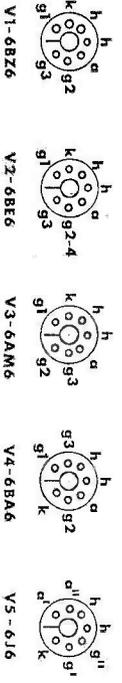
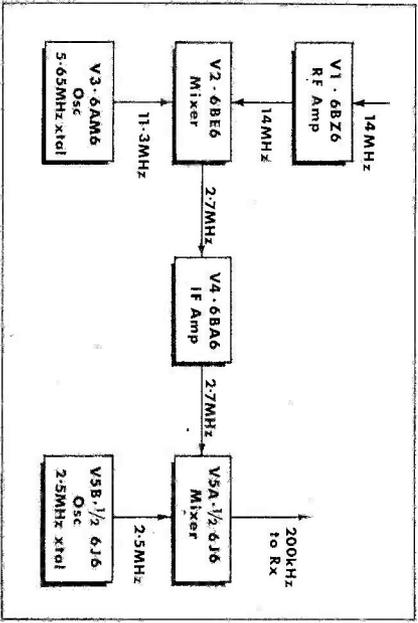
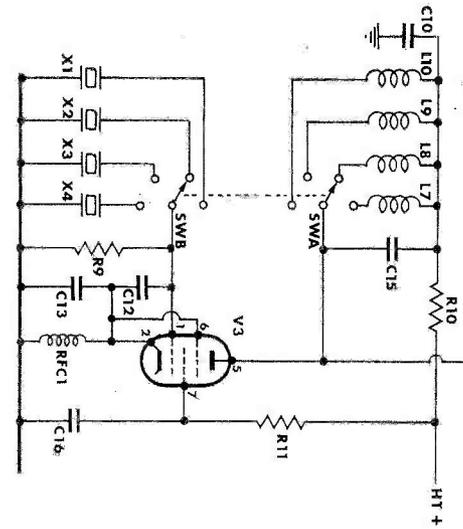
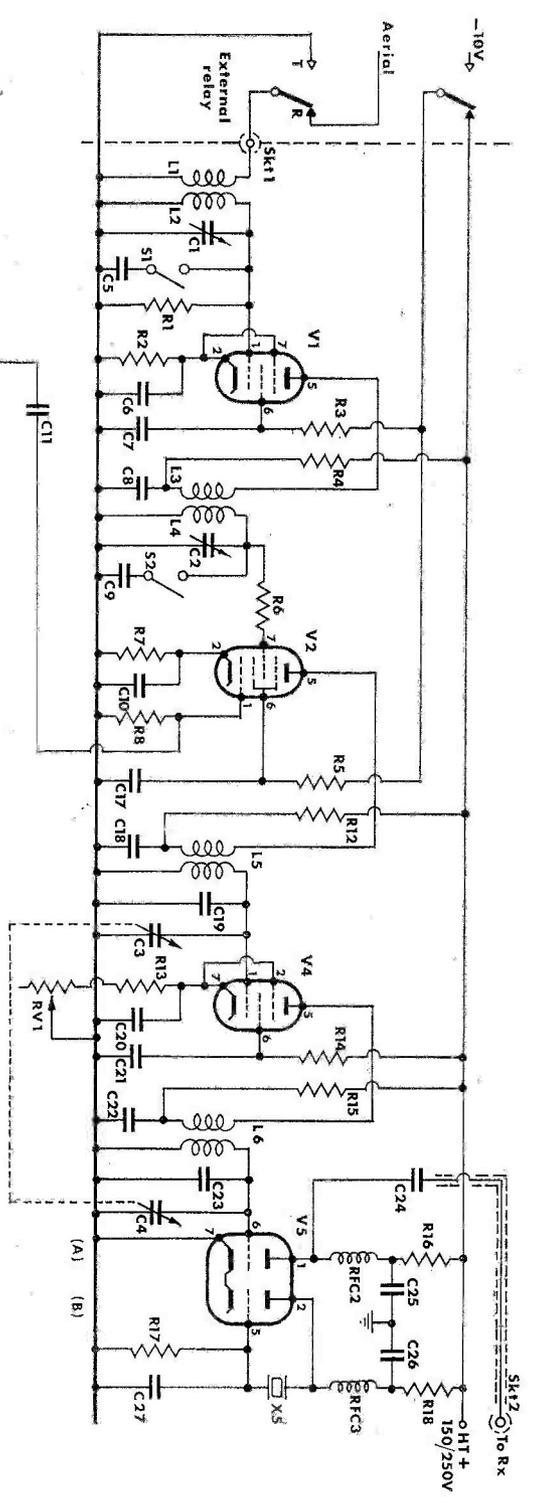


TABLE I

Signal Frequency	1st Osc. Xtal Frequency	Injection Frequency	1st IF MHz	BC-453 Frequency MHz
7.0 MHz 7.15	X1 4.3	4.3	2.7 2.85	0.2 0.35
14.0 MHz 14.35	X2 5.65	11.3	2.7 3.05	0.2 0.55
21.1 MHz 21.45	X3 9.2	18.4	2.7 3.05	0.2 0.55
28.2 MHz 28.55	X4 8.5	25.5	2.7 3.05	0.2 0.55

Table I. The frequency relationships for the converter. On all bands the crystal in the second conversion is 2.5 MHz. A 6.133 MHz crystal could be used instead of the 9.2 MHz crystal at X3. Many other combinations are possible. See text for suggested alternatives. Note: All frequencies in MHz.

V3 and V5. By using *Denco* coils for L5 and L6 the scope for modifications is increased (see later), but diards can try "rolling their own" if preferred.

#### RF Coils

For economy, the 21 and 28 MHz bands are tuned on one set of coils, and the 14 MHz band coils "double" as 7 MHz inductances when paralleled by the 100  $\mu\text{F}$  condensers, C5, C9; this is done by wiring an adjacent pair of the unused pins of the octal coil holders so that a shorting stub of about 16g. tinned wire ("loaded" as necessary with solder) slipped in under the plug-in coils, connects the 100  $\mu\text{F}$  condensers C5, C9 from earth to grid.

The coupling windings are wound on first, nearest the bottom of the coil former. Wind the wire from the earthy ends of the coupling and main windings in the same direction, with the "hot" end of the coupling winding near the earthed down end of the main winding. The spacing recommended is fairly close, so after dabbing the coils with poly. cement check that the turns are not shorting. (They probably will be at the first attempt!) The secret is to wind on the requisite number of turns with no spacing, as tight as possible, solder the ends, and then ease open the turns with a screwdriver; in practice there will always be sufficient slack to open up the coil to the desired spacing. The ends of the coils are soldered to the tops of the pins, and when doing this be sure to grip the pin in a pair of pliers as a heat shunt. See Table II for turns data.

#### Testing and Alignment

Check for HT-to-earth insulation, and that one side of the heater winding is earthed. Then switch on. Any HT between about 150 and 250 volts will do (215 volts was used on the model). Check that V5B (oscillator section) is oscillating by measuring the grid-to-earth voltage across the 4,700 ohm resistor R17 (about 20 volts). Tap an aerial on to pin 6 (grid) of V5A and if all is well "trawler-band" signals will be heard on the receiver. Then set the variable resistor RV1 at minimum

resistance between the two terminals used, and check V4 by tapping the aerial on to pin 1 (grid) of the 6BA6. Adjust the cores of L5 and L6 for maximum output at mid-capacity on C3 and C4, while listening at 350 kHz on the BC-453 (or main Rx). Check that the tracking is reasonable by tuning to each end of the band. Next, connect a milliammeter between the earthy end of R8 (6BE6 oscillator grid) and earth. Switch to each crystal in the oscillator (V3) and adjust the relevant coil in its anode circuit for exactly 0.5 mA on the milliammeter. This should be easy to obtain even with the injection frequency three times the crystal frequency, but if any difficulty is experienced it is suggested that the effect of varying C12 and C11 be tried, and R11 could be reduced somewhat.

#### Muting

When transmitting, the screens of V1 and V2 are biased 10 volts negative with respect to earth, this allowing the receiver to be used as a monitor. This arrangement was found adequate with a 50-watt transmitter.

#### Suggestions

Some comments on possible alterations to the design may be of interest, and are listed below:—

(1) Constructors starting from scratch may well prefer

TABLE II  
RF and Mixer Coils

Coil MHz	SWG (tinned copper wire)	Tuned Winding		Coupling Winding		Spacing between windings
		Turns	Length	Turns	Length	
7/14 RF	26	16	0.6 in.	4	0.16 in.	0.05 in.
7/14 Mixer	26	16	0.6 in.	5	0.16 in.	nil
21/28 RF	22	9	0.4 in.	3	(0.6 dia. spacing)	0.1 in.
21/28 Mixer	22	9	0.4 in.	4	(0.6 dia. spacing)	nil

#### First Oscillator Coils

All coils wound with 28 SWG enamelled (or cotton covered) wire on 0.415 in. diameter (Neosid) formers, with turns spaced or scrambled so that all coils take  $\frac{1}{2}$  in. winding length.

Coil	L7	L8	L9	L10
Frequency, MHz	4.3	11.3	18.4	25.5
Turns	40	17	9	6

Table 2. Coil data for the first conversion. *Denco* miniature dual-purpose types (Range 3, 1.67 — 5.3 MHz, "Yellow") are used for L5 and L6. See text for winding tips.

# SHORT WAVE MAGAZINE

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## INDEX TO VOLUME XXXIII

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# INDEX TO PRINCIPAL ARTICLES

*Alphabetically by Titles*

	<i>page</i>		<i>page</i>
About Aerial Feeding and the SWR.....	May 145	Mains PSU for the Liner-2.....	Jun 210
Active Aerial Unit.....	Nov 512	Mains Voltage Adjustment.....	Dec 579
Aerial Configuration for Top Band.....	May 24	Mobile Rally Season, 1975.....	Mar 23
Auto-Scan Unit for Two-Metre FM Receivers.....	Dec 575	Mobile Rally Season, 1975.....	Apr 84
		Mobile Scene, The— <i>feature</i> .....	Jun-Oct
Basic Auto-Key.....	Feb 707	Modifications to the KW-2000 Series	
Books for Christmas.....	Nov 508	Transceivers.....	Nov 509
BOOK REVIEWS:		Month with the Clubs— <i>feature</i> .....	monthly
“ARRL Antenna Handbook”.....	Nov 514	More About Speech Clipping.....	Jul 280
“ARRL Handbook,” 1975 Edition.....	Jun 211	More QRP Circuits.....	Jun 208
“World Radio/TV Handbook”.....	May 149		
Break-In for the Codar AT5.....	Dec 580	New QTH’s— <i>feature</i> .....	alternate months
Building the Venus SS/TV Monitor.....	Apr 92	Noise Bridge for Antenna Measurements.....	Aug 332
Change of QTH— <i>Editorial</i> .....	Oct 439	PA Cooling for the FL-DX500.....	Mar 25
Checking FM Deviation.....	Sep 393	Pollution— <i>Editorial</i> .....	Feb 691
Communication and DX News— <i>feature</i> .....	monthly	PSU Remote Sensing.....	Nov 512
Compact Modulator/PSU.....	Oct 451	Purpose— <i>Editorial</i> .....	Aug 319
Courses for the RAE— <i>first list</i> .....	Aug 333		
Courses for the RAE— <i>second list</i> .....	Sep 394	QRP on Eighty.....	Apr 85
Crystal Filter for Reception, The.....	May 148		
		Reflection— <i>Editorial</i> .....	May 139
Design of Power Supplies.....	May 146	RF Bridge Unit.....	Jan 640
Discussing the MFJ CW Filter.....	Apr 90		
DX from Eday Is., Orkney.....	Aug 330	Simple Filter for Seventycems.....	Feb 704
		Simplicity— <i>Editorial</i> .....	Mar 19
Five Watts on Forty.....	Sep 390	Some Notes on the Trio TS-520.....	Jan 641
Frequency Modulation for VHF Transmitters.....	Sep 390	Some Practical Points.....	Sep 391
		Starter for Two.....	Jul 270
Going QRP on Eighty.....	Aug 327	“SWL”— <i>Listener feature</i> .....	alternate months, Mar-Jan
		SWR Indicator for Low-Power Working.....	Jul 267
Half-Size Quad for Twenty.....	Sep 392		
		Ten-Metre Aerial Amplifier and Cheap RF	
Improving SSB Reception in Older Receivers.....	Jan 636	Output Meter.....	Aug 334
Imposition— <i>Editorial</i> .....	Apr 79	Transistor Grip-Dipper.....	Jan 639
Introduction to /M Working.....	Jun 206	Transverter for 70 Cms, Part I.....	Mar 27
		Transverter for 70 Cms, Part II.....	Apr 88
KW-77 Monitor Muting.....	Feb 705	Tunnel Diode, The.....	Feb 708
		Two-Metre RF Amplifiers.....	May 150
Learning Morse.....	Feb 706		
Leicester Show, The.....	Dec 572	VHF Bands— <i>feature</i> .....	monthly
Line Termination in Aerial Design.....	Oct 446		

# PRINCIPAL ARTICLES—BY ISSUES MONTHLY

*Features which appear every month are not included*

## MARCH 1975

Aerial Configuration for Top Band  
Mobile Rally Season 1975  
PA Cooling for the FL-DX500  
“SWL”—Listener Feature  
Transverter for 70 Centimetres, Pt. I

## APRIL 1975

Building the Venus SS/TV Monitor  
Counties of the British Isles  
Discussing the MFJ CW Filter  
Mobile Rally Season 1975  
QRP on Eighty  
Transverter for 70 Centimetres, Pt. II

## MAY 1975

About Aerial Feeding and the SWR  
Book Review—*World Radio/TV Handbook 1975*  
Design of Power Supplies  
Mobile Rally Season 1975  
“SWL”—Listener Feature  
The Crystal Filter for Reception  
Two-Metre RF Amplifiers

## JUNE 1975

Book Review—*ARRL Handbook, 52nd Edn.*  
Introduction to /M Working  
Mains PSU for the Liner-2  
More QRP Circuits  
The Mobile Scene

## JULY 1975

More about Speech Clipping  
Starter for Two  
“SWL”—Listener Feature  
SWR Indicator for Low-Power Working  
The Mobile Scene

## AUGUST 1975

Courses for the RAE—*First List*  
DX from Eday Is., Orkney  
Going QRP on Eighty  
Noise Bridge for Antenna Measurements  
Ten-Metre Aerial Amplifier and Cheap RF Output  
Meter.  
The Mobile Scene

## SEPTEMBER 1975

Checking FM Deviation  
Courses for the RAE—*Second list*  
Five Watts on Forty  
Frequency Modulation for VHF Transmitters  
Half-Size Quad for Twenty  
Some Practical Points  
“SWL”—Listener Feature  
The Mobile Scene

## OCTOBER 1975

Compact Modulator/PSU  
Line Termination in Aerial Design  
Rules—The Thirtieth MCC  
The Mobile Scene

## NOVEMBER 1975

Active Aerial Unit  
Book Review—*ARRL Antenna Book, 13th Edn.*  
Modifications to the KW-2000 Transceivers Series  
PSU Remote Sensing  
“SWL”—Listener Feature (Includes HPX Rules)

## DECEMBER 1975

Auto-Scan Unit for Two-Metre Receivers  
Break-In for the Codar AT5  
Mains Voltage Adjustment  
The Leicester Show

## JANUARY 1976

Improving SSB Reception in Older Receivers  
RF Bridge Unit  
Some Notes on the Trio TS-520  
“SWL”—Listener Feature  
Transistor Grid Dipper

## FEBRUARY 1976

Basic Auto-Key  
Learning Morse  
KW-77 Monitor Muting  
RAE Questions & Answers  
The Tunnel Diode

# INDEX TO CONTRIBUTORS

	<i>page</i>		<i>page</i>
BENNETT, G. J., B.S.C., PH.D. (G3DNF)		JARVIS, W. H. (GM8APX)	
QRP on Eighty .....	<i>Apr 85</i>	Ten-Metre Aerial Amplifier and Cheap RF Output Meter .....	<i>Aug 334</i>
BURNETT, P. (G4BLL)		KERFORD-BYRNES, A. P. (G6AB)	
PA Cooling for the FL-DX500.....	<i>Mar 25</i>	Break-In for the Codar AT5 .....	<i>Dec 580</i>
Building the Venus SS/TV Monitor.....	<i>Apr 92</i>	PAGE, C. (G4BUE/M)	
CLARK, D. E. (G8GPP), with H. R. Ward (G8KGG)		Introduction to /M Working.....	<i>Jun 206</i>
Auto-Scan Unit for Two-Metre FM Receivers .....	<i>Dec 575</i>	PERKINS, P. (G3OUV), with S. Scannell (G3ZSU)	
COOPER, J.		Modifications to the KW-2000 Transceiver Series .....	<i>Nov 509</i>
"SWL"—Listener feature <i>alt. months from March</i>		PHILLIPS, S. G. (G8HQA/DA4BM)	
CROSSLEY, R. M. (G4CZP)		Two-Metre RF Amplifiers .....	<i>May 150</i>
Mains PSU for the Liner-2.....	<i>Jun 210</i>	PLANT, A. B. (G3NXC)	
CUSHING, J. S. (G3KHC)		PSU Remote Sensing .....	<i>Nov 514</i>
Aerial Configuration for Top Band.....	<i>Mar 24</i>	POLSON, S. S. (GM3RFR)	
DAY, P. E. (G3PHO)		Five Watts on Forty .....	<i>Sep 390</i>
Half-Size Quad for Twenty.....	<i>Sep 392</i>	POOLE, I. E. B.S.C. (G3YWX)	
DOBBS, Rev. G. C. (G3RJV)		Design of Power Supplies.....	<i>May 146</i>
SWR Indicator for Low-Power Working.....	<i>Jul 267</i>	RAYER, F. G. (G3OGR)	
Going QRP on Eighty.....	<i>Aug 327</i>	The Crystal Filter for Reception.....	<i>May 148</i>
Active Aerial Unit.....	<i>Nov 512</i>	More QRP Circuits.....	<i>Jun 208</i>
DORMER, A. H., C.ENG., F.I.E.R.E. (G3DAH)		Starter for Two.....	<i>Jul 270</i>
Transverter for 70 Cms., Pt. I.....	<i>Mar 27</i>	Compact Modulator/PSU .....	<i>Oct 451</i>
Transverter for 70 Cms., Pt. II.....	<i>Apr 88</i>	REDDING, R. J., C.ENG., F.I.E.E.	
Simple Filter for Seventycems.....	<i>Feb 704</i>	Checking FM Deviation .....	<i>Sep 393</i>
"VHF Bands"— <i>feature</i> .....	<i>monthly Mar-Oct</i>	ROBSON, J. M. (GM3CFS)	
DRUMELLER, C. C., W5JJ		DX from Eday Is., Orkney .....	<i>Aug 330</i>
Line Termination in Aerial Design.....	<i>Oct 446</i>	SCANNELL, S. (G3ZSU), with P. PERKINS (G3OUV)	
DRYBROUGH, D. A. S., G8HEV		Modifications to the KW-2000 Series Transceivers .....	<i>Nov 509</i>
Improving SSB Reception in Older Receivers	<i>Jan 636</i>	TALBOT, A. C. (G8IMR)	
ESSERY, E. P. (G3KFE)		Frequency Modulation for FM Transmitters .....	<i>Sep 390</i>
About Aerial Feeding and the SWR.....	<i>May 145</i>	TUNGATE, A. R., <i>draughtsman</i>	
Communications and DX News— <i>feature</i> <i>monthly</i>		WARD, H. R. (G8KGG), with D. CLARK (G8GPF)	
FITCH, N. A. S. (G3FPK)		Auto-Scan Unit for Two-Metre Transceivers .....	<i>Dec 575</i>
Mains Voltage Adjustment.....	<i>Dec 579</i>	WORTHINGTON, J. W. (GW3COI), <i>cartoonist</i>	
"VHF Bands" <i>feature</i> .....	<i>monthly Oct-Feb</i>		
FORSYTH, A. J. E., OBE (G6FO/G3SWM)			
<i>Managing Editor.</i> Editorials and unsigned articles. All captions and paragraph items. Research, styling, layout and presentation.			
JANES, S. E. (G2FWA)			
RF Bridge Unit .....	<i>Jan 640</i>		

different crystal frequencies: for example a 3.3 MHz crystal in the second conversion would give a first IF of 3.5-3.85 MHz, so that 80-metre signals could be received by taking the aerial straight to pin 1 of V4. (This would, of course, mean altering the frequencies of the crystals associated with V1.) There is nothing critical about the choice of frequency for the first IF, and anywhere between about 1.5 and 4 MHz would be satisfactory, provided that the chosen IF does not mean using crystals having harmonics which fall within the amateur bands (otherwise it may be difficult to receive *anything* on those frequencies!) Having decided on the first IF, the first conversion injection frequencies are found by subtracting the first IF channel from the frequency of the band to be covered. Note that only 350 kHz of a band can be received with any one crystal in the first conversion oscillator. CW addicts, for example, may well prefer to bring down the 21 MHz first conversion oscillator from 18.4 to 18.3 MHz, so as to sacrifice the HF 100 kHz of the band rather than the lower 100 kHz. A 6.1 MHz crystal would be ideal (with the same oscillator coil).

(2) By replacing the 2.5 MHz crystal by 500 kHz and with a separate multiplier between the oscillator and the mixer (switched for the 3rd, 4th, 5th, 6th, 7th, 8th, 9th and 10th harmonics) and by replacing C3 and C4 by a 300  $\mu\text{F}$  two-gang variable capacitor, any frequency between 1.67 and 5.3 MHz (the limits of L5 and L6 with a 300  $\mu\text{F}$  variable capacity) can be covered

by the first IF. With some slight alterations to L1-L2, and L3-L4, and by increasing C1 and C2 to about 100  $\mu\text{F}$ , this would enable large slices of the HF spectrum to be received—with the same inherent stability as the BC-453 or main receiver gives.

(3) Although the method recommended for 7 MHz front end coils is entirely satisfactory (provided that you don't keep losing the stubs!) some constructors may prefer to wind larger coils to resonate with C1 and C2, or to make up a duplicate set of "14 MHz" coils, but with 100  $\mu\text{F}$  condensers mounted on the coils, across the tuned windings.

### Performance

The sensitivity seems to be very good, but no actual measurements have been made. The converter is certainly better in this respect than many "commercial set-ups" which the writer has heard. In spite of the number of stages before the "knot-hole," the big ones do not block the little ones and, for example, it is easy to copy stations with carriers separated by only about 2 kHz, and with about 30-40 dB difference in signal strength, merely by tuning to the other sideband. This is thought to be due to the predominance of semi- and remote cut-off valves in the design.

The image ratio is excellent, and there is no IF breakthrough at any detectable level. The remaining performance parameters are controlled by the BC-453 itself (or whatever main receiver is used), as mentioned earlier.



## SHORT WAVE LISTENER FEATURE

By Justin Cooper

### THOUGHTS ABOUT AERIALS — READERS' NEWS AND VIEWS — LATEST TABULAR MATTER

ONE suspects that lots of readers lost their skywires in the winter gales; which makes it a rather good time to talk about the choosing of these aerials and things.

In general, the rule is the best you can afford or get planning permission for (although the 1971 Act seems to this old scribe to specifically exempt us from the need for planning permission by its definition of "the use of any building or land within the curtilage of a dwelling house for any purpose incidental to the enjoyment of the house—this does not include erecting a building.")

Anyway, let us look at the advantages and snags to be found with the various types. First, the end-fed piece of wire: This suffers from the snag of needing to be used with the help of an ATU and an earth connection if it is to give of its best—and the earth connection is far and away the most difficult part to create satisfactorily. In general, if it is quarter- or half-wave long it will produce its major lobes at right angles to the wire, the pattern breaking up into several lobes as the wire becomes longer (over half-wave long, it may be regarded as a "long-wire.") If you can get up 66 or 132 feet, perhaps the best way to use this is to make it into the "end-fed Zepp," coupled through an ATU for those bands on which it is half-wave or more, and to strap both legs of the Zepp feeders together and work the connection against earth as a Marconi through an ATU for the low bands. In general, these arrangements will so organise you that all the globe will be covered effectively on one band or another.

On the other hand, should you be so situated that the shack and receiver are in the middle of the span you can yet out, then you need

something which is fed at the centre. A dipole is very effective as a single-band centre-fed aerial, but it won't "perk" on even harmonics which is a bit of a nuisance—however, a forty-metre dipole will operate as a third-harmonic device on 21 MHz. Should you wish to operate all bands with a centre-fed aerial, then you have to think more carefully. You have a choice, basically, from the W3DZZ arrangement, which is available commercially as the K.W. Trap dipole for 80-10 metres, or you can try the G5RV design—also for 80-10, though if you can't get the 102 feet top out, the half-size version covers Forty to Ten; with either G5RV or W3DZZ designs, to cover the lower bands, just strap the feeders at the bottom and operate the thing as an end-fed against earth. Should your garden demand an odd-ball length, then you can get up the largest span you can, and centre-feed it with the "centre-fed Zepp" set-up, through an ATU; the "extended double Zepp" gives a bit of gain if you can arrange to install it.

Among the verticals, if you use one at ground-level, then once again you are up against the need for a good earth; far better to get it up on the chimney-stack and use it as a "ground-plane" with three or four radials. This method is also the best way of mounting one of the trap verticals available commercially to cover several bands, though the maker's instructions should be followed as to the radials if they are to give of their best, and it must be realised that on Eighty one of these arrays will have very narrow bandwidth.

A beam is the ideal to aim at; the Quad is possibly the best, but a trapped beam is quite effective and in use by many DX operators. One thing to be sure of, though, with a beam, is to make sure the rotator is capable of coping. To this end, there should be a thrust bearing to take the weight of the aerial and mast off the rotator, and also another

thrust bearing to take away the sideways thrust due to windage, else the rotor may fail to cope and strip a gear, which invariably occurs when the weather is unpleasant for working on the aerial!

As to height, it is to be preferred that the aerial, if it is a horizontal one, should be at least a half-wave high on the preferred band (or a multiple of a half-wave, of course)—heights which are a multiple of a quarter-wave are to be avoided like the plague, as they tend to "shoot" straight up into the sky instead of at low angles.

Indoor aerials are not impossible by any means, and may be the only approach; here one can try the Joystick, remembering it should be vertical for best results, or just run as long a wire as can be got into the space in the loft, and feed it against earth through an ATU. One amateur known to your scribe, used a half-wave dipole on Top Band up in the loft by suitable zig-zagging, and it worked quite well round the U.K. on CW for years! And, if you can't even get anything into the loft, one way out is to get a long whip, either by using one of the glass-fibre car jobs, or a series of old tank-whip sections, with the base mounted on to a suitably-bent piece of metal which can be clipped into an opening window with the aerial outside when the window is shut again; stick it out when you want to listen, and bring it back in when you have finished (you can use this even in places where no aerials are allowed if you only poke it out at night!), feeding the brute with an ATU comprising an L-network sitting on the window-ledge to cover all bands and a waterpipe or central-heating pipe as earth, or even a counterpoise of thin wire spread out under the carpet!

So, there it is. There is always *some* way of getting an aerial organised; with an ATU, a receiver, and a good pair of ears (which is largely a matter of self-training) you are, as they say "in business."

### The Reports

*W. H. Smyth (Hartlepool)* agrees with what we said last time about the Joystick, he having used one exclusively for about nine years; radials were added a few months ago. Bill reckons the proof of the pudding is in the eating, and his "eating" includes, for example K8 on Top Band and plenty of DX on Forty, thanks to that good old 20 dB of attenuator at the front-end. Like lots of people, he has included JT0AB, but with reservations. One hardly likes to try and advise on this one; perhaps the best way would be to delete it for the moment on all lists, but if anyone gets a card or information appears about the claimed QSL manager it can go back in the lists.

*H. M. Graham (Harefield)* found things a little rough, with the HF bands flat in the evenings, much in the way of domestic jobs to do, and Twenty the best of a bad lot. Nonetheless, as always, Maurice seems to dig up the odd addition to the lists, and this time is no exception.

Just as an encouragement to the others, *A. Roberts (Shephed)* mentions that his aerial is 4½ feet long and made of old stair-rods, there is no ATU, and in a couple of years with gaps for studies at school Andrew has heard 250 countries and has 719 on HPX. That IV3VLS which everyone wondered about was in fact a "jolly" connected with the "Save Venice" campaign, and the operator was a bit put out to find that many stations he worked didn't know what the event was for! On a more serious note, one does begin to wonder if indeed it may already be too late to save that wonderful place from destruction.

Those who included "F7AN" can scrub him out—as *S. Foster (Lincoln)* reminds us, F7 has been unused since the U.S. forces pulled out of France in the early '60s. On a different note Stew has lost his 18AVQ in the winter gales, it having snapped off at the base of the forty-metre trap. So—if anyone has a spare forty-metre trap, please let Stew know, direct to 24 Dunston Road, Metheringham, Lincoln.

Heaven help us! *J. Fitzgerald* must be sitting there in *Gt. Missenden*, laughing like a drain—he wants to know whether FR7ZL/G counts as G7! It goes against the grain, but on the strict interpretation of the HPX Rules, there doesn't seem much alternative but to allow it. On a different theme, one recalls John beefing about the matter of CW, he having passed RAE; but now he has the trick more or less mastered, he finds CW listening to be a pleasant activity. Thus it always is—learning it is a dreary old business, and many an op. gives it up on the day he gets the pass-slip—but those who try their new skill on the bands, where there is much more incentive to read the stuff, very soon get to like it and even prefer CW to Phone operating. Thus, for instance, it is with old G3KFE, who started his amateur career with a JT licence, and gradually, through circumstance, found himself taking the trouble to pass Morse and get his "normal" ticket so he could operate (exclusively 'phone, of course) on the lower bands. One day he was sending slow Morse, and someone called him on the key after the session, so he stayed on the key to give that SWL some extra Morse to copy, (just for this once, of course!). A friendship was started, as a result of that QSO, more contacts followed, and the taste acquired; nowadays that old reprobate mutters into his beard about

coming up on Phone for anything less than a new country. It is an acquired taste, CW operating, but very much worth the bother of acquisition.

*M. C. P. Bennett (Slough)* remarks on the rudery on the DX segment of Eighty from other G's who are working locals on top of the DX. This has been a problem for more years than this old scribe can remember. While it is true that there is no mandatory band-planning here as there is in the States, the plan has been agreed by most people as being to the common weal; thus, those people who, quite deliberately, operate local phone QSO's either in the DX segment, or indeed in the CW portion of the band, are merely showing themselves up for what they are—oafs. One cannot expect such nasty characters to behave because it just wasn't knocked into their thick heads when they were babes; and one has the consolation that they wave their lack of good manners and civilisation in front of a world-wide audience, something that would make any civilised person red with shame.

*K. Kyezor (Irchester)* seems to be doing very nicely thank you at the new QTH, with quite a lot of listening done; but the early part of the New Year showed the bands going dead up to the time of his report.

*M. J. Rivers (Leyton, E.10)* has been tackling the Morse with enthusiasm, but notes how very easy it is to lapse "just once" which turns into a long enough time to put one back to Square One. There is one consolation, however, and that is that once the business has finally been mastered it will never be completely lost—a ten-year lapse and thirty minutes on the band sees you copying at almost the old speed. On the matter of R.A.E. courses, Malcolm finds he has to wait until next autumn for a course to start—they are geared to the Technical College year on the one hand and the May exam. date on the other. However, one can settle down in the meantime to a routine of an hour's daily dose of the "fundamentals" parts of, say, the *ARRL Handbook*; then get hold of the *Examination Manual*. Some careful work at this stage will make life much easier when the actual course begins in September.

"Time is of the essence" if one is to do any SWL-ing, says *R. H. McVey (Weston-super-Mare)* he having had little of that valuable commodity available for the receiver!

Apart from his DX'ing, *P. Barker (Sunderland)* has interests in photography, and a task with the local Radio Club. Yet still he has found time to put all the gear into a console which looks very smart—he says he will send us a picture when he can find time to develop the film!

Once again *G. Clegg* is on the move, this time still in *Deeping St. James*; and so aerials are coming down, packing cases filled and routines interrupted; however, it is hoped to be operational again from the new place in time for our next deadline.

*P. Rooney (Oxford)* remarks on the relatively small number of W stations using their special calls—which may well be a good thing, come to think of it! On a different tack, Philip mentions a VE, working into Europe with a 43-element log-periodic, which he "didn't like turning because of its weight!" Whatever he was doing with an aerial like that, Heaven only knows—a simple tri-bander at the same height would outrun it almost certainly, used only on our bands. However, one suspects that rig was being operated from a "work" QTH, where the log-periodic was up to give broad-band coverage of some commercial channels.

*H. A. Londesborough (Swanland)* found a CT4 over the Christmas holiday, who was saying that the normal CT1 series was now exhausted, as explanation of his new prefix. SWL Londesborough

## ANNUAL HPX LADDER (Starting date January 1, 1975)

SWL	PREFIXES	SWL	PREFIXES
P. L. King (Akrotiri)	449	J. B. Cooke	
A. C. H. Darragh		(North Walsham)	312
	(Wetherby)	S. Lawrence	
G. Ridgway (Ardleigh)	418	(Market Harborough)	306
R. Staples (Lymm)	382	R. Rennard (Redditch)	298
J. J. Ryan (London W.11)	333	M. Gibson	
M. Kelly		(Barrow-in-Furness)	212
(Lisburn, Co. Antrim)	312		

Starting Score 200, in accordance with HPX Rules. This is the last appearance of the 1975 Table. The 1976 Table, for Prefixes heard since January 1, 1976, will appear for the first time in the next "SWL."

bought himself a Stephens-James SWL ATU and finds it tunes his long-wire up very nicely—and that is gain with no penalty, which must be a help in these sunspotless times!

Odd conditions on Twenty are mentioned by *B. Mackness (Dagenham)*, who found the band open several times between midnight and 0600z; the Americas, Africa, and Oceania were all logged, the ZL's peaking at S9. The 12AVQ has been endowed with a couple more radials for both Ten and Fifteen, in addition to the specified ones; and the result seems to be an all-round improvement of about a half-S-point, even on Twenty—some consolation for aerial work carried out in freezing weather!

*J. B. Cooke (North Walsham)* is a retired headmaster who happens to live next door to G6PG, who seems to have been doing some "marketing" of Amateur Radio to good effect, as the Ladder shows; the aerial is a long-wire, feeding an FR50B through an ATU—and, by the way, we could do with some more licensed amateurs in Norfolk!

*M. Gibson (Barrow-in-Furness)* was a little worried about the non-appearance of his entry, which in fact was delayed in the mails and arrived after the deadline.

Another one to have been "under the influence" as it were, is *S. T. Bowen (Kippax)*, whose "influence" is through Father G4AAU. In his list WA7QZD/MMI counts as a WA7/MM; the "1" in the end merely indicates in which of the three Regions of the world the ship was situated.

*M. Barton (Market Deeping)* suffered a severe fade-out on January 2, caused by the pole departing into the garden next door and the eighty-metre wire just *disappearing* altogether! However, it's an ill wind that blows nobody good, and in this case the aerial has been replaced with three sixty-six foot elements which can be paired orfed against earth to produce directional effects; while writing, Mark notes that he was listening to Steve Lawrence of Market Harborough who has recently become G4EOF after corresponding as an SWL for quite a time.

*J. J. Ryan (London W.11)* lives in a flat where the noise level from local electrical devices can be pretty daunting at times; he has a Trio 9R-59DS front-ended by a Hamgear 11B Preselector, and has been experimenting with helical whips with some success; reduction in signal but greater reduction in noise! On a different tack, some trouble is experienced with the receiver "pulling" with variation in RF gain control. This is always a bit of a problem in design, and the stabilising of HT is often only at best a palliative. Perhaps the best way of attacking the problem is to run the receiver at full gain all the time, and reduce the input as necessary with an attenuator. As for the other problem, that the receiver sounds a bit numb(!) on Ten and Fifteen, this is partly that signal levels tend to be at lower levels than on HF, and probably more than that just plain "conditions"—the rig will doubtless perk up no end when the sunspots get back into circulation.

*N. A. Phelps (Devizes)* mentions a "TA4AA" which he regards as a Phoney, and also 3Y1BL, who could be from LA-land—but he, like us, knows not of any such effort so we must await the judgement of the QSL-Bureau!

*R. Carter (Blackburn)* has been listening on VHF, and he reckons that although there are some pretty poor efforts in the way of correct and clear signing on the HF bands, some of the VHF operators are the Utter End—with which your conductor is in full agreement, with just about all the sensible operators on Two also! Indeed, some of the earlier G8-plus-three chaps just refuse to operate on Two and stay at 430 MHz or even 1296 MHz just so they can at least do their sort of proper Amateur Radio in peace, experimenting and operating properly; and who can blame them?

*K. Whiteley (Castleford)* visited another SWL who has since become G4DIO, and spent a very pleasant evening. However, he was a bit surprised at the strength of the signals from G4DIO's sloping dipole on Twenty and so went home and scrapped his "bit of wire" in favour of a 14AVQ ground-mounted, which has livened the scene up considerably.

*R. Roberts* lives at 4 Leete Avenue, Rhydymwyn, Mold, Clwyd, and would like to get in touch with any other SWL's in the area to talk about the Amateur Radio equipment and so on. Due to unemployment, the receiver had to go recently, and so Richard is not active at the moment. One way of getting going with a BC receiver is to use another BC set as a BFO, injecting the oscillator from the second set by placing the two close together and tuning the two receivers in step. For instance, if the second receiver is fitted with a 450 kHz IF, and the first one is looking at a CW or SSB signal on, say 7 MHz, then the second receiver when tuned to 6.550 MHz will have a local oscillator at the right frequency for front-end injection. The degree of injection is simply adjusted by adjusting the separation of the two receivers, once the "best" has been found. This is a tricky way of going about things, but several SWL's have used the same idea with great success and got well into the All-Time list before finally getting round to any sort of "real" communications receiver. However,

## HPX LADDER

(All-Time Post War)

SWL	PHONE ONLY	PREFIXES	SWL	PHONE ONLY	PREFIXES
W. Bingham	(Carrickfergus)	1581	G. F. Gullis	(Ogbourne St. George)	796
S. Foster (Lincoln)		1559	W. H. Smyth (Hartlepool)		754
R. Shilcock	(Kingswinford)	1492	M. Rodgers (Harwood)		741
K. Kyezor (Perivale)		1458	L. Craven (Alvechurch)		737
R. Carter (Blackburn)		1333	J. Dougherty (Sunderland)		733
J. Fitzgerald	(Gt. Missenden)	1321	A. C. Roberts (Shephed)		719
M. J. Quintin	(Wotton-u-Edge)	1252	A. Rooney (Liverpool)		691
P. C. Jane (East Looe)		1239	M. Eccles (Lancaster)		682
B. F. Hughes (Worcester)		1223	J. Bell (Hampstead)		676
A. W. Nielson (Glasgow)		1156	B. T. Mackness (Dagenham)		669
M. Cuckoo (Herne Bay)		1109	L. Gignon	(Barrow-in-Furness)	584
K. A. Whiteley (Castleford)		1108	M. Law (Chesterfield)		573
H. A. Londesborough	(Swanland)	1079	M. Rivers (Leyton)		565
G. W. Raven	(London, S.E.13)	1075	D. Taylor (Harborne)		563
R. H. McVey	(Weston-super-Mare)	1067	R. C. Woolley (Ashbourne)		544
J. H. Sparkes (Trowbridge)		1045	N. N. Graham	(Newcastle-upon-Tyne)	541
Mrs. J. B. Jane (East Looe)		987	J. Aspinall (Leeds)		536
N. Hembrey (Northam)		957	M. Barton (Market Deeping)		531
E. W. Robinson	(Bury St. Edmunds)	902	G. Clegg (Deeping St. James)		506
H. M. Graham (Harefield)		893			
A. R. Holland (Malvern)		887			
E. Parker (Hove)		848			
P. Parker (Sunderland)		843			
C. K. Verstage (Old Basing)		800			
M. C. P. Bennett (Datchet)		799			

Starting score 500 for Phone, 200 for CW. Listings include only recent claims.

CW ONLY	
A. Glass (Plymouth)	1203
N. A. Phelps (Devizes)	1033
H. A. Londesborough	(Swanland) 876
G. Richards (Aberdeen)	524
A. F. Roberts	(Kidderminster) 436
A. W. McNeill (Newbury)	353
T. Grimbleby (Hull)	269

the second receiver should be transistorised, if only to keep drift due to receiver warm-up to a minimum.

*P. Ramsay (Stevenston)* works at night, which gives him time for studying for RAE; and on his night off he goes off to the Ardeer Club. The receiver is an AR88D used with a dipole on Eighty, a folded dipole on Twenty, and a compact ground-plane to a *Magazine* design on Fifteen. Peter's list is a pleasure to read, and all his "doubtfuls" are so marked with date, time and band—a pity he addressed it to "Club Secretary" which delayed its receipt by your scribe!

*A. E. Glass (Plymouth)* comes back at us about his being top of the Table and not intending to let anyone overtake him by commenting that he would be only too pleased to see such a thing happen! After all, it would all be to the good of the CW Table. One couldn't agree more; it's a much neglected mode among SWL's—and, indeed by the licensed chaps—which is hard when you first tackle it but becomes the favourite mode invariably once one has grasped the knack and compares the operating standards and behaviour impartially with the Phone end of the bands. To which J.C. would add that, in some odd and undefinable way, it is more personal than a Phone QSO, strange though that may seem. On a different point, Bert wonders who is the oldest entrant on the Ladder? He himself is 69. Any offers?

### Other Mail

Which is where we acknowledge letters and Table entries from: *M. J. Quintin*, Wotton-u-Edge; *M. Rodgers*, Harwood; *M. Cuckoo*, Herne Bay; *B. Hughes*, Worcester; *G. W. Raven*, Lewisham; *G. Ridgway*, Ardleigh; *J. Aspinall*, Leeds; *M. Kelly*, Lisburn, Co. Antrim; *Mrs. J. and P. C. Jane*, East Looe; *D. Taylor*, Birmingham; *G. F. Gullis*, Marlborough; *R. J. Rennard*, Redditch; *L. Gibson*, Barrow-in-Furness; *A. F. Roberts*, Kidderminster; *R. Shilcock*, Kingswinford; *T. Grimbleby*, Hull; and *M. Law*, Chesterfield.

### Deadline

The date of your offerings for the next appearance of "SWL" (*May issue*) is March 26, addressed: "SWL," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ. Don't be late, and have a good time on the bands meanwhile. 73 de J.C.

# VHF BANDS

NORMAN FITCH, G3FPK

## VHFCC Awards

THE two VHF Century Club Certificates awarded this month are both for two metres. Adrian Heath, G8KDV (Highworth, Wilts.) receives No. 250, thus becoming the first G8K/2 to qualify. After many years as an SWL, the licence was obtained in March, 1975, the first rig being an *Icom IG-20* to a 5-*ele.* Yagi. Then followed an *IC-21* with a *Liner-2* for SSB, with a home built linear amplifier and 8-*ele.* Yagi. Adrian is QRV on 70 cm., too, and hopes next to have a go at the Morse test for the G4 licence.

No. 251 goes to Arthur Bryant, G3ITV, from Hutton in Essex, who was first licensed in 1952. Till 1972, the main interest was construction and operation of HF-band gear with the accent on long haul, CW DX'ing. Decreasing spare time lately has resulted in Arthur's going commercial with an *HW-101* transceiver. Serious VHF operation was commenced in 1971 using a 28/144 MHz solid-state transmitter on CW and SSB. The aerial is now a 6-*ele.* rotatable Yagi. G3ITV hopes to build a 70 cm. transverter later.

In our brief mention of the VHFCC rules last month, we omitted to state that all contacts must have been made from one, fixed QTH, which rules out portable and mobile operation. However it does not matter if you change from a G8 to a G4 during the time you are collecting the cards.

## Liner Clinic

Some readers may know that early HF band transceivers of the FT variety were rather poor by today's standards. Radio amateurs soon started making modifications to these sets and, to disseminate details to a wider audience, the *Fox-Tango Club* was started by an enterprising American amateur. Whilst the *Liner-2* 2m. SSB transceiver has undoubtedly been a prime reason for the popularity of this mode on Two today, few will disagree that this equipment *can* make some nasty noises! Probably the most diabolical combination is an overdriven, "tweaked up" *Liner-2*, with a speech processor, driving a not-too-linear amplifier. G3OSS and others have proved that, with proper equipment, the *Liner-2* can be made to emit an acceptable signal, simply by intelligent alignment. In an attempt to assist those who use this equipment and who may not be satisfied with the performance, it is proposed to publish information under this heading, from time to time. For this to be a success, we need readers to communicate their ideas and experiments to this column.

To start the ball rolling, we return to

the problem of the in-band *spirit*, the frequencies of which can be calculated from the formula:—  $F_s = 231.2 - (F - 115.6) \times 3$  MHz where  $F_s$  is the frequency of the spurious emission and  $F$  is the transmitting frequency. If a graph of this equation is plotted, it will reveal that, for the usual 144-1 to 144-33 MHz coverage, *spirit* will likely be detectable in the range 145 to 145.7 MHz. The writer was talking to a concerned *Liner-2* operator who was surprised to find that these in-band *spirit* were far fewer decibels down than he expected. With the aid of a reliable spectrum analyzer, he was able to improve this situation markedly, but at the expense of much reduced output! The problem has been discussed elsewhere and a design for a double balanced mixer evolved which claimed a 15 dB reduction in spurious output. However, one user has pointed out that the device specified was working at the extreme limit of its frequency range and, in his case, whilst it did reduce the spurious emission, it introduced other problems.

Calculation shows that there are nine-teen frequencies in the normal operating range which could produce *spirit* on all the repeater input channels, on S20 to S24 and on the output frequencies of R1 to R4. It is not suggested that this will always be the case, but the likelihood is greater if one is close to a repeater and/or runs a high effective radiated power. Of particular note are the following: 144-300 MHz, which could produce a spurious signal on the R4 input channel; 144-308 (R3 input); 144-292 (R5 i/p); 144-283 (R6 i/p); 144-275 (R7 i/p). Anyone hearing a *lower* sideband signal in the range 145-145.7 MHz can calculate the transmitting frequency if a

$$F = \frac{578 - F_s}{3} \text{ MHz.}$$
*Liner-2* is suspected from:  $F = \frac{578 - F_s}{3} \text{ MHz.}$

Next time, on a more positive note, we will publish GD3YEO's circuit for CW operation.

## Beacon Skulduggery

One of the questions decided at the 1975 Warsaw Region I IARU Conference was that the higher power beacons be shifted to around 144.9 MHz in the two-metre band. Although no wide publicity has been given to the implementation of this as far as U.K. beacons are concerned, we understand from G3FZL that new frequencies for several of these have been allocated. The following is a round-up of the situation as far as we can ascertain: G3BVHF on 144-150 MHz is to stay where it is. GB3CTC on 144-130 MHz likewise, although its keeper, G3CZZ, would like to rebuild it. GB3GW has been assigned 144-915 MHz even though it has been off the air for some months (the licence is being renewed in case a new keeper and site can be found). GB3DM is to move to 144-935 MHz, GB3GI to 144-955 and GB3ANG to 144-975 MHz. The Polish beacon SP3VHF (in KM66g) has a new QRG of 144-905 MHz, whilst the very useful DL0PR in EO54d has moved to 144-910 MHz. It is hoped to keep readers up-to-date with the beacon situation but it is surprising that this kind of information is not broadcast over GB2RS, or otherwise promulgated.

## Calling Frequencies

The suggestion in the January column that a 2m. SSB calling frequency was now unnecessary has met with divided opinion, as expected. Brian Carter, G8ADD, wrote

at length pointing out the value of a single calling frequency to those in poor locations and criticizes various "prominent" amateurs for making the sort of *ex-cathedra* statements published in this feature in January. G8ADD states that "... none of you seem prepared to defend your statements ..." This writer cannot speak for others but is quite prepared to outline his reasons for questioning the retention of a 2m. SSB calling frequency. First, at times when band occupancy is low, it is quite logical to leave a receiver tuned to a particular frequency in case anyone else is about. However, if the band is at all lively, and especially during contests, it is pointless to do this. The stations capable of putting a good signal into distant parts will be heard and called back by several stations of which the strongest will probably be answered.

Secondly, when activity is reasonably high, a station calling on 144.3 MHz from a poor location with low power will likely be lost in QRM from other, louder signals. This was the reason for the suggestion of a calling *band* of 20 kHz or so, centered around the present calling frequency: at least that

## QTH LOCATOR SQUARES TABLE

Station	Total	23 cm.	70 cm.	2 m.
G8FUF	201	—	63	138
G3POI	127	—	—	127
G3FPK	107	—	—	107
G4BWG	119	—	17	102
G8HVY	86	—	—	86
GM4CXP	93	—	9	84
G6UW	78	—	—	78
G8BKR	79	1	6	72
G4CIK	61	—	—	61
G4DGU	90	—	30	60
G3COJ	109	10	45	54
OZ9IY	52	—	—	52
G8KSP	51	—	—	51
GC8AAZ	53	—	3	50
GW8HVP	48	—	—	48
G8KKX	46	—	—	46
GD2HDZ	66	6	19	41
G8KMB	41	—	—	41
G8JEF/A	38	—	—	38
G3FIJ	40	—	6	34
G8IFT	41	1	11	29
G8ITS	27	—	—	27
G8JEF	25	—	—	25
G8JAJ	23	—	—	23
G8JKA	21	—	—	21

Starting Date January 1, 1975.

No satellite or repeater, SO's.

"Band of the Month" is Two Metres.

## THREE BAND ANNUAL VHF TABLE

January to December 1976

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G4BWG	25	2	38	11	8	1	85
GM4CXP	3	2	49	14	1	1	70
G5DF	23	2	34	3	3	1	66
G3FPK	—	—	46	10	—	—	56
G8GML	—	—	38	6	6	1	51
G8BKR	—	—	12	6	—	—	18
G8KSP	—	—	14	4	—	—	18
GC8AAZ	—	—	7	7	1	1	16
G8ITS	—	—	10	2	—	—	12
GD2HDZ	1	1	1	1	2	1	7

would spread things out a bit. Thirdly, some operators in poor locations assume they cannot get out very well, because they do not hear many stations on. Having been answered by a local, they then carry on a QSO on 144.3 MHz, without realizing that well-sited stations can hear them and that they are interfering with other, more DX, stations calling "CQ."

G8ADD appreciates that well-sited stations can find the calling frequency, "... choked with stations and unusable." He concludes that it would be in their interests to spread things out "... although this would be against the interests of ordinary people like myself." Sorry, but that does not make sense. Surely a weak station on a clear frequency is much more likely to be heard than he would be on a cluttered up calling frequency?

Julian Moss, G8ILO, who lives in Essex but wrote from the University of Lancaster, also defends the calling frequency idea, pointing out the great difference in the level of SSB activity in the London area compared with that elsewhere. He suggests that, having established communication on 144.3 MHz it is logical to QSY as short a distance as possible. Surely that depends upon conditions, though? If there are other, very local stations on, it would be more courteous to QSY well away from 144.3 MHz. To sum up, whether the idea of a 2m. SSB calling frequency will persist or die out gradually will be determined by usage. What your scribe feels to be of paramount importance is that we use all of the amateur bands as far as possible. At the moment most SSB activity on 2m. seems to be between about 144.2 and 144.33 MHz. In fact, the part of the band between 144.33 and 145.0 MHz is often devoid of signals for long periods in marked contrast to the FM and repeater end, plus the present SSB part. If we do not use our bands fully, other interests will have a cast-iron case for demanding a further section here and there. It's been said many times but is worth repeating, "Use or lose!"

## November E-M-E Tests

A full report on the results of the November, 1975 E-M-E tests organised by the Stanford Research Institute in Menlo Park, California has been received. The SRI 150ft. diameter dish was used on 70 cm. The dish rides on top of a circular railroad track, with the operating building, and was fed via a built-in horn, using left-hand circular polarisation. Total feeder loss in the 250ft. of rigid 6 inch coax and 30ft. of 7/8-inch coax was 1 dB! During the eleven-hour test period on November 23, 84 two-way contacts were made with five continents, 11 countries and 20 U.S. states, using the call WA6LET. SRI's transmitting line up was a Collins KWM-2, Carmichael transmitting converter, 4X150A driver into a 7213 final.

The only British contact was with G3VZI, the Nortu Staffordshire Polytechnic ARS station, and the other European countries worked were DJ, F, I, LX, OK, PA and SM. Most of the contacts were on CW but 15 stations were worked on SSB. The most successful receiver polarisation was right-hand circular although a number of observers noted that the Moon reflections had a large, linear polarisation component. In addition to the two-way contacts, the group conducted two, one-way

variable-power tests to determine the lowest power level that each station could receive. Some stations with aeriels having only 7 dB gain could detect the full-power transmissions, whilst stations having better aeriels could copy code-groups sent at power levels as low as 25 watts!

The group are very pleased with the response of the VHF fraternity and mention that the SRI parabolic dish is usable from 50 to 1296 MHz although it has only been used for E-M-E work so far on 144 and 432 MHz. They are looking into the possibility of organising something for 1296 MHz by late Spring this year.

## Meteor Scatter

Congratulations to Clive Penna, G3POI, who completed the first contact via MS with San Marino with M1C in GDO3j. This was the first G/M1 2m. two-way by any mode. Clive reports the *Quadrantids* shower in early January to have been poorer than usual, producing more reliable QSO's north-south, than east-west. The G3POI aerial system had suffered from the gales and was only re-erected some twenty minutes before the M1C sked time. GM4CXP (Boarders) worked I4BXN during the *Quadrantids*, along with a few other partial QSO's. MS activity is fairly low at present, the next major shower being the *Lyrids* in April.

## Twenty-Three

No reports of recent activity on 1296 MHz have been received, the only correspondence being from a few readers up-dating their claims for the All-Time Table. It would be appreciated if you would tell us what you are doing, or plan to do, on this band. GC8AAZ (Jersey) mentions a rumour that French amateurs might soon be allowed the use of the 1296 MHz part of the band again. At present, they are restricted to 1248-1260 MHz. However, F9QW's VHF column in the February *Radio REF* has no mention of this.

## Seventy Centimetres

Judging by the few scores received for the 1976 Three-Band Table, there has been very

sparse activity on 432 MHz lately. The writer was out the day of the 432 MHz Open Contest but from comments on the air later, it would seem that conditions were flat, at least in the London area, due to the belt of rain to the north. G3OSS (London) reports it hard going for him with about 30 QSO's. The outstanding signal was G3JQA/P from Meriton Low who apparently had over 70 contacts. Your reports for next month, please.

## Two Metres

Apart from a "lift" to the south and east on the 7th and 8th of January, a good Aurora on the 10th, plus a feeble, repeat performance on February 7, conditions over recent weeks have been mediocre. At G3FPK, there are a number of stations from a fair distance whose signals are used as a reference for assessing band conditions, especially now that several beacons have disappeared. Most of the time, these usually good signals have been very much weaker, often subject to deep, slow fading, with a rapid, irregular mobile-type fluttering as well. It seems that quite a number of amateurs suffered damage to their aerial systems in the January gales, which may account for the marked diminution in activity. On one or two evenings, only a handful of stations have been heard on SSB, whilst the CW section has been devoid of any signals.

GM3YOR (Kirkcaldy) although previously active on 145.8 MHz, now has a 2m. transverter driven by his FT-101B transceiver. The 8-ele. Yagi is fixed south at present. Drew reports activity on the band to be very spasmodic and suggests there are many "licensed listeners" around who only put in an appearance when there is an opening or an Aurora. The January 10 Aurora provided 18 QSO's with six countries—G, GI, GM, GW, DJ and OZ, all on CW except for GI8HXU on SSB. He implores us to turn our beams towards Scotland stating, "... there are noises to be heard on these bands (he mentions 4m. too) at times other than contests or Auroras..." Point taken, OM.

GM4CXP enjoyed himself in the same Aurora, working 13 countries; not bad in one evening, Derrick. Apart from the U.K.,

F, LA, ON, OZ, PA, SM, SP and UR2 are now already in the log for 1976 which, along with the MS Italian QSO, accounts for the total of 14 countries. Derrick noted two phases, the first from 1600-2025, the second from 2136-0125Z. In the South, the second period was split into two, however, as mentioned in the February feature. At G3FPK, only two QSO's were managed in the weak Aurora of February 7, namely GM3JFG (Highlands) in XR40c, again the best signal, and GM3UKG (Grampian) in YR27j. There may have been more stations workable earlier, but we did not get on till 1820z so look forward to receiving your reports next month.

Dr. Robert Nash, Chairman of the Coventry and Warwickshire Astronomical Society, has written to request the assistance of radio amateurs in alerting his Society by giving early warnings of auroral events. Perhaps any reader in that area who is on the established phone link already would make a point of ringing Dr. Nash on Coventry 614779 or Mr. C. J. Reed on Wolston 2877. The group works closely with the Dundee Astronomical Society and any reader thereabouts is invited to telephone the Mills Observatory on Dundee 67138. Concerning the January 10 Aurora, Dr. Nash recorded two distinct phases on 2m. when strong signals from GM8FFX and GM8CMV were received. At 2035 the Dundee folk reported a bright, visual display, the brightest seen in the city for 18 years.

#### Four Metres

It is a pleasure to record a welcome increase in correspondence covering 4m. activity. G3RXX took us to task for decrying the band, "... as hardly inhabitable to bother with." But we did no such thing! If nobody tells us what they are up to on 70 MHz there is little "meat" for this column. Brian also stated we briefly mentioned the October Fixed-Contest results with no mention of the conditions. However, that aspect was reported in December "VHF Bands." With respect, it is somewhat presumptuous for anyone to infer that, just because G3FPK—or anyone else for that matter—does not operate on a particular band, then he dismisses it as not worth bothering with. Of course it would be nice to operate on all bands above 30 MHz but there are limits to the space available, both in the house and garden.

G3WOH (Liverpool) told your scribe that he will be back on four metres soon and has already a small amount of SSB going which it is intended to amplify. G4CMT (Humberside) is another 4m. enthusiast who operates on Sunday mornings from 0900-1100 local, both CW and SSB. GM3YOR complains that activity is even scarcer than on 2m. but lists the following stations known to have gear for Four: In *Fife*: GM's 31VZ, 30BC, 4AGS, 4AQO, 4BFQ, 4DOF and 4ECL. In *Perth*: 3TRI, 3YEW, 3YXJ, 4BVD, 4DQJ and 4DYZ. *Edinburgh/Borders*: 3BQA, 3JDX, 31NW, 3OWU, 4AOR, 4CXP, 4DTH. In *Aberdeen*: 3EOJ and 3ZBE, with 4DGT in *Alloa*. We hope that some of those listed will join in the Sunday morning activity sessions or at least let us know what modes they use and what gear. The equipment at GM3YOR consists of a commercial transverter driven by the FT-101B with a home built, 4-ele. Yagi, fixed south.

#### Two-Metre Repeaters

After first refusing to grant a licence for GB3RF at Burnley, as mentioned last month, the Home Office has now issued the licence for the North Western Repeater Group's baby on Hameldon Hill, in Rosendale Forest, having apparently been persuaded that the Pennines *really* are a barrier sufficiently effective for them to relax the 100-mile rule. GB3RF will be on R7. On R6, the Moely-Parc gear has also been licensed GB3MP's QTH locator is YN64a. It is hoped to have the Birmingham repeater on R5, GB3BM, going in beacon mode soon, whilst GB3CS on R6, GB3NC on R5 and GB3WW on R7 are expected to be licensed before long. The respective QTH locators are:—YP01e, XK56b and XL30a. The Mid-Lanark ARS advises of a Central Scotland Convention—FM Group Meeting on Sunday, March 14, 2 p.m. at Wrangholm Hall, Jerviston St., New Stevenston, Motherwell. In addition to much discussion about GB3CS, there will be trade stands, demonstrations and contests. Full gen from GM3KMG, phone *Hamilton* 28759. The UK FM Group (Southern) have meetings on the first Wednesday each month at 8.00 p.m. at Chineham House, Popley, Basingstoke, Hants. with 2m. talk-in on S20 or GB3SN. Full details from Janet Payne, 12 Meadow Way, Aldershot, GU12 4UU (*Aldershot* 26108).

#### Satellite News

On Wednesday, February 11, AMSAT arranged to make available to European amateurs both *Oscar VI* and *VII* to enable them to communicate to *Oscar VII* on 70 cm., through *Oscar VI* down to Earth again on 10m. This is possible due to the close proximity of the two satellites. Please send your reports on these experiments for the April issue. Orbit predictions for the coming week and up-to-date information can be obtained from G8CSI on the AMSAT net on 144.28 MHz from 1930 local time every Sunday evening. The station operates from New Malden in Surrey.

#### Final Miscellany

In our Scottish Notes last month, the recipient of the Courtney-Price Trophy was not identified. It was G. B. Burt, GM3OXX. Anyone needing a Salop QSO should listen for G8HAL/P from March 29 to April 2. John Nelson plans to operate from 1800 each evening from The Long Mynd, the highest point of which is 1695ft. a.s.l. in YM36c. Anyone wishing to fix up a sked on 2m. should write to:—13 Sulgrave Rd., London, W6 or phone John on 01-602 5855. SSB will be used.

Ann Buckby, presently G8KMB, reports passing the Morse test at the first attempt so should be a G4E-- by the time this appears. G8ECI was operating as GW8ECI/P from YL15e in Gwent during the December 27 lift when a Calor gas cylinder flashed back, starting a small fire which, amongst other things, destroyed the log. So, anyone needing a QSL from Gwent for a GW8ECI/P contact should send a card first, for a "by return" reply. GD2HDZ wrote whilst in the throes of moving but asks how can anyone work over 100 QTH squares in a year? Well, Arthur, you refer to the map of

Western Europe, whereas we use the IARU Region I map which is extended to Western Russia. There are probably at least 300 "land" squares and some of the top DX'er's have worked over 200. Oscar and repeater QSO's are excluded, by the way.

On the subject of our QTH Square Table, *no*, we do not want QSL type proof for your claims, any more than we do for your entries in the other tables. GC8AAZ has asked if we plan to issue any sort of certificate for working squares. No, we do not, because a Swedish group already does this. This month's listings are in order of two-metre squares and next month we will feature 70 cm., so send in your up-dated claims.

G3OSS has sent details of tests carried out on many well-known AM/FM radio receivers of the so-called hi-fi variety, to ascertain their proneness to RFI from amateur transmissions in the 2m. and 160m. bands. Whilst a few were quite good, many were rather poor. We understand the report will receive publicity in the appropriate press in the hope that manufacturers will try to improve the performance of their products with respect to RFI from amateur and other sources.

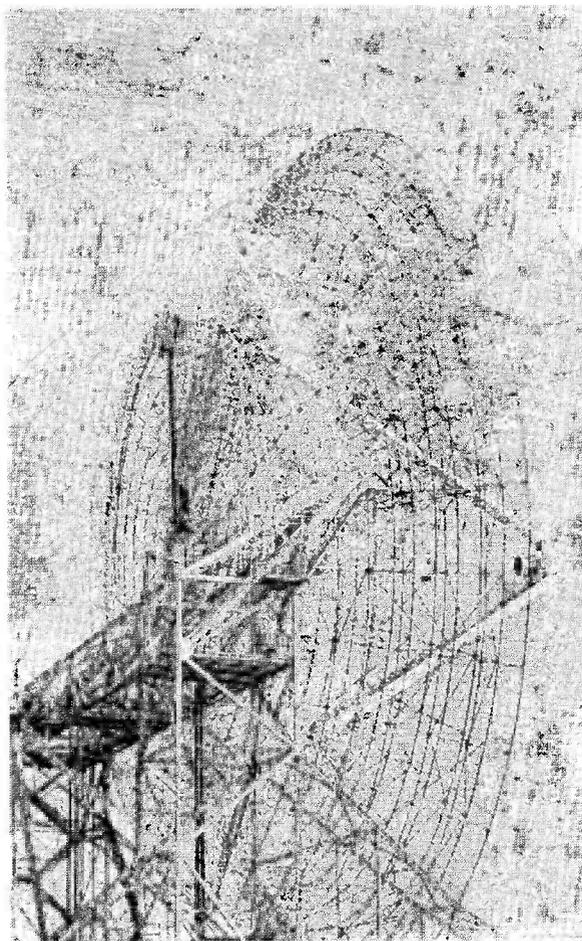
#### Deadline

That's it for another month. Your brickbats, bouquets, claims, comments and gen. for the April issue by March 8 to:—"VHF Bands" *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ. 73 de G3FPK.

#### TWENTY-THREE CENTIMETRE

##### ALL-TIME TABLE

Station	Counties	Countries	Total
G4BEL	38	10	48
G3NHE	24	5	29
G3JXN	25	4	29
G3DAH	23	4	27
G3JVL	21	4	25
G4ALN	20	5	25
G4BYV	17	8	25
G3OBD	20	3	23
G6NB	19	4	23
G3COJ	17	6	23
G8ARM	20	2	22
G5DF	13	1	14
G8FMK	12	1	13
G8AOD	11	2	13
G8AII	7	2	9
GD2HDZ	5	4	9
G8EOP	5	4	9
G8ABH	7	1	8
G8FJG	7	1	8
G8GNZ	4	2	6



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The set-up for the November E-M-E tests—discussed on p.37 in this issue—using the 150 ft. dish at Stanford University, Menlo Park, California (Above) at the key, signing WA6LET, is K6JYO (foreground), the others being, in sequence to his left: W6FO, K7CAD and WA6LCZ. The University has its own Radio Club. (Left) An impression of the giant radio dish at Stanford, which is steerable in azimuth and elevation. The SRI Amateur Radio Society had the use of this array for their E-M-E experiments last November.

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# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for April issue: March 8)

STILL the tale continues—Club after Club finding itself in problems, largely generated by inflation, or by loss of a cherished Hq. One would have thought Chiltern to be one of the stronger clubs, even though they are at the moment scratching around for a new place to meet; and yet one notices that for the AGM there are a couple of motions for debate—the first to wind up the Club completely, the second, which will only be reached if the first one is negated to hike up the subscriptions. Maybe a motion like this is necessary before Joe Average will get off his butt and argue for saving the group, or even for coming up to date with his subs!

## The Reports

Since we have just mentioned them we may as well start with Chiltern; and here all we can suggest is that you contact the Hon. Sec. of the moment, at the address in the box; he will be able to let you know the current situation, dates and venue.

Then there is Bishop Stortford, sitting secure in the knowledge that they have at least a couple of other places to fall back on should their present Hq. (The British Legion Club, Windhill) ever become unavailable. For the third Monday in March, G3XSE has promised to come along and give a talk; looking forward to April, we note that the "proper" date falls on the Bank Holiday and it will therefore be shifted a week.

At Ashford the Hq. address is given as "at the top of Hart Hill, at Charing,"—which sounds as though they have the loan of a tent! Seriously, it does sound rather as if their fine VHF QTH is a bit hard to locate, so we suggest a contact first with G3TIS, at the address in the Panel.

It looks like the first Thursday in the month for the Cheltenham group, at their Hq. in the Royal Clarence Hotel, Clarence Street, Cheltenham; we have no details of the event set out for this date, but no doubt that G3KII has something up his sleeve.

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On Wirral where the lads get together at the Sports Centre, Grange Road West, Birkenhead. For March 3 there is to be a talk on the latest developments at VHF, and on March 17 a Sale of Surplus Gear.

In the Sheffield area there is the Association of Sheffield Amateur Radio Clubs, to whom one can turn for all the information and a combined Newsletter—one wonders why more groups of clubs don't try something similar. For it we see that the Association's own meeting is on March 1, at Room 3106, Sheffield Polytechnic. Then there is the Sheffield Club itself, on the third Monday in every month at the Sheaf House Hotel, Bramall Lane; Worksp seem to be shifting from the North Notts. College of Further Education to the Anchor Inn, Eastgate, Worksp; while the University and Polytechnic Societies appear to have joined forced informally, as they both are to be found at the Phoenix, Charles Street, Sheffield 1; as this is a private Club, non-student visitors must be signed in, so a preliminary contact with the Secretary is advisable. And if anyone can't find a Club to suit him out of that bunch, he wants shooting!

At Grafton—one of the oldest Clubs in the London area—everything happens on Friday evenings, at Whittington School, Highgate Hill, London N.19. One notices how the Grafton T/B contest has grown since your scribe was a member twenty years ago—in 1975 there were GM, DA, and a couple of OK's in the placings, while most of the entries were from outside the immediate vicinity.

The second and fourth Thursday evenings are the ones to be noted in the diary by North Kent members and visitors; the venue being St. Mary's Institute, 2 North Cray Road, Bexley, and the time eight o'clock.

They seem to have had quite a change round among the officers and committee of the White Rose group, and this is reflected in the Secretaries Panel. It is of interest to note that there are now three fully licensed YL operators in the group—enough to run an all-YL DX-pedition and leave the OM's at home with the chores! They have

their place at 83 Town Street, Armley, Leeds 12.

Right down West now, to Cornish, where their last few newsletter issues with the article on a home-brew SSB transmitter Club project have been carefully filed away for this old scribe to have a dabble at. They are to be found at the SWEB Clubroom, Pool, Camborne, on March 4, for a talk on Slow Scan by G3LPB. Perhaps we should also look onwards a little and mention that the AGM occurs at the same venue on April 1st.

Now to the Royal Air Force, who have a Club catering for all those who are, or were, in the Service. And, we might remark, the Newsletter is invariably of interest, both technically and on the more social side. Details from the secretary—see Panel.

There is also an Amateur Radio Club group for the Royal Signals, with a very fat issue of Mercury this time, all of interest to anyone with a Service background; there are Associate and Affiliated memberships open to those who were not in fact in Royal Signals but have an appropriate background. Again details from G3DPS—see Panel.

Back up to Leeds again, where there is a group who call themselves the Star and get together at the New Inn Hotel, Bramley Town Street, Bramley, Leeds 13, on each Wednesday evening. The special treat for March is on the 31st, the "Chairman's Party Night"; an auction sale and free supper, with no admission charge whatever and all welcomed.

Shefford have a place at the Church Hall every Thursday; on March G8AKT will be doing the talk, the topic being as yet unannounced, followed by G2DPQ on the 18th about QRO Transmitters, the between-week being filled by some discussion of the NFD plans. On March 25, G4BWP and G4DRS will combine forces for their quiz.

The Silverthorn newsletter is called Spurious, which is not to suggest they all have "whiskers" on their signals! The Hq. address for this group is at Friday Hill House, Simmons Lane, Chingford, E.4, where they can be found every week.

For Hereford, things seem to have been getting steadily better over the years, which argues some good committee officials—and it is interesting also to note that these wise members re-elect their officers each year. The venue for the group is at County Control, Civil Defence Headquarters, Gaol Street, Hereford. For March the dates are March 5 and 19; with the addition, we understand, of a Social Evening on March 12.

On Nottingham now, in their Hq. at Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham, the kick-off being set for 7.30. March 4 is down for a Forum, and on the 11th there will be a display of gear by the firm of J. & A. Tweedy; this is followed by an activity night on the 18th, and the month finishes with a debate which should start a discussion going nicely—Home-brew or Commercial? Looking forward to the end of April, we must mention the AGM on April 29; nominations to be in the hands of the Secretary by April 1st.

The hour of "7.30 for 8.0" seems a favourite way of getting the ragchewing over before the formal proceedings start; the method is adopted, among others by Farnborough on the second and fourth Wednesdays at the Railway Enthusiasts' Club, Access Road, off Hawley Lane, Farnborough.

Cheshunt have a place at the Rosedale Sports Club, Andrews Lane, off Goffs Lane, Cheshunt, Herts, where visitors are quite welcome. On March 3 they have a knowledgeable guest speaker in G3COJ, talking about the Design of VHF Transceivers; 10 and 24 March are both down for informals with CW Practice, leaving us to account for the 17th, when G3WUX will be talking about Audio Instrumentation.

There are two clubs at Peterborough; the first one is called the Greater Peterborough group, with Hq. at Southfields School, Stanground, Peterborough, alongside the A.605, on the fourth Thursday.

The other Club in this area is the Peterborough Radio and Electronics Society, and is also a once-monthly business, this time on the third Friday each month; G3HXR has the stand in March to talk about Interference and Suppression. Incidentally the lads would like it known that they are the original Peterborough group and are in no way connected with the Greater Peterborough Club.

WAMRAC is a world-wide organisation of Methodists who are radio amateurs or SWL's; times are changing a little, though, as the group is now open to membership applications from any Christian radio amateurs.

Down West again, this time to Yeovil, for every Thursday evening at the Youth Centre, 31 The Park, plus R.A.E. and Morse on Sunday afternoons at Hq. Of the Thursday do's, the G2FKZ tape-talk on Radio Aurora is down for the 4th and G3MYM will talk on March 11 on Two-metre Propagation; he will also be in the hot seat on March 18, to talk about Experimental High-Gain Aerials for VHF.

The Scarborough Amateur Radio Society held its Annual dinner recently—here we see three of the officials: left to right, SWL Whitaker (publicity), G4EGB (chairman) and John Cutter, G3VAN (hon. secretary).



A change of date is notified by Spalding in April, from 2nd to 9th. To permit the slotting in of the annual dinner-dance; but before that there is a March meeting, at the Teachers Centre, Knight Street, Pinchbeck, where on March 5, G3MMS will be talking about Advanced D F Techniques.

Please Spread the Word! The cry goes up from the Secretary at Newport (and for the benefit of the other five Newports let us make it clear we are talking about Newport, Gwent) that he wants lots of new members—so, Roll Up, on any Monday evening at Brynglas House, Brynglas Road, Newport, Gwent. As to programme, we notice that on March 15, GW3RWX will be talking about Home Construction.

Another change is to be notified. This time it is Verulam where all members and prospectives or visitors should note that the main meeting is now on the third Thursday, not the third Wednesday as it has been for the past fifteen years; the venue will still be the Market Hall in St. Peter's Street, St. Albans. In addition, on the first Monday in each month there is an informal at the R.A.F. Association Club in Victoria Street, St. Albans.

The top floor at 119 Green Lane, is Derby's Hq. Here they have a regular Wednesday evening meeting, plus a fast-Morse session on Tuesdays and a slow-Morse class on Fridays, not to mention a local R.A.E. class with plenty of customers. Of the Wednesdays, March 3 is down for a Surplus Sale, and the 10th for Clive Burton to give a talk entitled "Radiophone." A Film Show takes up March 17, and the Annual General Meeting fills up March 24; this leaves March 31 for G8MW to talk about Stabilised Power Supplies.

Harrow have Practical Evenings on March 5 and 19, while on March 12 a talk is being arranged by G3PZK; that leaves March 26, which is down for a return visit from the Plessey people.

The same chap is scribe for both South Birmingham and Midland—keen type! Taking South Birmingham's affairs first, at Hampstead House, Fairfax Road, West Heath, March 3 sees G3JFL talking about his HF Linear, and April 7 is down for a Film Show. As for Midland, they are, oddly enough(!) at the Midland Institute in Margaret Street on March 16; but no programme had been settled at the time of writing.

Reigate are on the look out for a new Hq., thanks to a very heavy rise in the hire costs of their place at St. Marks Church Hall, Alma Road, Reigate; they will be there for the last time on March 16. The Natter Nite falls on March 2, at the Marquis of Granby, Hooley Lane, Redhill. In between there is the annual dinner-dance, at the Mill House, Salfords.

The arrangements at Torbay are also altered a bit; though they have not suffered a change of Hq., they have had to give up a room there, and therefore the R.A.E. work will be done on Tuesday evenings while the normal social activities will be enjoyed on Fridays. The Hq. is at Bath Lane (near of 94 Belgrave Road), Torquay.

Looking at the membership list of the QRP Club, we are pleased to see there are now no less than 178 members on the books, ranging from some of the oldest calls, through the G3-plus-threes to the very latest of the G4 and G8 fraternity and some SWL's; the notes by each name in the list indicate a remarkable range of interests and a resurgence of home-construction. One suspects that the quality of the Newsletter has much to do with this—always something of interest and your scribe has nearly all his issues carefully filed away for items to be referred to when the next bout of home-brewing hits us. Details from G3RJV, as Panel.

At Melton Mowbray the lads will be hearing all about the Nottingham Club's DX-pedition, by way of a lecture and slide show on March 19 at St. John Ambulance Hall, Asfordby Hill.

Sutton & Cheam seem now to be settled in to their new Hq. at Sutton College of Liberal Arts, where they will next be on March 16—details are not quoted. Meantime there is March 6, for the Annual Dinner and Ladies Festival of the group—tickets can be obtained from Bob Tillin, G3MES, who is QTHR. Incidentally, a "little bird" tells us the Ladies Price is really something!

One of the "meatiest" of the Club Newsletters to come our way is that from Edware this month. From it, we glean that their Hq. is at Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edware. On March 11, the subject will be Fibre Optics, by G8FOY, while on the 25th there will be a discussion and demonstration on Speech Processing.

West of Scotland notify a new Secretary—see Panel; and he advises that all enquiries as to the doings, the dates and the places as regards the group can be obtained from him.

Back down south, we come next to Acton, Brentford & Chiswick, where G3GEH advises their next date as March 16, for a group discussion on the *Dating RF Clippie*; this will be at 66 High Road, Chiswick, the Chiswick Trades and Social Club.

A letter from the Northampton Club Secretary says that their Hq. is "a bit of a brute to find" so he would like to give the visitor more detailed directions if they will but get in touch with him at the address in the Panel. The actual Hq. address, for the record, is the Spencer Dallington Community Centre, Tintern Avenue, which in turn is off Gladstone Road, Northampton. They are there every Thursday evening, the last meeting of each month being set aside for

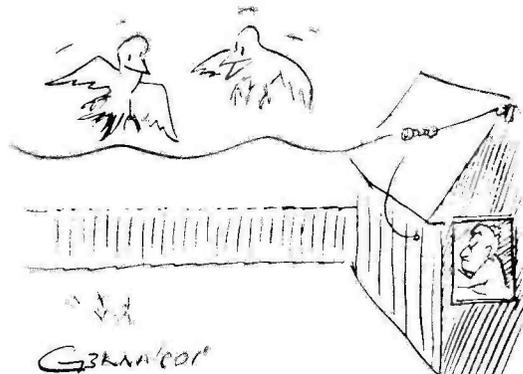


Members of the Newquay & District Amateur Radio Society, when out on VHF, signing G4ADV. Left to right are: G2BHW, G3NFI, G8IXN, G2DUP, G3XC, G8GOR, with G3YJX seated.

### 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.  
 ASHFORD: J. A. Clarke, G3TIS, 52 Grosvenor Road, Kennington, Ashford, Kent, TN24 9PA.  
 BISHOPS STORTFORD: C. Harlow, G8BTK, Thorn Cottage, Old Mead Lane, Henham, Elsenham, Bishops Stortford, Herts.  
 BURY: J. Clifford, G4BYE, 10 Arley Avenue, Bury Lancs.  
 CHELTENHAM: G. D. Lively, G3KIL, 26 Priors Road, Cheltenham (34785), Glos.  
 CHESHUNT: R. E. Chastell, 4 Fairley Way, Cheshunt, Herts.  
 CHILTERN: M. Connell, G8HDL, 38 White Close, High Wycombe (31374), Bucks., HP13 5NG.  
 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.  
 CRAY VALLEY: M. Tripp, G3YWO, 57 Cathcart Drive, Orpington (38199), Kent.  
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21931), DE3 7GE.  
 DLNSTABLE DOWNS: C. W. Stedman, G3XWS, 10 Wychwood Avenue, Luton (27789), Beds., LU2 7HL.  
 EDGWARE: P. D. Ling, G4BZY, 42 Greencourt Avenue, Edgware, Middx. (01-952 2495).  
 FARNBOROUGH: C. Beezley, G8KUY, 90 Giffard Drive, Cove, Farnborough, Hants., GU14 8QD.  
 GRAFTON: B. C. Bond, G3ZKE, 86 Agar Grove, Camden Town, London, NW1.  
 HARROW: L. Light, G3KDL, 22 Chippenham Avenue, Wembley, Middlesex. (01-902 2570).  
 HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford (3237).  
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<sup>10</sup> Eh, oop—he's switched  
on his linear . . .



a lecture. For March 25, we note they have an illustrated talk on Astronomy and Satellites by the Northampton Astronomical Society members.

Over to A.R.M.S. where, naturally, the accent is on the mobile radio amateur and his interests, world-wide. This is a good one to be a member of if you have any real interest in 'M working, particularly abroad. Details from the G3FPK at the address in the Panel.

It looks like every Wednesday for the Mid-Cheshire lads, at the Technical Activities Centre, rear of Verdin Comprehensive School, Grange Lane, Winsford. The junior members project takes up March 3, and a talk about repeater working and an access tone-generator takes up March 10. March 17 is given over to a talk on Transverters for Two, and there is a slide quiz (that's a new idea!) on the 24th.

A couple of dates are set aside for the Maidenhead chaps at the British Red Cross Hall, The Crescent, Maidenhead; these are Thursday, March 4, for a talk by Dave Grant on "BBC Outside Broadcast Equipment," and Tuesday, March 16 for the AGM. Oh, yes, light refreshments are provided, too.

The Surrey group have their 400th meeting up now, and the next thing is to look forward to the next 400! A good start will be made with the Surplus Sale—who'll take a bet that their 800th meeting will be within a few months of a Surplus Sale? More details from G3FWR as to the date; the venue is the Ship Inn, Croydon.

A change of name is noted next; Bury have dropped the "and Rossendale" bit of their title, though they still cover the same area and operate from the Mosses Community Centre, Cecil Street, Bury. On March 8, G8ENN, Dr. David Tong, will come along and talk about "Speech Processing," he of course being the developer of the well-known Datong Unit.

Yet another change of address to be noted; this time for Thames Valley, who will be at Gigg's Hill Green Library, Watts Road, Thames Ditton, Surrey on the first Tuesday in each month. This new venue is near the Milk Marketing Board, which provides a convenient reference.

Now to York where the officers were, it seems, re-elected more or less *en bloc* at the recent AGM, and simply told to get on with the entertainment—which, by the sound of it the locals are going to get in plenty. The group get together on each Friday (except the third) in each month, at the British Legion Club, 61 Micklegate, York.

The use of a standard form for advising us of meeting details more or less guarantees that all the information needed is given by the publicity chap at Southdown—a good idea which could well be taken up by others. The form tells us they have Hq. at the Victoria Hotel, Lamer Road, Eastbourne; on Monday March 1 they will have Mr. Houltham of the Post Office along to give a talk on Interference. Looking forward a little, they have a Junk Sale for April 5, which should bring in the troops.

Dunstable Downs still have their place at Chess House 77 High Street South, Dunstable, where they have been for years. For March the title on 5th is "QRM in the Club House"—crikey! March 12 sees a talk on the newer developments in the field of electronics, and the 19th is a "Bring a Friend Night." Finally, on March 26, an ex-Commando is going to talk about "Communications, 1939-1946."

Horndean next, down in deepest Hampshire; on March 11, at Merchiston Hall, Horndean, G4AMD will be talking and showing slides of his trip to Barbados. On a slightly different tack it is very interesting to notice that the Club net is running very successfully on 21.4 MHz—what a change from ten years ago, when no one would have dared put a whiff of RF out on Fifteen in TV hours!

We have an amusing newsletter from the Northern Heights chaps, which tells us that they are in session on Wednesdays at the Peat Pitts Inn, Ogden, Halifax. It also gives some details of the subjects of meetings ten years ago—but now for March 1976! However, we can, to be fair, say that in all the years we have been writing this piece, it has been only the proverbial "once in a blue moon" that there hasn't been something set up for the gathering to enjoy.

South Manchester have their usual busy time, with Friday evenings at Sale Moor Community Centre, Norris Road, Sale. On March 5, they will visit the Civil Aviation Authority, and on 12th, G8IPT will talk about Space Communications. Another visit is set up for March 19, to Madewel Products Ltd., who make Fire Alarms, and on March 26 the subject is TVI by S. Torkington. Looking forward a little, on April 2, we notice that they have nailed G4BJT VK6MW to talk to them about the enormous area which is known as VK6-land.

It looks like a Spring Surplus Sale for the Cray Valley gang in March, at Eltham United Reformed Church Hall, 1 Court Road, London S.E.9; it looks, from past events as though it will be the first Thursday in March, and the third—the former normally being a formal with a speaker, the latter the informal natter session.

#### J-O-T-A

Perhaps we should mention the report on the JOTA event for 1975. At least the bands did open to most parts of the world, which they did not the previous year, and so an estimated 8000 Scouts and Guides got a little feel for "how the other half lives" and at the same time a first (hopefully not last) taste of Amateur Radio.

#### Final

Which is where we pull the Big Switch for another month. For next time, all your April activities are for mention—just think, it'll be warmer then!—and your letter should be mailed to arrive here by first post on March 5, addressed as always to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, M15 1RQ.

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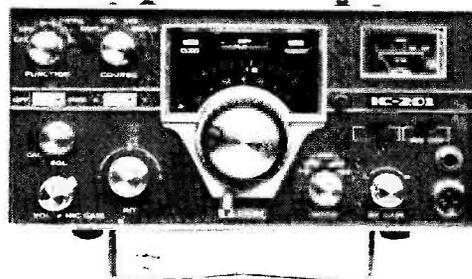
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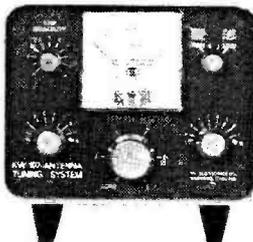


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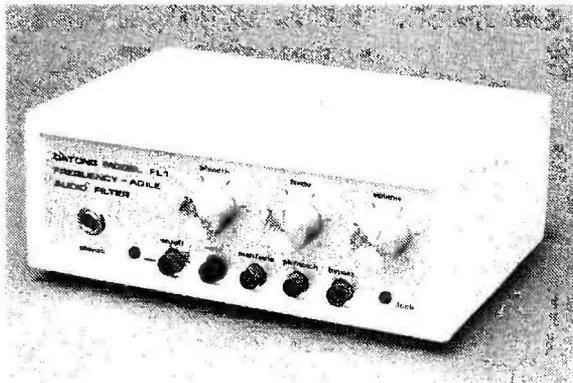
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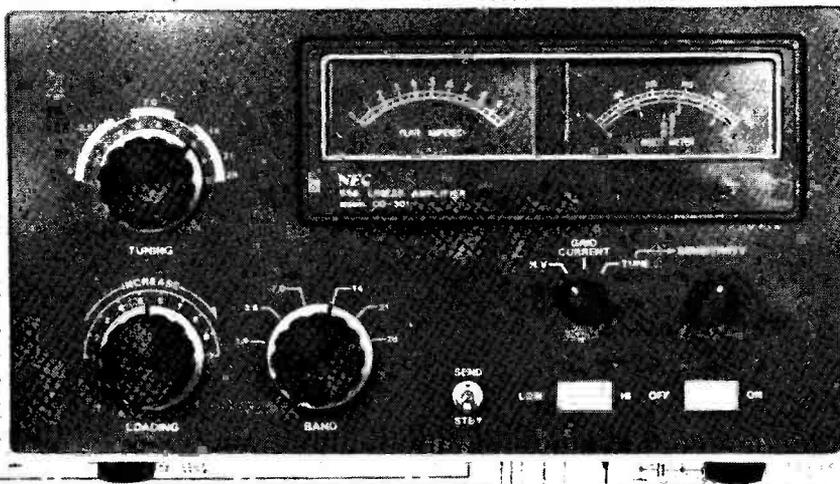
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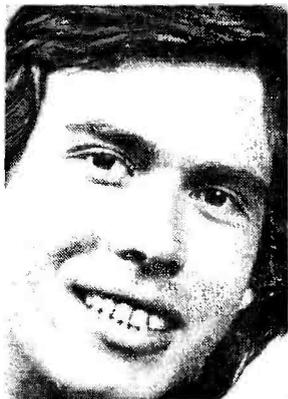
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# The Managing Director revealed all!

Sometimes I order my bits and pieces from Home Radio Components by post, but often I pop into their Mitcham shop and buy over the counter. Over the years I've got quite pally with their Managing Director (nice bloke he is too) and the other day we got chatting about the mechanics of producing their catalogue. I was amazed at the amount of work that has gone into it. In fact, you could say that it has taken 20 years to produce, because the present 240-page edition de luxe has gradually evolved from the duplicated effort they turned out in 1956.

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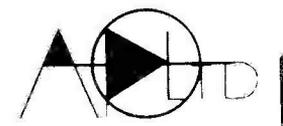
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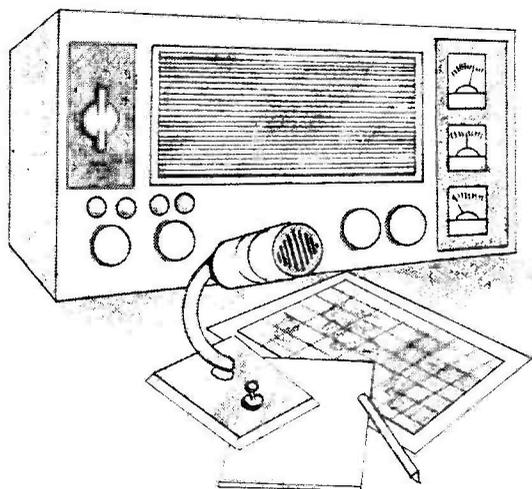
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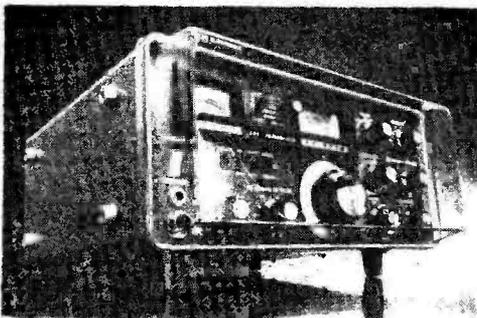
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4 0416	4 0423	4 0430	4 0437	4 0298	4 0305	4 0312	4 0319	4 0326
8 0833	8 0847	8 0861	8 0875	8 0597	8 0611	8 0625	8 0638	8 0652

RUI	SU20	SU22	GB3PY					
144-342	144-400	144-500	144-520	145-000	145-800	70-260	70-480	
433-025	433-200	433-500	433-550	431-350				

8-0189	8-0222	8-0277	8-0287	7-9879	8-0555	8-1000	8-7825	8-8100
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10-3603	10-3621	10-3639	10-3657	10-3728	10-3746	10-3764	10-3782	10-3800
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RUI	SU20	SU22	GB3PY					
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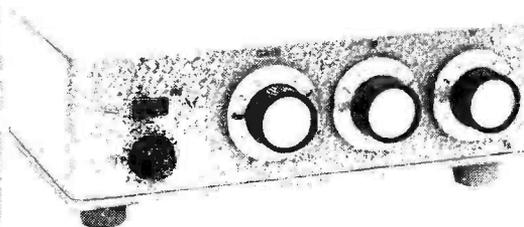
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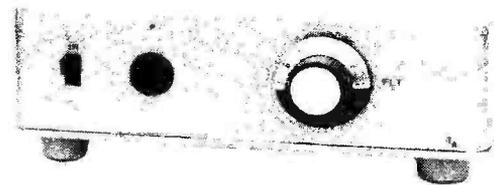
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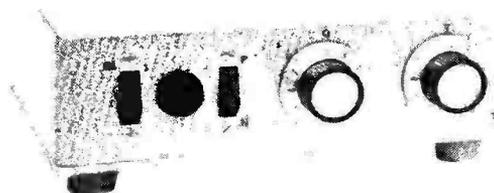
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Norwich, NR5 0BD, England.****April Issue: To appear Friday, March 26.** single copies at 45p post free will be despatched first-class mail on receipt from printers. Orders by Wednesday, March 24, with remittance to: Circulation Dept., Short Wave Magazine, Ltd., 29 High Street, Welwyn, Herts., AL6 9EE.**Selling:** Europa-B, with spare PA, 10-ele two-metre beam, 2m. Halo, £85. R.A.E. Course, £5. Complete HSC Morse Course, £2.50. Valves, ex-equipment, 250 for £3.50. Also assorted junk, such as pots, speakers, relays, variable capacitors, electrolytics, etc., etc., £2.50. Test meter, £1. T.W. two-metre converter, IF 28-30 MHz, 5-over-5 two-metre beam, £10. -- Calder, GM4ESW, 111 Muirside Avenue, Kirkintilloch, Glasgow, G66 3PP. (Tel: 041-776 5495).**Wanted:** Buy, borrow or hire for copying, manual for the AR88D. -- Palmer, 124 Woodside, Ashby-de-la-Zouch, Leicestershire, tel: 05304 3973.**For sale:** CR-100, £20, and Heathkit Mohican GC-1U, £25, general-coverage receivers. -- Collett, 48 Millington Road, Birmingham (021-747 7925).**Selling:** Home-built Linear, six-valve, for 20 metres, nice-looking job, powerful, output 1.5 kW p.e.p., £35, buyer to collect. Also UHF "Starphone" PMR mobile, OK for 70 cm. FM, as new, less mic, and xtals, £65 or near offer. -- Ring Hunter, 01-858 1448 (London) any time.**Wanted:** Receiver such as Hallicrafters SX-146, Drake 4A/B, Sommerkamp FR-100, KW-201, Hammarlund HQ-215, HQ-180A, or similar. Details and price, please. -- Snowden, Bungalow, Manor Farm, Amotherby, Malton, North Yorkshire.**For sale:** KW-2000B, with AC PSU, Shure 201 mic and SWR bridge, all excellent, £225 or near offer. Ring Lewis, Colne (Lancs.) 6622.**Breaking for spares:** HRO with bandspread coil packs, and manual, BC-348 with Q-5'er. Maxwell GW3UMD, 1 Nantfawr Crescent, Cardiff (751332), South Wales.**Selling:** Trio JR-310 Rx with matching speaker, 75 kHz marker, and manual, mint condition, £65. -- Ring Gaffney, Kidmore End 3562 (Berks.).**Wanted:** Two-metre FM transceiver. **For sale:** Pvc Tx/Rx "Pocketfones", crystallised for 433.2 MHz, complete, £30 pair. Compact "Pocketfone", with 433.2 xtals, £38. Pair H.B. Bantams, AM, with Ni-Cads, spare Ni-Cads, handbook and charger, £75. All "or near offer". -- Brownles, 36 Bowness Avenue, Battle Hill, Wallsend, Tyne & Wear. (Tel: 0632 622848).**Wanted:** B.40D communications receiver in clean and working condition. Details and price, please. -- Ellis, 37 Woodstand Road, Hassocks, Sussex.**Mobile:** Transceiver, Type 88 AFV, 12-volt, with aerials, headset and PSU, as new, £33 a pair. -- Colclough, ring Lingfield (Surrey) 832383.**Selling:** Trio 9R-59DS, perfect, with plinth, stabiliser, headphones and speaker, £45. **Transformer:** English Electric, oil-filled type, outputs 6.3v, 5 amp., 6.3v, one amp, 450-0-450v, at 320 mA, unused. -- Ring Smith, Guildford 65951, extn. 26, 9.0 a.m. to 6.0 p.m., week-days.

**Sale:** 18V 10-80m, vertical, new and never used, £12. — Ring Stewart, Slough 30477, extn. 47, day-time.

**Wanted:** K.W. Vanguard Series II (Viceroy-style cabinet), coverage 10-160m., preferably factory-built, must be in good working order and clean condition. Also an Eddystone slow-motion dial Type 598. Details and price, please. — Lawler, G4CMD, QTHR, or ring 01-500 5107 (Hainault, Essex) after 7.0 p.m.

**For sale:** Professionally built HW-12A 80m. transceiver, checked by Heath, few hours' use only, in mint and as-new condition, no PSU, £70. Eddystone 888 receiver, amateur bands only, with S-meter, no mods, since new, £50. Labgear LG.300 10-80m. CW Tx, with spare 813 PA, loafs along at 150w, on CW, no PSU, £35. A Collector's Item: Early receiver, with five bright emitter valves, Ediswan AR-type, in wooden case, with small "bullhorn" speaker, any offers? Mazda Type 30B1 scope tube PI, should be OK for flying-spot scanner. Several used Woden iron-core items available, e.g., UM3, HV and LT transformers and chokes; send s.a.e. for list. — Beaven, G3GBL, 85 Caxton Road, Hoddesdon (t2309), Herts.

**Sale:** Yaesu FR-50B receiver, covers 10 to 80m., with crystal calibrator and speaker, mint condition, £85 or near offer. Also Trio 959-RDS communications receiver, with stabiliser and speaker, in mint condition, £55 or near offer. — Ring Ledger, Chestfield (Kent) 3250.

**Selling:** Pye "Cambridge" model 10D, dash mounting, with varicap tuning, £35. Sentinel Mosfet converter, IF 4-6 MHz, £8. Microwave Modules 5w. Tx, with xtals for 145-145.5 MHz, £30. — Ring Dalley, 021-373 2985 (Birmingham).

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**For sale:** Liner-2, mint, six months old, good home-built regulated power supply, with pre-amp, and accessories, price £145, or near offer. — Grieve, GM4ATI, QTHR.

**Wanted:** Nova-Pal transistor Rx, with long, medium and marine band coverage. — Hare, G3PLB, 18 Vance Hill Drive, Basildon, Essex. (Tel: 0268 24453).

**Eddystone 730.6:** Reward for any information as to what "P.U. socket" on rear chassis-drop and "low-impedance IF output" are for? P.U. ties into AVC and NI diodes. No indication in my manual. Would welcome loan of relevant manual, or portion of same, with promise of immediate return. Would also be glad of hints for mods. to up-date this receiver. — Graepel, Kinsale, Co. Cork, Eire.

**Sale:** Heathkit GR-78 receiver, coverage 200 kHz to 30 MHz; built and aligned for "Practical Wireless" review July 1975. Kit costs £125, so offers please. — Ring Dowdeswell, G4AR, Ashstead (Surrey) 72515 evenings, or 01-634 4294 office hours.

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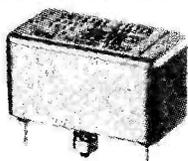
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