

# The SHORT WAVE Magazine

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MARCH 1983

NUMBER 1

## what is short wave radio?

Not so many years ago, an evening's entertainment for the family was to sit around the fireside, the young ones in their dressing gowns, and listen together to radio broadcasts from the BBC. With the advent of television things changed; no more was radio the single source of news and entertainment and consequently, the listening habits of a nation changed. The short wave listeners of these times still had their "shacks" full of equipment, usually located at the bottom of the garden. These were the people who were always well informed, one step ahead of the newspapers and, more often than not, the domestic service of the BBC.

Times have changed; man has landed on the moon and come back. Television although now in colour, has lost its initial aura and the short wave receiver has, with the advent of the microprocessor, become acceptable alongside the HI-FI equipment. The result is that now more people are rediscovering radio. The short wave receiver is their ticket to far away places and, again due to the

application of advanced technology, the set that now enables you to listen to the world can also be easily used to listen to Radios One, Two, Three and Four, etc. What do I mean by the term "Listen to the world"? The majority of countries world wide have radio stations, not only to broadcast to their own population but to inform others world wide of their life styles, customs and political beliefs. Many interesting programs can be heard and those beamed to us are, of course, broadcast in English.

Do not think for a minute that this is all the short waves have to offer; one can hear radio amateurs conversing — distances to them seeming insignificant. Ship's radio officers discussing matters with the owner's back in the home port, aircraft in mid Atlantic seeking out long distance weather information, in short, the world going about its business.

There's no need to worry about aerials either, your house does not have to look a miniature version of Jodrell Bank. The Trio general coverage receivers have as an included

accessory a simple length of wire which will enable you to listen immediately. In most cases, a length of wire down the garden will give good results, keep it away from trees and other buildings and the world will knock on your door.

I can hear you now saying, this is all very well but isn't a Short Wave receiver a very expensive item to buy? The answer is no, a good piece of equipment can be bought for as little as £215 and don't forget, you will have many years of pleasure from the receiver and unlike a conventional radio the equipment, if you buy wisely, will have a realistic second hand value. Of course you can pay more than £215, the two Trio receivers are priced at £391 for the superb R2000 and £244 for the simpler R600 model. For the enthusiast who wants a top notch Short Wave receiver then we have at the top of our range the NRD515 which will lift you into the professional sphere. You don't have to buy a new receiver though, we also have second-hand pieces of equipment. These items are all checked by our skilled workshop staff and each is sold with a full 3 months warranty. For a good second hand short wave receiver prices start at around £150. For more information regarding new or used equipment then don't hesitate to ring us, either here at Matlock or our London (01-837 6702) or Glasgow (041-945 2626) shops.



## LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.  
Telephone 0629 2817, 2430, 4057, 4995. Telex 377482.

ok, it was always a good receiver,  
but now with FM  
the **SRX 30D**, today's rig, yesterday's price.



- Extended coverage 200 kHz-30MHz.
- 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 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 ever better sound.
- All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.

We predict that the SRX 30D will be a landmark in low cost, high performance SWL receivers. Just consider how much you should pay for a receiver covering 200 kHz-30MHz with accurate digital readout; high performance FM 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.

**SRX 30D NOW WITH FM STILL £215.00, carr. £5.00**

From Daiwa yet another aid to operating. In addition to the notch, SSB and CW filters, the AF606K is equipped with a PLL tone decoder; when the tone frequency of the CW signal and the free running frequency of the PLL tone decoder are the same a locked signal is generated. This locked signal keys an audio oscillator which then reproduces the received CW signal. However, there is a tremendous difference between the produced signal and the received one — no noise and, of course, no fading. **ANOTHER PIECE OF EQUIPMENT TO ENHANCE YOUR LISTENING.**

**AF 606K** £56.50 inc. VAT, carr. £5.00



we now stock the **vibroplex** range of morse keys

THE VIBROPLEX IAMBIC — PRESENTATION £92.50 — DELUXE £62.18 — STANDARD £49.20, THE BRASS RACER EKI £99.00  
THE BRASS RACER IAMBIC £66.50, THE PRESENTATION £99.50, THE ORIGINAL — DELUXE £66.50 —  
STANDARD £53.20, THE VIBRO-KEYER-DELUXE £62.18 — STANDARD £49.20 ALL INC. VAT CAR. £5.00

FOR THE ENTHUSIAST THESE PRODUCTS REQUIRE NO MORE DISCUSSION  
FOR THE NOVICE "VIBROPLEX" IS NOT A MARITAL AID



Now from Daiwa, a new 2 metre monitor receiver. Using PLL synthesized circuitry, the SR1000E covers the entire amateur band in 5 KHz steps. It provides for today's amateur a small convenient means of monitoring activity on the busy 2 metre band. Compact and supplied with earphone, mounting bracket, the SR1000 provides for you mobile or fixed your contact with the 2 metre band.

**SR 1000 E** £72.50 inc. VAT, carr. £2.25

**LOWE IN LONDON,** Open monday to saturday, six days a week  
lower sales floor, Hepworths, Pentonville Rd, London. telephone 01.837.6702  
**LOWE IN GLASGOW,** Open tuesday to saturday  
4,5 Queen Margarets Rd, Glasgow. telephone 041.945.2626



**TR3500****COMPACT SIZE AND LIGHT WEIGHT**

Measures only 66W x 168H x 40D mm with a weight of 540grams including Ni-Cd battery pack.

**LCD DIGITAL FREQUENCY READOUT**

Easy to read in direct sunlight, or in the dark. Virtually no current drain (much less than LED's). Displays transmit and receive frequencies and memory channels. Display includes four "Arrow" indicators: "F. LOCK" (Frequency Lock), "REV" (Repeater Reverse), "PROG. S" (Programmed Scan), "MS" (Memory Scan).

**TEN CHANNEL MEMORY**

Nine memories may be operated in simplex mode, or with transmit frequency offset permitting access to repeaters.

**LITHIUM BATTERY MEMORY BACK-UP**

No loss of memory in case of complete discharge (or removal of the Ni-Cd batteries. Current (approximately 1 microampere) to maintain memory supplied by built-in separate lithium battery, with estimated life of more than 5 years.

**MEMORY SCAN**

Scans only those channels (maximum 10) in which frequency data is stored. Stops on "Busy" channel, resumes scan automatically approximately 2 seconds after signal goes off, or when "MS" key is pressed. The "STOP" key or the PTT switch may be used to cancel the scan function. LCD displays memory channel number and "MS" arrow while memory scan in use.

**PROGRAMMABLE BAND SCAN**

Scan bandwidth (lower and upper frequency limits) and scan steps of 5kHz and larger (5, 10, 15, 20, 25 kHz, etc.) may be programmed. Scan automatically locks up on busy channel and resumes approximately 2 seconds after signal goes off or when "PROG. S" key is pressed. "STOP" key or PTT switch cancels scan function.

**UP/DOWN MANUAL SCAN**

UP/DOWN manual scan in 5 kHz steps.

**FREQUENCY COVERAGE**

Covers 430.00 — 439.995 MHz in 5 kHz steps.

**STONE BURST SWITCH**

The TONE BURST switch activates the 1,750 Hz repeater access tone oscillator.

**TX OFFSET SWITCH**

Selects simplex or repeater operation (operator pre-programmes repeater OFFSET MAX  $\pm 9.995$  MHz).

**HI/LOW POWER SELECTION**

HI/LOW power output switch allows operation at 1.5W or, for extended battery life, 300 mW.

**REVERSE OPERATION**

"REV" switch shifts the receiver to the transmit frequency, and the transmitter to the receive frequency. Useful for checking signals on the input of a repeater, to determine if you are within simplex range.

**AUTO/MANUAL SQUELCH**

Selector switch on threshold control allows selection of automatic or manual squelch operation.

**BATTERY INDICATOR**

LED battery condition indicator flashes when battery charge level approaches nominal discharged battery potential.

**TWO "LOCK" SWITCHES**

"F. LOCK" switch prevents accidental loss of chosen frequency when in "LOCK" position. "TX. STOP" switch prevents accidental transmission if PTT switch is accidentally pressed in handling.

**BNC ANTENNA TERMINAL**

Allows antenna changeover to be quick and easy.

**ACCESSORIES INCLUDED**

- Flexible rubberised antenna with BNC connector.
- 400 mA Ni-Cd battery pack.
- AC charger.
- Plug for external microphone and speaker.
- Hand strap.

**“compatible”**

the two metre &  
seventy centimetre  
handhelds from  
Trio.

TR2500 £220.80 inc. VAT, carr. £5.00

TR3500 £238.51 inc. VAT, carr. £5.00

PRICES AND SPECIFICATION SUBJECT TO CHANGE WITHOUT NOTICE.

# LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.

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## GREAT NEWS

### THE ACTION PACKED PCS 4000 !

**£229**



- A choice of either 25 or 5 watts output
- 2 banks of 8 memories each with priority
- Choice of 12½ or 25 KHz steps. 144-146MHz
- Back lighted touch button freq. control
- Comprehensive programmable scanning
- Reverse repeater, tone-burst & 600KHz shifts
- Sensitivity better than 0.2uv
- Dimensions 2" x 5.5" x 6.8"

IN STOCK NOW !

We have never seen such an advanced rig. If you want further details about the many features, send S.A.E.

## **FDK** 2M ALL MODES—NOW EVEN GREATER VALUE



**M750X**

**NEW**

- Full coverage 144-148MHz in 5kHz and 100Hz steps
- High quality USB, LSB, CW, FM for base or mobile
- Power output 10 watts switchable 1 watt on all modes
- Receiver sensitivity better than 0.3µv/20dB and 0.15µv/10dB
- Dual programmable VFO's, 600kHz shift, automatic tone burst
- Automatic scanning and up/down frequency microphone control
- Complete with mic, mounting brackets and DC leads, etc

**£269!**

Carriage free

FULL FACTORY WARRANTY

**NEW**

### MIZUHO SB2X 2M SSB PORTABLE



- 144-25-144-35MHz VXO frequency control
- 2m SSB/CW internal battery powered portable. 0.2w output
- Receiver sensitivity better than 15dB for 0.5µv
- Built-in microphone with optional external mic socket
- Noise blanker circuit and built in CW key
- BNC aerial socket/ headphone socket/ external psu socket.
- Base station performance from a pocket portable

**£89!**

**NEW**

### FDK ATC720 AIRCRAFT MONITOR



- 118-136MHz AM portable aircraft monitor
- 25kHz steps controlled by thumbwheel switch
- Sensitivity better than 1 microvolt
- Internal long lasting rechargeable ni-cad battery pack
- Plug in helical whip and external earpiece socket
- Auto tracking front-end tuning for good image rejection
- Supplied complete with AC charger and aerial

**£129**

plus free list of UK airband frequencies.

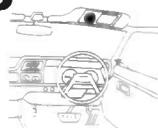
**NEW**

### ADONIS MOBILE SPEAKER

**£15.95**



Carriage £1.00



- Ideal remote speaker for mobile operation
- 8 ohm impedance. Ultra slim construction
- Includes "magic" memo pad
- Fits onto sun visor with special velcro straps
- Makes mobile copy much easier and more enjoyable

**NEW**

### AIRBAND BASE/MOBILE MONITOR CD-6000



**£89.95**

Carriage £1.50

- 110MHz-139-995MHz in 5kHz steps
- Covers all AM channels including beacons
- Clear LED digital readout display
- Sensitivity better than 0.5µv for 10dB
- 12v DC power requirement. 400mA
- Automatic scanning facility. Built in speaker
- Complete with mobile mounting bracket and DC cable

MAIL ORDER SLIP to: Waters & Stanton Electronics, Warren House, Main Road, Hockley, Essex.

Name ..... Goods required .....

Address .....

Please rush me the above. Cheque enclosed for £...../Please charge to credit card No.....

# DATONG

## TONE SQUELCH UNIT MODEL PTS-1

Model PTS-1 is ideal for Raynet groups, club nets, or groups of friends who wish to monitor for each others signals over long periods. Designed to wire-in to the microphone and loudspeaker lines of existing FM or AM transceivers Model PTS-1 provides a second independent squelch system. The squelch operates only when the incoming signal carries a prearranged tone of precisely the correct frequency. Thus two transceivers, each fitted with Model PTS-1, will respond only to each others transmission protecting the user from undesired interruptions. Sixty-four tones in the range from 1747 to 2330 Hz are selectable by a DIL switch and a built-in notch filter removes the tone from received signals.



PTS-1 £39.99 with VAT £45.99

## AUDIO FILTERS MODELS FL2, FL3, FL2/A

Model FL3 represents the ultimate in audio filters for SSB and CW. Connected in series with the loudspeaker, it gives variable extra selectivity better than a whole bank of expensive crystal filters. In addition it contains an automatic notch filter which can remove a "tuner-upper" all by itself. Model FL2 is exactly the same but without the auto-notch. Any existing or new FL2 can be up-graded to an FL3 by adding Model FL2/A conversion kit, which is a fully tested auto-notch module in P.C.B. Form. Datong filters frequently allow continued copy when otherwise a QSO would have to be abandoned.



Prices: FL2 £78.00 with VAT £89.70, FL3 £112.50 with VAT £129.37, FL2/A £34.00 with VAT £39.67

## MORSE KEYBOARD MODEL MK

As well as looking terrific, Model MK brings some very useful features to enhance your CW operating. Its four 64-character memories allow auto-repeat and any number of programmed pauses per message. It includes all normal characters (including accents) and the "merge" key lets you make up specials. The four colour key-board features individual click action switches beneath a tough wipe-clean surface and a buffer memory automatically converts indifferent typing to perfect morse. All this, and it runs for up to a year from four internal pen cells (not supplied).



MODEL MK £119.50 with VAT £137.42

## COMPACT RECEIVING ANTENNAS MODELS AD270/370

Datong Active Antennas solve the age-old problem of finding space for a 'good' receiving aerial. Model AD370 mounted on a roof top or Model AD270 in a loft will give similar sensitivity to much larger conventional aerials yet are only 2 1/2 and 3 metres long respectively. Moreover they do not suffer from interference picked up by the feeder cable, such pick-up can be a problem with conventional dipoles because it is hard to maintain good balance over a band of frequencies.



Although active antennas were introduced to the amateur market by Datong only a few years ago they have long been used by military and commercial receiving stations. The performance specifications achieved by the Datong AD270/370 are very close to those of "professional" active antennas selling for ten times the price - a point which is not lost on our many professional customers. The advanced design ensures two things: that you don't miss signals through inadequate sensitivity and that the antenna does not invent signals which are not there. Datong Active Antennas represent an advanced solution to a common problem and so far as we know have no serious competition in terms of performance at the price. (Reviewed in Rad. Com., June 1982).  
AD270 £41.00 with VAT £47.15 AD370 £56.00 with VAT £64.40

## GENERAL COVERAGE RECEIVER CONVERTER MODEL PC1

Once upon a time it was the norm to use a ten metre receiver to receive the two metre band. Now, large numbers of special purpose two metre SSB rigs are in use and conversion the other way becomes a very attractive possibility.

With the addition of Model PC1 each of these two metre SSB rigs becomes a really good general coverage receiver (from 50 kHz to 30MHz!). Two metre SSB rigs are not cheap and it makes good sense to get the most out of them. They also tend to have very good performance in terms of sensitivity, selectivity, and big signal handling. Each of these features is just as vital for short wave reception and Model PC1 is designed not to degrade them at all. The result, your two metre SSB rig receives below 30 MHz as well as it receives on two metres. And compared to many medium cost general coverage sets, that is saying a lot! Try this test. Listen on twenty metres after the band goes dead in the evening. With many general coverage receivers the band never dies. It remains populated with phantoms generated by the receiver from the many very strong signals on forty metres. This is the kind of effect that the higher quality receivers minimise, and that goes for PC1 plus a good two metre rig. Reviews: Rad. Com., April 1982.

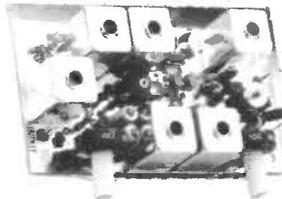


MODEL PC1

PC-1 £119.50 with VAT £137.42

## HIGH PERFORMANCE 2 METRE CONVERTER MODEL DC 144/28

Again strong signal performance is the key to the design of Model DC144/28. Where conventional converters use a dual gate mosfet as a mixer, the Datong uses a balanced pair of Schottky diodes fed with nearly 10 mW of local oscillator at 116 MHz. Where other converters use open wound coils, the Datong coils are in screening cans on a plated through board.



The result: an unusual freedom from spurious signals and overload effects together with a spurious-free dynamic range of 90 db. As the Rad. Com. reviewer wrote "With a 3 db noise figure and 90 db dynamic range the Datong DC144/28 is one of the best 144 MHz converters currently available". Rad. Com., April 1982. Model DC144/28 is available either as a tested PCB module, as illustrated, or fully cased in a diecast aluminium box.

DC 144/28 £34.50 with VAT £39.67



ALL DATONG PRODUCTS ARE DESIGNED AND BUILT IN THE U.K.

## PRICES

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

FL3	112.50	(129.37)	AD370	56.00	( 64.40)	Codecall	
FL2/A	34.00	( 39.67)	AD270+MPU	45.00	( 51.75)	(Linked)	28.00 ( 32.20)
FL1	69.00	( 79.35)	AD370+MPU	60.00	( 69.00)	Codecall	
FL2	78.00	( 89.70)	MPU	6.00	( 6.90)	(Switched)	29.50 ( 33.92)
PC1	119.50	(137.42)	DC144/28	34.50	( 39.67)	Basic DF System	149.00 (171.35)
ASP	72.00	( 82.80)	DC144/28			Basic Mobile	
VLF	26.00	( 29.90)	Module	28.00	( 32.20)	DF System	159.00 (182.85)
D70	49.00	( 56.35)	Keyboard Morse			Complete Mobile DF	
D75	49.00	( 56.35)	Sender	119.50	(137.42)	System	214.00 (246.10)
RFC/M	26.00	( 29.90)	RFA	29.50	( 33.92)	PTS1	39.99 ( 45.99)
AD270	41.00	( 47.15)					

See previous advertisement or price list for further details

Data sheets on any products available free on request - write to Dept S.W.

**DATONG ELECTRONICS LIMITED**  
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On many regular priced items for an invoice over £120 we provide *free finance*, 20% down (balance over 6 months) or 50% down and the balance over a year; *you pay no more than the cash price*. Where this service is not available we have taken the worry out of finance— enter a personal loan agreement — remember the deposit can be as low or lower than your monthly instalments — for 12 months to 3 years (at a typical APR rate of 31.8%) and in the event of sickness, accident, compulsory redundancy or death *your credit is covered by SMC*. If you have Access, Barclay or Bankers card, or a UK call sign and you bring your licence with you, or it appears in the call book, it's *INSTANT*.

Should you need a radio repaired, remember we have our own expert 10 man service department, equipped with over a hundred thousand pounds of spares and test equipment, and as the importer of most of our merchandise we are in daily contact with the manufacturer.

We are proud to be the largest representative in Europe of Yaesu Musen of Japan who produce the most diverse line of amateur radio equipment in the world. With them, communications is their only business not a sideline, thus they provide you with premium products at the forefront of technology.

We are also proud to be chosen as UK representatives by such fine manufacturers as The Japan Radio Company, KDK, Nag, Hansen, Kenpro, TTE, Leson, Telewand, Engineer, Comet, Fitlay, and Hokushin of Japan, plus HyGain, CDE, Gem Quad, Channel Master, Mirage, ETO, Dentron, MFJ, Van Gordon and KLM from the Americas.

The items illustrated here form only a tiny fraction of our range: 200 stock lines of Yaesu Musen equipment, 600 different antennas, masts, rotators, coaxes, etc., etc., plus 300 general items of communications equipment, selected as offering the best value in the world from: Jaybeam, Mini Beam, G4MH, Mosley, G-Whip, Bantex, Ascot, Strumech, Microwave Modules, JIR, Bearcat, Delica, Ashidavox, Hi Mound, ICS, Datong, RSGB publications amongst others.

We trust the outline of our services, recommendations from another amateur (aspiring or veteran) or a visit to your nearest SMC store will convince you to give us a chance to serve.

**SMC, your single stop source.**



### 12 MEMORY RECEIVER:— FRG 7700M; £399 inc. VAT @ 15% & SECURICOR

- ★ 30MHz down to 150kHz (and below).
- ★ 12 Channel memory option with fine tune.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2.7kHz, 6kHz, 12kHz, 15kHz, @ - 6dB.
- ★ 3 Selectivities on AM, squelch on FM.
- ★ Up conversion, 48MHz first IF.
- ★ 1kHz digital, plus analogue, display.
- ★ Inbuilt quartz clock/timer.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500Ω to 1.5MHz, 50Ω to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Switchable A.G.C. Variable tone.



**'7700 THE ONE WITH FM!**  
Non memory version £335

- ★ 110 and 240V ac, 12Vdc option.
- ★ Signal meter calibrated in "S" and SIMPO
- ★ Acc; Tuners, Converters, LPF, Memory.
- ★ **FRT7700**; 150kHz-30MHz, Switch, etc.
- ★ **FRV7700A**; 118-130, 130-140, 140-150MHz.
- ★ **FRV7700B**; 118-130, 140-150, 50-59MHz.
- ★ **FRV7700C**; 140-150, 150-160, 160-170MHz.
- ★ **FRV7700D**; 118-130, 140-150, 70-80MHz.
- ★ **FRV7700E**; 118-130, 140-150, 150-160MHz.
- ★ **FRV7700F**; 118-130, 150-160, 170-180MHz.
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- ★ **FRA7700**; Active Antenna.

### JRC COMMUNICATION RECEIVER NRD515 £985 inc. VAT @ 15% SECURICOR

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- ★ Backlash free, 10kHz rev, 500Hz analogue calib.
- ★ Fast tune up/down switch, dial lockout.
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- ★ Passband tuning ±2kHz for SSB and CW.
- ★ Variable BFO on CW for preferred tone.
- ★ Modular plug in design with mother board.
- ★ High reliability — low power schottky & CMOS.
- ★ Designed for maximum ease of operation.
- ★ Noise blanker, 0- 10- 20dB attenuator.
- ★ Small (140 x 340 x 300mm), light 7½kg, rugged.



**PROFESSIONAL MONITOR**

- ★ Up conversion, 70.455MHz and 455kHz.
- ★ No R.F. amplifier, balance U310 mixer.
- ★ Crystal filter before first IF amplifier.
- ★ Transceiver provisions; mute, trip, etc.
- ★ Frequency data input/output port.
- ★ **NHD518** 96 (4 x 24) channel memory unit.
- ★ **NCM515** Remote frequency keypad, LCD readout. Up/down step tuning, 4 chan. memory.
- ★ **CQE515** Junction unit (NCM515 to NHD518).
- ★ **NVA515** External 3W speaker.
- ★ **CFL260** 600Hz mechanical filter.
- ★ **CFL230** 300Hz crystal filter.

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- ★ 80-10 metres including WARC allocations.
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- ★ 100W PEP output. (10W "S" version).
- ★ No tune design — inbuilt SWR meter.
- ★ Only 3 1/4" x 9 1/2" — Less than a foot deep!
- ★ Dual selectable pulse width noise blanker.



**FT77 £475 inc.** VAT @ 15% & SECURICOR

**★ NEW ★**



ALL BAND MULTIMODE

FT77	Transceiver 100W output	£475.00
FT77S	Transceiver 10W output	£399.00
MARK7	Crystal Marker board	£7.65
FMU77	FM Unit	£23.75
XF8.9HC(N)	600Hz or 300Hz (N)	£24.90
FV707DM	Digital Memory VFO	£203.15
FC707	Antenna Tuner	£85.10
FP707	Mains P.S.U.	£112.50
FTV707	Transvertor, frame only	£90.00
Modules:	432...£185. 144...£100, 70...£80.00	



**FT707 £509 inc.** VAT @ 15% & SECURICOR

**THE SMC FM VERSION AVAILABLE**

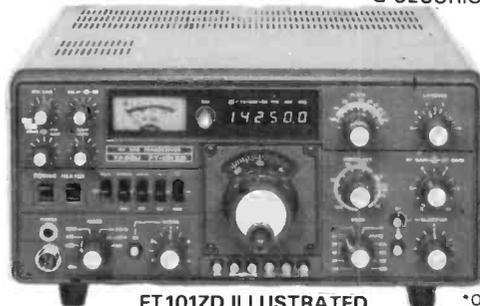


- ★ 80-10 metres (including 10, 18 and 24MHz bands).
- ★ USB-LSB-CWN-AM (Tx and Rx operation).
- ★ 100W PEP. 50% power output at 3:1 VSWR.
- ★ Full "broad band" no tune output stage.
- ★ Excellent Rx dynamic range, power transistor buffers.
- ★ Rx Schottky diode ring mixer module.
- ★ Local oscillator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



**FT101Z £559 inc.** VAT @ 15% & SECURICOR

**FREE SECURICOR**



FT101ZD ILLUSTRATED \*Option

- ★ 160-10 metres including new allocations.
- ★ Variable IF bandwidth 2.4kHz down to 300Hz.
- ★ Selectable CW fixed bandwidth CW-W and CW-N\*.
- ★ Semi-break in with sidetone for excellent CW.
- ★ Digital\* plus analogue frequency displays.
- ★ 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, AGC; slow-fast-off.
- ★ 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.
- ★ N.B. — 6 models: Digital/Analogue — AM/FM options. — N.B.



**FT102 £785 inc.** VAT @ 15% & SECURICOR

**"INSTANT" H.P.**



- ★ 1.8-3.5-7-10-14-18-21-24.5-28MHz.
- ★ All modes: — LSB, USB, CW, AM, FM, (≠Option board).
- ★ Front end: extra high level, operates on 24V DC.
- ★ RF stage bypassable, boosts dynamic range over 100 dB!
- ★ Variable bandwidth 2.7KHz → 500Hz and IF Shift.
- ★ Fixed bandwidth filters, parallel or cascade configurations.
- ★ IF notch (455KHz) and independent audio peak.
- ★ Noise blanker adjustable for pulse width.
- ★ External Rx and separate Rx antenna provisions.
- ★ Three 6146B in special configuration — 40 dB IMD!
- ★ Extra product detector for checking Tx IF signal.
- ★ Dual meter, peak hold ALC system.
- ★ Mic amp with tunable audio network.
- ★ SP102: — Speaker, Hi and Lo AF filters, 12 responses!
- ★ FV102: — VFO, 10Hz steps and readout, scanning, QSY.
- ★ FC102: — ATU, 1.2KW, 20/200/1200 W FSD PEP, wire.
- ★ FAS-1-4R: — 4 way remote waterproof antenna selector.



**FT902DM £885 inc.** VAT @ 15% & SECURICOR

**"PLASTIC" BY PHONE**



D & DE MODELS AVAILABLE

- ★ 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.
- ★ VOX built-in and adjustable.
- ★ Instant write in memory channel.
- ★ Tune up button (10 sec, of full power).
- ★ Switchable AGC and RF attenuator.
- ★ 350 or 600 Hz CW, 6kHz, AM filters included!
- ★ Clarifier (RIT) switchable on Tx, Rx or both.
- ★ 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.

- ★ 150(W) x 50(H) x 176(D)mm.!
- ★ Up/down, memory/band scanning.
- ★ Easy "write-in" memory channels.
- ★ Memory back-up "5 year" lithium cell.
- ★ Ten memories with priority functions.
- ★ Supplied with scanning microphone.
- ★ Illuminated "any angle" LCD display.
- ★ Display to 100's of Hz and functions.
- ★ Two completely independent VFO's.
- ★ Operation between memory and VFO.
- ★ Full reverse repeater function.
- ★ Manual and automatic tone burst.
- ★ Large "full sound" internal speaker.
- ★ Concentric volume and squelch.



2 or 70!

## FT230R £239 inc. VAT @ 15% & SECURICOR

- ★ 144-146 MHz (extensions possible).
- ★ 25W RF output, 3W on low.
- ★ 25 and 12½kHz steps provided.
- ★ ±600kHz repeater split, 1750Hz burst.
- ★ Tx; 5A. Rx 300mA (standby).
- ★ 430-434MHz (440-445MHz possible).
- ★ 10W RF output, 1W on low.
- ★ 25 and 100kHz steps provided.
- ★ ±1.6MHz repeater split, 1750Hz burst.
- ★ Tx 3A, Rx 300mA (standby).

- ★ Multimode USB, LSB, FM, CW
  - ★ 100Hz backlit LCD Frequency display
  - ★ 10 memory channels '5 year' backup
  - ★ Any Tx/Rx split with dual VFOs
  - ★ Up/down tuning from microphone
  - ★ AF output 1W @ 10% THD
  - ★ Bandwidth 2.4kHz and 14kHz @ -6dB
  - ★ LED's; 'On Air', 'Busy', m/c meter; S, PO.
  - ★ 58 (H) x 150 (W) x 195 (D) (1.3kg)
- |         |                         |        |
|---------|-------------------------|--------|
| SMC2.0C | Nicad 2.0A/hr "C"       | £2.35  |
| SMC8C   | Slow Charger (220mA)    | £8.80  |
| MMB 11  | Mobile Mount            | £22.25 |
| CSC1A   | Soft carrying case      | £3.45  |
| FL2010  | Linear Amplifier 2m 10W | £59.00 |
| FL7010  | Linear Amplifier 70cms  | £91.00 |



6 or 2 or 70!

## FT290R

£265

VAT @ 15% &amp; CARRIAGE

- ★ 144-146MHz (144-148) possible
- ★ 2.5W PEP, 2.5W RMS/300mW out
- ★ FM: 25kHz and 12.5kHz steps
- ★ SSB: 1kHz and 100Hz steps
- ★ ±600 kHz repeater split 1750kHz burst
- ★ Integral telescopic antenna
- ★ Rx, 70mA, Tx; 800mA (FM maximum)

## FT790R

£325

VAT @ 15% &amp; CARRIAGE

- ★ 430-440MHz (440-450 alternative)
- ★ 1W PEP, 1W/250mW FM/CW out
- ★ FM: 100kHz and 25kHz steps
- ★ SSB: 1kHz and 100Hz steps
- ★ 1.6MHz shift with input monitor, 1750Hz burst
- ★ Rx; 100mA/200mA. Tx; 750mA max
- ★ BNC Mounting ½" flexi antenna

- ★ USB-LSB-CW-FM (A 3j, A1, F3).
- ★ 30W PIP A 3j, 10/1W out A1 F3.
- ★ Any Tx Rx split with dual VFO's.
- ★ Four easy write-in memory channels.
- ★ Memory scanning with slot display.
- ★ Up/down tuning/scanning from mic.
- ★ Priority channel on any memory slot.
- ★ Digital RIT. Advanced noise blanker.
- ★ Satellite mode allows tuning on Tx.
- ★ Semi break in with side tone.
- ★ Very bright blue 100Hz digital display.
- ★ Display shows Tx & Rx freq (inc RIT).
- ★ String LED display for "S" and PO.
- ★ LED's; "On Air" Clar, Hi/Low, FM mod.
- ★ Size (Case): 8.3" D, 2.3" H, 6.9" W.

Ills. c/w SCI station consol and YD148 mic.



6 or 2 or 70!

## FT480R £369 inc. VAT @ 15% & SECURICOR

- ★ 144-146MHz (143.5-148.5 possible).
- ★ ±600kHz standard repeater split.
- ★ Excellent dynamic range and sensitivity.
- ★ FM; 25, 12½, 1kHz steps.
- ★ SSB; 1,000, 100, 10Hz steps.
- ★ 430-434MHz (440-445 possible).
- ★ GaAs Fet RF for incredible sensitivity.
- ★ FM; 100kHz, 25kHz, 1kHz, steps.
- ★ SSB; 1,000, 100, 10Hz steps.
- ★ FT780R 1.6 fitted 1.6MHz Shift £409 inc.

- ★ Keyboard entry of frequencies/splits
- ★ LCD digital display with backlight
- ★ Any split + or - programmable
- ★ Ten memory channels '5 year' back up
- ★ Up/down manual tuning. Memory scan
- ★ Manual or auto scan for busy/clear
- ★ Priority channel with search back
- ★ Scan between any two frequencies
- ★ Auto scan restart. 1.750Hz tone burst
- ★ Built in condenser microphone
- ★ 500mW to int/ext speaker
- ★ External speaker/mic. available
- ★ 168(H) x 61(W) x 39(D)mm
- ★ C/w Quick change NiCad pack, helical



2 or 70!

## FT208R

£199

VAT @ 15% &amp; CARRIAGE

- ★ 144-146MHz (144-148 possible).
- ★ 12.5/25kHz synthesizer steps.
- ★ ±600kHz repeater split.
- ★ 2.5 or 0.3W RF output.
- ★ Rx: 20mA squelch 150mA max. AF.
- ★ Tx: 800mA at 2.5W RF.
- ★ 0.25µV for 12dB SINAD.

## FT708R

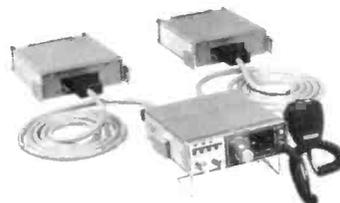
£229

VAT @ 15% &amp; CARRIAGE

- ★ 430-440MHz (440-450 option).
- ★ 25kHz synthesizer steps.
- ★ ±7.6MHz EU split standard.
- ★ 1W or 100mW RF output.
- ★ Rx: 20mA squelch, 150mA (max AF).
- ★ Tx: 500mA at 1W RF.
- ★ 0.4µV for 12dB SINAD.

- ★ Four easy write-in memory channels
- ★ Rx priority channel (auto check)
- ★ Scanning band/memory empty/busy
- ★ Up/down tuning/scanning from mic.
- ★ Optically coupled tuning control
- ★ Manual and automatic tone burst
- ★ String LED's for 'S' and PO, 7 status LEDs
- ★ 1½W of audio to internal/external speaker
- ★ FT720 Control Head
- ★ 3.3 (4.3)" D x 6" W x 2 (2.2)" H
- ★ S72 Switching box
- ★ Pushbutton band change Auto steps/splits.
- ★ E72S Extension cable, 2m long
- ★ E72L Extension cable, 4m long
- ★ MMB3 Mobile Mounting bracket for deck

Ills. c/w S72 and two E72S cables.



2 and/or 70!

## FT720RV £199 inc. VAT @ 15% & CARRIAGE

- ★ 144-146MHz (144-148MHz possible).
- ★ 12½kHz synthesizer, 600kHz shift.
- ★ 0.3µV for 20dB quieting.
- ★ Rx 0.5. Tx RV 3.5A, RVH 6.5A.
- ★ 5.8 (6.5)" D x 6" W x 2 (2.2)" D.
- ★ 430-434MHz.
- ★ 25kHz synthesizer steps, 1.6MHz shift.
- ★ 0.5µV for 20dB quieting.
- ★ Rx 0.5A, Tx 4.5A.
- ★ 5.8 (6.5)" D x 6" W x 2 (2.2)" D.

## FT720RU £229 inc. VAT @ 15% & CARRIAGE

**FT726R £649 inc.** VAT @ 15% & SECURICOR



**★ NEW ★**

MULTI-BAND VHF/UHF

- ★ 3 Bands\*! 2 metres. 70cms\* (10MHz) & 6M\* plug-ins.
- ★ Full Duplex\*! Cross band Tx & Rx simultaneously.
- ★ SSB-CW-FM! All optimally catered for.
- ★ Variable bandwidth and IF shift! SSB & CW.
- ★ Processor! Front panel mic gain and drive.
- ★ Two main VFO's! A & B with 20Hz steps.
- ★ Separate channelised VFO! (for FM operation).
- ★ Scanning! over the band and the 10 memories.
- ★ Repeater splits! programmable and preset.
- ★ Instant reverse! and + & - splits and A/B.
- ★ Twin meters; PO/DISC, S/ALC. Duplex switchable.
- ★ Switchable; AGC, CW bandwidth, dial lock.
- ★ Noise blanker; impulse interference tuned

FT726R(2) Transceiver c/w 144 MHz **£649.00**  
 430T726 430-440 MHz module **£208.90**  
 50T726 Six meter module **£157.15**  
 SAT726 Full duplex unit **£82.80** \* option.

- ★ 160-10 Metres (inc WARC) plus standard service Rx.
- ★ SSB, CW FSK, 100 Watts output (adjustable).
- ★ Two 10 Hz step digital variable frequency oscillators.
- ★ Split frequency or cross mode single frequency operation.
- ★ 3 PLL's (inc BFO) locked to 10MHz reference.
- ★ 11 Channel memory retains operating freq. and mode.
- ★ Listen on memory (fix Tx on VFO), microcomputer control.
- ★ Display of memory contents during operation. Up/down/lock.
- ★ Pass band tuning, tuneable notch, 10-20dB attenuator.
- ★ Adjustable noise blanker, switchable AGC, calibrator.
- ★ Adjustable RF output, RF speech processor, Vox.
- ★ Comprehensive metering including compression level.
- ★ Small 300(W), 327(D), 130(H), mm. 10Kg.

NBD50U Mains PSU. NFG97 A.T.U.  
 NVA88 Ext. speaker. CFL260 600Hz filter.  
 CHG43 Desk Mic. CFL230 300Hz filter.  
 CHG44 Hand mic. KY3A Morse key.

**JRC JST100 £T.B.A. inc.** VAT @ 15% & SECURICOR

**★ NEW ★**



**FT980 £1,115 inc.** VAT @ 15% & SECURICOR



**CREDIT COVER**

- ★ Rx 150 kHz-30MHz.
- ★ Tx 160-10m. 9 bands x 3 x 500 kHz Aux bands.
- ★ All modes AM, CW, LSB, USB, AFSK & FM (inc.)
- ★ IF shift & variable bandwidth 2.6 kHz-300 Hz.
- ★ Inbuilt keyboard operation + scanning.
- ★ Switchable attenuator 10, 20, 30 dB.
- ★ Audio peak + notch filter - 40 dB.
- ★ RF processor and Auto mic gain control.
- ★ 3rd order IMD - 40dB at 100W PEP.
- ★ AFSK shift 170, 425, 850 Hz selectable.
- ★ Multi channel memory + programmable scan limits.
- ★ Optional computer interface available.
- ★ Notch filter in IF (AGC immune to hetrodynes).
- ★ Full break in keying. 500/600/700 Hz beat.
- ★ Unique analogue scale of digital type.
- ★ Comprehensive twin meter metering.
- ★ Memory retains mode information.

- ★ Rx: 150kHz-30MHz. Continuous general coverage.
- ★ Tx: 160-10m (9 bands) or 1.5-30MHz commercial.
- ★ All Modes: AM, CW, FM\*, FSK, LSB, USB.
- ★ 10 VFO's!!! Any Tx-Rx split within coverage.
- ★ Two frequency selection ways, no bandswitch.
- ★ Main dial, velvet smooth, 10Hz resolution.
- ★ Inbuilt keyboard with up/down scanning.
- ★ Dedicated digital display for RIT offset.
- ★ Receiver dynamic range up to 100dB!!!
- ★ SSB: Variable bandwidth and IF shift.
- ★ 300\* or 600Hz\*, 2,400 → 300Hz, 6kHz\*, 12kHz\*.
- ★ Audio peak and notch filter. FM squelch.
- ★ Advanced variable threshold noise blanker.
- ★ 100W RF, key down capability, solid state.
- ★ Mains and 12VDC. Switch mode PSU built in.
- ★ RF processor. Auto mic gain control. VOX.
- ★ Last but not least full break-in on CW.

**FT ONE £1,349 inc.** VAT @ 15% & SECURICOR

**FREE FINANCE**



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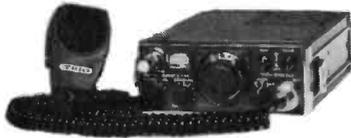
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The TS930S latest transceiver from Trio Price: **£1,216.00 inc. VAT.**



**TRIO TS430's**  
**£ 736.00**



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**TRIO R600 RECEIVER**  
**£ 257.00**

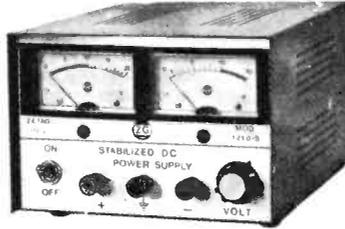


**TRIO R2000 RECEIVER**  
**£ 398.00**



**TRIO TS830S**  
**HF SSB TRANSCEIVER**  
**£ 697.00**

As the North West's only official Trio stockist we carry the full Trio range of equipment and accessories. Full service facilities. Send s.a.e. for up-to-date information.



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SOLID STATE STABILISED POWER SUPPLIES  
 Maximum ratings quoted. Prices include postage.  
 Model 125 10-15V 5 amp. . . . . £29.50  
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### 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. **£985.00**

NSD515 TRANSMITTER & AC PSU **£1,371.00**  
 NEW 24 CHANNEL MEMORY UNIT.

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**KENPRO**  
 KR400C . . . . . £116.15  
 KR600RC . . . . . £154.10  
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**Station Accessories**  
 Welz SP200PWR/SWR Meter . . . . . £61.95  
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 SP10X . . . . . £21.95  
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 Welz AC30 Antenna Tuner. . . . . £59.00  
 Global SWL AT1000 Tuner. . . . . £34.95  
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 DL600 500hm 600watt D.Load . . . . . £29.50  
 DL1000 500hm 1KW D.Load . . . . . £43.70  
 DL150 1KW D Load Wattmeter. . . . . £56.00  
 KX3SWL Antenna Tuner. . . . . £42.50

**DRAKE**  
 MN75 Antenna Tuner . . . . . £189.75  
 MN2700 2KW Antenna Tuner . . . . . £253.00  
 TR5 Transceiver & AC PSU . . . . . £742.50  
 Full range of Drake accessories.

Microwave Modules, FDk, and other equipment also available, including I.C.S. - Diawa.

### ANTENNAS

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 18AVT/WB 5Band Vertical . . . . . £109.25  
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 TH3MK3 3El. Tribander Beam . . . . . £274.85  
 TH3JNR 3El. Tribander Beam . . . . . £000.00  
 TH6XX Tribander Beam. . . . . £202.00  
 205BA 5Element 20m Beam . . . . . £396.00

**Mini Products**  
 HQ1 Minibeam 10-15-20m . . . . . £135.00  
 C4 3Band Vertical . . . . . £59.00

**T.E.T.**  
 HB23SP 2EL Tribander . . . . . £135.60  
 HB33SP 3EL Tribander . . . . . £192.50  
 HB34D 4EL Tribander . . . . . £222.90  
 HB35C 5EL Tribander . . . . . £283.95  
 HB35T 5EL Tribander . . . . . £278.50  
 MV3BH 3Band Vertical . . . . . £37.99  
 MV4BH 4Band Vertical . . . . . £48.90  
 MV5BH 5Band Vertical . . . . . £63.95  
 TE214 14Element 2m Beam . . . . . £74.40

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 17Element 2m Yagi . . . . . £35.19  
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**Hokasin**  
 1/4 wave 2m Whip mobile . . . . . £1.50  
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 7/8 wave 2m Whip mobile . . . . . £13.00  
 5/8 wave Base Station antenna . . . . . £14.50  
 GPV-5 2m Base Station Co-Linear . . . . . £29.50  
 GPV-7 70cm Base Station Co-Linear . . . . . £25.30  
 GPV720 144/432MHz dual base station . . . . . £29.50  
 GDx2 50-480MHz Disccone antenna . . . . . £39.50

**Butternut**  
 HF6V 80-10m (Inc. 10MHz) Vertical . . . . . £106.00  
 418HS-3T 3Element Tribander . . . . . £145.00

**JAYBEAM**  
 LW5 5El 2m Yagi . . . . . £14.37  
 LW8 8El 2m Yagi . . . . . £17.82  
 LW10 10El 2m Yagi . . . . . £24.15  
 LW16 16El 2m Yagi . . . . . £35.08  
 PBM10 10El Parabeam . . . . . £44.85  
 PBM14 14El Parabeam . . . . . £55.78  
 C5/2m 2m Co-Linear . . . . . £54.63  
 D5/2m Double 5Element Slot Yagi . . . . . £25.30  
 D8/2m Double 8Element Slot Yagi . . . . . £34.50  
 Q4/2m 4Element 2m Quad . . . . . £29.33  
 Q6/2m 6Element 2m Quad . . . . . £39.10  
 Q8/2m 8Element 2m Quad . . . . . £44.85  
 C8/70cm 432MHz Co-Linear . . . . . £62.00  
 D8/70cm Double 8Slot Yagi . . . . . £25.88  
 PBM 18/70cm 18El Parabeam . . . . . £32.20  
 PBM 24/70cm 24El Parabeam . . . . . £42.55  
 LW24 24El folded dipole . . . . . £27.00  
 MBM28 28El multibeam . . . . . £21.28  
 MBM48 48El multibeam . . . . . £35.65  
 MBM88 88El multibeam . . . . . £48.88  
 8XY/70 Crossed 8Yagi . . . . . £42.55  
 12XY/70 12El Crossed Yagi . . . . . £52.90  
 5XY/2m Crossed 8El Yagi . . . . . £28.18  
 8XY/2m Crossed 8El Yagi . . . . . £35.65  
 10XY/2m Crossed 10El Yagi . . . . . £46.00

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**ISOPOLE 2M ANTENNA £3.250**  
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For the caller we have a wide range of aluminium tubing.  
 20ft x 2" O.D. . . . . £14.50  
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 6ft x 1 1/4" O.D. . . . . £2.50  
 18" Wall Brackets . . . . . £6.00  
 12" Wall Brackets . . . . . £4.00  
 2" mast couplers . . . . . £6.00  
 Double Lashing Kits . . . . . £5.75



# AMATEUR ELECTRONICS UK



Your number one source for **YAESU MUSEN** THE SYMBOL OF TECHNICAL EXCELLENCE

## KEEP AHEAD WITH THE FT-102!

Once again YAESU lead the field with the exciting FT-102 HF transceiver— no other manufacturer offers so many innovative features.

### Better Dynamic Range

The extra high-level receiver front end uses 24 VDC for both RF amplifier and mixer circuits, allowing an extremely wide dynamic range for solid copy of the weak signals even in the weekend crowds. For ultra clear quality on strong signals or noisy bands the high voltage JFET RF amplifier can be simply bypassed via a front panel switch, boosting dynamic range beyond 100dB. A PLL system using six narrow band VCOs provides exceptionally clean local signals on all bands for both transmit and receive.

### Total IF Flexibility

An extremely versatile IF Shift/Width system, using friction-linked concentric controls and a totally unique circuit design, gives the operator an infinite choice of bandwidths between 2.7kHz and 500Hz, which can then be tuned across the signal to the portion that provides the best copy sans QRM, even in a crowded band. A wide variety of crystal filters for fixed IF bandwidths are also available as options for both parallel and cascaded configurations. But that's not all; the 455kHz third IF also allows an extremely effective IF notch tunable across the selected passband to remove interfering carriers, while an independent audio peak filter can also be activated for single-signal CW reception.

### New Noise Blanker

The new noise blanker design in the FT-102 enables front panel control of the blanking pulse width, substantially increasing the number of types of noise interference that can be blanked, and vastly improving the utility of the noise blanker for all types of operation.

### Commercial Quality Transmitter

The FT-102 represents significant strides in the advancement of amateur transmitter signal quality, introducing to amateur radio design concepts that have previously been restricted to top-of-the-line commercial transmitters; far above and beyond government standards in both freedom from distortion and purity of emissions.

### Transmitter Audio Tailoring

The microphone amplifier circuit incorporates a tunable audio network which can be adjusted by



the operator to tailor the transmitter response to his individual voice characteristics before the signal is applied to the superb internal RF speech processor.

### IF Transmit Monitor

An extra product detector allows audio monitoring of the transmitter IF signal, which, along with the dual meters on the front panel, enables precise setting of the speech processor and transmit audio so that the operator knows exactly what signal is being put on the air in all modes. A new "peak hold" system is incorporated into the ALC metering circuit to further take the guesswork out of transmitter adjustment.

### New Purity Standard

Three 6146B final tubes in a specifically configured circuit provide a freedom from IMD products and an overall purity of emission unattainable in two-tube and transistor designs, while a new DC fan motor gives whisper-quiet cooling as a standard feature. For the amateur who wants a truly professional quality signal, the answer is the Yaesu FT-102.

### New VFO Design

Using a new IC module developed especially for Yaesu, the VFO in the FT-102 exhibits exceptional stability under all operating conditions.

### A. SP-102 EXTERNAL SPEAKER/AUDIO FILTER

The SP-102 features a large high-fidelity speaker with selectable low- and high-cut audio filters allowing twelve possible response curves. Headphones may also be connected to the SP-102 to take advantage of the filtering feature, which allows audio tailoring for each bandwidth and mode of operation to obtain optimum readability under a variety of conditions.

### B. FC-102 1.2 KW ANTENNA COUPLER

1.2KW band-switched L-C pi-network antenna coupler.

In-line wattmeter with three ranges (20, 200 and 1200 watts full scale), and "peak hold" system.

### C. FV-102DM SYNTHESIZED, SCANNING EXTERNAL VFO



FT-101ZD Mk III

YAESU's FT-101ZD WITH FM. Undoubtedly the best selling HF transceiver ever — thanks to it's superbly comprehensive specification and sensible prices. Incorporates notch filter, audio peak filter, variable IF bandwidth plus many other features.

## FT-ONE SUPER HF TRANSCEIVER

The ultimate in HF transceivers - the superb FT-ONE provides continuous RX coverage of 150KHz-30MHz plus all nine amateur bands (160 thru 10m).

All-mode operation LSB, USB, CW, FSK, AM, \*FM · 10 VFO system · FULL break-in on CW · audio peak filter · notch filter · variable bandwidth and IF shift · keyboard scanning and entry · RX dynamic range over 95dB! and NO band switch!!!

\*OPTIONAL



A

B

C



# AMATEUR ELECTRONICS

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# NEW! FT-980 HF Transceiver



The ALL NEW FT980 CAT transceiver with continuous RX coverage of 150Hz-30MHz and computer interface option.

## FT-290R/FT-790R 2m & 70cm portables



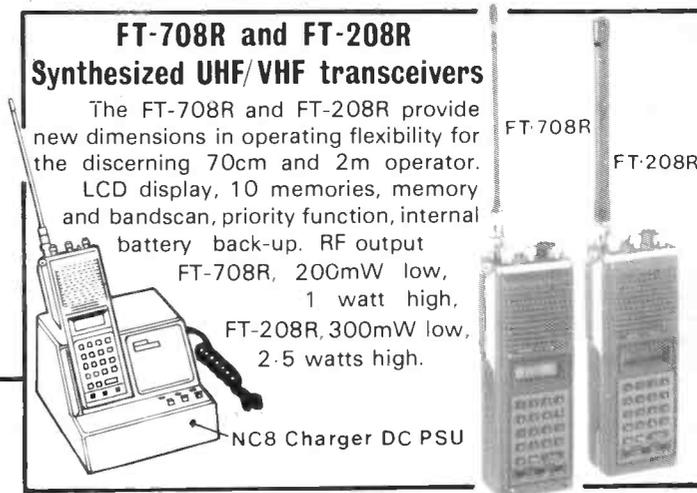
10 memories, 2 VFO's, LCD display, C size battery, easy car mounting tray,

FT-290R 0.5 low/2.5 high watts out

FT-790R 0.2 low/1.0 high watts out (incorporates speech compressor).

## FT-708R and FT-208R Synthesized UHF/VHF transceivers

The FT-708R and FT-208R provide new dimensions in operating flexibility for the discerning 70cm and 2m operator. LCD display, 10 memories, memory and bandscan, priority function, internal battery back-up. RF output FT-708R, 200mW low, 1 watt high, FT-208R, 300mW low, 2.5 watts high.



NC8 Charger DC PSU

## FT-230R/730R 2m & 70cm FM mobiles



- Two independent VFO's
- 10 memories
- Priority function
- Memory and band scan
- 12.5/25KHz steps (25/100KHz FT-730R)
- Large LCD readout.

## FT-480R/780R 2m & 70cm mobiles



The most advanced 2 metre and 70 cm mobiles available today — USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.

## FRG-7700 High performance communications receiver



YAESU's top of the range receiver. All-mode capability, USB, LSB, CW, AM and FM 12 memory channels with back-up. Digital quartz clock feature with timer. Pictured here with matching FRT-7700 Antenna tuner and FRV-7700 VHF converter.

### AGENTS

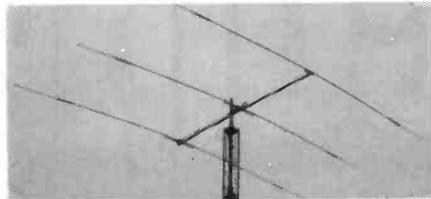
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- Wales & West - Ross Clare, GW3NWS, Gwent (0633) 880 146
- East Anglia - Amateur Electronics UK, East Anglia, Dr. T. Thirst (TIM) G4CTT, Norwich 0603 667189
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**TET ANTENNA SYSTEMS**



AX210N	10 ele. yagi for 2m crossed	74.95	(n/c)
HB10F2T	2 ele. 10m mono band beam	51.50	(n/c)
HB10F3T	3 ele. 10m mono band beam	74.95	(n/c)
HB15F2T	2 ele. 15m mono band beam	60.66	(n/c)
HB15F3T	3 ele. 15m mono band beam	93.46	(n/c)
HB15M2SP	VP mini size 15m 2 ele.	69.50	(n/c)
HB15M3SP	VP mini size 15m 3 ele.	102.30	(n/c)
HB34D	4 ele. tri band beam 10/15/20m	222.90	(n/c)
HB33SP	3 ele. tri band beam 10/15/20m	192.50	(n/c)
HB35C	Tri band array 10/15/20m	283.95	(n/c)
HB35T	5 ele. 10/15/20m	278.50	(n/c)
MV3BH	Vertical for 10/15/20m	37.99	(n/c)
MV4BH	Vertical for 10/15/20/40m	48.90	(n/c)
MV5BH	Vertical for 10/15/20/40/80m	63.95	(n/c)
MLA4	Loop antenna 10/15/40/80	105.60	(n/c)
SO22	Phased 2 ele. swiss quad 2m	58.95	(n/c)
SOY06	6 ele. quagi 2m	45.75	(n/c)
SOY08	8 ele. quagi 2m	52.75	(n/c)
HB210S	10 ele. dual driven yagi 2m	47.99	(n/c)
TE214	14 ele. long yagi 2m	74.40	(n/c)
SSL720	9 x 2 ele. (18) slot fed 70cm	77.20	(n/c)
HB23SP	2 ele. tri band beam 10/15/20m	135.60	(n/c)
SSL218	9 x 2 ele. (18) slot fed 2m	144.79	(n/c)
TPH2	Phasing harness 2m	17.25	(n/c)
QYU10	10 ele. quagi 70cm	67.90	(n/c)
SO007	70cm 2 ele. phased swiss quad	66.99	(n/c)
SO10	Swiss quad 10m	97.50	(n/c)
SO15	Swiss quad 15m	106.90	(n/c)

<b>YAESU ANTENNAS</b>			
<b>Base</b>			
RSL145GP	1/2 wave base ant. 2m	21.20	(1.50)
RSL435GP	1/2 wave co-linear 70cm	31.60	(1.50)
<b>HF Mobile</b>			
RSL3.5	3.5MHz resonator & whip	12.21	(0.50)
RSL7.0	7.0MHz resonator & whip	11.80	(0.50)
RSL14.0	14.0MHz resonator & whip	11.45	(0.50)
RSL21.0	21.0MHz resonator & whip	11.20	(0.50)
RSL28.0	28.0MHz resonator & whip	11.00	(0.50)
RSL2A	Mast to suit above	5.00	(0.50)
RSM2	Gutter mount/Feeder/PL259 suit above	10.94	(0.75)
<b>VHF Mobile</b>			
RSL145	2m 1/2 wave fibreglass whip	12.10	(0.50)
RSL145S	2m 1/2 wave steel whip foldover	9.25	(0.50)
RSL150SS	2m 1/2 wave PL259 shock spring	3.90	(0.50)
RSM2	Gutter mount/Feeder/PL259 (RSL145)	10.94	(0.75)
RSM4M	Heavy duty mag/Feeder/PL259	13.25	(1.00)
<b>UHF Mobile</b>			
RSL435S	1/2 wave antenna	15.50	(0.50)
<b>ANTIFERRENT ANTENNAS</b>			
<b>VHF Mobile</b>			
TAP3009	1/2 wave 3db snap-in hinged whip	11.42	(3.00)
TAP3677	1/2 wave 3db snap-in shock coil	15.64	(3.00)
TAP3002	1/2 wave unity gain snap-in hinged whip	8.81	(3.00)
<b>UHF Mobile</b>			
TAP3462	1/2 over 1/2 wave 3db	9.89	(3.00)
TAP3697	1/2 over 1/2 wave 5db	18.40	(3.00)
K220	Mag mount/Feeder to suit above	10.73	(2.00)

**Simply phone or write and leave the rest to us**

<b>Antennas Various/Accessories</b>			
HQ1	Mini beam 10/15/20m 2 ele. 1kW	T8A	(4.00)
C4	Vertical 10/15/20m	48.50	(3.00)
G4MH	Mini beam 10/15/20	85.00	(4.00)
KTLM-4	Gutter mount/Cable assy. SO239	6.90	(0.50)
<b>DATONG PRODUCTS</b>			
PC1	50KHz to 30MHz receive converter	137.42	(0.50)
VLF	Very low freq. converter	29.90	(0.50)
FL1	Frequency agile audio filter	79.35	(0.50)
FL2	Multimode audio filter	89.70	(0.50)
ASP/A	Auto RF speech clipper (YAESU)	82.80	(0.50)
ASP/B	Auto RF speech clipper (TRIO)	89.70	(0.50)
D75	Manual RF speech clipper	56.35	(0.50)
RFC/M	RF speech clipper module	29.90	(0.50)
D70	Morse tutor	56.35	(0.50)
AD270	Active dipole RX ant. (indoor)	47.15	(0.50)
AD370	Active dipole RX ant. (outdoor)	64.40	(0.50)
MK	Morse keyboard	137.42	(0.50)
DC144/28	2m converter	39.67	(0.50)
RFA	Broadband preamplifier	33.92	(0.50)
MPU	Mains power unit	6.90	(0.50)

<b>MICROWAVE MODULES</b>			
<b>Transverters</b>			
MMT28/144	10m transverter	109.95	(2.50)
MMT70/144	4m transverter	119.95	(2.50)
MMT432/144R	70cm transverter	184.00	(2.50)
MMT1296/144	23cm transverter	184.00	(3.00)
MMT70/28	4m transverter	119.95	(2.50)
MMT144/28	2m transverter	109.95	(2.50)
MMT432/28S	70cm transverter	159.95	(2.50)
<b>Linear Amplifiers</b>			
MML28/100S	10m 100W linear amp.	129.95	(3.00)
MML70/50S	4m 50W linear amp.	85.00	(2.50)
MML70/100S	4m 100W linear amp.	139.95	(3.00)
MML144/30LS	2m 30W linear amp. 1-3W in	69.95	(2.50)
MML144/50S	2m 50W linear amp.	85.00	(2.50)
MML144/100LS	2m 100W linear 1-3W in	159.95	(3.00)
MML144/100S	2m 100W linear 10W in	139.95	(3.00)
MML432/50	70cm 50W linear amp.	109.95	(3.00)
MML432/100	70cm 100W linear amp.	228.65	(4.00)
MML1296/10	23cm 10W linear amp.	199.00	(2.50)
MML432/30	70cm 30W linear amp. 1-3W in	99.00	(3.00)

<b>Converters</b>			
MM1000KB	ASC11 morse converter with keyboard	99.95	(3.00)
MM4001	RTTY to TV converter	189.00	(2.50)
MM4001KB	RTTY transceiver	269.00	(2.50)
MM4000KB	RTTY transceiver with keyboard	299.00	(4.00)
MMC28/144	10m to 2m converter	29.90	(1.00)
MMC50/28	6m to 10m converter	29.90	(1.00)
MMC70/28	4m to 10m converter	29.90	(1.00)
MMC70/28LO	4m to 10m with LO	32.90	(1.00)
MMC432/28S	70cm to 10m converter	37.90	(1.00)
MMC432/144S	70cm to 2m converter	37.90	(1.00)
MMC435/600	UHF ATV converter	27.90	(1.00)
MMC1296/28	23cm to 10m converter	34.90	(1.00)
MMC1296/144	1296MHz low noise converter	69.95	(1.00)
MMK1691/137.5	1691MHz meteosat converter	129.95	(2.50)
<b>Morse Talkers</b>			
MMS1	Morse tutor 2-20WPM Side tone	115.00	(2.50)
MMS2	Morse tutor (advanced) 6-32WPM + speak back	169.00	(2.50)

<b>Amateur TV</b>			
MTV435	70cm 20W (PSP) transmitter	149.00	(2.50)
MMC435/600	Converter ATV UHF output	27.90	(1.00)
<b>Preamplifiers</b>			
MMA144V	2m preamp RF switched	34.90	(1.00)
MMA28	10m preamp	16.95	(1.00)
MMA1296	23cm preamp	34.90	(1.00)
<b>Frequency Counters</b>			
MMD650/500	500MHz digital meter	75.00	(1.00)
MMD600P	600MHz pre scaler	29.90	(1.00)
Probe		14.90	(0.50)
<b>Filters</b>			
MMF144	2m band pass 40W max.	11.90	(1.00)
MMF452	70cm band pass 40W max.	11.90	(1.00)
<b>Various</b>			
MMS384	384MHz signal source	29.90	(1.00)
MMR15/10	15db 10W attenuator	11.90	(1.00)
<b>HI-MOUND MORSE KEYS</b>			
HK702	Up down keyer marble base	24.50	(0.50)
HK704	Up down keyer	16.68	(0.50)
HK705	Up down keyer	12.50	(0.50)
HK706	Up down keyer	13.75	(0.50)
HK708	Up down keyer	11.96	(0.50)
HK808	Up down keyer marble base	39.57	(0.50)
MK704	Twin paddle keyer	10.95	(0.50)
MK705	Twin paddle keyer marble base	22.00	(0.50)
<b>MOULDINGS</b>			
IK	lambic keyer	19.95	(0.50)

<b>TOKYO HY POWER</b>			
HC150	HF ATU SWR/Power meter	200W PEP	62.50 (n/c)
HC2000	HF 2kW ATU SWR/Power meter	6 POS ant. switch 6 to 1 vernier high Q coils 2kW peak 1kW continuous	276.55 (n/c)

<b>Antenna Rotators &amp; Accessories</b>			
SU2000	Light duty rotator		34.95 (3.50)
9502	Channel master med duty up to 8 ele.		57.00 (3.50)
9523	Alignment bearing for 9502		14.38 (1.25)
KR400	Med/Heavy duty 180° meter (inc. lower casting)		90.85 (3.50)
KR400RC	Med/Heavy duty 360° meter Load 200Kg 1 1/2"-2" masts		102.35 (3.50)
CASTING	Lower casting set (400RC)		15.00 (1.25)
KR600RC	Heavy duty 360° meter Load 200Kg Rot600Kg/cm Brake 4000Kg/cm 1 1/2"-2" masts		136.85 (3.50)

<b>Antenna Switches</b>			
SA450	SO239 connectors 1 in 2 out		9.75 (0.50)
SA450N	"N" type connectors 1 in 2 out		12.75 (0.50)
<b>Baluns</b>			
BL50A	RAK 50 ohm ferrite BALUN 1:1 1.8-38MHz 1kW		12.88 (1.50)
W2AU	1:1 50 ohm 3-40MHz 1kW		14.99 (1.50)

<b>Dummy Loads</b>			
T30	30W DC 500MHz PL259		6.61 (0.50)
T100	100W DC 500MHz SO239		20.12 (1.00)
T200	200W DC 500MHz SO239		31.36 (1.50)
T210	Wide band 10W 1.2G-2.4G		24.50 (0.75)
AW05	Pocket RF wattmeter SW up to 500MHz BNC		19.75 (1.00)

<b>Filters</b>			
AKD	Hi-pass blocks 0-200MHz RF interference to UHF above 400MHz		5.50 (0.50)

<b>Linear Amplifiers</b>			
<b>YAESU</b>			
FL110	HF 160/80/40/20/15/10m 100W (10W drive)	155.25	(n/c)
FL2100Z	HF warc 1200w PEP. SSB 1kW CW 400W AM/FM/FSK	449.00	(n/c)
FL2010	2m VHF 10W linear	54.00	(n/c)
FL2050	2m VHF 50W linear 10W drive	115.00	(n/c)
FL7010	70cm UHF 10W linear	91.00	(n/c)

<b>TOKYO HY POWER</b>			
HL32V	VHF 30W linear 1-5W drive HI-LOW output		53.50 (n/c)
HL82V	VHF linear preamp output meter 2-12W in 35-85+ out		144.50 (n/c)
HL160V	VHF linear preamp output meter 1-10W in 160W+ out		242.40 (n/c)
HL45U	UHF linear preamp 2-15W in 10-45W out		119.75 (n/c)

<b>ADONIS MICROPHONES Mobile/Base</b>			
MM202S	Mobile safety mic. (non scanning)	23.00	(1.00)
MM202HD	Mobile safety mic. (scanning)	30.00	(1.00)
AM502	Desk mic. (compressor selectable)	45.94	(1.00)

<b>Miscellaneous</b>			
<b>Mutec</b>			
SNL144S	2m preamp RF switched	33.90	(1.00)
RPCB	144UB FT221/225 front end board	64.50	(1.25)
<b>Ni-cads</b>			
AA	AA size Ni-cad	1.00	(0.20)
C	C size Ni-cad	2.40	(0.30)
NC1850	Ni-cad charger (4 x C or 4 x AA)	9.50	(1.00)

<b>DRAE PRODUCTS</b>			
DRAE4	4 amp PSU	30.75	(2.00)
DRAE6	6 amp PSU	48.00	(2.50)
DRAE12	12 amp PSU	74.00	(3.00)
DRAE24	24 amp PSU	105.00	(4.00)
DRAE WM	135-450MHz wavemeter	27.50	(1.00)

<b>"N" Connectors (Silver Plated)</b>			
N58	"N" Male connector RG58	2.25	(0.25)
N8	"N" Male connector RG8	2.40	(0.25)
N308	"N" T adaptor (three female)	2.40	(0.25)
N307	"N" L adaptor (1 male 1 female)	2.40	(0.25)
N306	"N" Double female adaptor	1.90	(0.25)
N310	"N" Double male adaptor	2.50	(0.25)
NB304	"N" Female to BNC male adaptor	2.10	(0.25)
N402	"N" Plug to SO239	2.05	(0.25)
N403	"N" Socket to PL259	2.00	(0.25)
N404	"N" Socket to SO239	1.80	(0.25)

<b>Speakers/Headphones</b>			
<b>Various</b>			
RT650	4 ohm, 8 ohm 3W nom 6W max	6.50	(0.50)
MS60	3W nom 5W max	7.50	(0.50)
S2	Headphones (cobalt magnets)	5.75	(0.50)
<b>YAESU</b>			
YH55	Headphones Low Z	10.00	(0.50)
YH77	Lightweight headphones Low Z	10.00	(0.50)



<b>SWR/Power Meters</b>			
<b>YAESU</b>			
YS200			52.90 (n/c)
YS2000			69.79 (n/c)
<b>Other Makes</b>			
RF2000	Twin meter 3.5-150MHz F/Scale 200/2000W		18.25 (1.00)
YM1X	Twin meter 3.5-150MHz F/Scale 12 or 120W		14.99 (1.00)

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# THANET'S GUIDE

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# SHORT WAVE MAGAZINE

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MMC144/28	2M Converter to HF Rig	29.90	(-)
MMC432/28S	70cm Converter to HF Rig	37.90	(-)
MMC432/144S	70cm Converter to 2M Rig	37.90	

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The  
**SHORT WAVE**  
Magazine

## EDITORIAL

**Another New Band**

The applicants for 50 MHz licences have been sorted through and a list agreed between the RSGB, Home Office and the B.B.C. Details appear in *VHF Bands* in this issue. As a band which can, at a sunspot peak, open world-wide around the middle of the day, it should prove to be a very worthwhile allocation if the brief experience of the early post-war years is anything to go by. Six-metres again, at last!

TVI is also here again! The maggot in the biscuit this time is the video recorder and its wide-band amplifier. Cases are known where TV sets which are normally clear become TVI-prone when a recorder is plugged in — but not switched on. Should you be looking at a case of TVI and there is a video recorder coupled up we suggest you try, as a first test, connecting the TV aerial directly to the video recorder and moving it away from the TV set; if this clears the TVI, then the recorder is at fault and needs to be dealt with. The only consolation is that it must be clear even to the most non-technical viewer that the fault lies in his recorder and not your transmitter, so he can be recommended to return it to the suppliers for them to sort out. Whether or not 'they' are able to do so is a moot point of course, so if any budding technical author feels that he can write the definitive article on TVI-proofing video recorders we would be pleased to see it and, if acceptable, publish it for the benefit of everyone.

This issue marks the beginning of Volume 41 of *Short Wave Magazine*. As most readers must be aware, this journal has been devoted exclusively to Amateur Radio since 1937, and we shall of course be continuing our unambiguous policy into this new volume with, we hope, lots of good things for your pleasure and interest — including more contributions from, amongst others, G3RJV, G3ROO, G3XAP, and a first article in our pages from W3NQN. And much, much more!

Next month we will announce the winner of the Volume 40 (1982-83) Article Competition.

*Ed. Williams*  
G3KFE.

WORLD-WIDE COMMUNICATION

# COMMUNICATION and DX NEWS

*E. P. Essery, G3KFE*

**A**NOTHER month of warm weather for the time of year has been accompanied by high winds to keep the aerial parties going, with conditions, on HF at least, that have varied from awful to abysmal; but it's an ill wind that blows nobody good and the LF addicts have had a feast — although not many of the latter seem to want to tell all!

## The Bands

We have already indicated the essentials of the position as we saw it. The sunspot number is declining steadily, but not so fast as a couple of months ago, and it would appear conditions have been more affected by other negative factors. And of course, there is always the matter of confusing activity and conditions; for example, Ten indicating 'dead' but a tune round the beacons indicating propagation to be world-wide!

## Top Band

One very noticeable absentee from the scene here, at least to the time of writing, has been W1BB; nobody seems to have reported him active, and we have not had a report from him in ages. Anyone with any news, please let your scribe know, as lots of people are enquiring.

We finally caught up with G4AKY (Harlow); Dave hasn't (by his lights anyway!) burned much midnight oil, as in general he has turned-in at the witching hour or just after, apart from one fairly heavy session in the contest. If we leave out of account the small fry, we find lots of W4, some W1 and W2, VE1BVL, VE1ZZ, XLIASJ, EA6JD, EA8QO, UA9UCO, UA9XAB, UA9CBO, EZ9MAZ, UL7NCL, UL7BAK, ZB2EO, VK6HD, VS6DO, RI8DAA, UH8DC, UD6DKW, NP4A, KV4FZ, HH2VP, V2AAW, and EA9KQ. Other DX heard included 4X4NJ, HI8DAF, 5Z4CS, JA6LCJ, YB5AES, NA5R and W8LRL, while these were known to be on but not heard: VU2WTR, XT2AW, 6Y5IC, and LU2ZU. All CW of course.

Our next reporter is G3ZGC/MM, who is now aboard *Gran*, a 5871-ton passenger-cargo ship running between Avonmouth and the Barbados-Windward Is. area of the Caribbean. Twelve passengers and general cargo outwards, and bananas by the box-full on the return trip. One week in four is spent in port in the Caribbean so Richard has taken out reciprocal licences in Barbados, St. Lucia, St. Vincent, and Grenada; Dominica has so far not been cracked due to red tape, but is progressing.

Top Band was operated once from 8P6: about midnight GMT on January 2, WA2BOT/8P6, W3ESU, N4DSA, and NIACH were worked. WA2BOT/8P6 was intending to stay up all night and hunt DX, but no EUs were heard. 6Y5IC was heard calling "CQ EU" with no takers, while VP2MIX and J6LB were enthusiastic for Top Band activities and hoping to be on the band before the season's end.

Top Band for G2HKU meant SSB as usual with PAOPN, and CW to LA1EKO (the Ekofisk oil rig station), RA9AKM, RF6FFW, I4ZUW, UB5UGF, 4X4NJ, and UQ2GMB. LA5SAA, who 'drives' the LA1EKO rig, told Ted he was due to return to Stavanger soon, and it is not known whether another amateur will replace him.

We have two very interesting letters from G3BDQ (Hastings). The first one, in the middle of the month, indicates the pleasure of an LF DX-er at getting back into the swing after years in houses where the aerial possibilities were distinctly limited — we know the feeling! Since his last letter John has stuck to Top Band to a large extent, and CW has accounted for all USSR except UA0, VK6HD, 4X4NJ, 4Z4MK, HZ1AB, UA9CBO, UA9CUD, UA9CPB, UA9ADE, VE1BVL, YB5AES, and JA1KFN at 2214 on January 5. It is interesting to find JA reported twice in one month, as JA is always reckoned to be a near-impossible path. G3BDQ is looking for skeds with VS6, ZL and, especially, South American stations for next winter — volunteers please! Turning to the second letter, we note a sked with VP8SB which was blocked by a large tribe calling "CQ DX", but it is believed G3RFS hooked him about an hour later working split-frequency. As a 'stop press' John rounded off with a QSO with 5Z4CS, who QSLs via J13VLV.

Next reports is from D. Whitaker (Harrogate) and has much to say about brother Mike's activity as GM3IGW in the contest over the final weekend in January. Mike seems to have worked twenty-five U.S States and four VE provinces, plus other DX, to end with a multiplier of 66 from 39 countries. The best seem to have been 4X4NJ, ZB2EO, EA8QO, TF3KG, UD6DKW, NP4A, V2AAN, UM8MAZ, UH8DC, UH8HCA, and KV4FZ; among the Ws the best were probably K0HA in Nebraska, and W0BXR in Iowa.

## Thoughts

The events of the past few years, it seems to this old scribe, have made a right mess of any existing band-planning as far as Top Band is concerned, through no fault of the users; national administrations have allocated Top Band bits in umpteen countries, and while this is great from the activity point of view, DX-wise there has by no means been any degree of unanimity as to *which* bits of the band they will allocate. Thus we hear OTs on the band complaining bitterly about EUs on the SSB in the "CW part of the band". No good complaining bitterly if that happens to be their (relatively tiny) bit of the band, is it? Perhaps some kind soul would care to sit down and list out the various national band allocations on Top Band, which we could publish for the benefit of all concerned?

The saga of Heard Is. continues. VK0HI duly arrived, ahead of time and started the pile-up, but VK0NS, who set off first, has been forced to turn back three times so far, and was last heard of at Kerguelen; they should be there at the time of writing, but so far we've not personally heard them (sorry about the pun!) VK0HI was due to be on for the month, but the Jim Smith expedition which was to have been there for a fortnight has not as yet indicated its intentions now it has been so badly delayed.

As far as China goes, it is believed a third BY station will be on before long; and it is understood that BY1PK is off the air through February, leaving BY8AA to hold the fort. BY8AA still has the rough note and chirp, and it is understood they listen a couple of kHz up in frequency. However, they are *very* fussy about the way there are called, and tail-ending or other short call techniques won't do more than get the cold-shoulder. One must remember that courtesy to the Chinese is all-important, in both directions; and in addition that the BY operators are monitored by their authorities who would themselves have the same viewpoint — which means that slow or not, one must play along with their way of doing it.

On the contests front, we note that we missed the RSGB 7 MHz shindig last month — sorry! The Phone leg of the ARRL International DX contest falls on March 5-6. Rules are essentially the same as last year, and exclude 10 MHz from consideration; otherwise all bands 1.8-28 MHz.

The G-QRP Club CW Activity is over the weekend March 19-20 for CW, with May 7-8 for SSB. Details from G4BUE,

QTHR. This is *not* a contest, but it is intended that the spread of bands and times shall have the effect of getting as many QRP operators into QSO with each other as may be, and we commend it to you.

CQ's WW WPX Contest is over the weekend March 26-27, with the CW leg over May 28-29. The usual 48 hours, midnight to midnight, and single-operator stations can only use 30 of the 48 hours, the 18 hours of non-operating time being split into up to five periods during the contest and clearly marked. Otherwise the rules are pretty well as in previous years. Logs to CQ Magazine, WPX Contest, 76 N. Broadway, Hicksville, NY 11801, before May 10 or July 10 respectively, as the mailing date.

March 19-20 is also the weekend for the very popular Bermuda Contest, where the prize of a guest trip to Bermuda to collect one's prize must be a big factor in the size of the entry. Entries to be received by May 31 by the Radio Society of Bermuda, P.O. Box 275, Hamilton 5, Bermuda. Incidentally, if you are in the U.K. you give your country each time, and you can work U.S.A., Canada and Bermuda. The multiplier is the number of VP9s worked (not the parishes) this year.

We have a nice letter from PYICC (Rio de Janeiro) who reports on the RIO QSO Party; it was such a success that future events will be called "Rio DX Party", and we hear the next event will be in the second full weekend in October to clear major world-wide contests. Details from PY1CC, PPC, C. Postal 2673, ZC 00 20000, Rio de Janeiro, RJ, Brazil. Carl says that they have a problem with getting foreign magazines in Brazil, and so they can miss the bus with announcements — hence the early report this time. He also says they are going to the trouble of circulating Brazilian amateurs by direct mail, as far as possible. Such enthusiasm deserves a resounding success.

On the awards front, we have been notified of one by the Gloucester club which is intended to celebrate the 500th anniversary of the granting of the Royal Charter to the City of Gloucester. They will have GB2ROG on the go in September, and the club station G4AYM throughout the year, for those chasing the award. Details from A. J. Martin, 12 Redwood Close, Podsmead, Gloucester GL1 5TZ.

## Ten Metres

How nice to hear again from G2ADZ (Chessington) who has managed to get the odd spare moment to be in the shack; Bill is very definitely one of the 'non-list' types; he says you have to be "sick in the mind" to call that working a station, and anyway one can let the country slide as it'll turn up again for sure operating properly through some other station's activity. Bill noted that his CW went out to 9N1OAT,



"... dnt xpect u will hr ant chirp nw. . . ."

VU2ALI, A92CE, VK2DQR, VU2JXO, 5B4RY, W6KG/A7, VK3CW, and KC7UU/5N6; gotaways included YB3ON, DUITV, HC2HM, and FR7CA. In the earlier letter we note a couple of oddities in ZD9RR for whom the beam was pointing *west*, and L8D/X who refused QTH but said QSL *via* GACW. All QRQ and in a big pile-up.

G3ZGC/MM has used his call either as quoted, or with the suffixes of his reciprocal calls as appropriate, but on 28 MHz Richard says he has only been on for his regular skeds. From Barbados, G3ZGC/8P6 worked G4NXG/M which must have chuffed the latter — this on the RNARS net.

Turning to G14MXW (Portadown) David found the band very erratic, and almost certainly dead by tea-time, so activity was confined to weekends; QSOs were completed with W6WDF, N7XS, W7QK, VE7DXI, W0WA, W0PA, and VE7DXI again, in N. America; South America was represented by YV3BRF, LU1E, PY4LH, HI8GB; 9Y4TAM, KP4EQF, YS1ECB, VP5WJR, C6ADV, and V2ARO represented Central America. However, most of the time, the beam was pointing towards the south for EA9KN, 5T5AA, CN8CO and C53CL. Among the also-rans we noted QSOs with A4XJO, IT9LYF, VO1QU, YU5GL/X and UR2QU.

The first letter from G4LDS (Chelmsford) missed the last deadline, Chris having been somewhat pre-occupied as his mother was taken into hospital on New Year's Eve; we are glad to hear by way of his second letter that she is now back home and on the mend. In the better of the January weather some gardening

has been done, and of course the corollary to that has to be some aerial-farming. However, all the aerial-farming in the world won't help a truly dead band, so there hasn't been much time spent on 28 MHz with beam pointing south before retreating to 21 MHz. However, Chris does mention his QSOs with UA3APP, KJ1R, HK0COP, N9CDE, W8UDN, KB3YK, K1VV, KB9N (who is QSL manager for VS6CT), ZS1FH, ZS2GR and UB5FL, not forgetting a W9 who must remain anonymous as we can't read the writing!

## Fifteen

Our first stop on this band is with GW4OFQ (Broad Oak, Carmarthen) who offers on SSB, G4AVW/ST3, AP2AC, J28AZ around noon, HH2RJ, VK6PY, FY7YE, VK2XG around 1300, and at 1500 VP2MSS. Roger continues to battle it out with the high-power-and-beam merchants but reckons his results would be comparable if he has a linear.

G3BDQ offers SSB contacts with 7Z2AP (QSL *via* I8YCP), FB8XAB (QSL *via* F6GXB), and HI3RST, while his CW made the grade with 3B8FK (his QSL address is Box 1080, Port Louis).

For G2ADZ, 21 MHz CW yielded L8D/X, JT0GM for whom the QSL address is wanted, TF3PMN who was running three watts and free of a pile-up, 5B4RY (QSL to OE2PAL), a gaggle of VKs; missed out on was W6KG/A4 and a 9N3. BY8AA was also heard but not raised.

For G3ZGC/MM the band has in the main been used for the regular skeds back home, but a couple of interest were A4XCB in Salamah, and K8MWO/AM

who was about to land on an aircraft-carrier off Puerto Rico.

G14MXW says he only spent a few hours on this band, but the pick of the crop included K5NA/KP2, N9EJ/P/C6A, WB6FJR, K6YRA, EA8BS, EA8TL, EA9KS, IT9ZGY, ZB2GW, HV3SJ, UC2OAV, UQ2GFN, and a short-skip QSO with GJ3DVC.

G4LDS mentions, in his earlier letter, KD6GH in Los Angeles, PT7CG, G4KXL/DU1, JR4ABF, JH3KKE, A71BJ for country number 210, WB6SJP, VE3IBR, and N9EJ/C6A; while the second letter adds VE7DGI, UA3AAH, W8JZR, ZL3WM, and 8P6OL, skipper of the replica pirate ship *Jolly Roger* from Barbados.

### Now Twenty

Where much of the traffic occurs, but as far as the writer goes it was found to be pretty dead in the evening hours.

G2HKU kept his usual ZL skeds with ZL3RS and ZL3FV on SSB, while CW worked out to UA9CBR an VK3XB; the QRP rig managed to raise UA9CBR with some five watts of CW.

G3BDQ tried out his SSB skills on A4XCB, 4S8OM (QSL *via* DF5UG), YV5EUX, VK6NO, VP8SB at Faraday, LU5LBD, M1V and many run-of-the-mill signals. CW took in JH7KWC, VK0HI (Heard Is.), LU3ZI, and then a string of EUs in a QRP contest. The latter prompted John to go down first to five and then to one watt, at which level he seemed to be swapping S7 to S9 reports.

For G14MXW the activity was all but non-existent as he found the band very noisy and full of QRM. The only stations raised were 4Z4HS and FC9UC, though quite a bit of DX was heard. Plans are afoot to get the mini-beam up another fifteen feet to around 35 feet, which should give a boost to the proceedings.

### Thirty

After all the trouble of getting this band, we don't seem to have much in the way of reports on it. This month there is just the one, namely G2HKU, who worked CW to VK3AUQ, but found himself being QRM'ed by SSB from VK3AW.

### Eighty

G3ZGC says that the eighty-metre activity in the Caribbean is massive, with the local weather net on 3.815 MHz, at 1030 and 2230z, as the main gathering-point. From Barbados, PJ8QQ on St.

Martin was worked, as was WICWU, VE1BPN, and W4PDL; and from J6L, KI9C, HH2BH, G4GZQ who was a shaky 229 on sked, DJ7HZ, N5RZ, KD4PR, WE4H, K6SSS, N3KV, HH2WK, K1CC, AF5K, VO1CA, G3FDQ, OE2VEL, W4YJ, YV3BRF, HI8KW, G4IUF and VO1FB.

GW4OFQ offers SSB contacts with KP4DEX/V2A, VP5RAC, J6LCV, JW5VAA, at 0100, then at 0600 came 6W8AR and 7X5AB. 1800 brought 5N8ARY, 1900 yielded 6W8DY, OE2TWM/YK, and VK3QI, while a whirl round at 2300 came up with OX3JF.

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

April issue—March 3rd  
May issue—April 7th  
June issue—May 5th

*Please be sure to note these dates.*

Next we have a positively enormous list of goodies heard by D. A. Whitaker, who seems to have listened at any time when he wasn't working, eating or sleeping — and we wonder about the latter. Even though work got in the way of much 'grey-line' listening possibilities, the score was some 104 countries heard in the month of January on Eighty SSB alone. As early as 1770 JAs and DU9RG appear, with 1900 and 2000 zulu as the two hours where DX was least noticeable (EL2 and 6W8!), things picking up then and carrying on lively right through to 0800 when ZL and lots of Central and South Americans were on offer.

G3BDQ operated some SSB on the band, and raised some W and VE, plus VK3, and on CW UL7IH plus C6ABA from his first letter in mid-month; the second letter adds nothing more on this band.

G4LDS offers DF5AI, OZ6XR, and AG1B in Vermont, while W2HCW and W6RU were gotaways.

Our last reporter on this band is G14MXW who checked the band most evenings as the HFs were dead; however TVI prevents operation in TV hours. The best DX was to be found, in any case, after midnight, when CW was used to hook PI2VAD and EA8XS.

### Forty

G2HKU used his CW to raise EA9KZ as his only offering in a month when he has been rather occupied with non-radio matters.

G14MXW tangled with YO5KLN, UD6CN, CQ7LN, OK1DN, VE3ICR and VK3MR, the last-mentioned putting out his usual good signal thanks to his rhombic farm.

Forty for G3LDS meant GB2BBC, ON7ES, and UB5AAF worked, plus ZL4BY heard on Christmas Day, and on 29th Y551J and 8P6OR. The second letter contains a plaintive note that he is "well on the way to DXCC in gotaways"!

Evenings and breakfast-time are, in the view of G3BDQ, 'sensible times' at which CW came up with VU9ARZ, VK3VJ and a string of JAs, while SSB accounted for ZL2SQ, TG5LXG, VK3AE, and VK3AMZ. Sundry VKs get a mention in the later letter.

We turn now to D. A. Whitaker, who works his way round the clock on SSB as follows: 0000z JX1CY, JW5VAA: 0100z CX3BA; 0700z 5T5AP; 0800z 8P6OR, JAs, ZP5WC, TG9VT, XE1CX, VP8AQB, VP2MF; 1700z ZL1AXU, SV5FD; 1800z F6FIC/TZ, 6W8DY, ZS4PB, YC2CGW, FB8XAB, 1900z YB2CR, UH8HCS, 6W8AR, 9X5SL, UJ8JCQ, UL7LAW, UH8EAA, TU2JL, TU2ID, OE8HNNK/YK; 2100z 4S7OM; 2200z FM7WS; and 2300z OE8HNNK/YK, ZD8BW and SV5OX.

Turning to GW4OFQ, Roger stuck to the 0800-0900 time slot, and raised JA4CQS, JA3EMU, JA4IKD, JF1IST, JA2BAY, JR7FTV, VK2AVA, and ZL4BO.

Our last reporter is G3ZGC/MM who says that he didn't use the band much, but he did make a QSO while /MM with G4GZQ, the ship at the time being between-islands.

### Conclusion

There you have the picture for another month. We can always do with some more reporters, and all April issue offerings should be addressed to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ, and be posted to *arrive* by first post on March 3. Meantime, mind how you go and may the DX fall right into your hands!

**For anything radio you want to buy, sell, or exchange, use the Readers' Advertisement columns in "Short Wave Magazine"**

## EQUIPMENT REVIEW

# THE MICROWAVE MODULES 144 MHz LINEAR AMPLIFIER TYPE MML 144/30LS

THERE are several single and multimode two-metre transceivers on the market with output powers of one to three watts, some of which have good receivers enabling the user to hear much further than he can work. Thus, a range of linear amplifiers to boost the output powers of these QRP transceivers must be attractive, especially when they incorporate a low noise receiver preamplifier.

Microwave Modules Limited is one of the best known companies manufacturing amateur radio equipment in the U.K. The company, which was formed in 1969, now sells its products throughout the world, and these items are listed in the glossy, 24-page, 1983 Catalogue. One of its best selling items is the MML 144/30LS linear amplifier for 144 MHz, reviewed here.

## Specification

The power output is 30 watts for one or three watts input. The bandwidth between -1dB points is 144-146 MHz. At maximum power output, the current consumption at 13.8 volts is 4A and the quiescent current, 0.8A. The receiver preamplifier has a gain of 12dB with a noise figure better than 1.5dB. The -1dB bandwidth is 144-146 MHz and the current consumed is 200mA.

## The Circuit

The receiver preamplifier uses a 3SK88 Mosfet device in a noise-matched circuit. The output goes through a 4dB attenuator, shunted by two 1N4148 diodes to protect the input to the transceiver "front end".

The power amplifier is a single stage RF2123A device, rated at 65 watts dissipation. A PIN-diode switched input attenuator selects one or three watts drive level from the front panel. The input and output networks have been carefully matched to 50 ohms using PCB tracks, stripline fashion, for the inductors. The output side incorporates a low-pass filter network and the PA transistor is thermally tracked against temperature rise during operation.

Two double-pole changeover relays are incorporated which control all four functions of the unit. These are:

1. Both preamplifier and PA off, when the antenna is switched straight through.
2. Receiver preamplifier operational only.
3. PA stage operational only.
4. Both preamplifier and PA stage operational.

When the PA is at stand by, any transmitter RF at the input is coupled through a small capacitor, rectified and fed to the RF switching circuit. This is a four-stage affair, using ZTX302 transistors, two of which act as relay drivers. The relays switch the RF2123A stage between transceiver output and the antenna. For SSB and CW operation, a slight delay can be provided by

switching in a 33 $\mu$ F capacitor to hold the base voltage on the first relay drive transistor. Alternatively, the PA can be hard switched via a separate PTT line brought out to a phone socket on the rear panel.

## Construction

The "works" are built on a double-sided, fibreglass PCB, housed in an extruded aluminium heatsink enclosure, 200mm. long, 115mm. wide and 55mm. high. The rear panel accommodates two SO-239 sockets for the connections to the transceiver and antenna, a fuse and a phono socket for the PTT lead. Red and black DC power leads come out of this panel and are 75cm. long. The front panel incorporates three, miniature toggle switches which are: "Power", a three-position, centre-off, selecting either one or three watts drive; "Power Amp", also centre-off which selects either FM — instant switching — or SSB — delayed changeover; and "Preamp", which simply switches the Rx preamplifier on or off. Each of these switches has an LED underneath as a status indicator. A green LED lights when RF power is being fed through the PA. The "works" are protected by a cover plate which carries a label, "Beryllium Oxide — Hazard", warning the user not to dismantle or tamper with the component parts.

## Results

The Rx preamplifier gain was about 15dB, measured by the previously calibrated S-meter in the station receiver and was slightly more than the specified figure. On very weak signals, such as distant beacons in flat band conditions, this stage made all the difference between marginal and "solid" reception.

The amplifier was used after the normal station transverter but with the output of the latter reduced to the one or three watts level by a "power control" in the 28 MHz driver stage. With this method, it was a simple matter to switch off the MML 144/30LS and run the normal station at 30 watts, and then switch it in and reduce the transverter output. This was done during numerous routine contacts and nobody realised any changes had been made. Dummy load tests confirmed that the signal quality was unaffected by the MML 144/30LS, in other words, it was linearly amplifying what was fed into it.

Two tone tests were carried out to compare the performance of the normal, valve PA and the solid-state one at 30 watts. For both experiments, the third order intermodulation distortion products were in excess of 30dB down. No figure for this parameter was quoted in the specification but, for a solid-state PA at this power level, with no RF feedback, that is a reasonably good figure. No doubt the use of a 65 watts dissipation device is the main reason for this respectable performance.

The SSB/FM switch does *not* alter the class of operation from AB to C, as might be expected. All it does is to switch in the aforementioned 33 $\mu$ F capacitor in the RF switching stage. For this operator's taste, the RF switching was too fast, so the alternative hard switching via the PTT line was much preferred for SSB and CW use. For constant carrier modes, such as AM and FM, the delay is unnecessary.

## Conclusions

The MML 144/30LS can be well recommended to anyone using a low power transceiver of the IC-202, FT-290 type, for example. At £69.95 including VAT, it is reasonably priced, especially when one considers the Rx preamplifier is provided. For the loan of this unit, we are indebted to the manufacturer, Messrs. Microwave Modules Limited, of Brookfield Drive, Aintree, Liverpool, L9 7AN.

N.A.S.F.

# THE EXTENDED GROUND PLANE AERIAL

WITH PRACTICAL DETAILS OF AN EASILY ADJUSTED RADIATOR FOR 10 METRES

P. C. COLE, G3JFS

**T**HE ground plane aerial is an effective omni-directional radiator that can be put almost anywhere. It is quite simple and inexpensive to construct and although it may not stand up to close comparison with a high gain beam under poor propagation conditions it will often work better than most other simple aeri- als, especially when the mean height is less than a half-wavelength above ground.

## The Basic Ground Plane

In its simplest form the ground plane is made up of a quarter-wave vertical radiator mounted above four equally spaced horizontal radials, as shown in Fig. 1. The feedpoint impedance

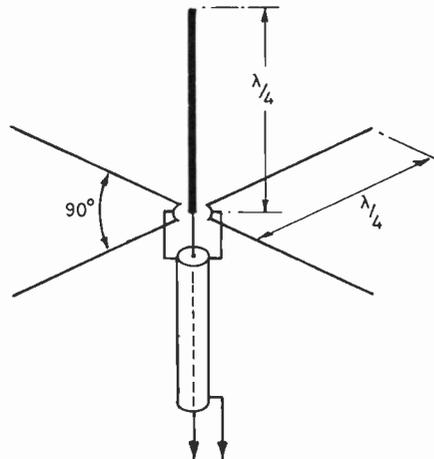


Fig.1 THE BASIC GROUND PLANE AERIAL

D 1001

The horizontal radials act as an artificial earth or ground plane allowing the aerial to be mounted at any convenient height. Fed with a short run of good quality coaxial cable, this arrangement will normally radiate efficiently without resorting to lengthy tuning and matching procedures. Element lengths are not extremely critical and can be cut to: length =  $(234/f \text{ MHz})\text{ft}$ .

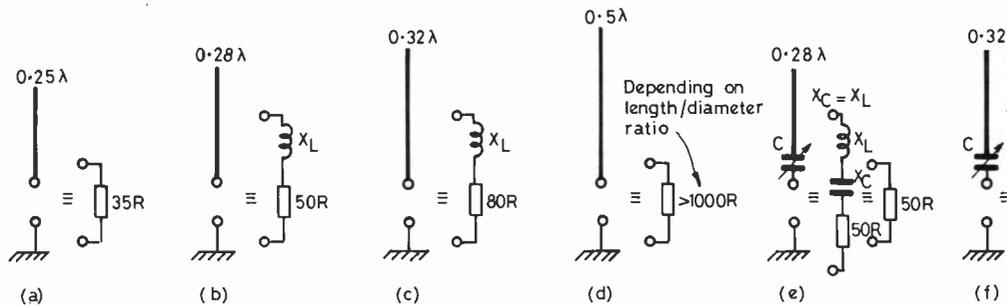


Fig.2 THE PRINCIPLE OF THE EXTENDED GROUND PLANE AERIAL

NB. The inductive reactances  $X_L$  shown in (b) and (c) are not the same, as like the resistive components they also increase with radiator length up to  $\lambda/2$

D 1002

Diagrams (a) to (d) illustrate the change in feedpoint impedance of a vertical radiator as its electrical length is increased from a quarter to one half wavelength. By proper choice of element length the resistive part of the feedpoint impedance can be matched to a standard 50-80ohm coaxial feeder and the unwanted inductive reactance can then be tuned out with a suitable capacitor to leave a purely resistive feedpoint, a shown in (e) and (f). See the text for comments on practical radiator lengths.

Use	Ground Plane	Dipole
Ground Wave — across town nets.	Very good, especially if all stations used verticals.	Good, but directivity can cause some problems.
Short skip — Western Europe.	Generally poor due to lack of high angle radiation.	Very good. The high angle of radiation from a low dipole is ideal for short skip.
Medium distance — Eastern Europe, Asia, etc.	Similar signals to dipole but usually more prone to fading.	Good but signal strengths start to fall off.
Longer distance — Far East, Australasia, etc.	Typical signal levels of S5 when the band is open. Very good contacts can often be made as the band opens or closes though signals may be weak.	Generally similar radiation level to ground plane. No discrimination against short skip signals on reception.

Table 1. Comparison of the performance of a ground plane aerial mounted close to ground with that of a dipole at 25ft. when used with a typical 100-watt output transmitter. This table is intended to be a very simple guide to the behaviour of a ground plane aerial, based on tests and observations over many years on the HF DX bands. It should be appreciated that the subject is very complex and cannot properly be covered in so simple a manner but it is hoped that this form of evaluation will be more useful than listing stations worked.

of a true ground plane is of the order of about 20 ohms, but in practice this can vary widely and values of 25-40 ohms are likely in a typical amateur radio installation on a less-than-ideal site. Thus in most cases a standard low impedance coaxial feeder can be connected directly to the feedpoint and the mismatch will not be serious enough to affect the radiation efficiency adversely. This is particularly true if the feeder is a short (say less than 50ft) run of good quality cable, when time spent in tuning and adjusting to reduce the VSWR would be wasted *as far as the strength* of the radiated signal is concerned.

However, radiation efficiency is not necessarily the only consideration and there may be times — for example to allow a rapid change between aerial systems without having to retune, or even just for personal satisfaction — when one wants the most accurate match possible. Also, another factor which may have to be considered is that many modern solid-state transmitters will not operate properly with a mismatched load and they have protection circuits which reduce the output power at quite low levels of VSWR.

### Matching

The most widely used matching arrangements involve such things as Q-sections, stubs and network transformers and whilst all of these devices are electrically sound their use is viewed with some apprehension by many radio amateurs.

The extended ground plane, in which feedpoint impedance is controlled by radiator length adjustment, is another way to

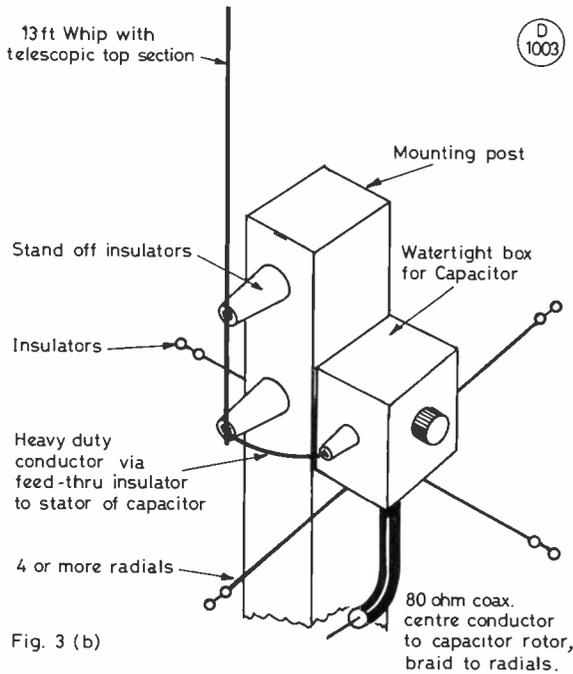


Fig. 3 (b)

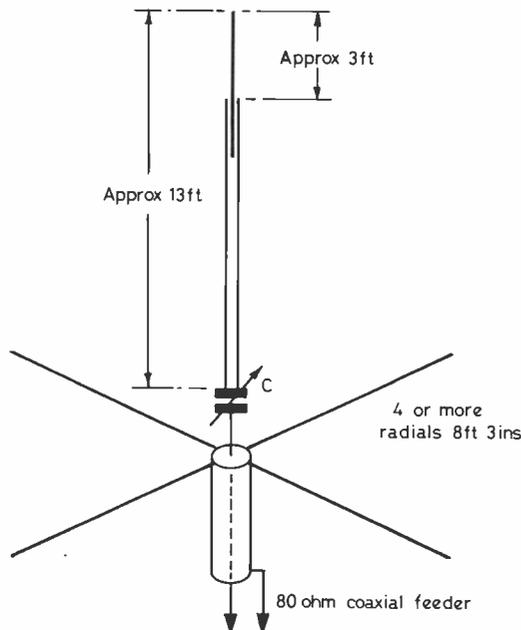


Fig. 3 (a)

(a) An extended ground plane aerial for use on 10 metres with an 80-ohm feeder. If a 50-ohm feeder is preferred this can be matched by suitably shortening the vertical radiator as described in the tuning procedure. 'C' is a low power transmitting type capacitor of about 100 pF maximum capacity. (b) Constructional details of an extended ground plane aerial for 10 metres. Note that the capacitor must be insulated from the box if this is made of metal. Also remember that the ends of the radials are at a high RF potential — even 10 watts will cause nasty burns — and they should be mounted out of the reach of family and friends, as well as being well insulated.

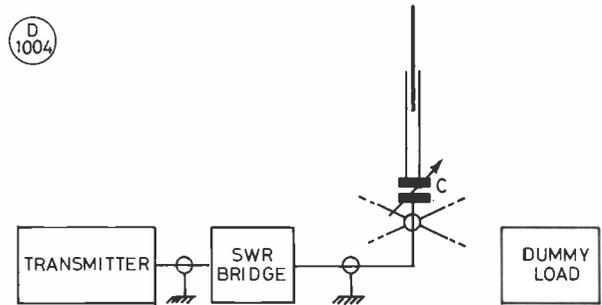


Fig.4 CONNECTIONS FOR THE TUNING & ADJUSTMENT OF AERIAL

achieve accurate matching. Using a method based on simple theory, it is easy to set up and only slightly more difficult to install than a more conventional ground plane.

### The Extended Ground Plane

The feedpoint impedance at the base of a resonant quarter-wave length vertical radiator is a pure resistance of perhaps 35 ohms. If the radiator length is made longer than a quarter-wave length the feedpoint impedance will increase but it then becomes a complex quantity looking like an increased value of resistance in series with an inductive reactance, as shown in Fig. 2. By choosing a suitable length for the radiator the resistive component of the feedpoint impedance can be made to match the characteristic impedance of the chosen feeder line, whilst the inductive reactance can be cancelled or tuned out by an equal amount of capacitive reactance in series with the aerial. In this condition the radiator will be resonant, it will be accurately matched to the feeder, and it will radiate RF power efficiently.

Most amateur radio aerial handbooks quote the theoretical radiator lengths of  $0.28\lambda$  for matching to a 50-ohm coaxial cable and  $0.32\lambda$  for matching to an 80-ohm one. Contrary to statements that have been made in some handbooks these lengths are *not* fixed free-space values and in a practical aerial it is usually found that the radiator must be made somewhat longer than these figures suggest. Because of the many variables involved it is not easy to predict accurately the proper length for the vertical element, but past experience has shown that  $0.4\lambda$  is a good starting point for the design of an 80-ohm system when using tubular elements. Once the aerial is built it is a simple matter to adjust the vertical element to the correct length with a little trial and error aided by some SWR measurements. However, as it is usually easier to cut bits off than it is to put them back on, initially it is wise to make the vertical too long; using radiator length =  $0.4\lambda$  errs in this direction.

### An Extended Ground Plane for 10 Metres

Fig. 3(a) gives the essential details of a 10-metre ground plane designed for use with a nominal 80-ohm coaxial feeder. (This impedance was standardised upon a long time ago at G3JFS simply because of the availability of a high power dummy load resistor which happened to be 80 ohms!) Fig. 3(b) shows one possible method of construction, but as the physical arrangement of the aerial is open to many different interpretations there is considerable scope for improvisation and exercise of one's ingenuity to make the best use of the available site and materials.

Some points to consider when building the aerial are:

- (1) Use metal tubing or the heaviest gauge of wire that is available for radiator and radials.
- (2) HF band ground plane radials are always something of a nuisance and difficult to install but every effort should be made to mount them above head height where they cannot be touched easily. The end of each radial is a point of high RF potential which is hot enough to give a very nasty burn with only the output of a low power transmitter applied to the aerial.
- (3) All joins and connections should be made mechanically

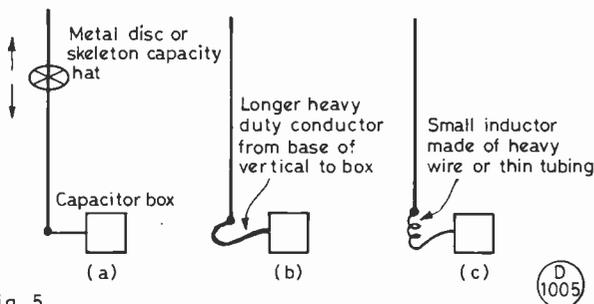


Fig. 5

Some possible ways of lowering the resonant frequency of a vertical that is too short. (a) With a capacitive hat — tuning of the aerial will depend on the dimensions and positioning of the 'hat' which must make good electrical contact to the radiator. (b) A small reduction in the resonant frequency can be obtained by increasing the length of the connection from the bottom of the whip to the capacitor box. (c) For a larger change of frequency a loading coil may be used. Adjust the number of turns and/or their spacing to obtain resonance at the desired frequency.

and electrically sound and then waterproofed to resist corrosion.

(4) Make sure that water cannot get into the capacitor box. A rubber grommet of appropriate size, smeared with silicon grease, can be used as a watertight seal for the capacitor spindle.

(5) Use good quality coaxial cable. The cable ends should be well protected with tape and waterproof sealant to prevent the ingress of moisture which will quickly ruin a good cable.

### Tuning and Adjustment

The tuning and adjustment of the aerial can be done very easily by using the station transmitter and a VSWR bridge to carry out the following simple procedure:

(1) Tune the transmitter into an 80-ohm dummy load at the desired operating frequency, using the lowest power level that will give a useful forward power reading.

(2) Connect the aerial in place of the dummy load and adjust the series capacitor 'C' for a minimum VSWR. If necessary alter the length of the vertical section and repeat the tuning procedure to get the lowest possible VSWR, or the best compromise over a band of frequencies of particular interest.

(3) If a telescopic aerial section is not provided, carry out the tuning procedure at intervals over the band. Then by plotting VSWR against frequency on a piece of graph paper it will be easy to decide if the radiator needs to be shortened or lengthened to resonate at the desired frequency.

(4) If the aerial has to be shortened by cutting do it a small piece at a time because it is far easier to cut some off than it is to put it back on!

(5) However, if you do cut off too much all is not lost as Fig. 5 suggests three simple ways of increasing the electrical length of the radiator.

Although the above description has been of a 10-metre aerial the dimensions can be scaled up for 15 or 20 metres, where the element lengths are still quite manageable. If a 50-ohm feeder system is preferred, this can be used if the radiator is shortened by a suitable amount; this is best determined experimentally by following the tuning procedure as above.

### Results

Most aerial handbooks put great emphasis on the low angle radiation produced by a ground plane aerial, but this is rarely achieved in practice as it depends on the aerial being mounted over perfectly conducting ground. As even the best approximation to this — an aerial over salt water — is out of the reach of most of us we must accept that the DX performance of a practical ground plane is not going to be as good as theory suggests, though just how well it will work is not easy to determine except by using it under actual operating conditions. Much does depend on the site but in one series of tests carried out by the writer a ground plane

mounted with its radials at 6ft. above ground on a reasonably open site gave very similar results to a dipole at 25ft., and it was 2 to 4 'S' points down on a TA-33 at 30ft. Other tests results are summarised in Table 1 which gives a simple comparison of the general behaviour of a ground plane with that of a dipole.

## BOOK REVIEW

### TELEPRINTER HANDBOOK

#### Second Edition

MY first encounter with amateur RTTY was in the early 1960s during a visit to the shack of a local friend. The size and noise of the *Creed 7B* page printer did not entirely endear me to the mode. However, much progress has been made in the last two decades with the advent of quieter, more compact machines, VDUs, and so on, so it was with considerable interest that the chance to review the second edition of the *Teleprinter Handbook* was accepted.

The book contains fourteen chapters, three appendices and an index, beginning with a short chapter on basic telegraphy transmission theory based upon a *British Telecom* pamphlet. The next section, entitled "Teleprinters", is the real meat of the book, its 156 pages occupying nearly half the volume. It deals in great detail with the *Creed 7B*, 54, 75 and 444 machines, the *Siemens T-100* and *T-150*, the *Teletype Corporation's* Models 15 and 19, and the *Creed Type 85* and *86* reperforators. There are brief details of the *Teletype Corporation's* 28, 32, 33 and 43 models. This chapter is copiously illustrated with scores of diagrams and photographs, akin to workshop manuals for motor cars.

Chapter three comprises 32 pages devoted to "Other RTTY Machines", and includes the *Creed 6S*-series of automatic transmitters and *Creed* and *Teletype Corporation* perforators and reperforators. The following short section on "Power Supply Units" is quite basic and conventional. The fifth chapter, "Demodulators", is the second longest and features the *Mainline ST-6* and *BARTG ST-5* designs in great detail in its 44 pages. The next chapter is devoted to "Polarised Relays" and covers the *Carpenter 3, 4, 5* and *6*, and *Western Electrics 251A* and *255A* devices, thoroughly illustrated with many drawings and photographs.

The next two chapters are quite short: seven deals with "Keying Methods", and eight with "Filters". Chapter nine's 21 pages are devoted to "Test Equipment" and includes information on various Telegraph Distortion Measuring Sets and Telegraph Signal Generators. I had assumed that teleprinters with reams of paper copy were rapidly becoming museum pieces, so found it somewhat surprising that a mere nine pages, forming Chapter 10, were devoted to a "Video Display Unit". It seems that the old *Hellschreiber* system is enjoying a bit of a renewal in Europe lately, so the handbook includes a brief reference to it in the three pages making up Chapter 11. The final three sections are short ones entitled; "Control Systems", "The RTTY Station", and "Operating Procedures", while the three appendices consist of a "Glossary of Commercial Equipment", "Terminology", and six pages of "Data".

To sum up, then, for the "mechanical" RTTY enthusiast, this second edition of the *Teleprinter Handbook* must be classed as a "bible" so can be thoroughly recommended. The editors are Messrs. Hobbs (G8GOJ), Yeomanson (G3IIR), and Gee (G2UK), and it is published by the RSGB. It is a hardback production of 368 pages, 246 x 184 mm. and is available at £13.70, including postage and packing, from *Short Wave Magazine Publications* Department, at 34 High Street, WELWYN, Herts., AL6 9EQ.

N.A.S.F.



## SHORT WAVE LISTENER FEATURE

By Justin Cooper

ONCE or twice in this column your scribe has remarked that each year he took an RAE class increased his own understanding of the subject somewhere. This thought always puts me in mind of others trying that hardest of all tasks; preparing for the examination alone with no one to elucidate the hard bits. For one thing, even if you had someone to help, for him the 'hard bits' would be different, and one tends to be impatient with those who find hard that which is easy to yourself.

We were, then, naturally very interested in the letter from *Barry Ward (Ruddington)* who faces just this sort of problem. With regard to the learning part itself, *repetition* is the word: read the text time and time again. The way we suggest is that you take a portion of the syllabus — say, a single chapter or less. Read it, and re-read it again at, as near as you can, daily intervals. There is a reason for choosing this interval of time, in that recall is better after 24 hours. Read with a pencil and paper; if a sketch of what is happening will help, then sketch it. After a few times, the idea will 'click', and then a couple more readings at 24-hour intervals will reinforce it; then go on to the next bit. Remember, especially if you haven't done any study since school-days, that you are in reality doing two subjects, of which one is the RAE, and t'other is "How to Learn"!

On a totally different tack, Barry is a CW buff of no mean ability but, being R.A.F. trained, there is a strong instinct to *write everything down*. The lad is just trying to break this habit, and rightly so — after all, even with the abbreviated symbols used by CW operators, 90% of what is copied are mere connecting words and irrelevant to the matter in hand. Even when ragchewing, J.C. only writes down the salient points on the scratch-pad, and in a 'rubber-stamp' QSO this is what goes in the log. However, everything is copied and 'stored' in the mind with anything demanding a response being noted on the scratch pad.

### The Mail

The ladies come first, and they lead with *Mrs. T. Parry (Blackpool)* from whom we had an interesting letter. Tina seems to have been in among the oddities this time; 70XN who claimed to be in Yemen, and she also returned J88 to her list having established it as the new prefix for St. Vincent and the Grenadines. G5ACI/AA provides a bit of a puzzler for the HPX Rules: this was Iris Colvin's call at one of the couple's stops — Abu Ail, and a country in its own right. This being so, to count it as G5/AA seems the right thing to do in accordance with the HPX Rules. On a different tack, Tina is getting interested in the business of *Oscar* and is reading-up first to get the hang of it all.

Only one letter and a short list this time from *Mrs. R. Smith (Nuneaton)* who has been somewhat occupied with the domestic chores incidental to Christmas, not to mention the difficulty of finding new ones at her level in the Table. Another problem has been QSB — fading which she reckons may well have been connected with the high winds.

*Mrs. J. Charles (Colchester)* has collected quite a few of the mobile and maritime mobile prefixes this time, but it has been under difficulties — she has been decorating the kitchen and having to 'make time' for a quick listen!

The CW prefix-chasing activity at *A. F. Roberts's (Kidderminster)* shack has been reduced, at least as far as the HF bands go, by a resurgence of interest in Top Band WAB. However, with a nice balance of interests, there must be an addition to the score — and there is!

What, enquires *A. Pyne (Bradford)*, does the suffix /MA mean when attached to a G callsign? This signifies that you are listening to a Maritime Mobile station, who is in fact using the station while at anchor as defined in the /MM permit.

Many readers commented on the shortage of prefixes of late, and it does seem that a combination of below-normal propagation and a shortage of DX-peditions has lowered activity among the rare ones. However, there are still nuggets to be found. L2M was a contest call from the Argentine, and XO2JCG was associated with the Canadian Winter Games, name of Roch, and address PO Box 212, Chicoutimi, Province of Quebec. Finally J87BS, on the island of Mustique, just off St. Vincent in the Windward Is. group.

Next we turn to *B. F. Hughes (Worcester)* who seems to have gained a new lease of life from the move of QTH, at least in terms of prefixes; probably changes of favoured direction, height, orientation of aerials and so forth, account for it.

### A Good Station

*E. G. Hughes (Belfast)* wants some ideas of how to make himself a first-class listening post. He is already doing the first part, by way of a home-study course, and we would strongly recommend a second activity of joining the local club. Thus one has inputs of theoretical knowledge and practical experience. Now to the station proper. On the face of it, one would imagine that 'the very best receiver obtainable' would be mandatory, but your J.C. doubts it; a simpler receiver, with short-comings to 'learn on' and on which your tastes in listening can be allowed to emerge while your operating skill is sharpened by its weaknesses. Then, by all means, a sooper-doooper receiver with the 'options' chosen to slant it towards your own preferences. Of course, the ideal station would have a room to itself, and enough room to operate the equipment in comfort, with the log and the reference books easily to hand — you always seem to want them in a hurry! — and, naturally, enough room to write as well. Nearby, the filing system; when you have the station logged you want to slot it into your HPX list, or know whether to QSL him, and if a QSL has gone out whether it has come back. There will be arrangements for several aerials, and their ATUs, and all aerials can be attached to any receiver; outside, there will be the real-estate, the towers and masts to hold up the chosen aerials. Last but not least a gardener!

So much for perfection: what about the practice? Do the best you can, but always bear in mind two things, namely that in the first place ingenuity can do a lot to make up for the shortcomings of the station, and in the second place that you *can* leave out the gimmicks so beloved of receiver makers, meaning that much of what is needed can be home-brewed or improvised.

Turning to QSLs; the report is the first thing, and all we need to say is that it must be detailed enough and informative enough to make the recipient feel it his duty to respond; in other words a *useful* report. Then you must decide whether the card goes through the Bureau system, and if so you must belong to a group

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## ANNUAL HPX LADDER

### Starting date, January 1, 1982

SWL	PREFIXES	
T. Kirby (Cheltenham)	466	I. Blair (Swansea) 263
Mrs. C. Law (Chesterfield)	390	H. Smith (Sale) 204
P. D. Hunt (Woolwich)	310	

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This is the last appearance of the 1982 Table. Next issue will include entries for the 1983 Table; 200 prefixes to have been heard since January 1, 1983 for an entry to be made, in accordance with HPX Rules shown on p. 26. At score 500, transfer to the All-Time listings is automatic.

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## HPX RULES

(1) The object is to hear and log as many *prefixes* as possible; a prefix can only count once for any list, whatever band it is heard on.

(2) The /M and /MM suffixes create a new series: thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.

(3) Where a suffix determines a *location* the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE3UJ/P/SU, they are arbitrarily counted as SU1 and SU2 respectfully, and the same holds good for similar callsigns.

(4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 both count.

(5) The object is to hear *prefixes* not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.

(6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate callsigns will not be credited, nor any MARS stations be claimed.

(7) G2, G3, G4, etc., all count separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, all count separately even though they may be in the same street.

(8) Send your HPX list, in alphabetical and numerical order showing the total claimed score. With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ, if possible to arrive before the SWL deadline for that particular month.

(9) Failure to report for two consecutive listings, *i.e.* four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.

(10) Starting score 200. Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.

(11) Lists will be based on those shown in the current "Radio Amateur Prefix-Country-Zone List", published by Geoff. Watts (*see* Advertiser's Index in any issue of SHORT WAVE MAGAZINE).

organising one (RSGB or ISWL in U.K.). For the rare ones, such as the upcoming Heard Is. DX-peditions, you will QSL direct to the address given by the station, and enclose an s.a.e. or IRC's, as directed. If you send an s.a.e. to a station in, say New Guinea, it's no good stamping it with English stamps — you have to go to the local philately shop and buy the needful quantity of New Guinea stamps to put on the return envelope. This, of course, can be difficult — hence IRC's (International Reply Coupons), available from major Post Offices, although a request for them will often produce a blank stare which has to be altered by asking them to read their Book of Words, or even by violent jumping-up-and-down. These are valid in almost every country in the world and convert into the right number of return-post stamps of the country where they are 'cashed in'. Often in fact, they stay in circulation for years among amateurs.

S. Foster (Lincoln) wants one or other of the Heard Is. stations, as he hasn't got that country; with 322 DXCC countries confirmed as an SWL, new ones are *rare* — like hen's teeth!

Listening time fell away somewhat towards the end of last year, says T. Kirby (Cheltenham); Tim was of course preparing for the RAE, and when he wrote was awaiting the results. As for the Morse, it is coming along, and 12 w.p.m. is there on a good day and a following wind, so the target is not too far out of range. And, in the process, Tim has found another facet of the hobby: during the year, the prime discovery was the totally unexpected

one of the DX potential of 80 and 40 metres; as he says, he nearly fell out of the chair when he heard his first ZL on Eighty!

Now R. Fox (Northampton) who, along with others, wonders about the recent rash of YU stations using the suffix /X. We seem to recall that years ago the /X implied another member of the family using the call, but a sudden flood of such calls raises a question as to whether it now has a new meaning.

Roy has been investigating the bands generally, and trying to establish the best times for listening in the mornings. So far he has achieved results for all bands except 7 MHz; but we bet that in a year's time he will have modified those views considerably! Seriously, Roy raises again the idea that those who are in the ATPW should be allowed to run an entry in the Annual too, the argument being that this will enable the newcomer to have a yardstick to measure his own progress against. We originally turned the bottom of the HPX Ladder into an Annual affair as so many readers preferred to compete with people at their own stage of development before going into the ATPW at which time they should be able to hold their own with the best.

Turning to B. Patchett (Sheffield) we find him now moving out of the Annual and into the ATPW lists, and also well into RAE studies at Rotherham college. Brian is having serious thoughts about the possibility of taking the Morse ahead of the RAE sitting in May, on the grounds that he is already practising at 17 w.p.m., but he does say he wishes more of the RSGB Slow Morse was to be heard on the LF bands. Top Band was traditionally where all the slow Morse lived, but of late years there has been a considerable upsurge on 144 MHz.

Congratulations are due to J. Dunnett (Rhyl) who is now sporting GW4RGA, a call which he is doing his level best to exercise to the full on all bands from 144 MHz down to 3.5 MHz, albeit CW only on some bands. A worthy end to a long and distinguished SWL career, and let's hope he will now be passing all that is worked on to G3KFE and "CDXN".

Lots of interesting things are said in the letter from M. Toms (Barkingside); Mike has been putting in lots of hours of work, but as he comments philosophically, why complain of that in time of recession? On a different tack, Mike thinks that the RSGB's U.K. Callbook is out-of-date before it comes out, due to the long

## HPX LADDER (All Time Post War)

SWL	PREFIXES		
	PHONE ONLY		
		K. Cooke (Cardiff)	762
		J. Dunnett (Prestatyn)	732
B. Hughes (Worcester)	2614	P. Lincoln (Aldershot)	702
S. Foster (Lincoln)	2304	J. Heath (St. Ives, Cambs.)	618
Mrs. R. Smith (Nuneaton)	2297	A. J. Hall (Alvaston)	588
E. W. Robinson (Bury St. Edmunds)	2139	R. Wooden (Staines)	540
H. M. Graham (Chesham)	1549	B. Patchett (Sheffield)	531
G. W. Raven (London SE13)	1441	A. Pilkington (Chesterfield)	518
M. Toms (Barkingside)	1400		
M. Rodgers (Harwood)	1392		CW ONLY
N. Askew (Coventry)	1279	E. B. Ward (Ruddington)	1513
M. Law (Chesterfield)	1268	J. Goodrick (I.o.W.)	1289
Mrs. T. Parry (Blackpool)	1250	J. M. Dunnett (Prestatyn)	1127
D. C. Casson (Reading)	1089	A. F. Roberts	
N. E. Jennings (Rye)	1077	(Kidderminster)	1093
B. A. Payne (Leeds)	1025	H. Scott (Wetherby)	1074
D. J. S. Williams (Wednesbury)	1024	P. L. Shakespeare (Foulness)	624
H. Bale (Cardiff)	1015	D. J. S. Williams (Romsey)	266
A. Pyne (Bradford)	916	R. Fox (Northampton)	276
Mrs. J. Charles (Colchester)	879		
R. Fox (Northampton)	859		RTTY ONLY
R. Everitt (Bluntisham)	831	N. E. Jennings (Rye)	334
		P. Lincoln (Aldershot)	328
		J. M. Dunnett (Prestatyn)	287

Minimum score for an entry: 200 for CW or RTTY, 500 for Phone. Listings to include only recent claims and to be in accordance with HPX Rules, see this page.



The super SWL station of Peter Lincoln, BRS42979, at his Aldershot QTH. In the picture above, at the top is the Realistic DX-300, below this the Sharp RT3151 cassette deck, and below this the Eddystone 1570/3 receiver (now replaced by an Icom IC-R70). On top of the Eddystone is the Datong FL3 and Microwave Modules MM-2000 RTTY converter; also a home-brew preselector and antenna selector. To the left of the picture is the Datong 144/28 converter and below it a home-brew ATU; the Cambridge Kits MSF clock is at the bottom. On the right of the photograph, at the top, is a Hitachi 4.5-in b/w TV set used for RTTY and SSTV display; below it is the Wraase SC-140 SSTV converter and below again, the Realistic PRO-2002 scanner, to the right of which is the antenna rotator control unit. Peter's station also has a sharp MZ-80K computer, dual floppy disc unit, interference unit, and printer. Something tells us this lad is serious!

processing delay at the Home Office and the chosen annual publication date. One feels this is a little unfair, because the delay in the system is not by any means traditional but is something which grew out of all proportion in 1982; we guess the printing schedule was set down long before anyone was in a position to foresee just how far adrift the H.O. people were going to be. However, the new three-times-yearly RAE schedule does make Mike's suggestion that a new issue of the *Call Book* each year should appear in, say, late November a very attractive one in terms of being as near up-to-date as can be. Doubtless, if any Council member should read this he might care to offer it at a meeting as a thought from the membership.

A couple of years ago, *H. M. Graham (Chesham)* decided to try for the U.S.A. counties; he got hold of a Rand-McNally road map and found himself some 2977 counties marked, of which so far 1124 have been heard; a full set for Connecticut, Delaware, New Hampshire, New Jersey, Rhode Island, and Washington D.C. but gaps in all other States. This is an interesting exercise, and it would be worthwhile getting hold of some copies of *CQ Magazine*, as they run an award programme on just this basis, and many of the rare ones are activated by mobiles and nets, just as with WAB at home.

*R. Everitt (Bluntisham)* has been somewhat restricted by the mock A-level examinations, but he has found some time to soak up the French-speaking DX at the lower end of the 14 MHz Phone band, an effort the more easy for him as he speaks the language quite well.

Another long and interesting letter from *J. Goodrick (Newport, I.o.W.)*; John found the early part of December good for a flood of new prefixes, which eased off a bit later but still kept

him rolling along nicely. John is one of the few contest-minded SWLs in our lists and he seems to tackle most of the important ones, even though the paperwork is a bit of a chore to keep up with.

A change of receiver is the big news from *A. P. Lincoln (Aldershot)*, who has put aside the old Eddystone in favour of a new Icom IC-R70, which he finds a vast improvement. For one thing the stability is much better, so CW and RTTY copy are that much easier, while the improved front-end dynamic range means that weak signals on SSB can be found and copied on 7 MHz, where the Eddystone had so much front-end attenuation to stop overload that only the big ones could be copied. Also notable is the reduction in the number of spurious responses.

*N. Jennings (Rye)* and *A. P. Lincoln* continue to maintain contact; Norman found a nice line in 'weirdos' this time with "EPAIB7" who claimed to be on a caravan site in Southern Spain. Probably a CB-er with delusions of grandeur, and we hope the poor fellow left the site before the Long Arm of the Law descended! On a totally different tack, Norman found another ISWL member in Rye, and is doing a bit of work at bringing him on to the HPX ladder. Good!

*A. Pilkington (Chesterfield)* has had a couple of weeks on the sick-list, and some mock A-level exams to be studied for and taken; but another 150 prefixes go on the total, nevertheless!

For *R. Wooden (Staines)* the long Christmas break was a good thing, enabling him to settle down and listen at times when he would normally be at work or asleep. Naturally the totals have gone up to suit. Surprising how a change of listening habits can improve results!

*J. Heath (St. Ives, Huntingdon)* seems to have been working at the SWL since last time, and his most interesting one is definitely VKOAB in Antarctica, talking about his recent visit to McMurdo Sound.

## Contest

We mustn't miss this one out — Barking Radio & Electronics Society have their 144 MHz contest on March 27, with an SWL category. Log stations taking part in the contest *only* for points claims. One point per station, or ten points if you hear G3XBF or G8XBF, the club calls. More details from our very own contributor Mike Toms, either by letter with *s.a.e.*, at 43 Waterloo Road, Barking, Ilford, Essex IG6 2EG, or by telephone, *weekends only*, on 01-550 2902. Include the usual declaration with the entry; and give Mike as much support as you can between 1300 and 1700 GMT as we suspect he has worked hard on this one.

Our last mention is just a list from *M. Rodgers (Harwood)*.

## Thoughts

Purely J.C.'s meanderings, sad to say! On wonders how many others are actively listening to the satellites; *Oscar 9* is of course the UOSAT one, now under full command, and there are the Russian ones, both *ISKRA* and the *RS* series, not to mention *Oscar 8*, and they can all contribute to interest in and activity on Ten in slack times. We'd be interested to hear.

A final thought, this time on the subject of learning Morse. Many of you have bought *Datong* Morse tutors, and use them to get up speed. The tutor produces perfect Morse, and therein lies a bit of a trap for the unwary! When you go for the test, you will get a dose of good, but *hand-sent*, Morse, and the divergence between it and perfection may be enough to 'throw' you. You need to do at least some practice on good hand-sent Morse so that the Morse you get at the test is still easy copy to you — and we suspect that a copy speed of around 15 w.p.m. on the *Datong* equates to easy copy at 12 w.p.m. of good hand-sent stuff.

## Period

All for now; the deadline for next time is **March 17**, to arrive, addressed to your scribe, "SWL", SHORT WAVE MAGAZINE, 34 High Street, Herts. AL6 9EQ. *Cheerio!*

# MINOR MODIFICATIONS TO THE LOWE SRX-30 RECEIVER

## LOWERING THE COVERAGE TO 190 kHz ON EARLY MODELS

A. SKAIFE, Tech(CEI), MSERT

THE Lowe SRX-30 receiver has now been around for several years and is used by hams and SWL's alike. However, the manufacturers have been periodically bringing out modified versions in a bid to tempt us towards newer models. My modification is for those (like myself) who still have the original version and who wish to improve its facilities. It is also cheap, easy and may be readily attempted by the novice.

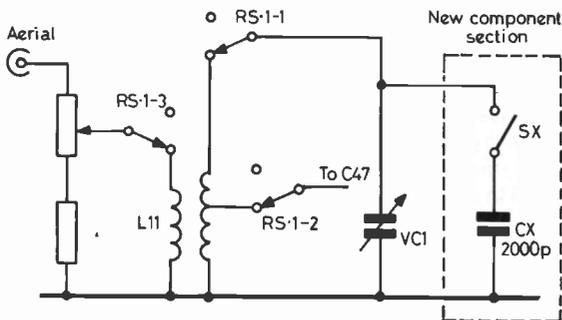


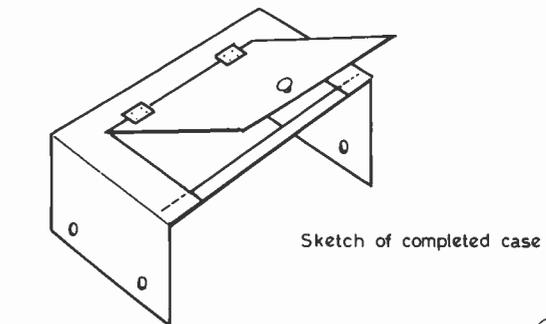
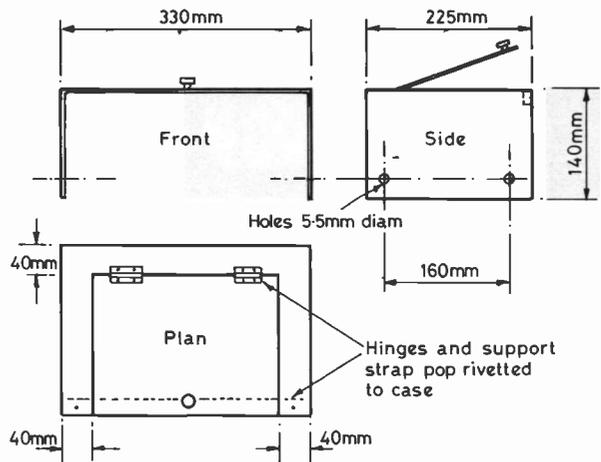
Fig.1 DIAGRAM OF 200kHz MODIFICATION

E 026

reception of *Radio 4* a slight adjustment to L11 may be found to be necessary if VC1 does not provide enough gain.

At the time of writing the radio is being used in Germany and *Radio 4*'s signal is OK on the normal portable 'tranny'. However, it is much more convenient when in the shack to be able to tune in on the SRX-30 and avoid those second channel or image noises.

In order that the receiver can be returned to original condition for future sale I decided to construct a new case; the dimensions and design of a new case are shown in Fig. 3. (It is a direct replacement so the original can be retained for future use). The hinged top lid makes access simpler when adjustments need to be done. I used aluminium (because it was at hand) but other materials such as tinplate, mild steel or even plywood may also be utilised. With a home-made case fitted one may feel a little happier when extra holes are required for other modifications.



Sketch of completed case

Fig. 3 MODIFIED CASE FOR SRX30

E 028

The lowest frequency at which the radio will operate is 500 kHz, but my modification will lower this range to 190 kHz. In order to make the radio tune to lower frequencies I adjusted the preselect circuits by simply adding a padder capacitor across VC1, the preselector. Also an on/off switch was incorporated in the new component section (Fig. 1) as the capacitor is not used on the higher bands. The circuit shows a 2000pF capacitor (CX) but I found two 1000pF capacitors in my junk box and twisted together in parallel found they worked OK. I mounted the on/off switch (SX) on the right-hand side, and Fig. 2 shows a simplified layout with only the major components shown. The capacitor is hard (or ugly) wired straight between the spare unsoldered connection on the pre-selector variable capacitor and the switch. From the other side of the switch a wire is soldered to the case of the variable capacitor at the top; this point is already tinned. To peak up

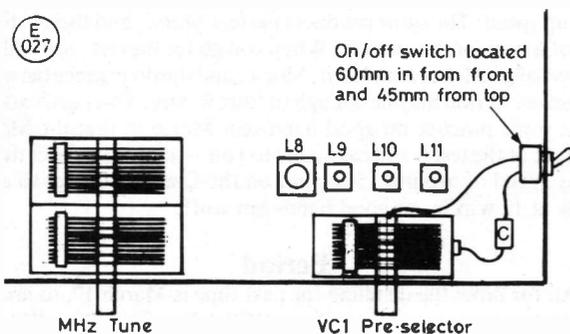


Fig. 2 SIMPLIFIED COMPONENT LAYOUT

E 027

### Icom ICB1050

There is an error in the article on converting this piece of equipment to 10 metres FM, on p. 656 of the February issue: line 17 of the right-hand column should read "... pin 11 and transfer to pin 13". We apologise to readers, and author G3XSE, for this mistake. However, it has also transpired since the article appeared that some examples of the ICB1050 have non-standard wire colour coding, and we suggest that anyone carrying out the modification should carefully follow the 'sense' of the description in the article, in conjunction with their own particular rig, without necessarily referring to wire colours — particularly if there appear to be discrepancies. There are, we understand, literally scores of converted ICB1050's now on the air, all modified successfully in accordance with G3XSE's article.

# “THE WHITFIELD” SSB/CW/QSK TRANSCEIVER PART I

AN EASY-TO-BUILD, 5 WATTS OUTPUT,  
MODERN DESIGN COVERING 160  
METRES, 80 METRES, AND 3 – 3.5 MHz

IAN KEYSER, G3ROO

**T**HIS transceiver was born when *Short Wave Magazine* asked me to follow George Dobb's, G3RJV, series “Plug In Your Soldering Iron and Begin Here” with a design that was easy to copy but still had all the required facilities. I intend to cover almost every component in the rig on a ‘blow-by-blow’ basis.

## General Description and Design Considerations

When considering the design of a new rig the first requirement is to decide the frequency coverage. Of course, with a ‘simple’ unit it is unwise to contemplate an all-band rig, but on the same basis it is rather a waste to build a ‘single bander’ when one considers that the amount of extra work to include a second band is minimal, especially if they are adjacent. With the sunspot maxima rapidly passing into history it was decided to construct the transceiver for 160 and 80 metres, plus a third range of 3 to 3.5 MHz for use with transverters. This meant that mental gymnastics were not necessary when trying to sort out calibration; also Ambient International market converters for the HF bands for this IF at very reasonable prices.

The next thing to sort out in the design are the modes which are to be available. Naturally it would be nice to include all modes, but this is to be a ‘simple’ set so it was decided that SSB and CW

would be used. With regard to CW I have a little fad that it must be full break-in (once QSK has been experienced it is very difficult to be happy with semi-QSK), and although it is an added complexity it is well worth the effort.

A problem that bugs all designers is the dial arrangement and tuning method. Over the years I have tried to use varicap tuning — with never very satisfactory results due to thermal problems. Various tricks are available that ease these, and with multi-turn pots which are now about there is no doubt it can be made satisfactory. However, as my mail bag is already plenty big enough, I decided to stick to convention. This decision was certainly influenced by the appearance of the Eddystone 898 dial on the second-hand market at very reasonable prices — sometimes as low as £5 — and this very smooth piece of machinery makes an excellent building chassis for the VFO.

As far as possible integrated circuits would be used to ease construction, in the major part of which a ‘breadboard’ would be built first and then re-built onto a PCB; this would verify the inherent stability of the circuits. (This decision at the onset of construction has proved rather enlightening, especially at the receiver IF stage where the Plessey SL6700 is used. When I tacked the components together I thought “this is impossible, no way can it work” . . . power was applied and — lo and behold — it was stable; yet when the PCB was built it was a very different story — it would *not* settle down. Then I discovered that I had forgotten to decouple the AGC detector: panic over!)

Peter Chadwick, G3RZP, had designed and built an 80-metre receiver using the SL6700 and the new high-level mixer from Plessey, the SL6440. After discussion with Peter, and with his kind permission, it was decided to pinch chunks of his design for use in “The Whitfield”. The ceramic filter was satisfactory for SSB, but there would be an advantage in having an audio filter for CW; and if this could be switched into a notch mode, so much the better. The audio amplifier was to have enough output to drive a loudspeaker. Although the specification of Peter's design was sufficient for the LF bands, provision would be made for those who wish to include an RF stage to make the rig ‘seem’ more lively during the day.

SSB generation would be carried out on the receiver IF PCB. This is the obvious place for it due to the placement of the IF filter and the CIO. Plenty of gain would be made available in the strip so as to be able to lose signal when coupling into the filter and so

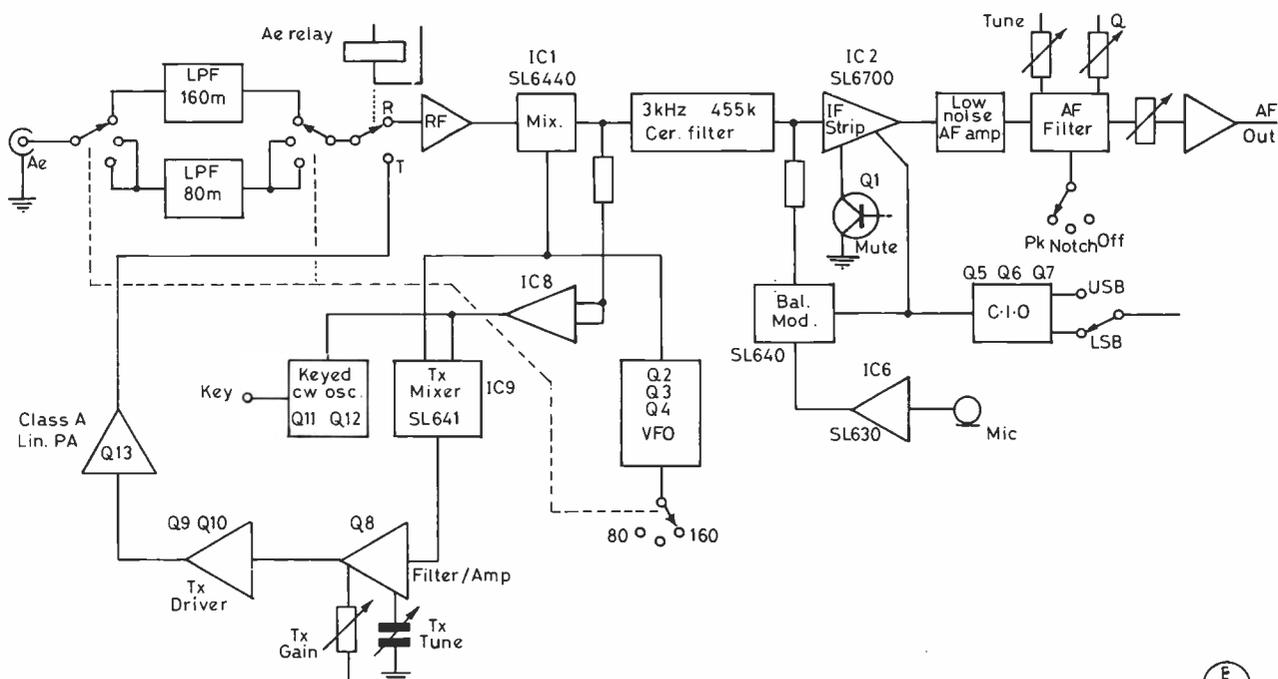


Fig.1 BLOCK DIAGRAM OF “THE WHITFIELD” TRANSCEIVER

reduce any loss of gain in the receiver section. Plessey SL1600 devices would be used in the SSB generator, but Vogad (voice operated gain adjusting device) would not be employed on the grounds of cost. Actually, I rather doubt the value of Vogad in amateur use, but in commercial applications it is superb.

The transmitter signal mixer would use an SL641, thus keeping component count to a minimum, to be followed by a Mosfet tuned amplifier/filter to select the correct signal on the band in use; this tuning to be independent of the main tuning and to cover the whole range 1.7 to 4.0 MHz without switching. This decision was made with split frequency working in mind; it is very difficult to align wide band passband circuits for this LF region, and if split frequency working is required it is much simpler to tune the Tx to that frequency and only have to switch the VFO signals. Split frequency is not included in this unit, but will no doubt be the subject of a future article.

Transmitter output to be about 5 watts, followed by low pass filters which would be used on receive as well as transmit. The reason for this is that with only two tuned RF circuits on receive, second channel is still (just) audible in practice; an ATU is sufficient to eradicate it, but the low pass filters are there and so might as well be used.

That covers the basic outline of "The Whitfield" before starting construction; we now have to consider the size of the rig. As mentioned earlier, the Eddystone 898 dial is the heart of the tuning and this automatically sets the front panel minimum size to 6 x 9 inches. There are also a fairly large number of controls: main tuning, Tx tuning, Rf attenuator, AF gain, mode switch, filter switch, filter tune, filter 'Q', meter, meter switch, phones socket, mic. socket, and Tx gain.

In view of the number of controls, and not wishing to use concentric pots, the front panel was set at 6 x 12 inches: this allows plenty of room between controls without making the unit too large. Certainly, by cutting down the dial and other modifications the set could be made very compact since the PCB's are small — it's just that as it stands there is plenty of space between them! Box, rather than chassis, construction was used for maximum screening and this enables a much more solid job, a necessity in any rig. The metalwork can be supplied by *H. L. Smith* 287-289 Edgware Road, London, and all the sizes will be given in due course for those who like to 'do it themselves'.

## The Block Diagram

Fig. 1 shows the block diagram. The aerial is fed into the low pass filters which are switched for the different bands, the 80m. LPF being used on the 3.0 to 3.5 MHz range. The aerial relay switches the output from the filter to the receiver input bandpass tuned circuit; the top coupling capacitor may be replaced by the optional RF amplifier. The output tuned circuit has a push-pull output winding (50 ohms) to drive the mixer, IC1; the required IF output from the mixer is selected by the ceramic LF filter (455 kHz) and the resultant signal is amplified in the SL6700. This integrated circuit also includes the AGC detector and SSB product detector. The required CIO signal for the product detector is supplied from Q5, Q6 and Q7, which use ceramic resonators as the frequency determining elements. The audio output from IC2 is low-level and IC3 is used to amplify this signal prior to audio filtering in IC4. (This filter is based on a very old design believed to originate from DJ6HP; a very useful little circuit which can be used in either peak or notch modes). IC5 completes the receiver chain as the audio output stage, giving about 1 watt of audio to the speaker.

The transmitter section starts with the microphone amplifier, IC6. This amplifies the AF signal and drives the signal input to the balanced modulator, IC7. The CIO signal is also fed into the balanced modulator producing (among others) a DSB signal on 455 kHz, and this DSB signal is fed into the IF filter where one of the sidebands is removed along with all the other mixer products from the balanced modulator. The sideband obtained depends upon which ceramic resonator is selected in the CIO. The low-level SSB signal from the ceramic filter is amplified in IC8 before being fed into the transmitter mixer, IC9. Here the 455 kHz SSB signal is mixed with the VFO signal to produce an RF signal on the required band. On CW the SSB signal is not present as the supply to the SSB generator is removed, and signal is supplied by the keyed CW oscillator circuit Q11 and Q12. The resulting output on the amateur band is filtered and amplified in the Mosfet, Q8; this stage is also used to vary the transmitter gain, by varying the gain of this device with a pot (mounted on the front panel) in the source. The signal on the required band is amplified by the wideband driver Q9 and Q10 which gives an output of about 100mW., sufficient to drive Q13, the Class-A linear power amplifier, to 5 watts output. This transmitter output signal is passed *via* the aerial relay, through the low pass filter, to the aerial.

*to be continued*

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## CLUBS ROUNDUP

### By "Club Secretary"

#### The Mail

**A** BIG pile for this month, with lots of updates to check, and quite a lot of changes. We hope we have picked up all of them; but sometimes the required detail is in a small paragraph and not underlined, so we can miss it. Please check your club's entry!

**Abergavenny** have the use of a room over Male Ward 2 at Penyfal Hospital, Abergavenny, every Thursday evening, while on Tuesdays their RAE class runs in the Seminar Room at Nevill

Hall hospital. Details from the Hon. Sec. — see Panel for his details.

Now we turn to **Acton, Brentford & Chiswick**, which of course means Chiswick Town Hall, High Road, Chiswick; the date is March 15, and the subject "An introduction to CW" for the benefit of the newer members.

**Addiscombe** are in the main a contest club, but they do also have social meetings, at "The Woolpack" in Gloucester Road, Croydon, from 9 p.m. every Tuesday.

We head south-west next, to **Axe Vale**, where they now have their Hq at the "Cavalier Inn", West Street, Axminster, on the first Friday of each month. Incidentally, this club now has all but two members licensed, and these took the December RAE anyway! So the moral is — they are looking for some SWL members.

For the essential details on the **Aylesbury Vale** doings we must refer you to the Hon. Sec. — see Panel. This is because we haven't had any updating for some time.

Over to GI, and nice to hear again from the **Bangor** gang, who

have a meeting on the first Friday of each month at 7.45 p.m. For March, the speaker will be G14BWM, who will be talking about repeaters, what they are and how to use them. During March, too, they have a dinner-dance fixed up, on the 18th. More from the Hon. Sec. — see Panel for his details.

The thriving new **Bath** club says they have a lot to offer licensed amateurs and SWLs in the way of events, projects and talks. March 9 is a night-on-the-air, and on 23rd they have a questions-and-answers session. Find them every other Wednesday at the “Englishcombe Inn”, Englishcombe Lane, Bath, at 7.45 p.m.

Over to **Biggin Hill**, and the Memorial Library on March 22; there they have a junk sale, which should bump up the attendance somewhat!

Every Wednesday at Horwich Leisure Centre, you can locate the members of the **Bolton** group; sometimes they have visiting speakers, sometimes their own members, and there are also activity nights, operation of HF and VHF stations, Morse practice and all sorts of other such goings-on.

Nice to hear again from the **Bristol** club, who now have their place at the YMCA, Park Road, Kingswood, Bristol, where they may be found every Tuesday evening.

Avoncroft Arts Centre is the address to find if you are looking for the **Bromsgrove** group; they have the main meeting on the second Friday of the month and a QRP meeting on the fourth Friday at the same place. March 11 is down as the club AGM, and in April they have the Constructors Contest.

**Bury** have a talk on RTTY on March 8 — a late change to the programme at Mosses Community Centre, Cecil Street. It should be noted that the group foregather every Tuesday here.

A familiar spider-in-the-ink sort of fist appears again for **Cambridge**, announcing that G2FKS has once again been pressed into service as P.R.O. The club Hq is in the Visual Aids Room, Coleridge Community Centre, Radegund Road; March 4 and 18 are informals, and March 11 a talk on simple digital circuits by G8JKV. On March 25 they have the Annual General Meeting.

On Thursday, March 3, the **Cheltenham** club have their Constructors Contest. However, we understand they have a search on for a new Hq address so we feel you should check the details with the Hon. Sec. — see Panel for his details.

There are three ‘natter nites’ for **Cheshunt**, on March 2, 16 and 30; in addition, on March 9, they have a talk on “VSWR and all that” by G6BTQ and on 23rd there is a junk sale.

Down at **Chichester** they have an informal on March 1, and on 17th there is a talk on wartime radar by G8HY; the venue is the Green Room, Fernleigh Centre, 40 North Street, Chichester.

Over to **Colchester** where we are advised that on March 10, G4AZR will be talking about car interference suppression, while on March 24 they have a talk on maps and map reading by G6HIR.

At **Cornish** the venue is the SWEB Clubroom, Pool, Camborne on the first Thursday in each month; they also have a Computer section who have the same venue on the third Monday of the month. For March the main meeting will be hearing from G6CSZ on “Audio Aspects of Hi-Fi”, and in April comes the AGM.

**Dartford Heath D/F** club have a meeting on March 2, at the “Malt Shovel”, Eynsford; as usual this is the Wednesday before a D/F Hunt, which in this case occurs on March 6. Details from the Hon. Sec. — see Panel.

Up north a little now, to **Denby Dale** which means the Denby Dale Pie Hall; March 9 is a talk on *Oscar* by G4JJ, and for the rest we refer you to the Hon. Sec. — see Panel.

March for **Derby** sees them foregathering at 119 Green Lane, Derby, every Wednesday; on 2nd there is a junk sale, and on 9th



David Mount, G3AXB (standing, left), Ivybridge Radio Club RAE course tutor, with Pete Allan, John Veale (right) and front, left to right, Graham Smith, Reg Welsh and Andrew Edcombe who, with Ian Kier, were all club members who successfully took the December RAE held at Kingsbridge Community College, Devon. Well done, chaps, hope you don't have to wait too long for your 'tickets'!

they have a talk on Royal Crown Derby china, followed on 16th by a natter evening. March 23 is down for the Annual General Meeting, and on 30th G3YUT will talk about his trip to Japan.

A new club comes up now; **Droitwich**, once so well-known as a Spa, and current home of the BBC transmitter, now has an amateur radio club, who are booked in on the first Monday of every month at the Scout Hq in Station Road. More details from the Hon. Sec. — see Panel.

On now to **East London RSGB**, where the Hq is at Wanstead House, which lies about 100 yards behind Wanstead Tube Station. The start is at 3 p.m. on the afternoon of March 20, and is set aside for a session on RSGB with the local RSGB representative present to answer the questions.

Turning to **Echelford** we find they are still meeting at The Hall, St. Martin's Court, Kingston Crescent, Ashford, Middx. on the second Monday and the last Thursday of every month.

March 10 is informal and 24th remains to be settled for **Edgware**; but they will definitely be in session on both dates at 145 Orange Hill Road, Burnt Oak, Edgware.

The **Farnborough** super-newsletter now comes out annually, but it must still cost them a bomb to produce! The group can be found at the Railway Enthusiasts Club, Access Road, off Hawley Lane (near the M3 bridge), on March 9 for a natter evening, and on March 23 for a talk on satellite communication by G3OQB.

Up to GM now, and **Glenrothes** where they have a Sunday meeting on March 20, at Provosts Land, Leslie, Fife. We believe they also have weekly evening meetings, the details on these being doubtless obtainable from the Hon. Sec. — see Panel for the needful.

The **G-QRP Club** caters for the low-power buffs, both SWL and licensed, and we hazard a guess that many of the 1000-plus members are more than a little interested in the circuits and things to build in the newsletter! Get the details from the Hon. Sec. — see Panel.

Turning to **Grafton**, we suspect the majority of the licensed amateurs in North London passed the RAE thanks to the Grafton classes. Nowadays they foregather at the “Five Bells” in East End Road, Finchley on the second and fourth Friday.

The **Greater Peterborough** gang are at Southfields Junior School, Stranground, Peterborough, usually on the fourth

**In next month's issue: repeater-shift for the Icom ICB1050 after conversion to 10 metres FM.  
Make sure of your copy now!**

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

- ABERGAVENNY: D. F. Jones, GW3SSY, 2 Dalwyn Houses, Llanover Road, Blaenavon, Gwent NP4 9HY. (0495 791617)
- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- ADDISCOMBE: P. J. Hart, G3SJK, 42 Gravel Hill, Croydon, Surrey CR0 5BD. (01-656 9054)
- AXE VALE: P. L. Peach, G3GOS, The Firs, Goldsmiths Lane, All Saints, Axminster, Devon. (Axminster 34259)
- AYLESBURY VALE: M. J. Marsden, G8BQH, Hunters Moon, Buckingham Road, Hardwick, Aylesbury, Bucks. (0296 641783)
- BANGOR: H. Squance, G14JTF, 24 My Lady's Mile, Hollywood, Co. Down.
- BATH: C. Rose, G8YCV, Westfield Orchard, 10 Englishcombe Lane, Bath BA2 2ED. (0225 311687)
- BIGGIN HILL: I. Mitchell, G4NSD, 37B The Grove, Biggin Hill, Westerham, Kent TN16 3TA. (09594 75785)
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- BRISTOL: M. Goodfellow, G4KUQ, 99 Somerset Road, Knowle, Bristol BS4 2HX. (0272 716093)
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- CHESHUNT: R. Frisby, G4OAA, 2 Westfield Road, Hoddesdon, Herts. EN11 8QX.
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- CORNISH: J. J. Vinton, G6GKZ, Cheriton, Alexandra Road, St. Ives, Cornwall. (Penzance 795860)
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- DENBY DALE: J. Clegg, G3FOH, 8 Hillside, Leak Hall Lane, Denby Dale, Huddersfield HD8 8QZ. (Huddersfield 862390)
- DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. (0332 556875)
- DROITWICH: E. G. Taylor, G4HFP, 6 Marlborough Drive, Stourport-on-Severn, Worcs. DY13 0JH. (S-on-S 3818)
- EAST LONDON RSGB: C. A. Ramsey, 45 Bulwer Court, Bulwer Court Road, Leytonstone, London E11 1DB.
- EHEL FORD: A. Matthews, G3VFB, 13A King Street, Twickenham. (01-892 2229)
- EDGWARE: H. Drury, G4HMD, 11 Batchworth Lane, Northwood, Middx. (Northwood 22776)
- FARNBOROUGH: I. Ireland, G4BJQ, 118 Mychett Road, Mychett, Camberley, Surrey. (Farnborough 543036)
- GLENROTHES: A. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. (Kirkcaldy 200335)
- G-QRP: Rev. G. C. Dobbs, G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham B37. (021-770 5918)
- GRAFTON: J. W. Chambers, 12 Sylvan Avenue, Finchley, London N3 2LE. (01-346 5841)
- GREATER PETERBOROUGH: F. Brisley, G4NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough, Cambs.
- GRIMSBY: R. J. Scarlett, G4HZF, 1 St. Martins Crescent, Grimsby, South Humberside.
- GUILDFORD: Mrs. H. Mullenger, G4OJO, 23 Foremans Park, Ash Vale, Aldershot, Hants. GU12 6JN.
- HARROW: C. D. Friel, G4AUF, 17 Clitheroe Avenue, Harrow, Middx. HA2 9UU. (01-868 5002)
- HASTINGS: G. North, G2LL, 7 Fontwell Avenue, Little Common, Bexhill-on-Sea. (Cooden 4645)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. (0473 44047)
- I.R.T.S.: S. Nolan, EI7CD, 68 Ratoath Estate, Ratoath Road, Dublin 7.
- JERSEY: P. Taylor, G16BUJ, 1 Don Terrace, Don Road, St. Helier, Jersey. C.I.
- LEYLAND HUNDRED: A. J. Jolly, G4JCO, 20 Crawford Avenue, Chorley, Lancs. PR7 2QT.
- LINCOLN: Mrs. P. Rose, G8VRJ, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln LN1 2AS. (Gainsborough 788356)
- LOTHIANS: E. Evans, GM6JAG, 4 Burdiehouse Street, Edinburgh. (031-664 5403)
- LOUGH ERNE: A. L. Sammon, 11 Drumclay Road, Enniskillen, N. Ireland.
- MAIDENHEAD: R. Hemmings, G3VCT, 107 Chalklands, Bourne End, Bucks. SL8 5TL. (062-85 21036)
- MALTBY: I. Abel, G3ZHI, 52 Hollygrove Avenue, Maltby, Rotherham, Yorks.
- MELTON MOWBRAY: R. Winters, G3NVK, 32 Redwood Avenue, Melton Mowbray, Leics. LE13 1TZ. (Melton Mowbray 63369)
- MEIRION: R. Halhead, GW3KOR, Bryn Derw, Golf Road, Dolgellau, Gwynedd.
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787)
- MID-ULSTER: D. Campbell, G14NKD, 109 Drumgor Park, Craigavon, Co. Armagh, Northern Ireland BT65 4AH.
- NEWARK: J. R. Hiscock, G4MDV, 17 The Green, Elston, Newark, Notts. NG23 5PF.
- NORFOLK: P. Gunther, G8XBT, 6 Malvern Road, Norwich NR1 4BA. (Norwich 610247)
- NORTHERN HEIGHTS: B. Aspinall, G6CJL, 539 Moor End Road, Mount Tabor, Halifax HX2 0UH.
- NORTH WAKEFIELD: S. Thompson, G4RCH, 3 Harlington Court, Morley, LS27 0RT. (0532 536603)
- NOTTINGHAM: P. G. Chapman, G4IJL, c/o ARCON, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
- PONTEFRAC: N. Whittingham, G4ISU, 7 Ridgedale Mount, Pontefract, W. Yorks. WF8 1SB.
- R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton K6 4TE.
- READING: C. Young, G4CCC, 18 Wincroft Road, Caversham, Reading, Berks. RG4 7HH.
- REIGATE: C. S. Barnes, G8FEE, 25 Hartswood Avenue, Woodhatch, Reigate, Surrey RH2 8ET.
- St. HELENS: D. Filer, G4OAM, 9 Heswall Avenue, Clock Face, St. Helens, WA9 4DR. (Marshalls Cross 820471)
- SALISBURY: A. C. A. Newman, G2FIX, 74 Victoria Road, Wilton, Nr. Salisbury, Wilts.
- SHEFFORD: A. R. Little, G4PSO, 41 St. Michaels Road, Hitchin, Herts. SG4 0QA. (Hitchin 57946)
- SOUTH DORSET: A. Prior, G6HEL, 3 Greenways, Dewlish, Dorchester, Dorset DT2 7LP.
- SOUTHDOWN: J. Pitt, G6BGT, 18 Kingsmere Court, Hurst Lane, Eastbourne. (Eastbourne 643463)
- S.E. KENT YMCA: A. Moore, G3VSU, 168 Lewisham Road, River, Dover. (03047 2738)
- SPALDING: I. Buffham, G3TMA, 45 Grange Drive, Spalding, Lincs. PE11 2DX. (Spalding 3845)
- STOURBRIDGE: M. Davies, G8JTL, 25 Walker Avenue, Quarry Bank, Brierley Hill. (Lye 4019)
- STRATFORD-ON-AVON: D. Boocock, G8OVC, 181 Lower Binton, Stratford-on-Avon. (Stratford-on-Avon 750584)
- SUNDERLAND: A. Everard, G8PCD, 19 Roker Park Road, Sunderland, Tyne & Wear.
- SURREY: R. Howells, G4FFY, 7 Betchworth Close, Sutton, Surrey SM1 4NR. (01-642 9871)
- SUTTON & CHEAM: G. Brind, G4CMU, 26 Grange Meadow, Banstead.
- SUTTON COLDFIELD: A. D. Turner, G8TUR, 10 Jervis Crescent, Sutton Coldfield, W. Midlands B74 4PW. (021-353 2061)
- SWANSEA: R. Williams, GW4HSH, 114 West Cross Land, Swansea SA3 5NQ. (0792 404422)
- SWALE: B. Hancock, G4NPM, Leahurst, Augustine Road, Minster, Sheerness, Kent ME12 2NB. (Minster 873147)
- THAMES VALLEY: J. Axe, G4EHN, 65 Ridgway Place, Wimbledon, London SW19 4SP. (01-946 5669)
- THANET: I. B. Gane, G4NEF, 17 Penhurst Road, Ramsgate, Kent. (Thanet 54154)
- THORNBURY: A. Jones, G8AZT, 9 Queens Walk, Thornbury, Nr. Bristol.
- TORBAY: Mrs. M. Rider, 7 Kingston Close, Kingskerswell, TQ12 5EW. (08047 5130)
- TYNEDALE: K. Hatton, G4IZW, 8 Alnwick Street, Newburn, Newcastle NE15 8PT. (0632 678828)
- VALE OF WHITE HORSE: I. White, G3SEK, 52 Abington Road, Drayton, Abingdon, Berks. (0235 31559)
- VERULAM: E. Bailey, G4KLQ, 50 Bettespaw Meadows, Redbourn, St. Albans, Herts. AL3 7EW.
- WAKEFIELD: R. C. Sterry, G4BLT, 1 Wavell Garth, Sandal Magna, Wakefield. (Wakefield 255515)
- WEST KENT: P. Reeve, G4GTN, 2 Court Road, Tunbridge Wells, Kent. (Tunbridge Wells 24689)
- WHITE ROSE: The Hon. Sec., W.R.R.S., P.O. Box 73, Leeds LS1 5AR.
- WIRRAL: N. B. McLaren, G4OAR, 596 Woodchurch Road, Oxton, Birkenhead. (051-608 1377)
- WORCESTER: A. C. Lindsay, G4NRD, 11 Durcott Road, Evesham, Worcs. WR11 6EQ. (Evesham 41508)
- WORTHING: Mrs. J. Lillywhite, 41 Brandon Road, Worthing, W. Sussex BN13 2PS.
- YARMOUTH: A. D. Besford, G3NHU, 49 Blake Road, Gt. Yarmouth, Norfolk NR30 4LT.
- YEovil: A. Denig, G4BJH, 19 The Park, Yeovil. (0935 23873)
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

Thursday. Details from the Hon. Sec. — see Panel for his details.

A change of the details is to be reported at **Grimsby** where they now foregather on alternate Thursdays (from January 13) in Cromwell Social Club premises. More details from the Hon. Sec. — see Panel.

The **Guildford** club are based at the Guildford Model Engineer's Hq in Stoke Park; on March 25 they have a tag sale. We rather liked the tailpiece on school science from G6BZ in the newsletter: "Many things that we once thought to be science fiction now actually are ". . . out of the mouths of babes and sucklings"?

**Harrow** now have some 147 paid-up members; you can meet them by going to Harrow Arts Centre any Friday evening, and they will be in either the Roxeth or the Belmont Rooms, the latter being the one for the AGM on March 18.

There are now some 196 members of the **Hastings** club, and here the venue is Ashdown Farm Community Centre. The 'main' meeting is on the third Wednesday of the month, but they have RAE and Morse classes on Tuesdays and a chat night every Friday — oh, and the computer section have the other Wednesdays, so you should have no difficulty in finding them in!

Turning the pages of the **Ipswich** newsletter, we have to turn to page 28 for the meeting details; they are at the "Rose and Crown", Norwich Road, Ipswich, on March 9 for a Constructional Contest, and 30th is the Spring Sale.

**I.R.T.S.** is the National Society in EI-land, and they are the ones to turn to if you want to know anything about the amateur radio scene, or clubs, in that country. All the needful from the Hon. Sec. — see Panel.

In **Jersey** the club has its Hq at Le Hocq Tower, St. Clements, where they turn up on Friday evenings and also on Sunday mornings. Details from the Hon. Sec. — see Panel.

It's a long time since we last heard of the **Leyland Hundred** group; nowadays they are to be found on the second Monday of each month at Astley Park Social Club, Hallgate, Astley Village, Chorley. The group intersperse natter sessions with talks and other more formal meetings; details from the Hon. Sec. — see Panel.

We now turn to the **Lincoln** situation, where we are in the doghouse with the Hon. Sec., G8VRJ — sorry! They have the Lincoln Mobile Rally and Hamfest booked for May 8 on the Lincolnshire Showground site. Ordinary club meetings are at the City Engineers Club, Central Depot, Waterside South, Lincoln, on March 9 for a talk on satellites by G4CUO, and a lecture/demonstration of fast-scan TV by G8CTG and G6HMS.

Up again to GM, and **Lothians** who are at the Drummond High School on March 10 and 24; on the latter date GM4COX will talk about Field Days.

March 3 is T.B.A., says the **Maidenhead** letter, and on March 15 they have the Annual General Meeting. Both are at the Red Cross Hall, The Crescent, Maidenhead.

The **Maltby** group are attacking with vigour the problem of supporting a weekly programme, based on the Methodist Church Hall, Blyth Road, Maltby. March 4 is down for microwaves and G3PHO, March 11 G6RIL and power supplies, March 18 for a film-show, and on 25th there is the Annual General Meeting.

**Melton-Mowbray** have been at the St. Johns Hq in Asfordby Hill for years; find them on March 18 talking about resonating aerials, with G3WKM and G3NVK.

A novel subject will come up for discussion at **Meirion** on March 3, when G3CSG will be talking to them about "Japanese Morse"; they get together on the first Thursday of each month at Nannau Country Club, Llanfachreth, which is two miles north of Dolgellau.

March 15 sees the **Midland** gang hearing all about new Midlands repeaters, the venue being the club Hq at 294A Broad Street, Birmingham, which faces the Repertory Theatre.

**Mid-Ulster** club writes to mention that Parkanaur Mobile Rally; details from the Hon. Sec. — see Panel.

Next we have **Newark** where they gather on the first Thursday

of every month at the Palace Theatre, Appleton Gate, Newark; details from the Hon. Sec. — see Panel.

No messing about with the **Norfolk** programme; they have all the needful on one bit of paper covering through to May. They have short meetings on March 2, 16 and 30; on March 9 there is the initial VHF NFD meeting, and on 23rd they have a surplus equipment auction. All this at Crome Centre, Telegraph Lane East, Norwich.

**Northern Heights** have their place at the Bradshaw Tavern, Bradshaw, Halifax. On March 9, G4MH will tell them all about Amateur Radio, and on 23rd they have a visit to Bradford Police Hq.

The **North Wakefield** newsletter writer has a distressing lack of faith in his typewriter; and it certainly failed to give us the venue for the weekly meetings each Thursday. Hence — his name and address are in the Panel!

We have often wondered about the 'Forum' that appears so often in the **Nottingham** programme; it now appears that these are dates on which the committee decisions are discussed by the membership at large. March 3 is the Forum, and there is a video film on 10th. March 17 is an activity night, with a junk sale on 24th; then on March 31 they will be judging the Constructors Trophy. The April 7 date is down for the AGM.

**Pontefract** have their Component Fair on March 13; for the rest it is Mondays at Carleton Community Centre, where they have rooms on the top floor. March 3 is down for G3HCW to talk about HF aerials.

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

*April issue—February 25th*

*May issue—March 25th*

*June issue—April 29th*

*July issue—May 27th*

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Next we come to **R.A.I.B.C.**, and here we are in the doghouse again, because we got G3LWY's address wrong last time. Sorry! This club caters for the blind, invalid and disabled among the amateur and SWL fraternity, and those who are qualified but need introduction and help in getting started. Details from the Hon. Sec. — see Panel.

March for **Reading** means an Alignment Evening on 1st, and a talk on 15th by G3SEK about RF radiation hazards. Both are at the clubroom, "The White Horse", Emmer Green.

At **Reigate** the Hq is at the Constitutional and Conservative Club, Warwick Road, Redhill; March 5 is a talk on RTTY by G3RIM.

The Conservative Rooms, Boundary Road, St. Helens is home to the **St. Helens** club members every Thursday. On March 3 they have a speaker still to be announced, and on 10th they have a Quiz against the Liverpool crowd and a Hot Pot Supper. March 17 is a preview for the NRSA show on which they have a stand — March 19/20. On March 24 they have a construction night and March 31 is down for a talk by G4OAM on D/F.

The **Salisbury** get together every Tuesday evening at Grosvenor House, Salisbury; they have a regular programme of outdoor events and special-activity stations during the summer, plus Morse and RAE classes in addition through the winter, or as required. Details from the Hon. Sec. — see Panel.

Nice to hear again after a long break from **Shefford**, who are still meeting at their Hq at the Church Hall, Amphill Road, Shefford; March 3 is a natter, and on 10th they have a junk sale. March 17 sees founder-member G2DPQ giving a talk, and on 23rd G3DOT will talk about USA Hamfests. Finally March 31 is down for an evening on test gear.

Now to **South Dorset**, which means the Annual Constructors

Cup on March 1 followed by a junk sale, at the Army Bridging Camp, Wyke Regis, Weymouth.

The **Southdown** gang have their place at Chaseley Home for Disabled Ex-Servicemen, South Cliff, Eastbourne, on the first Monday in each month; March is down for junk sale. April's meeting will be put back a week to avoid the Bank Holiday.

**S.E. Kent YMCA** is another name for the Dover gang, and acknowledges their Hq. Wednesdays are club nights, with RAE classes on Mondays and Morse on Tuesdays. We had to chuckle at the "Lament" from a very old-timer in the newsletter this time.

Off now to **Spalding**, where they are to be found on March 11 at the Maples Room, White Hart Hotel, Spalding, for a talk on "Planning Aspects of Aerials" by the planning officer for South Holland District Council.

The **Stourbridge** meetings are at the "Cross Inn", Hagley Road, Oldswinford; March 7 is a natter session and on 21st they have the Annual General Meeting.

A review and discussion of members equipment takes place for **Stratford-on-Avon** on March 14, at the Control Tower, Bearley Radio Station; it's there also that they have the AGM and a film of radio interest on March 28.

Main meetings for **Sunderland** are on Mondays, with other meetings on Thursdays and Sunday mornings; the Hq is the Brewery Yard, Westbourne Road, Sunderland.

March 7 at **Surrey** is a surplus equipment sale, and March 21 an informal, both being at *TS Terra Nova*, 34 The Waldrons, South Croydon.

**Sutton & Cheam** are at Sutton College of Liberal Arts on March 11, and Carshalton Sea Cadets Hq, Church Path, Beddington, near Carew Manor School on March 25. No details are given as to what's on.

Now to **Sutton Coldfield**, where they have a natter evening on March 14 at Sutton Coldfield Public Library, Sainsbury Centre and a talk on setting-up an amateur radio station by G2CVV on 28th.

**Swansea** meet on the first and third Thursday of each month at Lecture Room 'N' in the Applied Sciences Building, University of Swansea. They often have talks and demonstrations, but also have a club station in action.

**Swale** now foregather at Nina's Restaurant, 43 High Street, Sittingbourne, on Monday evenings.

**Thames Valley** have their PR operation well organised with a standard form carrying all the necessary information. They gather at Thames Ditton Library meeting room, Watts Road, Gigg's Hill on the first Tuesday of each month. March 1 is in fact their AGM.

**Thanet** have 'mini-talks' on March 4 and a talk by G3XDV on RSGB's Repeater Working Group on March 18; both are at Birchington Village Hall. On April 3 they have a special event station signing GB2TM, for the Thanet Marathon Race.

On the first Wednesday of each month you can find the **Thornbury** crew at the "White Horse" on the A38 at Grovesend, Thornbury; March is down for a talk on HF station equipment.

The Annual Dinner of the **Torbay** group is on March 12, at Templestowe Hotel, Torquay. The gang are at Hq, Bath Lane, rear of 94 Belgrave Road, Torquay every Friday evening, plus a formal business-and-lecture date on the last Saturday of each month.

If you are in the catchment area of the **Tynedale** club, look for the Falcon Hotel, Prudhoe-on-Tyne, on the first Tuesday in the month, in the room at the end of the bar.

G4CCC will be talking to the **Vale of White Horse** club at the "White Hart" in Harwell Village on March 1, and informally on the other Tuesdays.

A new Hon. Sec. takes over at **Verulam** — see Panel — and he advises that they have their G3PAO Memorial Lecture on March 22, with Dain Evans, G3RPE, talking about microwaves, at the Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger, near St. Albans.

**Wakefield** have some films on power generation on March 8, and on 22nd have an on-the-air and natter evening. Both are at Holmfield House, Denby Dale Road, Wakefield in Room 4.

**West Kent** are booked in at the Adult Education Centre, Tunbridge Wells, on March 4 and March 18, the latter for G2FKZ to talk about amateur radio projects. Informals are held at the Drill Hall, Victoria Road, Tunbridge Wells, for the Tuesdays alternating between the main meetings.

The **Wirral** club gather at Irby Cricket Club; March 9 is down for a session of nattering and details on their stand at the NRSA event. On March 23 they will have a session discussing their other hobbies. Informals are on March 16 at the "Wirral 100", Oxtan, and 30th at the "Red Cat", Greasby, for a pint and a natter.

March 7 sees the **Worcester** group at the Oddfellows Club to welcome ex-VP8QI; and on March 21 they will be at the "Old Pheasant" for an informal. Both venues are in New Street.

Tuesdays at 8 p.m. is the form for **Worthing** at Pond Lane Amenity Centre, *except* that on March 15 the club Hq is closed while they enjoy the Annual Dinner.

Great **Yarmouth** club are based on the STC Sports & Social Club, Beevor Road, South Denes, on a fortnightly basis. More details from the Hon. Soc. — see Panel.

A temporary change of Hon. Sec. occurs at **Yeovil**, where G3NOF is on the sick list; as for the weekly meetings, they are in process of changing their Hq, so we must refer you to G4JBH at the address in the Panel.

Finally, at **York**, they still meet weekly at the United Services Club, 61 Micklegate, York, each Friday. On March 11 they have a talk on satellites by G6GUW.

## Finale

The bottom of a Big Pile again. Deadlines for the next issue are in the 'box' in the piece, and are to arrive, addressed to "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73, BCNU.

## Components Fair in Yorkshire

**Pontefract** and District Amateur Radio Society is holding its 3rd Components Fair on Sunday, 13th March, at Carleton Grange Community Centre, Carleton, Pontefract; doors open at 11 a.m. (10.30 a.m. for the disabled). Traders will be displaying new and second-hand components and test equipment, station accessories and antennas; there will be no new 'black box' radio equipment. Also RSGB book stand, bring-and-buy, raffle, and talk-in on 2m. and 70cm. Ample nearby parking, with licensed bar and refreshments. Further information from G4AAQ, QTHR (tel: 0977 791071).

## New Low-Loss 50-ohm Coaxial Cable

**W. H. Westlake** of Clawton, Holsworthy, Devon, is introducing this month a new type of coaxial cable, designated **H100** and manufactured by Pope in Holland. **H100** has about half the loss of UR67, and should be of particular use to amateurs using the higher frequency bands up to 1296 MHz; other features include higher power-handling capacity and lighter weight than UR67. Full specifications are available from the above firm, who offer the cable at 80p per metre (100m. runs at 20% discount), plus postage.

## Ant Products

The telephone number of Messrs. **Ant Products** of Pontefract (whose "Silver 70" antenna we reviewed last month) is 0977 700949.

# A MICROPROCESSOR CONTROLLED MORSE DECODER, PART IV

Peter Lumb, G3IRM

**T**HERE are still three IC's to mount on the processor board and these form an interrupt controller. This part of the circuit would not be needed if everyone inserted correct spaces between words, but a check on the amateur bands will soon show that a very large number of operators leave spaces which are far too short. This is easily possible with many electronic keyers as only the lengths of the dots, dashes and letter spaces are usually controlled by the keyer; the sender has to guess the length of word spaces. With manual or bug keys some spaces must inevitably vary a little.

The circuit is shown in Fig. 8 together with connections to other parts of the circuit. The temporary  $\overline{MW}$  connection must be removed; one end of this to pin 3 of IC9 is now joined to pin 1 of IC21. The other end which comes from the memory board is joined to pin 11 of IC19. This part of the circuit cannot be checked at this stage but it enables the interconnecting tag strips to other circuits to be mounted and wired, making it possible to tidy up all the connections on the processor board; the tag connections are shown in Fig. 9.

The interrupt controller has two functions. Port C (high) is connected to a spacing switch *via* diodes to be described later. The switch varies the length of the word space accepted by the processor. For good, or machine-sent, Morse it can be set to a 'normal' position. (Try copying the ARRL bulletins when the decoder is complete). If when receiving other stations it is found that words join together it is due to the fact that the operator is not leaving correct spaces between words and the switch may be altered to compensate. The switch can be left in the 'shortest' position but this reduces the margin of error in the counting circuits and it is advisable to use the 'longest' position usable as much as possible. The switch can be altered at any time but nothing will happen until the interrupt push button is pressed to keep the operation of the switch in correct timing with the program. The interrupt switch can also be used at anytime to reset the speed controller to its starting point. It also resets the spacing

at the same time but this obviously has no effect if the spacing switch has not been changed. It was noted earlier that the reset switch on the processor also resets the speed controller but, in addition, it will be found to clear the whole display on the video monitor. The interrupt switch (called restart) resets the speed controller but leaves the display unchanged. This is useful if severe interference or other causes makes the automatic speed controller go out of range — a touch on the restart button will put it back again.

This part of the circuit has one further function which it carries out on its own. When the processor is switched on and the full program is run a number of initial operations take place, including clearing the video monitor display and returning its cursor to the top left hand corner of the screen; until these operations have been carried out the  $\overline{MW}$  line to the memory is disabled. When the program has reached a point where it is ready to decode incoming signals,  $\overline{MW}$  is enabled allowing alterations to be written into the memory. It should be noted that the memory takes note of the spacing switch and if the decoder is turned off and turned on again at a later date it will automatically go to the spacing set on the switch.

If an electronic keyer is available which has a negative-going TTL output a Morse decode program can now be carried out; should the keyer be positive-going it can be inverted by a single gate. The keyer is connected to either pin 12 or 13 on IC11 (key input). An alternative keyer can be made by taking a connection from pin 1 on IC2 on the programmer and using the programming switch as a key. If this is done it will be necessary to increase the value of C11 to 0.68  $\mu$ F to take account of the slower sending which will result. A voltmeter should be connected from pin 13 on IC17 to Ov. to read the output of the digital-to-analogue converter. The initial reset previously carried out by a switch is now done by part of the program. Connect PBO to PB7 on the 8255A to the corresponding indicator pins on the programmer as well as two power lines.

## Preliminary Program

This preliminary program will decode Morse entered by the keyer and display this on the indicator diodes as octal numbers. When power is applied the program resets the speed controller to

Table of Values  
Fig. 8

IC19 = 74LS00	IC21 = 74LS04
IC20 = 74LS74	SW5 = push-button changeover

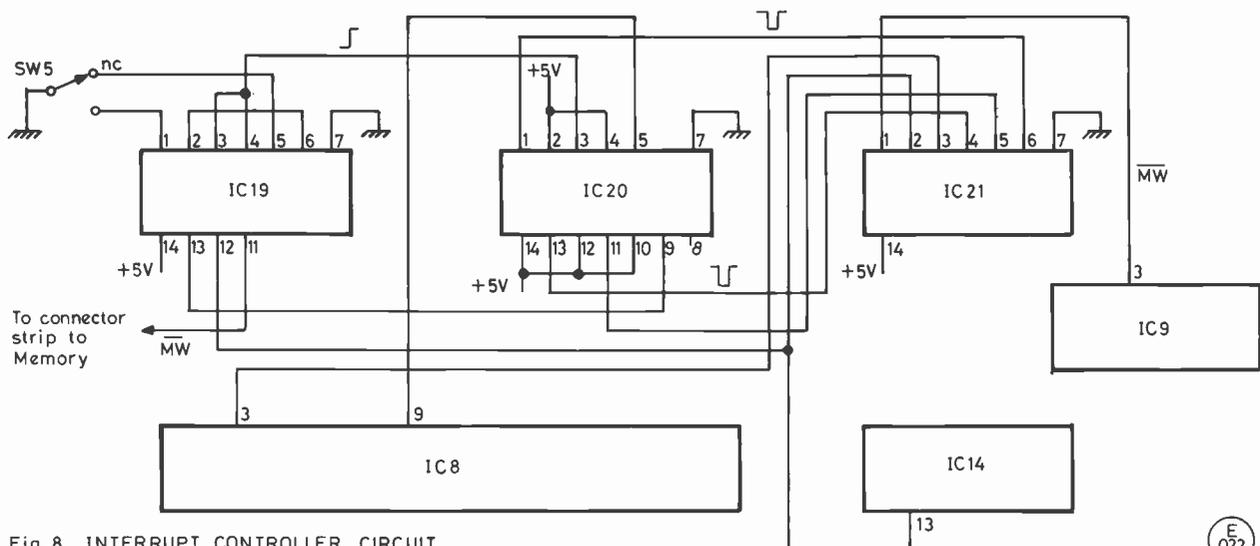


Fig. 8 INTERRUPT CONTROLLER CIRCUIT

Table 5

Address	Data	Mnemonic
000	000	NOP
001	076	MVIA
002	230	
003	323	OUT
004	203	
005	303	JMP
006	033	
007	000	
033	061	LXISP
034	377	
035	003	
036	056	MVIL
037	000	
040	145	MOVHL
041	076	MVIA
042	016	
043	060	SIM
044	303	JMP
045	064	
046	000	
054	303	JMP
055	000	
056	001	
064	076	MVIA
065	005	
066	323	OUT
067	203	
070	075	DCRA
071	323	OUT
072	203	
073	006	MVIB
074	000	
000	075	110 MOVCB
076	120	MOVDB
077	130	MOVEB
100	333	IN
101	200	
102	306	ADI
103	200	
104	322	JNC
105	100	
106	000	
107	303	JMP
110	127	
111	000	
116	006	MVIB
117	000	
120	333	IN
121	200	
122	306	ADI
123	200	
124	322	JNC
125	160	
126	000	
127	333	IN
130	200	
131	346	ANI
132	017	
133	326	SUI
134	001	
135	302	JNZ
136	127	
137	000	
140	004	INRB
141	333	IN
142	200	
000	200	312 JZ
	201	257
	202	000
	203	322 JNC
	204	211
	205	000
	206	332 JC
	207	223
	210	000
	211	076 MVIA
	212	003
000	213	323 OUT
	214	203
	215	075 DCRA
	216	323 OUT
	217	203
	220	303 JMP
	221	257
	222	000
	223	076 MVIA
	224	001
	225	323 OUT
	226	203
	227	075 DCRA
	230	323 OUT
	231	203
	232	303 JMP
	233	257
	234	000
	235	034 INRE
	236	303 JMP
	237	257
	240	000
	250	333 IN
	251	200
	252	306 ADI
	253	200
	254	332 JC
	255	050
	256	001
	257	333 IN
	260	200
	261	346 ANI
	262	017
	263	326 SUI
	264	001
	265	302 JZ
	266	257
000	267	000
	270	014 INRC
	271	303 JMP
	272	277
	273	000
	277	076 MVIA
	300	017
	301	271 CMPC
	302	312 JZ
	303	330
	304	000
	305	333 IN
	306	200
	307	346 ANI
	310	017
	311	326 SUI
	312	001
	313	312 JZ

000	143	346 ANI	314	305
	144	017	315	000
	145	326 SUI	316	303 JMP
	146	001	317	250
	147	312 JZ	320	000
	150	141	330	173 MOVAE
	151	000	331	007 RLC
	152	303 JMP	332	202 ADDD
	153	120	333	323 OUT
	154	000	334	201
	160	076 MVIA	335	303 JMP
	161	005	336	073
	162	270 CMPB	337	000
	163	322 JNC		
	164	116	001	050 172 MOVAD
	165	000		051 007 RLC
	166	076 MVIA		052 127 MOVDA
	167	020	001	053 173 MOVAE
	170	270 CMPB		054 007 RLC
	171	332 JC		055 137 MOVEA
	172	235		056 006 MVIB
	173	000		057 000
	174	024 INRD		060 110 MOVCB
	175	076 MVIA		061 303 JMP
	176	012		062 127
	177	270 CMPB		063 000

its starting point and the meter will register about 1.54v., as described earlier. If a single dot or a series of dots is entered the meter will vary about its starting point depending on the length of the dot, the speed of sending or the value of C11. Any or all of these must be altered to keep the meter roughly stable around its starting point; it will be noted that a dash has no effect on the meter. As each Morse character is entered the indicator diodes

Table 6

Morse holding codes			
A	004	1	056
B	027	2	046
C	031	3	042
D	013	4	040
E	001	5	037
F	021	6	057
G	015	7	067
H	017	8	073
I	003	9	075
J	026	0	076
K	014	.	124
L	023	,	162
M	006	?	113
N	005	=	060
O	016	:	167
P	025	;	151
Q	034	()	154
R	011	/	061
S	007	AS	047
T	002	AR	051
U	010	VA	104
V	020	CT	064
W	012	KN	065
X	030		
Y	032		
Z	033		

The error symbol will produce 077, 177 or 377 depending whether 6, 7 or 8 dots are strung together — this will be explained later.

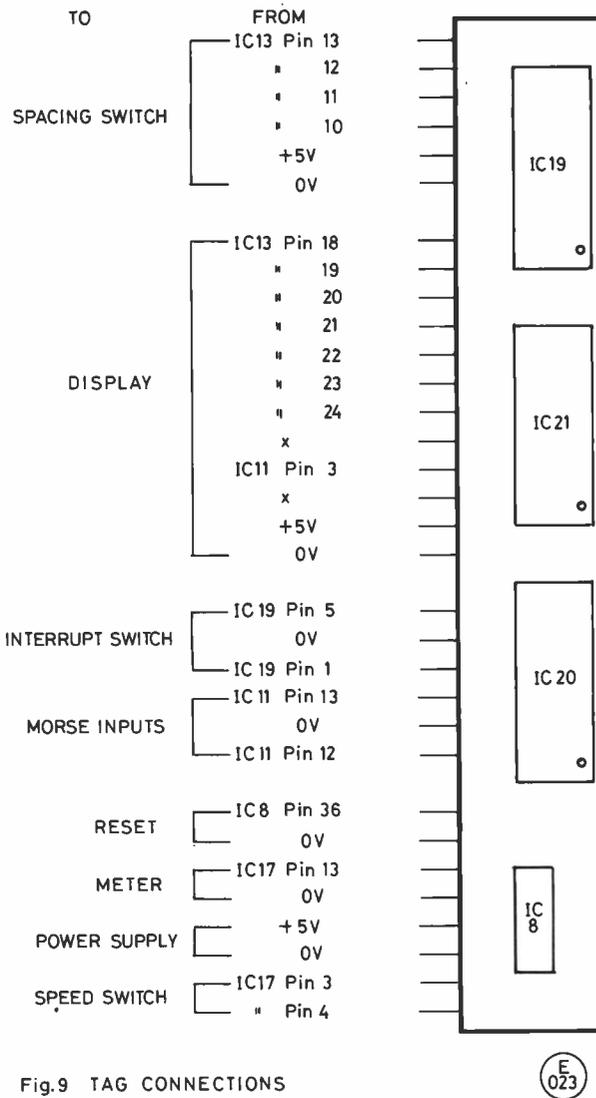


Fig.9 TAG CONNECTIONS

From this it can be seen which numbers on the indicator correspond to the memory addresses. One thing easily forgotten as a result of this is that if an alteration is found necessary between 002 000 and 003 377 it is necessary to pulse all the way through the first cycle of the counter before 002 000 is reached (when it returns to 000). In this preliminary program only the addresses between 000 000 and 001 063 are used corresponding to counter numbers 000 to 463 (first sequence).

### The Program So Far

*Note* — all numbers from now on are listed in *octal*. After a number of preliminary instructions to set the various sections of the decoder to their required values, the processor reads port A and, if it finds a space, it continues to idle in a loop until a mark is detected at 000 104; should a mark be received it will jump straight to 000 127. Whatever happens it will eventually jump to 000 127 and continue to input port A counting each Morse clock pulse passed and storing this in one of the general purposes registers (register B) by looping between 000 120 and 000 154. When a space is detected at 000 124 the processor jumps to 000 160. Register B is now checked to see if the count is less than 005; if it is, it is rejected and the program returns to 000 116. Register B is cleared and a space or the next mark commences. If B is greater than 005 it is checked at 000 166 to see if it is 020. If it is 020 or more a dash is received and the program goes to 000 235 to store this in register E. If the count is more than 005 and less than 020 a dot is received and this is stored in register D at 000 174. B is then checked to see if it is 012; if it is, no speed adjustment is needed and the program goes to 000 257. Depending on whether B is less than or more than 012, the program between 000 203 and 000 234 either increases or decreases the speed of the Morse clock by pulsing PC0 or PC1. In any event, it finally jumps to 000 257 where clock pulses begin to be counted during the space, each pulse increments register C by one; this continues in the loop 000 250 to 000 320 until a mark is detected at 000 254. The program then jumps to 001 050 for rotation. B and C registers are cleared and the processor returns to 000 127 to start again. However should the count in C at any time exceed 017, detected at address 000 277, a character space has been detected and the character must be printed out. The jump to 000 330 initiates this print out. Addresses not shown in the program can be skipped by pressing the address switch. Some of these will be programmed in the second part of the program and one or two alterations to the preliminary program will be needed. The spaces have been left to avoid extensive reprogramming later.

will change and readout as listed in Table 6. These are the Morse holding codes.

Before going on to the program to make all this possible it should be mentioned that the addresses used by the processor are 16 bits wide and not eight as used in the earlier examples where simplicity was being considered. To specify as 16-bit address two octal numbers must be used and the memory must be divided into four sections. In octal these are:

<i>Addresses</i>	
000 000 to 000 377 }	A
001 000 to 001 377 }	
002 000 to 002 377 }	B
003 000 to 003 377 }	

When the programmer address indicator was described it was stated that it would count up to 777 and then return to zero. The effect of this is that it is necessary to go through the address indicator sequence twice to program the whole memory though this is not necessary in this design. The first time it counts to 777 corresponds to the two lines marked 'A' above and the second time it corresponds to 'B'. The effect is that:

<i>Addresses</i>	<i>Indicator</i>
000 000 to 000 377	reads 000 to 377
001 000 to 001 377	reads 400 to 777
002 000 to 002 377	reads 000 to 377
003 000 to 003 377	reads 400 to 777

For those interested, an example of how the data in D and E is entered and rotated can be illustrated by taking the letter P. Rotation means moving all bits either one to the left or one to the right.

	<i>Register D</i> <i>(dots)</i>	<i>Register E</i> <i>(dashes)</i>
First dot received	00000001	00000000
Rotate left at 001 051 and 001 054	00000010	00000000
First dash received	00000010	00000001
Rotate left again	00000100	00000010
Second dash received	00000100	00000011
Rotate left again	00001000	00000110
Second dot received	00001001	00000110

When the end of the letter is detected by a space register E only is rotated left at 000 331.

Rotate E left	00001001	00001100
Add D to E at 000 332		00010101
		(octal 025)

and this is the display which will be seen when the circuit is connected together and this part of the program run and the letter P is received.

*to be continued*

#### Author's note:

There is an error in Fig. 1 (p. 539, December 1982 issue): R2 should connect to pin 7 of IC2.

When the writer programmed the memory the precaution was taken of entering 000 at all unused addresses. Recently some further tests have been carried out using the decoder and it has been discovered that the data at two of the addresses has changed

for some, so far, unexplained reason. Should this occur in the unused part of the memory no harm will be done. If it occurs in the look-up table (*Part V*) an incorrect readout will be obtained. Should, however, it occur in the program itself it would almost certainly stop the decoder working. In order to ensure that this cannot occur a new memory band has been built which separates the ROM and R/W sections and, by using a switch, the ROM section can be isolated so that the program cannot be altered while the decoder is running.

Anyone interested in building the decoder should contact the author for a copy of the new memory board circuit and the necessary amendments to the program. However, these revisions will be published at the end of this series of articles.

## “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* — I would like to reply to the letter from Susanne Tilley in the January issue.

For some years the build-up of illegal radio operation has continued apace, beginning in the days of “Radio Caroline” if not earlier. A check on frequencies such as 6.66 MHz, 26 MHz, plus sundry VHF areas, will reveal the current situation. Not that the aforementioned bands have much to do with amateur radio.

What does concern me is that illegal, so called “pirate”, operation using modern readily available off-the-shelf equipment is described by Susanne as being conducted by “very good radio operators, serious and basically responsible citizens”. It would seem that she has personal contact with these people — hardly an asset towards obtaining an amateur radio licence, in my opinion. Furthermore I fail to see how breaking the law can be described as an act of serious and responsible citizens.

Nothing is achieved in this world without effort: the amateur radio licence can be obtained by *anyone* who has the determination to study for it. Susanne says “I could pass a novice exam and Morse test tomorrow”, so she really should not have much difficulty in gaining a Class-A licence. Failing this, there is always CB.

I hope my comments will not deter her from pursuing the hobby, and that her desire to become an amateur will be realised — preferably with a Class-A licence!

*Pat Painting, G3OUC*

*Dear Sir* — May I, as an old-timer of fifty (that seems a bit hard! — *Ed.*) and an advocate of QRP, endorse Mark McIntyre's, GI3YDH, comments regarding contests in the January issue.

As a poor sleeper I am often in the shack from 0200 to 0500, Monday to Saturday, listening, and calling “CQ QRP” with five watts input, using both commercial and home-built equipment, on any band that appears to be open — usually only to be rewarded with a “no QSO” entry in the log.

Why not restrict contests to *weekdays* to keep the bands occupied, leaving the weekends clear for those who wish to *communicate*, whether QRO or QRP and regardless of equipment?

One further point: as I understand my licence conditions, the call “Test” should be made from time to time by stations

monitoring their signals for harmonic radiation, RFI and TVI. So should we answer a station calling “CQ Test”?

*Ken Terry, G3GSY*

*Dear Sir* — May one add a word to the views of GI3YDH (*Jan.*) and G3ZQS (*Feb.*) on the subject of contests? It is absurd to suggest, as G3JDK (*Feb.*) does, that any one person can be interested in amateur radio “in all its aspects”, but G4LDS (*Feb.*) hits the target when he reminds us that radio is all about communication. In contests, it is difficult to see what communication takes place. As someone who is, professionally “a person whose business is words”, I enjoy doing crossword puzzles. This occupation is entirely pointless. But it does not interfere with the enjoyment of others, or involve me in loutish behaviour.

Contests are similarly pointless, but interfere greatly with the pleasure of others. For most of us, Saturdays and Sundays are the only times when daytime operation is possible. How one groans, on switching on and hearing that first idiot “CQ Test”! Another Lost Weekend . . .

Surely, G3ZQS's suggestion is sane and sensible. The objection might be raised that it would be difficult to get international agreement to band limitations, but this is not really necessary. If UK amateurs would agree to use only, say the lowest 25 kHz of each 'phone and CW band, amateurs in other countries would soon learn that it was unproductive to beam their California-kilowatts anywhere else, thus leaving the rest of each band free for normal users. Fair shares for all, in fact. It would be interesting to hear other readers' views on this. Maybe some sort of poll could be conducted.

Secondly, as a Class 1 services operator from 1941-44, may I underline G4LDS's remarks by suggesting that, in these days of highly-efficient black boxes and highly inefficient operators, one or two of the “academic” sections of the RAE might profitably be replaced by a section on simple on-air procedure? We might then be spared the antics of those who send 173 CQs followed by one call sign and KN, and wonder why they never get a reply!

But, Sir, what we really need are more chaps with the attitude of G6HCV (*Jan.*). Don't worry, Byron, it's not that hard. There's no maybe. You are hooked, and we need you!

*James Lockyear, G4JQG*

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

## “CONFESSIONS OF A NOVICE”

JULIAN AYLMEYER-KELLY, G6HHI

THE fascination with all things radio, first recollection of which goes back nearly thirty years (rushing home having seen someone transmitting from a car to see if he could be heard on the “steam” radio), was finally kicked awake by a friend some two years ago who came visiting bearing a strange box with wires attached which he called a “CB rig”.

We’ll jump swiftly over that phase, sufficient to say that it did not take long for us both to realise — although we live a hundred miles apart — that the limitation of what the Home Office was then calling Open Channel radio was prohibitive to enjoying a pastime.

Ian found “It” before I did. The next time he came south he brought another strange box with wires attached, this one he called a “Scanning receiver”. It picked up signals from “radio amateurs” operating, very often from cars and through things called repeaters, in something called the “two-metre band” (not a dance orchestra, I was told). I can, and I think always will, remember hearing those first QSO’s standing beside Ian’s car — these people sounded sensible beings (I was to learn different later) and I realised I, too, had found “It” — amateur radio.

Then he said casually that he was going to night school to study for the RAE . . . the what? So he patiently explained. That was that I thought; what a shame, I can’t pass exams so forget it now before you get involved. I should explain that my knowledge of things electric was strictly confined to those domestic chores we all know and no further. At least Ian had been a bunting tosser in the Navy and he knew CW.

Still, the fascination stayed on after he’d gone and I found myself scouring the newsagents for magazines and borrowing books from the library, my bedtime reading was no longer fiction but Ohms Law, decibels, propagation and the like.

Then came the final straw; one of my customers who had a long, wavy thing on the roof of his car invited me to go with him to the local amateur radio club. Talk about the rocky road to ruin — there was no going back — there were all these chaps talking the language I’d heard on Ian’s box; but unlike other specialist cliques I’d ventured into before, these guys were pleased to see me, most friendly and only too eager to show me around. There were a couple of other strangers there that night (who have never been seen since), and we were given a potted version of what amateur radio was all about and a trip around the equipment there. All this unprepared and completely ‘off the cuff’. I learnt what frequencies amateurs were allowed to use, hastily scribbling them down on a piece of paper I still have now, and came away with the conviction that I must have a go to try to pass this confounded exam.

I attended the club pretty well regularly from then and slowly through the fog of this totally new experience little beams of sunlight shone. I found that a friend of some years standing had an HF receiver under his bed, collected it and was soon tuning the BFO to obtain an SSB signal on equipment that was designed before amateurs began to use the mode. My first shack — well, one picnic table in the loft on which was a sheet of chipboard, Ted’s Eddystone 730/4, a car loudspeaker, a length of cable through the air-brick and down to a post at the bottom of the garden, an extension lead to bring power to the rig; oh! and a chair. Then I found by first “net” — it was on eighty metres and I can remember it happened on a Wednesday morning; fascinating is the only word to describe it.

From then on I listened all over the bands to all sorts of contacts — discussions on how big the jam roly-poly pudding to be taken on the forthcoming DX-pedition should be; two august gentlemen discussing Mr. Mullard, one who had worked for him and the other who had written a book about the company; my local friend Ernie on the ground wave working a VK on phone (unusual for him) but no VK heard my end, then a PA0 working two VKs — and I could hear them, just.

Meanwhile time ticked on and September arrived, time to enlist, no, I mean enroll at one of the colleges for evening classes to study for the Radio Amateurs’ Examination.

I chose the college on the basis that another SWL from the club had elected to go there, enrolled, and then found he could not commit himself due to transfer of his job back to Devon; typical — I’m going to a college further away from home than necessary and for no good reason. So, armed with the books collected so far off I went to the first session. He started with electrical theory — all Greek to me but I followed the first couple of sessions. Then he started to accelerate and I started to flounder. Do you know, I spent nearly every night sitting up in bed pouring over that lot. The wife — sorry XYL — put up with it magnificently considering my eight-year-old was as keen as I. We went through the lot very briefly, then started in earnest. Now after a day’s work, rushing home for a meal and then rushing out to college you suddenly stop . . . and sit and listen to someone else doing the talking. I don’t think I actually snored, but I nearly fell off the chair on more than one Thursday evening.

Next to think about that exam. I had not done any of this studying or taken an exam for over twenty years. Now, of course there was this thing called multiple choice, so my reasoning went like this: The first component (paper to the uninitiated) was a cause of learning facts parrot-fashion and I’m not a bad impression of a parrot at times, so I should be able to cram for that. I would take the exam in December (you mad fool), hopefully pass the first paper, get it out of the way and get back into the routine of taking exams. Right then, apply for the December exam and pay your money, chum — and how many of you students wish to register for the December exam? Two — only two and the other guy a television engineer. Oh well, anything for a laugh.

I had a traumatic couple of weeks before the exam. Not only were there all the usual pressures that build up before Christmas but we had decided to move house as well. I spent as much time as possible with my nose in the books and kept on doing the sample papers in the back of the *Manual* until I could get quite a few right, presumably because I remembered the answer from last time.

The fateful day arrived — cancelling my usual business trip in the evening I arrived at the college a good half-hour before time with copious amounts of pencils, pens and rubbers. Oh yes, and a couple of good luck charms the XYL (I’m learning) pressed into my hand before leaving home. The silly girl said they’d brought her luck when she’d taken exams — her with her ten ‘O’ levels, I ask you. We assembled early in the room with “Silence — examination in progress” on the door. There was my colleague from the course, another chap who had been studying on his own and me. Lecture on what to do and what not to do and you can leave the room when you have finished. So away we went — read it all through first — crumbs, I’m supposed to be able to pass this one. So now to start filling in the little boxes and I’d finished in about half the time. They said check through when you’ve done but don’t alter any answers you’re not sure of. I’m sure that answer is ‘b’ and not ‘c’ — so I’ll alter it. The stranger handed in his paper and left so I think I will too.

Outside, comparing notes before Paper Two I found the answers I’d altered was right first time; now of course, it was answered wrongly.

Back we go for Paper Two. This time we’re joined by two more candidates who had already passed Paper One at an earlier attempt. Here comes the papers, read it all through first; my heart sank deeper and deeper as I read on. I didn’t even understand some of the questions let alone answer them. At least four were on

key click filters which we'd been all through at the club a couple of weeks before, I should get those right. OK, do the ones you are certain of first (that won't take long!), then the ones you need to work at, then the others and finally the guesswork. I'd finished and *all* the rest were hard at work — good sign or bad? Bad I fear. Check through once again and don't alter any this time, dummy. All done and still nobody stirred — OK then, up you get and hand it in. I looked back as I left the room and they were all hard at it.

I drove home feeling drained, perhaps I hadn't got into it yet, I'd forgotten what a strain exams are.

Now for the wait — the dye was cast and I'd passed or failed, failed or passed but I won't know for nearly two months. They'll get on with it, I thought, not many candidates on a December exam, the results will be early. Anyway Christmas was upon us and we'd moved temporarily to a house in a hole in the ground, no VHF signals there, even the police couldn't use their stuff outside that house! The HF receiver was in store so we gave it all a rest.

I suppose I started looking for the post soon after the new year, the experts said the end of January but I'm an optimist you see. (As some of you will remember it did go on a bit!) January went and then February nearly went. I must have got on the college's nerves ringing up to ask where the results were. I don't know why I did because I had decided quite definitely that although I might have passed the first bit I'd failed the second.

When the envelope eventually arrived and I'd opened it, I didn't understand what it meant. Paper One was marked 'C' and Paper Two 'P' — could this mean 'credit' and 'pass'? Immediately I rang the college (again) and, yes, they said it means Credit and Pass! Well, how about that then; who's a genius? It don't half boost your self esteem! The XYL (you see, I do learn) was almost as pleased as I — thinking I wouldn't be studying in bed anymore, I suppose.

Now what about this application for the licence? Where's the pass slip? Ring the college again; sorry, they're delayed, they said. I wasn't waiting any longer, it's all a conspiracy I'd decided; delay the results, don't issue the paperwork, just keep *him* off the air. So I'll ring the college — please could you issue me with a note on your headed notepaper and signed by someone in authority to say I've passed? Oh! yes, said the voice. Can I collect it after work tonight? Oh! no, said the voice, we close the office before you could get here. I must have sounded desperate. What a kind lady, she suggested she took the paper home with her and then I could pick it up from there. Armed with all the other bump and a stamped (First Class) addressed envelope off I went and collected the magic document from my new friend with grateful thanks. I rammed it into the envelope and having first checked it was still to be collected, into the nearest post box.

Now to wait again; if I had known. . . . The eternal optimist thought to himself, "I must be near the top of the pile, all they've to do is to scribble a number on my form and and I'm home and dry". I wonder what my callsign will be, we're on G6Gs at present, perhaps I'll get G6HAM or, in my business (the motor trade) G6GTX would be nice. I'll never learn, I didn't exactly watch the post because it arrives after I've left in the morning, but I did wait every morning for the XYL (I've really got the lingo now) to 'phone with the glad tidings. Time went on and then there was all the nonsense of a revised schedule, still I waited and began, I must admit, to get quite difficult to live with. Tuesdays at the club weren't much help, I was greeted week after week with "any news yet?", and consoling and soothing remarks, which were little consolation. My friend who'd started this all off came down with his all singing, all dancing two-metre multimode now sporting his C4. All I could do was to drive for him whilst he happily transmitted away.

We'd moved to our final QTH (home, that means) by now; and there, one evening when I got home, was a postcard from THEM. . . . "the documents enclosed with your licence application are not valid to prove success in the RAE — please forward pass slip" or words to that effect. Fancy not trusting me, of all people. I told you it was all a conspiracy. The pass slip had arrived meanwhile so, dash about everyone, paper, envelope,



"... glad to hear help is on the way. The rig here is. . . ."

stamp and pass slip and away in the car to the post office. Then to wait *again*. (They'll get that tomorrow or even the next day, one day to process, one day to come back, I should have it within a week.) Time went by, now my birthday was looming. I know, it'll arrive on my birthday. By this time all concerned were getting fed up and leading the the fed-ups was . . . guess who? The RSGB news service was referring to the delay but when I rang them they said sorting out the schedule was far more important as my licence would eventually come but the schedule had to be sorted out for good. Fair comment, I suppose but that was no help to me. So I thought . . . that's it, — the lot of them; I won't have anything to do with this amateur radio lark until the licence arrives, *if* it arrives.

I tried hard to practice that, but would occasionally get drawn to a magazine or to the rig I'd been out and bought in the first flush of success.

About this time a builder friend was doing a few jobs on the new QTH (house, you ignorant lot). Being interested in what was going on, or not going on which ever way you look at it, the penny dropped when, working alone at the QTH (yes, house) he was asked to sign for an O.H.M.S. recorded delivery package. He 'phoned work and suddenly all was pandemonium, I wasn't waiting till knocking off time. A friend who had dropped in offered to go and collect the package . . . "go into the hall and you'll see a box with wires attached, please will you bring that as well". She returned with the package and the box . . . yes, it was the much coveted, long awaited amateur transmitting licence.

Out into the yard I went . . . "CQ CQ CQ this is Golf Six Hotel Hotel India calling CQ" and there was a station answering . . . we had arrived.

Still I couldn't spend long, for Joan (the friend who'd fetched the bump and rig) had managed to lock herself out of her car in the excitement and I had to go and prise out her back window to get the car open. Complicated business this amateur radio.

That evening I set it all up on the sitting room floor, then followed one of the most enjoyable hours ever spent; I couldn't get away from the rig. I had a QSO with a friend from the club, then when we'd finished other stations kept calling me to congratulate me on the call-sign, it really was magic and all the frustrations melted away. It seems it wasn't a conspiracy after all.

You know, the amateur fraternity is, by and large, unique: such a friendly lot who are so keen to welcome newcomers to the hobby. Long may it remain so.

Now I'm intending to start on CW, I'll let you know how it goes.

# VHF BANDS

NORMAN FITCH, G3FPK

## Six Metres at Last

**F**EBRUARY 1, 1983 was an historic date in the British VHF calendar, which saw our once again getting an amateur band in the 50 MHz region. Following protracted negotiations between the RSGB and the Home Office, permits have been issued to 40 Class A licensees to operate between 50 and 52 MHz outside B.B.C. Band 1 television broadcasting hours. The power levels and emission modes are as those for the 4m. band. This news was officially broadcast over GB2RS on Feb. 6. The 40 licensees are:— G2AOK, G3COJ, G3LTF, G3NOX, G3OHH, G3PWK, G3TCU, G3USF, G3VZJ, G3ZIG, G4BAO, G4BPY, G4CUT, G4GLT, G4HUP, G4IJE, G4JLH, G5KW and G6XM. The three in Ulster are:— G13RXV, G13ZSC and G14MJD, and from Jersey:— GJ3RAX, GJ3YHU and GJ4ICD. The Ten from Scotland are:— GM3DOD, GM3OBC, GM3WCS, GM3WOJ, GM3ZBE, GM4DIJ, GM4ELV, GM4FDT, GM4FZH and GM4IHJ, while Wales is represented by:— GW3LDH, GW4BCD, GW4HBK, GW4HXO and GW4IIL. Any Class A licensee may work the above crossband, but not Class B folk.

Broadcasting hours includes trade test transmissions and engineering transmissions, as well as the normal public entertainment service. If in doubt, the local TV station manager will furnish a schedule since not all Band 1 stations come on and close down at the same time. All Band 1 TV transmissions have to vacate the band by the end of 1986. However, the Merriman report recommended an earlier "QRT", so the rest of the Class A fraternity could be operating on 6m. rather sooner than might have been anticipated.

First reports suggest activity was rather low in the first few days. Paul Turner, G4IJE, (Essex) has had a successful MS QSO with Chris Tran, GM3WOJ, in Fort William, as well as a few tropo. contacts. More reports are awaited with interest. To whet the appetite, there are reports that Brazilian for sure, and Chilean stations possibly, have been copied around 2200-2300 on the band working into the U.S.A. The signals were weak and watery and your scribe is assured that these were 6m. signals and not 10m. IF breakthrough.

G4IJE has been "promoting" 6m. on the European VHF Net on 20m. and the interest is such that Paul is building a few converters to be sent to keen types for crossband operation 6/2m. It is planned for these converters to be circulated within groups and likely duplicated.

## Awards News

Two more readers have joined the 2m. QTH Squares Century Club. Certificate No. 22 dated January 14, went to Erik Cechota, OE3CEW, (I152f) from Scheiblingstein in Austria, for exactly 100 squares confirmed out of 132 worked at Jan. 3. CW accounted for 16 QSOs, the remainder being on SSB. Five contacts were *via Ar*, two *via E's*, 16 by MS and the rest were tropo. Unfortunately, Erik did not forward any station or personal details.

QTHCC Certificate No. 23 was issued to Angelo D'Elia, I6DQE, (GD48d) from Recanati, Italy on Jan. 24. His total is 103 confirmed, made up of 37 CW, and 66 SSB contacts. 65 QSOs were *via tropo.*, 32 by MS and six *via E's*, these latter including OD5MR (RT) on June 12, 1981, and JY9CF (RR), ZC4AG (QU) and 4X4IX (RS) on Aug. 4 last year. John Hunter, G3IMV, who has QTHCC Certificate No. 3, has got his "300" sticker, the first reader to achieve this total. He now has 302 confirmed out of 324 worked.

Keith Hewitt, G6DER, from Barnsley, is the 354th member of the 2m. VHF Century Club, his certificate being issued on Jan. 19. Licensed in Aug. 1981, he operates from the living room with an Icom IC-290E and Microwave Modules MM144/100S amplifier. The aerial is a 14-ele. *Cushcraft Yagi*. A bigger amplifier is being contemplated so that some serious MS work can be done.

## Beacon Notes

The recent tropo. lifts brought reports of distant beacon reception from several readers. G3COJ found FX6VHF on 144.145 MHz. This would be somewhere in north-east France. OK0EA (HK 18d) on 432.935 MHz was widely reported, as was FX3UHF (ZH53a) on 432.950 MHz. G8KAX recorded DF0AAD (FO64a) which sent, "10W ERP OMNI 250 MASL" on 432.99 MHz. John also mentioned DK0YI (EM 70j) which is supposed to run 70 mW on 432.95 MHz. Back on 2m., Y41B (FN28f) was heard on 144.985 MHz.

Dave Johnson, G4DHF, (Lincs.) wonders if the middle of 2m. is now the right place for beacons. He reckons that FM-ers, hearing nothing just below 145.00 MHz, simply QSY to apparently vacant "channels", oblivious of the fact they are clobbering GB3ANG, etc. Another point he makes is that serious DX-ers, wishing to peak up their receivers, really need weak beacons at the bottom end of the band, say just below 144.5 MHz. Your scribe's view

is that any more moves will not solve the problem, since any apparently clear part of the band will be commandeered by FM operators for local chats. Perhaps we should be asking that, with the large number of stations using 2m., can we now justify using FM which is so wasteful of precious spectrum space?

## The Satellite Scene

First, a reminder that 2AMSAT-UK's Annual General Meeting is scheduled for April 9: see p. 639, last month. Their book, "Satellite Tracking Software for the Radio Amateur" is a best seller and a five page addition is now available at 56p for U.K. members or a one pound note from overseas folk. The QTH for all AMSAT-UK inquiries is:— AMSAT-UK, LONDON E12 5EQ. An *s.a.e.* is requested.

The latest launch date information for *Phase 3B* is not May 27, so let us hope that the *E.S.A.* engineers can achieve a perfect launch next time, of the *ARIANE* vehicle. It is reliably reported that *RS-1* and *RS-2* telemetry beacons are sometimes activated when these 1978 "birds" are over the Soviet Union. Transponder operation heard is likely to be through *RS-2*, the uplink band being 145.860-145.915 MHz and the downlink, 29.340-29.395 MHz, non-inverting, with a beacon on 29.401 MHz. Only very little power is necessary on this transponder. The *TLM* is in the form P01K, C01K, etc., which differs from all other satellites.

The recorded message from the University of Surrey concerning *UOSAT* on Feb. 3 informed of further attitude manoeuvres prior to imminent boom deployment. On orbit no. 7217 on Jan. 26, the explosive pin-pullers were successfully fired in preparation for boom deployment. The 2.4 and 10.47 GHz beacons were switched on at the end of January and behaved as expected. At weekends, the 145.825 MHz beacon has been transmitting high speed *TLM*, news bulletins and the "Digitalker", other engineering requirements permitting. A reference orbit for Feb. 6 was no. 7391, EQX 12h.33m.16s. at 321.1°W and the period in minutes:— 95.16695 minus 5.48025 x 10<sup>-5</sup>N. The track separation is:— 23.791985 minus 1.378845 x 10<sup>-5</sup>N, where N is the orbit number.

Adrian Chamberlain, G4ROA, (Coventry) is now getting hard copy from *UOSAT* via his MM-2001 converter and Epson 80Mk 3 printer. At 1,200 Baud, it is too fast to read from the VDU. Russell Coward, G6HRI, (Blackpool) operates, on average, on 4 or 5 orbits per day via *O-8J* and the *RS* transponders. Up to Jan. 23, he lists 64 QSOs with 14 countries this year with assorted European and North American stations. Russell uses a Yaesu FT-290R with amplifier to give 100w. *e.r.p.*, the aerial being a 10-ele. *Parabeam* with a fixed 15° elevation for transmission.

The Rx side comprises a Yaesu FT-901DE with MM 10m. preamp. with a Delta loop or crossed dipoles aerial system. For Mode J, he has an MM transverter and 48-ele. *Multibeam*, again at 15° elevation. He often uses the FT-290R "barefoot" illustrating the benefits of a good receiving system. (Too many satellite ops. have big mouths and small ears! Ed.)

## Contests

**Results:**— Winners of the 1982, 432 MHz *Cumulatives* were the Five Bells Contest Group, G8ZHP, with 1,410 pts. Chris Easton, G8TFI, was runner-up with 1,357 pts. John Brakespear, G8RZP, came 3rd with 1,298 pts. out of 25 entries. The 1,296 MHz *Cumulatives* winners were the Hillbillies Contest Group, G4HWA/P, with 499 pts., with G4FRE/A, the Ipswich Microwave Activity Group, in second place with 409 pts. There were 11 entries. **Coming Events:**— Mar. 5/6 weekend sees the 144/432 MHz affair, 1400-1400 GMT. This is in two sections, Fixed and All-other. The next leg of the 70 MHz *Cumulatives* is on Mar. 13, 1000-1200, with another on the 27th, 0900-1100, all GMT. The first *AGCW-DL* event is on Mar. 19, 1900-2300 GMT on 432 MHz, with rules, etc., as last year. The Barking Radio and Electronics Society's 1983 2m. contest is on Mar. 27, 1300-1700 GMT in three sections:— Low power (10w o/p on FM, AM and CW, 40w p.e.p. SSB); High power being full legal limit; SWLs. Exchanges to consist of callsign, RS(T), serial number and postal county. One point *per* contact, but G3XBF and G8XBF are worth ten. Final score is total points times number of counties worked with countries outside the U.K. and "Ireland" counting as additional counties. There is just one class in this event. Entries, by Apr. 14, to Mr. M. G. Toms, at 43 Waterloo Rd., Barkingside, Ilford, Essex, IG6 2EG.

Finally, advance news of a challenging contest promoted by The 9H VHF/UHF/SHF Group in Malta, and named "The 9H Falcon Contest". The dates are 0001 on June 1 through 2400 on June 15 on 144 MHz all modes and all types of propagation except satellites and repeaters. More details later, but you will have to work *ten* 9Hs to qualify: pray for E's!

## VHF Convention

March 26 from 1030 a.m. at Sandown Park Racecourse in the day for the 1983 RSGB VHF Convention, details of which were given on p. 638 last month. Concerning the Equipment Test Facility, this is down to Don Hamilton, G8DON, whom your scribe telephoned on Feb. 6 for details. There will be some *Hewlett Packard* test gear including noise figure measuring and transceiver testing gear, so take along your super preamps.,

converters, etc., and learn how rotten some of them are!

## January Round-up

1983 got off to a flying start with some excellent tropo. and several *Auroras*, not forgetting the *Quadrantids* meteor shower. The period Jan. 21-24 brought a fine lift which started off with Spanish stations, ending up with Scandinavians as a big anti-cyclone in mid-Atlantic wandered majestically eastwards and northwards. Consequently, the mail bag is swollen this time so let us begin with the microwave bands.

## Gigahertz Bands

Brian Bower, G3COJ, (Bucks.) remarks on the number of French stations QRV on 23cm. now. He worked FIBUU (ZE08e) on Jan. 11 and later met Jean when he was in England on business. FIBUU has a 30w. solid-state, masthead-mounted 23cm. amplifier and worked up to ZN and ZO in the lift. On the 21st, Brian contacted FIFHI (ZH63d) who runs 100w. on the band, while the 22nd yielded F6HLD/P (CG55a) and F6DZK (AI20d). Dave Sellars, G3PBV, (Devon) heard FIBUU on the 11th and worked FIFHI on the 23rd along with G4CBW in Stockport. In the later evening, beacons ON5SHF and GB3NWK were heard.

John Tye, G4BYV, (Norfolk) asks to be taken out of the Squares Table so that younger readers can be included. He also worked FIBUU on the 11th, as did Adrian Chamberlain, G4ROA, in Coventry, who added HB9AMH/P (DH) and G3GIM (ZL) on the 22nd. Adrian uses one watt but should have a couple of *D-15* aerials aloft by now. Ray Cox, G8FMK, (Oxon.) added quite a few U.K. counties for the 1983 Table on Jan. 21-23, including GW3CCF (Clwyd) for the first outside England QSO. At 2310 on the 23rd, he made his first QSO with France, thanks to F6DZK.

Gordon Emmerson, G8PNN, (Northumberland) is now up to 30 sq. on 23cm. On Jan. 23, he worked some Gs and DB6BU, HB9MIN/P (DH) and OE2CAL (GH) at 1,313 kms., the best DX to date. Richard Hope, GW8TVX, (W. Glam.) uses 1.3w. to four 23-ele. *Tonna Yagis* on 23cm. and worked FIBUU and FIFHI on the 23rd.

Chris Bartram, G4DGU, was out —/P in Cornwall on Jan. 21 with half-a-watt and a single *Tonna* beam from near Boscastle. Contacts included G3COJ, G4KDH, G4KIY, G6AVK, G8FMK, G8ZXG and ON1JE (BL80). Writing from Saudi Arabia, Derek Brown, G8EC1, says he hopes to be home in Lincolnshire from Apr. 7 to 26, Aug. 10 to Sept. 5 and Dec. 14 to Jan. 3. One aim is to build a 2C39A amplifier for 23cm. to put AN square on the map again.

## QTH LOCATOR SQUARES TABLE

Station	QTH LOCATOR SQUARES TABLE			Total
	23cm.	70cm.	2m.	
G3VVF	—	117	307	424
G3POI	—	—	393	393
G3IMV	—	39	324	363
GJ4ICD	1	103	225	329
DK3UZ	—	—	304	304
G3JXN	55	95	150	300
G4IJE	—	—	290	290
EA3LL	—	30	252	282
SP2DX	—	—	280	280
GJ8KNV	12	76	191	279
G3COJ	36	87	150	273
LA8AK	23	50	195	268
G8KBQ	4	91	172	267
G3PBV	18	85	161	264
G4IGO	—	19	245	264
G4ERG	—	16	235	251
G3XDY	30	86	131	247
G3BW	6	35	198	239
G4DEZ	—	—	236	236
GW3NYV	—	48	185	233
G8VR	—	3	224	227
G8ATK	15	81	129	225
G3CHN	—	—	225	225
G8RZO	—	75	148	223
G8RZP	—	76	147	223
9H1BT	—	11	210	221
GM4COK	—	26	194	220
G8HHI	12	70	133	215
G4MCU	—	49	161	210
G4JZF	—	68	140	208
G8PNN	30	70	106	206
G8CXQ	—	61	145	206
G2AXI	9	72	120	201
G4PCI	—	28	167	195
G3FPK	—	—	193	193
GW4EA1	—	—	187	187
G3NAQ	—	58	128	186
G3KEQ	—	—	186	186
GM4CXV	—	26	159	185
G4OAE	—	26	157	183
G4NBS	13	73	92	178
G8TFI	—	95	82	177
G4NFD	—	36	138	174
G4ERX	6	46	121	173
G4HMF	—	32	140	172
G8FUO	3	86	80	169
GJ8BT	3	—	161	164
G8WPD	—	24	139	163
G4HFO	—	59	102	161
G4NOX	—	47	113	160
G6ADH	—	27	129	156
G8VRJ	16	38	101	155
G8KAX	17	56	82	155
G8LUL	—	62	91	153
G8FMK	21	59	72	152
GD2HDZ	13	46	91	150
G8LFB	—	—	150	150
G6HKT	—	60	89	149
G6ECM	—	—	141	141
G4MUT	—	54	82	136
G6ADE	—	64	70	134
G6DDK	—	11	122	133
G8TGM	—	—	133	133
G3FIJ	—	29	92	121
G4MJC	—	12	108	120
GM8OEG	—	—	115	115
G4MEJ	—	—	114	114
G8ORP	—	37	76	113
G8X1R	—	—	112	112
GM41PK	—	—	111	111
G4ROA	5	43	58	106
G8SRL	—	21	83	104
G4GHA	—	—	104	104
GW3CBB	5	16	79	100
G8WUU	—	27	72	99
G4MWD	—	—	95	95
G4RSN	2	19	71	92
G6DER	—	18	74	92
G8VJV	—	—	89	89
GM8BDX	—	33	53	86
G8RWG	—	—	83	83
G6HTJ	—	17	66	83
G4BVY	9	72	—	81
G8XOS	—	4	76	80
G4K1X	—	5	74	79
G8WPL	—	—	79	79
G4NWT	—	22	55	77
G6ABB	—	—	75	75
G4NRG	—	11	61	72
G6ELO	—	—	69	69
G6CNX	—	—	63	63
G8XMP	—	—	62	62
G8LXY	—	20	34	54
G4PEM	—	—	50	50
G8XTJ	—	—	48	48
G8ZYL	—	—	46	46
G4LDY	—	3	41	44
G6HRI	—	9	31	40

Starting date January 1, 1975. No satellite or repeater QSOs.

## Seventy Centimetres

This should have been included in the Beacon Notes; the Emley Moor beacon, GB3EM, should have changed its callsign to GB3MLY on Feb. 5, according to G3COJ. John Hunter, G3IMV, (Bucks.)

is zooming up the squares table and now has 58 to his credit. He was impressed with the performance of his *Trio* TS-780 in the recent lift without benefit of a pre-amplifier, and is thinking about improving the aerial system.

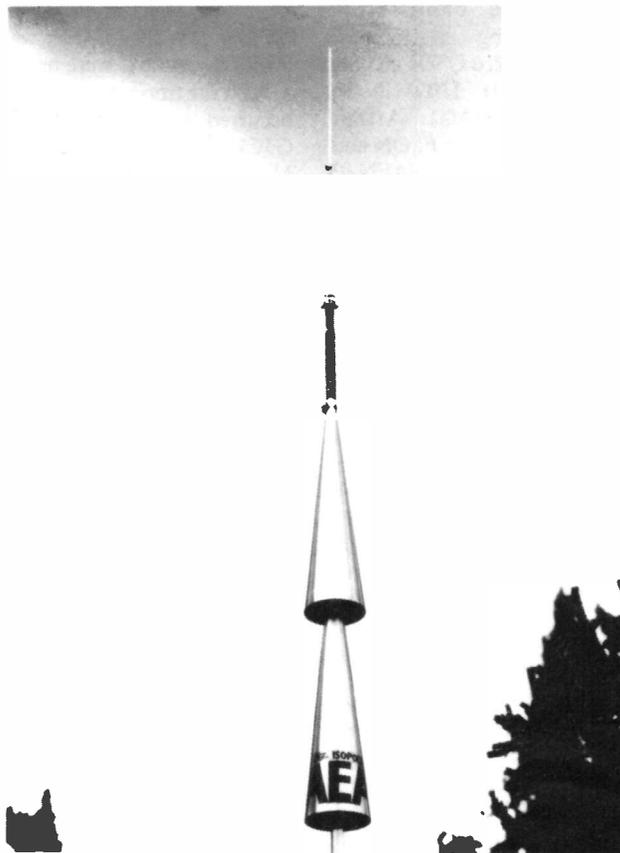
G3PBV reports strong *Syledis* QRM from Jan. 4 but did work F1BUU (ZE) and F6BZA (AG) on the 11th. The 17th brought F1FVP (ZF). The period 22/23 produced a crop of DX stations, the best being HB9AEN/P, DK2GR (FJ), OE3LFA (II). Dave called LA2SN (ES) for half an hour from 2100 on the 23rd, but could not get through "... 400 kms. of G stations". As compensation, he did get LA8AK (DS) to give Jan-Martin his first YK QSO. On Jan. 11, G4BYV heard EA2CA (YD60c) working Gs.

Nick Peckett, G4KUX, (Co. Durham) worked some OEs in the Jan. 22/23 affair but, although he copied OK0EA (HK), no OK stations were worked. German and Swiss stations were very strong. There is no doubt that the midlands and northern stations had much the best of the Jan. 22/24 lift and Jon Stow, G4MCU, (Essex) says he did not hear any of the really good DX to the south and south-east. It certainly seems that the London area was rather a dead spot much of the time. Jon's best DX on the 22nd were DF7VX (EL) on SSB/CW and DK2GR (FJ) on SSB. LA2SN was a good signal but the wall of PAs prevented a QSO.

Tony Collett, G4NBS, (Berks.) spent nearly all his operating time on this band and, although EA2CA (YD) was not completely worked, he did get a string of distant Fs on the 11th. Some GDX was also worked on the 11th and 12th. Between 1800 on the 22nd and 2400 on the 24th, Tony filled up three log pages contacting 20 Ds, 6 Fs, 3 HBs, 2 OEs, 2 LAs, PA, GU, GW, Y and assorted Gs. He was particularly pleased when DL7YC in Berlin answered a CW CQ call. This weekend produced 33 squares, including 12 new ones in six hours on the 22nd, but patience was needed for signals to come up to a workable level at times.

G4ROA in Coventry comments upon the very strong signals over the same weekend. Adrian has added another nine squares and remarks, "As usual, the band was very sedate with very little pile-ups". His best DX were HB9AEN/P, DG1NZ (FG) and DK5AI (FL). Derek Newton-Goverd, G6HKT, is a new contributor from Priddy in Somerset. On Jan. 11, he worked F1BUU, F1FVP (ZF80j) and F6BLP (ZE18h). On the 22nd, his list includes EA1NU (XD12d), F1BUT (AD63g), HB9AEN/P, HB9AMH/P (DH66c), some Ds in FJ and OE5UAL/5 (GI77a). Derek enters the Squares Table with 60 on the band.

G6HRI is always monitoring 432.2 MHz daily from 1500 to 2330 from his good QTH six miles east of Blackpool. He worked down to F1BUU on the 23rd, as



This unusual-looking two-metre omnidirectional vertical antenna is the *A.E.A. Isopole*, claimed to be the best vertical currently available in the United States and now obtainable in the U.K. The Isopole outperforms its competition not through size or gain but because, the makers say, of its unique feedline decoupling system: two decoupling cones prevent any radiation from the feedline, resulting in an absolutely horizontal radiation pattern. This means that distant FM stations and repeaters can be worked which could otherwise only be raised with either a large omnidirectional vertical or a beam antenna. Prices, including VAT, are: Isopole 144, £32.50; Isopole 440, £49.00. These antennas are available from *I.C.S. Electronics Ltd.*, P.O. Box 2, Arundel, West Sussex BN18 0NX. (Tel: 024365-590).

well as to other, nearer Fs. "What a superb start to the year", is how Martyn Jones, G8CXQ, (Warks.) begins his report which goes on to list 11 new squares worked in the Jan. 21-23 period. G8FMK, after a rather inactive 1982, hopes to be fairly active this year, mainly on this band and 23cm. Ray found conditions good but activity low, in the Jan. 10/11 lift, the only DX being F1FHI. On the 22nd, he contacted DF1EQ (DL), DF2UU/P (EI) and HB9AMH/P.

Richard Britton, G8FUO, (Berks.) wrote for the first time and increasing the power from 10 to 150w. has boosted his squares tally from 77 to 86 since the start of the year. On Jan. 11, he worked lots of Fs including AF, AG, ZE and ZH squares, plus EA2CA (YD). In a solid 12 hour session starting at 1320 on the 22nd, he made 75 QSOs, the choice offerings being:— HB9ASB (DG), EA1NU, DD9YB and OE5UAL/P in GI, Y22EN (GK), DL9RBK (GJ), DJ4AV (GK), OE3LFA and OE1APS in II, and

OE3PQU (HI). Much QSB was evident and conditions on the 23rd were indifferent except briefly around 2300 when LA8AK and LA2SN were worked.

John Lemay, G8KAX, (Essex) caught the Jan. 22/23 event and offers DG1NZ (FJ), DC5MJ (FI), FICCC/P (CG), F1BBS (DI) and HB9s AEN/P and 'AMH/P. Nearer home, Guernsey, Jersey and Alderney, GU3EIG, were worked. John Moxham, G8KBQ, (Somerset) worked 18 squares in the Jan. 21-23 event but found conditions poorer than on 2m. He reckons his best DX to have been DL9RBK, DL1EY (FJ), F1SA (CI), DK9MN (FI) and LA2SN.

Chris Easton, G8TFI, picked up 12 countries over the weekend Jan. 22/23, including EA, HB, LX, OE and OK. He worked HB9AMH/P and Arnold said that, when he heard the good conditions from his home QTH, he drove up the mountains to his portable location, but had to ski for the last two hours! G8PNN

had a ball on the band from Northumberland picking up 13 new squares on Jan. 23. Choice QSOs include OE2CAL, DF3CK (FH), HB9MIN/P, LA8AK and FIAGO (AG). Arthur Breese, GD2HDZ, got over to F, ON and PE on the 23rd and heard HB9AEN/P and the same day, Geoff Brown, GJ4ICD, found square no. 103, LA2SN in ES.

Now here's a thing! G4DGU had his 70cm. *E-M-E* array vandalised over the weekend Jan. 29/30, by someone who knew what they wanted. The power combiner and cables were stolen. Chris suggests potential *E-M-E* types consider a 16ft. stressed dish instead of multiple *Yagis*. It can be parked on the ground when not in use. He has had good results via the Moon last November working Z25JJ, YU1AW, JA6CZD, I5MSF, N9AB, F9FT, K3NSS, UA3LBO, SM3AKW, JA4BLC, OK1KIR and HB9SV, with VK5MC and VK6ZT heard. YU1AW was also worked on SSB at RS53 each way. All the above using eight *Tonna Yagis*.

Alex Scott, GM8BDX, (Borders) now has 300w. on the band to a 21-ele. *Yagi* at 35ft. and can now work G3NNG (Berks.) on a flat band. His best DX in the lift was OE3LFA, with DL7QY (FJ) and DL9MCC/P (GH) also worked. Walt Davidson, GW3NYY, (Swansea) confesses to playing with computers but offers RTTY QSOs for those needing XL square by that mode. On Jan. 23, he worked a number of Fs including F1ETX (AF) and FIAGO (AG) for two new squares.

## Two Metres

First the MS notes. Paul Turner, G4IJE, one of the keenest U.K. MS exponents, reports a successful QRP test with DJ5MJ (GI) on Jan. 30 when both stations were running 15w. Paul got 13 bursts and 5 pings from Peter, who received 6B, 5P from Paul, the test being completed in an hour. George Gullis, G4PCI, (Wilts.) had three skeds in the *Quadrants*, but none came off. He asks if the random SSB reference frequency of 144.400 MHz has replaced or augmented the earlier 144.200 MHz. The "200" QRG does not feature in the 2m. Band Plan published in the Jan. 1982 *RadCom*, only the "400" one. The idea of abandoning "200" was to get away from tropo. QRM. On this topic, Kevin Piper, G8TGM, (W. Sussex) mentions "some idiot" local to him who, from 1345 on Jan. 3, persisted in playing music on 144.200 during each listening period, for half an hour.

GW3NYY was busy in the *Geminids*, which he thought were not as good as in 1981. Walt reckons the *Quadrants* peaked around 20-22 hrs. on Jan. 3. He completed 10 QSOs:— DL3NAZ (EJ), YU3FM (HG), LA1TV (ET), YU3STB (HF), YU2JL (HD), LA6QBA (FT), Y22HA (GO), SM5CBN (HS) and

UQ2GCG (LR) at the fifth attempt, all on CW. IW2BNA (EF) was worked on SSB. Six contacts were new squares.

Next the tropo. events, the first of which occurred on Jan. 10/12. Roger Thorn, G3CHN, (Devon) heard weak PAs on the 11th and worked PA0RDY. The next day brought DC5AL/P (FL) and DF5DT (EL) on SSB but no CW signals were heard. Ken Osborne, G4IGO, (Bristol) mentions working Fs in AF, AG, CG, DI, ZE, ZF, ZG and ZH squares on the 11th. Jon Stow, G4MCU, had a partial QSO that day with EA2LP. G4NBS mostly left 2m. to the QRM but did work FIGTR (ZG) on the 11th, and F1CTK on the 12th. G4PCI picked out FIGFC (AF) and EA2EZ (ZD) as his best on the 11th, while Mick Cuckoo, G6ECM, (Kent) got EA2LP (ZD) and F6ELI (ZE).

Welcome to new contributor Robert Carter, G6ELQ, from Chesham, Bucks. who uses a *Yaesu* FT-480R and 100w. amplifier. The aerial is a 14-ele. *Cushcraft Yagi*, 6m. *a.g.l.*, his site being 165m. *a.s.l.* He lists 11 Fs on the 11th in southern France, the next day contacting DC5AL/P, F1CTK (CG), DF4IP (EJ) and two ONs in CK. G6HKT lists seven Fs worked on the 11th in AF, ZE and ZF squares and G8KAX worked down to AD and ZE, plus EA2LP the same day. On the 12th, John worked down to AE, ZE and ZH.

Jim Rabbitts, G8LFB, (London) did much the same on the 11th, but also managed HB9RDB (DH) and HB9ASB (DG) on the 12th. G8TGM also worked to southern France and into EA on the 11/12th period.

The next tropo. opening occurred on Jan. 16/17. G3CHN worked EB1WV (XD) and EA1CR on the 17th and the latter told Roger he had worked into Norway the previous day. G3PBV found FX8VHF in AF79h on the 17th. Dave did not mention the QRG which should be 144.955 MHz. G4IGO notes QSOs with EA1ANC and EA1TA (VD) and F6FOB (AD) in this period, while EA1ED (VD) was a new one for G4MCU on the 16th. Roger Greengrass, G4NRG, (Essex) worked F1BPS (AE) and F1HI (AD) on the 17th, also worked by G4PCI. For Rod Burman, G4RSN, F6GCI (AG) and EA1TA (VD) were two new squares on the 17th.

G6ECM contacted EA1CR and EA2LP on the 17th and G8KAX mentions QSOs with stations in AE, ZE and ZH. G8LFB lists F1BPS and two in AD, F6HLA and F1HI that day. G8TGM hopes to get AD confirmed, after working seven stations therein. Other contacts on the 16/17th were with EAs in VD, XD and YD.

The really spectacular opening was over the period Jan. 21-24. This started again with the northern Spanish area and southern France and the next day it favoured Italy and Switzerland, later Germany. On the 23rd, Austrian,

Czechoslovakian and Hungarian stations were worked, along with Germans, with the Scandinavians appearing towards the end of the day, when the Lerwick beacon, GB3LER, was a good signal in the south. This event fizzled out during the morning of the 24th.

David Whitaker, (N. Yorks.) sets the scene: he heard 16 countries and 70 squares. His best DX were OEs in GH, HI and II, and OKs in HJ, HK and IJ. After reading the *GB2RS* News Bulletin on the 23rd, G3CHN was called by OZ4VV, a novel experience, after which Roger worked LA, OZ and D folk in CS, EQ, EO and FO squares. In the evening, three SMs in FR provided the only new square. He reports that F6HRP worked to CU square from Normandy but that Alain was not too pleased when persistently called by G6s, in particular when he was calling for DX.

G3PBV worked OK1FH (GI) on the 22nd and a couple of Ds in GI. Dave also heard 4U1ITU very weakly when operator Geoff Grayer (G3NAQ) was working G8CKZ, but did get LA7RU (CS) at 1630 before the "wolf pack" descended. He wishes DX stations would be more selective and call for specific squares. Mark Turner, G4PCS, operated G3UNU in this lift and found DG and FH for new squares. He had QSOs with stations in D, F, HB, LA, LX, OE, OK, ON, OZ, PA and Y, and worked 4U1ITU twice. He found beam headings quite broad. Clive Penna, G3POI, (Kent) says his best DX on the 23rd was OK3CKJ/P in JI. Tim Raven's, G4ARI, (Leics.) list shows QSOs with D, GI, GM, GW, GU, EA, HB, ON and PA stations as well as a lot of GDX, which was overlooked by most operators anxious to get some EDX.

G4IGO wrote, "What an opening: all of Europe working all of Europe for most of the time". Ken then goes on to list some very choice DX. CW contacts took place with:— DF1CF (FH), DF3RU (FJ), HB9AOF (DG), Y24XN (GK), DL8MAS

TWENTY-THREE CENTIMETRES  
ALL-TIME TABLE

Station	Counties	Countries	Total
G3OSS	40	9	49
G3DAH	37	9	46
G8FMK	35	6	41
G6NB	28	7	35
G8IFT	28	5	33
G3XDY	25	7	32
G3PBV	21	7	28
GD2HDZ	21	7	28
G3COJ	19	8	27
G4NBS	20	6	26
G8LEF	16	6	22
G8PNN	12	9	21
G8KAX	18	3	21
G8HHI	17	3	20
G8VRJ	14	3	17
G4DKX	7	2	9
G3BW	3	5	8
GW3CBI	4	3	7
G8GNZ	4	2	6
G8OPR	3	1	4

Based on administrative counties.

## ANNUAL VHF/UHF TABLE

January to December 1983

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G4NBS	12	1	15	5	30	10	—	—	73
G8TFI	—	—	25	10	22	13	—	—	70
G4DEZ	—	—	39	22	—	—	—	—	61
G3FPK	—	—	44	14	—	—	—	—	58
G4ARI	11	1	32	11	1	1	—	—	57
G4ROA	—	—	22	5	13	6	2	3	51
G8FMK	—	—	7	2	12	6	19	3	49
G6HRI	—	—	19	8	9	6	—	—	42
G6ECM	—	—	28	14	—	—	—	—	42
G3PBV	<i>1</i>	<i>1</i>	11	10	6	7	2	2	38
G8PNN	—	—	3	6	14	8	3	4	38
G8KAX	—	—	17	8	5	7	—	—	37
G3FIJ	14	1	5	6	—	—	—	—	26
G4MUT	2	1	9	6	3	4	—	—	25
G8XTJ	—	—	13	5	—	—	—	—	18
GD2HDZ	—	—	3	6	4	4	—	—	17
GW4HBK	11	2	—	—	—	—	—	—	13
G4NRG	4	1	3	4	—	—	—	—	12
G2DHV	4	1	2	1	3	1	—	—	12

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

(GI), DL4RBK (FJ), OK1ATQ (HK), OK1FAV (GK), OK2LG (II), OK1FM (GJ), OZ1EYE (FQ), and LA4IAA (CS). On SSB, he offers:— HB9RCJ (DH), DL3MBG (GI), HB9QQ (EH), OE3CEW (II) SM7MRJ (GP), Y23BD (GM), OZ3ZW (FO), DF2ZC (EO), and LA7RU (CS). Y22QG (FM) was a mixed mode QSO.

D. Diambro, G4KTP, (Co. Durham) wrote for the first time and enthused over this opening. He uses a Yaesu FT-290 with home built QQV06-40A amplifier and 12-ele. ZL aerial at 40ft. He began on the 21st with Fs in AI and ZH, while the 22nd brought QSOs with D, F, HB and OK1FM and OK2LG (II). But the cream came on the 23rd with such as OE3EFS (HI), OE1WRS/3 (HH), OK2YCM (JI), OE3OBC (II), OE2DNM (GH) HG2KML (JH), HG4YF (JH), HG7PR (JH) and the best DX of all, HG4KXG (JG) at 1,685 kms. The total tally was 18 OKs, 11 OEs, 12 Ys, 39 Ds, 4 HGs, 18 Fs, 4 HBs and many OZ, PA and LA stations. The pile-up of rather undisciplined stations wishing to work ZO square is described as "horrific", with people calling during QSOs.

It certainly appears that Co. Durham did well in this lift as G4KUX worked all German squares except GO and HL, and all HB squares apart from FG. Nick missed 4U1ITU and was unable to get any HGs due to QRM. So his new QTH (ZO21e) has been well and truly christened. He runs 400w. *p.e.p.* to an 8-over-8 aerial, the site being 1,200ft. *a.s.l.*

G4MCU writes that this opening was remarkable for what he did *not* hear, when he could hear others, not all that far away, exchanging flattering reports with real DX. Jon's best DX was Y31QM/A on CW. Only two weak OKs were heard and no OEs. This was much the case at G3FPK. The choice DX went over G4NRG's head too, and Roger just notes a couple of HBs and an F station on the 22nd.

Ted Wharton, G4NUY, (N. Yorks.) is

another new correspondent and he did much better. His station comprises a Trio TR-9130, Mirage B3016 amplifier and 8-ele. Quad at 36ft. the site being 260ft. *a.s.l.* The majority of the DX was worked on the 23rd, a total of 50 SSB QSOs to D, OK, ON, PA and Y in 21 squares, 9 of them new. Best DX was OK1AIY/P (HK28c).

G4PCI only listed contacts over 700kms. and there were 45! 9 were over 1,000kms. and George's list shows 29 Ds, 7 Ys, 4 OKs, 2 Fs and OEs and an HB. G4RSN remarks upon the relative absence of near Europeans. Rod managed some F and D stations, plus HB9RO (DG) and LX1JA (CJ) on the 22nd.

It may have been disappointing in Essex and London, but from Herne Bay, Kent, G6ECM worked over 200 stations. Mick's list of the better QSOs breaks down to 14 Ds, 8 Fs, 5 HBs, one LA and LX, 2 Ys and OE5OLL/5 (GI78j). While most folk were looking to the south through east, there were good GDX conditions too, and G6HRI worked EI7EH (WN) on the 21st. Russell's best DX seems to have been DF1CF (FH) at 1,160kms. G8CXQ did not spend much time on 2m., but in the wee small hours of the 23rd, managed Y24XN (GK), OK1OA (HK), OE3LFA (II) and F6EQZ (CJ).

G8KBQ worked 32 squares over the three days and singles out the best DX as OK2KZR/P (IJ), OK2LG (II), OK1DKX (HI), OK1OA, OK1HAG (HJ), Y30BNE/P (HM) and LA6HL (CS). G8LFB's list includes 7 Swiss stations on the 22nd, plus OE5FPL (GI) and OE3CEW (II). G8TGM reports DX hard to find from Bognor Regis. Kevin heard a station in Southampton working OE, OK, OZ, LA and Y stations which were inaudible with him. Even so, he goes on to list assorted D, F and HB QSOs on the 22nd, plus Y23FG (FM), Y24XN, OE3CEW and then at 0145 on the 23rd, the best tropo. DX so far, OE3LFA at 1,251 kms. Some 23 hours later, LA6HL was worked for country no. 23.

John Fitzgerald, G8XTJ, (Bucks.) gave up trying to get through to the Ds and HBs and the one Y heard, but did contact a number of Fs, including F6ETI (YH) and FIGBP (XH). The furthest south he got was FICAS/P in AF. G8TFI mentions LA6HL and LX2BG, as the only stations worth reporting and GJ4ICD got his 225th square with LA9LS (DS). Although he did not get any new squares, GW3NYY made 150 Continental QSOs on Jan. 22/23, OK2KZR/P at 1,446 kms. being a record tropo. distance for Walt. In all he worked 46 squares in the period but could not hear any of the Scandinavians that other near neighbours were working on the 23rd.

Just as this was being edited, there were Auroras on Feb. 4, 5 and 6, rather northerly affairs, with lots of GMs, GIs, a few EIs, Scandinavians and some UQ2s, etc. Ken Willis, G8VR, (Kent) reckons he heard OY5NS (WW) around midnight on the 4th. More next time.

## Four Metres

Only a few reports, the first from G4ARI who added some counties in the first leg of the *Cumulatives* on Jan. 30. On Jan. 14, G4IJE (AL) had a very successful MS QSO with GM3WCS (YQ) getting 25B and 39P from Ken, who received 35B and 15P from Paul, the longest bursts being 7 secs. In the Feb. 4 *Ar*, Paul worked EI2CA (WM) and the next day, EI6AS (WN). All the 4m. beacons were *Ar* with EI4RF and GB3CTC quite loud.

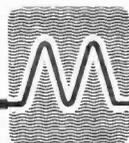
G4NBS borrowed a transverter and stuck a dipole in the loft to take part in the contest on Jan. 16. Tony had 17 QSOs and is now making a transverter of his own. GD2HDZ tuned the band on Jan. 21 at the start of the tropo. lift to find it full of broadcast FM stations *via E's* at 1800. Dave Crisp, G4OAE, reported strong *E's* at 2100 on Feb. 7. Dave Lewis, GW4HBK, (Gwent) was on for the contest and heard several new calls. The last two hours were the best with G3KMS (Lancs.) worked for best DX.

## Final Miscellany

G4DHF is planning a DX-pedition to YS, XS and YT squares at the beginning of August. Doug Parker, G4DZU, is handling the *Lunar Letter* for *E-M-E* types and will send details for an *s.a.e.* His address: 14 Moorside Crescent, Drighlington, Bradford, BD11 1HS.

## Deadlines

All your letters and claims for next month by **March 2**, please, and for May, by Apr. 6 to: "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 de G3FPK.



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R0	4.0277	8.0555	12.0833	14.9888	18.1250	44.9688
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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	4.0354	8.0708	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*
S18	—	—	12.1208	14.9722	18.1812	44.9166*
S19	—	—	12.1229	14.9750	18.1843	44.9250*
S20	4.0416	8.0833	12.1250	14.9777	18.1875	44.9333
S21	4.0423	8.0847	12.1270	14.9805	18.1906	44.9416
S22	4.0430	8.0861	12.1291	14.9833	18.1937	44.9500
S23	4.0437	8.0875	12.1312	14.9861	18.1968	44.9583

SR = Series Resonance \*HC25 only

Also in stock: R0 to R7 and S8 to S23 for following: Belcom FS1007, FDK TM56, Multi 11 Quartz 16 and Multi 7, Icom IC2F, 21, 22A and 215, Trio Kenwood 2200, 7200, Union 2030 and Yaesu FT2FB, FT2 Auto, FT224, FT223 and FT202

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	5	50	1.00 to 1.499MHz	£10.50	£6.00	
	6	10	1.50 to 1.999MHz	£4.75	£4.40	
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	10	10	21.00 to 24.999MHz	£6.00	£5.40	
	10A	10	25.00 to 30.000MHz	£8.50	—	
	3rd OVT	11	10	21.00 to 59.999MHz	£4.55	£4.00
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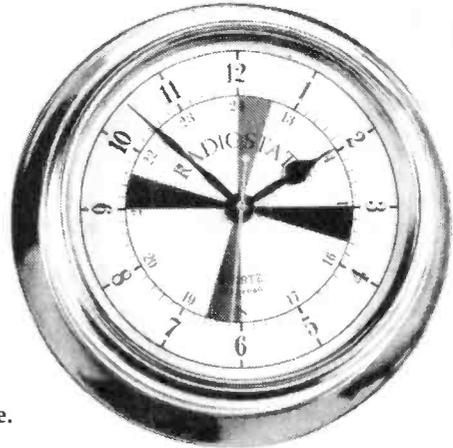
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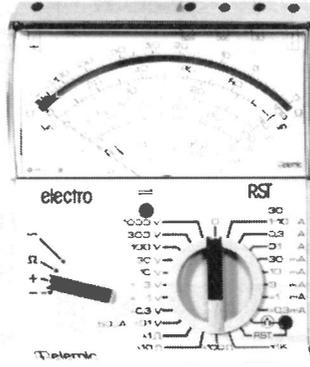
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