

The

# SHORT WAVE

Magazine

50p

VOL. XXXIX

JUNE 1981

NUMBER 4

**LE LOWE ELECTRONICS**

**NEW**



## **SRX 30D** a familiar name but a whole new receiver.

A familiar name, but a whole new receiver behind it. Building on all the excellent features of the SRX-30, including the drift cancelling system covering 500 KHz to 30 MHz; the selectable sidebands and AM; the easy to use tuning system; we now introduce the all new SRX30D which incorporates the suggestions made by our customers. Outstanding new features are:—

- Extended coverage 200 KHz - 30 MHz.
- Digital readout in large green display units which give true unambiguous frequency information — even when you switch sidebands or use the clarifier.
- All new frequency synthesis using Plessey SL 1600 series ICs for a new high standard of performance.
- All new audio system which produces outstandingly good quality on the built in speaker, and is capable of driving external hi fi speaker units for even better sound.

- All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.

There is so much that is impressive about the SRX30D that you have to see it and handle it to really appreciate the performance.

We predict that the SRX30D will be a landmark in low cost, high performance SWL receivers. Just consider how much you should pay for a receiver covering 200 KHz - 30 MHz with accurate digital readout; high performance USB/LSB/AM with switched filters; drift cancelling frequency synthesis; built in mains supply and built in speaker; high quality construction and advanced design — and so much more.

Then look at our price for the SRX30D and you will be even more impressed.

**£195.00 inc VAT, Securicor carriage £4.50.**

**LOWE ELECTRONICS Ltd.**

CHESTERFIELD ROAD, M4TLOCK, DERBYSHIRE DE4 5LE.

TEL. 0629 2817/2430



# TRIO

*pacesetter in amateur radio*

## TR9500

*70 cm FM, SSB and CW multimode mobile*

The TR9500, a 70cm multimode mobile giving SSB, FM and CW operation in a compact rig based on the phenomenally successful 2 metre 9000. Combining the convenience of FM with the "DX ability" of SSB on the 70cm band this is the rig all discerning VHF and UHF amateurs have been waiting for. Used alongside your existing 2 metre equipment a new spectrum of contacts becomes available. Repeaters, satellite working simplex and with the addition of your 2 metre rig Duplex communications are at your finger tips. Of course the matching accessories SP120 speaker, BO-9 system base and PS20 power supply are all available to enable you to build a base station system second to none.

The TR9500 features:

- FM, USB, LSB and CW.
- Similar in size to the TR9000.
- Two digital VFOs.
- Multiple scan facilities for various modes.
- 6 memories, 5 for simplex or repeater shift — and the sixth memory for a non-standard offset.
- Digital frequency display.
- Covers 430 to 440 MHz.



- Up/down microphone for manual band scan.
- RIT (Receiver Incremental Tuning) for SSB and CW.
- RF gain control.
- Mobile mounting bracket.
- Led indicators for on air and busy.

#### Optional Accessories

- PS20 fixed station power supply.
- SP120 fixed station external speaker.
- BO9 system base — with power switch, send/receive switch, memory back-up power supply and headphone jack.

## TS530S

*building on proven success*

The all new TS530S is firmly based on the reputation of the TS520 series and incorporates many of the features of the superb TS830S. Included are the three new bands and, of course, the rig has both digital and analogue frequency readout. Also available for the TS530 is a complete range of matching station accessories, the SP230 speaker, the VFO240 and, of course, the AT230 antenna tuning unit.

TS530S features:

- Single conversion receiver and transmitter using 8.83 MHz. I.F.
- LSB, USB and CW on 160-10 metres including the new 10, 18 and 24 MHz. bands.
- Built in digital display with 6 digits and also analogue dial.
- IF shift (passband tuning).
- RIT (Receiver Incremental Tuning) and XIT (Transmitter Incremental Tuning).
- Built in speech processor.
- Narrow and wide filter switching.
- Noise blanker threshold level control.
- Also retained are the rugged reliable 6146B PA valves and the easy to use controls.



#### Optional Accessories

- SP230 external speaker with selectable audio filters.
- VFO 240 external matching VFO.
- AT230 antenna tuner/SWR and power meter/antenna switch, 160 to 10 metres including the 3 new bands.

Have your thought about selling or trading in your QSL cards?

Not so daft as it seems, since our collectomaniac Director — John Wilson — is willing to buy or trade in QSL cards. They must be postally used, in other words have stamps on, and been sent to you from abroad. Particular interests are cards from former African colonies and places like Ascension, St. Helena, and so on.

If you are interested, why not contact John Wilson at Matlock; it's an easy way to turn waste paper into money.

## A DATE FOR YOUR DIARY AUGUST 15th

### LOWE ELECTRONICS' OPEN DAY

On Saturday, the 15th of August, here at Matlock, we are having our first Open Day. All the staff will be in attendance, including the back room boys and girls. You will have the opportunity to meet them and find out how we tick. Guided tours by G3PCY and G8GIY.

**JRC** *Japan Radio Co., Ltd.*

# NRD-515



## receiving for the discerning few.

The NRD 515 is a PLL-synthesised communications receiver of the highest class featuring advanced radio technology combined with the latest digital techniques. The new NRD 515 is full of performance advantages including general coverage, all modes of operation, PLL digital VFO for digital tuning, 24-channel frequency memory (option) direct mixing, pass-band tuning, etc. JRC's 65 years of radio communications experience will give you "the world at your fingertips". The NRD 515 is but a single item from the JRC product range which extends all the way to full marine radio installations for supertankers.

NRD 515 HF Receiver £948.75 inc. VAT  
 NHD 515 Multi Channel Memory £167.00 inc. VAT  
 NVA 515 Loudspeaker Unit £27.00 inc. VAT  
 CFL 260 600Hz CW Filter £34.50 inc. VAT

soon available **NSD515**  
 matching amateur band transmitter  
 ring for details.

 **TRIO**

*pacesetter in amateur radio*



TRio 8400 the new way to 70cm FM module, a fully synthesized 430 440 MHz 10 watt output, mobile transceiver with memories, 2 separate VFO's all in a truly amazing compact package. Complete with up/down frequency shift microphone and car mounting bracket, the TR8400 is the way to go... 70cm is on the move.

**TR8400** 70 cm. FM mobile.

£279 inc. VAT. Securicor carriage £4.50.



TR-9000 The exciting TR-9000 2-metre all-mode transceiver combining the convenience of FM with long distance SSB and CW in a very compact, very affordable package. Because of its compactness the TR-9000 is ideal for mobile installation; add on its fixed station accessories and it becomes the obvious choice for your shack.

**TR9000** 2 metre multimode.

£345 inc. VAT. Securicor carriage £4.50.



TR-7800 Trio's remarkable TR-7800 2-metre FM mobile transceiver provides all the features you could desire for maximum operating enjoyment. Frequency selection is easier than ever, and the rig incorporates new memory developments for repeater shift, priority, and scan. The TR-7800 by Trio, the only FM mobile.

**TR7800** 2 metre mobile FM rig.

£268 inc. VAT. Securicor carriage £4.50.

### HEAD OFFICE AND SERVICE CENTRE

Chesterfield Road, Matlock, Derbys. Tel. 0629 2817 or 2430.

Open Tuesday-Friday 9-5.30, Saturday 9-5.00. Closed for lunch 12.30-1.30.

For all that's best in ham radio, contact us at Matlock.

For full catalogues send 48p in stamps with your address. Mark enquiry SWM.

**LE**

# STEPHENS-JAMES LTD.

47 WARRINGTON ROAD, LEIGH, LANCs. WN7 3EA **G3MCN**  
 Telephone (0942) 676790



£258.75

### BEARCAT 220 FB

Specifications:  
 Frequency range:  
 Low Band Mobile..... 66 - 88MHz  
 Aircraft..... 118 - 136MHz  
 Amateur Band..... 144 - 148MHz  
 Public Service & Marine..... 148 - 174MHz  
 UHF Amateur..... 420 - 450MHz  
 UHF Band..... 450 - 470MHz  
 UHF Band..... 470 - 512MHz



### TR9000

The TR9000 is a compact lightweight 2 mtr. FM USB/LSB/CW Transceiver with an outstanding array of functions. FM1 for 25 KHz steps (for mobile use) FM2 for precise 100 Hz steps (for base station use). Microcomputer control giving many advanced features. Built in 5-channel memory. New type microphone with UP/DOWN switching. Built in high performance. N. Blanker. Side tone for CW.  
**ALL THIS PLUS MUCH MORE FOR £346.00 inc. VAT.**



### J.R.C. NRD515D

General coverage receiver 100 KHz to 30 MHz fully synthesised. Digital readout PLL synthesiser with rotary type encoder pass band tuning - modular construction. £949.00

ACCESS & BARCLAYCARD facilities. *Instant HP service Licensed Credit Broker - quotations upon request.*

Try our new "Overnite" service for £5.00. Guaranteed 24 hour service if order placed before 11 a.m. (except North GM).

Part exchange always welcome. Spot cash paid for good clean equipment. If you have equipment surplus to your requirement we would be pleased to sell this on commission for you.

Shop Hours: 9.30 to 5.30 Monday to Friday.  
 4.30 p.m. Saturday.

No parking problems. Turn at the Greyhound Motel on the A580 (East Lancs.) Road. S.A.E. with all enquiries. 25p will bring you latest information and prices. Postage carriage extra.

ALL OUR PRICES INCLUDE VAT  
 SEND S.A.E. FOR OUR UP-TO-DATE SECONDHAND LIST.



### TR2300

TR2300 2m Synthesised Portable Transceiver. We have lost count of the number of this model we have sold over the last 12 months. Hikers, campers, climbers, you can hear them all over the country and reliability which is the essence of TRIO equipment. £166.75

### JAYBEAM

5Y/2m 5 element yagi.....	£11.27
8Y/1m element yagi.....	£14.49
10Y/2m 10element.....	£31.05
PBM/14/2m. 14 element Parabeam.....	£44.80
5XY/2m. 5element crossed yagi.....	£22.77
8XY/2m. 8element crossed yagi.....	£28.40
10XY/2m. 10element crossed yagi.....	£37.72
Q4/2m. 4element Quad.....	£23.69
Q6/2m. element Quad.....	£31.39
D5/2m. 5 over 5 slot fed yagi.....	£20.12
D8/2m. 8 over 8 slot fed yagi.....	£27.40
UGP/2m. ground plane.....	£10.12
MBM48/70cms. Multibeam.....	£28.75
MBM68/70cms. Multibeam.....	£39.33
TAS 1/2" 2m. Whip mobile.....	£15.29
C5m. Colinear.....	£44.27
C8/70cm. Colinear.....	£50.00
D15/1296 23cm. Antenna.....	£34.04

Carriage on Antennas £3.00.

TRIO		
R820 Receiver.....	£690.00	
SP820 Speaker.....	£37.95	
SM220 Monitorscope.....	£197.80	
TL922 Linear Amplifier.....	£595.00	
PS-20 AC power supply for TS 120V.....	£44.85	
MB 100 Mobile mounting bracket.....	£17.25	
R1000 Receiver.....	£298.00	
TR2300 2m. Portable Transceiver.....	£166.75	
TR2400 Hand Held 2m. Transceiver.....	£198.00	
TL 120 Linear Amplifier.....	£128.80	
HS5 Headphones.....	£21.85	
HS4 Headphones.....	£10.35	
MC50 Desk Microphones.....	£24.15	
MC30S Hand Microphone 50K.....	£13.80	
TS 130V HF Transceiver.....	£404.34	
TS 130S HF Transceiver.....	£491.05	
AT 130 Antenna Tuner.....	£72.89	
PS 30 Power Supply.....	£85.10	
SP 100 Speaker.....	£26.45	
AT230 Antenna Tuner.....	£106.72	
SP230 Speaker.....	£33.14	
SP40 Mobile Speaker Unit.....	£26.89	



### R820 RECEIVER

THE ULTIMATE IN RECEIVERS

Frequency coverage 160-10m plus SW Broadcast Bands. All modes CW-USB-LSB-RTTY. Digital Readout. Noise Blanker. Fully variable. I.F. Bandwidth, plus Bandpass tuning, plus rejection notch filter. £690.00

### DRAKE

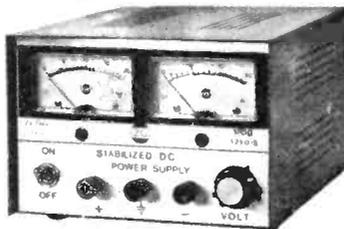
TR7 Digital Transceiver.....	£1,035.00
PS7 Power Supply.....	£207.00
RV7 Remote VFO.....	£138.00
MS7 Speaker.....	£29.90
R7 Digital Receiver.....	£989.00
Filters for TR7.....	£39.10
FA7 for TR7.....	£20.70
MN7 ATU/RF Meter 250Watts.....	£124.20
MN2700 ATU 2KW.....	£207.00
DL 300 Dummy Load 300Watts.....	£20.70
DL 1000 Dummy Load 1KW.....	£37.95
TV 3300 Low Pass Filter.....	£18.40
AK75, Doublet Antenna 132' top with 470 ohm Feeder.....	£23.00

AVAILABLE SHORTLY THE NEW TS530S  
 HF TRANSCEIVER AT £540.00



### TR7800

Continuing TRIO's policy of presenting the Radio Amateur with the finest equipment available, we were pleased to announce the NEW TR7800 2m FM Mobile Transceiver. 15 memory channels - Priority channels with simplex ±600 KHz or non-standard operation - "Priority alert" beeps when signal on M14 priority channel. Frequency coverage 144.00, 145.955 in switchable 5 KHz or 25 KHz steps. Front keyboard for selecting frequencies, programming memories and controlling scan function. ALL THIS and MORE for £268.50.



### MOD. 1210 S

SOLID STATE STABILISED POWER SUPPLIES  
 Maximum ratings quoted. Prices include postage.  
 Model 1505 4-15V 5amp Twin Meter..... £40.00  
 Model 1210S 4-20V 10amp Twin Meter..... £85.00  
 Model 1210 1 10 amp 13V..... £68.00  
 Model 1220 1 13.5V 20amp..... £90.00  
 Model 1220 2 13.5V amp..... £80.00



### TS830S HF SSB TRANSCEIVER AROUND £640 inc VAT

The new TS830S, the latest from TRIO. A high performance, very affordable HF SSB/CW transceiver with every conceivable operating feature built in for 160 through 10metres (including the new three bands). The TS830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift and an IF notch filter, as well as very sharp filters in the 455 KHz second IF. Together with the optional VFO230 (remote digital display VFO) which provides split frequency operation and 5 memories for frequency hold, the amateur has available today's advanced technology linked to the proven reliability and exceptional linearity of a valve PA.

- ★ VBT variable bandwidth tuning
- ★ IF notch filter
- ★ IF Shift
- ★ Various filter options
- ★ Built in digital display
- ★ 6146B final with RF negative feed-back
- ★ Optional Digital VFO for increased flexibility
- ★ Intrinsic PLL system of frequency generation
- ★ RF speech processor
- ★ Adjustable noise blanker level
- ★ Adjustable audio tone
- ★ RF attenuator
- ★ RIT/XIT
- ★ SSB monitor circuit
- ★ Expanded frequency coverage



### TRIO R100Q

R1000 Receiver £285.20  
 The latest general coverage from Trio. Frequency coverage 200 KHz to 30 MHz in 30 bands. Using an advanced PLL system. Full digital readout. Three filters 12 KHz for AM - 6 KHz narrow AM and 2.7 KHz SSB. Also incorporates a noise blanker. Operation is from 100-240V AC or 12V DC.

#### RECEIVERS AND TRANSCEIVERS (Inc. VAT and Postage)

SR9 Tunable 144-146MHz Receiver.....	£46.00
AMR217B Scanner Receiver, AC or DC operation.....	£113.50
R512 Aircraft Band Scanning Receiver.....	£135.00
Regency Digital Flight Scan Synthesised Aircraft Band Receiver.....	£215.00
Yaesu FRG7 Receiver.....	£199.00
'Sky ACE' Hand Held Aircraft Band Receiver.....	£49.50
SX200 Scanning Receiver.....	£237.00
FDK 700EX FM Transceiver.....	£199.00
FDK 750E All Mode Transceiver.....	£299.00
'Arganout!' Solid State Transceiver.....	£276.00
Bearcat 220 Scanning Receiver.....	£258.75
AR22 2m Hand Hold Receiver.....	£83.00

# DATONG

## QUALITY PRODUCTS ~ REALISTIC PRICES!

### A HIGH CLASS GENERAL COVERAGE RECEIVER FOR £120.75?

No, we don't make such a receiver, but we do make a converter for your 2-metre all-mode rig which will turn it into just that (Model PC1). You will then be able to hear all the action on the HF bands plus everything else from 60 kHz to 30 MHz (including 27 MHz!). This approach to a general coverage receiver is ideal for GB's who want to hear what they are missing. It also represents excellent value for money. After all why waste the expensive features built into your 2-metre all-mode rig on one band only when just by adding our converter it can be the basis for a really high class receiving system? By high class receiver we mean one with the kind of top-notch selectivity, sensitivity and high dynamic range that you are used to getting with good quality amateur bands equipment. After that anything less will be a disappointment - and less is what you will get if you move down to low price general coverage receivers. Model PC1 sounds simple. It converts incoming signals in 1 MHz segments from 0 to 30 MHz up to the band 144-145 MHz so they can be received on a 2-metre rig (or even a VHF scanner!). For example to receive on 6.350 MHz you simply set the main receiver to 144.350 MHz with Model PC1 set to '06 MHz'.

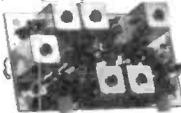


Model PC1

The trick is in doing the conversion in such a way that the noise threshold and overload levels of the main receiver are not spoiled and so that spurious responses to unwanted signals are minimised. Instead of the obvious Schottky mixer we use a specially developed high level parametric mixer. This comes with a -10 dbm intercept point with extremely low noise plus gain instead of loss. Instead of a broadband input we use a bank of six bandpass filters automatically selected by diode switches working at high current. A frequency synthesiser based on CMOS LSI generates all thirty local oscillator frequencies with excellent sideband noise levels. Throughout the design we worked hard to ensure that our converter is always better than your 2-metre rig. Only then can you be sure that you will get the same performance right from 60 kHz to 30 MHz as you get on the 2-metre band. If you already own a 2-metre all-mode transceiver, Model PC1 offers an unbeatable cost-effective route to high performance general coverage reception. It will also add 60 kHz to 30 MHz coverage to VHF scanning receivers, in effect turning them into short wave scanners as well!

### THE SAME FOR 28-29 MHz RECEIVERS

By adding our high performance 2-metre down-converter, Model DC144/28, between Model PC1 and your 28-29 MHz receiver you extend its total coverage in exactly the same way as described above. Simply tune 28-29 MHz on the main receiver and select any 1 MHz band from 0 to 30 MHz on Model PC1. Model DC144/28 also makes a fine 2 metre converter. It features a high intercept point thanks to its balanced Schottky diode mixer. Converters compare our products with the competition you will see that really there is virtually no competition at our chosen standard performance. What other audio filter can tune into heterodyne interference like tune-up whistles and notch them out automatically like our model FL1? Yet Model FL1 is also such a good CW filter that it is used by professional traffic handlers as well as thousands of amateurs.



Model DC144/28

using dual gate MOSFET S as mixer have insufficient dynamic range to match the superlative performance of Model PC1. But although we designed Model DC144/28 primarily for use with PC1 this same high dynamic range can be a great help for serious 2-metre DX work.

### A QUART IN A PINT POT!

Big is beautiful - sums up the traditional attitude to antennas, and indeed still applies to transmitting antennas. But for reception only the Datong line of Active Antennas has turned this conventional wisdom upside down. Now small is beautiful. What other antenna has an overall length of only 2 metres and yet behaves like a full size dipole from 30 kHz to 200 kHz? With the Datong Active Antennas you can even have a vertical dipole for top band - try that with a normal dipole! Put your finger on the gate of a FET wideband amplifier connected to a receiver and you can test the principle. The FET matches the high impedance antenna element (you) to the low impedance receiver (it). But and it's a big one - you will hear lots of stations which are not really there. These are generated by non-linearities in the amplifiers. The challenge with active antennas is to build an amplifier which continues extremely high linearity with high input impedance, low noise and high dynamic range. This in itself is no easy task but Datong do even more - we include differential inputs so that we can use a balanced dipole configuration. Compared with single whip systems balanced dipoles pick up less local interference and do not need a ground plane. Full details are given on our AD270/AD370 data sheet but briefly these antennas are ideal for general coverage DX reception. They give equivalent signal-to-noise ratios to much larger conventional antennas, but are only 2 metres long. (Indoor version is 3 metres overall). They also have a flat response from 200 kHz to well over 30 MHz. No external antenna tuner is required. Model AD270 is for indoor use while Model AD370 is engineered for outdoor use. The circuits are identical. Remember like in the FET example above, it's easy to make a lively active antenna. But if you want one that doesn't fill the bands with phantom signals there is no substitute for the careful and thorough design which is our speciality. If you have acres of ground then go ahead and erect large conventional receiving antennas and use tuner units and attenuators to stop your receiver overloading. If on the other hand you want similar results unobtrusively and without the hassle our active antennas are unbeatable.



Model AD370

### WHAT IS AN AUDIO FILTER?

Why buy a Datong audio filter when you can get other audio filters at lower prices? To answer this you first need to remember that the title 'audio filter' can mean anything, even down to a couple of 741's and a handful of parts. Only by comparing like with like can you make an informed decision. This means comparing features, performance and quality. If you send for our free data sheets and compare our products with the competition you will see that really there is virtually no competition at our chosen standard performance. What other audio filter can tune into heterodyne interference like tune-up whistles and notch them out automatically like our model FL1? Yet Model FL1 is also such a good CW filter that it is used by professional traffic handlers as well as thousands of amateurs. What other audio filter has passband edges sharper than SSB crystal filters and yet which can be tuned at will from 200 to 3500 Hz? To pull off this trick our Model FL2 uses no less than 32 op amps plus state-of-the-art pulse width modulation techniques. Two 5-pole elliptic filters and a 2-pole peak or notch filter in one box add up to a lot more filtering capability for SSB, RTTY, CW than you will find in any other 'audio filter' that we know of. To answer our question then an 'audio filter' can be almost anything. On the other hand, the phrase 'Datong Audio Filter' stands for state-of-the-art filtering backed by extra capability, extra thorough design and extra quality. If you need confirmation ask a user.



Model FL1



Model FL2

a lot more filtering capability for SSB, RTTY, CW than you will find in any other 'audio filter' that we know of. To answer our question then an 'audio filter' can be almost anything. On the other hand, the phrase 'Datong Audio Filter' stands for state-of-the-art filtering backed by extra capability, extra thorough design and extra quality. If you need confirmation ask a user.

### MODEL ASP: THE "INTELLIGENT" RF CLIPPER

Model ASP modifies your speech signal direct from the microphone and makes it more effective at modulating your transmitter. The effect is as if the transmitter peak power were to increase by between two and three times. Unlike other speech processors Model ASP automatically senses your voice level and reacts accordingly to always maintain the degree of true if clipping selected (in decibels) by the panel push-buttons. Novel circuitry avoids 'hang-ups' by discriminating against noise spikes and non-speech inputs. We use the same principle of clipping in two other units, Models D75 and RFC/M. Both of these need manual adjustment of the input level to control the amount of clipping, but otherwise give the same benefits. The technique has been proven by thousands of satisfied users of 'Datong Clippers'. If in doubt why not ask one?

Model FL2

Model PC1

Model ASP



### MODEL D70: THE GO-ANYWHERE MORSE CODE TRAINER

Since its introduction in 1979 the success of our Morse Tutor has surprised even us. Its effectiveness at speeding people through the Morse examination is legendary and we are constantly being told success stories by satisfied users. (The unconfirmed record so far seems to be three weeks to pass the exam starting from scratch!) Generating 60 hours of random Morse code from a low cost 9 volt battery, Model D70 gives you freedom to practice anywhere to suit your timetable and lifestyle. You learn the code with the characters at normal speed but with an extra delay between each one. As you improve you reduce the DELAY control until, with it fully reduced, you find you are reading code at the chosen speed and with correct spacing. You then book your test!



Model D70

### VERY LOW FREQUENCY CONVERTER MODEL VLF

If your communications receiver gives poor results below 500 kHz Model VLF is the answer. It also adds MW and LW coverage to amateur bands - only receivers for news, time checks etc. Connected in series with the antenna Model VLF allows you to tune the 0 to 500 kHz range (and above at reduced sensitivity) using the ten metre band (28-30 MHz) on your normal receiver.



Model VLF

### Products not shown in this advertisement

- Model Datest 1 Transistor Tester
- Model Datest 2 Transistor Tester
- R.F. Speech Processor Model D75
- Model RFC/M, R.F. Speech Processor PCB Module
- Model MPU, Mains Power Unit
- Accessory Leads

NEW PRODUCT

PREVIEW

### MORSE KEYBOARD MODEL MK

A keyboard operated Morse sender with a host of features to make CW sending a dream. The comprehensive character set includes procedure signals and there are four separate 64 character message memories with programmed pause capability. Plus a buffer memory for perfect sending despite imperfect typing. Memory contents are retained when switched off and four internal pen cells give an amazing 300 hours life. All you have to do is plug it into your keyjack.

DATONG ELECTRONICS LIMITED

## INGENIEURBÜRO ULRICH HANSEN

VHF & UHF PREAMPLIFIERS: A new range from Ulrich Hansen of West Germany

A range of high quality in-line preamplifiers for 2 metres or 70 cms, featuring ultra-low noise figures and state-of-the-art design. The range includes R.F. switching capability from 60 watts P.E.P. to 500 watts P.E.P. and choice of silicon low noise devices or the latest gallium arsenide MESFETs for the best possible noise figure. Indoor or mast mounted options are also included. Full details free on request. These units represent a cost-effective way of improving your DX receiving capability.

PRICES: All prices include delivery in U.K. basic prices in £ are shown with VAT-inclusive prices in brackets

FL1	59.00 (67.85)	D70	43.00 (49.45)	AD270 + MPU	37.00 (42.55)
FL2	78.00 (89.70)	D75	49.00 (56.35)	AD370 + MPU	49.00 (56.35)
PC1	105.00 (120.75)	RFC/M	23.00 (26.45)	MPU	6.00 (6.90)
ASP	69.00 (79.35)	AD270	33.00 (37.95)	DC144/28	31.00 (35.65)
VLF	22.00 (25.30)	AD370	45.00 (51.75)		

DATONG ELECTRONICS LIMITED

Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Tel: (0532) 552461



# South Midlands

SMC YOUR SINGLE STOP SOURCE

## FREE FINANCE

On regular priced items from: Yaesu, Ascot, SMCHS, CDE, HyGain, Channel Master, Hansen, SMC, MFJ, KLM, Mirage and Hi Mound; SMC offers free finance! (On invoices over £100). How is it done? Simple, pay 20% split the balance equally over 6 months or pay 50% down and split the balance over a year. You pay no more than the cash price!



GA AS FET RF  
**FT780R £409 inc.**

70cms, Synthesised. 100, 25, 1kHz steps FM. 1kHz, 100, 10kHz steps SSB. 10W PEP.



**FL2100Z £385**

10-160m, 9 bands Linear Amplifier. Pair 572B's 1.2KW PIP 400W (+ 3dB) PEP.

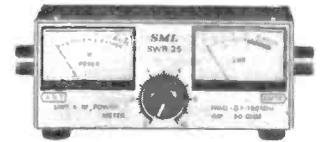


**SP4 £69 inc.**

RF speech processor. 12V but C/W mains PSU (SMC 12002) (p&p FOC).

## GUARANTEE

Yaesu's own warranty does not extend outside Japan. Repairs are the responsibility of the UK dealer selling the set. SMC's two year guarantee is backed, as UK distributors by daily contact with the factory and many tens of thousands of pounds of spares and test equipment. The wisdom of avoiding hawkers offering sets without serial numbers, without spares, service or advice back up must be apparent.



**T3-170L £11.85**

3-170MHz 50 ohms 1KW (3.5MHz 1:1). Relative power (p&p £0.80).



**FT7B £399 inc.**

80-10m, SSB, CW, AM. Audio filter for CW. 100W PEP 5 bands.



**FT/FP200 £335 inc.**

10-80m. SSB, CW, 180W PIP, C/W, FP200 AC PSU/speaker. 5 Bander.

## S.M.C. SERVICE

Free Finance on many items. Two year guarantee on Yaesu. Free Securicor delivery of major Yaesu items. Access and Barclaycard taken on the telephone. Biggest Branch, Agent and Dealer network. Ably staffed, courteous, service department. 'B Services' Securicor contract at £3.50!! Biggest stocks of amateur equipment in United Kingdom. Twenty-two years of professional communications experience. No item to small - no minimum orders.

## FT209R

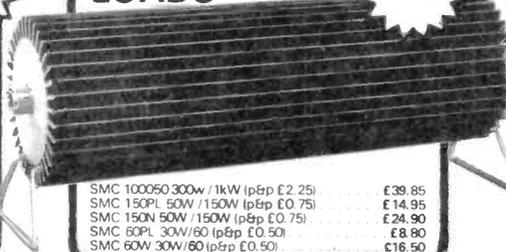
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Two metre multimode portable! 2½W output. LCD display. 58 x 150 x 190mm. Repeater split, Tone burst, memories (with backup) FM; 25 and 12½KHz (or 10KHz and 12.5KHz) steps. SSB 1KHz and 100Hz. Tuning from the microphone. A new dimension in handbags... and only... **£229.000.**

\* (70cms syntised handi FT708R £199!) E&OE

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SMC 100050 300w / 1kW (p&p £2.25)	£39.85
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SMC 60PL 30W/60 (p&p £0.50)	£8.80
SMC 60W 30W/60 (p&p £0.50)	£16.50

## P.S.U.s

NEW

- RU 120406 £15.00**  
4 Amps cont., 6 Amps surge @ 13.8volts. Regulated supply (p&p £1.50).
- RS 120810 £30.00.**  
8 Amps cont., 10/11 Amps surge at 13.8 volts. Full foldback etc. (p&p £1.50).
- SS 122535 £99.00.**  
25 A cont., 35 A surge @ 13.8. Foldback short circuit proof (p&p £2.00). £2.00).

FREE SECURICOR DELIVERY

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## FRG7

- ★ "Industry standard" receiver.
- ★ \*0.5-30MHz.
- ★ SSB (LSB/USB), CW, AM.
- ★ Selectivity of  $\pm 3$ kHz at  $-6$ dB.
- ★ Wadley-loop triple conversion.
- ★ 10kHz Direct dial readout.
- ★ Well calibrated "sharp" preselector.
- ★ AM Automatic noise suppression circuit.
- ★ Antenna Hi to 1.6MHz, 50ohm to 30MHz.
- ★ 3 position RF Antennuator.
- ★ 3 position AF Filter (LP, WBP, HBP).
- ★ 110-240Vac and 12Vdc.
- ★ Internal Battery holder option.
- ★ Illuminated edge type "S" meter.
- ★ Optional Battery holder £5.00.

**£ 199 INC.** VAT @ 15%  
& SECURICOR



## FT225RD

- ★ 144-148MHz inclusive Coverage.
- ★ Multimode USB-LSB-FM-AM-CW.
- ★ AC mains or 12V dc working.
- ★ Smooth Dual speed VFO.
- ★ Digital readout to 100Hz. Analogue 1kHz.
- ★ 22 Fix Channels (2 x 11) (2MHz).
- ★ Memory Option for split use.
- ★ "S"/centre zero/P output meter.
- ★ 20dB RF attenuator, Xtal cont tone burst.
- ★ FM power control, effective noiseblanker.
- ★ Switchable: AGC, lights/readout brightness.
- ★ Semi Break in CW with side tone.
- ★ Clarifier on Rx or Rx + Tx.
- ★ Clarifier works on VFO, xtal & mem.
- ★ ALC external phono socket.
- ★ Normal/Reverse/Auxiliary repeater shift
- ★ Relay make-break-common sockets.
- ★ Plug in board construction.
- ★ 11.8" D x 11.1" W x 4.8" H (case).
- ★ Weight 20lb (9kg).
- ★ LED's for; MEM, Burst, NB & Attn.
- ★ LED's for; RPT, CLAR, VFO, MEM, On Air.
- ★ 25W + PEP A3j, 25W + F3.

**£ 565 INC.** VAT @ 15%  
& SECURICOR

**NEW**  
VHF CONVERTERS  
ANTENNA TUNER  
LOW PASS FILTER



## FRG7700

- ★ Incredible new receiver.
- ★ 0.15-30MHz.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2.7kHz, 6kHz, 12kHz, 15kHz, @  $-6$ dB.
- ★ Up conversion 48MHz first IF.
- ★ 1kHz digital plus analogue display.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500ohm to 2MHz, 50ohm to 30MHz.
- ★ 20dB pad plus continuous antennuator.
- ★ Constantly variable tone control.
- ★ 110 and 240Vac and 12Vdc option.
- ★ 12 channel memory option.
- ★ Signal meter calibrated in "S" and SIMPO.
- ★ FRG7700M £389. Memory option £83.95.

**£ 309 INC.** VAT @ 15%  
& SECURICOR



## FT480R

- ★ 144-146MHz (143.5-148.5 MHz possible).
- ★ USB-LSB-CW-FM (A3j, A1, F3).
- ★ 30W PIP A3j, A1 and F3, 10W or 1W.
- ★ Bandpass filter no tune design.
- ★ Excellent rx dynamic range sensitivity.
- ★ Bandwidth 2.4kHz and 14kHz at  $-6$ dB.
- ★ Semi break in with side tone.
- ★ Very bright blue 100Hz digital display.
- ★ Display shows Tx and Rx freq (inc RIT).
- ★ String LED display for "S" and PO.
- ★ Digital receiver offset tuning.
- ★ Advanced effective noise blanker.
- ★ FM; 25 1/2, 1kHz steps.
- ★ SSB; 1,000, 100, 10Hz steps.
- ★ Any TX Rx split with dual VFO's.
- ★  $\pm 600$ kHz standard repeater split.
- ★ Four easy write-in memory channels.
- ★ Memory scanning with slot location display.
- ★ Up/down tuning/scanning from mic.
- ★ Priority channel on any memory slot.
- ★ Satellite mode allows tuning on Tx.
- ★ Scanning for busy or clear channels.
- ★ Size (Case): 8.3" D, 2.3" H, 6.9" W.

**£ 359 INC.** VAT @ 15%  
& SECURICOR



# South Midlands

## SMC FOR CHOICE IN HF EQUIPMENT



### FT 101ZDFM

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ 8 pole filters for razor edge selectivity.
- ★ Selectable CW fixed bandwidth CW-W and CW-N\*.
- ★ Semi-break in with sidetone for excellent CW.
- ★ Digital plus analogue frequency displays.
- ★ 6146B PA's with 6dB of negative feedback.
- ★ 180W PIP and — 31dB 3rd order intermod.
- ★ RF speech processor fitted — adjustable level.
- ★ VOX built-in and is adjustable from the front panel.
- ★ Wide dynamic range for big signal handling.
- ★ High usable sensitivity, for those weak ones.
- ★ Superb noise blanker — adjustable threshold.
- ★ Attenuator; 0-10-20dB, front panel switch.
- ★ AGC; slow-fast-off, front panel switchable.
- ★ Clarifier (RIT) switchable on TX, RX or both.
- ★ Low level transvertor drive output facility.
- ★ Universal power supply 110-234V AC and 12V DC\*.
- ★ Incredible range of matching accessories.
- ★ 4 Models; Digital/Analogue — AM/FM.

\*Option. **£ 599 inc.** VAT @ 15% & SECURICOR



### FT 902DM

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ Audio Peak and independent notch controls.
- ★ AM, FSK, USB, LSB, CW, FM, (TX and RX).
- ★ Semi-break in, inbuilt Curtis IC Keyer.
- ★ Digital plus analogue frequency displays.
- ★ 6146B's with negative feedback.
- ★ VOX built-in and adjustable.
- ★ Instant write in memory channel.
- ★ Tune up button (10 sec, of full power).
- ★ Curtis Keyer — lmbic, single or straight.
- ★ Switchable AGC and RF attenuator.
- ★ Optional 350 or 600 Hz CW, 6kHz, AM filters.
- ★ Clarifier (RIT) switchable on TX, RX or both.
- ★ Audio Peak and tunable notch filter.
- ★ Plug in modular, computer style constructor.
- ★ Fully adjustable RF Speech processor.
- ★ Ergonomically designed with necessary LEDs.
- ★ Incredible range of matching accessories.
- ★ Universal power supply 110-234V AC and 12V DC.

\*Option. **£ 799 inc.** VAT @ 15% & SECURICOR



### FT 107M

- ★ 160-10 metres (including 10, 18, and 24MHz).
- ★ USB-LSB-CWW-FSK-AM multi-mode.
- ★ Full broad band "no tune" power amplifier.
- ★ 240W PIP. 75 per cent power output at 3:1 VSWR.
- ★ 12 memory channels with clarifier on memory.\*
- ★ Digital Memory Shift gives offset from memory.\*
- ★ Up/down scanning control from microphone.\*
- ★ Variable IF bandwidth — 16 poles of selectivity.
- ★ Bandwidths: 6kHz\*, 2.4kHz-300Hz, 600Hz-300Hz.\*
- ★ Selectable CW "fixed" widths CW-W and CW-N.\*
- ★ Tunable Audio Peak (AFP) and Notch filter.
- ★ Diode ring mixer for very high Rx dynamic range.
- ★ Noise blanker — front panel adjustable threshold.
- ★ AGC; slow-fast-off switchable from the front panel.
- ★ Attenuator 0-20dB, plus RF gain on front panel.
- ★ RF speech processor fitted — front panel adjustable.
- ★ Digital (100Hz) plus analogue frequency displays.
- ★ Meter Reads: Vcc, Ic, ALC, Compression and SWR.
- ★ Semi-break in with side tone. Vox built in.
- ★ Choice of built-in or separate power supply units.

\*Option **£ 690 inc.** VAT @ 15% & SECURICOR



### FT 707

- ★ 80-10 metres (including 10, 18 and 24MHz bands).
- ★ USB-LSB-CWW-CWN-AM (Tx and Rx operation).
- ★ 100W PEP. 50% power output at 3:1 VSWR.
- ★ Full "broad band" no tune output stage.
- ★ Excellent Rx dynamic range, power transistor buffers.
- ★ Rx Schottky diode ring mixer module.
- ★ Local oscillator with ultra-low noise floor.
- ★ Variable IF bandwidth — 16 crystal poles.
- ★ Bandwidths 6kHz\*, 2.4kHz-300Hz (600-350)Hz\* -300Hz.\*
- ★ AGC; slow-fast switchable from the front panel.
- ★ VOX built-in and adjustable from the front panel.
- ★ Semi-break in with side tone for excellent CW.
- ★ Digital (100Hz) plus analogue frequency display.
- ★ LED Level meter reads: S, PO and ALC.
- ★ Convenient concentric AF/FR gain controls.
- ★ Indicators for: calibrator, fix, int/ext VFO.
- ★ Receiver offset tuning (RIT-clarifier) control.
- ★ Advanced noise blanker with local loop AGC.
- ★ 25kHz crystal calibrator feature.
- ★ Internal, xtal or external VFO control.

\*Option **£ 529 inc.** VAT @ 15% & SECURICOR

# Communications Ltd



SMC FOR CHOICE IN VHF/UHF FM EQUIPMENT

## FREE FINANCE + 2 YEAR GUARANTEE

Available on regular priced YAESU equipment — contact SMC for details.



### FT720

FT720 Control Head..... £120.00 inc.

- ★ Four easy write-in memory channels
- ★ Rx priority channel (auto check)
- ★ Scanning of band or memory channel
- ★ Up/down tuning/scanning from mic.
- ★ Scanning for empty or occupied channels
- ★ Optically coupled tuning control
- ★ Easy selection of up/simplex/down
- ★ Manual and automatic tone burst
- ★ String LED's for 'S' and PO
- ★ Seven status report LEDs
- ★ Convenient concentric AF and squelch
- ★ 1½ W of audio to internal/external speaker
- ★ 3.3 (4.3)" D x 6" W x 2 (2.2)" H
- ★ MMB3 Bracket for deck option..... £5.00 inc.
- ★ 720RV 10W, 2M deck..... £133.00 inc.
- ★ 720RVH 25W, 2M deck..... £143.00 inc.
- ★ 144-148MHz (144-148MHz possible)
- ★ 12½ KHz sythesizer steps
- ★ ±600KHz repeater offset
- ★ 0.3µV for 20dB quieting
- ★ Rx 0.5A, Tx RV 3.5A, RVH 6.5A
- ★ 10.7MHz & 455KHz double conversion
- ★ 5.8 (6.5)" D x 6" W x 2 (2.2)" D
- ★ 720RU 10W, 70cm. deck..... £156.00 inc.
- ★ 430-434MHz
- ★ 25KHz synthesizer steps
- ★ 1.6MHz repeater shift
- ★ 0.5µV for 20dB quieting
- ★ Rx 0.5A, Tx 4.5A
- ★ 16.9MHz + 455KHz double conversion
- ★ 5.8 (6.5)" D x 6" W x 2 (2.2)" D
- ★ E72S Extension cable 200cms..... £23.00 inc.
- ★ E72L Extension cable 400cms..... £28.00 inc.
- ★ S72 Switching box..... £56.00 inc.
- ★ Permits control head with two decks
- ★ Single button change of band
- ★ Auto change of synthesizer steps
- ★ Auto change of repeater split

**FT720RV 10W 2 metre**  
**£253 inc.** VAT @ 15% & SECURICOR

- ★ 144-148MHz (144-148 possible)
- ★ 12.5KHz synthesizer steps
- ★ 4 bit CPU chip for freq. control
- ★ Keyboard entry of frequencies
- ★ Keyboard lockout safety features
- ★ Digital display to hundreds of Hertz
- ★ Display auto shutdown times
- ★ Four Channels of memory
- ★ Memory back up disable
- ★ Up/down manual tuning
- ★ Bandscan for busy or clear channels
- ★ Memory scanning feature
- ★ ±600KHz split built in
- ★ Any split + or - programmable
- ★ Easy change Ni Cad packs
- ★ BNC antenna connector
- ★ "On Air" and "Channel Busy" LEDs
- ★ Built in condenser microphone
- ★ 200mW AF to internal/external speaker
- ★ External speaker/mic available
- ★ 2.5/0.2W of RF output
- ★ Rx; 35mA squelch, 150mA full vol.
- ★ Tx; 250mA low, 800mA high
- ★ 0.3µV for 20dB quieting
- ★ Double conversion 10.7MHz and 455KHz
- ★ Two tone encoder built in
- ★ 1.7 (2.2)" D x 2.5 (2.7)" W x 6.7 (7.2)" H
- ★ C/w Ni Cads, helical and case



### FT207R

**FT207R, 2½ W, 2 metre.**

**£175 inc.** VAT @ 15% & SECURICOR

- ★ YM24A External speaker Mic..... £16.85 inc.
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#### FT-707 All solid-state HF mobile transceiver



The definitive HF mobile rig, digital, variable IF bandwidth, 100 watts PEP SSB, AM, CW (pictured here with 12 channel memory VFO).

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#### FT-707 In base station format



Here we show the 707 together with the matching FP-707 PSU FC-707 ATU and FV-707DM VFO memory.



For full details of these new and exciting models, send today for the latest YAESU CATALOGUE and LEAFLETS. All you need to do to obtain the latest information about these exciting developments from the world's No. 1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get our credit voucher value £3.60p - a 10 to 1 winning offer.

**FL-2100Z High power all band HF linear**



Conservatively rated at 1200W PEP input, the new WARC model incorporates all the new bands.

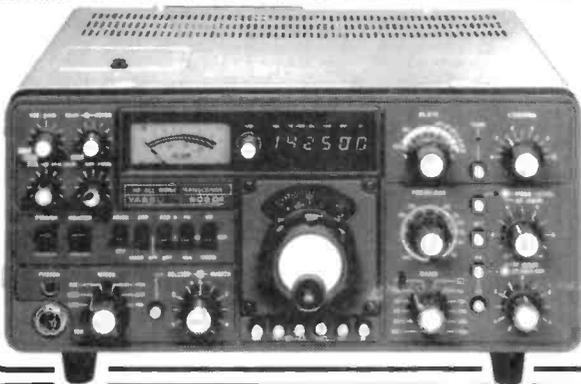
**FRG-7700 Synthesized general coverage receiver**



The very latest in receiver technology from YAESU. Receives USB, LSB, CW and FM—memory option with 12 channels and automatic band selection.

**FT-902DM Competition grade HF transceiver**

The YAESU world famous pace-setter with the acknowledged unbeatable reputation. 160 thru 10 metres including the new WARC bands. All-mode capability, SSB, CW, AM, FSK and FM transmit and receive. Teamed with the FTV-901R transverter coverage extends to 144 & 430MHz.



**FT-225RD Deluxe 2 metre base station**



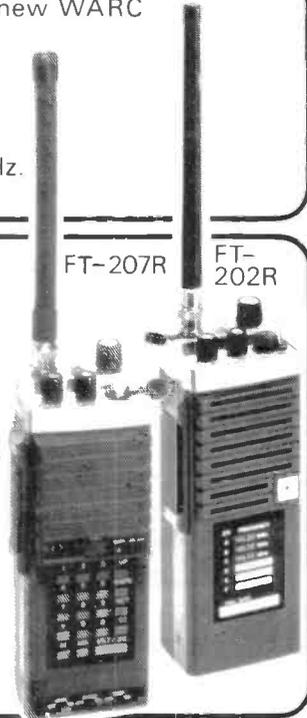
The tried and proven all-mode 225RD has a very comprehensive specification including memory option, variable power output and DC operation for portable working.

**FT-202R 2metre hand-held**

Ultra compact lightweight (400g) FM hand-held 1 watt 6 channel, rugged and reliable—many thousands in use.

**FT-207R Synthesized 2 metre hand-held**

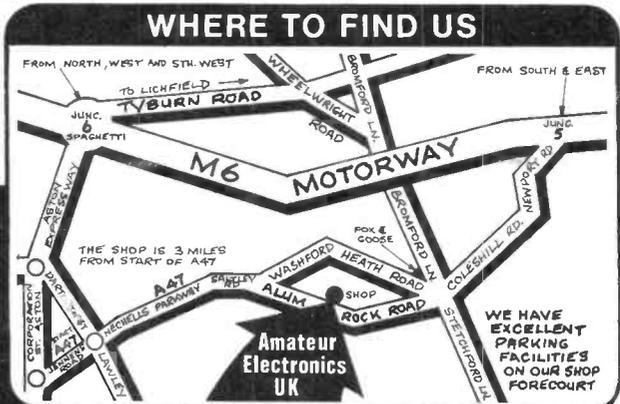
400 channels on 144-146 MHz. Memory back-up, 2.5 watt output.



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**FT-290R**  
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TS830S	160-10m transceiver	639.52 (4.50)	FT101Z	160-10m 9band trans. FM.	502.00 (n/c)	MMT28/144	10m linear transverter	99.00 (1.75)
VFO230	Digital VFO	194.45 (4.50)	FT101ZD	as above with digital FM	569.00 (n/c)	MMT144/28	2m linear transverter	99.00 (1.75)
AT230	All band ATU	106.72 (1.50)	DIG101Z	Digital kit	86.25 (n/c)	MMT432/28-S	70cm linear transverter	149.85 (1.75)
SP230	External speaker	33.14 (1.50)	DCT101Z	12v DC adaptor	34.50 (1.00)	MMT432/144-R	70cm linear transverter	184.00 (1.75)
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SP530	Speaker	t.b.a. (1.50)	FTV107	Transverter main frame	110.40 (n/c)	MML144/100P	2m 100 watt linear amplifier	142.60 (2.75)
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DK520	Conversion kit	10.35 (0.75)	50V107V901	Transverter	69.00 (n/c)	MML432/100	70cm 100 watt linear amplifier	228.65 (2.75)
SM220	Station monitor scope	197.80 (4.50)	430V107V901	Transverter	175.95 (n/c)	MM2000	RTTY to TV converter	169.00 (1.75)
B58	Panoramic display	48.30 (0.50)	SP107P	External speaker	57.50 (2.50)	MMC28/144	10m converter	27.90 (0.65)
B55	Scan board	48.30 (0.50)	SP107	External speaker	27.60 (2.00)	MMC50/28	6m converter	27.90 (0.65)
R820	Amateur band receiver	690.00 (4.50)	DMST107	12 channel memory	88.15 (n/c)	MMC70/28	4m converter	27.90 (0.65)
YG455C	500Hz CW filter	58.65 (0.50)	CW	CW filter for FT107	23.00 (0.50)	MMC70/28L0	4m converter	29.90 (0.65)
YG455CN	250Hz CW filter	60.95 (0.50)	AM	AM filter for FT107	23.00 (0.50)	MMC144/28	2m converter	27.90 (0.65)
YG88A	6kHz AM filter	34.50 (0.50)	YM34	Desk mic for FT707/FT107	18.80 (1.50)	MMC144/28L0	2m converter	29.90 (0.65)
TS180S	160-10m solid state trans.	679.65 (4.50)	YM36	Up/down mic for	12.65 (0.75)	MMC432/28-S	70cm converter	34.90 (0.65)
VFO180	External VFO	96.60 (1.50)	YM37	500ohm noise canclg. mic	11.90 (0.75)	MMC432/144-S	70cm converter	34.90 (0.65)
SP180	External speaker unit	36.80 (1.50)	FT707S	80-10m 8 band trans 10w	465.75 (n/c)	MMC436/51	70cm ATV converter	34.90 (0.65)
AT180	Matching 200W ant. tuner	95.45 (4.50)	FT707	80-10m 8 band trans 100w	479.00 (n/c)	MMC436/600	70cm ATV converter	27.90 (0.65)
YK88C	500Hz CW filter	26.45 (0.50)	FP707	230v AC PSU	109.25 (2.50)	MMC1296/28	23cm converter, 10m output	32.20 (0.65)
YK88S	Second SSB filter option	26.45 (0.50)	FC707	160-10m atu	80.50 (1.50)	MMC1296/14423cm	converter, 2m output	59.80 (1.75)
PS30	AC power sply. for TS180S	85.00 (4.50)	FV707DM	Digital vfo for FT707	186.30 (n/c)	MMD050/500	500mhz digital francy meter	69.00 (0.65)
TS130S	8band 200W mobile trans.	491.05 (4.50)	MR7	Metal rack	14.95 (1.50)	MMD600P	600 mhz prescaler	23.00 (0.65)
TS130V	8band 20W mobile trans.	404.00 (4.50)	MMB2	Mobile mount	16.10 (1.50)	MMDP1	frequency counter probe	11.50 (0.65)
DFC230	Digital frequency controller	163.00 (1.50)	FRB707	160-10m 1200 watt linear	385.00 (n/c)	MMA144V	10m preamplifier	14.95 (0.65)
TS120S	80-10m 200W mobile trans.	389.00 (4.50)	FL2100Z			MMA1296	2m RF switched preamplifier	34.90 (0.65)
TS130V	20W mobile trans.	404.00 (4.50)					23cm preamplifier	29.90 (0.65)
TL120	200W pep linear	128.80 (4.50)						

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2m & 70cms

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430-460Mhz

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\* Available separately at £169.

MB100	Mobile mount	17.25 (1.00)	YP150	150w dummy load/meter	83.00 (1.75)	MMF144	2m filter	9.90 (0.65)
YK88C	500Hz CW filter	26.45 (0.50)	YH55	8 ohm comm. headphones	9.95 (1.25)	MMF432	70cm filter	9.90 (0.65)
YK88CN	270Hz CW filter	28.75 (1.00)	FF501	Low pass filter	19.95 (0.75)	MMV1296	70cm to 23cm varactor tripler	34.50 (0.65)
VFO120	External VFO	89.70 (4.50)	QTR24D	24 hour quartz clock	25.70 (1.50)	MMS384	384 mhz frequency source	27.60 (0.65)
SP120	External speaker unit	25.30 (1.25)	FP12	230v AC 12 amp DC	78.20 (2.50)	MMR15/10	15db atten. BNC terminations	9.90 (0.65)
SP40	Mobile speaker unit	26.89 (1.50)	FP4	230v AC 4 amp DC	41.40 (2.50)			
AT130	100w antenna tuner	72.89 (1.50)	FSP1		9.60 (1.00)	<b>JAYBEAM ANTENNAS</b>		
PS20	AC pwr. sply. for TS120/130V	44.85 (4.50)	FRG7	0.5-30 MHz comm. receiver	189.00 (n/c)	TB3	HF 3 element Tribander	167.90 (4.50)
PS30	AC pwr. sply. for TS120/130S	85.10 (4.50)	BHGR7	Battery holder	5.00 (1.00)	VR3	HF Vertical Triband	42.50 (3.00)
MA5	5 band mobile aerial system	74.75 (4.50)	FRG7700	1981 version of FRG7000	309.00 (n/c)		<b>4 metre Antennas</b>	
TL922	160-10m 2KW linear	595.70 (4.50)	MEM	MEM with frequency memory	380.00 (n/c)	4Y/4M	4 element yagi	20.70 (3.00)
MC50	Deluxe desk microphone	24.15 (1.50)	FRG7700			PMH2/4M	2 way phasing harness	12.20 (1.00)
MC36S	Fist mic 50K impedance	13.80 (1.00)					<b>2 metre Antennas</b>	
MC30S	Fist mic 500 ohm impedance	13.80 (1.00)	FRG7700	Plug in memory	83.95 (n/c)	DC1/WB	Wide band discone (100-470mhz)	41.40 (2.50)
LF30A	HF lowpass filter	18.40 (1.00)	FP80	2m 10w SSB/CW/FM trans	359.00 (n/c)	LR1/2M	Vertical colinear	24.15 (2.50)
RD300	1KW dummy load	48.30 (1.50)		PSU for FT480R	59.00 (2.00)	C5/2M	5dB glass fibre colinear	44.30 (3.50)
TS770E	2m/70m dual band trans.	730.00 (4.50)				5Y/2M	5 element	11.25 (2.00)
SP70	External speaker	18.40 (1.00)				8Y/2M	8element	14.50 (2.50)
TR9000	2m multimode mobile	345.00 (4.50)	<b>FDK VHF/UHF EQUIPMENT</b>			10Y/2M	10 element	31.00 (3.50)
BO9	Base plinth for TR9000	32.20 (4.50)	M700EX	2m FM 25w 12 1/2/25kHz trans	199.00 (n/c)	PBM10/2M	10 element Parabeam	36.80 (3.50)
TR7800	2m FM synts mobile 25W	268.00 (4.50)	M750E	2m FM/SSB/CW 144-146 trans	299.00 (n/c)	PBM14/2M	14 element Parabeam	44.85 (4.50)
TR2300	2M FM synts portable	166.75 (4.50)	Expander	70cm transceiver	169.00 (n/c)	5XY/2M	Crossed 5 element	22.75 (3.00)
V82300	10W amplifier for TR2300	49.45 (1.50)	PS750	230v A.C. 6 amp. psu	69.00 (2.50)	8XY/2M	Crossed 8 element	28.40 (3.50)
MB2	Mobile mount	17.25 (1.00)	Palm II	2m FM 6 channel portable	89.00 (n/c)	10XY/2M	Crossed 10 element	37.70 (4.00)
RA1	Rubber flex. antenna	6.90 (0.50)	Palm IV	70cm FM 6 channel portable	149.00 (n/c)	X6/2M/X12/70cm	Dual band	38.50 (4.50)
PS1200	AC power unit and charger	29.50 (1.50)	TB1	1750Hz tone burst	10.00 (n/c)	PMH/2C	2 way phasing harness	7.50 (0.75)
TR2400	2M FM synts handheld	198.95 (4.50)	Palmsizer	2m FM 40 channel handheld	149.00 (n/c)	O4/2M	4 element quad	23.70 (2.50)
ST1	Base stand and quick chgr.	43.70 (1.50)	TM56B	2m FM monitor	89.00 (n/c)	O6/2M	6 element quad	31.40 (4.50)
BC5	12V quick charger	17.25 (1.50)	FDM40SP	Speaker/mic for Palmsizer	11.00 (0.50)	D5/2M	Double 5 slot-fed	20.15 (2.50)
SC3	Soft carrying case	11.50 (0.50)	CC2	Case for Palm II/IV	5.75 (0.50)	D8/2M	Double 8 slot-fed	27.15 (4.00)
LH1	Hard leather holster	18.50 (0.50)	BC2	230v AC battery charger	4.50 (0.50)	SVMK/2M	Kit for vertical pol.	7.25 (1.50)
PB24	Spare battery pack	14.26 (1.50)	SC2	Case for Palmsizer	9.75 (0.50)	UGP/2M	Ground plane	10.15 (1.50)
TR3200	70cm FM portable	164.45 (4.50)	BB2	External battery case	5.00 (0.50)	HO/2M	Mobile 'halo' (head only)	4.50 (1.50)
PL1	Spare power/charge lead	1.30 (0.15)	BT2	Ni-cad battery pack	12.00 (0.50)	HM/2M	Mobile 'halo' with mast	5.40 (1.75)
R1000	Gen. Coverage Receiver	285.20 (4.50)	Xtals	For Palm II and Palm IV	3.00 (0.15)	PMH2/2M	2 way phasing harness	9.90 (1.00)
TR8400	70cm trans. 430-440 MHz	£279 (4.50)	Xtals	For TM56B	2.50 (0.15)	PMH4/2M	4 way phasing harness	23.00 (1.75)

# 5 MILES FROM SOUTHEND ON SEA — BRING THE FAMILY!

	£	£		£	£		£	£	
<b>70cm Antennas</b>									
CB/70cm	8dB colinear	50.00	(3.50)	CDE AR40 (5 core cable)	59.80	(1.50)	BEARCAT 220FB 66-512mHz	258.00	(n/c)
DB/70cm	Double 8 slot-fed	20.70	(2.50)	Channelmaster 9502 (3 core)	42.00	(2.00)	SX200 26-512mHz	240.00	(n/c)
PBM18/70cm	18 element Parabeam	25.30	(2.50)	Sky King SU4000 (6 core)	75.00	(2.50)	SR9 Tuneable 144-148 or 156-162mHz	46.00	(n/c)
MBM48/70cm	48 element Multibeam	28.75	(3.00)	Jaybeam KR400 (6 core)	99.00	(2.00)	AR22 2m FM synthesized handheld	83.00	(n/c)
MBM88/70cm	88 element Multibeam	39.30	(4.50)	CDE alignment bearing	7.75	(1.00)	AR22 flexible antenna	3.00	(n/c)
8XY/70cm	Crossed 8 element	34.15	(3.50)	Channelmaster alignment bearing	11.75	(1.00)			
12XY/70cm	Crossed 12 element	42.32	(4.50)						
PMH2/70cm	2 way phasing harness	8.50	(1.00)						
PMH4/70cm	4 way phasing harness	18.00	(1.50)						
<b>23cm Antenna</b>									
D15/1296	Double 15 slot-fed	34.00	(1.50)						
PMH2/23cm	2 way phasing harness	25.40	(1.00)						
<b>Matching Transformer</b>									
MT75/50	75/50 ohms	3.60	(0.50)						
<b>Chimney Lashing Kit</b>									
DL	Double lashing kit	8.25	(2.00)						
<b>Wall Brackets</b>									
W6	6" wall bracket	2.65	(1.00)						
W21	21" wall stand-off bracket	10.35	(3.00)						
W24HD	24" wall stand-off bracket	14.70	(4.50)						
<b>Masts (Aluminium)</b>									
SPM	16' x 1" Portable Mast	15.15	(3.00)						
PME	4' extension	2.50	(2.00)						
A4	4'6" x 1 1/2" straight	3.80	(1.50)						
A5	5' x 1" straight	2.30	(1.50)						
A9	9' x 1 1/2" straight	6.50	(2.50)						
A10	10' x 2" straight	12.55	(2.50)						
A12	12' x 2" straight	14.95	(2.50)						
A14	14' x 2" straight	17.40	(3.00)						
<b>AZDEN EQUIPMENT</b>									
PCS3000	2m 25W transceiver	219.00	(n/c)						
PCS2800	10m 10W transceiver	179.00	(n/c)						
	5m remote cable kit	25.00	(n/c)						
<b>AERIAL ROTATORS (complete with control boxes)</b>									
	CDE AR30 (5 core cable)	47.00	(1.50)						
	ADDONIS MICROPHONES								
	AM202G Mobile safety mic.	20.95	(n/c)						
	AGM202S Mobile safety mic.	20.95	(n/c)						
	AM202H Mobile safety mic.	29.00	(n/c)						
	AM502G Base station comp. mic.	39.00	(n/c)						
	AM802G Base station 3 outputs	59.00	(n/c)						
	HF ANTENNAS (various manufacturers)								
	Mini-Prdts HQ-1 20/15/10m 2 ele.	99.00	(2.50)						
	Mini-Prdts C4 20/15/10m vertical	49.00	(2.00)						
	Mosley TD3JR 20/15/10m wire dipole	34.50	(1.50)						
	Mosley "Mini-Beam" 20/15/10m 2 ele. 600w	99.00	(2.00)						
	Mosley "Mini-Beam" 20/15/10m 2 ele. 2Kw	129.00	(2.00)						
	Mosley TA32 20/15/10m 2 ele. 600w	89.70	(2.00)						
	Mosley TA33 20/15/10m 3 ele. 600w	133.40	(2.50)						
	Mosley Mustang 20/15/10m 3 ele. 2Kw	166.75	(4.00)						
	Hy-Gain 12AVQ 20/15/10m vertical	43.00	(2.00)						
	Hy-Gain 14AVQ 40-10m vertical	60.00	(2.00)						
	Hy-Gain 18AVT/WB 80-10m vertical	87.00	(2.50)						
	HF5 80-10m vertical 200w	48.00	(2.00)						
	Radial Kit for HF5	28.00	(2.00)						
	Sagant EL40X 80-40 dipole (79' long)	36.00	(1.50)						
	Jaybeam TB3HF 3 element 2Kw	167.90	(4.50)						
	Jaybeam VR3HF vertical 2Kw	42.50	(3.00)						
	2 METRE PORTABLES								
	SB2M 2m SSB portable	99.00	(1.50)						
	AR245 (previously AR240A) 2m FM 5w	178.00	(1.50)						
	AR245 carrying case	4.10	(0.50)						
	AR245 optional helical	4.10	(0.50)						
	AR245 12v DC car adaptor	4.10	(0.50)						
	VHF/UHF MONITORS								
	TM568 FM Scanner 12v DC/230v AC	79.00	(n/c)						
	008 8 channel FM monitor	69.00	(n/c)						
	M161 16 channel FM monitor	59.00	(n/c)						
	MF083 Marine/Broadcast scanner	85.00	(n/c)						
	VHF/UHF MOBILE AERIALS								
	ASP201 2m 1/2 wave	3.50	(1.25)						
	ASP2009 2m 1/2	9.25	(2.00)						
	ASP3009 2m 1/2	9.75	(2.00)						
	ASP462 70cm co-linear	8.25	(1.25)						
	Magnetic base adaptor	8.50	(0.75)						
	ASP677 2m 1/2 wave	14.95	(2.00)						
	ASP667 70cm co-linear	17.95	(1.25)						
	ASPM125 27mHz 1/2 wave	18.50	(2.00)						
	Magnetic base adaptor for above	8.50	(0.75)						
	ASPbootmount adaptor	3.75	(0.50)						
	2NE 2m 1/2 mobile whip	13.00	(2.00)						
	RG4M Base for above aerial	3.50	(0.75)						
	GSS Gutter/boot mount	3.15	(0.50)						
	MB5 Magnetic mount	7.95	(1.00)						
	10SE 28mHz whip 1.72m long	11.50	(1.25)						
	15SE 21mHz whip 1.72long	11.50	(1.25)						
	20SE 14mHz whip 1.72long	13.80	(1.25)						
	WELZ PROFESSIONAL POWER/SWR METERS								
	SP200 1.8-160mHz 20w-200w-1Kw	49.95	(n/c)						
	SP300 1.8-500mHz 20w-200w-1Kw	69.95	(n/c)						
	SP400 130-500mHz 5w-20w-150w	49.95	(n/c)						
	SHORT WAVE LISTENER AERIALS								
	3-30mHz Inverted "L"	9.95	(1.00)						
	3-30mHz Broad band dipole	29.00	(1.00)						
	Mosley RD5 all-band dipole	40.00	(1.00)						
	AIR BAND PORTABLE MONITORS								
	Sharp FX213 tuneable	13.50	(0.75)						
	INGERSOLL MW/FM/Airband monitor	12.95	(0.75)						
	R517 Professional Air Monitor	49.50	(0.75)						

## OUR PERSONAL SELECTION FROM TRIO RANGE

### TRIO TS830S £639.52



A brand new model having all nine bands fitted and providing 200 watts input SSB/CW. Built-in 230V ac supply, 6146B tubes and full digital and analogue display. Plus a really comprehensive variable selectivity and notch filtering system. The DX'er's dream.

### TRIO TS130S £491.05



Base or mobile this solid state HF transceiver covers eight bands SSB/CW with a genuine 10C watts output. No tune up. IF tuning and speech processing are just a few of its features. 12V dc operation with full digital display plus optional PS3C for 230V ac operation.

### TR2300 £166.00



The TR2300 still amazes us at its value for money. Portable, mobile or base station it is equally at home in all 3 situations. 1 watt 80 channels complete with ni-cad ac charger. An ideal rig for the beginner.

### TRIO R1000 £285.20



The receiver that revolutionised short wave listening. Full 30 band coverage 200kHz to 30MHz SSB/CW/AM. Both digital and analogue readouts are provided together with 230V or 12V dc operation facilities. Trio engineering at its best and at a very competitive price.

### TRIO TR9000 £345.00



An all mode 2 metre transceiver that serves the dual roll of mobile and base station. Features include digital readout, 12 1/2 or 25kHz steps in FM, five memories band scanning and a lot more! Send for coloured leaflet.

**NEW**

### TRIO TS530S £505.00 inc. VAT



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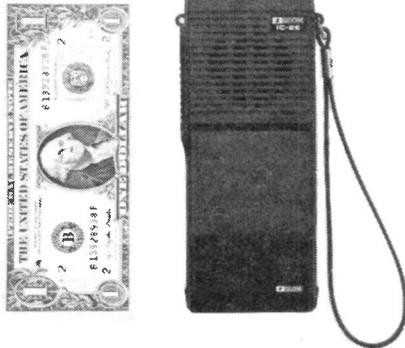
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## It's not the size that counts it's the Quality IC-2E Handy Talky £159inc



### CHECK THE FEATURES

**FULLY SYNTHESIZED** – covering 144-145.995 in 400 5kHz steps.  
**POWER OUTPUT** – 1.5W with the 9V rechargeable battery pack as supplied – but lower or higher output available with the optional 6V or 12V packs.  
**BNC ANTENNA OUTPUT SOCKET** – 50 ohms for connecting to another antenna or use the Rubber Duck supplied.  
**SEND/BATTERY INDICATOR** – Lights during transmit, but when battery power falls below 6V it doesn't light indicating the need for a recharge.  
**FREQUENCY SELECTION** – by thumbwheel switches, indicating the frequency.

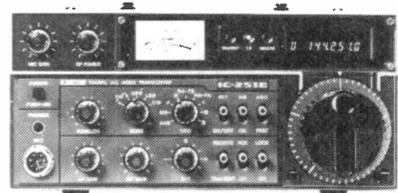
**+5kHz SWITCH** – adds 5kHz to the indicated frequency.  
**DUPLEX SIMPLEX SWITCH** – gives simplex or plus 600kHz or minus 600 kHz Transmit.  
**HI-LOW SWITCH** – reduces power output from 1.5W to 150mW reducing battery drain.  
**EXTERNAL MICROPHONE JACK** – If you do not wish to use the built-in electret condenser mic an optional microphone/speaker with PTT control can be used. Useful for pocket operation.  
**EXTERNAL SPEAKER JACK** – for speaker or earphone.  
This little beauty is supplied ready to go complete with nicad battery pack, charger, rubber duck.



## Enjoy VHF mobile at it's best-IC-260E

The IC-260E offers such extras as full frequency read out, upper and lower sideband, and scanning as well as FM and CW. Thus, it makes an ideal base station, when used with a DC power supply, as well as a mobile. Now supplied with up-down scanning mic.

**£339inc**



## The Latest 2M Multimode Base Station

Facilities include: FM, USB, LSB and CW. Built in scanner and memories. Bright green digital readout.

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## A Great Little Baby

Covering all bands from 80m – 10m including the new ones.\* 13.8V DC operation. 100 watts RF output (40W on AM).\* TWIN VFO with in band duplex available.\* Modes USB, LSB, CW and AM.\*

Digital readout with 3 tuning speeds down to 10Hz steps.\*

Noise blander.\* Switchable preamp.\*

RIT\* IF Shift\* Dial lock and of course the usual SUPERB ICOM quality and performance.\*

**IC-730**

**£549  
inc**

Supplies will be slow at first so if you are interested, call us and get your name on the list for further details.



## The Portable Pair

**IC-202S £169inc**



The IC-202S is a very well designed 2m SSB portable. It offers: 3W pep output on USB, LSB and CW. \* Large Battery capacity (HP11 type) or Nicads if you wish. \* A special VXO circuit to provide smooth tuning and crystal stability needed for SSB operation on 2m. \* Each of the four 200k Hz band positions allows operation anywhere in 2m. (Supplied with 144-144.2 and 144.2-144.4). \* Top of the band Oscar xtals available for "cross-pond working". \* It has a DC socket and SO239 sockets for mobile or base station working, barefoot or as a prime mover. \* Mobile mounting brackets, Nicad packs, chargers, cases all available options. You must agree, a very versatile well proved rig. The 70cm twin of the 202S having very similar features, covering the frequency range of 432-435.2 MHz.

Their versatility is well worth an enquiry.

**All over the World  
they haven't been able  
to get enough!  
(But things are getting better)**



ICOM's new 9-band HF Transceiver – the IC-720A beats the lot!

Some features.

- \* 9 Bands Top Ten including new ones!
  - \* General Coverage Receiver – 100KHz to 30MHz.
  - \* Tuning down to 10Hz steps – YES! 10Hz – yet stable as a rock!
  - \* Built-in Speech Compressor which really gets excellent reports.
  - \* The famous ICOM Band Pass Tuning.
  - \* Memory – it even does all the band changing for you.
  - \* Self cancelling RIT.
  - \* 3 rates of Tuning.
  - \* Two Independent VFOs (in band duplex possible).
  - \* 100 W Output.
  - \* Modes AM,SSB,CW and RTTY.
- A lot in a small packet for £795 inc. VAT (13.6V operation – matching mains PSU £100)
- \* Solid State 500W linear available shortly.

**IC-720A £795inc**

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**An experts  
mobile choice**

**for only  
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INCL.**



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# SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

Vol. XXXIX

JUNE, 1981

No. 452

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*Published at 34 High Street, Welwyn, Herts. AL6 9EQ, on the last Friday of the month, dated the month following.*  
*Telephone: 04-3871 5206 & 5207*

**Annual Subscription:**

*Home: £7.50, 12 issues, post paid*  
*Overseas: £7.50 (\$17.00 U.S.), post paid surface mail*

*Editorial Address: Short Wave Magazine,*  
**34 High Street, Welwyn, Herts. AL6 9EQ, England.**

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

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The  
**SHORT WAVE**  
Magazine

EDITORIAL

## More Interference

We note with some alarm that the freeing of restrictions on telephone equipment seems to be generating a new interference problem for us. It seems to have produced some "cowboy" efforts before the introduction date. The offenders are equipped with a touch keypad and a cordless connection to a 'black box' by way of a signal which is radiated quite strongly on a frequency between 1.7 and 1.9 MHz, with AM which can be heard for several miles from the offending device. If such a signal is heard and can be noted giving his number or otherwise traced to source, pass the details on to British Telecom, who seem to be prepared to help in such a case. However, it is worth first checking that the signal is *not* a normal fish-fone connection into the telephone network of the sort we have heard for years, before a formal complaint is sent off to British Telecom.

No sooner do we get one form of QRM — Loran — out of the way, than another takes its place. The difference is that these telephones are illegal at the moment, and will probably continue so to be after July, as we do not see them being type-approved.

*Ed. Williams*  
G3KFE.

WORLD-WIDE COMMUNICATION

# COMMUNICATION and DX NEWS

*E. P. Essery, G3KFE*

WE make no apology for starting this month with a matter only distantly related to DX — but which is very much connected with *communication*. We have a letter from ex-G2AUB and the DX heard on Top Band; however that can be discussed in its due place. What we are interested in now is his plea for a *CW only* licence, available only to profoundly deaf people, subject to their passing a morse test and proving their disability. As he says, most deaf people have the additional handicap of tinnitus, varying from the high-pitched whistle that comes and goes (as indeed with your scribe) to Nigel's 24-hours daily cascade of 'broken glass'. In addition many people have the handicap of a very limited frequency response, making speech at best R2. The argument runs that if children in schools for the deaf were all taught morse, this would open up a channel of communication that needs but the narrowest window in the audio spectrum to be available — a far narrower audio spectrum than that required for the successful use of a hearing-aid. Indeed one could go further than ex-G2AUB and say that morse provides an input even to a person who is totally without hearing: the sense of touch on, say, the cone of a loudspeaker is quite enough to obtain solid copy at 25 w.p.m. (your conductor has in fact seen this done). If such a licence were to be made available, obviously in the absence of an RAE pass, one would have to specify type-approved equipment having a BFO which could cope with the matter of putting the incoming signal into the small "window" an individual could copy — any SSB transceiver with CW and a suitable RIT control would serve — and perhaps a group such as RAIBC who could deal with any problems arising from the lack of a technical test. As to bands, 28 MHz, and Top Band obviously, with perhaps 14 and 21 MHz as the bit of sugar.

This situation is just not covered by the world-wide requirement for the technical test, but on the other hand the problem of deafness is *also* world-wide, and one might hope that all countries could find enough common ground to enable such a licence to become possible. For the deaf, morse is probably in many cases the only opening through which they can communicate with others on an equal basis. The writer knows only too well how so many deaf people find themselves embarrassed by the efforts of normal-hearing people to communicate with them; and even if the licence proposed proved to be impracticable,

teaching deaf people morse and its use to contact other people who can read the stuff must be a worthwhile idea.

We think that this is a question on which RSGB could well take a lead, having enough specialist knowledge on Council to establish the nature and extent of the problem and to generate a strong and commanding case. Let none of us think there are very few people about with restricted range audio; there are many, most of whom are in that position through excess noise. (Your scribe was somewhat shattered when his hearing was tested as to its frequency response, when the person conducting the test passed over the graph at the end with the comment that this was typical of damage caused by excess noise).

## The Bands

For various good and proper reasons, the writer has not had his normal time to prowling the bands — but the comments in the mail should give a good picture. So — let us begin again with Top Band.

First off with G2HKU (Minster) who, like others, was nearly caught by the changed deadline for this June piece, caused by a temporary change in a production schedule. Luckily, Ted spotted it, and he notes that on SSB he hooked up with GW4LJS, GM3ONT/M, EF6BDX, PA0PN, EG5HM, UP2BAW, 4N3EF, YT0R, and SP9DH; in between there was some CW, to connect him to HB9BA/P, HB9AGA, HB9AUY, HB9BDI, HB9PR, EA8AK, EA9EU, EA5AIO, UK2GDZ, OK1PDQ, ZD8TC, OL6BCE, and OH0XZ/OJ0.

Ex-G2AUB (Lancing) who provoked the thoughts that formed the preamble this time, finds his old HRO as good as anything when a low beat note is required — he hears best at about 250 Hz. The aerial was a vertical length of co-ax cable topped by a UHF TV aerial up in the loft, and in the small hours of January 24 (contest night it will be recalled) between 0030z and 0315z, the following stations were logged: EI9J, LU1BA, UP2BAW, 4X4NJ, M1XX (definitely an M, checked a dozen times), VE1ZZ, VE3EK, K1BR, K1KI, K1ZZ, K1NBN, N1EE, W1WY, W1EK, W1MX, W1OO, W1YN, W1BB, W1XX, K2BQ, N2NT, W2IB, W2QD, W2FJ, K3WW, N3RD, W3GN, W3NX, W3BGN, W4NVN, N4WW, NP4A, K5RC, N5JJ, W5SUS, and W8LRL.

Now we must turn to the doings of G4AKY (Harlow). On April 20 Dave got on the band a little late at 2220z, hearing

VK6HD working G3XTJ and signing. A quick call, and — lo! — VK6HD came back, but he was now 449 and within a minute was gone! Several others are known to have got over to VK6HD, including G3PQA and G3IGW. As G3PQA is fairly local, Dave might have had a change on April 11, when the VK6HD/G3PQA QSO occurred, but in the event, G4AKY was away for the weekend. Gotaways included UM8MAO on April 12, RA9AJC (Magnitogorsk) on 19th, and on 26th there was EZ6GAW at 0130z, and the sound of G13OQR calling and calling VS5RP and failing to connect — while G4AKY was hearing the VS5RP signal quite well. Rumble, rumble! However, the game goes on, with some eighty-five QSOs noted, among which we may note in Asia EZ6DEX, UA9WEE, and UV9AH, EA8AK in the Canaries, EA9EU in Spanish Morocco, and nearer home GM3SBS on a Joystick, and GB1IARU.

## "CDXN" deadlines for the next three months —

July issue — June 4th  
August issue — July 2nd  
September issue — August 6th

*Please be sure to note these dates.*

## Eighty

G3ZPF (Dudley) was, as he put it, on duty down in the CW DX bit; nothing much on except the odd UA9 or W/VE, when, all of a sudden clatter appears. When it paused for a few moments, a single "de YU . . ." was heard, which at least indicated *somebody* was inaudible. A second clue gave a band of something over 5 kHz for the row, from which one could deduce that the somebody was operating split-mode. Progress. Then in come the Big Guns, defined by G3ZPF as being "those who know what goes on and have big, clean, well operated signals." Mmm, must be something to cause all the rumpus. G3ZPF latches on to the back of a chap who is in contact, and there is J5AG. Next, J5AG comes back with QRZ G3ZP?, and a second call is made, in competition with all the YU, LZ, DL and other chaps having calls beginning with

G3ZP, and there it is in the log, signed sealed and delivered. Only left to find out where the blazes J5 lived — a look at Geoff Watts' *Countries List* showed it was CR3! And it was all over for the month.

Regular readers of this piece will have noticed that G3CED/G3VFA (Broadstairs) — he of the Joysticks and witty log comments — has been missing of late. Well, folks, he's back — but we really ought to cut his log in half and send the VHF bit to G3FPK of *VHFB!* There are several pages where the QSOs are down to S-numbers or to repeaters, mainly GB3KR and GB3DA, but enough foreigners to make it look as though George is after some "Worked All EU Repeaters" award! All of course, with the Joystick or Joyframe, and powered by an FT-227R. However, thanks be, George eventually, in February, came back into the HF scenery with his 2 watts; but even then, nothing at all about Eighty — must have found all the old pals on VHF.

Looking on to G2NJ (Peterborough) we find that Nick worked the GB1ARU station down at Brighton a couple of times, the operators being G4GNX first time and G4KWU. Another welcome QSO was with G6FU, who has been in the Frimley Park hospital a couple of times, and found G4PS in there too, not to mention G8TVF, who had a two-metre rig with him. A YL operator was worked, OK2BWZ, Helena, and VE6ATE/DL, who was in Rees, but from Calgary when at home in Canada.

On the QRP front we have G2HKU again, with four watts of CW to raise GM4HBG and GM3OXX/A. On a different tack, Ted mentions this "5NN" business again; apart from it being always given in contests, Ted has just seen several copies of the QSL from a recent DX-pedition where the report of RST was actually *pre-printed*, while a tick in the right place did for the band leaving only the date and time to be added. We don't like the idea of pre-printing the report at all, but we have to admit to some small pity for the poor soul faced with, say, 10,000 QSLs to be written out after an operation!

## Forty

Odd, how so many people ignore this band, and yet one can go down the bottom end and find lots of DX!

G3VFA seems to have worked all around Europe with his Joyframe arrangement, both before and after his trip on the magic (repeater) roundabout; the two watts of CW need a good pair of crystal-filter ears even when the 100 watt merchants come back. But G3CED thrives on it, and his QRO rig continues to gather dust in the corner until it is needed as a high-power test source.

G2HKU also is a QRP man; his four watts netted a CW QSO with PA3ABA, and then the FT-101Z was brought into use to raise UA0AG, U18ACW and EC3KH.



Derek Jeffries, VU2BEJ, is on the air regularly from his QTH in Bombay, and always pleased to QSO UK stations. The rig is an FL-DX400 Tx, HQ-180 Rx and SB-200 linear; antenna is a two-element 3-band quad on top of a 150-ft. high building. Photo: G3ZXX

## Snippets

If you worked RG4C, the QSL goes to UK4CAA, the exercise being one to commemorate Yuri Gagarin, the first man into space just 20 years ago, from the place where he landed. A nice thought, that the first man into space should have been a radio amateur.

That odd call TYA11 was genuine enough, and certainly rolled up a goodly number of contacts; pretty well every one who could overcome his doubt at the call and dive in seems to have connected. As for J5AG, SM0AGD, Erik, and his pals rolled up a total of some 20,442 contacts. As Erik is not now globetrotting for business, he won't be able to pop up here and there as he used to, and indeed it does seem as though this effort they made requires some help in the way of donations; they go, as do the QSLs, to SM3CX5. We might add our own thought that to delicately hint that help would be appreciated, after the exercise is over, is a lot more civilised than yelling for donations and then aborting, as some others have been known to do.

The noises about China seem to be in conflict again and the feeling we have is "wait and see" — but if you hear a BY signal going begging, work it quick and then cross your fingers. Despite doubts raised in the *DX Bulletin* we still keep hoping!

Harking back to that Kingman Reef/Palmyra activity, the original plan was to start from Palmyra and then do Kingman, but in the event the clerk of the

weather stepped in personally to reverse the schedule. In fact this is the fourth Kingman Reef effort since it became a 'country' back in 1974. But, of course, you never can tell — the Market Reef efforts on our own doorstep, as it were, seem to have been popular enough, and indeed the last show offered the choice of SSB or CW, split around 50:50, to the tune of 11000 contacts.

If you haven't worked Y11BGD yet, we hear they are about on Tuesdays and Thursday evenings; look around 14290 kHz at 1900 onwards and be advised that the list may be taken — but sometimes the station doesn't appear, and at other times (like most times!) they don't show till late.

Should you come across KA1GIN, a YL, she and a companion are crossing the Atlantic from Casablanca to the Caribbean in a rowing boat; the rig is a TR-7 with Hustler vertical aerial, powered from solar cells. They have a sked on 28150 kHz on Tuesdays and Saturdays with W1RVY, 1415z. We can understand *TDXB* holding it back from their first issue in April!

Lloyd and Iris Colvin are, at the time of writing, relaxing after their recent expeditionary efforts — they ran up some 12K contacts from FM0FOL alone. Now they are talking about another trip starting in September, and they are looking for some really rare ones — China, Albania, Kamarans for example! They are now poised with ears pressed to the ground for any indications as to how these tricks are to be turned.



"The antenna's a five-eighths whip on top of the castle here"

## Twenty

If you can stand the noise, you can usually pan some sort of pay-dirt. Let G3NOF (Yeovil) have a little say; he reckons the couple of weeks prior to his letter saw conditions rather poor, and to make things sadder still he had a receiver fault. On Twenty, Don only listened in the mornings 0600z to 0930z, when he found long-path openings to VK, ZL, 9M6, and at the same time to W6 and W7. The only contacts noted were all SSB and with CE0AE, IP5FGM (a Marconi special-event station), J5AG, KC4AAA, KH6ACD, VKs, VP8AEO/CE9 (S. Shetland Is.), VS5DX and 9G1JV/9M6.

G2HKU comes in now, and starts with some SSB to Z11VN, ZL3SE, and ZL3FV; plus CW QSOs with CX7AQ, VU2SU, N4KZ, W9CL, VK3BXN, J5AG, WB6VSK, W7VY, and W7TF (Idaho).

Looking through the long log from G3CED/G3VFA, we were amused to see a QSO on Twenty with a GW station, who, in the middle of a natter on CW remarked that he "can't stand this band!" Then there was OZ8AA, OE6CTG, Y57SH, DL8AN, DL1HAK and DL2CT; the several months of VHF-only, until mid-March, showed him the proper way to QSO (*i.e.* 2 watts and a morse-key!) with SP5DIU, HA5LV, after which it seems the bandswitch got stuck at 28 MHz!

## Now 21 MHz

This in fact was the only band your scribe made any real attempt to operate on, listening around in the evenings while doing other tasks in the main. Band conditions were decidedly erratic, sometimes all but dead right through the evening, on other days as lively as a cricket right through the evening. The biggest annoyance though, has been the noise level — the thrum of rain on the roof, and a northerly wind for so much of the time

since. Easter. And, of course, there was the glorious flurry of snow, preceded by hard frosts which caused every gardener to be long-faced.

Let us return to 21 MHz, and G3CED, and his Joyframe aerial. SM0CCE, YU2RAM, then a break, followed by a contest flurry with YU7NG, YU4YA (he gave George a 599 report and was rewarded by the log comment "Liar!"), UA1OAD, UA1OAI (comment. "Don't they know logs cost money?"), then YU3JYE back to a CQ, OH3CW, YU3TVB, EA7BMH, SP8KDF, SM2JAC, OH1KA, OE3RE, HA1VF, then to the VHF's, before returning to work EA3XZ. One thing we would like to know: in the log of the VHF period, a repeater is noted as signing ON0FF — wonder what joker allocated that?

G3NOF heard a few VK/ZLs between 0800 and 1000 long path, and again around noon on the short path, till about 1400, when they were displaced by the short path to 9V, VK6, and YC. Ws were around from about 1000 until the following morning but not regularly, and a few Africans were noted between 1700 and 1800z. SSB was used to work J5AG, JAS, P29AC, UK0QAA (CQ Zone 19), VE7AAZ/4U in Syria, VE7DG, VKs, VP2ARS, VP2MPB, VP2VHK, W6s, W7s, YC2BJM, YC6NH, ZL1AOV, ZL1BDH, ZL1BJU, ZL3IJ, 5B4KE, 5V7HL, 8Q7AZ, and 9G1VV.

## Ten

Here we must begin with a sickly smile; last time round, we are certain, we had a letter from G2ADZ about this band, of which we can find no trace right now, it having reached the writer's hands after the piece was finished and then filed with great care; but Prof. Murphy can spirit these things away until we stop looking, at which moment he will replace it in the allotted place. Or has Frodo Baggins escaped from

Radio 4 and picked it up with the One Ring on his finger?

So, we must go to G3NOF again, and Don says conditions have been rather like the last few months save that the openings have been far fewer. Some VK/ZLs were heard in the mornings on occasion, but nothing from the Pacific, while the Americans surfaced between noon zulu and about 2100. Don talked to HK0FBF, J5AG, J73CB, VE7AAZ/4U, VP2ARS, VS5PP, and Ws.

At G3CED, the QRP seems to do best on this band, with W3ARK, W9MYD, UA9CPJ, UK9CCI, W2BAI, IT9AF, VE3DFM, WA6CIL, WB8NVX; followed after the VHF episode by IS0FPH, KA0JUX, UA6AKO, UA6ABS, W3BUR, a solid hour of CW with OH9VL, UA6ECH, KA4MHT, a QRP UA6LNY, UK6HBV, UA9FIS, and another with RG4C for good measure (we don't think George believed the Yuri Gagarin landing bit!) plus the usual crop of small fry.

G2HKU used his QRP rig to raise EA8UT, and then got out the FT-101 to key with VK2QL and JA6GSX.

Finally, of course, we have a letter from G4HZW in Knutsford. Tony again held the rig together for a full month, but it didn't help him a lot as he found, like the rest of us, that the band fell away badly during the past couple of weeks prior to writing. One thing noted was that the long path to VK/ZL has been much better than last year; indeed this time all the VK/ZL QSOs have been over that way. March 31 gave 20 watts of SSB from an FT-75 and two-element quad W5HAD/M, AJ7C (Arizona), and on April 1 the VK beacons were audible at 2200, and CE3TC worked at 2236. Next day, there were KH6DQ, WA6GUT, KL7CHO, WA1SQ/CE0 on Easter Island, LU3DTV; this was followed on April 3 by 3B8AE/3B9 on Rodrigues. Over the page of his letter, and on to VK3NBZ at 2219, VU2SNM, WA7FXN, N6BCH, VK4VIC again long path at 2300z. KA7DXE, W6SYM, KH6IJ, WD6FXY/P/KH6, VK3NLX, VK2DTP at 2200, VK3VAB, HC1NS, more VKs this time around 2330, UAs only over April 16 and 17 save for AP2AD, JE2CGR, ZD8RH and ZS6OX/3D6; April 20 a Sporadic-E opening to OK and DF, then lots of UAs, ZF1SB back to a CQ EA8AK, LU1DGZ, ZP5PMP, TYA11; and HR3JJR, who calls Knutsford home — a small world!

## Finis

Is the word this time, and our apologies to anyone who missed the changed date of the deadline. We promise to make more noise about it if we have to do it again! Next time round, date as in the 'box', addressed to your old scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. 73, *es benu.*

# BITTE QRX, KRIEG!

## WARTIME AMATEUR OPERATIONS

MICHAEL OCKENDEN, G3MHF

G7FH DE D3FBA — GM OM ES TNX FER REPT — UR SIGS 569 — NAME WALDEMAR ES QTH NR BERLIN — TX 15 WATTS ES ANT DIPOLE — NW QRU ES 73 —

**A** PART from the unfamiliar call signs, this seems to be just an ordinary QSO between a German amateur and a British station. What makes it unusual is that it could have taken place in 1945, *before* the end of the war, between two amateurs both officially licensed by their respective authorities. Thousands were being burnt alive in Dresden, V1's were falling on London, and yet two radio amateurs were able to wish each other 73! This QSO was typical of many similar contacts between German radio amateurs with wartime licences (Kriegsfunksendegenehmigungen — KFSG) and eight British stations with call signs in the series G7FA-G7FH.

At the outbreak of the war, G stations went off the air and all transmitters were impounded by the Post Office. The same action was taken in Germany on 1st September but three operators were allowed to keep their equipment. The most well known of these was D4BIU whose contacts with American stations caused a great deal of interest throughout the world. The object of the exercise was propaganda. The authorities wanted to persuade outsiders that life in Germany was continuing normally despite the minor inconvenience of a war! Gradually more licences were issued until there were some 150 stations on the air, most of them on the 80 and 40 metre bands.

It does seem strange that radio amateurs should be permitted to operate transmitters from their homes in a country where people were not even allowed to listen to foreign broadcasts. This, and the fact that from May 1940, the president of the National Society, the DASD, was an SS General, gave rise to the suspicion that anyone with a KFSG must be a confirmed Party member. *However, this was not at all the case.* The licences were issued during the war by the German Army High Command (OKW) entirely without regard to the recipient's political leanings. Some of the licence holders must have been members of the NSDAP or similar organisations; others may have held full-time jobs in the Abwehr communications intelligence service. All had to be trusted, but no more so than any other soldier or civilian engaged in sensitive work. Neither in their political allegiances nor in their professional capacities can any common ground be established. They were not involved in any kind of monitoring duties similar to those performed by British amateurs in the wartime RSS organisation. Although the motive for putting them on the air — "propaganda by their very presence" — is hardly compatible with the true spirit of Amateur Radio, there was nothing at all sinister about the operators or the QSO's which passed between them.

Since 1932, a traffic-handling network of radio amateurs had been operating in Germany. The 'Offizielle Betriebsdienst' as this network was called was really the origin of the wartime licences. Regular schedules were maintained and transmitting amateurs and SWL's alike were encouraged to take part in these exercises which were organised by the DASD. This disciplined activity was clearly excellent training for operators and it did much to keep the hobby alive at a time when the internationally-minded amateur fraternity was regarded with suspicion by the Nazis, who attempted to control its activities, first through the Party-sponsored 'Verband Deutsche Funker' (League of German Radio Operators) and later by penetration of the DASD.

Contacts with American stations continued until 1941 when the W's were forbidden to work stations operating from the war zone. Operation by JA's ceased with their entry into the war in December 1941 and this put paid to plans for a contest involving German and Japanese amateurs. In 1942, licences were issued to a

few operators in Hungary and Czechoslovakia. To stimulate activity on 10 metres, some fifty other German operators were given licences for exclusive operation on this band. Although some experimental telephony transmissions were made, CW was used for the vast majority of all contacts. The QSL bureau functioned throughout the war and a communications receiver with plug-in coils similar to the HRO was available through the DASD.

With military approval, beacon stations D4WYF 2/3/4/5 operated during the war on the 80, 40, 20 and 10 metre bands; the 80 and 10 metre beacons were located at the Ludwigsfelde military base near Berlin where the Germans monitored foreign broadcasts. This unit — the German equivalent of Caversham — was known at the "Giftküche" or "poison kitchen" and passed foreign propaganda to the High Command. The operators included several amateurs who all held special permits signed by Keitel himself authorising them to listen to foreign news broadcasts. Allied intelligence concerning the work of the Ludwigsfelde base must have been rather vague for an air raid during the night of 1st and 2nd January 1944 closed the station down for several weeks and thereby prevented our propaganda from getting through.

A number of licensed German amateurs also operated from outside the Reich. Stations were on the air with D calls from France, Greece, North Africa, Norway and even from Spain. Contacts were made with stations at home and a certain amount of third party traffic was passed. D4XYN (DL1DX today) operated from the German embassy in Madrid. One day he intercepted a message from a Swiss cargo ship (Yes, the HB's did and still do have a small merchant navy!) en route from South America to Genoa. The ship's main WT installation had been damaged in a storm but the radio officer came up on the 40 metre band with a small CO-PA transmitter. D4XYN tried to help by relaying messages to Berne but it was a full three days before they replied for fear that Swiss neutrality would be prejudiced.

Early in 1945, a number of British stations with G7 calls appeared on the bands. The feeling in Germany was that these stations were located on the east coast of England. At first it was thought that they were pirates and so QSO's were prolonged in order that they could perhaps be identified. The contacts were conducted in a polite and correct manner and a log of all traffic was passed to the authorities in Berlin. It is strange to think that some of these wartime QSO's between the German amateurs and the G7's were probably between old friends from the pre-war days. On 24th June, 1945 about 30 HB7 stations operated a communications exercise on the 80 and 40 metre bands and once again there were contacts with G7 stations. No official explanation concerning the activities of the G7's has ever been given by British sources. They must have had some intelligence function but it is not clear whether this was to find out about the German stations or to provide a link for anyone in Germany (P.O.W's perhaps, or agents emerging from hiding places) who had radio equipment and needed to contact England. Another possibility is that they were set up to help locate pirate operations from Britain. Certainly other stations were heard by German amateurs: these were using G4 and the G9 industrial call signs and may well have been pirates. A lone operator doing a boring night watch at a signals station somewhere in Europe, a powerful transmitter at his fingertips . . . the temptation must have been great!

After the war, the bands gradually returned to normal: Swiss amateurs operated officially from 26th November, 1945 and the British followed in December with permission to use the 6 and 10 metre bands. Operation for G stations on the other bands resumed in July 1946, and the first official DL's came on the air in 1949.

### References:

- (1) "Geschichte des Amateurfunks" by W. F. Körner (DL1CU), published by Koerner'sche Druckerei.
- (2) "Faszination der kurzen Wellen" by Dr R. Stuber (HB9T), published by USKA.

# SIMPLE MEMORY KEYERS FOR METEOR SCATTER, PART II

CONCLUDING THE ARTICLE BEGUN IN  
THE APRIL ISSUE

KEN WILLIS, G8VR

**P**ART I of this article described a simple memory keyer which, though using only four integrated circuits, is nevertheless quite adequate for serious meteor scatter work. The basic keyer, designed by Paul Turner, G4IJE, was further developed by G8VR to provide expanded memory capability and other features which greatly assist meteor scatter operation.

Figs. 1 and 2 of *Part I* illustrated how the 2102 memory chip is accessed by the action of a 4040 binary divider driven by a clock circuit. An obvious question which arose was whether the same binary divider could drive a number of 2102's in parallel to provide extra storage capacity without the need to duplicate the other circuits in the keyer. Furthermore, since for M6 work only one 2102 storing a single message would need to be operative at any time, it was decided to find out whether a 2102 in a bank of four could be separately programmed without the other three being affected, and then, by appropriate switching, be brought into a position where its data could be read out. Experiments showed this to be possible, opening the way to the construction of an 4-memory keyer which has proved ideal for MS work, and yet requires no special skills to build.

## Switching Multiple Memories

There are three connections to each 2102 which need to be switched if they are to be used in multiple memory configurations. This number could probably be reduced further by the use of diodes, but the simplest approach will be described to avoid unnecessary complication. Each memory chip has an input (pin 11) into which data is fed when the memory is loaded, and an output (pin 12) from which the read-out is taken. It is a simple matter, using a 2-pole, 4-position switch to select both the input and the output of each individual memory in a bank of four since both pins 11 and 12 can be left floating when the memory is not in

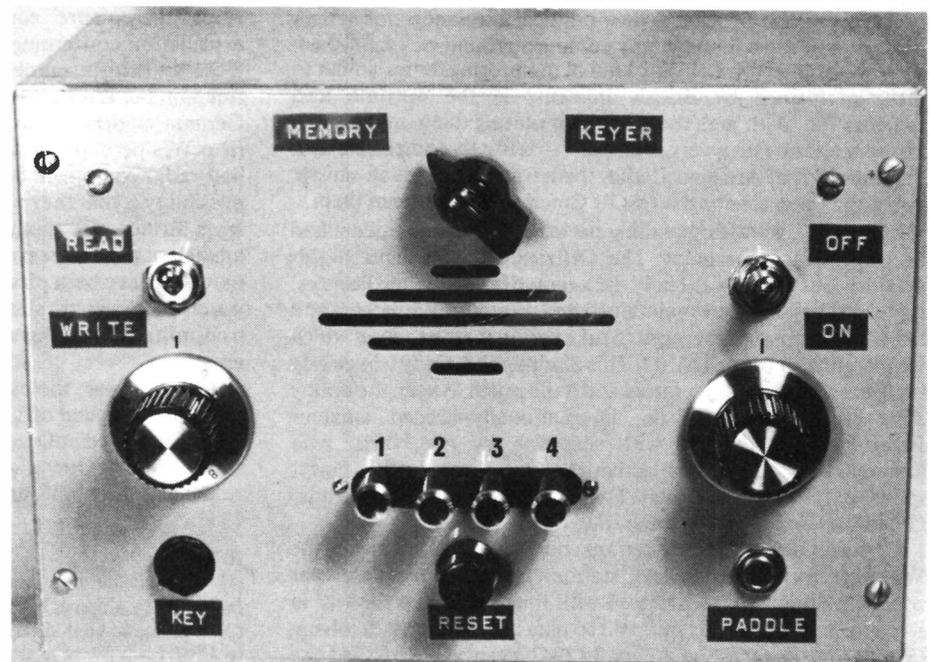
use. Unfortunately there is a third pin, pin 3, which needs to be switched, and it introduces a minor problem. Pin 3 is the read/write connection, and it is important that this pin be maintained at a positive potential of about 5 volts at all times except when data is being inserted into the memory; failure to do this will result in any formation stored in the memory being lost should pin 3 fall to zero or low potential. Consequently the switching necessary to accomplish this is rather more complex and calls for a 6-pole, 4-position switch as shown in Fig. 7. This would consist of two wafers, each 3-pole, 4-position and a suitable item could be purpose made from *RS Components* "Switch Kits", *Maplin* "Maka-switches", etc.

Much the best solution is to use push-button switches where these are available. Certain types of tape recorder of the cheaper variety, and some broadcast receivers, use a row of push-buttons which provide a number of changeover switches per button. Those which should be used are of the self-cancelling type. With these, whenever any button is pushed in, any other button already in will come out, so only one button and its associated switches are operative at any time. This is very suitable for MS work where only one message at a time is called up. When the message has served its purpose, pressing the button associated with the next memory brings it into operation and disconnects the memory which has just been used without destroying the information stored in it. Fig. 8 shows the switching requirements when push-buttons are used. Three changeovers per button are required for this unit. Suitable push buttons can often be obtained from discarded equipment deemed beyond repair by service centres, but if not, a suitable bank of switches can be made up from *RS Components* push-button "Signal Switches" or *Maplin* equivalents, for example. In either case, four 4-pole changeover units are required with the associated latching assembly and buttons. The fourth pole could be used to switch indicators, if required. As far as construction and RFI avoidance are concerned, what was said in *Part I* applies equally here.

## Operation

Having selected a particular memory, the operation is much the same as for the single-memory model described in *Part I*. However, there is one other operational point to be considered when using the multiple-memory keyer. It is very probable that each message held separately in the 4-memory bank will contain a different number of characters: the clock speed must therefore be

Fig. 6 View of the Four-Memory Keyer. The controls at the left relate to the memory section, the four, separate memories being selected by the push-buttons above the "Reset" button. The electronic keyer paddle and speed control are on the right. The knob above the monitor speaker grille switches the side-tone on or off for the memory and electronic keyers respectively. The unit is mains operated and is built into a 9 x 6 x 5-in. aluminium case.



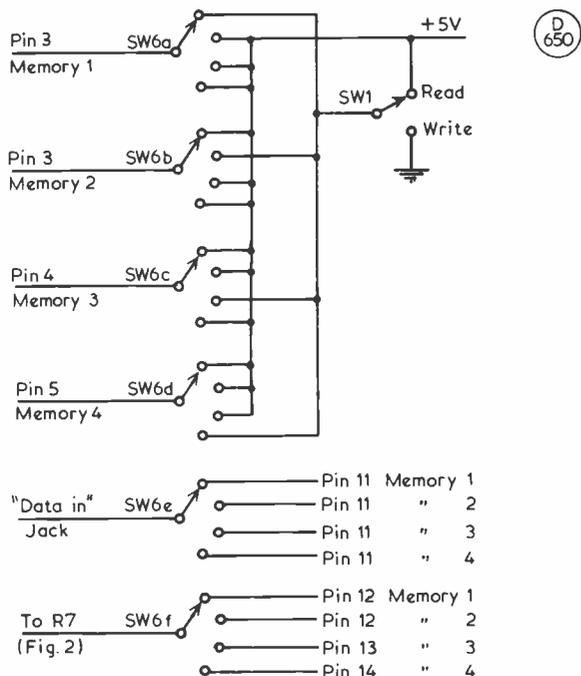


Fig. 7. SWITCH CONNECTIONS USING 6 POLE 4 WAY SWITCH WITH SINGLE 'READ/WRITE' SWITCH.

adjusted each time a message is changed so that transmission at the correct l.p.m. occurs. It is convenient when programming the unit, to make a note of the clock speed which will be needed for each message so that the unit can be readily set up as each message is selected for use during the QSO.

### Built-in Keyer

During experiments with these memory keyers, a home-built electronic keyer was used to program them. It soon became apparent that this represented a good deal of redundancy in terms of the equipment used; both the memory keyer and the electronic key had their own power supply units and side-tone oscillators, while both were screened against RFI. It seemed to the writer that by combining both units in a single enclosure and giving a little thought to how the necessary switching could be arranged, a much more compact and versatile unit could be built. After considering the needs for such a unit, the following broad specification was drawn up.

1. The unit must provide electronic keying with and without side-tone facilities at speeds up to about 30 w.p.m. It must provide for the use of both a paddle and a straight key without having to unplug either key or disconnect the unit from the transmitter.
2. It must incorporate memory capability to permit up to four different MSCW messages of a length not exceeding 30 characters to be stored. When required, the unit must key these messages at speeds between 400 and 1000 l.p.m.
3. The unit must be self-contained with an internal power supply and built-in protection against RFI.
4. Changing from memory keyer operation to straight or electronic keying must not cause the stored information in any memory to be lost. Moreover, such changeover must be both simple and rapid to allow messages in the memories to be "topped or tailed" as required, e.g. to send call signs at readable speeds for identification during an MS sked or to add contest numbers and similar information which, for any reason, cannot be incorporated in the stored message.

The block diagram in Fig. 9 shows the arrangement finally adopted, SW5 being a DPDT toggle switch. For normal keying, the dot-dash generator is connected *via* the side-tone generator to an output circuit which keys the transmitter. When the memories are to be used however, output from the dot-dash generator goes

to the data input of the memory bank, while output from the selected memory is routed to the side-tone generator and to the output circuit. Thus, whether the standard keyer or the memory facilities are being used, the operator hears, *via* the side-tone, what is being sent or inserted in the memory.

The system switching used a 4-position switch whose functions are adequately described by listing them:

1. Side-tone off, memory keyer selected.
2. Side-tone on, memory keyer selected.
3. Side-tone on, electronic key to transmitter.
4. Side-tone off, electronic key to transmitter.

The switch was wired so that these positions were selected in the above sequence with 1 fully anti-clockwise and 4 fully clockwise. The choice of this particular sequence was deliberate since it met the writer's requirements for a typical MS sked and also represented the most favourable arrangement for all other CW activities at the station. A few words at this point may assist others to decide their own requirements and construct a unit accordingly. Suppose a MS sked to be in progress with the switch in position 2 so that a memory is in the process of reading out its message, with side-tone generation, and the transmitter is being keyed. If the sked takes place in the late night or early morning hours, it may be politic not to disturb the household, so switching to 1 mutes the side-tone but keeps everything else ticking over. At the end of the sending period, to identify the station by sending call signs at readable speed, the switch is turned through 2 (where the side-tone will be heard briefly) to 3 where morse can now be sent at any speed using the electronic key (with its own speed control) or the straight key. This switch position provides side-tone. If this is not required, switching to position 4 will mute it. Meanwhile the memory chips continue to hold their stored data to be called up on demand. Switch position 4 has a further use. Since many transmitters and transceivers have built-in side-tone when in the CW mode, it is convenient to be able to switch off the side-tone in the electronic key unit when it is being used for normal CW purposes. Alternatively if no side-tone use is ever contemplated when using the keyer for normal CW, then switch position 3 can be excluded.

Figure 6 shows the unit built by G8VR. It has proved so useful that it is now the main station keyer, embodying all the features necessary for all forms of CW operation. A study of the photograph will show that as far as possible the memory keyer and the electronic key sections have been separated, one on each side of the panel; each has its own calibrated speed-control knob. With a little practice and by reference to the simple calibration charts described in *Part I*, the setting of these knobs presents no real problems. The four-position switch, just described, is shown at the top of the panel in the centre, and the push-buttons used are clearly visible.

### Electronic Key Features

Not all amateurs will be prepared to build their own electronic key, nor to modify their existing key for incorporation in a

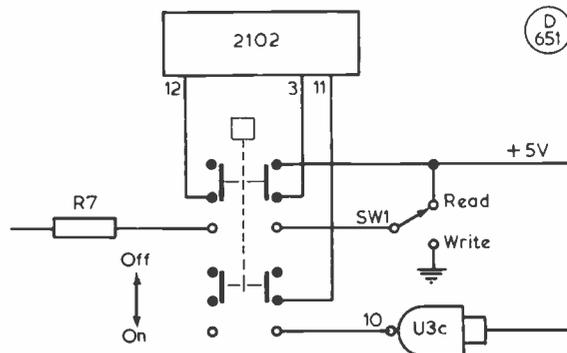


Fig. 8. PUSH BUTTON MEMORY SWITCHING. One circuit is thus required per memory. R7, SW1 and U3c refer to components in Fig. 2, Part 1.

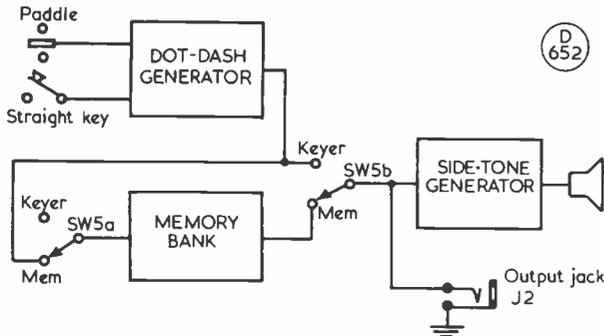


Fig. 9 BLOCK DIAGRAM OF COMBINATION KEYS

combination unit as described. Hence, it is not intended to provide detailed instructions on these constructional aspects but rather to describe what this particular unit consists of, as this will identify several points of significance which will have to be taken into account by anyone wishing to "roll his own".

The writer built an electronic keyer in 1978 based on a design published in *QST* for June of that year.<sup>1</sup> It uses five integrated circuits and is a simple design which tends to work first time. Two of the IC's used are type 555's, one being a side-tone oscillator and the other the clock circuit which determines the sending speed. As only one side-tone generator is needed in the combination unit, the 555 was chosen simply because it was already built and available. Two clocks are of course necessary since while the memories are being programmed both the clock driving the binary divider and that governing the electronic key-speed are both in operation, and at quite different speeds, so they cannot be combined. (Readers who have access to *QST* for June 1978 should refer to page 23, where Fig. 2 is a complete circuit diagram of the electronic keyer). If the lead from pin 3 on integrated circuit U4B is disconnected, this will provide a point to which the output from either the electronic key or the memory key can be switched to the side-tone generator and from there to the output keying circuit, in this case a transistor with or without a keying relay. Similarly, the pin 3 connection of U4B provides the output of the dot-dash generator and this in turn is switched either to the side-tone generator for standard CW, or to the input of the memory keyer for loading the memories.

This keyer works well on 5 volts but a 12 volt rail must usually be provided if a keying relay is to be used. (See Fig. 4 in *Part I*). Printed circuit boards for the construction of this keyer were originally available from one of the authors, but the keyer is simple enough to be built in the same way as the memory keyer; that is, on experimenter board. The use of other types of keyer will obviously depend upon their characteristics, though any model

should work provided that the owner is prepared to modify it slightly to provide the necessary switching connections.<sup>2, 3</sup>

A very useful feature of the *QST* key is that it has a "Tune" function. This takes the form of a point in the circuit which, when earthed, produces a continuous dash or key-down situation, whereas the paddle provides only a string of dots or dashes. If a straight key is connected between earth and the "Tune" point, then morse may be sent and heard on the side-tone as it keys the transmitter. This increases the versatility of the keyer still further since it can now be operated in paddle, memory or straight key modes. Consequently the unit can take its place in the shack as an all-purpose keyer which is likely to satisfy the requirements of the CW operator indefinitely and yet need cost much less than anything commercially available. Also, having built it yourself, it should prove easy to service in the future!

### Optional Refinements

In *Part I*, reference was made to transistor instead of relay keying, this being desirable to avoid contact bounce associated with mechanical devices. Fig. 10 shows a circuit (non-valued components are listed in *Part I*) to achieve this and which caters for transmitters with either positive or negative key-up voltages of up to 300 volts across the open key jack, J2. In the case of positive keying, the case of the keyer must be connected to the common, or negative, line, whereas in the negative keying situation, the positive rail of the power supply must be connected to the case. In the latter arrangement, the "common" rail becomes negative with respect to the keyer case and this is accomplished by SW7d.

SW7 can be a conventional 4-pole, 2-position rotary wafer switch. However, as these 2-position ones usually have 6 poles, a spare pole could be used to switch either of two LED's on the front panel to indicate the chosen keying polarity. This would be very useful if the keyer were to be used on several different transmitters. Alternatively, SW7 could be a ganged DIL component mounted on the printed circuit board. *ERG Components* "SuperDIL" type DS16A 4-2, or *RS Components* equivalent would suffice.

If the universal keying suggestion of Fig. 10 is chosen, it is imperative to ensure that the "common" rail of the power supply and general ground plane of the keyer(s) are *not* directly connected to the case but to SW7d instead. However, if the keyer is only ever to be used with positive keying rigs — e.g. cathode keying — then Q2 and its associated components, and SW7 can be omitted and the "common" line connected to the case. If it is likely that RF might be a problem it would be prudent to slip ferrite beads over the base leads of Q1, Q2 and Q3 and at point "Y" by J2. See you on MS soon?

### References:—

- [1] "A Low-Cost Dot-Memory Keyer" by James M. Rohler WB0LHE and William J. Vancura WB9OBB, *QST* June 1978. *Note:* Correction subsequently published in *QST* in respect of D5 in circuit which should be connected between pins 6 and 9 of U3B and *not* pins 6 and 8 as shown.
- [2] "A C-MOS Morse Keyer" by N. Hoult, G4CIK, *Short Wave Magazine*, December 1977. This design uses nine IC's and included transistor keying for either positive (cathode) or negative (grid block) keying.
- [3] "A C-MOS Keyer" by R. H. J. Goldstone, G3TAG, *Short Wave Magazine*, November 1979. This design uses seven IC's and incorporates a DIL keying relay.

### Correction

There is an omission in the circuit diagram of Fig. 2 in "Simple Memory Keyers for Meteor Scatter, Part I" which appeared in the April issue: R3 is not shown, and should be connected between pin 11 of U2 (the 4040 chip) and earth. Also, in Fig. 2, U2 is shown as having two pins marked '10', the correct pin 10 being the one which connects to C1 and U3; the pin marked '10' which connects to the +5 volt rail should be pin 16. In the Table of Values on p. 93, C2 should be 0.01  $\mu$ F, not 0.001  $\mu$ F as shown.

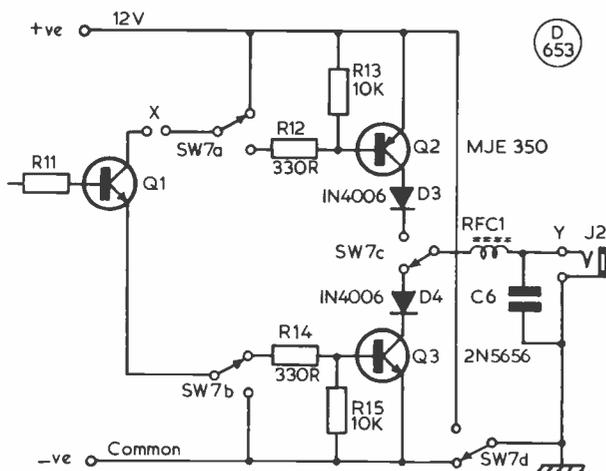


Fig. 10 POSITIVE AND NEGATIVE TRANSISTOR KEYING (SW7 indicated for positive keying.)

# BASICS FOR THE SWL AND R.A.E. CANDIDATE, PART I

## SUGAR-COATED THEORY

**B**EFORE we start to work, let's just attempt to say what we are about. From time to time, we will be looking at the R.A.E. syllabus, as space permits; we shall try and sugar-coat the theory by sorting out the "sore spots" and trying to clarify by analogy, what may be a stopper for a candidate who is only just coping with his course. We *don't* aim to write a course, and we *will* go up a few side-streets of interest.

### In the Beginning . . .

Everything material is of mixtures, compounds and elements. Mix salt and sand, and you've got a *mixture* — at the bottom limit you can recover a grain of sand and a grain of salt from the pile, just as they were when we mixed the pile up. This mixing process can't be applied to everything — sometimes you mix them up and get something different altogether, and the smallest piece you can take of the 'different' result is still of this different substance — your two (or more) constituent materials seem to have disappeared! But — if you are a chemist you will be able, usually, to go through some clever process and get back your raw material, although the stuff you made has now disappeared again. A fine example is a mixture of hydrogen and oxygen. There is usually a bang and you have some water. Notice some things about this: hydrogen is a light gas which can be used to fill balloons but is very explosive, while oxygen is a heavier substance, still a gas, and is essential for our survival, and is also essential to support fire. What a contrast to water! Water is a liquid, which we can drink, swim in, and chuck over fires to put them *out!* One cannot imagine anything much further removed from water than its constituents. Water is called a *compound* of hydrogen and oxygen (as we've just seen, it certainly can't sensibly be called a "mixture"). The smallest lump of water, the molecule, comprises two atoms of oxygen and one of hydrogen all locked together like drunks round a lamp-post. Separate the oxygen and the hydrogen and they go back to what they were, *elements*.

Now, we've got to the smallest particle of matter we can find — *one atom of an element*. If we try breaking up an element we get into a weird new world of sub-atomic particles. There are about 92 elements occurring naturally, plus a few more which can be synthesised in the laboratory, and we find that they all in their turn comprise varying numbers and proportions of sub-atomic particles. There's umpteen of these, but we are going to forget about all save the *electron*, the *nucleus* and their relationships. Any atom comprises a nucleus which can be thought of as a weight and a lump of positive charge; the size of the lump of charge is such that it balances the negative charges of the electrons which are practically weightless and can be imagined as orbiting the nucleus. If, by some chemical or physical means we separate an electron from an atom, we have "ionised" that atom. But more important to us simple, budding hams is the fact that we've just generated a "hole" — so a hole is a place where there ought to be an electron but there isn't!

If we think about that, and imagine an electron stream drifting along in a material, it would result in a stream of holes which would seem to be drifting in the opposite direction. If the lump of material is, say, a penny on the palm of our hand, the movement of holes and electrons is quite random as to direction; but if we put a battery across our penny current flows from one terminal of the battery to t'other. What happens is that there is a kind of pressure existing at the battery terminals which can't move — hence a "potential difference" exists. When we connect the penny across the terminals, electrons, shouting with glee, come belting out of the battery heading for the opposite battery terminal *via* the

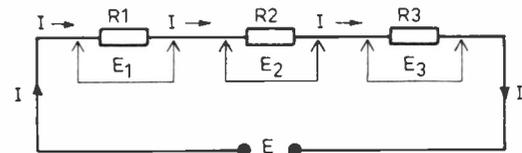
penny. But of course the electron can only progress by getting into a hole left by a previous electron, and in the progress it leaves a hole for the electron next behind which nips in and leaves another for the electron next again behind, and so on. So, we have a stream of electrons leaving at one terminal, going through the penny and re-entering the battery; and since we can't move an electron without a hole, it follows that holes will be going (apparently) in the opposite direction. The electron is a negative charge, and since a hole is a place which needs an electron to fill it, pretty obviously its power to attract electrons implies it is a positive charge. Positive and negative attract, like charges repel each other.

Where has all the energy come from to cause this flow of electrons and holes which we call a current and which we can measure? From the battery. In the battery. Where in the battery? Locked up in the chemical reaction which formed the battery in the first place. So — as we push the current from the battery, chemical changes are releasing the energy. Ordinary "dry" batteries (and chargeable ones, too) go flat when there is no more chemical energy to be released. Dry ones go in the gash-bin, while the re-chargeable ones can be restored to life by a charging current which reverses the chemical reaction so that energy is again stored in the battery (nicads and car batteries, for example).

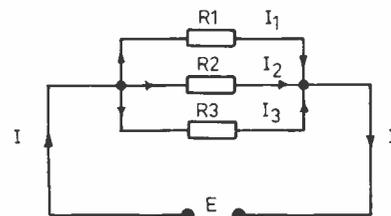
Perhaps you did these experiments with a car battery and a penny just to prove them wrong — and then dropped the penny. 'cos it got hot! Having dug it out from under the bench where it rolled, we'll sit back and think. What can this electricity *do*? Heat things up, make chemical reactions occur, and make the starter motor on the car go round — oh, yes, and if we aren't careful we'll see sparks jumping about.

Next we come to the question of using this current we've learned about. Back to those darned atoms again! When we gave you that clever (and over-simplified) line about electrons and holes, we overlooked a rather obvious point! Some elements will tolerate having holes in them for odd moments without too much protest. Other elements put up barbed-wire fences to "keep those riff-raff downtown electrons out" while some seem to be a bit in-between. The first are *conductors* of electricity and the second are *insulators*. But, be it noted, the stoutest barbed wire fence can be overcome if you try hard enough and don't care about the resulting damage. (Ask any ex-P.O.W. about escapes!) Our third category of element could be regarded as a passable conductor or a poor insulator, or even, on occasion as a semi-conductor. A not very barbed wire loosely strung on rotten uprights about sums it up — but it has its uses as we'll see in due course.

So far, then, we've discovered about a flow of electrons, and that to make the flow go in a desired direction we have to use



(a) RESISTORS IN SERIES



(b) RESISTORS IN PARALLEL

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**Fig. 1.** Notice in (a) that the current,  $I$ , is the same all along the chain, whereas in (b) the current total divides to flow through the resistors, and  $E$  is now the common factor.

something to push them along. We've discovered that insulators don't let electrons trot around, and that conductors will; and we've seen that there are some in between. Now, if we need a potential difference to be able to move the electrons in a current, then if the same p.d. causes a different current under different conditions, then there has to be something resisting the flow of electrons. Incidentally, when the battery is lying idle the potential difference between the terminals is just that; but when it is set to work pushing electrons around we give it a new name — *electromotive force* or e.m.f. E.m.f. or p.d., we measure it in *volts*. The current an e.m.f. can generate is measured in amperes, or, more commonly in our field milliamps, (1/1000 of an ampere) or microamperes (1/1000000 of an ampere). Volts range from fractions of a micro-volt, through millivolts and volts, right up to kilovolts (a kilovolt is 1000 volts). To make sure that we get these "multipliers" right, we give them capital letters, while the smaller sub-units have their letters in lower case: thus 1MV and 1mV are unmistakably one megavolt and one millivolt respectively.

Now, we have indicated that different materials resist the flow of current differently; we always have some resistance present, like it or no, but we can also make lumps of it, called *resistors*. Clearly there must be a unit of resistance, and it is the *ohm* — again the range goes from milliohms to mega-ohms (megohms), and 1mohm is a milliohm while 1Mohm is a megohm.

### Ohms Law

Volts, current and resistance are joined together by some relationship, so here's the definition: if a current of one ampere flows for an e.m.f. applied of one volt, the resistance to that flow is one ohm. We use the generic letters E for volage, R for resistance, and I for current, and so we can express our definition algebraically, as  $\frac{E}{I} = R$ . This is Ohms Law.

Please don't step overboard at this little formula! Just hang on while we explain the *equation* a bit more. Ever had an old-fashioned pair of scales with two pans one each end of the beam and the centre of the beam on a pivot so in the absence of any weights the things sat level? Right: imagine for a moment we have dropped  $\frac{E}{I}$  into the left-hand pan, and R into the right-hand pan. After a bit of rocking, due to our clumsiness, the scale settles to neutral, showing  $\frac{E}{I} = R$ . If we want just E in one pan, we stop dividing it by I in the left hand and do the same in the right hand pan where we get IR (*note: stopping dividing by I on the left hand side means the same as multiplying by I on the other — think it out using numbers!*) So,  $E = IR$ . By a similar operation on the scales we can get I on one side —  $I = E/R$ . Ohms Law explained!

Back to our battery and penny — you recall it got hot and we dropped it under the bench: Now it is cold stick it back in your pocket against a redundancy notice! But think about it, nonetheless — if it got hot what made it hot? *Power*. So, it follows there must be a relationship with volts current resistance and power somewhere. There is. If we measure power in *watts*, then a voltage of one volt pushing current of one amp through a resistance results in one watt of power. Thus  $W = EI$ , and by fiddling with Ohms Law and this last statement on a scrap of paper before you go to sleep, you'll eventually get  $W = I^2R$ , and  $W = E^2/R$ .

Stop a bit now. We've forgotten something, haven't we? When we had our battery, eventually it ran flat; all our equations and industry up to now haven't noticed that our battery contained a *quantity* of electricity. Just like a pint bottle of light ale, when you've poured it all out of the bottle, you must either pour it back, or get another bottle. We measure the quantity intuitively by the rate at which we pour and the time it takes to empty the bottle. Quantity of electricity then, can be measured in ampere-seconds, or in kilowatt-hours (this is the one the electricity bill hits us with!), and apart from this we shall need the concept of a quantity of electricity later. First, though, we must satisfy the questioner who wonders about the kilowatt-hour and the ampere-second. Well, the ampere-second is equal to  $6.28 \times 10^{18}$  electrons and is called a *coulomb*. Thus the ampere is clearly a measure of the rate of flow, and the coulomb of the quantity of electricity. We

generally use a larger unit, called the ampere-hour in amateur radio. What then about that kilowatt-hour used by the electricity people on your bill? A subtle difference lies here: they don't sell you electricity in bucketsful, so ampere-hours aren't really convenient — they are selling you *power* by the kilowatt-hour. Power, we saw, means watts, and is the result of pressure and flow of current — and they charge us for the rate at which we soak up the power they generate in watt-hours rather than ampere-hours. Again to relate to real life, a power of 746 watts is equal to one horse-power.

Now, put down the wet towel for a bit and take a rest, while we prepare you for the next bit. We are going to think about resistance a bit, but intuitively rather than in numbers. Imagine a length of wire which we can, to order, cut exactly in half. Now, somehow we measure the resistance of the wire, and call it 'X' (we don't know the proper unit yet, but X will do!) Now, cut the wire exactly at its mid-point. Commonsense says that each piece will have half the resistance of the whole, or X/2. Measure each piece, and it is so; joint them back again and we get back to X. OK so far. Now send the apprentice to the stores and tell him to draw another piece of wire identical to our first piece. It will have resistance X and be the same length as the first one. Revert to the first piece for a moment, in its two halves. If we used a battery or something to send a current down the wire we would expect the current to drop when we added back the second half, because the current has to traverse twice the length of wire — agreed? Now, take a note of the current, and let's string out the new piece of wire alongside the old and join the ends so that the two wires now act like one (we say they are in parallel). If we think about our battery, the current leaving it is going to divide equally between the two wires, and so we would expect the current to rise — intuitively we now can say with some confidence that when we put the two wires in parallel the total resistance has dropped. Our original case was "resistors in series" and the latter was for "resistors in parallel." Now you know it's true. See Fig 1a, we'll give you the formulas — for resistors in series:

Total Resistance is the sum of the individual resistors in series or  $R_T = R_1 + R_2 + R_3 \dots (1)$

For the case of the resistors in parallel, Fig. 1b, we have to end up with an answer that is less than the lowest value we have in the circuit, as we have seen intuitively:  $1/R_T = 1/R_1 + 1/R_2 + 1/R_3 \dots (2)$

Both these equations are directly derivable from Ohms Law  $E/I = R$ , so if you're a bit rusty with the sums sit down and prove them for yourselves!

For the series case, it is pure mental arithmetic: say you have three resistors, respectively twenty, thirty and fifty ohms: add 'em up and the answer's 100 of whatever the unit is! (*Ohms* — see earlier!)

For the parallel case, taking the three resistors we've just used  $1/R_T = 1/R_1 + 1/R_2 + 1/R_3$ , or  $1/R_T = 1/20 + 1/30 + 1/50$ .

If we have a pocket calculator it's child's play, otherwise we'll have to find the common denominator:  $1/R_T = \frac{15+10+6}{300}$ . It's easiest to turn it upside-down at this stage, but if you prefer to leave it till later, OK — so long as the answer comes out right! So  $R_T = \frac{300}{31}$  or 9.69 ohms. Notice, it meets our criterion that the answer to a sum of resistors in parallel is lower than the value of the individuals forming the parallel link.

So — that's it for the moment. We're just going to creep up a highway which befogs many at this stage, namely Kirchoff's Laws. Forget that, and just call it Common Sense's Laws. Kirchoff said that the sum of the algebraic currents or voltages entering and leaving a point in a circuit is zero. In other words, what arrives must go away again! If you apply Ohms Law to it, it says that the sum of the IR voltages across each resistor must equal the sum voltage of the supply. You can't lose anything about sums it up! The second of Kirchoff's Laws is stated to be: The voltage drop around any closed loop in a network is equal to zero. We say, forget it for a while, and when you find you need it, come back to it. Saves cluttering the brain!

See you next time!

# A HIGH PERFORMANCE POWER SUPPLY AND CONTROL SYSTEM FOR 4CX350/4CX250 AMPLIFIERS, PART I

JOHN H. NELSON, G4FRX

**I**N an article published in the January and March, 1981, issues of *Short Wave Magazine*, the author discussed some requirements for using the 4CX250 family of valves in high-power amplifiers, with special reference to the requirements of the power supplies. Since it was intended to build a completely new VHF amplifier using a pair of 4CX350FJ valves, which, as explained in the earlier article, are capable of quite outstanding performance, it seemed logical at the same time to design and build a new power supply and control system which would enable the potential performance of the valves to be achieved. It was also intended to provide the best possible protection for what are, after all, expensive devices, and to provide also an internal monitoring and alarm system which would alert the operator in the event of a malfunction and deal with the fault condition as appropriate.

The resulting design falls naturally into three sections, namely: the bias, relay, ALC and heater supplies, together with all control logic and alarms; the screen-grid supply, with its requirements for sinking as well as sourcing current and, concurrently, excellent short- and long-term dynamic stability; and a thyristor-controlled EHT supply for the anodes, which is stabilised to better than 0.7% regulation and variable between 500 and 2500V. This latter has a built-in "soft-start" characteristic, as well as being fully protected against untoward events in the amplifier department.

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A general view of the unit discussed in this article, showing the bolt-in feedthrough capacitors used to supply voltages into and out of the die-cast box. A ten-turn variable with miniature turns-counting dial is used for the bias voltage control, RV7.

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## Design Description

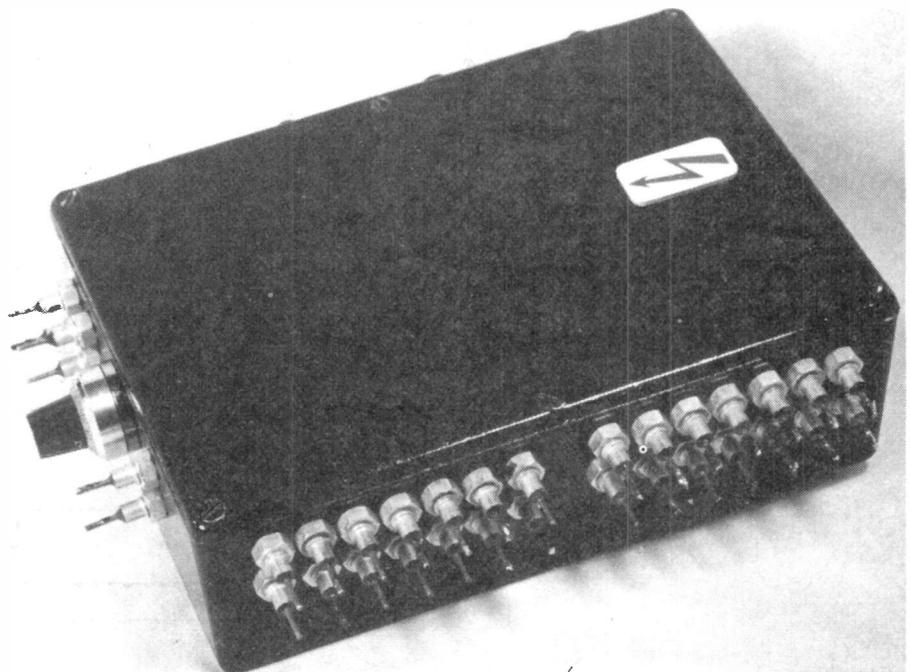
In this part of the article, the first section is considered. As may be seen from the photographs, it is housed in a standard size (170 x 120 x 55mm) die-cast box — as is the screen supply and the EHT regulatory circuitry. So the complete power supply and control unit (with the exception of the EHT transformer and its associated smoothing capacitors, which occupy a box of their own well out of the way of the main operating position) contains three die-cast boxes, a separate sub-chassis for all relays, the transformers and screen supply rectifiers and smoothing capacitors. All metering and switching, as well as all warning lamps, are on the front panel, and a photograph of the complete unit will be shown in the final part of the article.

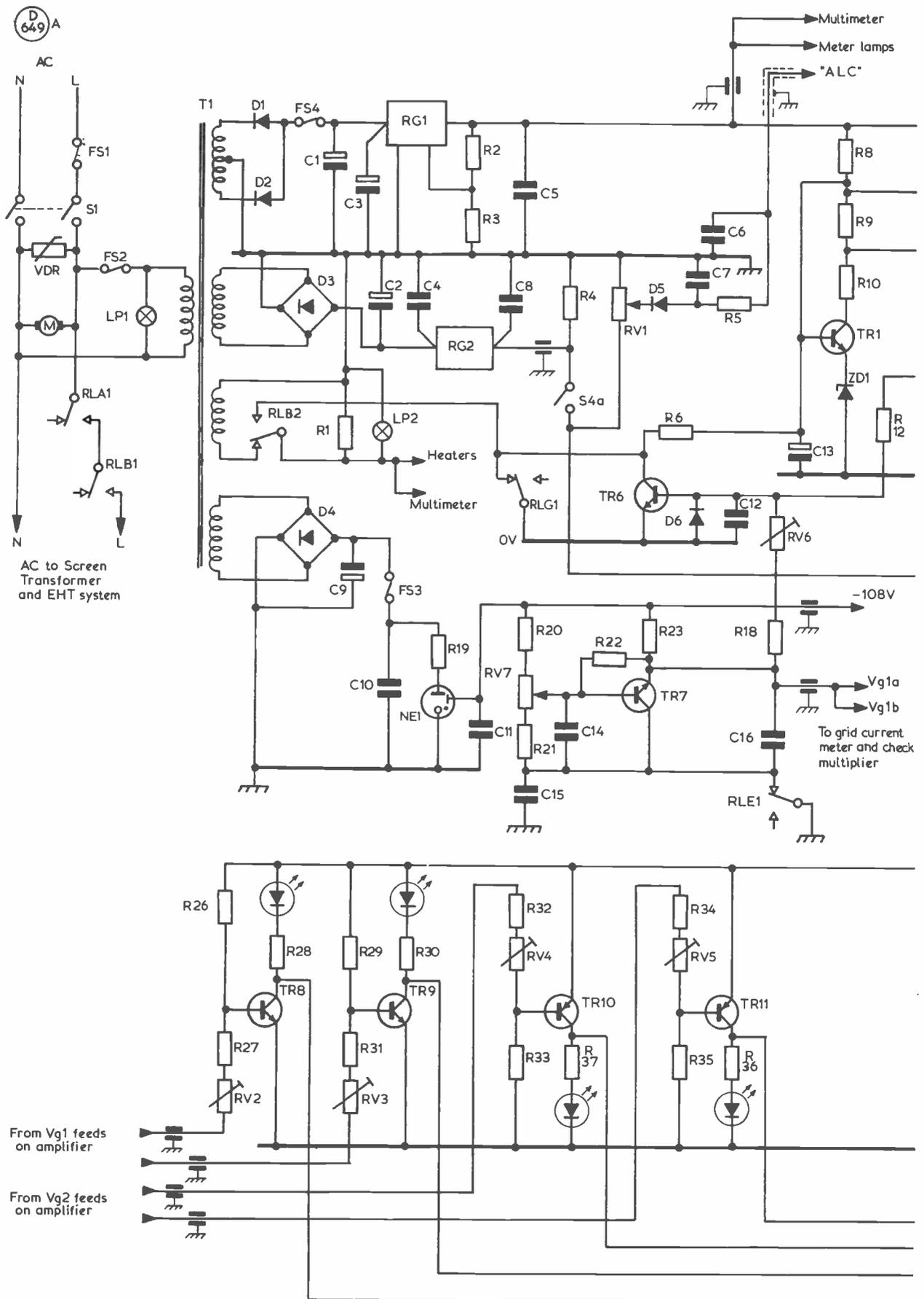
From what has been said so far, it will be evident that this design is a good deal more complex than the average amplifier power supply: and the author finds no difficulty in understanding that many existing or intending users of high-power amplifiers will dismiss the result with an incredulous snort of "over-design!". Whilst accepting that there are many less complicated ways of doing the job, the author is quite convinced that many amateur power supplies for 4CX amplifiers are inadequate; and, as the earlier article set out to show, most of the subtlety of any high power amplifier rests in the design of its power supplies. Amateurs we may be, but "chewed-string-and-sealing-wax" techniques have no place in high-power operations, ever.

So, to the charge of "over-design" the author would reply that at least the valves are being given every chance to perform at their best and live a long and uneventful life, with any fault condition being immediately detected, alarmed and the amplifier shut down in an undramatic fashion. It is also felt that the resulting quality of signal is well worth the extra complexity, bearing in mind, that, as explained in the earlier article, the radiated signal at 400W can be narrower and cleaner than most black boxes running 15 Watts!

The operational requirements of this first section were as follows:

- (a) a stabilised, variable bias supply suitable for use with the 4CX350 or the 4CX250.
- (b) a stabilised supply for the relays, control logic and alarms, etc.
- (c) a stable and variable supply suitable for the "ALC" method of power and drive control outlined in the earlier article.
- (d) full logic control of the power-up sequence, taking into account that the 4CX family of valves should not have supplies





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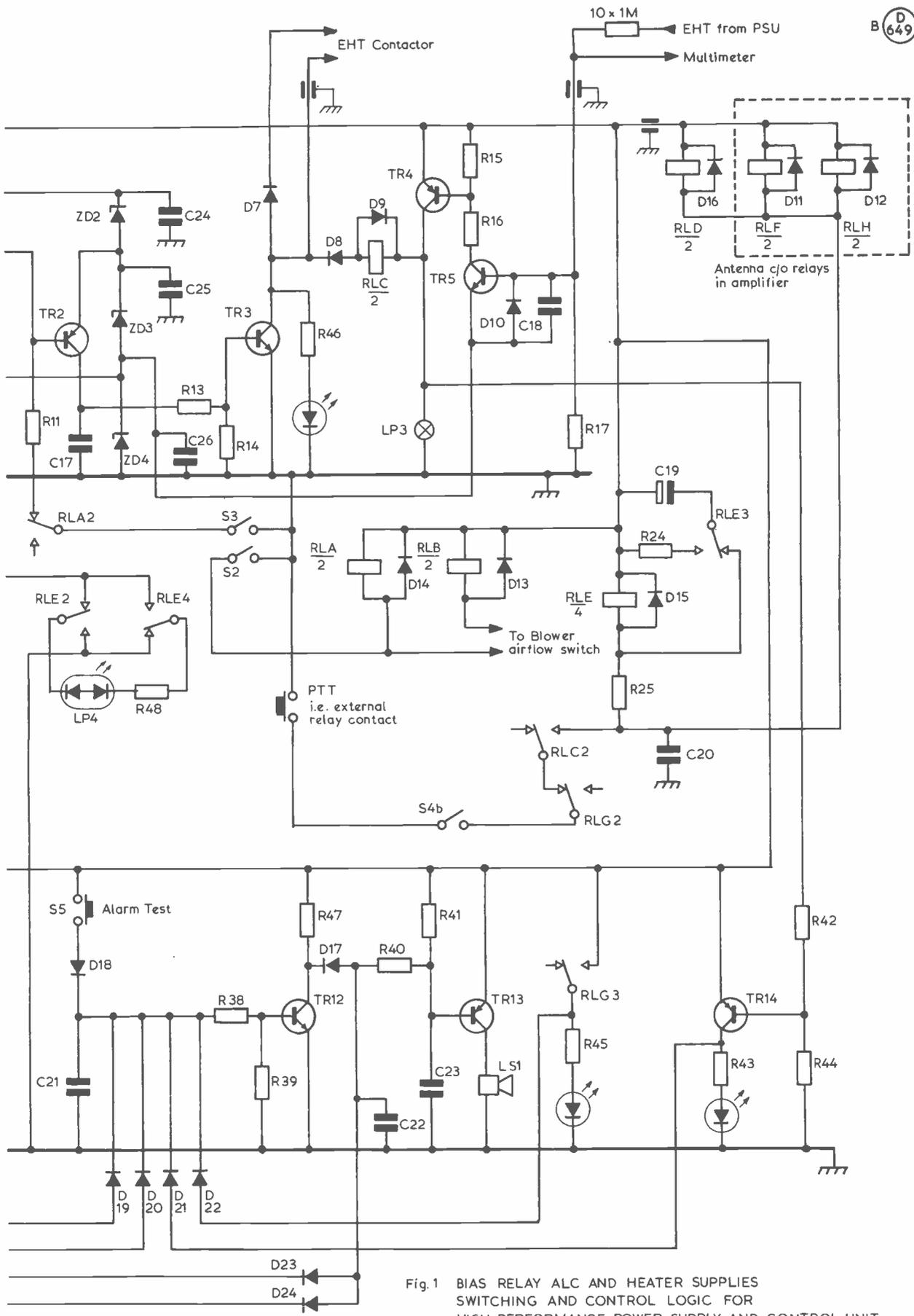


Fig. 1 BIAS RELAY ALC AND HEATER SUPPLIES SWITCHING AND CONTROL LOGIC FOR HIGH PERFORMANCE POWER SUPPLY AND CONTROL UNIT

**Table of Values**  
**Fig. 1**

R1, R27, R31, R42 = 1K	C13 = 100 $\mu$ F, tant., 10v.
R2 = 6K8	C16 = 10 nF, ceramic
R3, R13, R48 = 1K8	C19 = 47 or 100 $\mu$ F, 30v.
R4, R14, R15, R16 = 4K7	Adjust for RLE delay.
R5 = 100K	C20 to C26 = 1 nF, ceramic
R6 = 68R	ZD1 = 6.8v.
R7 = 1M5	ZD2 = 3.3v.
R8 = 470R	ZD3 = 5.6v.
R9 = 5K6	ZD4 = 12v.
R10 = 22K	D1, D2 = 1N5404
R11 = 33K	D3 = BY164
R12, R44 = 18K	D4 = BY179
R17 = 270K	D5 = 1N4148
R18 = 10K, 1W.	D6, D8 = 1N4004
R19 = adjust for correct current through NE1.	D7 = 1N4007
R20 = 6K8, 1W.	D9 to D24 = 1N4148
R21 = 1K, 1W.	TR1, TR5, TR6, TR8, TR9, TR12 = BFX85
R22 = 39K	TR2, TR4, TR10, TR11, TR13, TR14 = BFX88
R23 = 6K8, 6W. w/w	TR3, TR7 = 2N3773
R24 = 22R	RG1 = 78HG
R25 = 160R	RG2 = 7912 or 79L12
R26, R29, R33, R35 = 6K2	LP1 = mains neon
R28, R30, R36, R37, R43, R45, R46 = 2K5	LP2 = 6 or 28v., depending on heaters.
R32, R34 = 47K	LP3 = 28v.
R38, R40 = 10K	LP4 = tri-state LED, e.g. RS 586-728
R39, R41 = 2K	S1 = mains DPDT
R47 = 8K2	S2 = air-on SPST
RV1 = 1K, 10-turn	S3 = EHT-on SPST
RV2, RV3 = 10K preset	S4 = amplifier in/out DPDT
RV4, RV5 = 47K preset	S5 = alarm test, push-to-make
RV6 = 22K preset	NE1 = OB2 (uses B7G valve base)
RV7 = 5K, 10-turn	LS1 = see text
C1 = 1000 $\mu$ F, 63v.	VDR = 380v., e.g. RS 238-457
C2 = 1000 $\mu$ F, 30v.	FS1 = 13A
C3 = 1 $\mu$ F, 35v. tant.	FS2 = 1A anti-surge
C4 = 220 nF, poly.	FS3 = 250mA anti-surge
C5 = 100 nF, ceramic	FS4 = 3A anti-surge
C6, C12, C17 = 100 pF, cer.	LED's = as required
C7, C11, C14, C15, C18 = 1 nF ceramic	Feedthroughs = see text
C8 = 470 nF poly.	
C9 = 16 $\mu$ F, 250v.	
C10 = 0.1 $\mu$ F, ceramic	

Note: all relays are 24v. except RLE (12v.); RLF and RLH are antenna c/o relays in amplifier; RLD and RLG are part of screen supply. Zeners are all 500mW, e.g. BZY88 series.

switched to them for at least one minute after the heaters are powered and also the correct order of applying bias, screen and anode supplies.

(e) a fully automatic shut-down sequence for any foreseeable fault condition.

(f) audible and visual warning of the nature of any fault; this being of great use especially under contest conditions, where the well-being of the amplifier can easily be overlooked in the heat of the pile-ups and an audible alarm plus a test facility being of some comfort!

Early on in the design stage some consideration was given to the idea of fulfilling requirements *d*, *e* and *f* by a microprocessor-controlled monitoring system. This would have had some advantages, including making complete self-tuning and loading of the amplifier easily practicable, continuous monitoring of many, if not all, important amplifier and power supply parameters and the ability to select a required power level and leave the power supply to apply the optimum voltages and drive levels to achieve it. However, it seemed after a good deal of thought and discussion with microprocessor-minded colleagues that it would be a difficult system to implement, rather more

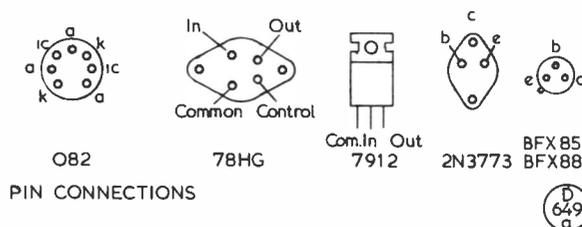
expensive than at first seemed the case and also not particularly easy to interface with the amplifier and power supply. So, rather regretfully, the author discarded the idea, although the possibilities remain very tempting. (That "self-training" clause in the licence is a wonderful thing — one imagines that a professional engineer asked to consider the possibility of controlling a pair of valves with a microprocessor would either mutter about "cost-effectiveness" or die laughing!)

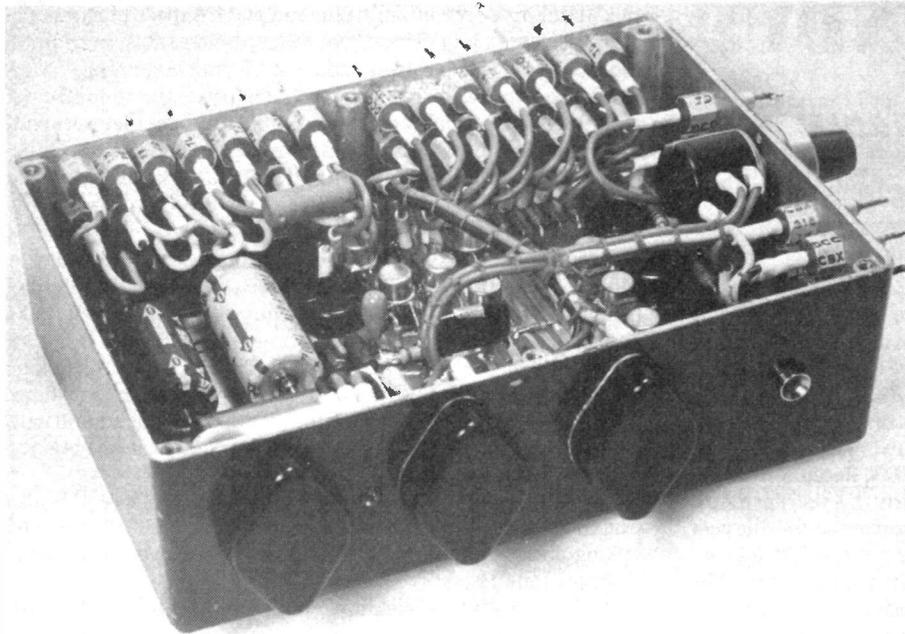
It was realised after some more thought that the heart of this particular part of the power supply could, with some modifications, consist of the design published in *Radio Communication* by A. J. Wade, G4AJW, in October 1977. Several people known to the author have built this design and, with minor changes, it performs well. It is easily possible to design other ways to achieve, for instance, the one-minute timer and the anode/screen voltage interlocking, and some time was spent with a handful of BFX85 transistors and an NE555 timer playing with different circuits; but in the end the elegance and simplicity of the G4AJW design, plus the ease of implementing it in a number of different ways and adding new bits and pieces to it, made it the selection of the core of this part of the system.

There are, of course, a few caveats. Since the author's amplifier was to use 4CX350 valves, some component values need changing around the bias supply: these are dealt with later. The 2N3055 in the original would have sufficed for the — 85V line which the author intended to use with the 4CX350, but the —150V line in the original 4CX250-based design seemed to pose too great a threat to the longevity of any 2N3055 known to the author, and a 2N3773 was substituted so as to be suitable for either valve type. Equally, the EHT contactor switching transistor TR3 is a BC184 in the original design; as G4AJW points out "... if this device fails short-circuit, the EHT will come on regardless of other conditions". It was decided early on to substitute another 2N3773 for the BC184, since the contactor available seemed to need rather more current than a BC184 could safely supply for very long and where 2.5kV is being switched then, as far as the author is concerned, the concept of "over-design" ceases to exist. The 2N3773 is rated at 16A and 140V, and the BC184 at 200mA and 30V.

It was also decided to standardise on the BFX85 wherever n-p-n transistors were required by the original design, and the BFX88 where p-n-p devices were called for — with, of course, the exception of the two 2N3773 transistors mentioned above. This is really for two reasons; the BFX85 and 88 have stood all kinds of fearful abuse at G4FRX over the years, and a fair supply was available. As can be seen from the circuit diagram, the alarm system uses these devices too, although when in use as LED drivers, for instance, this constitutes considerable overkill. At least it simplifies the spares position!

In the original design the auxiliary supply line for relays, logic and so on is not stabilised and it is not strictly necessary that it should be. However, since the author's transformer had a 27-0-27V winding and a 78HG regulator was available in the spares box, it seemed logical to stabilise the relay supply at 24V and thereby derive the benefits of a regulated supply (*i.e.* current limiting, short-circuit protection, stabilisation of voltage levels for the alarms and logic and the lamps not dimming as one switches to "transmit" and four relays pull in!). The 78HG will supply 5A quite happily, although not called upon here to supply more than an amp or so, and with resistor values as shown on the circuit diagram will supply 24V as long as the input to it exceeds 27V.





An inside view. The three devices on the side panel are the 78HG relay supply regulator and two 2N3773 transistors for the bias shunt stabiliser and the EHT contactor switch. Adjacent to the latter is its associated LED, whose function is discussed in the text. The wire-wound resistor connected between two feedthroughs in the top left-hand row is R23.

In order to produce a variable negative supply for the "ALC" line, a small three-terminal regulator of the 7912 series was used — in fact, since this supply is not called upon to provide more than a few milliamps a 79L12 100mA device would have been ample, but a 7912 1A regulator had been salvaged from some surplus equipment and was used here. It is worth noting at this point that the 78 series regulators of this style, *i.e.* those supplying positive voltages, have their heatsink surfaces connected to the centre pin of the device, which is common; this means that they may be bolted directly to the chassis. The 79 series regulators (*i.e.* the negative voltage version), although having their centre pin connected similarly to the heatsink, cannot be bolted to chassis because the centre pin on these is the input! So the appropriate mica washer and bush must be used of a 79 series device, such as the 7912 used here, and it is easy to overlook this if one is not in the habit of using them.

The 7912 provides —12V which is fed to a front-panel drive control consisting of RV1; this can with advantage be a ten-turn component, and along with a turns-counting dial on the front panel, this forms an easily resettable drive level setting system. D5 ensures that at no time can the ALC supply go positive, and R5 (which should be placed as close to the ALC output socket as possible and well decoupled) ensures a high source impedance for the ALC line. The ALC voltage is also used as the driving source for a tri-state LED on the front panel which, in conjunction with the amplifier in/out switch S4, shows that the amplifier is in circuit and in receive or transmit condition.

## Circuit

Turning now to the circuit diagram and the mode of operation, it is suggested that intending constructors first read the part of G4AJW's original article which deals with the bias supply and control logic, etc., and his "Fig. 1". It will be noted that the main changes are those detailed above, along with the addition of the alarm sensing circuits, the deletion of the original metering and the substitution of a somewhat more comprehensive metering system, the relocation of the blower to a point pre-RLA1 (so that the blower comes on immediately and is also the last thing to be switched off by the mains switch), the addition of the amplifier changeover relays, plus a facility to switch the amplifier in and out of circuit *via* S4a and S4b, and the changing of the 680K resistor feeding the base of TR1 (R7 in the present circuit) to 1.5M. This last is because in at least two cases known to the author, as well as his own when first tested, the specified one minute delay was nearer 35 seconds; it may be necessary to adjust this resistor's

value further on completion of the construction because its value must to some extent depend on leakage in C13, the exact zener voltage of ZD1 and tolerances elsewhere in the circuit. It is worth recalling that zener diodes are not exactly precision devices at the best of times, and a 7 or 8% spread of zener voltage for a specified zener current is not at all unusual.

Other changes are in the value of R18 (68K in the original, 10K in the design here to allow for the much lower bias voltage requirement of the 4CX350FJ, plus RV6 for fine adjustment of the timer reset point), and the repositioning of one or two indicator lamps, etc.; also, sundry decoupling has been added, on the basis that it can't hurt. By way of convenience when setting-up, an LED has been added between the collector of the EHT contactor switching transistor, TR3, and earth; when illuminated, this shows that the timer is reset and EHT is switched off. This LED could, if required, be on the front panel of the control unit, although its main use is when testing the various timer reset conditions. As can be seen from the photograph, it is placed next to the transistors mounted on the side of the die-cast box.

The original article gives some details of the operation of the basic circuitry, and there is little point in repeating it here; so we may now examine the alarm system. It was decided that the fault conditions to be detected were (a) failure of grid bias to either valve, or total failure of the bias supply, (b) failure of screen voltage to either valve or, again, complete screen failure, (c) screen overcurrent, and (d) EHT failure. All these faults are taken care of in G4AJW's circuit in terms of shutting the amplifier down, but the alarm system's function is to light an LED associated with each type of fault and to cause an audible alarm to sound to alert the operator to the existence of a fault; the absence of a voltage may be checked on the multi-function meter, which, as may be seen from the circuit diagram, can check each grid bias line and screen feed, EHT, heaters, ALC, relay supply and RF out. On the prototype, a small area of the 50 $\mu$ A meter scale is painted red, and the various preset variable resistors associated with the meter are set up so that, in normal use, a quick flick round the rotary meter selection switch will show the needle sitting in more or less the same place in the centre of the red area on the scale.

To digress a little, the author is a very firm believer in having separate meters for the grid and screen currents of each valve, as well as a combined anode current meter. The functions of each meter and their operational use were detailed in the article dealing with the use of the 4CX250 family.

*to be continued*

# CLUBS ROUNDUP

By "Club Secretary"

PEOPLE are beginning to take note of our up-to-date requirements at last, and as a result this month we have a pile of daunting magnitude, even though we have been through it with the pruning tools. So let's get on with it!

Alphabetical is the word this month, but first we would like to mention a specialised activity for which a club is mooted. This one is for the TV/DX buffs. The **National TV/DX Reception Group** has been holding London meetings since early this year, and now feels securely based enough to look for more members — the gear they use is varied, from a 5-in. B/W box, right through to a 27-in. full colour job which has provision for satellite reception. The idea is to get that interchange, or flow, of ideas and advice, so that members may get the best of their aspect of the hobby. Such people are asked to contact George Grzebieniak, c/o 185 Fleet Street, London EC4A, and to include a stamped addressed envelope for a reply please.

Now to the regular mail, and here our first is **Acton, Brentford & Chiswick**; they foregather at Chiswick Town Hall, High Road Chiswick, on June 16, for G3GEH to tell about the GU4GYT station he helped to set up in Guernsey.

For the first time since 1979, **Addiscombe** have put out a newsletter. From it we gather that this mainly contest club now has every Tuesday, from 2100 onwards at the "Prince of Denmark", in Portland Road, South Norwood. The Hon. Sec. — see Panel for his address — seems to write the newsletter with a delicate sense of humour; apart from the tale of their "lost" transmitter from 1972 and the reproduction of a piece which appeared in a local Welsh paper where they operated, we noted that in one contest they hired a 3.5 KVA generator which enabled them, among other things, to have a fire in the tent.

From **Barking** we hear that the gang have two rooms for their exclusive use at Westbury Recreation Centre, Westbury School, Ripple Road, Barking, which they use on four evenings each week. Mondays sees any sick rigs being worked-over, Tuesdays is Morse, Wednesdays is construction night, and on Thursdays they have the "main" meetings. June 4 is noted for G3AMF to talk about Early Days in Amateur Radio.

**B.A.R.T.G.** looks after the interests of all those who operate RTTY, whether licensed or SWL, and provides various services to members. The old objection to RTTY, of the clatter of the teleprinter, can now be got round quite easily by use of a VDU and keyboard, and of course the home computer can be persuaded to do the trick, too, if you are clever enough to write the program on the one hand and to silence the electrical noise of the computer on the other — a delicate combination of skills, to keep any brain ticking over!

At **Bishops Stortford** the gathering of the clans is on the third Monday in the month, at the British Legion Club, which lies at the top of Windhill.

Now **Bournemouth**, and here we have to recommend you to contact the Hon. Sec., as to the venue to be used; his details are in the Secretaries' Panel.

At **Braintree** the club are to be found on the first and third Mondays at Braintree Community Centre, in Victoria Street, a place which lies next to the bus station. More details from the Hon. Sec. — see Panel.

The venue for **Brighton** is 47 Cromwell Road, Hove, on the second Wednesday of the month (then we look at the programme dates, and begin to suspect it is actually a matter of alternate weeks); whatever it may be, the June 3 date is for Cdr. Hatfield to

talk about his observations of the sun and his spectrohelioscope. Then, on June 17, G5RV will be talking about aerals. In addition the club have Morse classes and an RAE course running.

**Bromsgrove** will be having an aerial party on the June 12 date, at Stoke Prior, probably connected with NFD over that weekend. On June 20, they are 'on' from Bromsgrove Carnival, signing GB2BRC, and on 30 they have a natter at the Parkgate Inn, which lies off the A448. The main meetings are at Avoncroft Arts Centre, Bromsgrove.

Over 100 members now at **Bury**, gathering every Tuesday at Mosses Community Centre, Cecil Street, every second Tuesday being the "formal" with a lecture. Thus on June 9 G8JHL talks about Meteor Scatter.

**Cambridge** are now well settled at their Hq at Coleridge Community Centre, Radegund Road, every Friday in term-time; the Visual Aids room is available for the talks, and the station is up in the Tower Room. The latest programme details can be obtained from the Hon. Sec. — see Panel.

The **Cheltenham** lot are at the Old Bakery, Chester Walk, Clarence Street, Cheltenham, where, on June 4 G3LRM will be talking about the way radio is used to be, followed by a natter night on June 19.

Wednesdays at Whitehill Community Centre is the way **Chesham** do it, with the second date each month set aside for a formal session. Changes are in the wind reading between the lines, so if you are a stranger, a quick call to the Hon. Sec. might be in order, to check the venue.

**Cheshunt** are at the Church Rooms, Church Lane, Wormley, near Cheshunt, every Wednesday evening, and they usually have something fixed up, even if it is not finalised at the time of writing.

**Chichester** are going to visit Swandean telephone exchange and Museum of Telephones on June 2 and on June 18 there is the normal club meeting, at Room 34A, Lancastrian Wing, Chichester High School for Boys, Basin Road, Chichester.

As far as the **Clifton** situation goes, we are in the dark, as they have had a move, which was indicated might be only temporary, since their last letter . . . so the answer is a call to the Hon. Sec. — see Panel.

We were amused by the reaction of the **Congleton** Newsletter editor to the absence of contributions — rather than just moan he wrote it all, and then told the rest that if they didn't like the result, they know what to do! Good for him, and we think it is a good offering well written. The group are based in Congleton Library, and now have the Lecture Theatre on the first Wednesday of each month.

**Cornish** will be meeting on June 4, for a talk on SCR's and Triacs by G3XFL. As usual, the SWEB Clubroom, Pool, Camborne, will be the venue; this is also the place where the club computer section foregather.

Back into the Midlands, to **Coventry**, where they are at Baden Powell House, Radford, Coventry, on Fridays. Details on the programme and how to find the Hq can be gotten, as our American friends have it, from the Hon. Sec. at the address in the Panel.

Sad to say, the **Crawley** newsletter has run out of dates, so we must refer you to the Hon. Sec. — see Panel.

We seem to have fallen off the **Cray Valley** grapevine of late and we are in definite need of an update — in the meantime, we can only suggest a call to the Hon. Sec. at the address in the Panel. The Hq is at Christchurch Centre, Eltham High Street, SE9.

For **Crystal Palace** the date is Saturday, June 20, at Emmanuel Church Hall, Barry Road, London SE22, at 2000. The subject is, at the time of writing, not finalised.

The **Dartford Heath D/F** gang have their base at the Scout House, Broomhill Road, Dartford. For the current dates and hunts, contact the Hon. Sec. — see Panel.

On up to **Derby** now, at 119 Green Lane, Derby, where they occupy the top floor. June 3 is the junk sale, June 10 a measurement evening (for which you are asked to bring along your rig), June 17 a talk and demonstration on Aerials from the Ground Up, and on June 24 there is a barbecue at Drum Hill,

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

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- B.A.R.T.G.: J. Binning, G3AJS, 293 Perry Street, Billericay, Essex.
- BISHOPS STORTFORD: B. J. Salt, G4ITL, 135 Kingsland, Harlow, Essex. (Harlow 0279) 20478)
- BOURNEMOUTH: G. T. Lloyd, G8GTB, 4 Gorleston Road, Parkston, Poole, Dorset.
- BRAINTREE: D. A. S. Holmes, G3JSV, Thaddeus House, East Street, Coggeshall, Colchester CO6 1SH.
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- MANSFIELD: J. M. Coates, G4GYU, 30 Abbott Road, Mansfield. (Mansfield 27257)
- MARCONI S & D.S.: V. G. Scambell, G3FWE, 52 Freshwater Road, Cosham, Hants.
- MELTON MOWBRAY: R. Winters, G3NVK, 32 Redwood Avenue, Melton Mowbray, Leics. LE13 1TZ. (Melton Mowbray) 3369)
- MEXBOROUGH: I. Abel, G3ZHI, 9 Grove Terrace, Maltby, Rotherham, Yorks. (0709 814911)
- MID-LANARK: G. Hunter, GM3ULP, 12 Airbles Drive, Motherwell, Strathclyde, ML1 3AS.
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 2AN. (021-422 9787)
- NATIONAL TV/DX RECEPTION: G. Grzbienski, c/o 185 Fleet Street, London EC4A 2HS.
- NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon EX31 2DP.
- NORTHERN HEIGHTS: M. Topham, G8NUC, 1200 Great Horton Road, Bradford. (Bradford 73271)
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- REIGATE: V. Cates, G4AVE, 13 Bolsover Road, Merstham, Redhill RH1 3NU.
- ROYAL AIR FORCE: Admin Sec., RAFARS, R.A.F. Locking, Weston-super-Mare, Avon BS24 7AA.
- ST. HELENS: P. Gaskell, G8PQD, 131 Greenfield Road, St. Helens, Lancs. WA10 6SH. (St. Helens 25472)
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- SOUTHAMPTON: P. Harris, G4BDQ, 10 Westridge Road, Portswood, Southampton SO2 1WQ.
- SOUTH BIRMINGHAM: Mrs. G. Appleby, G4GZI, 35 Denise Drive, Harborne, Birmingham 17.
- SOUTHDOWN: R. E. Holtham, G4EKS, 2 Benbow Avenue, Eastbourne, E. Sussex BN23 6AB. (Eastbourne 31620)
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- UNIVERSITY of LIVERPOOL: P. K. Jones, GW6AJK, Guild of Undergraduates, 2 Bedford Street, North, Liverpool 7.
- VALE OF THE WHITE HORSE: A. Lovegreen, 16 Church Lane, Wallingford. (Wallingford 37482)
- VERULAM: G. Dale, G3PZF, 16 Palfrey Close, St. Albans. (St. Albans 57665)
- WAKEFIELD: R. C. Sterry, G4BLT, 1 Wavell Garth, Sandal Magna, Wakefield. (Wakefield 255515)
- WEST KENT: B. P. Castle, G4DYF, 6 Pinewood Avenue, Sevenoaks, Kent TN16 5AF. (0732 56708)
- WIRRAL: G. O'Keefe-Wilson, G8VPF, 20 South Drive, Upton, Wirral. (051-677 1531)
- WORCESTER: M. Tittensor, G4EKG, 16 Durcott Road, Evesham, Worcs. WR11 6EQ. (0386) 41105)
- YEovil: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

Little Eaton. These are the main items for the month, but they are in session every Wednesday evening.

June 9 for **East Antrim** covers contest and summer activities planning, at Carnthall Hall, near Mossley.

**East London RSGB** are usually to be found on the third Sunday in each month at Wanstead House, 21 The Green, Wanstead, E11, starting at 3 o'clock. Latest details will be available from the Hon. Sec. — see Panel for his address — by the time this comes to be read.

Watling Community Centre is at 145 Orange Hill Road, Burnt Oak, Edgware, on the second and fourth Thursday of each month. June 11 combines the Construction Contest with NFD final briefing, NFD itself is being played off from a site at Cophthall Playing Fields, Hendon. This is followed by the Summer Junk Sale on June 25.

**Fareham** next, and Room 12, Portchester Community Centre, on June 3 and 17. The first date is taken up with the matter of measurements and how to use test equipment, and on 17, they extend this to the oscilloscope and how to use it and interpret it.

The **G-QRP** caters for the amateurs who are interested in the low-power activity, whether CW or SSB, HF or VHF. With over 1000 members they are becoming ever more international. Apart from the common interest in low power, there is the quality of the contents of the quarterly magazine **SPRAT**, and the evident fact that this very large group is still a "people" group.

Now to **Grafton**, and that means the "Five Bells" in East End Road, Finchley, where they are to be found on the second and fourth Fridays of each month, right through the year (which was something they could never do when using the old place).

**Guildford** had an AGM a couple of days before this was

written, so we wonder who will be the Hon. Sec. and, indeed, the newsletter editor. We hope the present incumbent keeps the latter task at least, as his versions of what happened at the previous meeting are, to say the least, entertaining as well as conjuring up clear pictures of various members. They are to be found at the Guildford Model Engineering Club Hq in Stoke Park on the second and fourth Friday evenings. We hear that room gets pretty crowded.

Now to **Havering** where we get our story straight from the horse's mouth — except that the horse is in PJ7-land and didn't give us an Hon. Sec. address! The gang are at Fairkytes Arts Centre, Billet Lane, Hornchurch on Wednesdays.

**Hereford** have a visit organised for June 5, for which details can only be obtained from the Hon. Sec. — see Panel — at this late stage. They are also going to meet on June 19 at Hq, the County Control, Civil Defence Hq, Gaol Street, Hereford, for an informal natter.

The **Ipswich** lads should by now have settled in to their new Hq at the "Rose and Crown", 77 Norwich Road, at the junction with Bramford Road, on the second and last Wednesdays in each month. Even if you don't want to attend regularly it is worth joining for the programme data on *ten* clubs in the newsletter!

Over the water now to **IRTS**, where the current piece of paper is entirely the Annual Report and Accounts for the AGM, which is probably just about closing as we write. So for anything you want to know about the amateur radio activities in Eire, contact the Hon. Sec. — see Panel.

In the **Isle of Wight** the hub of things is Unity Hall, Wootton Bridge, Isle of Wight, which we believe to be rather less than 1000 miles from the Sloop Inn. The group get together each Friday and like to have a general chinwag, or chat with visitors and new members.

Another group with an AGM is **Kilmarnock & Loudoun**, who make the Buchanan Centre, Riccarton, Kilmarnock, into their Hq on the first and third Tuesdays. Between our writing and your reading they will have had their AGM and be in the process of drawing up the programme for the next year, so we refer to you to the Hon. Sec. — see Panel for his address.

## Hamfest

Not such a familiar term in Britain as in USA, but over the weekend June 26/27/28 **Leeds** will be putting on their own version. On the Friday evening there is a Welly Disco with a prize for the best decorated pair, and an outdoor bar with time extension; Saturday sees a demonstration station, with a Hoe Down in the evening, again with an outdoor bar and time extension. On Sunday, a demonstration station, mini-rally, picnic, and entertainment for the children, to close around 1600. They have made arrangements for an overnight camping/caravan stopover, and it will all happen at Old Hall Golf Club, Woodhall Lane, Calverley, Pudsey. Tickets from Leeds Amateur Radio, 27 Cookridge Street, Leeds, are in limited supply, so apply quickly. Doubtless, the same address will be able to give you the details on the club as well.

**Liverpool** have their base in the Conservative Association Rooms, Church Road, Wavertree, on Tuesdays. They seem to have a firm programme for most of these evenings, if the earlier dates are anything to go by. Details from the Hon. Sec. — see Panel.

At **Maidenhead** the local Red Cross Hall, The Crescent, on the first Thursday and the third Tuesday evenings. Naturally, both the June dates are occupied with NFD, HF and VHF. Now, although they don't say so, this Hq is not all that easy to find — but if you are on the A4 and coming towards Maidenhead from Slough, you will find a roundabout where you can turn right on to the A308 Marlow road, leaving Aegis House to your left. As you enter the A308, keep a sharp lookout for the Crescent.

Nice to hear again from the **Mansfield** lads after a long silence; they are still at the New Inn, Westgate, on the first Friday of the month, and details of the programme are obtainable from the Hon. Sec. — see Panel.

Next we go to **Marconi Space & Defence Systems Ltd.**, at the Airport, Portsmouth. They have completed the first phase of the operation, and seem to have been able to keep the progress going; the next phase is to get the more permanent accommodation organised, set up a VHF Beacon, and make noise at other GEC outposts, such as Slough and Chelmsford. Company clubs seldom succeed, but this one seems to be going very well indeed. More details from the Hon. Sec. — see Panel.

On we go to **Melton Mowbray**, and here it seems there is a possible visit to Waltham TV station, so we must refer you to the Hon. Sec. for details.

**Mexborough** live at Harrop Hall, Dolcliffe Road, Mexborough, on Friday evenings; they seem to have a full programme of activities, to include visits, talks, RAE, Morse, attractive enough to ensure a normal attendance of about 60. If needed, G4BTS will give talk-in on S21.

**Mid-Lanark** are another 'Friday' group, based on Wrangholm Hall Community Centre, Jerviston Street, New Stevenson, Motherwell, with an Open Day on June 21 when they will have a talk-in, trade stalls, lectures, a bring-and-buy sale and a junk sale. The talk-in will be on S22 and through GB3CS. Details on this, as well as the normal club meetings, from the Hon. Sec. — see Panel.

All the **Midland** meetings are held at the Broad Street Hq now, which is a bit unfortunate since we don't have the address and Broad Street is a long one! So how to get to the Cheese and Wine Party on June 23 is a matter of contacting the Hon. Sec. — see Panel for his details.

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### Deadline for "Clubs" for the next three months —

July issue — May 29th  
 August issue — June 26th  
 September issue — July 31st  
 October issue — August 28th

*Please be sure to note these dates!*

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Down West now, to **North Devon**; the routine here is to foregather on the second Wednesday in each month; the odd months are at Pilton Community Centre, Chaddiford Lane, Barnstaple, while the even months are at Bideford Community College, Abbotsham Road, Bideford, save for August which is missed.

**Northern Heights** come next, at the Bradshaw Tavern, Bradshaw, Halifax, every Wednesday. Alternating with the ragchew evenings, we note June 10 for G3PTU to talk about SS/TV, and June 24 for a surplus sale.

**Pontefract** meet every other Thursday at Carleton Community Centre; a "special" is June 11, when G3PSM will be demonstrating new equipment. The meeting room is at the top of the Centre and, they say, the bar is on the ground floor — for safety reasons!

**R.A.I.B.C.** are now entering their 27th year of activity, and in this Year of the Disabled it is of interest to note they enrolled more members in the first quarter of 1981 than in all 1980; but sad to say Local Reps. are not being recruited at anything like the same rate. This is a very fine thing for the individual or, for that matter, club to do — and while G3LWY knows that wherever a member may be, blind or invalid, there is help at hand, it would make her life *much* easier if such help would go "on the books" so she can match things up. G3LWY's address is in the Secretaries Panel.

The **Reading** programme says the Hq is at the "White Horse" in Emmer Green, on the Nettlebed road, and they will be there on June 9 for a VHF NFD discussion, while June 25 is down for a talk on the latest techniques by *Siliconix Ltd.* who are well known for their power FETS and work on FET double-balanced mixers.

Nice to see the **Reigate** news again; they foregather at the upstairs meeting room, Constitutional and Conservative Centre, Warwick Road, Redhill. On June 16 they will be hearing G2MI talking about the QSL Bureau.

The **Royal Air Force** group write to remind us that they will be represented at Longleat again this year, on June 28, and that they will also have a station at Flowerdown Fair on July 4, so if you are in the Weston-super-Mare area on that day, drop in and see them.

**Saint Helens** have grown out of their old Hq and so have moved to the Conservative Association Rooms, Boundary Road, St. Helens, every Thursday evening.

Now **Salisbury**, who are at the Activities Centre, Wilton Road, every Tuesday, with, appropriately, all sorts of activities being organised.

Further on in the same general direction and we come to **Saltash**; they are still at Burraton Toc H, at the junction of Warraton Road, and Oaklands Drive where the booking is for the first and third Friday in each month.

Another new Hq to be mentioned next, this one being at **Southampton**; they are now at the Toc H building, Little Oak Road, Bassett, Southampton, every Wednesday. More details from the Hon. Sec. — see Panel.

Over to **South Birmingham** where the Hq is Hampstead House, Fairfax Road, West Heath; the first Wednesday in the month is the main meeting with lecture starting at 2000. Every Thursday the shack is open for an HF night and every Friday is an Open Night.

At **Southdown** the venue is the Chaseley Home for Disabled Ex-Servicemen on the first Monday in every month. The Home is to be found at Southcliff, Eastbourne.

The Scout Hut in Wilson Street, Winchmore Hill Green, London N.21 is the home of **Southgate**, on the second Thursday in the month. The June session is down for a talk on Tropospheric Scatter Systems, Mr. Dabrowski of *Cable and Wireless* being the speaker.

As an ex-member, it is great to hear that the gang at **Stevenage** is now some 72 members strong, a rise of 100% in a year. They are still at the Senior Staff canteen in British Aerospace Plant B, Gunnels Wood Road; but we don't have any indication of the dates of the meetings! So we recommend a contact with the Hon. Sec. — see Panel.

On the first and third Mondays, 34 The Waldrons, South Croydon, becomes the home of the **Surrey** lot; June 3 is to be arranged at the time of writing, and on June 17 they have an informal, with the club station on the air.

**Thurrock** book Tuesday evenings at Grays Park Hall, Orsett Road, Grays, where they occupy the top floor.

The Hq at **Torbay** is still at Bath Lane, rear of 94 Belgrave Road, Torquay; details of the meetings are not available, but we do have a mention of their Rally at ITT Social Centre, Paignton, on August 30.

**University of Liverpool** club seems to be largely interested in DX-pedition activity on VHF, but no doubt the Hon. Sec. — see Panel — can give all the gen on normal meetings.

In the **Vale of the White Horse** the date has been changed to the first Tuesday in the month, at the "White Hart" in Harwell village, at 8 p.m. in the upstairs meeting room; on June 2 they will be listening to David Evans, G3OUF, General Manager of RSGB. Other clubs are invited to attend this one. All other Tuesdays are informals.

Now to **Verulam** where the main meeting, at the Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger, near St. Albans, is held on the last Tuesday in the month. Details as to "what's on" from the Hon. Sec.

The **Wakefield** group have a two-metre D/F Hunt, starting from Holmfield House on June 2; on June 30 a pitch-and-putt contest at the same spot, and on June 16, they actually use their Hq in Room 2 for a natter and on-the-air evening. Holmfield House is in Denby Dale Road.

**West Kent** have the Adult Education Centre, Monson Road, Tunbridge Wells; June 5 takes them out to the Zone Centre telephone exchange, and on June 19 there is a Foxhunt to start from Hq.

At **Wirral** the first and third Wednesdays are taken, at the Hq in the Sportscentre, Grange Road West, Birkenhead. June 3 is NFD planning, and on June 17, the latest in electronic keyers will be discussed by G3CSG.

June 1 is the date for **Worcester**, at the "Old Pheasant" in New Street, when they entertain and are entertained by Dr. G. Alfrey, of Birmingham University, his subject being Radio Signals from the Universe.

Looking at the **Yeovil** situation, we find their Hq to be at Building 101, Houndstone Camp Yeovil, where on June 4, G3MYM will talk about the Mechanics of Ionospheric Reflection, and on 11th he changes to The Simplest 20-metre SSB Receiver. G3NOF takes over on June 18 to tell them how to work DX (and who better?), and on June 25 they have a natter evening.

Last but not least, **York**, at the United Services Club, 61 Micklegate, York. Every Friday it is, *except for the third one in each month*, and doubtless they will be well into the swing of their outdoor activities during June.

## Finis

That's the lot for this time, and quite a few will go into 'discard' before our next offering — enough said! The dates are in the 'box', and the address "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ.

## Special Event Stations

Leeds and District A.R.S. will be holding a 'Ham Fest' on **June 26/27/28**, to introduce amateur radio to the general public and allow amateur radio enthusiasts from all over the country to meet and indulge their common interest. On the Saturday and Sunday there will be a working demonstration station, and on all three days a variety of activities have been arranged to suit those people not necessarily committed to amateur radio. Tickets are obtainable from Leeds Amateur Radio Shop, Cookridge Street, Leeds, or from club PRO C. Gledhill on Pudsey 567702. **July 29**, GB2WED will be operated by Bromsgrove and District A.R.C. to celebrate the Royal Wedding Day, and each contact will receive a special QSL card. Operation will be on all bands. Full details from G4IVJ, QTHR. on receipt of s.a.e. or IRC. **August 1/2/3**, "International Weekend on the Air" to mark the International Year of Disabled People, arranged by Exeter A.R.S. which will operate stations from St. Loye's College, Exeter, on all amateur frequencies from 80m. to 10m., VHF and UHF, between 0900z and 2000z, using the calls GB2IYD and GB6IYD. It is hoped that disabled operators all over the World will contact each other and exchange greetings and QSL cards. It is suggested that stations should call "CQ IYDP from (call sign)".

# “A Word in Edgeways”

## Letters to the Editor

*The views expressed here are not necessarily those of the Editor, nor should they be taken to represent any particular SHORT WAVE MAGAZINE policy.*

*Dear Sir* — Your letters feature is but four issues old and already it reveals that we radio amateurs are no freer of the besetting national sin than the rest of our society. That sin is small-mindedness. It divides and restricts us. In our own special case, the very composition of our call-signs would seem to cause a patent narrowness; these instantly reveal our vintage and pedigree, and as instantly, in many cases, set us apart from each other.

In one issue G3JDK writes a few humorous lines concerning a ‘G4-plus-three’ tangling cross-mode with a 160-metre CW beacon; there was no malice in his letter and the occasion must have been hilarious, though his conclusion that a compulsory year on CW should be re-instated was, perhaps, a trifle heavy. (At 57 years of age, as a ship’s operator and former Regular Army telegraphist, having “pounded the brass” virtually every working day since I was eighteen, I contend that all forms of compulsion lose the honourable CW mode good friends.)

In the next issue comes a withering fire aimed at poor old G3JDK by the double barrels of G4JQO and G4KQX: it is small calibre stuff but with malice aforethought. Their ‘shotgun’ is also directed against all G3’s of the 1952 era, it seems — one would think that all the bores within our numbers derive solely from that year and call-sign block. Of course some of our very oldest members may tend to garrulity; it is the human way of things. There was no need for ‘buckshot’, Lloyd and Olivia, when a peashooter would have sufficed.

In the March issue a lady amateur, Donna, G4FID, writes a fresh and refreshing article on our hobby from the feminine viewpoint. Lo, comes a *cri de coeur* accusation from G8UXT in the May issue: his irony is much over-done and he is petty enough to pursue Donna through the pages of the call book. Is this a sign that higher education *creates* the contradictory by-product, small-mindedness? Is there some sacrifice of breadth for depth?

A larger view is expressed by John Cordeaux in the very same issue. He rightly deplores the shrillness of your April Editorial concerning Open Channel radio. Must we radio amateurs be so jaundiced in our view of the new CB youngsters? Their route to the game may have been a bit of a short-cut by our standards, but let us not be so inimical at the outset. Let us instead assist them whenever possible in a common, *larger-minded* interest.

*Reg Prosser, G4BUS*

*Small-mindedness is indeed a sin: the April Editorial was not anti the principle of CB, merely anti some CB practices and looking at one in particular (as well as criticising Government handling of the matter). Leaving aside the point that CB is still actually illegal, G4BUS implies, rightly, that one shouldn’t deplore other people’s different means to the same end just because they are different. However, the encroachment onto parts of the amateur bands by CB-ers is something which the great majority of amateurs, presumably, would agree is totally unacceptable and to be roundly condemned — Ed.*

*Dear Sir* — As a relatively new amateur operator, but an ex-professional, may I comment on the lack of use of a standard phonetic alphabet. It is often difficult enough to pick up a call-sign out of the mush, but when the operator is using some exotic concoction of his own, or none at all, the problem is considerably

aggravated. The standard phonetic alphabet was scientifically formulated to be readily understandable by all nationalities.

On an entirely different matter, if there are people interested in re-forming a Thanet club, perhaps they would contact me.

*G. Abrahams, G4KEJ,  
5 Minnis Road,  
Birchington, Kent*

*Dear Sir* — Whilst the BARTG committee (of which I am a member) was pleased to see the article on RTTY in the April issue, there are some errors which we felt should be pointed out.

The RTTY code in common use is CCITT 2; the ‘T’ in BARTG stands for Teleprinter, *not* Teletype; and BARTG membership is now handled by the XYL of G8CDW at 89 Linden Gardens, Enfield, Middlesex EN1 4DX.

*Ian Brothwell, G4EAN*

*Dear Sir* — I am prompted to write by G3OGR’s letter in the March issue of *S.W.M.* I fully agree with his comments.

I have never owned anything other than homebrew or vintage receivers, starting initially with a homebrew Top Band receiver, graduating to a CR-100 and finally ending up with a 1937 vintage HRO for which I have produced homebrew bandspread coil packs. These receivers, together with various homebrew transmitters and a twenty year-old DX-40U with outboard VFO, have given me hours of pleasure on CW on all bands. Admittedly the performance on 21 and 28 MHz leaves something to be desired, and resolving SSB is a little trickier than with a modern SSB receiver. The main point is that the most I have ever paid out for a piece of equipment is £20 — for the HRO.

There must be many people who are attracted to amateur radio but are forced away by the astronomical cost of modern factory produced equipment. Perhaps this letter will emphasise that one does not need 240w. p.e.p., digital frequency readout and all the other “goodies” which are advertised, to enjoy our great hobby.

*F. E. Jackson, G3ZMX*

*Dear Sir* — Regarding J. Mathers’ question in the April column as to what the famous and fascinating ‘Woodpecker’ might be, the answer is Russian over-the-horizon radar. This military radar has appeared on different frequencies and for varying durations, between 3 and 30 MHz. The reason why it cruises up and down the HF spectrum is because it is thought that the transmitter is connected to ionospheric sounding equipment which enables the O-T-H radar’s signal to achieve maximum propagation.

The ‘Woodpecker’ is used for detecting aircraft, rockets and missiles, and it’s been suggested that it can determine the actual shape of a detected object. As Mr. Mathers rightly says, the ‘Woodpecker’ is audible in every part of the globe — and no wonder! The ultra-powerful transmitter is estimated to be churning out between 20 and 40 megawatts, or maybe more. Reports state that the ‘Woodpecker’ is located in the area of Gomel, a town in Byelo-Russia.

The Soviets are not the only ones to possess a ‘Woodpecker’, as the British and Americans each have their own over-the-horizon radar.

*Robert Preston, Barnsley*

*Address your letters for this column to “A Word in Edgeways”, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.*

## BOOK REVIEWS

### “OSCILLOSCOPES. HOW TO USE THEM, HOW THEY WORK”

**F**EW would disagree that even the simplest oscilloscope would be a very useful addition to the test equipment complement of the average electronics hobbyist. In his preface to *Oscilloscopes. How to use them, How they work*, author Ian Hickman says his book, “. . . is for anyone who is interested in oscilloscopes, how to use them, how they work and for anyone who might be if he or she knew a little more about them”.

This 122 page book has eight chapters, the first of which is a short introduction followed by “The Basic Oscilloscope” which includes a block diagram of such an instrument and a family tree of its variants. The *Scopex* model 456 is described as a typical example. In Chapter 3, “Advanced Real-time Oscilloscopes”, the author describes the *Tektronix* model 475A in some detail as illustrating an up-market instrument, while the following section, “Accessories”, deals with probes and cameras.

Chapter 5, “Using Oscilloscopes”, contains a couple of practical examples of use — ascertaining 100Hz ripple on a power supply rail and examining the waveform produced by a TTL decade divider. Dual trace ‘scopes, *Lissajous* figures and servicing are also mentioned. Chapter 6, “Oscilloscopes for Special Purposes”, includes sections on long persistence, storage and sampling ‘scopes, time domain reflectometers, spectrum and logic analysers.

The last two chapters, “How Oscilloscopes Work”, cover the c.r.t. and the circuitry respectively, the latter being well illustrated with circuit diagrams including a Y-deflection amplifier designed by the author for use with the old 3BP1 tube. Two short appendices list c.r.t. phosphor data and oscilloscope manufacturers. The book is in glossy, soft cover format, 215 x 135mm. and contains an index.

### “ELECTRONICS POCKET BOOK” — 4TH EDITION

The reviewer has seen some lamentable publications attempting to deal with everything electronic but which have made an absolute hash of it. However, Andrew Parr’s *Electronics Pocket Book* is the complete reverse. Such has been the information revolution since the 3rd edition was published in 1976, he has completely rewritten this 4th edition.

This is an ambitious book covering a large amount of ground. Mr. Parr’s success lies in the fact that he explains everything very clearly and concisely with the absolute minimum of padding or waffle, getting down to the meat of the particular topic at the outset. The result is an eminently readable reference manual which is right up to date.

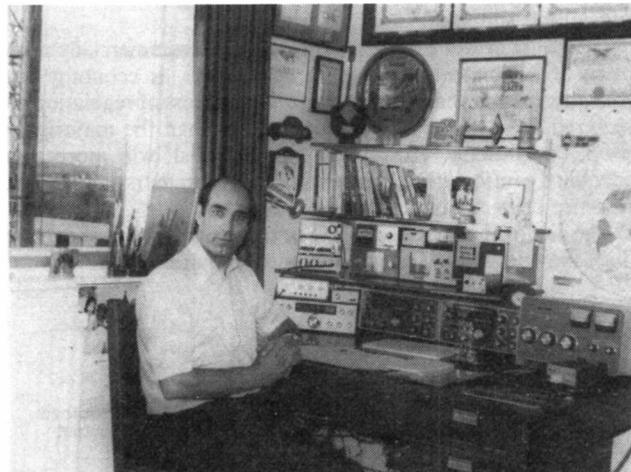
The wide scope of the book is best illustrated by listing its seventeen chapters which are:— Electron Physics, Electronic Components, Integrated Circuits, AC Amplifiers, DC Amplifiers, Oscillators, *Digital Circuits*, *Digital Computers*, *Optoelectronics*, Communications, Servosystems and Controls, Transducers, Electromagnetic Devices, Electronic Instruments, Power Supplies, Maintenance Fault-finding and Safety, and Reference Data. Those in italics are new to this edition. The book contains hundreds of neat diagrams and the ten page index is very comprehensive.

Mr. Parr is to be congratulated for compiling an absorbing and highly informative book for the dedicated amateur hobbyist and

professional engineer, alike. Indeed, it would make an acceptable gift for the budding newcomer to electronics, young or old. The *Electronics Pocket Book* runs to 350 pages and is in 186 x 122 format with glossy, soft cover.

Both books are *Newnes Technical Books* published by Butterworth & Co. Ltd., the former costing £3.85 and the latter £6.20 inclusive of postage and packing from:— SHORT WAVE MAGAZINE, Publications Dept., 34 High Street, WELWYN, Herts., AL6 9EQ.

N.A.S.F.



Pictured here is Chris Page, G4BUE, joint winner (with G3RJV) of the 1981 “Short Wave Magazine” article competition. Chris, who is a Detective Inspector in the Regional Crime Squad of the Sussex Police, was licensed in 1973 and is a member of RSGB, FOC, ARRL and the G-QRP club. He is active on all bands 1.8 to 28 MHz, exclusively CW except for the odd SSB contest. G4BUE holds an impressive selection of awards, including: DXCC Mixed (292 countries confirmed), SSB (275 confirmed) and CW (213 confirmed); also holder of Mobile DXCC No. 22 with 146 confirmed, QRPp DXCC Trophy No. 8, 200 QRPp DXCC Trophy No. 3, Milliwatt DXCC Trophy No. 3, and Five Band DXCC Plaque No. 628. His present interest is QRP CW, both rag-chewing and contesting, while on the award front he is chasing Worked All States on two-way QRP, and Five Band DXCC on QRP! Equipment is, usually, a Western DX-34 four-element tri-band beam at heights between 30 and 55 feet, Ten-Tec Argonaut 509 for QRP, and Yaesu FR-101/FL-101 combination with an SB-220 for QRO.

Subscription rate to  
Short Wave Magazine  
is £7.50  
for a year of twelve  
issues, post paid

SHORT WAVE MAGAZINE, LTD.,  
34 HIGH STREET,  
WELWYN, HERTS. AL6 9EQ

# REGULATED POWER SUPPLIES FROM THE JUNK BOX

I. D. POOLE, G3YWX

**E**ACH radio amateur transmitting and listening station usually has a good selection of spare components either left over from a previous project, bought because it "might come in useful", or just accumulated over the years somehow. These can very often be put to good use in building up useful modules for service within a larger project or use by themselves. One piece of equipment which the author is always in need of is a power supply for powering circuits which he has dreamed up with the great hope of them being just the solution to the latest problem... needless to say there is almost always some snag, even if a suitable power supply can be found. Nevertheless this does not reduce the need for suitable supplies!

Designing power supplies for use within a commercially made piece of equipment where such parameters as economy and operation over a wide voltage range without loss of regulation are required, needs far more exacting design than the majority of people may think. However a supply which will more than adequately fulfil the requirements of most amateurs can easily be designed using a minimum of components.

The aim of this article is to give two designs and also show how these may be adapted to suit individual requirements.

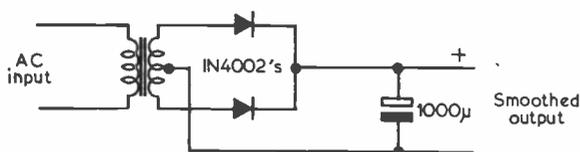


Fig. 1a Full wave rectifier with centre tapped transformer

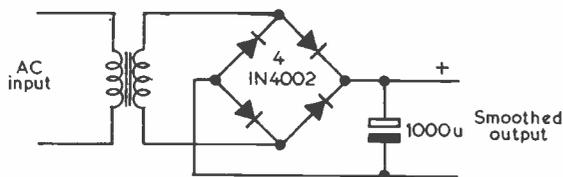


Fig. 1b Full wave Bridge rectifier

## Circuit Design

The first section is the transformer, rectifier, and the smoothing. It is usual to have full-wave rectification, because the size of the smoothing capacitor is greatly reduced compared with half-wave rectification. There are of course two types of full-wave rectification, as shown in Fig. 1; either circuit can be used, the determining factor being the type of transformer available. Off load, the smoothed voltage will be 1.4 times the off-load r.m.s. voltage of the transformer because the capacitor will take the peak voltage (see Fig. 2), and this will of course fall as load is applied. The transformer for a regulated power supply having an output of about 12 volts should be around 15 volts giving a theoretical output of 22 volts, which gives ample voltage drop across the regulator when on load and the voltage drops. The value of the smoothing capacitor will very often be determined by what is available; usually 1000µF, or maybe larger, will suit most low current applications. The calculation of the value of the capacitor depends on several factors including the amount of ripple which can be tolerated before the regulator, transformer resistance, current drawn, etc.; if the regulated output has too much ripple then the value of the capacitor can be increased. It should be noted

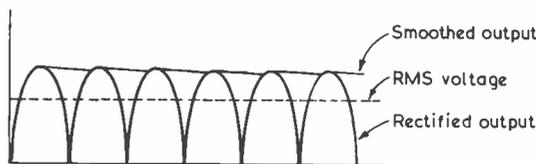


Fig. 2. Smoothed output from a rectifier circuit

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that the working voltage of the capacitor should be in excess of the minimum voltage which will be found across it, i.e. 1.4 x (the r.m.s. voltage + the regulation factor).

Two types of regulator will be described, as shown in Fig. 3. The first is an emitter follower with a zener diode providing the voltage reference on the base, the transistor just acting as a current amplifier. (As there were plenty of old germanium pnp transistors laying around it was decided to use these instead of the more common npn silicon types). It is perfectly acceptable to earth the negative side of the supply and use the positive output in the normal way, or *vice versa*, provided that both positive and negative sides of the supply do not become earthed at the same time! Owing to the base emitter drop it will be found that the output voltage is 0.2 volts less than the zener diode reference voltage, and so accordingly the zener diode should be chosen; this voltage drop is 0.6 volts for silicon transistors. The whole circuit can easily be "turned around" if silicon npn transistors are to be used.

The second type of regulator used consists of the main series regulator, TR1 and a second transistor, TR2, which compares a portion of the output voltage with the standard reference voltage generated by the zener diode and feeds back an error to TR1 so that the output voltage is maintained. Generally the zener diode is chosen to be about half the output voltage, and accordingly the trimmer potentiometer will be set about half way. With the regulator operating correctly the voltage on the slider will be about 0.2 volts above the zener voltage. This voltage is about 0.6 volts in the case of silicon transistors.

This second design is the more useful because the output voltage can be set exactly to the required voltage, giving a certain amount of leeway for the zener diode. Even though the circuit is shown using germanium pnp transistors it can just as easily be "turned upside-down" again for use with npn transistors.

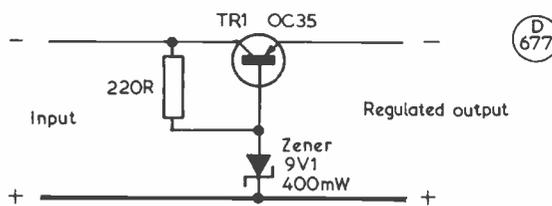


Fig. 3a. Emitter Follower Regulator

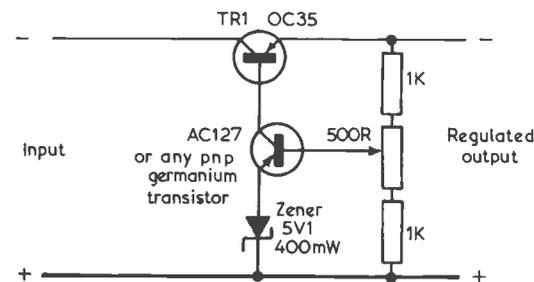


Fig. 3b. Regulator with feedback

## Conclusion

Both of these designs have been used by the author in several applications. One obvious use is in battery eliminators for thirsty transistor radios.

# VHF BANDS

NORMAN FITCH, G3FPK

## VHF Convention

**S**ATURDAY, April 11 saw the first RSGB VHF Convention to be held at the new venue, the Sandown Park Racecourse, at Esher in Surrey. It was a very easy place to find and parking, close to the building, was no problem. Your scribe arrived just before opening time and joined the long queue snaking its way to the turnstiles.

The trade exhibition area was quite spacious and it was possible at all times to get to the numerous stands without the ungentlemanly pushing and shoving needed at the Winning Post Hotel. One was hard put to find much of real interest to the VHF/UHF buff. Apart from *Cambrian Electronics*, with *Eimac* products, *Randam Electronics*, with the *Tonna* range of aerials, and *muTek Limited*, displaying assorted "front ends", antenna combiners, etc., the rest of the exhibitors were selling general components; the kind of merchandise on offer at the numerous mobile rallies on Sundays during the summer.

The event afforded an opportunity to meet a number of readers, most of whom asked, "Where's all this high technology, then?" Even so, there were plenty of essential, general components for construction projects on offer; after all, if you are building a converter for 23cm. you still need run-of-the-mill components and hardware.

The lectures appear to have been well attended although the facilities of rooms for social purposes cannot match those of a dedicated classroom. The catering facilities came in for a great deal of criticism. The reason for this was that the food and drink ran out before noon as the outside caterers stocked up for an attendance of 300 instead of the 900-odd advised by the RSGB. This communications failure necessitated panic measures to get more supplies. Furthermore, it was understood that on site restaurant facilities would be available for those wanting more than a snack, but none was open.

Total attendance was nearly 1,200, about 30% up on last year, and the provisional date for 1982 is March 18. It is proposed to use the upper ground floor for the enlarged trade show since a number of exhibitors, who would have made it a better quality show this year, were

excluded because they were slow off the mark in applying for the limited space. Geoff Stone, G3FZL, has asked that constructive criticisms be sent to the VHF Committee at RSGB HQ so that next year's convention is better.

## Awards News

Two more readers have been awarded their 2m. VHF Century Club certificates this month. No. 336 goes to Kevin Piper, G8TGM, from Pagham, W. Sussex, who was licensed in September 1979. He started off with an *Icom* IC-202 transceiver and an 8-ele. *Yagi*. Four weeks later, a *Microwave Modules* 25 watts amplifier with Rx. preamp. was added. The present station comprises an *IC-202S* and *S.E.M.* Sentinel 36w amp./preamp., the aerial being a 9-ele *Tonna Yagi* at 9m. An amplifier using a single 4CX250B valve is on the stocks with a view to some reliable MS work later on. An AMSAT member, Kevin would like to do some satellite operation and is also interested in SS/TV.

Manfred Eisel, HB9POM, from Landquart in Switzerland, receives certificate no. 337. He began in 1972 as an *s.w.l.* and got his licence in 1979. His 2m. station comprises a *Yaesu* FT-225RD running 40 watts to a 10-ele. long *Yagi*. A BF981 preamp. is used. On 70cm., Manfred uses an *Icom* IC-402 with *MM* 20w amplifier and a 28-ele. aerial. He operates through *OSCARS* 7 and 8, modes "A" and "B" and does MS work, too.

## The Brighton Conference

A great many topics were discussed during the IARU Region 1 Triennial Conference at the Metropole Hotel in Brighton, at the end of April, many of them concerned with VHF/UHF matters. Detailed reports will be published elsewhere later, but a few of the decisions can be reported here. First, concerning 2m., it was decided to define the limits of the beacon sub-band as 144.999 to 144.844 MHz, in view of the increasing number of beacons now operating or planned. To this end, the RAYNET frequencies will be phased out of general use. However, during any emergency, it goes without saying that any emergency traffic will take priority.

Next, it was formerly adopted that all repeaters with outputs on R8 — 145.800 MHz — and R9 — 145.825 MHz — be closed down as soon as possible. This becomes essential in view of the wider band width of the Phase 3B satellite, due for launch next year. Third, an *IARU Region 1, Amateur Satellite Coordinating Group* was set up following the abortive attempt to get *AMSAT-International* off the ground, previously. Ron Broadbent, G3AAJ, was appointed as Honorary Secretary, and there will be a Chairman/Convenor. Most communication will be by correspondence. The Soviet Union delegation fully supported this proposal.

Fourth, the G4ANB proposals for a world-wide QTH locator system, as outlined in this column in the September 1980 issue, were rejected. There was little interest in this from Regions 2 and 3 so it would seem that the present, familiar system will continue for a considerable time yet.

The Conference was marred by the death of Peter Balestrini, G3BPT, the immediate Past-President of the RSGB and the Society's Emergency Communications Manager, on April 30. He joined the RSGB in 1950 and had been a Council member since 1974. Peter was only in his mid-fifties. A Dutch delegate, Mr. A. H. Kokee, PA0KOK, from The Hague, also died during this conference.

## Contest News

The 144/432 MHz Contest of March 7/8 attracted only 92 entries. In the Single-op. section, the winner was G3YTE (Essex) with 1,158 points, and second place went to Geoff Brown, GJ4ICD, with 1,000 pts. The clear winner of the Multi-op. part was the Harwell Club, G3PIA/P, with 1,545 pts., with the Norfolk Club, G3ZIG/A, runner-up with 1,183 pts. The Club with the highest 2m. score was Hastings, G6HH/P.

Several contests are scheduled for June. The 7th sees the 70 MHz and S.W.L. event from 0900-1600GMT, a two section affair comprising Fixed stations in one group and all others in the other one. Usual radial ring scoring with locator and QTH exchanges. On the 27th., a Saturday, the second AGCW-DL Contest takes place from 1900-2300GMT, this being a 2m. one. The rules are as for the 432MHz event for which see page 38 of the March issue. These contests are all for single operators, by the way.

SHF folk will be QRV on the 21st for the 3rd leg of the 10GHz *Cumulatives*. At the same times, 0900-2000 GMT, the 3rd session of the Microwave Contest will take place, this leg being for 5.7GHz. VHF NFD is over the weekend July 4/5.

## DX Notes

Andrew Veitch, G8FRB, who does a lot of portable operating, is currently in France with the call F0DPZ, where he will be till around the end of July. He will spend some time in the high Pyrénées and some in the Massif Central. 2m. and 70cm. operation is planned, the times being 5 to 7 o'clock in the evenings.

In late June, Edouard Bariteau, F1CYB, Jean-Louis Maridet, F1DYD, and four other French amateurs will be in Corsica. Operation from EC square is suggested from June 28 through July 23, with ED being activated in the *Perseids* period, August. 11-13. F1DYD is the one to contact concerning MS skeds.

Kees Nieuwland, PA0NIE, passes on the news that during the first week of June, SK7NM will be QRV from JQ square on

QTH LOCATOR SQUARES TABLE

Station	23 cm.	70 cm.	2 m.	Total
G3JXN	39	81	107	277
G3XDY	30	83	120	233
G3COJ	24	74	116	214
G8HYY	22	83	141	246
G8LEF	22	62	101	185
G8FMK	15	53	62	130
G8IFT	15	34	81	130
G4CMV	14	59	157	230
G8GXE	13	57	89	159
G3PBV	12	59	104	175
GD2HDZ	12	41	83	136
G8KAX	9	41	77	127
G8HHI	6	47	113	166
G8ATK	5	56	111	172
G4ERX	5	45	92	142
G3BW	4	30	167	201
G2AXI	4	54	96	154
GJ8KNV	2	54	119	175
G8RZO	2	30	84	116
G8RZP	2	24	87	113
GJ4ICD	1	88	188	277
G8OPR	1	38	111	150
GJ3RAX	1	27	74	102
G3VYF	—	88	214	302
G3POI	—	—	300	300
SP2DX	—	—	280	280
DK3UZ	—	—	264	264
14EAT	—	25	238	263
G3IMV	—	—	252	252
EA3LL	—	15	194	209
G4ERG	—	16	186	202
G3CHN	—	—	196	196
9H1CD	—	13	178	191
GM4COK	—	12	172	184
G3SEK	—	—	182	182
G4IJE	—	—	175	175
9H1BT	—	11	163	174
G4BWG	—	38	136	174
G4IGO	—	8	165	173
G3FPK	—	—	168	168
G3KEQ	—	—	166	166
G8TFI	—	53	101	154
G4DEZ	—	—	151	151
G8JJR	—	38	108	146
G8LGL	—	25	121	146
G8MFJ	—	23	114	137
G4AWU	—	22	113	135
G8LFJ	—	24	107	131
G8KGF	—	28	99	127
G8IXG	—	—	116	116
G4HFO	—	46	68	114
G4FBK	—	5	105	110
G8VLQ	—	34	76	110
G8VR	—	3	102	105
G3FIJ	—	27	76	103
G8CXQ	—	—	96	96
G8KPL	—	7	87	94
GJ8EWM	—	25	67	92
G6UW	—	1	89	90
G4JZF	—	—	90	90
G8JAG	—	7	79	86
G4GHA	—	—	86	86
G8RMA	—	12	71	83
G8TGM	—	—	79	79
G8RWG	—	—	64	64
G8JGK	—	—	62	62
G8TIN	—	3	56	59
G8SKG	—	5	53	58
G8SVG	—	—	58	58
G4GSA	—	6	51	57
G8LXY	—	18	32	50
G4GXL	—	1	48	49
G8VFX	—	—	45	45
G8WRD	—	22	19	41
G4LDY	—	2	37	39

Starting Date January 1, 1975. No satellite or repeater QSOs. "Band of the Month", 23cm.

2m. and 70cm. SM7FJE is the chap to contact via the 20m. VHF net. Kees advises that from July 10 to 20, six Dutch amateurs will be QRV from the Principality of Monaco on 2m. SSB and CW. Skeds. can be arranged through PA3ARM, Schepersstraat 34, NL-5975 VV Sevenum, Netherlands.

From July 27 to August 8, Kees and DF5JT will be in Andorra with 500 watts on 2m. and 200 watts on 70cm. CW and SSB. They will be on the 20m. VHF net

and tropo. and MS skeds can be arranged by contacting Peter Lemken, DF5JT, at Vandalenstrasse 31, DL-4200 Oberhausen 14, Fed. Rep. of Germany. Lastly, Kees says that DR square will be activated between August 1 and 15 by PA2HKR, PA2REH, and PD0IMA on 2m. with 300w and four 9-ele. *Yagis*. Skeds via Heino Keller, PA2HKR, Engelandlaan 746, NL-2034 HG Haarlem, Netherlands, whom you can telephone from the U.K. by dialling:— 010 31 23 354011.

Looking further ahead, George Gullis, G8MFJ, says he will be in the Irish Republic September 2-12 and more information will be given later concerning bands and sites. Peter Jones, GW6AJK, the Secretary of the University of Liverpool ARS, writes that from July 10-20, they will be QRV from XO18h, 6km. SW of Glenluce on all bands up to 23cm. Skeds for the latter via 2m. The calls will be GM3OUL/P and GM8JUL/P and the team should include G4FXD, G4ELJ, G4IKK, G6AZJ, G8LGL and G8NOY.

### Scottish News

A Scots reader has forwarded some notes of activity north of the border. GM8WEF in Wick (YS) had planning problems for his aerial, living in a conservation area. He now has a 10XY up at 32ft. and fully rotatable and is on FM and SSB and working away to get his GM4 call. Present power is 10w with 40w soon once a p.s.u. is completed. Iain has already worked GM4BYF in Edinburgh and G8PHI in Co. Cleveland.

More repeaters are now on in GM. GB3AY near Patna is presently running at the reduced power of 8w. GB3HI (Mull) has been having its Rx. made more sensitive and the Tx. is only running 5w *e.r.p.* at present but an amplifier is being built to increase this to 25w. The back-up battery is being increased and, when on battery power, the Tx. will send a "B" instead of a "K". The aerial system is to be replaced by something more likely to withstand the rigours of winter. GB3SS, near Elgin, is well under way and it is hoped to have this on by the time the tourist season starts to give needed VHF coverage of the Moray Firth and A9 up to Caithness. Problems are arising with GB3HI and GB3FF (Fife) both being on R4. Quite often both can be accessed, even by mobiles on the move. A possible solution might be to have GB3FF and GB3GN (Aberdeen) change channels.

### Twenty-three Centimetres

Syd Harden, G2AXI, (Hants.) has now got a transverter for 23cm. and has made up a "JVL" loop-type *Yagi* out of odd junk box material, for nothing. A valve amplifier is under construction and should be commissioned soon to up the output to 40-50 watts. He enters all four bands now in the annual table. Bill Hodgson, G3BW, (Cumbria) now has, "... a few more watts

to tack onto the *MM* transverter but unless I increase the amount of metal outside, I'm afraid I am not going to hear anything up here". Bill asks why the 23cm. beacons aren't omnidirectional so as to be a bit more useful.

In the contest on April 4, Derek Poulter, G3WHK, accumulated 5,565 pts. from his Morden, Surrey, home QTH. Alan Bellfield, G4GLN, operated -/P from Tatsfield in that event and worked 75 stations for 10,200 pts., best DX being DK2UO around the 500km. mark. John Quarmbury, G3XDY, (Suffolk) remarks on several spells of good conditions without there being any noticeable lift on 70cm. or 2m., citing April 7 as an example. Six PAs were contacted, mostly S9-plus, and a couple of local Gs. John reports that the Tuesday activity night idea, mentioned in our March piece, seems to be quite successful. On April 21, he made 8 QSOs into the London area and Hampshire and, during the mid-April lifts, PAs and DLs in DL, DM and FN squares were worked.

Ray Cox, G8FMK, (Oxon.) has been quite active adding 11 more 1981 countries. He found the April 4 contest well supported in only average conditions and worked 21 stations, best DX being GW4LIP/P at 210km. G4ANT, (Norfolk) at 190km. was another good contact. After several, unsuccessful previous attempts, Ray finally managed to work John Lemay, G8KAX, (Essex) on April 14. Beacon PA0QHN was audible at 0600GMT on the 15th but there was nobody on. The following day, Ray worked G4KCT in York.

Tony Collet, G8XE, (Berks.) put up four *Quad Loop Yagis* for the contest, mounted at 45ft., with 4w of RF at the masthead. This produced an improvement between NW through East and enabled four new all-time counties to be added. 23 QSOs were completed, worth 1,500 pts., with G3SPJ/P in E. Sussex, GW4LIP/P, G8GDZ in W. Midlands and G4ANT in Norfolk among the longer distance QSOs.

23cm. is John Pilag's, G8HHI, (Hants.) main interest at the moment and he used his one watt to a 15-over-15 array to good effect in the contest, working G3VCT in B'rum, G3SPJ/P, G8GDZ, GW4LIP/P and G4BPO in Suffolk, for best DX. On May 2, G4ERP/P (Glos.) and G4KIY (Cams.) provided two more countries. John mentions increased power later. The April contest gave John Lemay, G8KAX, his first GW, while the activity night on the 7th provided his first continental, PA2DOL in CL03j, all with one watt of RF. John thinks the activity night idea is a fine one. The QRG is 1,296.2 MHz and the time from 2000.

### Seventy Centimetres

Both G3BW and GD2HDZ complain about the dreadful QRM they suffered for five weeks from the *Syledis* transmissions. These were centred on 432.5 Mhz with a 5

MHz bandwidth. As Bill wrote, "Why, in this technological age, a firm needs so much clatter for so long to position a rig or vessel beats me. To have to contend with a 'G Woodpecker' is nothing very funny. . ." While appreciating we are only secondary users of the 430-440 MHz band, it would be illuminating to hear from anyone connected with *Syledis* just why this system needs to take up so much spectrum space. Surely there must be more efficient ways of positioning things to great accuracy.

Dave Sellars, G3PBV, (Devon) heard very little on April 15 apart from the DJ9DL EME station, and ON5FF. An attempted QSO with PA0THT (DM) faded out. In the poor conditions of April 5, only 11 QSOs were made in the contest, with nothing north of Norwich. Dave reports equally poor conditions during the May 2/3 event, with nothing north of W. Yorks. worked, only a few relatively local Fs, plus PE0MAR.

G3XDY added three more squares in the mid-April lift with G8PNN (ZP), OZ5BZ (EP) and GM8SVB (YR). G8FMK reckons April to have been quite a good month, with five more 1981 counties added in the April 5 contest. Ray found conditions poor in this event, though, with fast and deep QSB. He made 38 QSOs. On the 14th, he worked OZ9SL (FP) and OZ2OE (EP) the latter being S9 but nothing heard on 23cm. The following day, DF3XU (FN), DK6AS (FM) and DC6MV (DK) were contacted.

G8GXE got his 70cm. signal over to GW8ELR (Dyfed) and was received by Sheldon better than on 2m. Unfortunately, he has no 70cm. Tx., so it was a crossband contact on April 3. In the April 5 contest, Tony made 76 QSOs for 334 pts. with breaks for food and gardening, but agrees about the poor conditions. Right at the end, he worked his best DX, F1CBH at 302km. On the 15th, EI9Q was at last worked with a great struggle. Tony says he might be going to XN square this June with 70cm. operation on 432.23 MHz. The most likely period would be June 19-22.

John Moxham, G8KBQ, (Somerset) has a fine UHF QTH at Windmill Hill, Glastonbury. The station at present uses a *Yaesu* FT-225RD and *MM* transverter with a selected MRF901 RF stage. The aerial is a 19-ele. *Tonna Yagi* at 65ft. but four 19-ele. *Yagis* with a W0EYE splitter are promised soon, when John will concentrate on this band. On April 15, he copied the Swiss beacon HB9F (DG40c) on 432.984 MHz but no Swiss stations were heard. However, he did work DF3XU, DD8BN (DN), DC6TY (DL), DC6MV and PA0THT. The 21st brought just PA0FRE (CL).

Jon Stow, G8LFJ, (Essex) uses only 8w to a 21-ele. aerial and in the mid-April tropo. worked OZ5GN (EQ) for a new country and square, plus three more new

squares in Germany; DF3XU, DK6AS and DG4BB in FN, FM and EN respectively, FN and FM never having been worked on 2m. Jon also says that conditions for the May 2/3 contest were awful with the Sutton Coldfield beacon weaker than usual. Chris Easton, G8TF1, (Middx.) was out portable for the two contests but reckons the May 2/3 one was poorly supported due to the concurrent 2m. event, a point echoed by GD2HDZ who wrote, "What on earth possessed the RSGB to arrange for the 2m. and UHF/SHF contests to run simultaneously? Just plain stupidity in my opinion". Terry Hackwill, G8WRD, broke his 70cm. DX record on April 15 by working DF3XU, followed by DK6AS for a new square. LA6HL (CS) appeared on the band on April 15, G8TF1 heard him and Mike Lee, G3VYF (Essex) worked Johannes.

## Two Metres

A very big postbag this month of 2m. news. Eddi Ramm, DK3UZ, (EN) has added KC square with an MS QSO in the *Lyrids* with YZ0B. Early on April 12, Eddi was copying Dave Olean, K1WHS, off the Moon, called him and got a QRZ? back. An SM4 calling Dave, with a hissing sound, heralded the big *Aurora* which netted OH5LK and 51Y (NU), UA3MBJ (SS), OH3TE/4 (NV), UA3LBO (QO), GI4KSO (WO), OH7PI (NW), OH3ML/4 (NV) and OH4UC (NV). The next night saw UA3LBO again, plus F6GIF (BI), UP2CG (MO) and UQ2, UR2 and OH.

Mike Allmark, (Leeds) lists a host of Scandinavian stuff heard in the April 11/12 *Ar*, plus many Germans in the northern squares, but, although he listened till 0615, no SPs were heard, or Russians. Another minor *Ar* was noticed around 1630 on the 20th. On the 15th, tropo. was excellent with LA6HL 40dB. over S9. GM4FNE (ZU26g) in the Shetlands was logged. G3BW made 38 QSOs on April 12, best DX in this intense *Ar* being RQ2GGS (LQ06b), UQ2GCG (LR66a), and Y22ME (HM53a). On the 19th, a mini-*Ar* gave Bill his 22nd country this year — OY5NS (WW77f) — and an all-time new one. In a short *Ar* on the 26th, LA8SJ (FT) was worked, the only other DX being OH5LK (NU) via random MS.

The mid-April tropo. did not reach G3PBV in Devon, the only DX heard on the 14th being OZ1DPR who promptly went QRT to watch the space shuttle landing! Dave mentions that Eric Woolley, GU2FRO, is now on SSB from Sark with a *Yaesu* FT-480 multimode and an 8-ele. beam. G3XDY reports low activity in the CW contest of April 26, but did work DK3UZ (EN). Bryn Llewellyn, G4DEZ (Essex) managed to work Estonia at last at 0431 on April 13 in the shape of UR2GZ (MS04b). At 0333, 59A reports were swapped with UP2BFR.

Rob Mackean, G4HAO, has acquired a 100w amplifier which has made a great difference to what he can work from home in Liverpool. The extra 10dB. usually gets an extra 4-5 S-points from the other station. On April 12, both GB3GI and GB3CTC were *Auroral*, whereas GB3ANG definitely was not. Ken Osborne, G4IGO, (Bristol) heard *Ar* signals on April 12 between 1243 and 1309, then from 1622 to 1745. GMs in XP and YP were copied at QTF 010°, also PA0KDV (DN), 3 Gs, 2 GIs, a GW and a DL at 045°. On the 19th, an *Ar* event was noted at 1634-1717 and 1809-1832 when GM3JII and GM3SWK, both in WS69, were worked at QTF 005-015°. The on the 20th, a further event occurred from 1608 to 1745 at QTF 010° initially, but shifting to 035° for the last hour. Ken worked GM4JEJ (YQ38g) and heard GMs in WS, YQ, YR and YS, plus SM4IVE (HT). The mid-April tropo. brought QSOs with several OZs, all in EP square, plus PA, ON and DL stations.

Graham Taylor, G4JZF, (Staffs.) worked an all-time new county, Tyrone, in the April 12 *Ar*, thanks to GI8TVK. The tropo. of the 14/15th saw QSOs with folk in CN, DL, DM, DN, EM and FM squares, while a PA was heard working OY stations. G8FMK missed the OZs on the 14th by being on 70 and 23cm. but the next day Ray netted LA6HL for the first ever Norwegian contact. While several strong Grampian Region GMs were heard, GB3ANG was inaudible in Thame.

G8GXE has not spent too much time on the band but did manage to work EI9Q on the 15th and to add a few more counties to the 1981 score. On April 1, G8KWX, GM8OFV and GW6AJK, operated G8JUL/P from the summit of Helvellyn in the Lake District. These University of Liverpool ARS folk used an *Icom* IC-260E, 40w amplifier and 8-ele. *Yagi* with a heavy car battery supplying the power. Stations as far away as Dorset were worked in what some thought was an April Fool's joke!

G8KBQ uses his FT-225RD with a 14-ele. *Cushcraft* 214B aerial, 100ft. a.g.l. John's 25 watts brought in PE1FMU, (CM), PE1BMD and PA2DWH, all in CM, DG2LK (EN) and GMs and GIs in WO, XO, YO, YP and YR squares on SSB in the April 12/13 *Ar*. On the 14th, several OZs were heard on tropo. but not worked due to TVI. G8LFJ missed all the *Ar*'s but lists OZs in EP, EQ and FO, and a couple of Germans in FO, plus LA6HL (CS) in the April 14/15 tropo. GM8NFG (Orkneys) was heard working Dutchmen and Jon mentions the PA, ON and DLs who were working the OYs, as does Neil Montanana, G8RWG (Surrey).

G8TF1 found QTF 015° best for working GI4GVS (XO) and GM8DMZ (XP) during the April 12 *Ar*. The tropo. on the 14th brought the first OZ of the year, OZ1CTC (EP), and the next day, LA6HL

was an all-time new one. Later on that night, GM4FTB/M (YR) was an unusual QSO. Roger Gregory, G8TIN, (Oxon.) now has a *Nag* amplifier and mentions PE1AQW/A in BN square on a North Sea gas platform, worked on the 14th.

Ken Willis, G8VR, (Kent) comments on Dave Olean's, K1WHS, fantastic *EME* aerial array in Maine. Using only a 9-ele. *Tonna Yagi*, Ken relates that his neighbour, G4IYA, recorded a "CQ" from K1WHS on April 12, during the first of the Moonbounce contests. It would seem that many, average, 2m. stations have been able to work Dave. G8VR says the *Lyrids* meteor shower peaked very briefly and other readers reckon this to have been a very poor shower. G8WRD mentions the ducting to the east on April 15 that skipped over the PAs and ONs, producing many strong Germans.

John Cooper, G8WUU, (Essex) has been busy on the band with his *FDK M-750E* and 40w *MM* amplifier, with 4-ele. *Quad* at 26m. *a.s.l.* Recent *GDX* includes GD8ODB, G8VJO (Lancs.) and G8WJA/P in Durham. John Fitzgerald, G8XTJ, (Bucks.) is somewhat restricted for aerals but the 195m. *a.s.l.* QTH in the Chilterns does help. The transceiver is the popular FT-480R, plus an *MM* 40w amplifier. GW8ELR in Dyfed was worked on April 15. GM3PXX/P (YP) was a good signal in the May 2/3 contest but John failed to raise him.

Dave Dhuglas, GM3ELV, (Strathclyde) is now QRV, all modes, from XQ67g with a 16-ele. *Tonna* beam 105ft. *a.s.l.* His nearest radio neighbour is 18 miles away! Charlie Newton, G2FKZ, reports that in the early morning *Ar* of April 13, many Russian stations were working over 2,000km. into western Europe, some QRBs of 2,200km. being mooted. The spectacular three-day *Ar* was set off by a disintegrating filament in the Sun's southern hemisphere. It rather messed up the *EME* contest by causing more-than-usual *Faraday rotation* of the signal polarization. On the 13th, the "A" index at Boulder, Colorado, reached 105 and a visible *Ar*, from California to Louisiana, a 2,000 mile arc, was reported.

On April 26, around 0830, John Hunter, G31MV, (Bucks.) and Jim Rabbits, G8LFB, (London) both heard a strong Italian-sounding station nattering away just below the *GB2RS* news broadcast frequency. At the time, there was nothing to suggest E's propagation on Band 2 FM or on 4m.

### Four Metres

G3BW now has a 4m. station again but Bill's 4-ele. beam is on the ground due to there being no room on the tower. John Baker, GW3MHW, (Dyfed) sent in his usual, detailed report and says that band activity continues to increase. He contacted EI2DJ (WN50f) in Dublin, who had borrowed EI6DT's transverter, but

### ANNUAL VHF/UHF TABLE

January to December 1981

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G2AXI	32	4	51	10	40	7	5	1	144
G8FMK	—	—	57	11	42	6	21	2	139
G8GXE	—	—	51	10	44	9	16	5	135
G8VLQ	—	—	64	14	38	8	—	—	124
G3BW	3	4	58	22	21	6	2	2	114
G8TFI	—	—	58	13	31	9	—	—	111
G3PBV	—	—	51	11	36	6	5	1	110
G8HHI	—	—	34	8	41	8	13	2	106
G8RZP	—	—	57	11	32	6	—	—	106
G8RZO	—	—	46	11	33	6	—	—	96
G3CO	14	3	39	8	22	5	—	—	91
GD2HDZ	11	2	30	11	27	8	1	2	89
G3FPK	—	—	69	16	—	—	—	—	85
G4ARI	18	2	54	10	—	—	—	—	84
G8VR	30	3	32	11	6	1	—	—	83
G3FIJ	11	2	42	9	16	3	—	—	83
G4DEZ	—	—	62	19	—	—	—	—	81
GW3CBY	9	2	39	10	15	5	—	—	80
G4JZF	—	—	59	13	—	—	—	—	72
G8KAX	—	—	28	5	20	3	10	3	69
G4FKI	20	3	20	5	16	4	—	—	68
G4GXL	—	—	51	15	1	1	—	—	68
G3VJV	—	—	53	12	—	—	—	—	65
G8JJR	—	—	36	7	15	4	—	—	62
G8TIN	—	—	40	7	12	3	—	—	62
G8WRD	—	—	30	8	16	7	—	—	61
G4HAO	—	—	48	10	—	—	—	—	58
G8RWG	—	—	48	7	—	—	—	—	55
G8WUU	—	—	46	7	—	—	—	—	53
G8SKG	—	—	39	10	2	1	—	—	52
G8XTJ	—	—	44	8	—	—	—	—	52
G8LXY	—	—	19	4	18	5	—	—	46
G8TRW	—	—	35	8	—	—	—	—	43
G8RMA	—	—	25	9	4	4	—	—	42
G6ABB	—	—	32	6	—	—	—	—	38
G4LDY	—	—	29	5	—	—	—	—	34
GM4COK	—	—	21	12	—	—	—	—	33
GM4ELV	—	—	10	3	—	—	—	—	13

Three bands only count for points. Non-scoring band figures in italics.

who is building his own. EI9Q is reported to be coming on the band soon, so, with EI6AS, that will make four EI's active. GW4HXO at St. David's, is listening on 4m. and John had a QSO with GW4HBK, (Gwent) on April 30. A licence for the Angus 4m. beacon is still awaited. It will incorporate high speed CW keying for MS studies, and this keying unit was seen by your scribe at the Convention. Brian Bower, G3COJ, says that ZB2BL will soon reinstate the Gibraltar beacon, ZB2VHF from 1200-1400 weekdays, but all day on Sundays. The 80m. net on 3,718 kHz is where 4m. devotees congregate and there is often evening activity from 1930.

### Six Metres

Brian Bower, G3COJ, (Bucks.) writes that on March 26, from 1309-1325, he heard the South African beacon, ZS1STB, located at Still Bay. He thinks that Gordon Pheasant, G4BPY, (Staffs.) may also have heard it at 1250. This is probably the first time this beacon has been heard in Europe, other than *via* TEP by SV1DH in Athens, even though it has been operating for two years.

GW3MEH heard ZS3E on 50.080 and ZS6PW on 50.034 MHz both sending beacon signals around 1500 on Apr. 29. John went onto the 10m. *SMIRK* net and raised ZS5LB who said he had this beacon on 50.105 MHz, but that was not heard at

GW3MHW. John tells that G4BPY heard FY7THF for the first time this season on Apr. 26, and ZB2VHF on the 29th. He is experimenting with a 6m. beam on a very long boom which will be put on the tower later. Regarding *SMIRK*, the Society devoted to the band, it now has over 4,000 members. Recruits pay a once-only fee of four U.S. Dollars plus a few IRC's to get the latest 6m. new sheets.

The Anglesey beacon, GB3SIX, (XN49f) on 50.02 MHz remains the sole, amateur station in the U.K. on 6m. Rumours were rife at the VHF Convention that the Home Office was about to grant a few amateurs limited facilities on the band, outside of TV hours. However, it now seems that this might not happen for a long time yet. The only *fact* which can be stated is that all U.K. Band 1 TV broadcasting has to cease by the end of 1986, if that is any consolation.

### Deadlines

That wraps it up for another month. All your news and claims for the July column by June 3 and for the August issue, by July 8, to;— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 *de* G3FPK.

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## RECEIVERS

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Lowe SRX30	£158.00	Search 9	£45.00	Search 9	£45.00
Yaesu FRG7	£189.00	F.D.K. TM56 B	£89.00	F.D.K. TM56 B	£89.00
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Yaesu FRG7700 (basic)	£309.00	SX200	£237.00	SX200	£237.00
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H.F.	
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Trio TS 130S	£491.00
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Swan Astro 150	£613.00
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F.D.K. Palm IV (70cm)	£159.00
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A.O.R. AR 245A	£178.00
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Yaesu FT 207R	£175.00
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Yaesu FT 290	£220.00

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MMC 432/28 converter	£34.90 (£0.75)
MMC 432/144S converter	£34.90 (£0.75)
MMC 1296/28 23cm converter	£32.20 (£0.75)
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Adonis MM202H (head band + up/down)	£29.00 (£0.50)
Adonis MM 202FU (swan neck + up/down)	£30.00 (£0.50)
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Trio MC 50 (dual imp.)	£24.15 (£0.75)
Shure 444D (dual imp.)	£29.95 (£0.75)
Adonis AM 502 compressor mic.	£39.00 (£0.75)
Adonis AM 802 compressor mic.	£59.00 (£0.75)

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MFJ 901	£50.95 (£0.75)
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Trio AT 230	£106.00 ( - )
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UR 67 coax 50 ohm per metre	£0.60 (£0.10)
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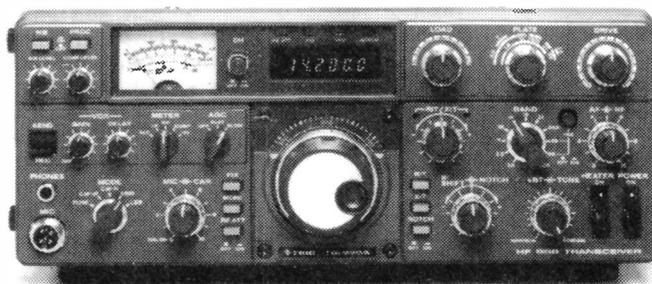
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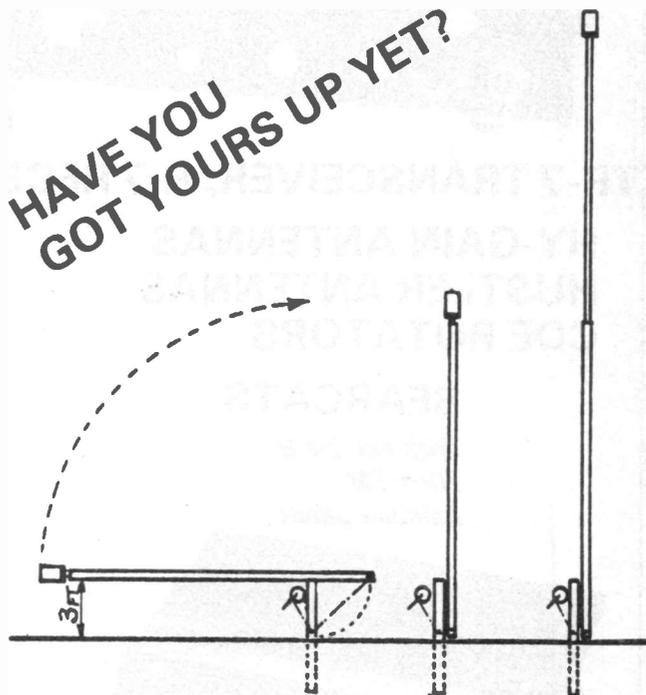
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OUTPUT FREQUENCY										
144.4 (433.2)	b	e	e	b	e	b	e	e	e	e
144.480	e	e	e	e	e	e	e	e	e	e
144.800	e	e	e	e	e	e	e	e	e	e
144.850	e	e	e	e	e	e	e	e	e	e
145.000/ROT	a	a	a	a	c	e	b	b	a	a
145.025/R1T	a	a	a	a	c	e	b	b	a	a
145.055/R2T	a	a	a	a	e	b	e	e	e	e
145.055/R3T	a	a	a	a	e	b	e	e	e	e
145.975/R3T	a	a	a	a	e	b	e	e	e	e
145.100/R4T	a	a	a	a	e	b	e	e	e	e
145.125/R5T	a	a	a	a	e	b	e	e	e	e
145.150/R6T	a	a	a	a	e	b	e	e	e	e
145.175/R7T	a	a	a	a	e	b	e	e	e	e
145.200/R8T	a	a	a	a	e	b	e	e	e	e
145.300/S12	a	a	a	a	e	b	b	b	a	a
145.350/S14	e	e	e	e	e	e	e	e	e	e
145.350/S16	e	e	e	e	e	e	e	e	e	e
145.400/S16	e	e	e	e	e	e	e	e	e	e
145.425/S17	e	e	e	e	e	e	e	e	e	e
145.450/S18	a	a	a	a	e	b	b	b	a	a
145.475/S19	a	a	a	a	e	b	b	b	a	a
145.500/S20	a	a	a	a	c	c	b	b	b	a
145.525/S21	a	a	a	a	c	c	b	b	b	a
145.550/S22	a	a	a	a	c	c	b	b	b	a
145.575/S23	a	a	a	a	c	c	b	b	b	a
145.600/R0R	a	a	a	a	c	c	b	b	b	a
145.625/R1R	a	a	a	a	e	e	e	e	e	e
145.650/R2R	a	a	a	a	e	e	e	e	e	e
145.675/R3R	e	e	e	e	e	e	e	e	e	e
145.700/R4R	e	e	e	e	e	e	e	e	e	e
145.725/R5R	e	e	e	e	e	e	e	e	e	e
145.750/R6R	e	e	e	e	e	e	e	e	e	e
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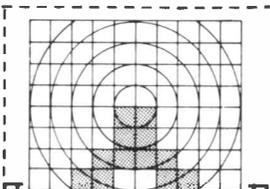
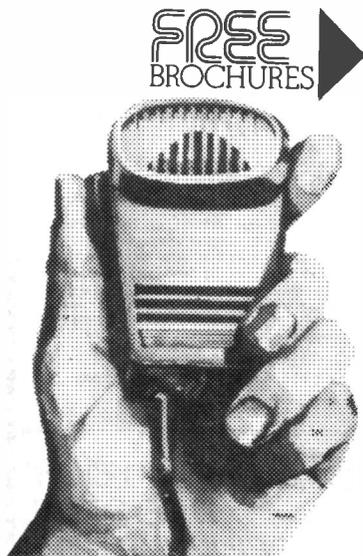


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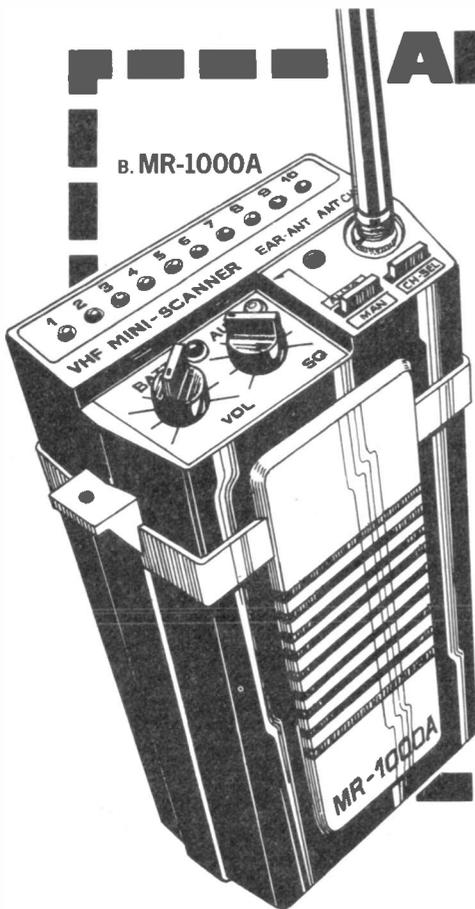
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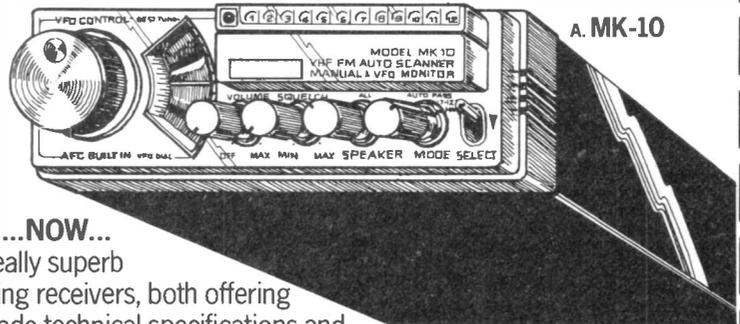
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# SOUND ADVICE – SOUND VALUE

A GOOD START is essential to short wave listening and expert advice is important in achieving this — so here's some — if you've made up your mind to buy a receiver you should be aware it will perform only as well as the antenna it sees. The old adage regarding wire antennas "As long and as high as you can" is still good, but at best is only good for PEAK PERFORMANCE on one or two frequencies, at worse none.

Whichever frequency you tune your receiver to, for PEAK PERFORMANCE on all frequencies you need good matching between your Receiver and Antenna to hear the best from it. If you plan to listen on the high frequency bands up to 30MHz then you know you can't have an antenna for every frequency! Or can you? — Well not quite! BUT we can offer you MUCH IMPROVED PERFORMANCE from your receiver by using an antenna tuning unit, that will electrically change the length of your antenna to match the frequency you select — in other words — A MATCH AT ALL FREQUENCIES.

You'll see many antennas being advertised under gimmicky names, but when it comes down to it they're only random wires or odd configurations. At the end of the day, if you're expecting the performance the manufacturers specified, then you'll have to buy an antenna tuning unit. Tell you what we'll do — we'll prove to you — we'll give you one ABSOLUTELY FREE when you buy your FGR 7700 or FRG 7700M and we'll give you complete advice on an antenna to suit your available space, which should only cost you a couple of pounds!

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30pF TX	30pF TX	40pF TX	30pF RX	20pF TX	SR RX
R0 4.0277	8.0555	12.0833	14.9888	18.1250	44.9666
R1 4.0284	8.0569	12.0854	14.9916	18.1281	44.9750
R2 4.0291	8.0583	12.0875	14.9944	18.1312	44.9833
R3 4.0298	8.0597	12.0895	14.9972	18.1343	44.9916
R4 4.0305	8.0611	12.0916	15.0000	18.1375	45.0000
R5 4.0312	8.0625	12.0937	15.0027	18.1406	44.0083
R6 4.0319	8.0638	12.0958	15.0055	18.1437	45.0166
R7 4.0326	8.0652	12.0979	15.0083	18.1468	45.0250
S8 —	—	12.1000	14.9444	18.1500	44.8333*
S9 —	—	12.1020	14.9472	18.1531	44.8416*
S10 —	—	12.1041	14.9500	18.1562	44.8500*
S11 —	—	12.1062	14.9527	18.1593	44.8583*
S12 —	—	12.1083	14.9555	18.1625	44.8666*
S13 —	—	12.1104	14.9583	18.1656	44.8750*
S14 —	—	12.1125	14.9611	18.1687	44.8833*
S15 —	—	12.1145	14.9638	18.1718	44.8916*
S16 —	—	12.1167	14.9667	18.1750	44.9000*
S17 —	—	12.1187	14.9694	18.1781	44.9083*
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				A	B
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	5	50	1.00 to 1.499MHz	£9.00	£6.00
	6	10	1.50 to 1.999MHz	£4.75	£4.20
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	9	10	4.00 to 20.999MHz	£4.55	£3.60
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